Application for Site Certification

Washington Energy Facility Site Evaluation Council
Wautoma Solar Energy Project

Applicant

INNERGEX

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Acronyms and Abbreviations

AC	alternating current
ADT	Average Daily Traffic
amsl	above mean sea level
Applicant	Innergex Renewable Development USA, LLC
ASC	Application for Site Certification
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
BCC	Benton County Code
BESS	battery energy storage system
BGEPA	Bald and Golden Eagle Protection Act
bgs	below ground surface
BLM	U.S. Bureau of Land Management
BMP	best management practice
BPA	Bonneville Power Administration
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
CRP	Conservation Reserve Program
CSWGP	Construction Stormwater General Permit
CUP	conditional use permit
dBA	A-weighted decibels
DC	direct current
DNR	Washington Department of Natural Resources
Ecology	Washington State Department of Ecology
EFSEC	Energy Facility Siting Evaluation Council
EPA	U.S. Environmental Protection Agency
ESCP	Erosion and Sediment Control Plan
FEMA	Federal Emergency Management Agency
gen-tie line	generation-tie transmission line
GHG	greenhouse gas
GMAAD	Growth Management Act Agricultural District
HCA	habitat concentration area
HPA	Hydraulic Project Approval
IBC	International Building Code
ISO	International Organization for Standardization
KOP	key observation point

kV	kilovolt
L_{eq}	equivalent sound level
LOS	level of service
MW	megawatt
NAAQS	National Ambien Air Quality Standards
NEC	National Electric Code
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
NO_2	nitrogen dioxide
NRHP	National Register of Historic Places
O&M	operations and maintenance
PCS	power conversion system
PHS	Priority Habitats and Species
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
POI	point of interconnection
Project	Wautoma Solar Energy Project
PSD	Prevention of Significant Deterioration
PV	photovoltaic
RCW	Revised Code of Washington
SCADA	supervisory control and data acquisition
SEPA	State Environmental Policy Act
SO_2	sulfur dioxide
SPCC Plan	Spill Prevention, Control, and Countermeasure Plan
SR	State Route
SWPPP	Stormwater Pollution Prevention Plan
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WNHP	Washington Natural Heritage Program
WSDOT	Washington State Department of Transportation

PART 1 – OVERVIEW/SUMMARY

A. Basic Information

A.1. Applicant

Name/Contact:
Innergex Renewable Development USA, LLC c/o Laura O'Neill

Mailing address:
3636 Nobel Drive, Suite 260
San Diego, CA 92122

Phone: (604) 633-9990
Email: Loneill@innergex.com

A.2. Preparer

(if different from applicant)

Name/Contact:
Tetra Tech, Inc.
c/o Linnea Fossum

Mailing address:
19803 North Creek Parkway
Bothell, WA 98011

Phone: (503) 727-8062
Email: linnea.fossum@tetratech.com

A.3. Property Owner

(if different from applicant; attach a list of owners if applicable; identify if the property is under lease, and identify any nonprivate owners)

Name/Contact: See the Applicant's response to Part 1, Section A.4 below.
Mailing address: See the Applicant's response to Part 1, Section A.4 below.
Phone: N/A
Email: N/A

The table provided in the Applicant's response to Part 1, Section A.4 identifies property owners of the 35 assessor parcels encompassed by the Project Lease Boundary (see Part 2 Section A.2 for definition of terms used in this Application for Site Certification [ASC]). The Applicant has executed a Lease Agreement with each identified property owner. All of the parcels in the Project Lease Boundary are privately owned. The Applicant is also pursuing easements/crossing/road use agreements with the Bonneville Power Administration (BPA) and one other landowner for Project access roads and collection line crossings of existing easements, as well as a transmission interconnection agreement (refer to Part 2, Section A.2 Project Description for additional details).

A.4. Location of Proposed Site

(attach a list of additional properties, if applicable)

Street address: N/A
County: Benton County
County Assessor's number(s): See below
Township/Range/Section Number: See below
Legal description: See Attachment C

The table below provides the description of the assessor parcels encompassed by the Project Lease Boundary and Project easements. The location of these parcels is shown on Figure A-2 in Attachment A.

Assessor Parcel Number[1/]	Property Owner	Mailing Address					PLSS
		Street	City	State	Zip	County	
119241012749001	Ford, Robert and Marilyn	5804 W Walnut St	Yakima	WA	98908	Benton	T12N R24E S19
119243000001001	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S19
119244000001001	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S19
119244000001002	Wautoma Valley LLC	5305 MacLaren Ct	Yakima	WA	98908	Benton	T12N R24E S19
119244000002000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S19
120241000001000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S20
120242000001000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S20
120243000002000	Robert Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S20
120243000003000	Robert Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S20
120243000004000	Robert Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S20
120243011787001	Robert Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S20
120244000000000	Robert Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S20
121241000001000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S21
121243000000000	Robert Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S21
122241000000000	Robert, Et Al Michael V	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S22
122242000000000	High Valley Land LLC	1221 Plateau Dr	Richland	WA	99352	Benton	T12N R24E S22
122243000001000	High Valley Land LLC	1221 Plateau Dr	Richland	WA	99352	Benton	T12N R24E S22
122243000002000	High Valley Land LLC	1221 Plateau Dr	Richland	WA	99352	Benton	T12N R24E S22
127240000000000	High Valley Land LLC	1221 Plateau Dr	Richland	WA	99352	Benton	T12N R24E S27
128241000000000	Robert Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S28
128243000000000	Robert Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S28

Assessor Parcel Number[1/]	Property Owner	Mailing Address					PLSS
		Street	City	State	Zip	County	
129241000000000	Robert, Jean Emile	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S29
129242000001000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S29
129243000001000	Robert Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S29
129244000000000	Robert, Robin	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S29
130241000000000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S30
130242000001000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S30
130242000003000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S30
130244000000000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S30
132241000001000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S32
132241000002000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S32
133240000000000	Robert Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S33
1192410055555552/	United States Government (BPA)	-	-	-	-	-	T12N R24E S17
1172430055555553/	United States Government (BPA)	-	-	-	-	-	T12N R24E S19
1202410000020004/	United States Government (BPA)	PO Box 61409	Vancouver	WA	98666	Benton	T12N R24E S20, 21

1/ Assessor parcel information is based on current Benton County assessment records last updated by the County on 3/3/2022.
2/ Parcel associated with the easement for access road and collection across an existing transmission line in the northwest corner of the Project.
3/ Parcel associated with the Wautoma Substation access road and access to the northern solar array and point of interconnection (POI).
4/ Parcel associated with the transmission line POI at the Wautoma Substation and access road to the northern solar array and POI.

B. Project Summary

Innergex Renewable Development USA, LLC (Applicant) proposes to construct and operate the Wautoma Solar Energy Project (Project) located in unincorporated Benton County, Washington (Attachment A, Figure A-1). The Project is a 470-megawatt[1] (MW) solar photovoltaic (PV) generation facility coupled with a 4-hour, 470-MW battery energy storage system (BESS), as well as related interconnection and ancillary support infrastructure.

The Project's solar PV system will convert energy from the sun into electric power. The solar PV system will consist of a series of solar PV panels mounted on a solar tracker racking system and related electrical equipment. The system includes the solar panels, tracker racking system, posts, collector lines, and power conversion systems (PCS), which consists of the BESS, inverters, and transformers. The BESS can either store electricity for future use or, as required based on grid demand, convert direct current (DC) electricity to alternating current (AC) electricity and send the AC electricity to the step-up transformer. The solar PV system and BESS system are further described in Part 2, Section A.2.a.

The Project also includes the following supporting components: Project substation, overhead 500-kilovolt (kV) generation-tie transmission line (gen-tie line), operations and maintenance (O&M) building, associated Project access roads, and perimeter fencing. Chain-link fencing will be installed around the perimeter of the solar array, Project substation, and O&M building area. The point of interconnection (POI) is the Bonneville Power Administration (BPA) transmission system at the BPA Wautoma Substation, which is located on BPA federal lands surrounded by the Project Area. An approximately 0.25-mile-long overhead 500-kV transmission line will extend from the Project substation to the POI. Project-supporting components are further described in Part 2, Section A.2.a.

The Project's construction is anticipated to begin in the second quarter of 2028, with a Commercial Operations Date planned for the first quarter of 2030 (22-month construction schedule).

[1] Megawatt rating provided in alternating current (MWac)

C. Site Summary

The Project is generally located 12.5 miles northeast of the city of Sunnyside and 1 mile south of the State Route (SR) 241 and SR 24 interchange in Benton County, Washington (see Attachment A, Figure A-1). The Project Lease Boundary encompasses approximately 5,852 acres across 35 privately owned assessor parcels listed in Part 1, Section A.4. The Applicant has executed a Lease Agreement with the underlying properties within the Project Lease Boundary for adequate acreage to accommodate the Project. The Applicant is also pursuing easements/crossing/road use agreements with BPA for Project access roads, collection lines, and transmission interconnection. The Project Area is a subset of the Project Lease Boundary within which surveys have been conducted and Project facilities may be constructed, in compliance with conditions that may be imposed by the Site Certification Agreement. The Project Area encompasses approximately 4,573 acres. Within the Project Area, a smaller area will be permanently or temporarily disturbed by Project construction, as described in Part 2 of this ASC.

Lands in the Project Area have historically been utilized for agricultural activities (crop cultivation and grazing), although the areas used for these activities have varied over time. The Project is located entirely on land within the Benton County Growth Management Act Agricultural District (GMAAD). Existing land uses in the Project Area include dryland and irrigated agriculture, rangeland, undeveloped areas, local roads, electrical infrastructure (e.g., transmission and distribution lines, substations), and scattered unoccupied structures (e.g., agricultural storage). Adjacent land uses surrounding the Project Area are similar and also include scattered rural residences, vineyard, rangelands, state highways, and the Hanford Reach National Monument. Project consistency with local land use codes and policies is addressed in Part 4, Section 4.14 and in Attachment D.

Habitat surveys identified nine habitat types within the Project Area, including agricultural land, developed/disturbed, eastside (interior) grassland, irrigated hedgerows, non-native grassland and forbland, planted grassland, rabbitbrush shrubland, shrub-steppe, and talus. As shown in Table 4.8-1, approximately 93 acres of eastside (interior) grassland, 63 acres of shrub-steppe, and 3 acres of talus habitat occur within the Project Area. As shown in Attachment A, Figure A-9, eastside (interior) grassland habitat is most prevalent in the southern and eastern portions of the Project Area, shrub-steppe habitat is most prevalent in the north-central portion, and talus slopes are found in the southwest corner. See the Wildlife and Habitat Survey Report (Attachment G) for additional details on habitat types observed within the Project Area as well as their distribution in the area.

As discussed in Part 4, Section 4.3, there are three palustrine emergent wetlands and 34 ephemeral stream segments within the Project Area. The Project Area contains a creek located in the 100-year floodplain listed on the Federal Emergency Management Agency (FEMA) maps. However, no flow in this creek has been observed during Project surveys, and per discussions with a Project participant landowner, it is extremely rare for the creek to have visible flows. Further, a Riparian Analysis Memo prepared in 2020 for Benton County's critical areas update stated that Dry Creek was among several named streams in the County that were not measured

due to lack of visible flows (AC Geospatial LLC 2020). The Project is designed to avoid and minimize impacts to ephemeral streams to the extent feasible.

Slopes within the Project Area range from zero to 51 percent. In general, the Project Area is on relatively flat terrain with slopes of less than 3 percent. Soils with slopes greater than 30 percent account for less than 3 percent of the Project Area. Steeper terrain is also located in areas to the south, east, and north outside of the Project Area. Geology, soils, slope, topography, and potential geological hazards relative to the Project Area are evaluated in Part 4, Section 4.1.

The visual setting of the Project Area is agricultural land with a mix of irrigated cropland, dryland agriculture, and open rangeland with a low number of related agricultural buildings and rural residential development. Where the Project is visible, the Project components would be consistent with other horizontal and vertical lines and geometric shapes visible throughout the landscape lines (fencing, roadway, substation, transmission towers and lines, utility poles and lines, agricultural structures) and would not block views of the surrounding hills. The Project will not introduce a source of light that will significantly impact views in the area. The glare analysis (Attachment H) concluded the Project will not introduce a source of glare that will significantly impact motorists, residents, or views in the area. Additional discussion of light, glare, and aesthetics are addressed in Part 4, Section 4.16.

Some changes to stormwater drainage may occur as a result of new impervious surfaces developed as part of this proposal (e.g., gravel roads, foundations for solar array posts, battery storage container pads, pads for substation components, etc.). Overall, impervious surfaces are a low percentage of the total Project Area (approximately 3 percent of the Project Area; see Part 2, Section B.2). The Project will be designed and constructed to comply with Benton County and the Washington State Department of Ecology (Ecology) requirements in retaining stormwater on-site and maintaining natural drainage patterns for conveyance of upland flow, and the Project's Erosion and Sediment Control Plan (ESCP), Construction Stormwater Pollution Prevention Plan (SWPPP), Permanent Stormwater Control Plan, and Vegetation and Weed Management Plan will provide specific measures to minimize erosion and sedimentation during and after construction. Additional discussion of stormwater best management practices (BMPs) and design considerations for stormwater runoff are addressed in Part 4, Section 4.5.

During siting and design, the Applicant took several measures to avoid and minimize impacts to botanical resources. The Applicant minimized impacts to shrub-steppe habitat and will avoid talus slopes (i.e., Priority Habitats). As described above, the Applicant sited the Project to avoid the population of the state sensitive Columbia milk-vetch documented during surveys conducted for the Project. In addition, the Applicant incorporated passageways through the solar panel array fencing to allow big game to pass through the Project Area.

Incorporating a number of conservative assumptions, acoustic modeling results indicate that the Project will comply with the 50-decibel nighttime limit at all non-participating noise sensitive receptors (i.e., residences). In addition, the Project is predicted to comply with all the applicable Washington Administrative Code (WAC) regulatory limits at the Project Lease Boundary implementing either BESS design configuration. WAC 173-60-050 exempts temporary construction noise from the state noise limits; however, BMPs will be implemented to reduce off-site construction noise impacts. Noise associated with Project construction and operation is addressed in Part 4, Section 4.16a.

The Project has been designed to avoid direct impacts to cultural resources that are eligible or unevaluated/potentially eligible for listing on the National Register of Historic Places (NRHP). As currently designed, the Project has no direct impacts to such resources, which are avoided by a minimum of 30 meters. The Applicant would continue to coordinate with the Tribes regarding the archaeological sites and the potential impacts of the Project on these sites. The current design does not avoid eight archaeological sites of historic-era refuse scatters or farm equipment pieces that have been recommended in confidential Attachment Q as not eligible for listing on the NRHP. The sites are not considered significant register-eligible resources and, pending concurrence by the Department of Archaeology and Historic Preservation (DAHP), any impacts on them would not be considered significant impacts and would not require a permit under Revised Code of Washington (RCW) 27.53. If any pre-contact-era archaeological site or any NRHP-eligible or unevaluated/potentially eligible historic-era site would be impacted by the Project's final design, the Applicant would obtain a DAHP excavation permit and perform all necessary archaeological work in order to comply with RCW 27.53. Archaeological and historic resources and cultural resources are addressed in Part 4, Section 4.18 and Section 4.19, respectively.

A Traffic Control Plan will be prepared in coordination with the Washington State Department of Transportation (WSDOT) and the Benton and Yakima Counties Public Works Departments to mitigate transportation hazards during the construction of Project accesses to public right-of-way. Operations traffic would be negligible since there will be four or fewer permanent employees. The limited number of daily trips anticipated during Project operations would be negligible relative to current and projected level of services. Traffic management during Project construction is addressed in Part 4, Section 4.20.

Based on the information provided herein, the State of Washington Energy Facility Siting Evaluation Council (EFSEC) may find that the Project complies with applicable laws under RCW 80.50 for energy facility site locations and with applicable rules under WAC 463-60 for evaluation of this streamlined solar ASC. EFSEC may also find under WAC 197-11 that with mitigating conditions and compliance with applicable County, state, and federal regulations and permit requirements, the Project will not result in significant adverse impacts on the environment.

D. Screening Summary

Note to applicant:
- This is an active, changing list and on-going focus for discussion.
- This information must match with the information in Part 3.
- This information is very important in the pre-application stages.

	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
1. Earth	Yes	Yes	Yes	Yes	Yes
2. Air Quality	Yes	Yes	Yes	Yes	Yes
3. Water Quality – Wetlands and Surface Waters	Yes	Yes	Yes	Yes	Yes
4. Water Quality – Wastewater Discharges	No	N/A	Yes	Yes	N/A
5. Water Quality – Stormwater Runoff	Yes	Yes	Yes	Yes	Yes
6. Water Quantity – Water Use	No	N/A	Yes	Yes	N/A
7. Water Quantity – Runoff, Stormwater, Point Discharge	No	N/A	Yes	Yes	Yes
8. Plants	Yes	Yes	Yes	Yes	Yes
9. Animals	Yes	Yes	Yes	Yes	Yes
10. Energy and Other Natural Resources	No	N/A	Yes	Yes	N/A
11. Waste Management	No	N/A	Yes	Yes	N/A
12. Environmental Health – Existing Site Contamination	No	N/A	Yes	Yes	N/A
13. Environmental Health – Hazardous Materials	Yes	N/A	Yes	Yes	Yes

	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
14. Land Use, Nat. Resource Lands & Shoreline Compatibility	Yes	Yes	Yes	Yes	Yes
15. Housing	No	N/A	Yes	Yes	N/A
16. Noise, Light, Glare, and Aesthetics	Yes	Yes	Yes	Yes	Yes
17. Recreation	No	N/A	Yes	Yes	N/A
18. Archaeological and Historical Resources	Yes	Yes	Yes	Yes	Yes
19. Cultural Resources	Yes	Yes	Yes	Yes	Yes
20. Traffic and Transportation	Yes	Yes	Yes	Yes	Yes
21. Public Services and Facilities	No	N/A	Yes	Yes	N/A
22. Utilities	No	N/A	Yes	Yes	N/A

E. List of Studies

Note to applicant:
- This is an active, changing list and on-going focus for discussion.
- This information must match with the information in Part 3.
- This information is critical to the pre-application stage.

Report No.	**Topic**	**Name of Report and Location for Review**	**Status** (e.g., scoping, contracting for, started)	**Date of Completion** (past or expected)
Attachment D	Land Use	Land Use Consistency Review	Complete	April 2022
Attachment F	Vegetation	Botanical Survey Report	Complete	January 2022
Attachment G	Wildlife and Habitat	Habitat and General Wildlife Survey Report	Complete	January 2022
Attachment H	Glare	Solar Glare Analysis Report	Complete	April 2022
Attachment I	Wetlands and Surface Waters	Wetland Delineation Report	Complete	November 2021
Attachment J	Water Quality	Preliminary Stormwater Management Report	Complete	January 2022
Attachment K	Water Quality	Preliminary Hydrology Report	Complete	December 2021
Attachment L	Wildlife	Raptor Nest Survey Report	Complete	January 2022
Attachment N	Socioeconomic	Socioeconomic Review	Complete	April 2022
Attachment O	Noise	Acoustic Assessment Report	Complete	April 2022
Attachment P	Visual and, Aesthetics	Visual Impact Assessment Report	Complete	April 2022
Attachment Q (Confidential)	Archaeological, Historical, and Cultural	Cultural Resources Survey Report and Unanticipated Discovery Plan	Complete	April 2022
Attachment S	Earth	Preliminary Geotechnical Engineering Report	Complete	February 2022
Attachment G	Wildlife and Habitat	Habitat and General Wildlife Survey Report Addendum	Complete	August 2022
Attachment F	Vegetation	Botanical Survey Addendum	Complete	August 2022
TBD	Environmental Health	Phase 1 Environmental Site Assessment	Pending	Prior to construction; TBD

F. List of Stakeholders

Note to applicant:
- This is an active, changing list and on-going focus for discussion.
- This information is critical to the pre-application stage.

Type	Specific[1/]	Contact (name, program)	Areas of Discussion	Status of Engagement[2/]
State Government	Washington Department of Fish and Wildlife (WDFW)	Mike Ritter and Jason Fidorra	Wildlife, surveys, and general biological resources.	Ongoing
State Government	Washington Energy Facility Siting Evaluation Council (EFSEC)	Sonia Bumpus and Amí Hafkemeyer	General, permitting, project description, and application process.	Ongoing
State Government	Washington State Department of Ecology (Ecology)	Lori White	Wetland and waters delineation.	Ongoing
State Government	Washington Department of Archaeology and Historic Preservation (DAHP)	Allyson Brooks	Review of Cultural Resource Survey Report.	Anticipated upon report submittal
Tribal Government	Confederated Tribes of the Warm Springs Reservation of Oregon	Christian Nauer	Cultural resources, surveys, and general introduction to the Project.	Ongoing
Tribal Government	Samish Indian Nation	Tom Wooten	Cultural resources, surveys, and general introduction to the Project.	Ongoing
Tribal Government	Wanapum Tribe	General mailing address	Cultural resources, surveys, and general introduction to the Project.	Ongoing
Tribal Government	Confederated Tribes and Bands of the Yakama Nation	Casey Barney and Phil Rigdon	Cultural resources, surveys, and general introduction to the Project.	Ongoing
Tribal Government	Confederated Tribes of the Colville Reservation	Cody Desautel and Michael Findlay	General introduction to the Project.	Ongoing
Tribal Government	Confederated Tribes of the Umatilla Indian Reservation	Teara Farrow Ferman	Cultural resources, surveys, and general introduction to the Project.	Ongoing
Local Government	Benton County	Greg Wendt, County Commissioners, County Communications Officer	Land use and local permits, arranging for Innergex to present the project at a Benton County Commissioner's Meeting in Q2 2022.	Ongoing
Property Owners	Property Owners	See Part 1, Section A.4	The Applicant has executed a Lease Agreement with each identified property owner within the Project Lease Boundary.	Ongoing

1/ Entities typically consulted include Ecology, WDFW, Washington Department of Natural Resources (DNR), DAHP, tribal governments, the Department of Defense, neighboring property owners, local government, etc. Not all of these may be required for each project but should serve as a starting point for applicant contacts for coordination.
2/ for example: Intend to contact, contacted, ongoing engagement, engagement complete

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PART 2 – CORE INFORMATION

A. Project Basics

A.1. Project Name

Wautoma Solar Energy Project (Project)

A.2. Project Description

A.2.a Describe Proposal

Include all components of land use.
Include activities occurring during project phases.

1.0 INTRODUCTION

The Applicant proposes to construct and operate the Project located in unincorporated Benton County, Washington (Attachment A, Figure A-1). The Project is a 470-megawatt[1] solar PV generation facility coupled with a 4-hour BESS sized to the maximum capacity of the Project, as well as related interconnection and ancillary support infrastructure. The Project is generally located 12.5 miles northeast of the city of Sunnyside and 1 mile south of the SR 241 and SR 24 interchange in in Benton County, Washington.

This streamlined solar ASC uses the following terms to describe areas associated with Project development:

- **Project Lease Boundary**: The approximately 5,852-acre area that encompasses 35 privately owned assessor parcels for which the Applicant has executed a lease agreement with the underlying property owner (Attachment A, Figure A-2). Construction and operation of the Project are limited to the Project Area described below and shown on Figure A-1 in Attachment A.

- **Project Area:** The approximately 4,573-acre area that includes all of the Project facilities, including solar PV system and BESS, Project substation, transmission line, O&M facility, and associated access roads.

- **Fenced Area:** The estimated 2,974 acres within the Project Area that will be enclosed by fencing, including solar arrays, Project substation, and the O&M facility.

Current land uses in the Project Area include irrigated agriculture, rangeland, undeveloped land, local roads, and existing electrical utility infrastructure. Lands within the Lease Boundary and to the north, west, and south are zoned for agricultural purposes in Benton and Yakima counties with similar land uses as the Project Lease Boundary, as well as several rural residences. The Hanford Reach National Monument Rattlesnake Unit is located to the east.

[1] Megawatt rating provided in alternating current (MWac)

The Applicant is considering various design layouts within the Project Area. The preliminary layout of the PV solar system and supporting components accounts for the Project's generating capacity, topography, and other constraints; however, the precise equipment and layout have not yet been finalized and the Applicant seeks to permit a range of technology to preserve design flexibility. Therefore, this ASC analyzes the largest anticipated temporary and permanent disturbance area within the Project Area. While the final Project design is not anticipated to disturb the entire Project Area, the entire Project Area is evaluated to allow for design flexibility. For these reasons, the Applicant is requesting flexibility to microsite[2] the Project and its associated supporting components anywhere within the Project Area, provided the final layout does not exceed the Project Area evaluated in this ASC and allowed for in the Site Certification Agreement.

The Project is located entirely on parcels in unincorporated Benton County within the GMAAD zone, defined by Benton County Code (BCC; 2022). The Project is consistent with Benton County's definition of a "solar power generator facility, major" under BCC 11.03.010(167). Prior to December 21, 2021, the Project would have required a conditional use permit (CUP) in the GMAAD per BCC 11.17.07(cc). On December 21, 2021, Benton County passed Ordinance Amendment 2021-004, which, among other changes, removed "solar power generation facility, major" from the list of uses requiring a conditional use permit in the GMAAD zone and effectively prohibits this type of use in the GMAAD zone. Therefore, the Project is not consistent with, nor is it in compliance with, the county zoning ordinances.

Though the Project is currently not in compliance with BCC 11.17 after the passage of Ordinance Amendment 2021-004, the Applicant demonstrates in its Land Use Consistency Review, Attachment D, how the Project is substantially consistent with the applicable standards of the Comprehensive Plan and BCC. Based on the primacy of the state when siting energy facilities as provided by RCW 80.50.110(1), and the state's express preemption and occupation of the field pursuant to RCW 80.50.110(2), the Applicant is therefore requesting preemption of the local land use regulations under WAC 463-28-020.

The Project Area was selected by the Applicant for its favorable site suitability characteristics, including high solar energy resource, topography, proximity to electrical infrastructure, compatible zoning and adjacent land uses, and low resource conflicts. The Project will have a number of benefits to the local community and Washington state. Based on similar projects, it is anticipated that the construction of the Project will support approximately 515 jobs during peak construction and up to 4 permanent jobs during operations. The Applicant will solicit experienced Washington-based contractors with the intention of a proportionally high locally hired workforce. The Applicant is developing a strategy to ensure that local benefits reach the community, local landowners, local skilled workers, as well as local businesses. A campaign will be run during construction to maximize local construction worker hiring (i.e., within 1-hour from the Project and within Washington). This strategy includes a local procurement policy, community event sponsorship, and participation throughout the Project's life cycle. The Project

[2] Micrositing is the process of placing facilities (such as solar panels) in locations that achieve optimal power production while considering land constraints such as terrain and sensitive environmental areas.

will also provide Benton County with additional tax revenue (refer to Socioeconomic Review in Attachment N). In addition, construction of this renewable energy resource will help Washington meet its goal of 100 percent clean electricity supply as set forth in the Clean Energy Transformation Act, passed by the Washington legislature in 2019.

2.0 PROJECT COMPONENTS

This section identifies the components, structures, and systems incorporated in the Project's design. The Project solar PV system and associated supporting components are shown on the Preliminary Site Plan (Attachment A, Figure A-1). The Preliminary Site Plan is based on studies and facility design done to date and is subject to change following outstanding technical studies and design and stakeholder consultations. A set of Construction Plans and Specifications will be provided to the State of Washington EFSEC for approval at least 60 days prior to the beginning of construction.

2.1 Solar Photovoltaic System

The solar PV system will consist of a series of solar panels mounted on a solar tracker racking system and related electrical equipment. The system includes the solar panels, tracker racking system, posts, collector lines, and PCS, which consists of the DC-coupled BESS, inverters, and transformers. The Applicant is considering a range of technologies to preserve design flexibility and incorporate rapidly changing advances in solar technology. During the final engineering design, the Applicant will consider micrositing factors and solar technology available at that time to design the most efficient and effective solar PV system. However, the actual equipment and layouts included in the final design will be selected to ensure that they do not exceed the Project Area evaluated in this ASC.

2.1.1 Solar Panels and Racking Systems

The solar PV panels, or modules, will be bifacial panels comprised of cells of mono-crystalline, poly-crystalline, cadmium telluride, or a combination thereof, used to generate electricity by converting sunlight into DC electrical energy. The electrical generation from a single module varies by module size and the number of cells per module. The cells are contained within antireflective glass panels and a metal frame and are linked together with factory-installed wire connectors. The solar PV panels in portrait orientation will be organized in rows (or "tables") within several solar array areas (or "blocks") mounted on a racking system. The length of each row may vary by topography and the number of panels that the racking system can hold. The row-to-row spacing will be approximately 36 feet (with approximately 15 to 21 feet of open space between adjacent rows). The panels themselves will be approximately 6.6 feet long by 4.1 feet wide and 2 inches thick.

The racking system will be on a single axis, oriented on a north-south axis that will allow the panels to follow the sun in order to maximize power output. The racking system will be designed to support the panels, snow loads, and prevent wind uplift. Once mounted on the racking system, the highest point of the panels is expected to extend approximately 9 to 14 feet above the ground surface, with an average of approximately 2 to 5 feet of ground clearance below the panels. Project impact assumptions in this ASC are based on the use of 15,812 racking systems

for the 470-MWac solar array. The actual number of racking systems will depend on the system selected.

The racking system will be supported by steep posts spaced approximately every 16 feet and installed to a depth of approximately 6 to 10 feet, with a maximum depth of 20 feet depending on specific soil conditions. Steel posts could be round hollow posts or pile-type posts. For the purposes of this ASC, the Applicant assumes that approximately 169,453 posts will be installed. The actual number of posts and foundation method may vary depending on the final racking system, topography, height of the solar modules, and site-specific geological conditions. Post locations will be determined based on geotechnical investigations and will be installed in soil or in concrete foundations, depending on geological conditions.

Figure A-1 in Attachment A depicts the Project's proposed solar array layout for purposes of analyzing impacts. The preliminary design incorporates key components and assumptions for currently available technology. The final number of panels will be determined by power ratings and optimization (in watts) of the specific panels chosen prior to construction and may be fewer than the number of panels included in the preliminary design. As a result, the Project impact assumptions in this ASC are conservatively based on the use of 1,292,376 panels, which is anticipated to be the maximum number of panels needed. For the purposes of illustration, a schematic drawing of the solar PV panel and racking system are shown on Figure B-1 in Attachment B.

2.1.2 Direct Current Electrical Collector Lines

The solar panels will produce DC electricity at a low voltage. Within each solar array area, the DC electricity from the panels will be transmitted to one of the power conversion systems distributed throughout the solar array areas via electrical wiring mounted on the racking or buried underground. The underground DC electrical wiring will be installed within trenches approximately 3 feet wide and 4 feet deep; however, final trench design will be determined by thermal resistivity studies. In areas where the desired depth cannot be achieved (due to bedrock or other prohibitive subsurface conditions), the collector lines may be housed in above-ground cable trays or covered with concrete slurry in accordance with the applicable National Electric Code (NEC) provisions. Installation of buried cables associated with the fenced solar array will temporarily disturb a corridor for each cable. Because the entire area inside the fence line will be temporarily disturbed during construction, this temporary impact is not calculated separately. All areas inside the fence line are included in the estimated altered habitat associated with the fenced solar array (i.e., no separate temporary impacts are calculated for buried cables inside the perimeter fence).

2.1.3 Power Conversion Systems

The Project layout includes 159 PCSs distributed throughout the solar array areas. Each PCS includes up to five DC-coupled BESS units and a step-up transformer installed on a foundation approximately 50 feet (wide) by 150 feet (length). A DC-coupled BESS unit is a self-contained and standalone unit that combines a battery system (such as nickel manganese cobalt, nickel cobalt aluminum, lithium-ion, or lithium iron phosphate), inverter, and controller that can either

store electrical energy for future use, or as required based on grid demand, convert DC electricity to AC electricity and send the AC electricity to the step-up transformer. Lithium-ion batteries are a type of rechargeable battery in which lithium ions, suspended in an electrolyte, move from negative to positive electrodes and back when charging and recharging. Batteries experience a degradation of performance over time and are gradually replaced over time.

Each DC-coupled BESS unit is approximately 11 feet (height) by 6 feet (width) by 30 feet (length). The DC-coupled BESS will be positioned in groups of up to five around a single step-up transformer, which is approximately 12 feet (height) by 11 feet (width) by 16 feet (length). The step-up transformer increases the AC voltage from the DC-coupled BESS units to 34.5 kV where it will then be conveyed via AC medium voltage collector lines and combiner boxes to the Project substation where it is transformed to grid voltage. All components of the PCSs will be mounted on concrete pads or beam foundations. Each PCS unit will include and incorporate multiple layers of protection to avoid failures and risks of fire or spills and will comply with the applicable requirements of the National Electric Code, National Fire Protection Association Standards, and Institute of Electrical and Electronics Engineers Standards.

For the purposes of this ASC, the Applicant conservatively assumes that up to 159 PCSs will be needed to convert the DC from the modules to produce 470 MWac. The final number of PCSs may vary depending on final design of the solar array and selection of PCS technology.

The Applicant is additionally considering an optional design in which a centralized AC-coupled BESS will be used in place of the distributed DC-coupled system described above. Under this option, AC-coupled BESS units would be placed within a centralized approximately 18- to 20-acre area located near the Project substation. The AC-coupled BESS area would replace panels in this area, thereby reducing the number of solar panels and increasing the area that would be permanently impacted. If this option is selected, up to 20 acres within the Fenced Area would contain concrete pads instead of solar panels. This adjustment would be accounted for in the final design impact calculations and required habitat mitigation. The AC-coupled BESS units will be of a similar design and dimensions as that described above for the DC-coupled BESS. To provide flexibility in the final design, this ASC analyzes both BESS options.

2.1.4 Alternating Current Medium Voltage Collector Network

The AC medium voltage (34.5 kV) collector network will convey the electricity from the medium voltage step-up transformers located at each PCS to the Project substation where the electricity will be transformed to 500 kV by one or more main power transformer(s) for final distribution to the grid via the Project's gen-tie line. Similar to the underground DC electric collector lines, the AC medium voltage collector lines will be installed underground within a trench approximately 3 feet wide and 4 feet deep, with final design determined by thermal resistivity studies. Areas with multiple circuits running in parallel will have approximately 20 feet between each circuit, resulting in a wider temporary trench area. At stream crossings, collector lines will be bored underneath the streambed to a minimum depth of 48 inches. Advanced electrical engineering, as well as further studies related to thermal dissipation, have not yet been performed. These studies will inform the number of circuits and trenches, as well as the distance between them.

The estimate of 20 feet between circuits represents the greatest possible impact (most conservative estimate). Following analysis from the thermal dissipation study and detailed electrical engineering, the distance between trenches may decrease. It is likely that, should this distance be decreased, the same trench could be used for several circuits (i.e., fewer, larger trenches throughout the site).

Similar to the DC collector network, the buried cables included in the estimated altered impacts associated with the fenced solar array (i.e., no separate temporary impacts are calculated for buried cables inside the perimeter fence). Buried cables exterior to the perimeter fence will be constructed within a 50-foot-wide construction corridor. A larger construction corridor is required where multiple cables run in parallel to one another (up to 25 feet on either side of the outermost cables). Where buried collector lines are located outside of the fenced area, these disturbances are considered to be temporary for purposes of estimating impacts to habitat and vegetation.

2.1.5 Project Substation

The Project substation will function to further increase the voltage in order to match the voltage of the BPA transmission system of 500 kV. The Project substation and associated interconnection infrastructure will include equipment such as free-standing steel switch-rack structures, one or more main power transformer(s), breakers, power meters, and associated electrical lines. Backup power for the Project substation will be provided by sealed 2x10 12-volt valve-regulated lead-acid cell battery packs housed in the control enclosure building. The Project substation will be constructed on an approximately 8.5-acre area and will include concrete foundations. The Project substation will be separately fenced for electrical safety. The substation equipment will generally range in height from 15 feet to 25 feet above ground level.

2.1.6 Overhead Transmission Line

An approximately 0.25-mile long overhead 500-kV transmission line will extend from the Project substation to the point of interconnection (POI) with the existing BPA transmission system at the BPA Wautoma Substation, which is located in on BPA federal lands surrounded by the Project Area. Interconnection to a BPA transmission system is subject to review under the National Environmental Policy Act. BPA will lead this process as a separate action from the site certification process. This federal process is not within the jurisdiction of EFSEC and is not addressed in this ASC.

A preliminary transmission line alignment is shown on Figure A-1 in Attachment A. The route alignment will be finalized prior to construction. The line will be suspended above ground on H-frame steel structures that will be approximately 60 to 150 feet tall and installed on drilled concrete piers. The transmission line will span Dry Creek and associated 100-year floodplain, which is located between the Project substation and the POI. A temporary 50-foot-wide access corridor across the floodplain will be used during construction of the overhead line. To minimize impacts to this area, only vehicles equipped to carry the transmission wires (conductor, shield wire, etc.) and matting will be allowed.

The transmission line will be constructed in compliance with codes and standards from the following: National Electrical Safety Code (NESC; 2017 Edition, Grade B Construction), Washington Administrative Code (WAC), American National Standards Institute, National Electrical Manufacturers Association, American Society for Testing and Materials, Avian Power Line Interaction Committee, as well as other applicable laws and construction codes. Ground clearances for the suspended portion of the line will conform to the NESC standards.

2.1.7 Operations and Maintenance Building

The Project may include an O&M building that will consist of a single-story structure with office space, warehousing space, a bathroom, and breakroom facilities. The O&M building could be up to 4,500 square feet in size on an approximately 1-acre area including an on-site 10,000-square-foot graveled area for parking for employees and visitors (approximately 10 parking spaces) and an open staging area. The O&M building will be surrounded by a security fence separate from the solar array perimeter fence.

The O&M building will be equipped with fire extinguishers as well as smoke detectors tied to the supervisory control and data acquisition (SCADA) system. In addition to fire extinguishers, the O&M building will have basic firefighting equipment for use on-site during maintenance activities including shovels, beaters, portable water for hand sprayers, and personal protective equipment. In addition, the Project's O&M area may include a 10,000-gallon water cistern to store water for fire suppression needs.

Water for operations use will either be obtained from an existing on-site well with a valid water right, hauled to the site from off-site sources with existing water rights (i.e., a municipal water source or vendor with a valid water right), or obtained through a new permit-exempt groundwater well (using less than 5,000 gallons per day). Wastewater will be managed using a permitted onsite septic system or portable restroom (the impact assessment used in this ASC assumes a permitted on-site specific system is used). Local utilities will provide electrical and communications/telephone connections.

Relevant building permits will be obtained for the O&M building, including for the well and septic system, from Benton County and the Benton-Franklin Health District (see Section 3.6 [Water Quantity – Water Use] and the Land Use Consistency Review [Attachment D] for additional permitting details).

2.1.8 Access Roads

The Project will be accessed primarily from SR 241 and Wautoma Road. A new approach from SR 241 will be constructed in the northwest corner of the Project. The northern solar array blocks and the POI will be accessed via the existing Black Rock Substation access road. The Applicant will consult with the WSDOT, Yakima County (for the portion of Wautoma Road in Yakima County), and Benton County regarding the preferred approach and the necessary permits required for upgrading an approach from SR 241. The Applicant will obtain a General Permit from WSDOT prior to upgrading the approach. The applicant has also consulted with BPA regarding access roads and collection and will obtain easements or crossing agreements from BPA, where required, prior to construction.

Access roads within the Project Area will consists of improvements to existing roads and new access road. Improvements to existing roads may include drainage upgrades, smoothing, and graveling as needed to accommodate construction vehicles. New access roads may require excavation and fill to achieve acceptable grades. Access roads will have a compacted gravel surface, with a permanent width of approximately 24 feet as well as the required clearance and turning radius needed for emergency response vehicles, in accordance with fire code. The final layout will be provided to the Benton County Fire Marshal's Office. The access roads will provide primary access to each of the solar array blocks, including each PCS, as well as the Project substation. The spacing between the rows of panels will allow for localized access within each of the solar array areas. A schematic drawing of the typical access road design is included in Figure B-2 in Attachment B.

2.1.9 Fencing and Lighting

Fencing will be installed around the perimeter of the Project for general security purposes and public safety. The fence is expected to be a 7-foot-tall chain-link fence, or other fence meeting the requirements of NEC. Fencing around the Project substation will extend to the ground and will be topped by barbed wire consistent with the fencing around the existing BPA substation. Solar array perimeter fencing will be designed to have an average gap between the bottom of the fence and the ground surface of approximately 4 inches and will not be topped with barbed wire. The top of the solar array perimeter fence will therefore be approximately 7 feet 4 inches above ground surface. Gates 20 to 24 feet wide will be installed for approved pedestrian and vehicular access. In the southeast corner of the Project Area where an ephemeral drainage corridor bisects the Project Area, the area east of the drainage will be fenced separately from areas on the west side of the drainage. An access road and gates will be used to provide pedestrian and vehicular access between these fenced areas. A schematic drawing of the typical fence design is included in Figure B-3 in Attachment B.

Lighting is needed at the O&M building for security and occasional after-hours work; however, the Applicant will limit the amount of lighting and will shield lighting as needed. In addition, applicable lighting will include motion-detector-activated lighting to minimize the amount of time lights need to be active. Lighting is also needed at the Project substation in accordance with North American Electric Reliability Corporation (NERC) standards.

2.1.10 Temporary Laydown Areas

Six temporary laydown (i.e., staging) areas (approximately 5 acres each) will be established within the fenced solar array area. Some grading may be needed to level the ground surface, with geotextile materials and compacted gravel installed as needed. Temporary laydown areas will be replaced by the solar array as the Project is built out.

3.0 CONSTRUCTION

The Project's construction is anticipated to begin in the second quarter of 2028, with a Commercial Operations Date planned for the first quarter of 2030 (22-month construction schedule). The Project may be built in phases up to the maximum Project generation capacity of 470 MWac. Construction phasing will be determined based on final offtake discussions with

energy customers and contractual arrangements. If the Project is built in phases, the initial phase will likely include construction of the substation, transmission line, O&M building, along with a subset of solar arrays, PCSs, and access roads, and site entrance road improvements. Subsequent phases will then consist of construction of the remaining solar panels with their associated PCSs and access roads. If construction is phased, the average and peak number of construction workers on site at a given time may be less than estimated here, but the total duration of construction may be longer and may include an interim period during which little construction work is done. The construction of the Project will include transport and delivery of Project equipment and materials, site preparation, equipment installation, and revegetation and landscaping. Each of these activities is generally described below.

3.1 Construction Staff

During construction, an estimated average of 225 people will be employed at the Project, with an estimated maximum of 515 employees. Most construction workers will be employees of construction and equipment manufacturing companies under contract to the Applicant. The construction workers will consist of approximately 45 to 65 percent of locally hired workers and a limited number of specialized workers for specific construction tasks (for example, construction management). The Applicant will solicit experienced Washington-based contractors with the goal of hiring construction workers from local communities. All employees hired directly by the Applicant may go through U.S.-wide background checks, including criminal record check, credit rating check, and employment/professional references, as applicable.

3.2 Transport and Delivery

Heavy vehicles delivering equipment and materials are expected to travel from ports in western Washington and Oregon (Port of Vancouver, Port of Portland, Port Westward, Port of Seattle, etc.) or driven to the Project Area from manufacturing facilities or warehouses in the United States. Deliveries will access the Project via SR 241. Deliveries will generally access the site from north via Interstate 90 (I-90) and I-82 to SR 24 at Yakima, Washington or SR 241 in Sunnyside, Washington. Deliveries from the south will generally access the site from I-84 to I-82 at Hermiston, Oregon to SR-241 at Sunnyside or I-182 in Richland, Washington. Worker commutes are anticipated to follow similar routes to SR 24 and SR 241, with the majority of workers arriving at the site from the north (Richland or Yakima areas). It is anticipated that an average of approximately 289 vehicles/day (289 roundtrips), including worker vehicles and truck deliveries, will be added to the roadway network during construction and commissioning (a 22-month period). Peak traffic numbers will occur over a 3-month period, with the numbers tapering up and down before and after the peak. Road approach improvements to access the site from the SR 241 site entrance, and at SR 241 and Wautoma Road, are expected to be required to accommodate the equipment transport. Refer to Part 4 Section 4.20 for further details on transportation and delivery, including detailed traffic estimates over the course of the construction period.

3.3 Site Preparation

Initial site preparation will involve grubbing and vegetation clearing within the Project Area, along with installation of BMPs as described in Section A.5. Clearing and grubbing will be phased, and soil will be temporarily stabilized. Following clearing and grubbing, laydown/staging

areas and access roads will be established. Some grading may be needed to level the ground surface of the laydown/staging areas and geotextile materials and compacted gravel will be installed as needed. Similarly, installation of new access roads will also involve grading, subgrade preparation and compacted gravel. Clearing, grubbing, and grading will be conducted using equipment such as bulldozers, excavators, compactors, graders, and front-end loaders. Water trucks will be used to provide moisture for compaction as well as dust control during construction as required. Depending on the moisture levels, up to approximately of 53 million gallons of water could be used throughout the construction for dust suppression. Water use for Project construction will be obtained from an existing on-site well with a valid water right (to be verified in coordination with Ecology) or will be hauled to the site from off-site sources with existing water rights (i.e., a municipal water source or vendor with a valid water right). If needed, a combination of the options identified above may be used to obtain water for Project construction. Refer to Section B.8d for further discussion of water use and source. Construction activities that include the use of major excavating and earth-moving machinery will be conducted during normal weekday hours to the extent feasible.

3.4 Installation of Project Equipment

Following site preparation activities, the general sequence for construction will involve installation of the following equipment: foundations, the racking system, solar PV panels and associated wiring, electrical collector lines, concrete equipment pads and foundations, DC-coupled BESS units, step-up transformers, collection substation equipment, and transmission line.

Overall, the extent of ground disturbance associated with the solar array areas is expected to be relatively minimal since the single axis tracking system will be installed using structural steel posts (as opposed to larger foundations) and can tolerate slopes up to 15 percent (based on the manufacturers' specifications). The Project is being designed to accommodate as much as possible the existing topography of the site in order to minimize the amount of earthwork needed. In general, grading for the Project will primarily occur in areas where new access roads, concrete equipment pads, retention areas, and the Project substation will be sited. Where grading is required, soils excavated from one area will be used as fill for other areas to minimize or eliminate the need for imported fill material.

The foundation posts for the racking system will be installed using a hydraulic pile driver and/or auger for pre-drilling to depths of approximately 6 to 10 feet, with a maximum depth of 20 feet depending on soil conditions. In areas where the desired depth cannot be achieved, foundations will be pre-drilled and supported with concrete slurry or cast in place concrete spread footings.

The panel frames and other components of the racking system will be bolted to the posts, with the solar PV panels affixed to the frames. For any electrical wiring or collector lines to be installed belowground, trenches will be excavated with track-mounted excavators (or similar) or specific trenching machines, and will be approximately 3 feet wide and 4 feet deep; following placement of the electrical lines, the excavated soil will be backfilled into the trench and tamped back to the appropriate level of compaction per the design specifications. In areas where the desired depth cannot be achieved (due to basalt rock or other prohibitive subsurface conditions), the collector lines may be placed in above-ground cable trays in accordance with

the applicable NEC provisions. In cases where adequate space for undergrounding the collector lines is limited, the collection system may go overhead similar to a transmission line.

The equipment pads and Project substation foundation will involve excavation up to approximately 6 feet in depth and installation of concrete. Excavated soil will be used elsewhere within the Project Area. Concrete for the pads and foundations will be delivered in ready-mix concrete trucks; the Project will not include a concrete batch plant. Once the concrete equipment pads and Project substation foundation have been installed, the DC-coupled BESS units, transformers, and various electrical equipment will be installed. All electrical equipment and wiring will be installed and inspected in accordance with applicable code requirements and best industry practices.

3.5 Revegetation and Post-Construction Site Control

Following construction, areas that have been temporarily disturbed will be revegetated for soil stabilization and erosion control purposes. It is anticipated that revegetation will involve application of hydroseeding, with a suitable mix of non-invasive grass species and/or species currently found throughout the site. In addition to revegetation of temporarily disturbed areas, permanent BMPs will be implemented to address long-term stormwater requirements.

4.0 OPERATIONS AND MAINTENANCE

Periodic maintenance and inspection of the infrastructure will occur intermittently over the course of Project operations. Typical maintenance will follow basic monthly inspections, preventative quarterly inspections, and an in-depth annual maintenance program. Four full-time personnel will be based at the site, and limited additional temporary staff will be on site periodically depending on the type of maintenance scheduled per month. On average, four vehicle trips per day are anticipated during operations. Approved technicians will service electrical equipment, primarily the DC-coupled BESS units and transformers, on average once per month. A performance audit and inspection to assess the quality of equipment will be conducted annually. If any equipment needs to be replaced before the Project's end-of-life, the Applicant will seek the most environmentally responsible route for reuse, recycling, or disposal. No material quantities of chemicals of fuels will be stored at the O&M facility. Only negligible amounts of lubricating oils, greases, and hydraulic fluids for solar tracking arrays, and negligible amount of raw materials for component parts maintenance of solar panels and batteries, will be stored onsite at the O&M facility.

Typical maintenance of the solar PV panels will include surface cleaning to remove accumulated dust and dirt to optimize performance. Based on environmental conditions and rainfall, it is anticipated panel washing may occur once per year across approximately 20 percent of the panels. A variety of equipment is available on the market for cleaning solar panels. Typical utility-scale solar projects utilize water trucks with an assortment of hoses and support personnel to scrub down panels with heavier soiling. If panel washing occurs, the wash water will not contain additives and will not be discharged into nearby water bodies (i.e., it is expected infiltrate into the ground surface at and near the point of application). The amount of water needed for cleaning will be dependent on the extent of the soiling but is estimated to be approximately 120,000 gallons per wash. During operations panel washing, approximately 1 to

2 water truck trips are anticipated per day over a period of 2 to 3 weeks. Other more innovative waterless and dry brushing techniques will be explored as an option.

Vegetation within the Project fence line will be managed throughout the life of the Project. A Vegetation and Weed Management Plan that will be developed prior to construction (Part 3, Section 3.8 and Part 4, Section 4.8) will be followed during operation to ensure that vegetation does not overgrow the solar panels, preventing solar radiation from reaching them. Vegetation management will also establish and maintain fire breaks around each solar array, PCS, the Project substation, and along the Project's fence line. Mechanical vegetation control such as mowing, trimming, and pruning will be the primary means for vegetation management. Mowing frequency is anticipated to be once per month during the growing season. Herbicides may be utilized for vegetation control; however, an effort will be made to minimize use and only apply bio-degradable, U.S. Environmental Protection Agency (EPA) registered, organic solutions that are non-toxic to wildlife and used in a manner that fully complies with all applicable laws and regulations.

5.0 DECOMMISSIONING

The Project is expected to have an operational life of approximately 35 years, following which the Project may be re-powered with new equipment (under subsequent permits/certification) or retired and restored adequately to a useful, non-hazardous condition. The Project will be decommissioned following the end of its useful life. Pursuant to WAC 463-72-040, the Applicant will provide EFSEC with an Initial Site Restoration Plan at least 90 days prior to beginning Project site preparation. The Initial Site Restoration Plan will follow the proposed retirement steps provided in the Applicant's Decommissioning Summary and Estimate (Attachment R). The Initial Site Restoration Plan will address provisions for funding or bonding arrangements to meet the retirement costs identified in Attachment R.

Decommissioning will be conducted in accordance with EFSEC's rules and the Site Certification Agreement for this Project and will involve removal of all equipment associated with the Project and returning the area to substantially the same condition as existed prior to Project development. Decommissioning will include consideration of local environmental factors to minimize effects such as erosion during the removal process, and the recycling of materials demolished or removed from the site to the extent feasible. The activities that may occur as part of decommissioning are summarized below.

- Decommissioning will commence once the Project has been fully de-energized and isolated from all external electrical connections.
- Consistent with the measures described for construction and operation of the Project, BMPs will be implemented and maintained throughout the decommissioning phase as needed to avoid and minimize potential impacts to the surrounding environment, particularly those related to dust, erosion, and stormwater.
- Once the site has been adequately prepared for decommissioning, the following equipment will be removed: solar PV panels and racking system, including steel piles, power conversion systems (including BESS units and step-up transformers), electrical

wiring and connections, Project substation components, communication equipment, and fencing. All above-grade foundations will be removed to a level of no less than 3 feet below the ground surface unless requested to be maintained by the property owner. The extent of which access roads will be removed will be coordinated with the landowners at the time of decommissioning.

- Equipment and materials will be salvaged or recycled to the extent feasible and in coordination with licensed subcontractors, local waste haulers, and/or other facilities that recycle construction/demolition waste; the remaining materials will be disposed of by the contractor at authorized sites, in accordance with applicable laws. Reuse or recycling of materials will be prioritized over disposal. Recycling is an area of great focus in the solar industry, and programs for both batteries and solar panels are advancing every year. Panels and batteries will most likely be shipped to recycling facilities. All waste requiring special disposal (e.g., transformers) will be handled according to regulations that are in effect at the time of disposal.
- Following removal of Project equipment, site restoration will be conducted such that the physical conditions of the area are returned to substantially the same condition that existed prior to Project development. These activities will include removal of gravel and other aggregate material, localized grading and disking to match surrounding elevations, replacement of topsoil from on-site stockpiles, and revegetation of disturbed areas with an appropriate hydroseed mix.

During decommissioning, the Applicant will adhere to federal, state, and local requirements, including obtaining and adhering to applicable permits and authorizations. The Applicant's Decommissioning Summary and Estimate is provided in Attachment R and will inform the Initial Site Restoration Plan.

6.0 SOCIOECONOMIC REVIEW

The Applicant prepared a Socioeconomic Review (Attachment N) for consideration under WAC 463-60-535. The document contains information about population and labor force impacts as well as housing. The document demonstrates that, at peak construction, the locally available workforce will be sufficient to meet demand for local direct workers, which are expected to account for about 45 to 65 percent of the total construction workforce. Local workers are those who normally reside within daily commuting distance of the Project site (within 1 hour of the site) and will commute daily to the Project site from their homes. Non-local workers hired from outside the area are expected to temporarily relocate to the vicinity of the Project for the duration of their employment. There is sufficient capacity in the region to house permanent and temporary workers.

A.2.b Project Schedule, Employees and Public Access

Phase	Proposed Timing	Duration	Employee Numbers on Site & Frequency	Public Access (yes/no)
Site preparation	2028	60 days		No
Construction	2028 to 2029	22 months	On average 225; with a peak construction workforce of 515.	No
Operation/use	2030	35 years	Up to 4	No
Closure/reclamation	2065	6 months	Similar to, or less than, those required for construction (average of 225 with a peak of 515).	No

A detailed Construction Schedule would be submitted to EFSEC at least 30 days prior to start of site preparation.

A.3. Phased and Future Projects

Is this project an addition, continuation, or expansion of a previous proposal or are there other related actions planned?

☒ No ☐ Yes

	The Project will not exceed 470 MWac. The Project may be built in phases up to the maximum Project generation capacity. Construction phasing will be determined based on final offtake discussions with energy customers and contractual arrangements.

A.4. Site Maps and Plans

Attachment A contains site maps referenced in this ASC. Additional maps are included in the detailed studies and reports provided in other attachments. The list below consists of the maps provided in Attachment A.

Map #	Map Name	Purpose and Description	Completed?
A-1	Preliminary Site Plan	Preliminary layout and map book showing Project components	Yes
A-2	Assessor Parcels	Provide parcel numbers for Project Lease Boundary	Yes
A-3	Soils	Mapped soil types throughout the Project Area	Yes
A-4	Slopes and Project Impacts	Present LiDAR mapped topography and slopes greater than 15 percent within the Project Area and vicinity	Yes
A-5	Geologic Hazards	Identify active faults and historic earthquake locations within 25 miles of the Project Area	Yes

Map #	Map Name	Purpose and Description	Completed?
A-6	Surface Waters and Floodplain	National Hydrographic Database, National Wetlands Inventory, and FEMA flood hazard mapping within the Project Area and vicinity	Yes
A-7	Critical Aquifer Recharge Areas	Identify locations of features identified by Benton County as Critical Aquifer Recharge Areas	Yes
A-8	Habitat Types within the Project Area	Mapped habitat classifications based on site-specific habitat surveys	Yes
A-9	Big Game Habitat Areas in the Project Area	Priority Core and Linkage Areas developed by the Washington Wildlife Habitat Connectivity Working Group	Yes
A-10	Transportation Routes	Road network providing access to the Project Area	Yes

A.5. Mitigation Measures Summary

Mitigation Measure	Description	Expert Agency Participation
Earth		
Implementation of Geotechnical Recommendations	The Applicant will follow all geotechnical recommendations provided in the Final Geotechnical Engineering Report. Recommendations included in the Preliminary Geotechnical Engineering Report (Attachment S) include the following. Recommendations for shallow foundations are included in Section 5.2 of the Preliminary Geotechnical Engineering Report (Attachment S). Shallow foundations must have a minimum embedment of 1.5 feet below finish site grade. Other alternatives are non-frost susceptible fill under foundations or thermal insulation to protect against frost. At some locations, soft silt soils require remediation for bearing capacity. Where remediation is necessary, the continuous or square footings should bear on a minimum of 2 feet of compacted structural fill materials. The over-excavation should extend a minimum lateral distance of about 1 foot beyond the edge of the footings. Anticipated settlement of the foundations under service loads will be on the order of about 1 inch or less. Shallow foundations should be adequately reinforced and proportioned to resist adfreezing forces associated with the frost depth. Shallow foundations should be adequately reinforced and proportioned to resist swell/uplift forces associated with the near surface clay soils. The subgrade preparation and compaction recommendations in Section 5.3 of the Preliminary Geotechnical Engineering Report (Attachment S) will be followed to mitigate the risks associated with corrosive soils. The Project will provide seismic design using 2018 International Building Code (IBC). Site Class C will be used	EFSEC

Mitigation Measure	Description	Expert Agency Participation
	for very dense soils and bedrock conditions. The Mapped Spectral Response Acceleration for the 1 second (S1) and short periods (SS) were computed in the Preliminary Geotechnical Engineering Report using the Applied Technology Council Seismic Design Maps, which is a web-based application program. Native sand and silt material can be used as general site grading fill, provided they do not contain significant amounts of organics. After site clearing and grubbing, the general fill should be placed in loose lifts not exceeding 12 inches in thickness and compacted to a minimum of 90 percent of the ASTM D698 maximum dry unit weight. If the general site grading is located below proposed pavement, foundations, or equipment pads, then other compaction requirements apply. Structural fill should consist of a non-expansive, well-graded material with sufficient binder for compaction purposes and meet the requirements of 2020 Standard Specifications, Publication No. M41-10, Division 9 Materials, "Item 9-03-10 Aggregate for Gravel Base" issued by the Washington Department of Transportation. The Project would make structural fill interchangeable with flexible road base. Structural fill should be compacted to a minimum of 95 percent of maximum dry density determined by ASTM D1557. The structural fill should be moisture conditioned within 2 percent of optimum moisture content. Lift thickness is a function of energy, equipment, and ideal moisture. Typically, 9-inch lifts are a maximum, but if a contractor is able to complete thicker lifts and it can be verified that full densification occurs throughout the lift, then lifts up to 12 inches are possible.	
Best Management Practices (BMPs) - Erosion	As further described in Part 4, Section 4.5, the Applicant will implement an Erosion and Sediment Control Plan (ESCP), a Construction Phase SWPPP, and an Operations Phase SWPPP, in compliance with local stormwater regulations. These plans will address stormwater runoff, flooding, and erosion to ensure compliance with state and federal water quality standards. The ESCP will include BMPs such as the appropriate use of silt fencing to avoid or eliminate runoff of contaminants. The SWPPP will include BMPs from Ecology's Stormwater Management Manual for Eastern Washington (Ecology 2019). Benton County has adopted Ecology's Stormwater Management Manual for Eastern Washington (SWMMEW) as their basis of design and review. Per RCW 17.10.140, the Applicant will prepare and submit a Vegetation and Weed Management Plan to EFSEC for the control of noxious and problem weeds prior to construction. The plan will be implemented to revegetate temporarily impacted areas and minimize erosion.	Ecology, EFSEC
Building Permits	The Applicant will provide grading plans and obtain necessary building permits from Benton County Building Division if needed.	Benton County Building Division and Washington State Building Code Council

Mitigation Measure	Description	Expert Agency Participation
	Seismic design parameters that will be used to design the Project are included in the 2018 IBC and American Society of Civil Engineers (ASCE) 7-10 and ASCE 7-16. These parameters are consistent with the Washington State Building Codes. The Project will comply with the current codes at the time of construction, demonstrating compliance with WAC 463-62-020.	
Soil Monitoring	The Applicant will prepare a Soil Monitoring Plan to monitor soil compaction, assess topsoil depth, and measure nutrient, organic matter, and pH levels of the soil to assess whether the Project is having a positive or adverse impact on soil health. The plan will include adaptive management actions that could be implemented if there is a decline in soil conditions.	EFSEC
Air Quality		
Implementation of Best Management Practices (BMPs) and Standard Construction Practices	Washington Administrative Code sections addressing air quality include: • WAC 173-400-040(3) Fallout • WAC 173-400-040(4-4a) Fugitive emissions • WAC 173-400-040(5) Odors • WAC 173-400-040(9)(a) Fugitive Dust To adhere to these codes, the Applicant would implement BMPs and standard construction practices, including the following: • Vehicles and equipment used during construction would be properly maintained to minimize exhaust emissions. • Operational measures such as limiting engine idling time and shutting down equipment when not in use would be implemented. • Watering or other fugitive dust-abatement measures would be used as needed to control fugitive dust generated during construction. When applied, the Applicant will use water or a water-based environmentally safe dust palliative such as lignin for dust control. • Construction materials that could be a source of fugitive dust would be covered when stored. • Traffic speeds on unpaved roads would be limited to 25 miles per hour to minimize generation of fugitive dust. • Truck beds would be covered when transporting dirt or soil. • Carpooling among construction workers would be encouraged to minimize construction-related traffic and associated emissions. • Erosion-control measures would be implemented to limit deposition of silt to roadways, to minimize a vector for fugitive dust. • Replanting or graveling disturbed areas would be conducted during and after construction to reduce wind-blown dust.	N/A
Water Quality – Wetlands and Surface Waters		
Avoidance	The Project would not impact wetlands or wetland buffers and is consistent with WAC 463-62-050. Ephemeral	N/A

Mitigation Measure	Description	Expert Agency Participation
	streams and stream buffers were avoided to the greatest extent feasible as described above.	
Stream crossing construction best management practices	Minimization of temporary water quality impacts (WAC 220-660-120; Stormwater Management Manual for Eastern Washington (Chapter 173-204 WAC); and Construction Stormwater General Permit (Chapter 90.48 RCW) will be implemented on site during construction and operations and include the following best management practices: • Staging of materials and equipment to prevent contamination of waters of the state • Development of the Stormwater Pollution Prevention, Erosion and Sediment Control, and Spill Prevention Countermeasures and Control plans • Installation and maintenance of temporary erosion and sediment control measures • Completing work in the dry with no water present	Ecology, WDFW, EFSEC
Hydraulic Project Approval	The Applicant is using the JARPA to obtain a Hydraulic Project Approval (HPA) permit per WAC 20-660-050.	WDFW, EFSEC
Special Flood Hazard Development Permit	The Applicant will obtain a Special Flood Hazard Development Permit from Benton County prior to construction.	Benton County
Water Quality – Stormwater Runoff		
Construction Stormwater General Permit	In compliance with WAC 173-200, the Applicant will obtain a Construction Stormwater General Permit (CSWGP) from EFSEC. The CSWGP requires an ESCP and a SWPPP. Benton County has adopted Ecology's Stormwater Management Manual for Eastern Washington (SWMMEW) as their basis of design and review. In compliance with SWMMEW, the proposed development will require storage onsite for any increase in runoff for the 100-year, 24-hour storm. The basin design for any required storage will also follow the requirements outlined in the SWMMEW. As the Project design advances, the post-construction stormwater management should be reviewed in further detail with the County Engineer. The following requirements will be met for the Project: Stormwater quantity control will be provided so that proposed conditions peak runoff rates and volumes must be equal to or less than existing conditions. The 2-year, 10-year, 25-year, and 100-year 24-hour stormwater events must meet these requirements. The aim of Core Element #5 of the SWMMEW is to treat at minimum 90 percent of runoff from pollution-generating impervious surfaces (PGIS). A surface is considered a PGIS if it is being regularly used by vehicles. Since the access roads on the Project site are primarily for O&M, it is assumed that this Project is exempt from the Core Element #5 requirements. Water quality will be addressed using the Full Dispersion BMP (SWMMEW, Table 6.10).	Ecology, EFSEC

Mitigation Measure	Description	Expert Agency Participation
	Proposed culverts and low water crossings will be sized for the 10-year 24-hour stormwater event.	
Best Management Practices - Stormwater	The ESCP and SWPPPs (both for construction and operation) will address stormwater runoff, flooding, and erosion to ensure compliance with state and federal water quality standards. The ESCP will include BMPs such as the appropriate use of silt fencing to avoid or eliminate runoff of contaminants. The SWPPPs will include BMPs from Ecology's Stormwater Management Manual for Eastern Washington (Ecology 2019). The Applicant will prepare and submit a Vegetation and Weed Management Plan to EFSEC prior to construction. The plan will be implemented to revegetate temporarily impacted areas and minimize erosion. Temporary basins and erosion control measures will be implemented during construction to protect existing discharge locations. Permanent basins will be provided at each discharge location that has an increase in runoff due to the proposed development in critical discharge locations. Each basin will have a minimum depth of 3.5 feet, a length-to-width ratio of 3:1 to 6:1, and a pond riser outlet structure to provide treatment per State of Washington requirements. These basin locations are shown in Exhibit 5 of Attachment J.	Ecology, EFSEC
Preventative procedures to avoid spills	Substantial quantities of oils, fuels, and other potential contaminants are not expected to be stored on-site during construction or operation. The Applicant will prepare a Construction Phase Spill Prevention Control and Countermeasure Plan (SPCC Plan), consistent with requirements of 40 Code of Federal Regulations (CFR) Part 112, to prevent spills during construction and to identify measures to expedite the response to a release if one were to occur. Preventative procedures and rapid response measures will address and prevent potential water quality issues. Preventative measures will include best management practices, such as not fueling within the Ordinary High Water Mark of waterbodies to reduce the potential for spills going into water courses. Appropriate containment and spill response kits will be present on site. The Applicant will also prepare an Operations Phase SPCC Plan in consultation with Ecology and pursuant to the requirements of CFR Part 112, Sections 311 and 402 of the Clean Water Act, Section 402 (a)(1) of the Federal Water Pollution Control Act, and RCW 90.48.080.	NA
Plants		
Avoidance and Minimization Measures	During siting and design, the Applicant took several measures to avoid and minimize impacts to botanical resources. The Applicant minimized impacts to shrub-steppe habitat and will avoid talus slopes (i.e., Priority Habitats). As described above, the Applicant sited the Project to avoid the population of the state sensitive Columbia milk-vetch documented during surveys conducted for the Project.	WDFW
Habitat Management Plan	Per WAC 463-60-332(3) and consistent with requirements in the BCC 15.14.030 for the Applicant to provide a habitat assessment and discuss the habitat avoidance,	WDFW, EFSEC

Mitigation Measure	Description	Expert Agency Participation
	minimization, and mitigation measures proposed for the Project, the Applicant has prepared a Draft Habitat Management Plan (Attachment M). This plan will provide details regarding mitigation measures for impacts to habitat types from Project construction and operation including impacts to "habitats and species off local importance" (i.e., shrub-steppe habitat), per BCC 15.14.030. A Final Habitat Management Plan will be prepared prior to construction.	
Revegetation and Noxious Weed Control	Per RCW 17.10.140, the Applicant will develop a Vegetation and Weed Management Plan with input from EFSEC and the Benton County Noxious Weed Control Board prior to construction. Herbicide and pesticide applications will be conducted in accordance with manufacturer instructions and all federal, state, and local laws and regulations; herbicides will only be directly applied to localized spots and will not be applied by broadcasting techniques (RCW 17.21).	EFSEC, Benton County Noxious Weed Control Board
BMPs	The Applicant will implement the Project's ESCP, Construction SWPPP, and Permanent Stormwater Control Plan. These plans will help reduce erosion and impacts to vegetation.	Ecology; WDFW, EFSEC
Animals		
Avoidance and Minimization Measures	During siting and design, the Applicant took several measures to avoid and minimize impacts to wildlife and habitat. The Applicant coordinated with WDFW prior to conducting surveys, and used the feedback obtained during this coordination to inform surveys and the assessment of impacts. As described above, the Applicant avoided talus slopes (i.e., a Priority Habitat) by 125 feet and burrowing owl nests by 2,800 feet, and minimized impacts to shrub-steppe habitat to the extent feasible. Additionally, the Project is sited primarily on currently disturbed lands, which minimizes impacts to wildlife and habitat. The Applicant has modified the layout of the Project's perimeter fence to include separate smaller fenced units versus one large fenced array in order to allow for wildlife movement through the area. The layout of the perimeter fence was also modified to maintain open access to the ephemeral drainages within the Project Area (see Attachment I) that are used by mule deer and elk for movement corridors as well as for water sources; the existing transmission line ROWs through the project would also be left unfenced to maintain movement corridors along these existing transmission lines. With the exception of fencing around the Project substation which will extend to the ground, perimeter fencing will be designed to be at least 4 inches above ground. The fence design may be revised further based on ongoing coordination with EFSEC and WDFW. The applicant is also in discussions with WDFW and affected landowners to see if existing artificial water sources that were primarily developed for livestock can be moved outside of the fenced areas in order to maintain wildlife access (including access for elk and mule deer) to these water sources.	WDFW, EFSEC
Construction and Operations BMPs	Unnecessary lighting will be turned off at night to limit attraction of migratory birds to the area. This includes using lights with timed shutoff, downward-directed lighting to	WDFW, EFSEC

Mitigation Measure	Description	Expert Agency Participation
	minimize horizontal or skyward illumination, and avoidance of steady-burning, high-intensity lights. If construction occurs during the bird nesting season, nest clearance surveys will be conducted prior to site disturbance. Evening and nighttime construction activities will be avoided to the extent practicable, which will limit the impacts of construction noise to wildlife. Prior to construction, construction personnel will be instructed on wildlife resource protection measures, including: 1) applicable federal and state laws (e.g., those that prohibit animal collection or removal); and 2) the importance of these resources and the purpose and necessity of protecting these resources. Construction personnel will be trained in the following areas when appropriate: awareness of biological resources (including Priority Habitats and special status species), potential bird nesting areas, and general wildlife issues. The Applicant will prepare an ESCP that would include BMPs to minimize surface water runoff and soil erosion. Appropriate stormwater management practices will be implemented in accordance with the SWPPPs. The Applicant will prepare SPCC Plans to be implemented during construction and operation to reduce the likelihood of an accidental release of a hazardous or regulated liquid and, in the event such a release occurs, to expedite the response to and remediation of the release (see Part 4, Section 4.3 for more details). Vehicle speeds will be limited to 25 miles per hour on internal Project access roads to avoid wildlife collisions. Existing posted speed limits on county and private roads will be followed outside of the Project Area. If any overhead power lines are required to connect the Project to the grid, these lines will be designed and constructed to minimize avian electrocution, according to guidelines outlined in Avian Power Line Interaction Committee standards (APLIC 2012). Fire hazards from vehicles and human activities will be reduced via use of spark arrestors on power equipment, avoiding driving vehicles off roads, and allowing smoking only in designated areas per the requirements of WAC 463-60-352. The Applicant will prepare an Emergency Management Plan that contains fire safety measures, which will be developed with input from applicable agencies (see the “Fire” section above for more details). Following decommissioning, reclamation of the Project Area will begin as quickly as possible to reduce the likelihood of ecological resource impacts in disturbed areas. Section 4.8.D contains additional measures targeted at successfully restoring vegetation communities.	

Mitigation Measure	Description	Expert Agency Participation
	Implementation of these Vegetation mitigation measures will have indirect benefits to wildlife species as well.	
Compensatory Mitigation	In order to achieve "no net loss of habitat functions and values" as required by WAC 463-62-040, the Applicant will continue to work with the WDFW and EFSEC to determine appropriate compensatory mitigation. The Applicant has prepared a Draft Habitat Management Plan (Attachment M), which provides a framework for determining the compensatory mitigation required to achieve "no net loss." A Final Wildlife Habitat Management and Mitigation Plan will be prepared prior to construction.	WDFW, EFSEC
Environmental Health – Hazardous Waste		
Emergency Management Plan	Prior to Project construction and operations, the Applicant will develop an Emergency Management Plan to address worker health and safety, standards concerning potential release of hazardous materials, and fire prevention and control. This plan will provide safety guidelines and procedures for potential emergency-related incidents during the Project's construction, operation, and decommissioning phases. This includes coordination with emergency service providers and fire suppression measures associated with the Project. Specifically, the plan will be developed with input from, and in coordination with, the Benton County Emergency Management, Benton County Sherriff, Benton County Fire Marshall, and DNR Wildland Fire Management Division. Applicable laws/codes include: • WAC 463-60-352 (2 through 4), which addresses fire and explosion, hazardous materials release, and safety standards compliance. • WAC 463-60-352(6), which describes emergency plans to ensure public safety and environmental protection. • 49 CFR §173.185m, which regulates the transportation of lithium-ion batteries. • 49 CFR §173.159, which regulates the transportation of lead-acid batteries. International Fire Code	Benton County Emergency Management, Benton County Sherriff, Benton County Fire Marshall, and DNR Wildland Fire Management Division
Best Management Practices – Fire Prevention	To minimize the risk of fire or explosions, the Project will implement BMPs to be detailed in the Emergency Management Plan noted above. Typical BMPs will include, but are not limited to, the following: • Equip construction vehicles with fire extinguishers, spark arrestors and heat shields, as appropriate. • Establish roads before accessing the site to minimize vehicle contact with grass. • Use diesel construction vehicles instead of gasoline vehicles, where feasible, to prevent potential ignition by catalytic converters. • Prohibit vehicles from idling in grassy areas. • Restrict the use of high-temperature equipment in grassy areas. • Install lightning protection measures to protect generators and other equipment. • Install fire protection equipment in accordance with Washington state fire code. • Notify the local fire district of construction plans and access to Project equipment.	Benton County Fire Marshal and DNR Wildland Fire Management Division

Mitigation Measure	Description	Expert Agency Participation
	• Provide mutual assistance in the case of fire in or around the Project during construction. • Monitor wildfire activity during Project construction and operations and, if necessary, modify Project activities, change the schedule, cease construction operations, or remove equipment. • Prevent and control potential fires inside the Project Area with trained staff who have 24-hour access to the site. A Vegetation and Weed Management Plan will be prepared and will includes revegetation management and noxious weed control measures.	
BESS design	The BESS will contain a fire suppression and detection system in accordance with fire code and National Fire Protection Association (NFPA) Standards, specifically NFPA 855 "Standard for the Installation of Stationary Energy Storage Systems." The system will include monitoring equipment and alarm systems with remote shut-off capabilities.	NFPA
Construction Stormwater General Permit (CSWGP), Construction Phase Stormwater Pollution Prevention Plan (SWPPP), and Erosion and Sediment Control Plan (ESCP)	As described in Part 4, Section 4.5, the Applicant will obtain a CSWGP from EFSEC, which requires a SWPPP and ESCP. These plans will contain measures to minimize the risk of spills and stormwater pollution, as well as to reduce the effects of erosion to ensure compliance with state and federal water quality standards. Applicable laws/codes include the following: • RCW 90.48, which establishes general stormwater permits for Ecology under the Water Pollution Control Act • WAC 173-201A, Water Quality Standards for Surface Waters of the State of Washington Clean Water Act (33 United States Code 1251)	Ecology, EFSEC
SPCC Plan	The Applicant will prepare an SPCC Plan, consistent with requirements of 40 CFR Part 112, to prevent spills during construction and to identify measures to expedite the response to a release if one were to occur. Preventative procedures and rapid response measures will address and prevent potential risks to water quality.	Ecology
Use of approved herbicides	In compliance with RCW 17.10.140, the Applicant will only use herbicides that are approved for use in the state of Washington by the EPA.	EPA and the Benton County Noxious Weed Control Board
Land Use		
Based on the information provided in Section 4.14.C and in the Land Use Consistency Review (see Attachment D), the Project will have no significant adverse effects on land use. Therefore, no land use mitigation or monitoring measures are proposed. Mitigation measures specific to other topics (e.g., wetlands and surface waters, wildlife habitat, or geological hazards) are addressed in their respective resource sections in Part 3 and Part 4 of this application.		
Noise, Light, Glare, and Aesthetics		
BMPs-Noise	WAC 173-60-050 exempts temporary construction noise from the state noise limits; however, BMPs will be implemented to reduce off-site construction noise impacts. Since construction equipment operates intermittently, and the types of machines in use at the Project change with the stage of construction, noise emitted during construction will be mobile and highly variable, making it challenging to control.	EFSEC

Mitigation Measure	Description	Expert Agency Participation
	Project construction will generally occur during the day, Monday through Friday. Furthermore, reasonable efforts will be made to minimize the impact of noise resulting from construction activities, including implementation of standard noise reduction measures listed below. Due to the infrequent nature of loud construction activities at the site, the limited hours of construction, and the implementation of noise mitigation measures, the temporary increase in noise due to construction is considered to be a less than significant impact. The construction management protocols will include the following noise mitigation measures to minimize noise impacts: • Maintain construction tools and equipment in good operating order according to manufacturers' specifications. • Limit use of major excavating and earth-moving machinery to daytime hours. • To the extent practicable, schedule construction activity during normal working hours on weekdays when higher sound levels are typically present and are found acceptable. Some limited activities, such as concrete pours, will be required to occur continuously until completion. • Equip any internal combustion engine used for any purpose on the job or related to the job with a properly operating muffler that is free from rust, holes, and leaks. • For construction devices that use internal combustion engines, ensure the engine's housing doors are kept closed, and install noise-insulating material mounted on the engine housing consistent with manufacturers' guidelines, if possible. • Limit possible evening shift work to low-noise activities such as welding, wire pulling, and other similar activities, together with appropriate material-handling equipment. Use a complaint resolution procedure to address any noise complaints received from residents.	
BMPs – Light, Glare and Aesthetics	The Facility will implement BMPs including: • Downward-directed lighting to minimize horizontal or skyward illumination, and avoidance of steady-burning, high-intensity lights. • Utilizing solar panels with an anti-reflective coating to minimize glare. Maintenance of revegetated surfaces until the vegetation has been established.	N/A
Archaeological, Historic, and Cultural Resources		
Avoidance of Protected Sites	Given protection under RCW 27.53 of sites 45BN1286, 45BN2121, 45BN2195, 45BN2196, 45BN2198, 45BN2202, 45BN2203, 45BN2204, 45BN2205, and 45BN2212, and IFs 45BN2208, and 45BN2209, these archaeological resources are recommended to be avoided by the Project's final layout. A minimum avoidance buffer of 30 meters (100 feet) around the sites has been recommended in confidential Attachment Q and is achieved in the current Project design.	DAHP, Confederated Tribes and Bands of the Yakama Nation,

Mitigation Measure	Description	Expert Agency Participation
	If avoidance of these buffers is infeasible during final design, monitoring of construction activities within the buffer may be necessary. If avoidance of the sites themselves is infeasible, an Excavation Permit from DAHP will be required under RCW 27.53	
Archaeological Excavation Permit	Pre-contact archaeological sites, regardless of register eligibility, or NRHP-eligible or unevaluated historic-era archaeological sites that cannot be avoided in the Project's final layout/design, require an archaeological excavation permit from DAHP under RCW 27.53.060 before they can be disturbed. This requirement is limited to the site boundaries themselves. Based on the register eligibility evaluations in confidential Attachment Q, no such sites will be impacted by the current design and no permit is necessary for the current design.	DAHP, Confederated Tribes and Bands of the Yakama Nation
Unanticipated Discovery Plan	In the event unrecorded archaeological resources are identified during Project construction or operation, work within 30 meters (100 feet) of the find should be halted and directed away from the discovery until it can be assessed in accordance with steps in the Unanticipated Discovery Plan (provided as Appendix G in Attachment Q). This appendix does not contain any confidential information and can be shared with Project personnel and contractors.	DAHP, County, Confederated Tribes and Bands of the Yakama Nation
Continued Coordination with Native Americans	Only regulatory agencies can formally consult with tribes. Informal communications are included with this ASC as part of resource identification efforts and as due diligence. Coordination and open communications will continue with interested tribes during Project permitting and design to incorporate tribal input regarding avoidance of potential impacts to cultural resources, including traditional use areas or other areas of significance to tribes. Lines of communication will remain open to better facilitate any response to unanticipated discoveries during construction.	DAHP, County, Confederated Tribes and Bands of the Yakama Nation
Traffic and Transportation		
WSDOT Oversize and Overweight Permit	A permit will be obtained for heavy or oversized loads in accordance with WSDOT regulations including RCW 46.44 and WAC 468-38.	WSDOT
WSDOT Right of Way Access Permit	Per WAC 468-51, the Applicant will obtain a General Permit from WSDOT to upgrade the portion of the approach off SR 241 that is within the WSDOT right-of-way.	WSDOT
Benton County and/or Yakima County Right of Way Access Permit	Based on final Project design, the Applicant will obtain access permits to construct approaches to County road right-of-way from Benton and Yakima Counties pursuant to County Standards.	Benton County Public Works Department, Yakima County Public Works Department
Traffic Control Plan	A Traffic Control Plan will be prepared in consultation with WSDOT for traffic management during improvement of highway access. This plan would contain measures to facilitate safe movement of vehicles in the vicinity of the construction zone and would be in accordance with 23 CFR §655 Subpart F that provides for the Federal Highway Administration to maintain the Manual on Uniform Traffic Control Devices for Streets and Highways, which defines standards for traffic control. A Traffic Control Plan will be prepared in coordination with Benton County and Yakima County Public Works Departments for traffic management during construction	WSDOT, Benton County Public Works Department, Yakima County Public Works Department

Mitigation Measure	Description	Expert Agency Participation
	and for construction of access approaches from county right-of-way.	

A.6. Project Plans and Submittals

Submittal Name	Description	Submittal Timing	Expert Agency Participation
Preliminary Site Plan	Shows the preliminary Project design in relation to the Project Lease Boundary and Project Area.	Completed (Attachment A; Figure A-1)	N/A
Construction Stormwater General Permit (CSWGP) and Notice of Intent (NOI)	In compliance with WAC 173-200 and WAC 463-76, the Applicant will obtain a CSWGP. The Construction Stormwater General Permit requires an ESCP and a SWPPP.	Prior to site preparation	EFSEC with input from Ecology
Erosion and Sediment Control Plan (ESCP)	The ESCP will be prepared to control erosion and sediment discharges during construction and will include BMPs such as the appropriate use of silt fencing to avoid or eliminate runoff of contaminants.	Prior to site preparation	EFSEC with input from Ecology
Construction Phase Stormwater Pollution Prevention Plan (SWPPP)	The Construction Phase SWPPP will be based on Ecology's SWPPP template and will address stormwater runoff, flooding, and erosion to ensure compliance with state and federal water quality standards. The SWPPP will include BMPs from Ecology's Stormwater Management Manual for Eastern Washington.	Prior to site preparation	EFSEC with input from Ecology
Construction Phase Spill Prevention Control and Countermeasure (SPCC) Plan	The Construction Phase SPCC Plan will be prepared to prevent spills during construction and to identify measures to expedite the response to a release if one were to occur. Preventative procedures and rapid response measures will address/prevent potential water quality issues. The plan will be prepared pursuant to the requirements of CFR Part 112, as well as Sections 311 and 402 of the Clean Water Act, and Section 402(a)(1) of the Federal Water Pollution Control Act.	Prior to site preparation	EFSEC with input from Ecology
Emergency Management Plan	The Emergency Management Plan will address worker health and safety, as well as fire prevention and control measures for construction and operation.	Prior to site preparation	Benton County Emergency Management, Benton County Sherriff, Benton County Fire Marshal, and DNR Wildland Fire Management Division.
Traffic Control Plan	A Traffic Control Plan will be prepared in coordination with Washington State Department of Transportation, Benton County, and Yakima County for traffic management during construction and for construction of access approaches from WSDOT right-of-way. The plan will be developed consistent with WDOT and Benton County design standards.	Prior to site preparation	With input from WSDOT, Benton County, and Yakima County
Construction Schedule	Final construction schedule.	Prior to site preparation	EFSEC

Submittal Name	Description	Submittal Timing	Expert Agency Participation
Construction Plans and Specifications	A set of construction plans, specifications, drawings, and design documents that demonstrate the Project is in compliance with applicable conditions of the Site Certificate Agreement.	Prior to site preparation	EFSEC
Operations Phase SWPPP	The Operations Phase SWPPP will be based on Ecology's SWPPP template and will address stormwater runoff, flooding, and erosion to ensure compliance with state and federal water quality standards. The SWPPP will include BMPs from Ecology's Stormwater Management Manual for Eastern Washington.	Prior to commercial operations	EFSEC with input from Ecology
Operations Phase SPCC Plan	The Operations Phase SPCC Plan will be prepared to prevent spills during operations and to identify measures to expedite the response to a release if one were to occur. Preventative procedures and rapid response measures will address/prevent potential water quality issues. The plan will be prepared pursuant to the requirements of CFR Part 112, Sections 311 and 402 of the Clean Water Act, Section 402(a)(1) of the Federal Water Pollution Control Act, and RCW 90.48.080.	Prior to commercial operations	EFSEC with input from Ecology
Habitat Management Plan (HMP)	The Habitat Management Plan will specify the avoidance, minimization, and mitigation obligations and implementation plans, including those for Project construction, operations, and decommissioning. The plan will address the applicable requirements of WAC 463-60-332 and applicable guidelines such as WDFW's Mitigation (M-5002) Policy.	The Draft HMP is provided with this ASC (Attachment M) The HMP will be revised in coordination and with input from EFSEC and WDFW and completed prior to site preparation	EFSEC with input from WDFW
Revegetation and Weed Management Plan	The Revegetation and Weed Management Plan will address vegetation management activities related to the Project's construction and operation and specify methods that will be implemented for effective revegetation of temporarily disturbed areas and noxious weed control.	Prior to site preparation	EFSEC with input from WDFW and the Benton County Noxious Weed Control Board
Unanticipated Discovery Plan	Plan to address situations when an unanticipated archaeological resource is discovered during construction. In the event unrecorded archaeological resources are identified during Project construction or operation, work within 30 meters (100 feet) of the find will be halted and directed away from the discovery until it can be assessed per the measures outlined in the plan.	Completed (confidential Attachment Q)	EFSEC, DAHP, and Tribes

Submittal Name	Description	Submittal Timing	Expert Agency Participation
Initial Site Restoration Plan	Consistent with WAC 463-72-040, the Applicant will provide EFSEC with an Initial Site Restoration Plan at least 90 days prior to beginning Project site preparation. The Initial Site Restoration Plan will generally follow the proposed retirement steps provided in the Applicant's Decommissioning Summary and Estimate (Attachment R). The plan will include provisions for dismantling and removing aboveground solar array components and other aboveground associated supporting components described in Part 2, Section A.2.a. In areas where foundations are removed, the surface will be recontoured reasonably similar to the pre-construction condition, and the area will be reseeded with a seed mixture reasonably acceptable to the property owner.	At least 90 days prior to site preparation	EFSEC
Soil Monitoring Plan	In order to assess potential impacts on soil health from Project development, the Applicant will prepare a Soil Monitoring Plan to monitor soil compaction, assess physical characteristics, and measure nutrient levels in the soil. The plan will include a selection of potential adaptive management actions that could be taken if soil health declines due to Project development and operation.	At least 90 days prior to site preparation	EFSEC

A.7. Federal and State Requirements

Per WAC 463-60-297, Table A.7-1 below lists the federal and state statutes, rules and permits potentially applicable to the Project, and where compliance is addressed in the ASC. The Applicant's Land Use Consistency Review addresses local statutes and requirements (Attachment D).

Table A.7-1. List of Federal and State Permits and Regulations Potentially Applicable to the Project

Permit or Requirement	Agency Code, Ordinance, Statute, Rule, Regulation, or Permit	ASC Section Reference
Federal		
Record of Decision/ National Environmental Policy Act Compliance	Bonneville Power Administration National Environmental Policy Act, Section 102 (42 U.S.C. § 4332); 40 CFR § 1500. The POI with the BPA transmission system is subject to review under the National Environmental Policy Act. BPA will lead this process as a separate action from the site certification process. This federal process is not within the jurisdiction of EFSEC and is not addressed in this ASC.	Part 2, Section A.2.a
Threatened or Endangered Species	U.S. Fish and Wildlife Service Endangered Species Act of 1973 (16 U.S.C., Section 1531, et seq.) and implementing regulations. Designates and provides for protection of threatened and endangered plants and animals and their critical habitat. Section 7, 9, and 10 Consultation under the Endangered Species Act and Bald and Golden Eagle Protection Act (BGEPA).	Part 4, Sections 4.8 and 4.9
Migratory Birds	U.S. Fish and Wildlife Service Migratory Bird Treaty Act (16 U.S.C., 703-711).	Part 4, Sections 4.8 and 4.9
Eagles	U.S. Fish and Wildlife Service Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c). Eagle permit regulations (50 CFR 22)	Part 4, Sections 4.8 and 4.9
Air Quality	U.S. Environmental Protection Agency (EPA) Clean Air Act (42 USC 85, Section 7401, et seq.; 40 CFR 60).	Part 4, Section 4.2
Waters of the United States	U.S. Army Corps of Engineers (USACE), Seattle District Clean Water Act of 1972 (40 CFR 230) Section 404. The need for a Section 404 permit is pending coordination with the USACE. The Applicant submitted a request for an approved jurisdictional determination to the USACE on December 13, 2021 (reference number NWS-2021-1146)	Part 4, Section 4.3
Aviation	Federal Aviation Administration Construction or alteration requiring notice (14 CFR 77.9), Form 7460-1.	Part 4, Section 4.16b

Permit or Requirement	Agency Code, Ordinance, Statute, Rule, Regulation, or Permit	ASC Section Reference
State		
Electrical Construction Permit	Washington Department of Labor and Industries WAC 296-46B, Washington Department of Labor and Industries Safety Standards—Installing Electrical Wires and Equipment— Administration Rules.	Part 2, Section A.7
Noise Control	Washington Department of Ecology RCW 70A.20 Noise Control; WAC 173-58, Sound Level Measurement Procedures. WAC 173-60, Maximum Environmental Noise Levels; WAC 463-62-030, Noise Standards.	Part 4, Section 4.16a
Air Quality	Washington Department of Ecology WAC-173-400, General Regulations for Air Pollution Sources. WAC 173-441, Reporting of Emissions of Greenhouse Gases. WAC 173-476, Ambient Air Quality Standards.	Part 4, Section 4.2
Water Quality Storm Water Discharge	Washington Department of Ecology RCW 90.48, Water Pollution Control Act, establishes general stormwater permits for the Washington Department of Ecology National Pollutant Discharge Elimination System (NPDES) Permit Program. Construction Stormwater General Permit for NPDES (through EFSEC jurisdiction, WAC 463-76). WAC 173-201A, Washington Department of Ecology Water Quality Standards for Surface Waters of the State of Washington, which regulates water quality of surface waters. Federal statute(s) and regulations implemented by the above state statute(s) and regulations include: Federal Clean Water Act, 33 U.S.C. 1251; 15 CFR 923-930.	Part 3, Sections 3.3, 3.5; Part 4, Sections 4.3 and 4.5
Water Quality Waters of the State	Washington Department of Ecology Section 401 Water Quality Certificate, Joint Aquatic Resource Permit Application (JARPA).	Part 4, Section 4.3
Shorelines of the State	Washington Department of Ecology WAC 173-18, Shoreline Management Act, Streams and Rivers Constituting Shorelines of the State. WAC 173-22, Adoption of Designations of Shorelands and Wetlands Associated with Shorelines of the State. JARPA and shoreline CUP for fill in wetlands associated with Shorelines of the State.	Part 2, Section B.6; Not anticipated to be required for the Project.
Fish and Wildlife	Washington Department of Fish and Wildlife WAC 220-610, defines State species status and protections. RCW 77.55, Hydraulic Code for in-water work; Hydraulic Project Approval (HPA).	Part 4, Sections 4.8 and 4.9 (*for WAC 220-610*) Part 4, Section 4.3 (*for RCW 77.55 and HPA*)
SEPA	RCW 43.21C, Washington Environmental Policy Act WAC 197-11, Washington Department of Ecology State Environmental Policy Act (SEPA) Rules, which establish uniform requirements for compliance with SEPA.	Parts 3 and 4

Permit or Requirement	Agency Code, Ordinance, Statute, Rule, Regulation, or Permit	ASC Section Reference
Archaeology and Historic Preservation	Washington State Departments of Archaeology and Historic Preservation RCW 27.53, Archaeological Sites and Resources.	Part 4, Section 4.18
Energy Site Certification	Energy Facility Site Evaluation Council RCW 80.50 Energy Facilities – Site Locations.	This ASC addresses the site location review requirements for a Site Certification Agreement
Transportation	Washington State Department of Transportation (WSDOT) General Permit, WAC 468-51. Oversize and Overweight Permit, WAC 468-38-075.	Part 4, Section 4.20
Local		
Special Flood Hazard Development Permit	Benton County Development within special flood hazard area, BCC Chapter 3.26.	Part 3, Section 3 and Part 4, Section 4.3

B. Project and Site Information

B.1. Earth and Ground Disturbance

B.1.a. Soils and Slopes

Soil types	Soils in the Project Area are shown on Figure A-3 in Attachment A and listed in Attachment E. Burke silt loam, 0 to 5 percent slopes Burke silt loam, shallow, 0 to 5 percent slopes Esquatzel silt loam, 0 to 5 percent slopes Finley fine sandy loam, 0 to 15 percent slopes Finley stony fine sandy loam, 0 to 30 percent slopes Hezel loamy fine sand, 0 to 30 percent slopes Kiona very stony silt loam, 0 to 30 percent slopes Kiona very stony silt loam, 30 to 65 percent slopes Ritzville silt loam, 0 to 5 percent slopes Ritzville silt loam, 15 to 30 percent slopes, severely eroded Ritzville silt loam, 30 to 65 percent slopes Scooteney silt loam, 0 to 5 percent slopes Shano silt loam, 0 to 5 percent slopes Shano very fine sandy loam, 15 to 30 percent slopes, eroded Warden silt loam, 0 to 5 percent slopes Warden silt loam, 15 to 30 percent slopes, severely eroded Warden very fine sandy loam, 0 to 15 percent slopes
Steepest slope	51%
Range of Slopes	0 to 51%

B.1.b. Demolition, Grade and Fill

Would any demolition or renovation occur during construction?	
☒ No	**☐ Yes**
	Method:
	Waste Use or Disposal site:

Would any demolition or renovation occur during operation?	
☒ No	**☐ Yes**
	Method: N/A
	Waste Use or Disposal Site: N/A

Would any grade, fill, or excavation in upland areas occur during construction?		
☐ **No**	☒ **Yes** The extent of grading and fill that will be used as well as the source of fill material is pending final Project design. The values provided below are preliminary and will be revised with final Project design. The Applicant will specify the final quantity and source of fill in the Construction Plans and Specifications which will be provided to EFSEC for review prior to site preparation and once the final engineering design is completed.	
	☒ Grading	Cubic yards proposed: Approximately 451,600
	☒ Filling (import material to site)	Cubic yards proposed: Approximately 25,300
		Source of fill: Unknown
	☐ Excavating (Export material off site)	Cubic yards proposed: N/A
		Disposal site or use: N/A

Would any grade, fill, or excavation in upland areas occur during operation?		
☒ **No**	☐ **Yes**	
	☐ Grading	Cubic yards proposed: N/A
	☐ Filling (import material to site)	Cubic yards proposed: N/A
		Source of fill: N/A
	☐ Excavating (Export material off site)	Cubic yards proposed: N/A
		Disposal site or use: N/A

Is fill or excavation proposed within surface waters, wetlands, or frequently flooded areas?
☐ **No** ☒ **Yes** The Project has been designed to avoid wetlands and wetland buffers. No fill or excavation will occur within ephemeral streams, stream buffers, and frequently flooded areas. Project components that will intersect with waterways (ephemeral streams) and Benton County critical areas ordinance regulated steam buffers include: • A temporary 100-year floodplain and stream crossing for the installation of the overhead transmission lines. • Collection lines will be bored underneath the ephemeral waterways in four locations. All four of the borings will be located outside of the stream buffers. One of the borings, which is located outside of the stream buffer, will also be outside of the associated 100-year floodplain. • The temporary and permanent widening of an existing access road that lies in between two ephemeral drainages. All temporary and permanent impacts associated with the road widening are located outside of the adjacent ephemeral

	drainages and stream buffers. This road widening is co-located with one of the boring locations. The impacts associated with these components are described in greater detail in Part 4, Section 4.3 and Attachment T Joint Aquatic Resources Permit Application (JARPA). The final extent of excavation and fill that will be used is pending final Project design, which will be completed once the construction contractor has been selected following issuance of the Project SCA. The values provided below are preliminary and will be revised with final Project design. The Applicant will specify the final quantity in the Construction Plans and Specifications which will be provided to EFSEC for review prior to site preparation and once the final engineering design is completed. As described in Part 4, Section 4.3.C, because ephemeral streams within the Project Area are not fish-bearing, the Applicant will engage with the Washington Department of Fish and Wildlife (WDFW) to determine if a Hydraulic Project Approval (HPA) is necessary based on final Project design (i.e., per WAC 220-660-010, the purpose of the HPA is to ensure that construction or performance of work is done in a manner that protects fish life). A JARPA has been prepared as part of this ASC (Attachment T)	
	☒ Fill	Cubic yards: • Wetlands: No fill is proposed within wetlands or wetland buffers. • Ephemeral streams, stream buffers, and frequently flooded areas: No fill is proposed within ephemeral streams, stream buffers, and frequently flooded areas. • A total of 424 cubic yards of fill is proposed for a permanent road widening and culvert between two ephemeral waterways that, while outside of the waterways and their regulated buffers, is included because the WDFW has indicated that this type of crossing may require an HPA.
	☒ Excavation/ Dredging	Cubic yards: • Wetlands: No excavation is proposed within wetlands or wetland buffers. • Ephemeral streams, stream buffers, and frequently flooded areas: No excavation is proposed within ephemeral streams, stream buffers, and frequently flooded areas.
	Describe area(s) where this would occur: See Part 4, Section 4.3 and Attachment T	

B.2. Surface Types and Acreage

		Acreage	
Project Site Areas		**Pre-Construction, within the Project Area**	**Post-Construction, within the Project Area**
Roads, buildings, and other impervious surfaces		33	161
Altered Habitat (revegetated area inside the solar array fenceline)		0	2,954
Wetlands	**Emergent wetland**	0.1	0.1

Project Site Areas		Acreage	
		Pre-Construction, within the Project Area	**Post-Construction, within the Project Area**
	Scrub Shrub wetland	0	0
	Forested wetland	0	0
	Open Water *(do not include any area already listed in previous categories)*	0	0
Vegetated Uplands	**Agriculture**	793	29
	Eastside (interior) Grassland	41	37
	Non-native Grassland and Forbland	1,319	696
	Shrub-steppe	118	114
	Irrigated Hedgerow	9	1
	Rabbitbrush Shrubland	129	37
	Planted Grassland[1/]	2,128	542
Unvegetated *such as rock, earth, or fill*			
Other	**Ephemeral Streams**	3	3
	Talus slopes	3	3
TOTAL:		**4,573**	**4,573**

B.3. Plants and Habitats

Are there any plants or habitats present on the site?			
☐ **None**	☒ **Yes** See the Botanical Survey Report (Attachment F) and the Habitat and General Wildlife Survey Report (Attachment G) for additional details regarding plants and habitats found within the Project Area. Appendix B of the Botanical Survey Report provides a complete list of vascular plants observed within the Project Area.		
	Deciduous trees: *such as alder, maple, aspen*		
	☐ **No**	☒ **Yes**	
	Specify: Deciduous trees observed within the Project Area were all non-native planted species, primarily located in irrigated hedgerows/windbreaks. Species observed included: Russian-olive (*Elaeagnus angustifolia*), cherry (*Prunus* spp.), black locust (*Robinia pseudoacacia*), and Siberian elm (*Ulmus pumila*).		
	Evergreen trees: *such as fir, cedar, pine:*		
	☐ **No**	☒ **Yes**	
	Specify: The only evergreen tree observed within the Project Area was western juniper (*Juniperus occidentalis*). These juniper trees were also observed within the irrigated hedgerows/windbreaks.		
	Shrubs, grass, pasture		

☐ No	☒ Yes	

Specify: Non-native grassland and forbland; species observed in this habitat type include:

- Grasses: bulbous bluegrass (*Poa bulbosa*), cheatgrass (*Bromus tectorum*), cereal rye (*Secale cereale*)
- Forbs: blue mustard (*Chorispora tenella*), common stork's bill (*Erodium cicutarium*), tall tumblemustard (*Sisymbrium altissimum*), yellow salsify (*Tragopogon dubius*)

Eastside (interior) grassland; species observed in this habitat type include:

- Grasses: bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), needle-and-thread (*Hesperostipa comata*), Sandberg bluegrass (*Poa secunda* ssp. *secunda*), cheatgrass, bulbous bluegrass
- Forbs: Carey's balsamroot (*Balsamorhiza careyana*), desert-parsley (*Lomatium* spp.), threadleaf fleabane (*Erigeron filifolius*), long-leaf phlox (*Phlox longifolia*), lupine (*Lupinus* spp.), woolly plantain (*Plantago patagonica*)

Rabbitbrush shrubland; species observed in this habitat type include:

- Shrubs: rubber rabbitbrush (*Ericameria nauseosa*), green rabbitbrush (*Chrysothamnus viscidiflorus*)
- Grasses: big bluegrass (*Poa secunda* ssp. *juncifolia*), bluebunch wheatgrass, crested wheatgrass (*Agropyron cristatum*), cheatgrass, bulbous bluegrass
- Forbs: hawksbeard (*Crepis* spp.), hoary-aster (*Dieteria canescens*), lupine, threadleaf fleabane, common stork's bill, tall tumblemustard

Shrub-steppe: *such as sage brush, native grasses*

☐ No	☒ Yes	

Specify: Shrub-steppe; species observed in this habitat type include:

- Shrubs: big sagebrush (*Artemisia tridentata*), threetip sagebrush (*Artemisia tripartita*), green rabbitbrush, rubber rabbitbrush
- Grasses: Sandberg bluegrass, squirreltail (*Elymus elymoides*), bulbous bluegrass, cheatgrass, crested wheatgrass
- Forbs: hawksbeard, hoary-aster, threadleaf fleabane, woollypod milkvetch (*Astragalus purshii*)

Wet soil plants: *such as cattail, buttercup, bulrush, skunk cabbage*

☐ No	☒ Yes	

Specify: Wet soil plants were observed in wetlands that formed from leaking irrigation pipes. Species observed include: cattail (*Typha latifolia*), barnyard grass (*Echinochloa crus-galli*)

Water plants: *such as water lily, eelgrass, milfoil*

☒ No	☐ Yes	

Specify:

Other vegetation types: Planted grassland; Agricultural lands

☐ No	☒ Yes	

Specify: Planted grassland; species observed in this habitat type include:

- Shrubs: rubber rabbitbrush (low cover of shrubs)
- Grasses: crested wheatgrass, bluebunch wheatgrass, big bluegrass, bulbous bluegrass, cheatgrass
- Forbs: hawksbeard, fiddleneck (*Amsinckia* spp.), common stork's bill, tall tumblemustard, yarrow (*Achillea millefolium*)

Agricultural land:

- Fallow and active wheat fields
- Alfalfa fields
- Livestock and horse pastures

Irrigated hedgerows/planted windbreaks; species include those listed under deciduous trees above.

Other habitat types:

☐ No	☒ Yes	

Specify: Talus: sparsely vegetated scree and talus on steep slopes. Vegetation observed included bluebunch wheatgrass, Sandberg bluegrass, needle-and-thread, cheatgrass, bulbous bluegrass, Carey's balsamroot and butterfly bearing biscuit-root (*Lomatium papilioniferum*).

Developed/disturbed: includes roads, structures, and other areas disturbed in association with agricultural and ranching activities.

Do you know of any at-risk plant species on the site*:*

- *Threatened or endangered*
- *Species of local importance*
- *Federal or state listed*
- *Federal or state priority*
- *Tribal-specific plant resources present on the site where abundance is limited elsewhere*

☐ None known	☒ Yes

Species Name	Listing Status
One population of the state sensitive species, Columbia milk-vetch (*Astragalus columbianus*), was observed during surveys conducted for the Project. Subsequent to these surveys, the Project Area was revised to avoid this population. Additional details on this population can be found within the Botanical Survey Report (Attachment F). No other at-risk plant species were observed. Additional surveys for at-risk plant species will be conducted in the spring of 2022 within the portions of the Project Area that were not surveyed during surveys conducted in May 2021.	

	Name the sources that were checked, or work done to identify the at-risk species: See the Botanical Survey Report (Attachment F) and the Habitat and General Wildlife Survey Report (Attachment G).

B.4. Forest Harvest

Is a forest practice or timber harvest proposed on any sites associated with the proposal?		
☒ No	**☐ Yes**	
	Acres proposed:	N/A

B.5. Fish and Wildlife

Are there any animals that have been observed or are known to be on or near the site?			
☐ None known	**☒ Yes** See the Habitat and General Wildlife Survey Report (Attachment G) for additional details regarding animals found within the Project Area. Appendix A and Appendix C of the Habitat and General Wildlife Survey Report (Attachment G) provide a list of special status wildlife species with potential to occur within the Project Area and wildlife species and sign observed during field surveys, respectively.		**List species that use the site as a travel corridor.**
	Birds: *such as hawk, heron, eagle, songbirds*		
	☐ No	**☒ Yes**	

		Specify: The Habitat and General Wildlife Survey Report (Attachment G) lists the 36 avian species identified during the general wildlife surveys (either through direct observation or though signs). These included: American goldfinch (Spinus tristis), American robin (*Turdus migratorious*), barn swallow (*Hirundo rustica*), black-billed magpie (*Pica hudsonia*), Brewer's blackbird (*Euphagus cyanocephalus*), Bullock's oriole (*Icterus bullockii*), California quail (*Callipepla californica*), cliff swallow (*Petrochelidon pyrrhonota*), common raven (*Corvus corax*), Eurasian collared dove (*Streptopelia decaocto*), European starling (*Sturnus vulgaris*), ferruginous hawk (*Buteo regalis*), golden-crowned kinglet (*Regulus satrapa*), golden eagle (*Aquila chrysaetos*), grasshopper sparrow (*Ammodramus savannarum*), great-horned owl (*Bubo virginianus*), green-winged teal (*Anas crecca*), horned lark (*Eremophila alpestris*), house finch (*Haemorhous mexicanus*), house sparrow (*Passer domesticus*), killdeer (*Charadrius vociferus*), lark sparrow (*Chondestes grammacus*), long-billed curlew (*Numenius americanus*), mourning dove (*Zenaida macroura*), northern harrier (*Circus cyaneus*), red-breasted nuthatch (*Sitta canadensis*), red-tailed hawk (*Buteo jamaicensis*), red-winged blackbird (*Agelaius phoeniceus*), rock pigeon (*Columba livia*), savannah sparrow (*Passerculus sandwichensis*), Swainson's hawk (*Buteo swainsoni*), turkey vulture (*Cathartes aura*), vesper sparrow (*Pooecetes gramineus*), western kingbird (*Tyrannus verticalis*), western meadowlark (*Sturnella neglecta*), and yellow warbler (*Setophaga petechia*). Additional surveys for avian species were conducted as part of the Raptor Nest Surveys (see Attachment L). Species and their nests identified during the Raptor Nest Surveys included burrowing owls (*Athene cunicularia*), common ravens, great horned owls (*Bubo virginianus*), and Swainson's hawks.	See Section 4.9 for a detailed discussion of migration routes. Also, please see the 2021 Wildlife and Habitat Survey Report (Attachment G) for additional information regarding species occurrence in the area.
	Mammals: *such as deer, bear, elk, beaver*		
	☐ **No**	☒ **Yes**	

	Specify: The Habitat and General Wildlife Survey Report (Attachment G) lists the mammal species identified during the general wildlife surveys (either through direct observation or though signs). These included: coyote (*Canis latrans*), mountain lion (*Puma concolor*), mule deer (*Odocoileus hemionus*), and elk (*Cervus canadensis nelson*). No small mammals were directly observed; however, unidentified small mammal scat and sign were observed.	See Section 4.9 for a detailed discussion of migration routes. Also, please see the 2021 Wildlife and Habitat Survey Report (Attachment G) for additional information regarding species occurrence in the area.
Fish: *such as bass, salmon, trout, herring, shellfish*		
☒ **No**	☐ **Yes**	N/A
	Specify: N/A	
Other:		
☐ **No**	☒ **Yes**	N/A
	Specify: An unknown snake was observed during the Habitat and General Wildlife Survey Report (Attachment G); however, surveyors were not able to identify it to species.	

Do you know of any at-risk animal species on or near the site?

- *Threatened or endangered*
- *Species of local importance*
- *Federal or state listed*
- *Federal or state priority*
- *Tribal-specific fish, plant, or wildlife resources present on the site where abundance is limited elsewhere*

☐ **None known** ☒ **Yes**

Species Name	**Listing Status**[1]
Birds	
Burrowing owl	C
Ferruginous hawk	E, PS
Golden eagle	BGEPA, PS
Northern harrier	BCC
Mammals	
Elk	PS
Mule deer	PS

	C = State Candidate; E = State Endangered; PS = WDFW Priority Species; BGEPA = Bald and Golden Eagle Protection Act; BCC = Bird of Conservation Concern.	
	Name the sources that were checked, or work done to identify at-risk species: The list above indicates the special status species identified during surveys (i.e., "known" to occur "on or near the site"); however, Appendix A in Attachment G lists the special status wildlife species with a potential to occur at the Project. The following data sources were used to develop the list of special status wildlife species with a potential to occur at the Project. • Tetra Tech Wautoma Solar Wetland Delineation Report (Tetra Tech 2022) • U.S. Fish and Wildlife Service (USFWS) federally listed species list for Project location in Benton County (USFWS 2021a) • USFWS Birds of Conservation Concern (USFWS 2021b) • Washington State Listed and Candidate Species (WDFW 2020) • WDFW Priority Habitats and Species (PHS) List (WDFW 2008) • WDFW PHS on the Web (WDFW 2021a) • WDFW Threatened and Endangered Species Profiles (WDFW 2021b) • WDFW PHS Distribution by County (WDFW 2021c)	

B.6. Property/Site Designations

Provide information for these 7 items	
Comprehensive Plan (name, date, pertinent sections):	Benton County Comprehensive Plan (Benton County 2018, as amended though 2021) Pertinent sections include: Chapter 2, Goals and Policies Chapter 3, Land Use Element Chapter 4, Natural Resources Element Chapter 5, Economics Element Chapter 6, Housing Element Chapter 7, Transportation Element Chapter 10, Utilities Element Consistency with the Benton County Comprehensive Plan is reviewed in Part 4, Section 4.14 and Attachment D.
Current Zoning:	GMAAD – GMA Agriculture
Planning Area:	GMAAD
Shoreline Master Plan:	Benton County Shoreline Master Program (Benton County 2021).
Designation:	None in the Project Area
Closest Surface Water:	The closest named stream is Dry Creek located within the Project Area. Dry Creek and other unnamed stream segments in the Project Area are ephemeral streams as described in the wetland delineation report (Attachment I; Part 4, Section 4.3).

Distance:	See above
WRIA #:	37 – Lower Yakima

Is the site within a mapped FEMA Flood Zone?	
☐ **No**	☒ **Yes**
	Zone name: There is one mapped Zone A (100-year floodplain) associated with the named ephemeral stream, Dry Creek, which crosses through the northern portion of the Project Area. See Part 4, Section 4.3 for additional details.

Is the site a designated Natural Resource Land? *Designated by the county or city*	
☒ **No** ☐ **Yes**	**Forest land:**
☐ **No** ☒ **Yes**	**Agriculture:** The Project is located in the GMAAD zone, which is a designated agricultural land of long-term commercial significance by Benton County (Benton County 2021).
☒ **No** ☐ **Yes**	**Mineral:**

Is the site, or land within 300 feet of the site, in a designated Critical Area? *Designated by the county or city*	
☐ **No** ☒ **Yes**	**Wetland:** See Part 4, Section 4.3 for additional details.
☐ **No** ☒ **Yes**	**Frequently flooded:** See Part 4, Section 4.3 for additional details.
☐ **No** ☒ **Yes**	**Aquifer recharge:** See Part 4, Section 4.5 for additional details.
☐ **No** ☒ **Yes**	**Geologic hazard:** See Part 4, Section 4.1 for additional details.
☐ **No** ☒ **Yes**	**Fish/wildlife habitat conservation:** See Part 4, Section 4.9 for additional details.
☒ **No** ☐ **Yes**	**Other**

On a Local, State, or Federal Historic Register?		
☐ **No**	☒ **Yes**	See Part 4, Section 4.19
	☒ **Listed**	☒ **Proposed**

Identified as a Local, State, or Federal Cultural Site?		
☒ **No**	☐ **Yes**	See Part 4, Section 4.19
	☐ **Listed**	☐ **Proposed**

Are there tribes that may have or claim particular rights to all or part of the project area?

☐ **None known**	☒ **Yes** The Applicant consulted DAHP's Interactive Tribal Map, which identified the Confederated Tribes of the Warm Springs Reservation of Oregon, Samish Indian Nation, Wanapum Tribe, and Confederated Tribes and Bands of the Yakama Nation as tribes with traditional territories in the Project Area.	
	Tribe	**Contact Made or Attempted, Who/When/method of contact** **Outcome of Contact including Right Asserted (*if any*)**
	Confederated Tribes of the Warm Springs Reservation of Oregon	Christian Nauer, via letter on 8/11/2021, to discuss cultural resources, surveys, and general introduction to the Project. A Project update letter was sent on March 1, 2022.
		A draft copy of the survey report was provided for review. Outreach is ongoing.
	Samish Indian Nation	Tom Wooten, via letter on 8/11/2021, to discuss cultural resources, surveys, and general introduction to the Project. A Project update letter was sent on March 1, 2022.
		In response to our letter of March 1, 2022, Jackie Ferry (Chelángen Director/Tribal Historic Preservation Officer, Samish Indian Nation) indicated they are not interested in engaging on cultural resources on this project. Outreach is ongoing.
	Wanapum Tribe	Rex Buck Jr., via letter on 8/11/2021, to discuss cultural resources, surveys, and general introduction to the Project. A Project update letter was sent to Wanapum Tribe's general mailing address on March 1, 2022.
		In response to our letter of March 1, 2022, Jackie Ferry (Chelángen Director/Tribal Historic Preservation Officer, Samish Indian Nation) indicated they are not interested in engaging on cultural resources on this project. Outreach is ongoing.
	Confederated Tribes and Bands of the Yakama Nation	Casey Barney, via letter on 8/11/2021, to discuss cultural resources, surveys, and general introduction to the Project. A Project update letter was sent on March 1, 2022. A draft copy of the survey report was provided for review. Outreach is ongoing.
		Phil Rigdon, from September 2021 through March 2022, via numerous emails and phone conversations to discuss a general introduction to the Project. Outreach is ongoing.
		Shannon Adams, Habitat Coordinator, via email on 3/3/2022, to discuss a potential opportunity for a habitat mitigation plan. No response received to date.
	Confederated Tribes of the Colville Reservation	Cody Desautel and Michael Findlay via phone message. No response received to date. Outreach is ongoing.
	Confederated Tribes of the Umatilla Indian Reservation	Teara Farrow Ferman, via letter on 03/11/2022, to discuss cultural resources, surveys, and general introduction to the Project.

Other applicable plans or local/state/federal designations that apply to the site?		
☒ None known	☐ Yes	
	Names:	N/A

B.7. Land Uses

Identify the following.

Existing Land Uses	Dryland and irrigated agriculture, rangeland, undeveloped areas, local roads, electrical infrastructure (e.g., transmission and distribution lines, substations), scattered unoccupied structures (e.g., agricultural storage).	
Past Known Land Uses	Agriculture, rangeland, undeveloped land, scattered unoccupied structures.	
Existing Adjacent Uses	**North:**	Dryland and irrigated agriculture, scattered rural development, local roads, and state highways.
	South:	Undeveloped areas and dryland agriculture.
	West:	Dryland and irrigated agriculture, vineyard, scattered rural development, local roads, and state highways.
	East:	Rangeland, undeveloped areas, local roads, state highways, and Hanford Reach National Monument (Rattlesnake Unit of the Fitzner/Eberhardt Arid Lands Ecology Reserve).

B.8. Utilities

Answer all yes/no options. Check boxes that apply and answer any items associated with the checked box.

B.8.a Stormwater Management - Construction

Would there be stormwater runoff during construction?

☐ No	☒ Yes		
	Source of runoff:	Compacted soils and construction areas. See Part 3, Section 3.5 for additional information.	
	Quantity of runoff:	A Preliminary Stormwater Management Report is provided in Attachment J. Drainage basins and other erosion control measures have been incorporated into the Project design to address construction runoff.	
	Method of collection:	Ground infiltration through undisturbed native vegetation, as well as temporary drainage basins and erosion control measures.	
	Drain/ discharge to:	☒ Onsite	☐ Overland flow
			☒ Engineered infiltration

			Describe: A Preliminary Stormwater Management Report is provided in Attachment J. Drainage basins have been incorporated into the Project design to address construction runoff. Temporary basins during construction will be located throughout the Project Area as needed pending final engineering.	
		☐ **Offsite**	☐ **Utility**	**Name:**
			☐ **Other**	
			Describe: N/A	
	Is a new facility, system, or line required?			
	☒ **No**	☐ **Yes**		
	Describe and locate on site map*:* N/A			

B.8.b Stormwater Management - Operations

Would there be stormwater runoff during operations?

☐ **No**	☒ **Yes**			
	Source of runoff	New impervious surfaces will be developed as part of this proposal (e.g., gravel roads, solar array posts, foundations for PCS, O&M building, substation components, etc.). However, these impervious surfaces are a small percentage of the total Project Area and stormwater will generally infiltrate across the site by infiltrating through vegetation or, where necessary, through permanent detention basins with outlet culverts to allow water to slowly release and infiltrate. Overall impervious surfaces are anticipated to be approximately 3.8 percent of the total Project Area (see Part 2, Section B.2). See Part 3, Section 3.5 for additional information.		
	Quantity of runoff	A Preliminary Stormwater Management Report is provided in Attachment J. Permanent detention basins will be provided at each discharge location that has an increase in runoff due to the proposed development.		
	Method of collection	In general, there will be minimal grading across the site and existing drainage patterns and natural infiltration will be retained. Temporary disturbance areas will be revegetated following construction. Permanent detention basins will be provided at each discharge location that has an increase in runoff due to the proposed development.		
	Drain/ discharge to:	☒ **Onsite**	☐ **Overland flow**	
			☒ **Engineered infiltration**	
			Describe: Permanent detention basins will be provided at each discharge location that has an increase in runoff due to the proposed development.	
		☐ **Offsite**	☐ **Utility**	**Name:**
			☐ **Other**	

			Describe: N/A
	Is a new facility, system, or line required?		
	☒ No	**☐ Yes**	
	Describe and locate on site map: N/A		

B.8.c Energy

Would there be energy consumption?

☐ No	**☒ Yes**	
	☒ Electricity ⇒ Utility name: Local utility, Benton County Rural Electric Association	
	☐ Natural gas ⇒ Utility name:	
	☐ Fuel ⇒ type:	
	Is a new facility, generator, line, or connection required?	
	☐ No	**☒ Yes**
	Describe and locate on site map: Local utility connection to Benton Rural Electric Association at the Project substation and O&M building. The Project substation and O&M area are shown on Figure A-1 in Attachment A.	
Would there be energy production?		
☐ No	**☒ Yes**	
	☒ Electricity ⇒ Receiving utility name: Unknown at this time. The Applicant is actively pursuing offtake discussions with customers for delivery of the Project's power generation.	
	Is a new facility, generator, line, or connection required?	
	☐ No	**☒ Yes**
	Describe and locate on site map: An approximately 0.25-mile-long overhead 500-kV transmission line will extend from the Project substation to the POI at the existing the BPA transmission system at the BPA Wautoma Substation, which is located on BPA federal lands surrounded by the Project Area. The line will be suspended above ground on H-frame steel structures that will be approximately 60 to 150 feet tall and installed on drilled concrete piers.	

B.8.d Water Use - Construction

Would there be water use during construction?

☐ **No**	☒ **Yes**	
	Gallons per day proposed: Approximately 53 million gallons over the 22-month construction period, or approximately 80,000 gallons/day. Water use for construction is primarily associated with dust control. Concrete used for the Project will be brought to the site by ready-mix trucks and water is not anticipated to be used on-site for the mixing of concrete. Water trucks will be used to provide moisture for compaction as well as dust control during construction as required. Depending on soil moisture levels, up to approximately of 53 million gallons of water could be used throughout the construction for dust suppression.	
	Water source: Water use for Project construction will be obtained from an existing on-site well with a valid water right (to be verified in coordination with Ecology) or will be hauled to the site from off-site sources with existing water rights (i.e., a municipal water source or vendor with a valid water right). If needed, a combination of the options identified above may be used to obtain water for Project construction. The Applicant or the Applicant's construction contractor will verify the source and availability of water from a permitted source prior to construction.	
	☒ **Utility**	**Name:** Unknown (Yet to be determined)
	☐ **Surface water**	**Name:**
	☒ **Private well**	
	☐ **Private water system**	**Name:**
	Is a new well, diversion, line, or connection required?	
	☒ **No**	☐ **Yes**
		Describe and locate on site map: The Applicant or the Applicant's construction contractor will verify the well location and availability of water from a permitted source prior to construction.

B.8.e Water Use - Operation

Would there be water use during operation?

☐ **No**	☒ **Yes**
	Gallons per day: Approximately 120,000 gallons per year. Water will be used during operation for domestic uses at the O&M building and during operations for panel washing. The Project is expected to use less than the groundwater permit-exempt well threshold of 5,000 gallons a day (RCW 90.44.050 sets a maximum withdrawal of up to 5,000 gallons per day [or 5.6 acre-feet per year] for permit exemption). Using a groundwater permit-exempt well, a maximum of 1,825,000 gallons per year could be used during operation (i.e., if the maximum permitting threshold of 5,000 gallons of water a day was used); however, it is estimated that the likely actual use will be 120,000 gallons per year. This total includes the water use related to the potential panel washing (i.e., if 20 percent of the panels are washed once per year).
	Water source: Water use for Project operations will either be obtained from an existing on-site well with a valid water right, hauled to the site from off-site sources with existing water rights (i.e., a municipal water source or vendor with a valid water right), or obtained through a new permit-exempt groundwater well.
	☒ **Utility** — **Name:** Unknown (Yet to be determined)
	☐ **Surface water** — **Name:**
	☒ **Private well**
	☐ **Private water system** — **Name:**
	Is a new well, diversion, line, or connection required?
	☐ **No** / ☒ **Yes**
	Describe and locate on site map: The Applicant or the Applicant's construction contractor will verify the well location and availability of water from a permitted source prior to operations.

B.8.f. Sanitary Waste Management

Would there be a need for sanitary waste management?

☐ **No**	☒ **Yes**
	Gallons per day: The O&M facility will be served by an on-site sceptic system. Up to four operations employees are anticipated, and therefore, the expected use of the on-stie septic system will be less than the permitting threshold of 3,500 gallons per day.
	Discharge to: On-site septic system
	☐ **Utility** — **Name:** N/A
	☒ **Septic system:** On-site septic system to be permitted through Benton County.
	☐ **Other**
	Is a new system, line, or connection required?
	☐ **No** / ☒ **Yes**

	Describe and locate on a site map: A new on-site septic system will be installed at the O&M facility.

B.9. Emergency Service Providers

Identify the providers for the following services for the project site:

Police Services:	Benton County Sheriff's Office
Fire Services:	Washington Department of Natural Resources (DNR) Wildland Fire Management Division
Other Emergency Services:	Benton County Emergency Management Astria Sunnyside Hospital Prosser Memorial Hospital

B.10. Transportation

Will transportation methods other than roads/motorized vehicles be used to access the site? (air, water, rail, pedestrians, bicycles, etc.)	
☒ No	**☐ Yes**
	Describe: N/A

What are the arterial roads serving the area of the project site?	The Project will be accessed via SR 241 and Wautoma Road. See Part 3, Section 20 and Part 4, Section 4.20 for additional details.

Vehicular traffic generated by project:				
	Round trips per day		**Peak hour trips/day**	**Timing of peak hours**
During:	**Vehicles**	**Heavy equipment/material deliveries**		
Construction	225 (average)	20 (average) equipment deliveries 44 (average) water truck deliveries	450 trips (i.e., 225 roundtrips) per day	6 a.m. to 7 a.m., 5 p.m. to 6 p.m.
Operation/use	1 to 4	Infrequent, as needed 1 to 2 water truck deliveries per day during panel washing (once per year over a period of 2 to 3 weeks)	N/A	N/A

Are new public roads proposed?	
☒No	**☐ Yes**

Are any public road improvements proposed?	
☐ No	**☒ Yes**
	Location/description: There are no anticipated changes or improvements to existing transportation infrastructure except for the proposed temporary access road improvements at site entrances from SR 241 and Wautoma Road. The Applicant will obtain County Right of Way Access Permits and a WSDOT Right of Way Access Permit for the proposed Project approaches on County and State Routes within the Project Area based on final design.
Parking	**Existing spaces:** N/A
	Spaces after project: Parking for O&M employees will be provided at the O&M facility. Parking area will accommodate up to 10 spaces.

B.11. References

Benton County. 2018. Benton County Comprehensive Plan Update. Prepared by Anchor QEA LLC and Oneza & Associates. February.

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USFWS. 2021b. Birds of Conservation Concern 2021. United States Department of Interior, Fish and Wildlife Service, Migratory Birds Program, Arlington, Virginia. 48 pp. Available online at: https://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php. Accessed August 2021.

WDFW (Washington Department of Fish and Wildlife). 2008. Priority Habitats and Species List, Revised February 2021. Available online at: https://wdfw.wa.gov/sites/default/files/publications/00165/wdfw00165.pdf Accessed May 2021.

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WDFW. 2021a. Priority Habitats and Species (PHS) on the Web. Available online at: https://wdfw.wa.gov/conservation/phs/. Accessed May 2021.

WDFW. 2021b. Threatened and endangered species profiles. Available online at: https://wdfw.wa.gov/species-habitats/at-risk/listed. Accessed May 7, 2021.

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PART 3 – SCREENING QUESTIONS

3.1 Earth

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	Yes	Yes	Yes	Yes	Yes

3.1.a Screening Question – Earth

Will the project occur in an area that contains steep slopes, unstable soils, surface indications or history of unstable soils; or other geologic hazard with the potential of landslide, mass wasting erosion, faulting, subsidence, or liquefaction, or identified in local ordinance as a designated geologic hazard critical area?	☐ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☒ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Explain below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

Portions of the Project Area are mapped by Benton County as geologically hazardous areas, including areas of combined erosion hazard and steep slopes greater than 15 percent, moderate to high liquefaction, and alluvial fan intermediate risk. The Applicant has prepared a Preliminary Geotechnical Report that describes the geology, soils, topography, and existing erosion patterns of the Project Area (Attachment S). The Preliminary Geotechnical Report provides information regarding geologic hazards that may affect the Project, including seismic hazards (e.g., ground shaking, surface fault rupture, soil liquefaction, and other secondary earthquake-related hazards), slope instability, flooding, ground subsidence, collapsible soils, corrosive soils, and erosion.

The analysis in Part 4 describes the geological and soil conditions within the Project Area, including any geologically hazardous area designated by Benton County as critical areas, as well as the mitigation strategies that will be implemented to minimize the risks associated with potential geological hazards. The Part 4 analysis also address relevant factors identified in WACs 463-60-265, 463-60-302(1)-(2), and 463-62-020.

As you complete the Detailed Analysis in Part 4 - 1. Earth, make sure you consider and address:

How the project could/would:

- Disturb the area(s)

And considering other relevant factors addressed in:

- Be at risk from the area(s) in their current condition
- Be at risk from the area(s) if it degrades further
- Increase water flow over or through the area(s)

- WAC 463-60-265: describe the means to be employed for protection of the facility from earthquakes, volcanic eruption, flood, tsunami, storms, avalanche or landslides, and other major natural descriptive occurrences.
- WAC 463-60-302, (1) and (2)
- WAC 463-62-020 regarding seismicity standards

3.2 Air Quality

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	Yes	Yes	Yes	Yes	Yes

3.2.a Screening Question – Air Quality

Will the project have:		
• Indoor or outdoor air pollution emissions including dust, during operation, other than those related to vehicle emissions • The potential to produce an odor nuisance • Dust during construction	☐ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☒ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

The Project will use heavy construction equipment, which will result in air pollution emissions related to vehicle emissions as well as generate dust within construction areas and along Project roads. Dust will be mitigated using standard dust control practices including, but not limited to, spraying water or a binding agent, and/or applying gravel as necessary.

The analysis in Part 4 addresses the anticipated air pollution emissions generated during construction/operations, as well as the measures that will be implemented to avoid or minimize these impacts. In doing so, the analysis addresses each topic identified by WAC 463-60-312, which includes air quality, odor, climate, climate change, and dust. Pursuant to WAC 463-60-225(1), any emissions subject to regulation by local, state, or federal agencies are quantified.

As you complete the Detailed Analysis in Part 4 - 2. Air Quality, make sure you consider and address:

- Health hazards
- Area's existing/potential air quality issues (failure to meet standards, haze, aesthetics, etc.)
- Proximity to populated areas, recreational areas, or other areas of sensitivity

See guidance regarding information required by WAC 463-60-312.

And considering other relevant factors addressed in:

- WAC 463-62-070 regarding air quality laws and regulations
- WAC 463-60-225 (1) through (3)

3.3 Water Quality – Wetlands and Surface Waters (Buffers, Fill, Dredging, & Sedimentation)

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	Yes	Yes	Yes	Yes	Yes

3.3.a Screening Question – Water Quality (Wetlands and Surface Waters)

Will the proposal involve any activities on a steep slope, area of unstable soils, or within a surface water body, wetland, or within 300 feet of those areas, within a floodplain, or an area known to flood?	☐ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☒ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

The Project Area contains steep slopes and areas of unstable soils (see response to Part 3, Section 1 above). A Preliminary Geotechnical Report has been conducted to determine the extent of these areas within most of the Project Area (Attachment S), as well as identify any applicable mitigation strategies that will be implemented in regard to these unstable areas (e.g., avoidance of applicable areas, development of targeted erosion control devises/strategies, or refinement of the Project's engineering design).

A wetland delineation was conducted within the Project Area from March 15 to 18 and October 4 to 5, 2021, to determine the extent of wetlands and waterbodies within the area. The Wetland Delineation Report is provided in Attachment I and was provided to Ecology for review on April 13, 2022. Ecology provided comments on the delineation report and ASC on June 27, 2022. A call was held between Ecology, EFSEC, and Innergex on September 19, 2022, and Ecology visited the site on May 12, 2023. The comments and discussion did not result in any changes to the Wetland Delineation Report. Three palustrine emergent wetlands and 34 ephemeral drainages were identified within the Project Area. There is also one mapped Zone A (100-year floodplain) associated with a named ephemeral stream, Dry Creek, which crosses through the northern portion of the Project Area.

The Project has been designed to avoid wetlands, and no wetland or wetland buffers impacts (temporary or permanent) are proposed in the current Project layout. Some Project impacts for temporary crossings would occur within ephemeral streams and frequently flooded areas (refer

to the JARPA in Attachment T). The following activities would occur within waterways (ephemeral streams) and Benton County critical areas ordinance regulated stream buffers:

- A temporary 100-year floodplain and stream crossing at Dry Creek for the installation of the overhead transmission lines.
- Collection lines will be bored underneath the ephemeral waterways in four locations.
- The temporary and permanent widening of an existing access road that lies in between two ephemeral drainages. All temporary and permanent impacts associated with the road widening are located outside of the adjacent ephemeral drainages and stream buffers.

The analysis in Part 4 describes the full extent of waterbodies and floodplains within the Project Area, describes the extent of steep slopes and areas of unstable soils (based on information developed for the Part 4 Earth analysis), and describes the impacts the Project would have to ephemeral waterbodies and floodplains and the proposed mitigation strategies that would be implemented.

As you complete the Detailed Analysis in Part 4 – 3. Water Quality (Wetlands and Surface Waters), make sure you consider and address:

- Erosion/erosion control
- Existing/potential water quality issues (temperature, turbidity, sedimentation, etc.)
- Loss of wetland/surface water functions and values (flood control, groundwater recharge, water quality, fish and wildlife habitat, aesthetics, recreation, etc.)
- Existing/potential flood risks

And considering other relevant factors addressed in:

- WAC 463-62-050 starts for wetland impact mitigation
- WAC 463-62-060-060 regarding water quality standards
- WAC 463-60-255, 463-60-322 (1-5), and 463-60-333

3.4 Water Quality – Wastewater Discharges

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	No	Yes	Yes	Yes	N/A

3.4.a Screening Question – Water Quality (Wastewater Discharges)

Will the proposal discharge wastewater (septic systems, process waters, washing of solar panels, etc.) to onsite or offsite surface waters, wetlands, or the ground? (do not include discharges to utilities, and county approved septic systems)	☒ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☐ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

Portable restrooms will be used during construction. During operations, the Project will include an O&M building that may include a bathroom, breakroom, and sink(s) that will drain into a new on-site septic system. The on-site septic system will be permitted, installed by a licensed professional, and maintained in compliance with applicable regulations including WAC 246-272A and Benton-Franklin Health District rules and regulations for on-site sewage systems. The on-site septic system will be designed to accommodate the anticipated needs of the O&M facility and up to four operations employees (sized to approximately 500 gallons per day). No wastewater will be discharged to on-site or off-site surface waters, wetlands, or the ground outside of the constructed septic system.

The Applicant will obtain an Onsite Sewage Construction Permit for the on-site septic system from the Benton-Franklin Health District prior to construction. The on-site septic system will be consistent with the Benton-Franklin Health District's design and construction criteria (BFHD 2022). Because the septic system will manage wastewater flows of less than 3,500 gallons per day, it is not considered a large on-site sewage system and will not require a permit from the Department of Health (WAC 246-272B). The required permit for the on-site septic system will ensure that septic wastewater will not adversely impact area groundwater or surface water quality.

Panel washing (which, if required, may use up to approximately 120,000 gallons of water per year) would not be expected to generate runoff from the site or cause erosion. Most water used for washing would evaporate from the panels before reaching the ground. That said, the total amount of water used for panel washing (120,000 gallons) is equivalent to 0.37 acre-foot.

Spread over the 2,974-acre Fenced Area, even if no evaporation occurs and all panel washing water reached the ground at one time, the depth of water on the ground would be approximately 0.0015 inch. Although the water dripping off panels would be concentrated over smaller areas, the conservative calculation demonstrates the relatively small quantity of water involved in this process relative to the size of the area containing solar panels. This amount of water would easily infiltrate into the vegetated ground around the panels and is not expected to run off to surface water bodies nor impact aquifers. Furthermore, washing of solar panels, if required, would be done with water only, and no surfactants or other chemicals would be added. Because the panel wash water would not contain added chemicals and the water is expected to evaporate with only minimal amounts potentially reaching the ground, no adverse impacts to water quality would occur, and therefore no mitigation would be required.

Therefore, a detailed Part 4 analysis is not required for wastewater discharges.

As you complete the Detailed Analysis in Part 4 – 4. Water Quality (Wastewater Discharges), make sure you consider and address:

- Existing/potential water quality issues (nutrients, bacteria, metals, turbidity, temperature, etc.)
- Loss of wetland/surface water functions and values
- Discharge type, volume, potential contaminants, location, and method of discharge.
- Sole source aquifers

And considering other relevant factors addressed in:

- WAC 463-62-060 regarding water quality standards
- WAC 463-60-322 and 463-60-333.

3.5 Water Quality - Stormwater Runoff

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	Yes	Yes	Yes	Yes	Yes

3.5.a Screening Question – Water Quality (Stormwater Runoff)

Does the proposal involve any potential sources of stormwater contamination from:		
☐ Drainage from impervious surfaces ☒ Erosion from disturbed soils, lost vegetation, etc. ☐ Animal wastes ☐ Fertilizers or decomposing organic material ☐ Pesticides or other chemical usage Other _____	☐ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☒ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

The Project may result in some stormwater drainage as a result of new impervious surfaces developed and identified in Part 2, Section B.2 (e.g., gravel roads, solar array posts, foundations for PCS, O&M building, substation components, etc.). Because solar panels are spaced apart from each other and the full area including the surface under the rotating panels would be revegetated, allowing natural infiltration of rainwater, the panels themselves are not considered impervious surfaces and are not included in the impervious surface calculation. The total new impervious surface area is a small portion (approximately 142 acres, or 3 percent of the total Project Area), and stormwater will generally infiltrate across the full area of the site.

In general, there will be minimal grading across the site, and existing drainage patterns and natural infiltration will be retained. Although classified as impervious surfaces, stormwater will generally infiltrate through the gravel roads, but at a reduced rate compared to most soils in the area. The vegetated area between panel rows is greater in area than the width of the rows of panels. The panels themselves would rotate, meaning the area underneath the panels would directly receive rainwater depending on the rotational status of the tracker system at the time of rainfall; any runoff from panels would flow onto and across vegetation, so infiltration is maintained.

A Preliminary Stormwater Management Report is provided in Attachment J. The Project will also prepare an Erosion and Sediment Control Plan (ESCP), Stormwater Pollution Prevention

Plan (SWPPP), and Vegetation and Weed Management Plan prior to construction that will include measures to minimize soil erosion and stormwater runoff.

The Part 4 analysis provides detailed information regarding the type and extent of impervious surfaces that will be created; the infiltration rates of the soils within the affected areas; and the best management practices from the ESCP, SWPPP, and the Vegetation and Weed Management Plan that will be implemented to minimize the effects of stormwater runoff.

As you complete the Detailed Analysis in Part 4 - 5. Water Quality (Stormwater Runoff), make sure you consider and address:

- Existing/potential water quality issues (oil and grease, turbidity, sedimentation, nutrients, metals, and other pollutants)
- Loss of wetland/surface water functions and values

And considering other relevant factors addressed in:

- WAC 463-62-060 regarding water quality standards
- WAC 463-60-215 and 463-60-322

3.6 Water Quantity – Water Use

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	No	Yes	Yes	Yes	N/A

3.6.a Screening Question – Water Quantity (Water Use)

Will the proposal involve a new withdrawal, diversion, retention, or use for water not received from a utility?	☒ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☐ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

Water use for construction is primarily associated with dust control. Concrete used for the Project will be brought to the site by ready-mix trucks, and water is not anticipated to be used on-site for the mixing of concrete. Water trucks will be used to provide moisture for compaction as well as dust control during construction as required. Depending on soil moisture levels, up to approximately of 53 million gallons of water could be used throughout construction for dust suppression. The water trucks on site for dust control would also be available for fire suppression if needed.

The Applicant is evaluating several options for sourcing construction water. These include obtaining water from an existing on-site well with a valid water right (to be verified in coordination with Ecology) or purchasing water from a permitted off-site source (i.e., municipal water source or vendor with a valid water right). If water is purchased from an off-site source, it will be hauled to the Project.

Water will be used during operation for domestic uses at the O&M building and during operations for panel washing. The Project is expected to use less than the groundwater permit-exempt well threshold of 5,000 gallons per day (RCW 90.44.050 sets a maximum withdrawal of up to 5,000 gallons per day [or 5.6 acre-feet per year] for permit exemption). Using a groundwater permit-exempt well, a maximum of 1,825,000 gallons per year could be used during operation (i.e., if the maximum permitting threshold of 5,000 gallons of water per day was used); however, it is estimated that the likely actual use will be 120,000 gallons per year. This total includes the water use related to the potential panel washing (i.e., if 20 percent of the panels are washed once per year). In addition, the Project Area may include a 10,000-gallon water cistern to store water for fire suppression needs.

The Applicant or the Applicant's construction contractor will verify the well location and availability of water from a permitted source prior to Project construction and operations. Therefore, a detailed analysis of water use under Part 4 is not warranted.

As you complete the Detailed Analysis in Part 4 – 6. Water Quantity (Water Use), make sure you consider and address:

- Changes in flow or volume
- Existing/potential water quantity/ availability issues (water right controversy, endangered aquatic species, high ground water table, etc.)

And considering other relevant factors addressed in:

- WAC 463-60-165 (1) and (3), 463-60-322 and 463-60-333

3.7 Water Quantity – Runoff, Stormwater & Point Discharges

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	No	Yes	Yes	Yes	Yes

3.7.a Screening Question – Water Quantity (Runoff, Stormwater & Point Discharges

Is the project likely to result in changes in flow or volume in any water body or aquifer? Consider changes in vegetation, blocking of recharge by new impervious surfaces, grading, filling, discharges, water use, etc.	☒ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☐ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

No changes to the flow or volume of any water body or aquifer are anticipated as a result of the Project. Because slopes within the Fenced Area are generally very flat, the grading required will be minimal and will maintain existing drainage patterns. During construction, supplemental stormwater management measures will be implemented to prevent stormwater from flowing offsite. BMPs for stormwater management will be addressed in the Project's Erosion and Sediment Control Plan and Construction Stormwater General Permit. Following construction, disturbed areas will be revegetated in accordance with a Vegetation and Weed Management Plan. Impervious surfaces will be a small percentage of the overall area and will not significantly alter stormwater infiltration patterns (see response to Part 3 Section 5). In addition, the minimal water discharge to the ground from periodic solar panel washing is not expected to infiltrate an aquifer (see response to Part 3, Section 4), and all water used for the Project would be obtained from existing or otherwise permitted sources in compliance with all applicable regulations (see response to Part 3, Section 6).

As described above in the response to Part 3, Section 3, some Project impacts will occur within ephemeral streams and frequently flooded areas for temporary and permanent access road crossings (see Attachment T). The Project's transmission line between the Project substation and POI will span Dry Creek and associated 100-year floodplain. A temporary 50-foot-wide access corridor across the floodplain will be used during construction of the overhead line. To minimize impacts to this area, matting or other BMPs will be used to minimize disturbance of the floodplain area, and only vehicles equipped to carry the transmission wires (conductor, shield wire, etc.) will be allowed. Impacts in this area will be

temporary and because Dry Creek almost never contains surface water flow, no impacts to surface water flow are anticipated.

As described in Part 4, Section 4.3 and Attachment T (JARPA), an existing access road will be improved within the Benton County critical areas buffer of a delineated stream channel to accommodate Project construction and operations. Because the existing road is not within the delineated stream channel and its improvements will be designed so as to not alter or impede the flow of stream courses or floodplain, no change to surface water flow or volume would occur. Because construction and operations of the Project would not change the flow or volume in any waterbody or aquifer, a detailed analysis of water quantity under Part 4 is not warranted. Mitigation actions and best management practices will be implemented during construction, such as revegetating disturbed soils to minimize erosion/runoff, and implementing an ESCP, SWPPP, and Vegetation and Weed Management Plan.

As you complete the Detailed Analysis in Part 4 – 7. Water Quantity (Runoff, Stormwater & Point Discharges), make sure you consider and address:

- Potential loss of groundwater recharge
- Change in seasonal stream flow
- Existing/potential flood risks
- Existing/potential water quantity/ availability issues

And considering other relevant factors addressed in:

- WAC 463-60-215, 463-60-322 and 463-60-333

3.8 Plants

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	Yes	Yes	Yes	Yes	Yes

3.8.a Screening Question – Plants

Will the project occur in or near an area with special status plants, (e.g. DNR natural heritage program or WDFW Priority Habitats and Species (PHS))?	☐ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☒ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

The Applicant conducted habitat and botanical surveys within the Project Area from May 10 through 14, 2021, with additional habitat surveys conducted in October 12 and 13, 2021. Supplemental surveys for a portion of the Project Area (approximately 990 acres) not previously surveyed for botanical resources in 2021 was surveyed in May 2022. A supplemental survey report was provided to EFSEC in August 2022 following completion of this additional survey. The habitat surveys mapped and characterized the habitat types observed within the Project Area, while the botanical surveys focused on rare vascular plant species and noxious weeds in the Project Area. Note that the term "rare plant" in this context refers to federally listed and candidate vascular plant species, as well as vascular plant species that are listed in Washington state as endangered, threatened, or sensitive by the Washington Natural Heritage Program. Details regarding the habitat surveys are provided in the Habitat and General Wildlife Survey Report and Addendum (Attachment G) while details regarding the botanical surveys are provided in the Botanical Survey Report and Addendum (Attachment F).

The Applicant mapped nine habitat types within the Project Area: agriculture, developed/disturbed, eastside (interior) grassland, irrigated hedgerows, non-native grassland and forbland, planted grassland, rabbitbrush shrubland, shrub-steppe, and talus. The vast majority (approximately 93 percent) of the Project Area consists of three of these habitat types: planted grassland, non-native grassland and forbland, and agriculture. Planted grassland is the most prevalent habitat type within the Project Area, and although this habitat type was observed in locations throughout the Project Area, it was most widespread in the eastern portion of the Project Area. Non-native grassland and forbland was the second most prevalent habitat type, and although this habitat type was also noted throughout the Project

Area, it is most widespread in the northern portion of the Project Area. Agricultural land in the area (which consist of fallow and active wheat and irrigated alfalfa fields, and livestock and horse pastures) occurs primarily in the central portion of the Project Area.

Three of the nine habitat types found in the Project Area are considered Priority Habitats or Priority Habitat Features by the WDFW, including eastside (interior) grassland (i.e., eastside steppe), shrub-steppe, and talus (WDFW 2008). The eastside (interior) grassland type was primarily found on hillslopes and crests of hills where topography precludes agricultural production. Patches of shrub-steppe habitat are found along hillslopes and crests of hills or along ephemeral drainages within the Project Area. One small (approximately 4 acres) area of talus was mapped in the southwestern portion of the Project Area.

No federally listed plant species were identified within the Project Area during surveys; however, one state sensitive species (i.e., Columbia milkvetch; *Astragalus columbianus*) was found during surveys. This population consisted of approximately 125 individuals and covered approximately 3 acres of the spring 2021 survey area; it was documented within eastside (interior) grassland habitat on a slope and crest of a hill in the southwest portion of the survey area. In addition, nine noxious weeds were documented during field surveys: jointed goatgrass (*Aegilops cylindrica)*, kochia (*Bassia scoparia)*, diffuse knapweed (*Centaurea diffusa*), rush skeletonweed (*Chondrilla juncea*), field bindweed (*Convolvulus arvensis)*, Russian olive (*Elaeagnus angustifolia)*, Russian knapweed (*Rhaponticum repens)*, cereal rye (*Secale cereale)*, and medusahead (*Taeniatherum caput-medusae).*

The Applicant has been in contact with WDFW regarding this Project, including via a virtual conference on March 8, 2021, during which the Applicant introduced the Project to WDFW and described planned wildlife, habitat, and rare plant surveys. At the meeting, WDFW concurred with the proposed survey timing and approach, as well as gave a verbal description of sensitive biological resources that may occur in the Project vicinity. The input from WDFW provided during this meeting was used to inform the biological background review and field surveys conducted for the Project. The Applicant additionally provided copies of survey reports to WDFW and met with WDFW representatives on February 16, 2022, to present survey results and solicit input on the Project. The input provided from WDFW during this meeting was used to inform the Part 4 analysis and Draft Habitat Management Plan (Attachment M). WDFW provided comments to EFSEC on the project and habitat survey report on August 30, 2022. The Applicant's responses to these comments, along with revised survey reports, were provided to EFSEC on October 31, 2022. This Revised ASC includes the updated reports with changes as requested by WDFW.

The Part 4 analysis is based on the information obtained during the habitat and rare plant surveys as well as site-specific feedback from WDFW. The Part 4 analysis also outlines applicable mitigation measures, where necessary, based on the survey results.

As you complete the Detailed Analysis in Part 4 – 8. Plants, make sure you consider and address:

- Alteration/loss of fish/wildlife habitat
- Endangered or other at-risk plant species
- Changes to critical areas identified in part C.1.

And considering other relevant factors addressed in:

- WAC 463-60-332

3.9 Animals

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	Yes	Yes	Yes	Yes	Yes

3.9.a Screening Question – Animals

Will the project occur in or near an area with migration areas, special status wildlife or habitats (e.g. WDFW Priority Habitats and Species (PHS)?	☐ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☒ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

The Applicant conducted three rounds of ground-based raptor nest surveys within the Project Area; the first round of surveys was conducted on March 13, 2021, the second round was conducted in May 10-12, 2021, and the third round was conducted on October 2, 2021. Details regarding these raptor nest surveys are provided in the Raptor Nest Survey Report (Attachment L). A total of 15 nests were detected during these surveys, including three in-use burrowing owl (*Athene cunicularia*) nests, two in-use Swainson's hawk (*Buteo swainsoni*) nests, one in-use red tailed hawk (*Buteo jamaicensis*) nest, one in-use great horned owl (*Bubo virginianus*) nest, five in-use common raven (*Corvus corax*) nests, and three small inactive nests with unknown species determinations. No eagles or federal or state-listed threatened or endangered species were documented during these raptor nest surveys; however, WDFW has designated the burrowing owl as a candidate for state listing, and thus, it is a WDFW priority species. No ferruginous hawk (*Buteo regalis*) individuals or ferruginous hawk nests were observed during the survey; however, a single ferruginous hawk was observed briefly soaring in an area of native grassland habitat in the far southwestern edge of the Project during the habitat and general wildlife survey (Attachment G).

The Applicant conducted habitat/wildlife surveys within the Project Area from May 10 through 14, 2021, with additional surveys conducted in October 12 and 13, 2021 and May 9-10, 2022. Details regarding the habitat/wildlife surveys are provided in the Habitat and General Wildlife Survey Report and Wildlife Survey Addendum (Attachment G). Thirty-six bird species and one mammal species were detected within the Project Area during the habitat/wildlife surveys. Of these, one bird species (i.e., the ferruginous hawk) has a special status (i.e., designated state threatened at the time of surveys and has been subsequently up-listed to endangered).

Prior to the surveys, WDFW and PHS data indicated that the Project may be important to elk (*Cervus canadensis*), particularly in the winter. During surveys, suitable habitat for two priority big game species was documented (i.e., elk and mule deer - *Odocoileus hemionus*), and indirect evidence (i.e., scat) indicate that these species use the Project Area. Potentially suitable habitat for these species within the Project Area is generally limited to portions of the area that occur outside of agricultural or other developed land.

Three palustrine emergent wetlands and 34 ephemeral drainages were identified within the Project Area (refer to response *"3. Water Quality – Wetlands and Surface Waters";* Attachment I). A 100-year floodplain also occurs in the Project Area. The stream segments within the Project Area were not identified as fish streams (Attachment I).

The Applicant has been in contact with WDFW regarding this Project, including via a virtual conference on March 8, 2021 during which the Applicant introduced the Project to WDFW and described planned wildlife, habitat, and rare plant surveys. At the meeting, WDFW concurred with the proposed survey timing and approach, and gave a verbal description of wildlife resources that may occur in the Project vicinity. The input from WDFW provided during this meeting was used to inform the biological background review and field surveys conducted for the Project. The Applicant additionally met with WDFW on February 16, 2022, to present survey results and solicit input on the Project. Following submittal of the ASC to EFSEC, the Applicant met with EFSEC and WDFW on August 18, 2022 to discuss survey findings and the proposed Draft Habitat Management Plan. The input provided from WDFW during these meetings was used to inform the updated Part 4 analysis and Draft Habitat Mitigation Plan (Attachment M).

The Part 4 analysis is based on the information obtained during surveys as well as site-specific feedback from the WDFW. The Part 4 analysis also outlines applicable mitigation measures, where necessary, based on the survey results.

As you complete the Detailed Analysis in Part 4 – 9. Animals, make sure you consider and address:

- Alteration/loss of fish/wildlife habitat
- Endangered or other at-risk animal species
- Obstructions/barriers to the movement of fish and wildlife
- Noise, light, or glare
- Changes to critical areas identified in part C.1.

And considering other relevant factors addressed in:

- WAC 463-62-040 regarding fish and wildlife mitigation
- WAC 463-60-332

3.10 Energy and Other Natural Resources

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	No	N/A	Yes	Yes	N/A

3.10.a Screening Question – Energy and Other Natural Resources

Will the project, because of type, size, or design, require the consumption or removal of substantial quantities of natural resources including energy (electricity, petroleum, etc.), rock minerals, trees/wood, peat, etc. during either construction or operation?	☒ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☐ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

As a solar generation facility coupled with a BESS, the Project will provide a new source of clean, renewable electricity. The Project is designed to take advantage of the region's renewable solar energy resources and adjacent transmission interconnection with the existing BPA transmission system. The Project design minimizes impacts to adjacent properties and will not limit or otherwise affect the potential use of solar energy by adjacent properties.

The Project will not require consumption or removal of substantial quantities of natural resources during construction or operations; however, some natural resources will be consumed in the form of non-renewable construction materials (see Part 2). Non-renewable fossil fuels will also be required to fuel construction vehicles, equipment, and operational vehicles. Fossil fuel quantities consumed will be typical of commercial construction facilities of a similar size. Electricity for the Project's O&M building will be provided by the local utility, Benton Rural Electric Association. Local service providers will be able to accommodate the materials, electricity, and fuel needs of the Project.

No detailed Part 4 analysis is warranted because the Project will not require the consumption or removal of substantial quantities of energy or natural resources during construction or operations. Furthermore, no mitigation is anticipated to be required for this resource.

As you complete the Detailed Analysis in Part 4 - 10. Energy and Other Natural Resources, make sure you consider and address:

- Existing/potential of resource supply not meeting demand

And considering other relevant factors addressed in:

- Conservation methods
- Use of renewable vs. non-renewable resources

- WAC 463-60-342(1)-(4)

3.11 Waste Management

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	No	N/A	Yes	Yes	N/A

3.11.a Screening Question – Waste Management

Will the project generate large quantities of waste during either construction or operation other than those listed as a discharge under D.3.WATER QUALITY or D.2.AIR QUALITY?	☒ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☐ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

The Project will not generate large quantities of waste during construction or operations.

During Project construction, quantities of solid waste generated will be similar to commercial construction projects of a similar size. Wastes generated during construction will typically include discarded building materials such as metal, concrete, wood, and wiring scraps, and waste plastic packaging. Construction waste materials will be recycled to the extent practicable. Portable restrooms will be used during construction.

During operations, low volumes of solid waste will be generated at the O&M building, including paper, cardboard, plastic, and food waste. Wastewater will be managed using an on-site septic system (see response to *"3. Water Quality – Wastewater Discharges"*). Maintenance and replacement of Project components such as solar modules and batteries will also produce low volumes of solid waste during operations.

Minimal solid waste produced during construction and operation of the Project will be handled by a licensed contractor in accordance with applicable regulations (see also Part 3, Section 21).

The BESS options described in Part 2 may generate incidental solid waste from repair or from the replacement of batteries made necessary by the normal degradation of those batteries over time. Required environmental, health, and safety protocols will be followed for disposal of battery components. Used batteries and components will be recycled or disposed of at an approved facility by a licensed vendor. With increasing demand for BESS technology, recycling companies are increasing capacity and advancing technology to respond to the growing use.

As described in Part 2.A.2, either a distributed (DC-connected) or centralized (AC-connected) battery system may be installed. Final selection of battery technology has not yet been made. For purposes of the analyses presented in this ASC, specifications for Tesla Megapack batteries are presented. According to their 2020 Impact Report (Tesla 2021), Tesla is currently recycling 100 percent of its scrapped batteries. Battery packs manufactured by Tesla are either re-manufactured or recycled in-house, and no battery components go to landfills.

Solar modules typically have a useful lifetime of over 30 years and will be replaced infrequently if necessary. RCW 70.355 requires manufacturers of solar modules to provide effective recycling options for all solar modules purchased after July 1, 2017. As a result, recycling of the solar modules will be done to the extent that recycling is available and feasible.

The Project will not generate large quantities of waste during either construction or operation; therefore, a detailed Part 4 analysis or mitigation is not warranted for this resource.

As you complete the Detailed Analysis in Part 4 - 11. Waste Management, make sure you consider and address:

- Landfill capacity
- Loss of resources
- Opportunities to reduce, reuse, or recycle waste

3.12 Environmental Health – Existing Site Contamination

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	No	Yes	Yes	Yes	N/A

3.12.a Screening Question – Environmental Health (Existing Site Contamination)

Is there any evidence that the project site(s) contain(s) potentially hazardous materials including toxic chemicals, volatile gases or other poisonous or hazardous substances?	☒ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☐ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

No direct studies have been conducted to date regarding existing environmental contamination within the Project Area. A site-specific Phase 1 Environmental Site Assessment will be conducted prior to construction (refer Part 1.E List of Studies).

A review of Ecology's cleanup site database (Ecology 2022a) and historical aerial photographs (Google Earth 2022) found no evidence that the Project Area contains potentially hazardous materials, including toxic chemicals, volatile gases, or other poisonous or hazardous substances. However, no direct studies have been conducted to date regarding existing environmental contamination within the Project Area.

The Project Area contains a mix of dryland and irrigated agricultural use, rangeland, transmission and electrical infrastructure, and undeveloped areas. Based on available historic aerial imagery, the land use in the Project Area has been consistent with current conditions for at least the past 30 years (Google Earth 2022). As a result, historical use of organic and inorganic fertilizers, pesticides, or herbicides has likely occurred in agricultural production areas in the Project Area. The application of fertilizers, pesticides, and herbicides is assumed to have occurred according to manufacturer guidance, in a relatively uniform and generally consistent manner typical of agricultural practices. The concentrations of fertilizers and pesticides are likely to be similar to other dryland and irrigated agricultural operations. Risks to human health and the environment associated with soil disturbance during Project development are assumed to be low and similar to those associated with agricultural operations such as tiling. Therefore, potential past applications of fertilizer, herbicides, and

pesticides pose little to no concern of adverse environmental impact with respect to Project development.

Because potentially hazardous materials are unlikely to occur within the Project Area, a Part 4 analysis is not warranted. Further, a site-specific Phase 1 Environment Site Assessment will be conducted prior to construction to verify this assessment.

As you complete the Detailed Analysis in Part 4 - 12. Environmental Health (Existing Site Contamination), make sure you consider and address:

- Public health and safety
- Environmental health (air, soils, ground water, surface waters, plants, and animals)
- Conflict /compatibility with planned land uses
- Include description of hazardous materials and the manner and extent of the contamination.

3.13 Environmental Health – Hazardous Materials

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	Yes	N/A	Yes	Yes	Yes

3.13.a Screening Question – Environmental Health (Hazardous Materials

Will the project involve the removal, use, or disposal of hazardous materials that involve toxic chemicals, asbestos, risk of fire or explosion, and/or spill or danger to public health and the environment?	☐ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☒ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

Most materials used in construction of the Project will not be hazardous or dangerous, and the risk of fire, spills, or other dangers to public health and the environment will be low. However, the Project will include a PCS system with a DC-coupled BESS and/or an AC-coupled BESS option (refer to Part 2.A2 Project Description). The BESS units will be designed to incorporate multiple layers of protection to avoid failures and risks of fire or spills and will comply with the applicable requirements of the National Electric Code, National Fire Protection Association Standards, and Institute of Electrical and Electronics Engineers Standards.

If improperly handled or stored, the batteries in the BESS could be considered hazardous materials. Improperly stored or disposed of batteries could leak hazardous substances such as mercury, lead, cadmium, and sulfuric acid (Ecology 2022b). Spent batteries may be considered dangerous wastes; however, when properly recycled, batteries can be managed as universal wastes (Ecology 2022b). The Project will properly handle, store, and dispose of or recycle spent batteries at an appropriate facility in order to minimize risks to the public. As an example, the Tesla Megapack batteries presented for purposes of analysis in this ASC are recycled or re-manufactured by the manufacturer (Tesla 2021); see Part 3, Section 11.a for additional information.

The Part 4 analysis presents more detailed information regarding potential BESS technologies and their respective risks as well as the associated control measures that will be implemented to protect public health and the environment. The Part 4 analysis also discusses the Project's compliance with fire safety measures, spill control measures, and regulations for

solar energy generation facilities. Mitigation measures are also discussed in the Part 4 analysis.

As you complete the Detailed Analysis in Part 4 – 13 Environmental Health (Hazardous Materials), make sure you consider and address:

- Public Safety
- Environmental health (air, soils, ground water, surface waters, plants and animals)
- Hazardous material sources, storage, identification, classification

And considering other relevant factors addressed in:

- WAC 463-60-352 (2) – (4), (6)

3.14 Land Use, Natural Resource Lands, & Shoreline Compatibility

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	Yes	Yes	Yes	Yes	Yes

3.14.a Screening Question – Land Use, Natural Resource Lands, & Shoreline Compatibility

Will the proposal involve or result in any of the following (include likely future proposals that will occur as a result of this action, such as increased development from newly created lots or extension of services, etc.) • Change in land use • Change in intensity of land use • Provide new or improved service to an area (e.g. transportation, utilities, entertainment, etc.)	☐ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☒ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

The Project Area was selected by the Applicant for its favorable site suitability characteristics, including high solar energy resource, topography, proximity to electrical infrastructure, compatible zoning and adjacent land uses, and low resource conflicts. Existing land uses in the Project Area include dryland and irrigated agriculture, rangeland, undeveloped areas, local roads, electrical infrastructure (e.g., transmission and distribution lines, substations), and scattered unoccupied structures (e.g., agricultural storage). Adjacent land uses around the Project Area are similar and also include scattered rural development, vineyard, state highways, and Hanford Reach National Monument (Rattlesnake Unit of the Fitzner/Eberhardt Arid Lands Ecology Reserve).

The proposed solar power generating facility will result in a change in the type and intensity of the existing land use in the Project Area. The Project is located entirely on parcels in unincorporated Benton County within the Growth Management Act Agricultural District (GMAAD) zone, defined by Benton County Code (BCC). The GMAAD zone is designated as agricultural lands of long-term commercial significance by Benton County (Benton County 2018).

The Project is consistent with Benton County's definition of a "solar power generator facility, major" under BCC 11.03.010(167). Prior to December 21, 2021, the Project would have required a conditional use permit (CUP) in the GMAAD per BCC 11.17.07(cc). On December 21, 2021, Benton County passed Ordinance Amendment 2021-004, which, among other changes, removed "solar power generation facility, major" from the list of uses requiring a

conditional use permit in the GMAAD zone and effectively prohibits this type of use in the GMAAD zone. Therefore, the Applicant requests that EFSEC preempt this element of Benton County's zoning ordinance for the reasons presented in Section 4.14 and Attachment D to this ASC.

The Land Use Consistency Review (Attachment D) provides a complete review of the Project's compliance with the Benton County Comprehensive Plan and County Code. The Part 4 analysis addresses the Project's potential effects to existing and nearby land uses, as well as the Project's compliance with relevant local land use regulations. Outside of complying with landowner lease agreements and EFSEC conditions, no land use mitigation requirements are anticipated for the Project.

As you complete the Detailed Analysis in Part 4 – 14. Land Use, Natural Resource Lands, & Shoreline Compatibility, make sure you consider and address:

- Loss of designated natural resource lands (agriculture, forest, mineral) under RCW 36.70A.030; or other existing land uses
- Viability of existing or planned adjacent or nearby land or water uses
- Compatibility or conflict with intended land or shoreline uses
- Increased transportation, utility, or service demands

3.15 Housing

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	No	N/A	Yes	Yes	N/A

3.15.a Screening Question – Housing

Will the project be likely to displace or otherwise affect existing or future housing, particularly housing for low and moderate-income households?	☒ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☐ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

The Project is located in a sparsely populated rural area of Benton County outside of designed urban growth boundaries. It is anticipated that the construction of the Project will provide jobs for an estimated peak of 515 workers during peak construction, with an average of 225 workers during the 22-month construction period. Up to 4 permanent jobs are expected during operations. The Applicant will primarily solicit experienced Washington-based contractors with the intention of a proportionally high locally hired workforce. The non-local share of the workforce is estimated to be approximately 35 to 55 percent, with non-local workers expected to temporarily relocate to the vicinity of the Project for the duration of their employment. As a result, an estimated average of 79 to 124 workers are expected to seek temporary accommodation in the Project vicinity, with an estimated peak of 180 to 283 workers.

In compliance with WAC 463-60-535, a Socioeconomic Assessment that provides information regarding population, labor force, and housing impacts has been prepared for the Project (Attachment N). As described in Attachment N, the estimated number of housing units required for Project construction conservatively constitutes approximately 5 to 8 percent of the normally available supply of temporary housing. Non-local workers are expected to seek a range of temporary accommodations, including rental housing (houses, apartments, mobile homes), hotel/motel rooms, and RV parks/campgrounds, as well as other special living situations such as Airbnb units and spare bedrooms. The review of temporary housing resources presented in Attachment N indicates that temporary housing resources in the study area include approximately 2,100 housing units that are vacant and available for rent, with additional units classified for seasonal, recreational, or occasional use that may also be available. Temporary housing is also available in the form of hotel and motel rooms. Available

estimates indicate that there are about 7,100 hotel and motel rooms in the vicinity of the Project. Hotels in the Tri-Cities had an overall average occupancy rate of 62.5 percent from December 2016 to November 2017. In Yakima, there were 30 hotels and motels in 2017, with an estimated total of 2,400 guestrooms. Occupancy rates in the area have historically averaged around 55 to 60 percent. Temporary accommodation in the study area also includes recreational vehicle (RV) parks and campsites. Facilities in Benton and Franklin counties within 1 hour of the Project area include 15 RV parks and campgrounds, with a total of 1,640 RV spaces. Parks and campgrounds are located in Richland, West Richland, Pasco, Prosser, Benton City, and Vantage. An additional six RV parks and campgrounds, with a total of 390 spaces, are located within 1 hour of the Project area in Yakima County, including locations in Yakima, Sunnyside, and Selah.[1] Assuming a peak occupancy of 77 percent suggests that a minimum of approximately 1,630 rooms are normally empty and available for rent. Therefore, temporary housing needs during construction can be accommodated by existing available temporary housing options.

Operation and maintenance of the Project is anticipated to employ up to four workers. These workers and their families are likely to reside within daily commuting distance and will either already reside in the area or permanently relocate. Up to four workers and their family members could potentially relocate. The average U.S. family household consisted of 3.13 people per family in 2021 (U.S. Census Bureau 2021). Applying this average family household size results in an estimated maximum of 13 people in four households that could permanently relocate to the Project vicinity to support Project operation; in fact, some or all of the permanent operations staff may be hired locally. Therefore, given the available housing described in Attachment N, there is sufficient existing available housing to accommodate new permanent residents in the Project vicinity.

The Project is not anticipated to displace or otherwise affect existing or future housing during construction or operations; therefore, a Part 4 detailed analysis of housing impacts is not anticipated. Furthermore, no mitigation is anticipated to be required for this resource.

As you complete the Detailed Analysis in Part 4 – 15. Housing, make sure you consider and address:

- Decreased availability of housing for low to moderate income households
- Impediments to meeting fair housing and/or population growth goals

[1] Data on RV parks and campsites were compiled from a number of online sources, including visittri-cities.com, rvshare.com, goodsam.com, and campgroundreviews.com, as well as individual campground web sites.

3.16 Noise, Light, Glare, and Aesthetics

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	Yes	Yes	Yes	Yes	Yes

3.16.a Screening Question – Noise, Light, Glare, and Aesthetics

Will the project transmit light, glare, or noise onto adjacent areas or alter or obstruct any views in the immediate area?	☐ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☒ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

During construction, noise will be generated by construction equipment at levels typical for commercial projects of a similar size (including other solar facilities of a similar size). During operations, light and glare may be generated by the Project, and noise will be generated by transformers as well as potentially heating, ventilation, and air conditioning equipment associated with battery storage. Views of the Project Area will be altered due to the change in land use from primarily open rangeland and agricultural fields to a commercial solar facility.

The Applicant has completed a Visual Impact Assessment (Attachment P), Solar Glare Analysis Report (Attachment H), and an Acoustic Assessment (Attachment O) and incorporated these analyses into the Part 4 detailed discussion. For the Part 4 analysis, maximum Project noise levels were modeled to evaluate compliance with state noise regulations protecting sensitive noise receptors (WAC 173-60). Potential effects of the Project are disclosed in the Part 4 analysis, along with proposed mitigation measures, where necessary, based on the analysis.

As you complete the Detailed Analysis in Part 4 - 16. Noise, Light, Glare, and Aesthetics, make sure you consider and address:

- Proximity to residential areas, or other areas with sensitivity
- Scenic views that could be blocked, altered, or impaired for existing or planned uses in adjacent areas

And considering other relevant factors addressed in:

- WAC 463-62-030 regarding noise standards

- WAC 463-60-352 (1), 463-60-362 (2) and (3)

3.17 Recreation

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	No	N/A	Yes	Yes	N/A

3.17.a Screening Question – Recreation

Will the project occur in an area or location that includes the following? ❑ Existing designated and informal recreation opportunities in the immediate vicinity ❑ Displace or otherwise affect any existing recreational uses during construction or operation		
	☒ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☐ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

The Project Area is located entirely on privately owned lands. The Project parcels are located within the Blackrock Valley hunting grounds (site 295), which are part of the private lands hunting access program that provides access to private lands where WDFW has a management agreement with the owner that regulates hunting (WDFW 2022a). Hunters are required to obtain written permission from landowners prior to hunting in this area. One existing hunting shed is located within the Project Area and will be relocated outside of the fenced solar array prior to construction. No hunting blinds or tree stands are provided or allowed. The landowners in the Project Area have indicated that hunting usage is low and limited to guided elk hunts. Outside of hunting, there are no formal recreational opportunities within the Project Area.

During construction, hunting would be excluded from the private lands within the Project Area except in areas or times agreed upon by the landowners and the Applicant where hunting can be conducted without health and safety risks (e.g., if it would occur far enough from active construction zones as to not incur health and safety risks to personnel or equipment). During operations, hunting would be excluded from within the Fenced Area, which represents approximately 23 percent of the 12,502-acre Blackrock Valley hunting grounds. Hunting will still be allowed with written permission in a majority of the Blackrock Valley hunting grounds. To ensure the safety of personnel and equipment, Innergex will communicate with the landowners of adjacent parcels to ensure they are aware of routine and scheduled maintenance activities by O&M staff, as well as requesting that the landowners inform Innergex of scheduled hunting activities.

There are no other formal recreation areas on lands adjacent to or within 5 miles of the Project Area. The Hanford Reach National Monument is approximately 1 mile east of the Project Area; however, this area of the Monument is part of the Fitzner-Eberhardt Arid Lands Ecology Reserve, use of which is limited to agency-approved ecological research and environmental education activities, and no general public use is allowed (USFWS 2022). There are several scattered and checkerboard WDNR state trust and Bureau of Land Management (BLM)-managed parcels located within 5 miles of the Project Area (USGS 2020; WDNR 2022). There are no formal recreation sites on these parcels; however, some limited public use may occur, such as off-highway vehicle use or hunting (BLM 2022; WDFW 2022b). Due to a lack of formal recreation opportunities and limited roads accessing these parcels (Google Earth 2022), public use of these areas is likely minimal to low. The closest designated recreation sites are the Hanford Manhattan Project National Historical Park located approximately 13 miles to the northeast of the Project Area within the Hanford Reach National Monument and various city parks located in Sunnyside, Washington approximately 12 miles southwest of the Project Area.

Given the limited designated or informal recreation opportunities within or near the Project Area, the Project would not adversely affect existing recreational uses. Therefore, a detailed analysis of potential impacts to recreation opportunities under Part 4 is not warranted. Furthermore, no mitigation is anticipated to be required for this resource.

As you complete the Detailed Analysis in Part 4 - 17. Recreation, make sure you consider and address:

- Existing recreation uses (e.g. hunting) that could be removed

3.18 Archaeological and Historical Resources

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	Yes	Yes	Yes	Yes	Yes

3.18.a Screening Question – Archaeological and Historical Resources

Will the project occur in an area or location that includes the following? *Note: to answer these questions with a definite "yes" or "no" requires a Desktop Survey that must be conducted by a consultant. See guidance for more information.* ❑ Archaeological Site or Built Environment Property over 50 years in agricultural resource site ❑ Any known landmarks or evidence of historic, archaeological, scientific or cultural importance ❑ Is listed or is eligible to be listed on a local, state, or federal historic register	☐ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☒ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

A desktop survey was completed on September 15, 2021, and archaeological field investigations were conducted for the Project in September and October 2021. The methods and results of the desktop review and field surveys are presented in the Cultural Resources Survey Report provided as an attachment to the ASC (confidential Attachment Q), as well as in the Part 4 analysis.

The Applicant intends to avoid disturbing archeological and historical resources. However, if a resource is unavoidable, the Applicant will obtain the necessary permits prior to any direct impacts. An Unanticipated Discovery Plan has been prepared that set procedures in the event an unidentified archeological or historical resource is encountered during construction or operations of the Project (confidential Attachment Q).

The Part 4 analysis discloses the potential impacts of the Project to archaeological and historical resources, and summarizes the proposed mitigation measures, based on the findings presented in the studies described above.

As you complete the Detailed Analysis in Part 4 - 18. Archaeological and Historical Resources, make sure you consider and address:

- Effects on access to the site or to the resource
- Methods to protect/preserve cultural and historic resources
- Enhancement measures (improved public or tribal access, matching the character of the site, etc.)
- Include description of the cultural/historic resource and how it was identified.

And considering other relevant factors addressed in:

- WAC 463-60-362

3.19 Cultural Resources

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	Yes	Yes	Yes	Yes	Yes

3.19.a Screening Question – Cultural Resources

Will the project occur in an area or location that includes the following? • existing tribal hunting or fishing rights • existing tribal plant gathering • tribal cultural sites • a usual and accustomed area • material culture artifacts • activities on the site could impede views of tribal cultural sites	☐ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☒ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

As noted above, a cultural resources survey was conducted in the Project Area from September 25 through October 18, 2021, with a systematic subsurface survey completed in July 2023. The methods and results of the desktop review and field surveys are presented in a Cultural Resources Survey Report (confidential Attachment Q), as well as in the Part 4 analysis. The draft report was reviewed by the Department of Archaeology and Historic Preservation (DAHP) and the Yakama Nation Cultural Resources Program, and the updated report, which has been approved by DAHP, is provided in Attachment Q to this revised ASC.

The Part 4 analysis discloses the potential impacts of the Project to cultural resources and proposed mitigation measures, based on the findings presented in the studies described above.

As you complete the Detailed Analysis in Part 4 - 19. Cultural Resources, make sure you consider and address:

- Whether you have talked to any tribal representatives
- Whether you have checked any tribal websites

3.20 Traffic and Transportation

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	Yes	Yes	Yes	Yes	Yes

3.20.a Screening Question – Traffic and Transportation

Will the project be likely to cause any of the following in relationship to the local and regional transportation system during construction or operation? • Reduce the level of service (LOS) in an area • Restrict vehicular use • Potential to create or increase local safety hazards • Conflicts with local, state or federal requirements related to traffic and transportation	☐ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☒ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

Project construction will involve temporary increased traffic to the site for delivery of materials and worker transportation, and an improvement to the approach off SR-241 to the Project, as well as new approach construction along Wautoma Road. During Project operations, traffic will be limited to periodic maintenance visits and commutes of two to four operations and maintenance employees. The Project will be unlikely to reduce the level of service on area roads, except potentially for brief periods during construction. The Project will not restrict vehicular use or create local safety hazards and would not conflict with local, state, or federal requirements related to traffic and transportation. However, due to potential truck traffic and potential transportation of oversize or overweight loads during construction, a Part 4 analysis was completed.

The Part 4 analysis discloses the potential impacts to the existing level of service on transportation routes that will be used during construction and operations and identifies proposed mitigation measures for traffic impacts.

As you complete the Detailed Analysis in Part 4 - 20. Traffic and Transportation, make sure you consider and address:

- Existing/potential safety hazards

And considering other relevant factors addressed in:

- Traffic delays or road closures during construction
- Relevant factors addressed in WAC 463-60-372

3.21 Public Services and Facilities

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	No	N/A	Yes	Yes	N/A

3.21.a Screening Question – Public Services and Facilities

Will the project be likely to directly or indirectly increase use of public services and facilities such as fire protection, law enforcement, schools, parks and recreation, public open space, social services or general government?	☒ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☐ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

The Project is a largely self-sufficient solar power generating facility and is therefore unlikely to directly or indirectly increase use of public services and facilities during construction or operation. Further, the Project is located in rural Benton County where many public services and facilities are unavailable. Potential impacts to public services and facilities will be minor and will primarily occur during the construction period, which is anticipated to take approximately 22 months. During construction, a peak of up to 515 workers may be employed, with an average of 225 workers. As described in Attachment N, the non-local share of the construction workforce is anticipated to be approximately 35 to 55 percent of the work force, or an average of 79 to 124 workers, with a peak of 180 to 283. Due to the temporary nature of these jobs, workers from outside the area would be unlikely to move their families to the area. This compares to an estimated population in Benton County of 209,400 in 2021, along with a population in Franklin County of 98,350 and a population in Yakima County of 258,100. During construction, if all construction workers temporarily reside in the Tri-Cities area (which is unlikely), the peak temporary increase in the population would be approximately 0.1 percent. During operations, the Project will be staffed by up to four personnel. Considering these factors along with implementation of the mitigation measures outlined below, the Project will not significantly adversely affect the use of public services and facilities during construction or operation.

Fire Protection. The Project will develop and maintain an Emergency Management Plan (which will be developed and finalized prior to construction) and implement best management practices for fire prevention. The Applicant will coordinate with the Benton County Sheriff's Office, Benton County Emergency Management, and DNR Wildland Fire Management Division to collaboratively develop safety measures that will be incorporated into the Project's

design and construction. The Applicant will also coordinate with these entities regarding necessary equipment or training, if any are identified, that may be required to provide fire protection services to the Project. To further mitigate the need for fire protection services, the Project's facilities will include and incorporate multiple layers of protection to avoid failures and risks of fire or spills will be designed to applicable requirements of the National Electric Code, National Fire Protection Association Standards, and Institute of Electrical and Electronics Engineers Standards. Furthermore, the Project's design will incorporate graveled areas around the O&M facility and substation, as well as graveled access roads and fire breaks, where applicable.

Law Enforcement. The Benton Country Capital Improvement Plan for 2021-2026 does not identify significant needs for increased equipment, personnel, and facilities for the Benton County Sherriff's Office to provide services to the community (Benton County 2020), and these services have been funded at sustained levels over the past 5 years (Benton County 2021). A temporary peak increase of up to 283 workers, and an average increase of approximately 79 to 124 workers, during the Project's construction is less than one percent of the Benton County population and will not effectively reduce the level of service that the Benton County Sheriff's Office and local law enforcement can provide the community. To mitigate the need for additional law enforcement services, site access will be restricted, and Project components will be secured by a perimeter fence. The Project will not require special services from the Benton County Sheriff's Office. As a result, no adverse impacts to law enforcement services are anticipated as a result of the Project.

Schools, Parks, and Recreational Facilities. No significant adverse impacts to schools, parks, or recreational facilities are anticipated as a result of the Project. Construction of the Project will take about 22 months, during which period a peak of up to 515 workers will be employed. Because the construction period is temporary, little to no adverse impact on housing or schools is anticipated. Temporary school and housing needs would be supported within the purview of Benton County's current growth trajectory, which plans for population growth in the Tri-Cities area and associated rural transition areas and urban growth areas (Benton County 2018). Temporary, occasional use of parks and recreational facilities associated with the temporary construction population influx would not significantly adversely affect these facilities. During operations, the Project will employ up to four personnel, which will not create an adverse impact for schools, parks, or recreational facilities.

Public Open Space, Social Services, and General Government. The Project is not located on public land and its construction and operation will not have any impact on public open space. Increased jobs for community members as described in Appendix N, and increased property tax revenue from the Project (see Attachment D) will provide support for social services and general government operations.

Because public services and facilities will not be adversely affected, a detailed analysis of potential impacts to public services and facilities under Part 4 is not warranted. Furthermore, no mitigation, beyond what is described above, is anticipated to be required.

As you complete the Detailed Analysis in Part 4 - 21. Public Services and Facilities, make sure you consider and address:

- Existing/potential inadequacy of service providers to meet need
- Consumption of disproportionate share of existing or future service capacities
- Options to reduce service demand (onsite security, etc.)

3.22 Utilities

SUMMARY	1. Does **screening** trigger a Part 4 analysis?	2. Is it clear what **analysis or study** is called for?	3. Is the analysis sufficiently complete for **SEPA determination**?	4. Is the analysis fully complete for **application review**?	5. Is the proposed **mitigation** (if any) adequate?
[Applicant only] No, Yes, Maybe/na / [EFSEC only] No, Yes, Maybe/na	No	N/A	Yes	Yes	N/A

3.22.a Screening Question – Utilities

Will the project be likely to increase demand for public or privately-owned water, sewer, storm water, solid waste, communication, or energy utilities?	☒ **No**	⇒ *Explain below why you believe "No" is the appropriate answer.*
	☐ **Yes**	⇒ *Explain below what aspect of the question triggered a "Yes" response;* *AND* ⇒ *Complete Part 4 - Detailed Analysis*
	☐ **Maybe**	⇒ *Describe below how you plan to obtain the information needed to move to a definitive "Yes" or "No" prior to the final submission on your application.*

Explanation:

The Project will not significantly increase demand for public or private water, sewer, solid waste, stormwater, communication, or energy utilities. The Project's impacts to these public and private utilities will be minimal, largely because the Project is a solar power generating facility that will produce much of its own electricity. Additionally, the Project is located in rural Benton County where public utility services are largely unavailable, including no public sewer or stormwater facilities.

During construction, water will be obtained from an existing groundwater well or will be hauled to the site from off-site sources with existing water rights (i.e., a municipal water source or vendor with a valid water right). Best management practices will be employed to manage stormwater within the Project Area (see Part 3, Section 3.5, and Part 4, Section 4.5, for more information). Portable toilets will be used for sanitary wastes. A licensed hauler will be used to transport and dispose of construction waste in accordance with applicable laws. Recycling will be implemented to the extent practicable. Electricity and necessary communications connections for the Project will be provided by Benton Rural Electric Association before the start of operations, and communications will be provided by a local utility.

During operations, the Project will obtain water from an existing groundwater well, haul water from off-site sources with existing water rights (i.e., a municipal water source or vendor with a valid water right), or utilize an on-site well (as discussed in Part 3, Sections 3.4 and 3.6). Domestic waste produced during construction and operation of the Project will be handled by a licensed waste contractor. After the Project is decommissioned, spent panels will be recycled by the manufacturer to the extent possible. The Project will be designed to capture stormwater and reduce runoff as described in Part 3, Section 3.5, and Part 4, Section 4.5. No

municipal stormwater facilities will be utilized. The Project will generate electricity during operations, which will be supplemented with a small amount of power for the O&M building as needed from the Benton Rural Electric Association.

No significant adverse impacts to water, stormwater, sewer, or solid waste facilities are anticipated as a result of the Project. The Project is outside the urban growth boundary service area where public water, stormwater, sewer, and solid waste facilities are available; therefore, construction and operation of the Project is not anticipated to impact these services and facilities. During construction, water will be obtained from a source with verified water rights. The Project may use a new well or purchase and haul water from off-site sources during operation; therefore, the Project will not use public water services.

The Project will install a new on-site septic system for the O&M facility. Several licensed wastewater treatment facilities are available in the Tri-Cities area and nearby Yakima County. During operations, routine domestic septic waste would be produced at the O&M facility in quantities that can be accommodated by existing licensed providers.

Routine solid waste would be produced during construction and operation of the Project, including packaging materials and domestic refuse. These materials would be handled by a licensed contractor in accordance with applicable regulations (see Part 3, Section 3.11). At the end of the Project's useful operational life, spent solar panels will be recycled by the manufacturer after decommissioning in accordance with state law. Solid waste landfills and waste transfer stations in Benton County and nearby Yakima County are available with sufficient capacity to accommodate wastes generated by the Project, including the Yakima County Lower Valley Transfer Station, Cheyne Landfill, Terrace Heights Landfill, City of Richland Horns Rapid Landfill, and the Waste Management Kennewick Transfer Station. Therefore, the Project will not adversely impact public solid waste disposal facilities.

The Project design will generally maintain existing topography and therefore stormwater would continue to flow and infiltrate into the ground as under existing conditions. No municipal stormwater facilities will be utilized or impacted.

Because the Project will not significantly increase demand for public and private utilities, a detailed analysis of potential impacts to utilities under Part 4 is not warranted. No mitigation is proposed or anticipated to be required.

As you complete the Detailed Analysis in Part 4 - 22. Utilities, make sure you consider and address:

- Existing/potential inadequacy of utilities to meet need
- Consumption of disproportionate share of existing or future utility capacities
- Potential to reduce service demand (conservation, etc.)
- Identify where utilities have confirmed service availability

3.23 References

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PART 4 – DETAILED ANALYSIS

4.1 Earth

4.1.A Studies

Describe any studies that have already been conducted or will be conducted related to this topic and provide the expected timing for the completion of studies to be completed.

Study name	Expected completion date	Author / Expert agency participation Name, Title, and Involvement	Completed Y/N
Preliminary Geotechnical Engineering Report (Attachment S)	February 18, 2022	RRC, geotechnical engineering consultant for the Applicant	Y

☒ **Check this box when all proposed studies for this topic are completed**

4.1.B Existing Condition and Issues

Describe the existing condition for this topic, including any existing problems associated with the issue being discussed.

Topical area/issue	Existing Condition and Problems
General description of site	General Conditions: The Project Area is located within the Columbia Plateau physiographic province of Washington, an extensive region comprised of early Tertiary (17 to 6 million years old) volcanic and sedimentary rocks and Quaternary volcanic rock and sediment. Around 17 million years ago, a series of extensive flood basalt eruptions known as the Columbia River Basalt Group (CRB) began to cover up the surface of the state of Washington, reaching as much as 10,000 square miles and over 100 feet in depth (Attachment S). The Preliminary Geotechnical Engineering Report describes the geology, soils, topography, and existing erosion patterns of the Project Area, per the requirements of WAC 463-60-302(1) and (2) (Attachment S). Geology: The Project Area is located on top of the Saddle Mountains Basalt, the youngest of the seven major groupings (or formations) within the CRB group. The Quaternary silty and sandy deposits found on top of the Saddle Mountain basalt are a product of wind-blown and lake deposits. Quaternary deposits consist of alluvium, loess, and outburst flood deposits. Alluvium consists of clay, silt, sand, and gravel deposited in streambeds and fans. Alluvium also includes terrace and organic deposits in places; commonly includes reworked loess and outburst flood deposits. Loess consists of eolian silt and fine sand, some clay and caliche. Typical geomorphic expression is a complex of dunes. Outburst flood deposits consist of lacustrine silt and fine sand and fluvial fine to coarse sand, predominantly quartz and feldspar, with basalt grains in coarser sections. The Preliminary Geotechnical

	Engineering Report indicates silt with gravel, silt with sand, silty gravel, and silty sand were observed in borings up to 15.5 feet in depth. Groundwater was not encountered to depths up to 15.5 feet (Attachment S). Soils: Attachment A includes figures of the soils and topography in the Project Area (Attachment A, Figures A-3 and A-4, respectively), while Attachment E includes a table listing the soils and related soils information within the Project Area (NRSC 2022). Silt loam soils are the primary underlying soil type within the Project Area accounting for over 85 percent of the soil types. Primary soils mapped within the Project Area include Warden silt loam (49 percent); Ritzville silt loam (17 percent); Finley stony fine sandy loam (8 percent); Warden silt loam (severely eroded) (8 percent); and Scooteney silt loam (5 percent). These units are also primarily characterized by eolian deposits over residuum weathered from basalt, with areas of gravelly alluvium and loess. Restrictive Layer/Shallow Bedrock: Restrictive layers less than 25 inches is reported for approximately 1 percent of the Project Area. Shallow bedrock (less than 80 inches in depth) is not reported for the soil types within the Project Area. The Preliminary Geotechnical Engineering Report did not identify shallow bedrock or restrictive layers as an issue for Project construction (Attachment S). Steep Slopes: Slopes within the Project Area range from zero to 51 percent. In general, the Project Area is on semi-flat terrain with slopes of less than 3 percent. A review of Benton County critical areas data and the Washington Department of Natural Resources light detection and ranging (LiDAR) data identified portions of the Project Area as containing slopes greater than 15 percent as shown on Figure A-4 in Attachment A. Soils with slopes greater than 30 percent account for less than 3 percent of the Project Area. Areas of steep slopes are further described below under geologic hazards. Alluvial Fan Intermediate Risk: An area of Benton County's "alluvial fan intermediate risk" is mapped in the westernmost portion of the Project Area (Attachment A, Figure A-4). An alluvial fan is a sign that catastrophic floods, often laden with sediment and debris, have occurred in the area and may occur again. It is noted that this area is not within the 100-year floodplain of Dry Creek, which is located approximately 0.75 mile to the north. Refer to Part 4, Section 4.3, and Attachment A, Figure A-6, for additional details on the 100-year floodplain. Erodibility: Soils mapped within the Project Area are rated as low to moderate wind erodibility. Eighty-six percent of soils within the Project Area are mapped with a moderate to high potential for water erosion. Soil wind and erodibility details are provided in Attachment E, Table E-1.

	Drainage/Topography: Drainage and topography within the Project Area are described in Part 4, Section 4.5. Attachment A, Figure A-4 provides a figure showing the topography in the area of the Project Area. All of the soils in the Project Area are rated as well-drained. Topography in the Project Area generally ranges from 960 feet above mean sea level (amsl) to 1,240 feet amsl. In general, Project features have been sited to avoid steep slopes that are present in the northern and western portions of the Project Area, and along drainages in the eastern portion of the Project Area.
Geologic hazards	Geological hazards are defined as Critical Areas in Chapter 15.8 of Benton County's Critical Areas Regulations. The following are defined as geological hazards under Benton County 15.8, Part Five) "Geologically hazardous areas include areas susceptible to erosion, land sliding, bluff failures, or other geological events. Such areas pose a threat to the health and safety of citizens when incompatible development is sited in areas of significant hazard." The Preliminary Geotechnical Engineering Report (Attachment S) provides information regarding geologic hazards that may affect the Project, including seismic hazards (e.g., ground shaking, surface fault rupture, soil liquefaction, and other secondary earthquake-related hazards), slope instability, flooding, ground subsidence, collapsible soils, corrosive soils, and erosion, per the requirements of WAC 463-60-265 and WAC 463-62-020. Seismic Hazards: As described in Attachment S, the Project site is distant from known active faults and is at a low to moderate risk of seismicity or ground rupture from earthquakes. Figure A-5 in Attachment A provides mapping information on earthquakes in the vicinity of the Project obtained from the Pacific Northwest Seismic Network (PNSN). According to the U.S. Geological Survey (USGS) earthquake catalog, the nearest event was a magnitude 1.5 earthquake located approximately 0.4 mile southeast of the Project Area (USGS 2022a). The largest event within 25 miles of the Project Area was a 3.8 magnitude earthquake located approximately 18 miles northeast of the Project Area, recorded in 1971. The most recent event within 25 miles of the Project Area was a 1.3 magnitude earthquake located approximately 6 miles north of the Project Area, recorded in 2016. The 3.8 magnitude event would have been classified at the Project as a 3.0 to 4.0 on the Modified Mercalli Intensity scale. This classification corresponds to weak to light shaking that would generally be felt indoors with negligible potential for damage to structures in the area. The nearest potentially active fault system to the Project Area is the "Rattlesnake Hills Fault Zone (Class B) No. 565," which is located immediately south of the Project Area that is part of the Yakima fold and thrust belt (USGS 2022b). A Class B fault characterized with geologic evidence demonstrating the existence of a fault or that suggests Quaternary deformation, but either (1) the fault might not extend deeply enough to be a potential source of significant earthquakes, or (2) the currently available geologic evidence is too

	strong to confidently assign the feature to Class C but not strong enough to assign it to Class A. The potential for surface fault rupture within the Project Area is considered low due to the Class B classification of the potentially active fault zone and lack of large earthquake events mapped near the Project Area. Although the seismicity of the region is low to moderate, groundwater is expected to be deep (approximately 60 feet or greater). Therefore, the liquefaction potential on site is considered low (see Attachment S for detail). It is noted that Benton County has mapped high liquefaction potential areas within the Dry Creek 100-year floodplain and it is acknowledged that temporary saturation of these areas would occur during rare flood events. If a major earthquake occurs during flooding, liquefaction is possible in these areas. Sections 4.5 and 5.5 of Attachment S provide additional discussion on the impacts of seismicity on the Project. Slope Stability and Landslides: As described above, the Project Area is on semi-flat terrain with the majority of slopes less than 3 percent. The Project Area does not contain any known landslides (DNR 2022a; Benton County 2022). Benton County has a geologic hazard layer for combined erosion hazard and slopes greater than 15 percent (Attachment A, Figure A-4). Approximately 172 acres (3.8 percent) of the Project Area are mapped as combined erosion hazard and slopes greater than 15 percent. The Applicant further reviewed DNR LiDAR data for the Project Area to identify slopes greater than 15 percent (DNR 2022b). Based on the DNR lidar data, an additional 222 acres (4.8 percent) are mapped as slopes greater than 15 percent in the Project Area. As shown on Figure A-4 in Attachment A, these areas are primarily associated with drainages (ephemeral streams and non-jurisdictional drainages) and steeper terrain at the outskirts of the Project Area. Steeper terrain is also located in areas to the south, east, and north outside of the Project Area. Project facilities have been sited to avoid mapped slopes of greater than 15 percent to the extent possible. See Attachment S for information on geotechnical practices to address Project facilities that required siting in steeper slopes. Volcanic Activity: The nearest mapped volcanic feature to the Project Area is the Ice Harbor Member volcano vent that lies approximately 33 miles east of the Project. The Ice Harbor Member was erupted from now-extinct volcanic activity in the central part of the Columbia Plateau about 8.5 million years ago. The Project Area is mapped by DNR in the Tephra (ash) volcanic hazard zone. The nearest active volcanoes are located in the Cascade Range, with Mount Adams approximately 80 miles to the west of the Project site. When a volcano erupts, the blast sends gas and pieces of molten rock into the air. Lighter pieces, such as volcanic glass, minerals, and ash, can rise high into the air and form a massive cloud called an eruption column. The larger pieces—called volcanic bombs—usually fall quickly to the ground within a few miles of the volcanic

	vent. All of these pieces of ash, bombs, and rock fragments produced during the eruption are known as tephra. When eruption columns become large, they pose a serious hazard to health and aviation. The small particles of dust, rock, and volcanic glass—called ash—could fall in the vicinity of the Project if a Cascade Range volcano were to erupt. Flooding: Floodplains in the Project Area are addressed in Part 4, Section 4.3. Stormwater runoff is addressed in Part 4, Section 4.5. As described above, an area of Yakima County's "alluvial fan intermediate risk" is mapped in the very western portion of the Project Area (Attachment A, Figure A-4). An alluvial fan is a sign that catastrophic floods, often laden with sediment and debris, have occurred in the area and could occur again under heavy rain conditions, which are unusual in this area. Ground Subsidence and Mines: A listing of mine information (USGS 2022c), indicates that there are no active or inactive subsurface mines in the vicinity of the Project Area and no surface mines within the Project Area. A few clay pit mines are located south of the Project Area. These surface mines are not considered a subsidence hazard. Therefore, the potential for mine subsidence is generally considered low. Karst topography is not present in the vicinity of the Project. Collapsible Soils: Soils mapped within the Project Area are dominated by silt and loess (Figure A-3) and are not saturated. Collapse potential is generally considered moderate but is mostly dependent on access to water (Attachment S). Corrosive Soils: Electrical resistivity measurements were used to design the electrical grounding systems and to assess corrosion potential (Attachment S). These data indicate subsurface corrosive soil conditions are low for concrete but moderate to high for unprotected steel in the Project Area.
Unique physical features	There are approximately 3 acres of talus slopes located in the southwestern corner of the Project Area (refer to Part 4, Section 4.8 for additional discussion on talus slopes). The Project has been designed to avoid talus slopes in the southwestern corner of the Project Area. The Project is set back by at least 125 feet from this feature.

4.1.C Changes to and from Existing Condition

4.1.C.1 Changes to the Existing Condition from the Proposal

Could the activities associated with the proposal result in changes to the existing condition for this topic.

☐ No	☒ Yes	
	Topical Area/issue	**Changes**
	Geohazards	The potential for surface fault rupture within the Project Area is considered low due to the relative distance of the confirmed active fault zones and lack of large earthquake events mapped near the Project Area (Attachment S). The Project will provide seismic design using 2018 International Building Code (IBC). Site Class C will be used for very dense soils and bedrock conditions. The Mapped Spectral Response Acceleration for the 1 second (S1) and short periods (SS) were computed in the Preliminary Geotechnical Engineering Report using the Applied Technology Council Seismic Design Maps, which is a web-based application program. The permanent Project infrastructure would not be constructed within the 100-year floodplain. During construction, a temporary access road will be required across the floodplain for construction the overhead transmission line. Refer to Part 4, Section 4.3 for discussion of this temporary work area in the floodplain. The Project Area includes approximately 7.6 acres of temporary and 0.5 acre of permanent disturbance within the area mapped as “alluvial fan intermediate risk” mapped in the very western portion of the Project Area (Attachment A, Figure A-4). The preliminary geotechnical report (Attachment S) concluded that some siting grading may be necessary in this area, and additional design will be conducted to address any potential slope failure issues should they be present at this location. Soil liquefaction and/or mine subsidence are not concerns for the Project Area based on the lack of saturated soils and absence of underground mines in the vicinity of the Project. The Project will also be designed to meet seismic design and soil characteristic requirements (including collapsible and corrosive soils) documented in the Preliminary Geotechnical Engineering Report (Attachment S). Project infrastructure has also been designed to avoid the majority of slopes equal to or greater than 15 percent in the Project Area, including those areas located along the western and northern portions of the Project Area and slopes along drainages in the eastern portion of the Project Area (Attachment A, Figure A-4). The Project will have approximately 10.6 acres of temporary disturbance and approximately 0.3 acre of permanent disturbance in areas mapped by Benton County as combined erosion hazard and 15 percent or greater slopes. An additional approximately 50.2 acres of temporary and 2.6 acres of permanent disturbance will

		occur in areas with slopes greater than 15 percent based on the DNR LiDAR survey results. During construction, temporary disturbances will include minimal site grading for the installation of PV solar panel posts across the Project. Some collection lines will be installed in trenches in areas of slopes greater than 15 percent slope. Areas of permanent disturbance that will require additional grading in areas with slopes greater than 15 percent include the access roads, foundations for PCS and BESS units, and the Project substation. Areas of slopes greater than 15 percent will be reviewed during the final Project design and avoided to the greatest extent feasible. The Applicant will provide a site-specific grading plan in the Construction Plans and Specifications that will be submitted to EFSEC prior to site preparation. The Project's Stormwater Management Plan, Erosion Control Plan, and design BMPs will address these areas to prevent erosion and stabilize changes to local topography and drainage patterns. Access roads will be required during construction to accommodate construction equipment and deliveries. The access roads will also facilitate long-term operation and maintenance of the Project. These roads will be subjected to heavy loads, but only for limited duration and frequency. The surficial materials encountered within a majority of the preliminary geotechnical testing locations indicated native soils consisting of clay soils with varying amounts of sand and silt. These materials are generally considered to be poor in terms of supporting vehicular and construction traffic as defined by AASHTO when used for support of pavement structures. Access roads for the Project will be gravel roads. The final access roadway section thickness and required aggregate course material thickness recommendation will be provided during final Project design and engineering. Access roads will be constructed with an aggregate surface to help ensure accessibility during wet conditions. As described above and in the mitigation section below, the Project will avoid identified geological hazards (e.g., seismic hazards, 15 percent slopes, erosive soils, collapsible soils, high risk flood areas, etc.); or mitigate the effects of Project construction on these areas (e.g. steep slopes and erosion); or will mitigate the effects of these hazards on the Project (e.g., corrosive soils and erosion). As a result, the Project is in compliance with the County's Critical Area Ordinance in regard to geological hazards.
	Water flow	The majority of the Project Area will not be covered with impervious surfaces (see Part 2, Section 2.B.2) and infiltration of precipitation will not differ significantly from current conditions; any additional scour will be minimized and avoided within existing drainages through Project design and BMPs. New impervious surfaces will be developed as part of this Project (e.g., gravel roads, solar array posts, foundations for PCS, O&M building, substation components, etc.). However, these impervious

		surfaces are a small percentage of the total Project Area, and stormwater will generally infiltrate across the site by infiltrating through vegetation or, where necessary, through permanent detention basins with outlet culverts to allow water to slowly release and infiltrate. Overall, impervious surfaces are anticipated to be 142 acres, or approximately 3 percent of the total Project Area (see Part 2, Section B.2). See Part 3, Section 3.5 and Part 4, Section 4.5 for additional information.
	Topography	The Project will require minimal grading on-site (see Part 2, Section 2.B.1). The Applicant will provide grading plans and specify the source of fill in the Construction Plans and Specifications that will be provided to EFSEC for approval prior to site preparation. The Applicant will obtain Building Permits from Benton County if needed. Per RCW 17.10.140, the Applicant will prepare and submit a Vegetation and Weed Management Plan to EFSEC for the control of noxious and problem weeds prior to construction.

4.1.C.2 Changes to the Proposal from the Existing Condition

Would the existing condition for this topic have the potential to affect the proposal now or in the future?

☐ **No**	☒ **Yes**	
	Topical Area/issue	**Changes**
	Design around slope and geohazards	The Project has been designed to avoid the steepest slopes in the Project Area, watercourse drainages, and geological hazardous areas to minimize risk due to erosion and flash flooding. No development is planned within or in proximity to incised drainages that might pose a risk from potential flooding events. All permanent Project components are located outside of the 100-year floodplain. Refer to Part 4, Section 4.3 for additional information on the temporary construction corridor across the floodplain and the one proposed access road crossing located between two ephemeral streams. In addition, the stormwater design will account for sufficient measures, including drainage basins, to address the minor amount of additional impervious surface. Appropriate Project design, construction, and maintenance will be implemented to mitigate the risk from site erosion.

4.1.D Proposed Mitigation and Monitoring

☒ Check this box when all final proposed mitigation is described here, or the location of the mitigation information is referenced here.

Are you proposing any mitigation, either required in rules or proposed for impacts?

☐ No	☒ Yes		
	Mitigation	**Applicable law and how well it addresses the impact**	**Expert agency participation**
	Implementation of Geotechnical Recommendations	The Applicant will follow all geotechnical recommendations provided in the Final Geotechnical Engineering Report. Recommendations included in Section 5.2 of the Preliminary Geotechnical Engineering Report (Attachment S) include the following. Shallow foundations must have a minimum embedment of 1.5 feet below finish site grade. Other alternatives are non-frost susceptible fill under foundations or thermal insulation to protect against frost. At some locations, soft silt soils may require remediation for bearing capacity. Where remediation is necessary, the continuous or square footings should bear on a minimum of 2 feet of compacted structural fill materials. The over-excavation should extend a minimum lateral distance of about 1 foot beyond the edge of the footings. Anticipated settlement of the foundations under service loads will be on the order of about 1 inch or less. Shallow foundations should be adequately reinforced and proportioned to resist adfreezing forces associated with the frost depth. Shallow foundations should be adequately reinforced and proportioned to resist swell/uplift forces associated with the near surface clay soils. The subgrade preparation and compaction recommendations in Section 5.3 of the Preliminary Geotechnical Engineering Report (Attachment S) will	EFSEC

		be followed to mitigate the risks associated with corrosive soils. The Project will provide seismic design using the 2018 IBC. Site Class C will be used for very dense soils and bedrock conditions. Native sand and silt material can be used as general site grading fill, provided they do not contain significant amounts of organics. After site clearing and grubbing, the general fill should be placed in loose lifts not exceeding 12 inches in thickness and compacted to a minimum of 90 percent of the ASTM D698 maximum dry unit weight. If the general site grading is located below proposed pavement, foundations, or equipment pads, then other compaction requirements apply. Structural fill should consist of a non-expansive, well-graded material with sufficient binder for compaction purposes and meet the requirements of 2020 Standard Specifications, Publication No. M41-10, Division 9 Materials, “Item 9-03-10 Aggregate for Gravel Base” issued by the Washington Department of Transportation. The Project would make structural fill interchangeable with flexible road base. Structural fill should be compacted to a minimum of 95 percent of maximum dry density determined by ASTM D1557. The structural fill should be moisture conditioned within 2 percent of optimum moisture content. Lift thickness is a function of energy, equipment, and ideal moisture. Typically, 9-inch lifts are a maximum, but if a contractor is able to complete thicker lifts and it can be verified that full densification occurs throughout the lift, then lifts up to 12 inches are possible.	
	Best Management Practices (BMPs) - Erosion	As further described in Part 4, Section 4.5, the Applicant will implement an Erosion and Sediment Control Plan (ESCP), a Construction Phase SWPPP,	Ecology, EFSEC

		and an Operations Phase SWPPP, in compliance with local stormwater regulations. These plans will address stormwater runoff, flooding, and erosion to ensure compliance with state and federal water quality standards. The ESCP will include BMPs such as the appropriate use of silt fencing to avoid or eliminate runoff of contaminants. The SWPPP will include BMPs from Ecology's Stormwater Management Manual for Eastern Washington (Ecology 2019). Benton County has adopted Ecology's Stormwater Management Manual for Eastern Washington (SWMMEW) as their basis of design and review. Per RCW 17.10.140, the Applicant will prepare and submit a Vegetation and Weed Management Plan to EFSEC for the control of noxious and problem weeds prior to construction. The plan will be implemented to revegetate temporarily impacted areas and minimize erosion.	
	Building Permits	The Applicant will provide grading plans and obtain necessary building permits from Benton County Building Division if needed. Seismic design parameters that will be used to design the Project are included in the 2018 IBC and American Society of Civil Engineers (ASCE) 7-10 and ASCE 7-16. These parameters are consistent with the Washington State Building Codes. The Project will comply with the current codes at the time of construction, demonstrating compliance with WAC 463-62-020.	Benton County Building Division and Washington State Building Code Council
	Soil Monitoring	The Applicant will develop and implement a soil monitoring plan in general alignment with the memorandum included as Attachment V to this ASC, to assess soil health following construction of the Project and identify mitigation measures that would be implemented if soil health declines.	EFSEC

4.1.E Effects on Other Environmental Elements not yet Discussed

Does any information provided for this topic affect other environmental elements (e.g. water, plants, animals, noise), that has not already been considered and discussed in this form?

☒ No	☐ Yes	
	Environmental Element	**Additional changes or effects**
	N/A	N/A

4.1.F References

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Ecology (Washington State Department of Ecology). 2019. Stormwater Management Manual for Eastern Washington. Publication Number 18-10-044. August. Available online at: https://apps.ecology.wa.gov/publications/documents/1810044.pdf.

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USGS (U.S. Geological Survey). 2018. 2018 Long-term National Seismic Hazard Map. Available online at: https://www.usgs.gov/media/images/2018-long-term-national-seismic-hazard-map. Accessed February 2022.

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4.2 Air Quality

4.2.A Studies

Describe any studies that have already been conducted or will be conducted related to this topic and provide the expected timing for the completion of studies to be completed.

Study name	Expected completion date	Expert agency participation Name, Title, and Involvement	Completed Y/N
No studies related to air quality have been conducted for the Project, nor are any studies planned.			

☒ Check this box when all proposed studies for this topic are completed

4.2.B Existing Condition and Issues

Describe the existing condition for this topic, including any existing problems associated with the issue being discussed.

Topical area/issue	Existing Condition and Problems
Regulatory	The Clean Air Act (CAA) is the primary federal statute governing air quality. The U.S. Environmental Protection Agency (EPA) has promulgated primary and secondary National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), two size categories of particulate matter (PM_{10} and $PM_{2.5}$), ozone (O_3), sulfur dioxide (SO_2), and lead. The primary standards are concentration levels of pollutants in ambient air, averaged over a specific time interval, designed to protect public health with an adequate margin of safety. The secondary standards are concentration levels judged necessary to protect public welfare and other resources from known or anticipated adverse effects of air pollution. Although states may promulgate more stringent ambient standards, the State of Washington has adopted standards identical to the federal levels (see WAC 173-476, Ambient Air Quality Standards). Local air quality is measured against these national and state standards, and areas that do not meet the standards are designated as “non-attainment” areas. A new emissions source must demonstrate compliance with all applicable federal and state air quality requirements, including emissions standards and ambient air quality standards. The State of Washington has established rules through Ecology for permitting new sources in both attainment and non-attainment areas of the state, and additional requirements may be imposed by local air authorities. WAC 463-62-070 requires that energy facilities meet all federal and state air quality laws and regulations mentioned above, and WAC 463-78 establishes adoption of these requirements by EFSEC. EFSEC issues authorizations for air emissions for sources under its jurisdiction. In general, if potential emissions from stationary sources exceed certain thresholds, approval from the applicable permitting authority is required before beginning construction. In an effort to

	bring the area back into compliance with air quality standards, new sources of air emissions in non-attainment areas must undergo more rigorous permitting than equivalently sized sources in attainment areas. However, the Project is not located within a non-attainment area for any criteria pollutants (EPA 2022). Under the CAA, new industrial sources of air pollution must receive an air quality permit prior to operation. The two most common permits associated with industrial activity emitting regulated air pollutants are Notice of Construction/New Source Review approvals and Prevention of Significant Deterioration (PSD) permits. WAC 463-39 and 173-400 establish the requirements for review and issuance of notice of construction approvals for new sources of air emissions. A Notice of Construction is not required for the Project because there would be no permanent source of regulated air emissions. PSD regulations apply to proposed new or modified sources located in an attainment area that have the potential to emit criteria pollutants in excess of predetermined de minimus values (40 CFR Part 51). For new generation facilities, these values are 100 tons per year of criteria pollutants for 28 specific source categories, or 250 tons per year for sources not included in the 28 categories. A PSD permit would not be required for the Project because the generation of electricity by solar arrays does not produce air emissions. A concrete batch plant will not be required during construction or operation of the Project, and as such, no associated permit will be required. During operations, the Project substation and O&M building will be connected to the local utility (Benton Rural Electric Association). No back-up power generators are proposed and therefore no associated permits will be required. **Construction Emissions:** Although construction emissions are not included in permitting of stationary sources, mobile sources (such as construction equipment and maintenance pickups) are regulated separately under the CAA. Washington State regulates what are known as “fugitive” air emissions, which consist of pollutants that are not emitted through a chimney, smokestack, or similar facility. Blowing dust from construction sites, unpaved roads, and tilled agricultural fields are common sources of fugitive air emissions. Solar energy plants are not included among the facilities for which review and permitting of fugitive emissions are required (WAC 173-400-040). Nevertheless, WAC 173-400-040(9)(a) requires owners and operators of fugitive dust sources to take reasonable measures to prevent dust from becoming airborne and to minimize emissions. Other Washington State regulations that apply to nuisance emissions, including fugitive dust, and various equipment used during construction include the following: • WAC 173-400-040(3) Fallout. No person shall cause or allow the emission of particulate matter from any source to be deposited beyond the property under direct control of the owner or operator of

	the source in sufficient quantity to interfere unreasonably with the use and enjoyment of the property upon which the material is deposited. • WAC 173-400-040(4-4a) Fugitive emissions. The owner or operator of any emissions unit engaging in materials handling, construction, demolition, or other operation, which is a source of fugitive emissions, if located in an attainment area and not impacting any non-attainment area, shall take reasonable precautions to prevent the release of air contaminants from the operation. • WAC 173-400-040(5) Odors. Any person who shall cause or allow the generation of any odor from any source that may unreasonably interfere with any other property owner's use and enjoyment of his property must use recognized good practice and procedures to reduce these odors to a reasonable minimum. • WAC 173-400-040(9) Fugitive dust. The owner or operator of a source or activity that generates fugitive dust must take reasonable precautions to prevent that fugitive dust from becoming airborne and must maintain and operate the source to minimize emissions. **Greenhouse Gases:** Greenhouse gases (GHG) play a critical role in determining the earth's surface temperature. A GHG is any gas in the atmosphere that absorbs infrared radiation. The infrared radiation is selectively absorbed or "trapped" by GHGs as heat and then reradiated back toward the earth's surface, warming the lower atmosphere and the earth's surface. As the atmospheric concentrations of GHGs rise, the average temperature of the lower atmosphere gradually increases, thereby increasing the potential for indirect effects such as a decrease in precipitation as snow, a rise in sea level, and changes to plant and animal species and habitat. Climate impacts are not attributable to any single action but are exacerbated by diverse individual sources of emissions that each make relatively small additions to GHG concentrations. GHGs are emitted by both natural processes and human activities. Human activities known to emit GHGs include industrial manufacturing, utilities, transportation, residential, and agricultural activities. The GHGs that enter the atmosphere because of human activities are CO_2, methane, nitrous oxide, and fluorinated carbons (i.e., hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride). In Washington state, GHGs are regulated by RCW Chapter 70A.45, which establishes goals for statewide reduction of GHG emissions. The statute aims to reduce overall GHG emissions to 45 percent below 1990 levels by 2030. By 2050, the state intends to reduce overall emissions to 95 percent below 1990 level. Goals also included fostering a clean energy economy by increasing the number of jobs in the clean energy sector to 25,000 by 2020, from just over 8,000 jobs in 2004 (RCW 43.330.310). WAC 173-441 established an inventory of GHG emissions through a mandatory greenhouse reporting rule for certain operations. Because solar power would not emit GHGs during operations, these regulations would not apply

	to the Project. In addition, the Project could assist the State in achieving these goals by providing clean renewable energy to the State.
Climate	The Project is located 12.5 miles northeast of the city of Sunnyside and 1 mile south of the State Route (SR) 241 and SR 24 interchange in Benton County, Washington. It is located in a sparsely populated rural area of Benton County and contains a mix of dryland and irrigated agricultural use, rangeland, transmission and electrical infrastructure, and undeveloped areas. It is located within a rain shadow created by the Cascade Mountains, which causes a decrease in precipitation to the east. In this region of Washington, the summers are hot and mostly clear, winters are very cold and partly cloudy, and it is typically dry year-round (e.g., on average, there are over 200 days of sunshine). Average annual precipitation at Priest Rapids Dam, Washington (nearest monitor, approximately 10 miles north of the Project) is 7.0 inches. The average seasonal snowfall at Priest Rapids Dam is 5.9 inches. In winter, temperatures average a high of 48.4 degrees Fahrenheit (°F) and low of 28.6°F, with extreme lows below 20°F. In summer, temperatures average a high of 88.1°F and a low of 62.5°F, with extreme highs above 95°F (Western Regional Climate Center 2021). Wind conditions near the Project can be characterized by Automated Surface Observing Systems (ASOS), which serves as the nation's primary surface weather observing network. The closest ASOS station to the Project is located at the Sunnyside Municipal Airport in Sunnyside, Washington (K1S5). Based on data collected over the 5-year period 2015 through 2020, the prevailing winds most frequently blew from the west (approximately 11 percent of the time), from the north (approximately 9 percent of the time), and from the northeast, east, and southwest (each approximately 7 percent of the time), with calm conditions (less than 2.0 miles per hour) occurring approximately 50 percent of the time. The average wind speed for the period was approximately 3.5 miles per hour (1.6 meters per second) (IEM 2022).
Regional Air Quality	While the air quality in Benton County is healthy most of the year, the county's sunny climate, pollution-trapping mountains, and growing population contribute to occasional air quality issues. Fugitive dust and smoke are two of the most prevalent existing sources of air pollution in the area. Agricultural and outdoor burns, as well as wildfires, are the main $PM_{2.5}$ sources. Tilling operations, windblown dust, and resuspended road dust sometimes gives rise to elevated levels of PM_{10}. The area surrounding the Project is sparsely populated and largely undeveloped, with the nearest schools and parks located 12 miles to the south in the town of Sunnyside. The nearest air quality monitors to the Project that can be used to determine compliance with the NAAQS are summarized in Table 4.2-1. Ambient monitoring data reported in this table are for years 2018 through 2020, as summarized in the 2021 Ambient Air Monitoring Network Plan. The nearest monitor is located in Sunnyside, Washington (approximately 12 miles to the south), which measures $PM_{2.5}$. The nearest PM_{10} monitor is located in Yakima, Washington (approximately 30 miles to the west). The nearest ozone monitor is in Kennewick, Washington (approximately 35 miles to the

southeast). The nearest SO_2 monitor is located in Malaga, Washington (approximately 60 miles north). The nearest CO and NO_2 monitors are in Seattle, Washington and Tacoma, Washington, respectively (both approximately 135 miles to the northwest).

In recent years, Washington experienced extended smoke events from regional wildfires in the Pacific Northwest. These smoke events caused repeated exceedances of the PM standards. Due to the regional and exceptional nature of these events, EPA issued waivers for the unmet monitoring requirement. Under normal conditions, pollutant concentrations fall well below NAAQS (Ecology 2021).

Table 4.2-1. Ambient Air Quality Monitors Nearest the Project with Comparison to NAAQS

Pollutant / Averaging	Site	2018	2019	2020	3-year Design Value	NAAQS	Units
CO 1-hr	Seattle Beacon Hill (ID 530330080)	1	1.1	1.7	1.7	**35**	ppm
CO 8-hr		0.9	0.7	1.7	1.7	**9**	ppm
NO_2 1-hr	Tacoma – S 36th St. (ID 530530024)	46.4	40.3	39.8	42	**100**	ppb
NO_2 Annual		16.7	15.13	12.47	17	**53**	ppb
PM_{10}	Yakima 4th Ave. (ID 530770009)	129	60	326	326	**150**	µg/m³
$PM_{2.5}$ 24-hr	Sunnyside – S 16th St. (ID 530770005)	62.4	31.3	118.1	71	**35**	µg/m³
$PM_{2.5}$ Annual		11.9	10.8	15.2	13	**12**	µg/m³
SO_2 1-hr	Malaga Hwy. (ID 530070012)	1.2	1.0	1.7	1	**75**	ppb
SO_2 3-hr		1.1	0.8	1.5	1.5	**500**	ppb
Ozone 8-hr	Kennewick – S Clodfelter Rd. (ID 530050003)	0.073	0.061	0.061	0.065	**0.07**	ppm

4.2.C Changes to and from Existing Condition

4.2.C.1 Changes to the Existing Condition from the Proposal

Could the activities associated with the proposal result in changes to the existing condition for this topic.

☐ No	☒ Yes	
	Topical Area/issue	**Changes**
	Construction	The primary sources of air pollution generated by construction of the Project would be vehicle exhaust emissions, as well as fugitive dust particles from disturbed soils that become airborne. A concrete batch plant will not be required during construction. Sources of vehicle exhaust emissions would include heavy construction equipment operating on the site, trucks delivering construction materials and Project components to the site, and vehicles used by construction workers to access the site. Pollutant emissions from these sources would be relatively small, given the size of the construction workforce and equipment fleet, and similar to emissions from other equipment commonly used for agriculture, transportation, and general construction in Benton County. The emissions would generally

		be dispersed among multiple locations in and near the Project Area at any given time rather than concentrated in a specific location, and they likely would not reach significant concentrations at off-site locations. Construction activities that could create fugitive dust include transportation of materials; clearing and grading for roads, crane pads, solar array pads, and other Project infrastructure; and trenching or plowing for underground utility cables. Construction activities for the Project are scheduled to take approximately 22 months (see Part 2 of the ASC). Construction emissions have been estimated using EPA's Motor Vehicle Emissions Simulator (MOVES3) and NONROAD emission factor models. These emissions are associated with exhaust from heavy equipment, worker vehicle commutes, delivery and haul trucks, as well as fugitive dust from earth-moving and material handling activities. Construction scheduling and equipment have not been finalized, and therefore, reasonable and conservative assumptions have been made for the purpose of estimating construction emissions. A summary of total estimated emissions from construction of the Project is shown in Table 4.2-2. When compared to the most recent published emissions inventory (2017) for Benton County, Project emissions would represent a very minor fraction of total emissions for the county (Ecology 2020). Given the relatively low magnitude, localized extent, and temporary duration of construction-related emissions, air quality impacts associated with Project construction would not be substantial. The following assumptions were used to develop the calculations presented in Table 4.2-2: • Construction equipment emissions were based on estimated construction activity schedule, types of vehicles/equipment, number of vehicles/equipment, fuel type, equipment load factors, and equipment size (horsepower). Equipment operating times for the equipment were based on a 5-day work week and an 8-hour workday. • Fugitive dust sources were estimated using South Coast Air Quality Management District's (SCAQMD) recommended methodology. An uncontrolled PM_{10} emission factor of 20 pounds per acre per day was used, consistent with California Air Resource Board's URBEMIS2007 model. The Project would implement Best Management Practices to minimize fugitive dust during construction, including but not limited to graveling, watering, and limiting traffic speeds on unpaved roads. For the purposes of estimating fugitive dust emissions, it was assumed that disturbed areas would be watered at least twice a day, reducing fugitive dust by at least 50 percent. Based on the equipment mix, an estimated

average disturbed area of 3 acres per day was used in the calculations. $PM_{2.5}$ emissions were assumed to be 21 percent of PM_{10} emissions, using the fraction recommended by SCAQMD (SCAQMD 1993).

Table 4.2-2. Summary of Total Estimated Construction Emissions (tons per year)

Source	VOC	NOx	CO	PM_{10}	$PM_{2.5}$
Off-road Construction Equipment	3.2	21.9	10.4	2.0	2.0
Worker Commuting	1.5	0.8	22.3	0.04	0.03
Material Delivery and Hauling	1.0	5.6	3.6	0.11	0.11
Fugitive Dust from Construction	--	--	--	3.8	0.8
Project Construction Annual (Max.) Total	**5.6**	**28.3**	**36.4**	**6.0**	**2.9**
Benton County 2017 Total Emissions[a]	**14,186**	**6,709**	**31,652**	**11,159**	**2,535**
Project Total as a Percent of Benton County Total Emissions	***< 0.1%***	***0.4%***	***0.1%***	***< 0.1%***	***0.1%***

[a] Ecology 2020

Operation

O&M impacts on air quality from the Project will be minimal. Combustion emissions and fugitive dust generated by vehicles traveling on Project access roads to perform operations and maintenance functions will be the primary emissions expected during this timeframe. The volume of O&M vehicle traffic will be very low; therefore, quantities of potential emissions generated by these vehicles will be very low, intermittent, and localized. Areas disturbed during construction and not occupied by permanent Project infrastructure will be revegetated to prevent the generation of dust. A local utility connection to Benton Rural Electric Association will be provided at the Project substation and O&M building and therefore no generator engine emissions will occur during operations. Operation of the Project will not produce visible plumes, fogging, misting, icing, impairment of visibility, changes in ambient levels of pollutants, or impacts on climate.

The Project is not expected to induce regional growth that would result in substantial changes to off-site air quality. Other pollutants, including GHGs, will be emitted from outside the immediate vicinity, as a result of the total fuel cycle of the Project. These emissions will be generated from manufacturing and transporting Project parts and equipment. However, the Project itself will not directly emit GHGs beyond the use of vehicles and transportation (as mentioned earlier). Furthermore, the Project will support the state's goal of increasing use of renewable energy resources, which has been declared in part to protect Washington's clean air and water.

Implementation of any weed control measures at the Project (e.g., herbicide spraying) will be conducted in compliance with federal, state, and local regulations to ensure that adverse impacts to air quality do not occur (see Part 4 Section 4.8).

	Odors	During Project-related construction activities, exhaust from diesel-powered vehicles and equipment as well as painting of the O&M building and other structures could create minor odors. These odors are not likely to be noticeable beyond the immediate vicinity and will be temporary and short-lived. Long-term odors are associated typically with industrial projects involving use of chemicals, solvents, petroleum products, and other strong-smelling elements used in manufacturing processes, as well as sewage treatment facilities and landfills; however, the Project involves no elements related to these types of uses. Therefore, no long-term odor impacts related to odors will occur with operation of the Project.

4.2.C.2 Changes to the Proposal from the Existing Condition

Would the existing condition for this topic have the potential to affect the proposal now or in the future?

☒ No	**☐ Yes**	
	Topical Area/issue	**Changes**
	N/A	Existing conditions at the site have been analyzed and incorporated as described in above.

4.2.D Proposed Mitigation and Monitoring

☒ Check this box when all final proposed mitigation is described here, or the location of the mitigation information is referenced here.

Are you proposing any mitigation, either required in rules or proposed for impacts?

☐ No	**☒ Yes**		
	Mitigation	**Applicable law and how well it addresses the impact**	**Expert agency participation**
	Implementation of Best Management Practices (BMPs) and Standard Construction Practices	Washington Administrative Code sections addressing air quality include: • WAC 173-400-040(3) Fallout • WAC 173-400-040(4-4a) Fugitive emissions • WAC 173-400-040(5) Odors • WAC 173-400-040(9)(a) Fugitive Dust	N/A

		To adhere to these codes, the Applicant would implement BMPs and standard construction practices, including the following: • Vehicles and equipment used during construction would be properly maintained to minimize exhaust emissions. • Operational measures such as limiting engine idling time and shutting down equipment when not in use would be implemented. • Watering or other fugitive dust-abatement measures would be used as needed to control fugitive dust generated during construction. When applied, the Applicant will use water or a water-based environmentally safe dust palliative such as lignin for dust control. • Construction materials that could be a source of fugitive dust would be covered when stored. • Traffic speeds on unpaved roads would be limited to 25 miles per hour to minimize generation of fugitive dust. • Truck beds would be covered when transporting dirt or soil. • Carpooling among construction workers would be encouraged to minimize construction-related traffic and associated emissions. • Erosion-control measures would be implemented to limit deposition of silt to roadways, to minimize a vector for fugitive dust. • Replanting or graveling disturbed areas would be conducted during and after construction to reduce wind-blown dust.	

4.2.E Effects on Other Environmental Elements not yet Discussed

Does any information provided for this topic affect other environmental elements (e.g. water, plants, animals, noise), that has not already been considered and discussed in this form?

☒ No	**☐ Yes**	
	Environmental Element	**Additional changes or effects**
	N/A	N/A

4.2.F References

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EPA (U.S. Environmental Protection Agency). 2022. Green Book, Washington Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants. https://www3.epa.gov/airquality/greenbook/anayo_wa. html. Accessed February 28, 2022.

IEM (Iowa Environmental Mesonet, Iowa State University). 2022. Sunnyside Municipal Airport (K1S5) ASOS Station Windrose Plot. https://mesonet.agron.iastate.edu/sites/dyn_windrose.phtml?network=WA_ASOS&station=1S5. Accessed on February 28, 2022.

SCAQMD (South Coast Air Quality Management District). 1993. CEQA Air Quality Handbook. http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook.

Western Regional Climate Center. 2021. Priest Rapids Dam, Washington Climate Summaries. https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?wa6747. Accessed on February 28, 2022.

4.3 Water Quality – Wetlands and Surface Waters (Buffers, Fill, Dredging, & Sedimentation)

4.3.A Studies

Describe any studies that have already been conducted or will be conducted related to this topic and provide the expected timing for the completion of studies to be completed.

Study name	Expected completion date	Expert agency participation Name, Title, and Involvement	Completed Y/N
Wautoma Solar Facility Wetland and Other Waters Delineation	Completed	Wetland Specialists at Tetra Tech, Inc. performed field surveys and wrote a Wetland Delineation report that meets USACE and Washington State Department of Ecology (Ecology) specifications; see Attachment I.	Y

☒ Check this box when all proposed studies for this topic are completed

4.3.B Existing Condition and Issues

Describe the existing condition for this topic, including any existing problems associated with the issue being discussed.

Topical area/issue	Existing Condition and Problems
Wetland delineation	The wetland and other waters delineation found that there are three palustrine emergent wetlands within the Project Area (refer to Attachment A, Figure A-6 and Attachment I Wetland Delineation Report). These wetlands are the result of long-term leaks in an irrigation pipeline that is positioned on the soil surface and are adjacent to an existing farm road. The wetlands are labeled as WT500, WT501, and WT502 in Attachment I.
Ephemeral streams within the Project area	The wetland and other waters delineation found that there are 34 ephemeral stream segments within the Project Area (refer to Attachment A, Figure A-6 and Attachment I Wetland Delineation Report). The ephemeral streams are characterized and labeled in Attachment I, and only one has an official name in the National Hydrography Dataset maps. Dry Creek (also labeled ST-207 in Attachment I) is in the northern end of the Project Area and has a 100-year floodplain listed on the Federal Emergency Management Agency maps. Per discussions with a Project participant landowner, it is extremely rare for Dry Creek to have visible flows. Further, a Riparian Analysis Memo prepared in 2020 for Benton County's critical areas update stated that Dry Creek was among several

	named streams in the County that were not measured due to lack of visible flows (AC Geospatial LLC 2020). All of the ephemeral streams lack connectivity to other intermittent, perennial, or fish-bearing streams. Two of the stream segments (ST-207/Dry Creek, and ST-217 in Attachment I) continue out of the Project Area. ST-217 is a tributary to ST-207/Dry Creek just outside of the Project Area. ST-207/Dry Creek connects to Cold Creek at 4.5 miles downstream from the Project Area. Cold Creek is uncategorized on the Washington Department of Natural Resources (DNR) stream typing maps and does not contain fish per the StreamNet database (DNR 2022; StreamNet 2022). The Cold Creek drainage continues about 21 miles downstream to the Yakima River. However, Cold Creek appears to no longer be directly connected to the Yakima River in the historical orthoimagery (Google 2022). The Horn Rapids Campground and Park as well as the Tapteal Water Trail Access Road cover the historical floodplain and confluence of Cold Creek and the Yakima River (Google 2022).
Flood risks	There is a Zone A (100-year) floodplain associated with ST-207/Dry Creek in the north end of the Project Area. This special flood hazard area is regulated by Benton County as described below.
Regulatory	On August 30, 2021, the Navigable Waters Protection Rule was vacated and the definition of WOTUS has reverted to pre-2015 rules. Under those rules, certain isolated wetlands and ephemeral waterways are again considered jurisdictional. As of November 18, 2021, a revised definition of WOTUS has been published in the Federal Register for public comment. The proposed definition is a codified version of the current pre-2015 rules. The virtual hearings for the proposed 2022 definition of WOTUS occurred in mid-January 2022, but no findings from those hearings have been presented to the public. The State of Washington considers all water bodies to be waters of the state and therefore has jurisdiction over the ephemeral streams found within the Project Area. Crossings or other work within the ordinary high-water marks of ephemeral streams may require a Hydraulic Project Approval (HPA) permit from the WDFW. The Applicant is designing the Project to avoid and minimize impacts to ephemeral streams to the extent feasible. Per WAC 220-660-010, the purpose of the HPA is to ensure that construction or performance of work is done in a manner that protects fish life. A JARPA is included in this submittal because WDFW has indicated that this type of crossing may require an HPA. The Applicant understands that WDFW will make a determination on whether an HPA is required on the basis of a review of this application. Benton County Code (BCC) (Chapter 15.14.040) requires 50-foot buffers on Non-Fish Seasonal (Ns) streams without adjacent slopes of 10 percent or greater, and 100-foot buffers on all Ns streams with

	adjacent slopes of 10 percent or greater. All of the streams within the Project Area are considered Ns pending confirmation of the wetland delineation by Ecology (Appendix I). Benton County does allow averaging of buffer widths with approval of the Planning Administrator. However, buffer averaging is not required for this Project because no stream buffers would be impacted by the Project. Buffer averaging is not anticipated to be required for the Project's proposed temporary stream crossing located within the special flood hazard area because that crossing will be regulated under the BCC Chapter 3.26 and Special Flood Hazard Development Permit (see below). Benton County's Flood Damage Prevention Ordinance regulates development within the special flood hazard areas per BCC Chapter 3.26. The 100-year floodplain along Dry Creek is a special flood hazard area. A Special Flood Hazard Development Permit is required for development within the flood hazard area per BCC Chapter 3.26.

4.3.C Changes to and from Existing Condition

4.3.C.1 Changes to the Existing Condition from the Proposal

Could the activities associated with the proposal result in changes to the existing condition for this topic.

☐ No	☒ Yes	
	Topical Area/issue	**Changes**
	Wetland and wetland buffer impacts	The Project has been designed to avoid wetlands, and no wetland or wetland buffer impacts (temporary or permanent) will occur. No solar panels will be placed over the wetlands or their buffers, and disturbance of wetlands and their buffers will be avoided during construction.
	Stream crossings	Ephemeral streams and stream buffers were avoided by Project design to the greatest extent practicable. The Project design has avoided permanent impacts to ephemeral streams or stream buffers. Further, the Applicant designed the Project security fence line to avoid crossing streams and stream buffers. The Project design would widen an existing access road by 2 feet on each side where it runs between two ephemeral stream segments (ST-216 and ST-217; see Figure 8 in the JARPA). The road is about 60 feet downhill from where bed and banks disappear in ST-216 and 140 feet uphill from where bed and banks begin on ST-

		217. The access road is about 2 feet in elevation above the low point in the drainage. Temporary impacts in the vicinity of the crossing could include sediment and dust from construction of the Project. Given the topography of the area, there is the potential for water to drain across the existing road from ST-216 into ST-217 during a large storm event or rapid snowmelt runoff; the proposed widened road also will have this potential for drainage to occur across it. However, there were no signs of previous drainage across the existing road observed during the wetland and waters delineation surveys, and therefore, this is likely to be a relatively rare event. The existing temporary and permanent impacts from widening the road will occur outside of the 50- and 100-foot buffers for the delineated Ns/ephemeral waterways (see Figure 8 in the JARPA, Attachment T). No temporary or permanent impacts to the stream to the stream buffer are anticipated. There are four locations (see Figures 4, 5, 6, and 7 in the JARPA, Attachment T) where collector lines will be installed underneath ephemeral drainages by boring underneath the stream bed. The boring depth has not yet been determined but is expected to be at least 4 feet below the bottom of the ephemeral stream channels. Boring entrance and exit locations will be outside of the buffers on those delineated Ns ephemeral waterways, and the entrance and exit locations will be outside of the floodplain. Therefore, no impacts to the stream channels, floodplains, or their buffers will occur from the boring. However, the Applicant understands that WDFW may require an HPA for this activity. As a result, these crossing are included in the JARPA (Attachment T).
	Existing/potential flood risks	The Project's overhead transmission line will span Dry Creek and the associated floodplain. As shown in Figure 3 of the JARPA, a temporary 50-foot wide access corridor would cross the floodplain and Dry Creek. The temporary access corridor will be used during the construction of the overhead transmission line by vehicles equipped to carry the transmission line wires (conductor, shield wire, etc.) and will be closed to

		other vehicles. Temporary use of this access corridor would occur when no water is flowing through the stream channel. No temporary structures or permanent impacts are proposed within the floodplain. Only limited temporary impacts (i.e., one temporary stream crossing) will occur, with no fill placed within the floodplain, and that location will be restored to pre-Project condition with no impacts to flood capacity or flood levels. Further, matting would be placed to minimize disturbance to the floodplain. No permanent Project components will be constructed within the floodplain. A Special Flood Hazard Development Permit will be obtained from Benton County prior to construction for the temporary access corridor.
	Erosion and surface water quality	Risks of erosion during construction will be addressed through construction best management practices as described in detail in Part 4, Section 4.1 and Section 4.5. The Project will be designed and constructed to comply with Benton County and Ecology requirements in retaining stormwater on-site and maintaining natural drainage patterns for conveyance of upland flow, and the Project's ESCP, Construction SWPPP, Permanent Stormwater Control Plan, and Vegetation and Weed Management Plan will provide specific measures to minimize erosion and sedimentation during and after construction. Further, stream crossings would be constructed to minimize risks of erosion, including locating directional boring entrance and exit locations outside of the floodplain and outside of buffers; installing adequately sized and designed culverts where required; and restoring areas of temporary impacts to the natural, pre-project channel dimensions and vegetation.

4.3.C.1 Changes to the Proposal from the Existing Condition

Would the existing condition for this topic have the potential to affect the proposal now or in the future?

☒ No	☐ Yes	
	Topical Area/issue	**Changes**

	Existing/potential flood risks	While a floodplain is located within the Project Area, all permanent features are proposed to be located outside of the floodplain. A Special Flood Hazard Development Permit will be obtained from Benton County for the temporary construction access across the floodplain as descried above. Therefore, the Project will not be affected by existing and potential flood risks.

4.3.D Proposed Mitigation and Monitoring

☒ Check this box when all final proposed mitigation is described here, or the location of the mitigation information is referenced here.

Are you proposing any mitigation, either required in rules or proposed for impacts?

☐ No	**☒ Yes**		
	Mitigation	**Applicable law and how well it addresses the impact**	**Expert agency participation**
	Avoidance	The Project would not impact wetlands or wetland buffers and is consistent with WAC 463-62-050. Ephemeral streams and stream buffers were avoided to the greatest extent feasibly as described above.	N/A
	Stream crossing construction best management practices	Minimization of temporary water quality impacts (WAC 220-660-120; Stormwater Management Manual for Eastern Washington (Chapter 173-204 WAC); and Construction Stormwater General Permit (Chapter 90.48 RCW) will be implemented on site during construction and operations and include the following best management practices: • Staging of materials and equipment to prevent contamination of waters of the state • Development of the Stormwater Pollution Prevention, Erosion and Sediment Control, and Spill Prevention	Ecology, WDFW

		Countermeasures and Control plans • Installation and maintenance of temporary erosion and sediment control measures • Completing work in the dry with no water present	
	Hydraulic Project Approval	The Applicant is using the JARPA to obtain an HPA permit per WAC 20-660-050.	WDFW
	Special Flood Hazard Development Permit	The Applicant will obtain a Special Flood Hazard Development Permit from Benton County prior to construction.	Benton County

4.3.E Effects on Other Environmental Elements not yet Discussed

Does any information provided for this topic affect other environmental elements (e.g. water, plants, animals, noise), that has not already been considered and discussed in this form?

☒ No	**☐ Yes**	
	Environmental Element	**Additional changes or effects**
	N/A	N/A

4.3.F References

AC Geospatial LLC. 2020. Riparian Buffer Analysis Summary Memorandum. Prepared for White Bluffs Consulting and Benton County. Available online at: https://www.co.benton.wa.us/files/documents/SMPRiparianAnalysisMemo20211290127 32032321PM.pdf.

DNR (Washington State Department of Natural Resources). 2022. Washington Department of Natural Resources GIS Open Data: DNR Hydrography – Watercourses -Forest Practices Regulation. Available online at: https://fpamt.dnr.wa.gov/default.aspx#.

Google Earth (Google Earth Pro). 2022. Historical Aerial Imagery of the Project Study Area from 2021, 2018, 2017, 2016, 2015, 2013, 2012, 2011, 2009, 2006, 2005, 2004, 2003, 1996 and 1985.

StreamNet. 2022. StreamNet Mapper: Fish Data for the Northwest. Available online at: https://www.arcgis.com/apps/webappviewer/index.html?id=3be91b0a32a9488a901c3885bbfc2b0b. Accessed March 2022.

4.4 Water Quality – Wastewater Discharges

Part 4 Analysis is not required for this section.

4.5 Water Quality - Stormwater Runoff

4.5.A Studies

Describe any studies that have already been conducted or will be conducted related to this topic and provide the expected timing for the completion of studies to be completed.

Study name	Expected completion date	Expert agency participation Name, Title, and Involvement	Completed Y/N
Preliminary Stormwater Management Report (Attachment J)	Complete (January 2022)	Prepared by Westwood, engineering consultant for the Applicant	Y
Preliminary Hydrology Report (Attachment K)	Complete (December 2021)	Prepared by Westwood, engineering consultant for the Applicant	Y
Final Preliminary Geotechnical Report (Attachment S)	Complete (January 2022)	Prepared by RRC, geotechnical engineering consultant for the Applicant	Y
Wetland Delineation Report (Attachment I)	Complete (November 2021)	Prepared by Tetra Tech, environmental consultant for the Applicant	Y

☒ Check this box when all proposed studies for this topic are completed

4.5.B Existing Condition and Issues

Describe the existing condition for this topic, including any existing problems associated with the issue being discussed.

Topical area/issue	Existing Condition and Problems
Surface-water runoff[1]	The Project Area is located on varying terrain within the valley that contains Dry Creek. In general, the Project Area is on semi-flat terrain with slopes of less than 3 percent, although there are locations where the slopes reach roughly 51 percent (see Part 4, Section 4.1 Earth for additional information on slopes). The southern portion of the Project Area drains north along several concentrated flow paths toward Dry Creek. The northern portion of the Project Area drains east following Dry Creek. A small part of the eastern portion of the Project Area drains east. Dry Creek flows through the north side of the Project Area from west to east (Figure A-6 in Attachment A). There are 34 ephemeral streams within the Project Area (Figure A-6 in Attachment A). The topography within the Project Area is the relatively flat bottom between two ridges. The majority of the waterways originate in the alluvial fans coming off the hills into the

[1] Existing conditions related to water quality and wetlands are addressed in Part 4, Section 4.3, while existing conditions related to hazardous materials within the Project Area are addressed in Part 3, Section 3.12, as well as Part 4, Section 4.13.

	Project Area and dissipate before joining the ephemeral drainages present on the valley floor (Attachment I). The ephemeral drainages within the Project Area eventually lead about 21 miles downstream to the Yakima River. All stream segments within the Project Area including Dry Creek were determined to be ephemeral (Attachment I; Part 4 Section 4.3). The Project Area is located primarily in FEMA Flood Zone C or unmapped areas containing minimal flood hazards. Flood Zone C represents areas located outside of the 500-year flood event and that have a minimal chance of flooding. The Project Area contains areas of FEMA Zone A flood hazards surrounding Dry Creek (Figure A-6 in Attachment A). A FEMA Zone A flood hazard is a 100-year flood hazard (1 percent annual flood risk) with no defined base flood elevations. The watershed area that was modeled in the Preliminary Hydrology Report (Attachment K) encompasses approximately 101 square miles and generally slopes east. Dry Creek flows east through the northern portion of the Project Area and through the central portion of the modeled watershed. The analysis shows low to moderate water depths and velocities across the majority of the site. Higher flood depths exist within Dry Creek and its surrounding areas located within and adjacent to the site. Minimal scour is expected onsite except within and adjacent to Dry Creek. Onsite runoff is split into 38 drainage areas based on discharge locations and existing low areas. Land use within the Project Area is primarily shrubland with areas of alfalfa, wheat, and other cropland. Soils are primarily classified as Hydrologic Soil Groups A and B within the Project Area. The Preliminary Hydrology Report (Attachment K) shows type B soils over a majority of the site with type A soils present along Dry Creek and drainages. A small area of type C soils is located north of Dry Creek in the northeastern portion of the Project Area. Soil Group A soils have low runoff potential when thoroughly wet. Water is transmitted freely through the soil. Group A soils typically have less than 10 percent clay and more than 90 percent sand or gravel and have gravel or sand textures. Some soils having loamy sand, sandy loam, loam or silt loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. Soil Group B soils have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded. Group B soils typically have between 10 percent and 20 percent clay and 50 percent to 90 percent sand and have loamy sand or sandy loam textures. Group C soils have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted. Group C soils typically have between 20 percent and 40 percent clay and less than 50 percent sand and have loam, silt loam, sandy clay loam, clay loam, and silty clay

	loam textures. The soils in the Project Area are expected to have moderate to high infiltration rates based on their clay content and their drainage class ratings. The Preliminary Geotechnical Report (Attachment S) indicates that soils in the Project Area have low moisture content (average of 6 percent), and the clay content is estimated to be between 10 and 20 percent. Surface soils in the Project Area are rated as "well drained" with a moderate to high potential for water erosion (see Section 4.1). Benton County classifies all lands with moderate to high susceptibility to contamination as critical aquifer recharge areas (BCC 15.06.010). The Project Area includes critical aquifer recharge areas due to the presence of areas including floodplains, combined hydrological soil group A and irrigated agriculture, and alluvial soils (Figure A-7 in Attachment A). Boreholes were used during the geotechnical study to determine the presence and level of groundwater in the Project Area. A static groundwater level was not observed in any of the test borings drilled to approximately 15.5 feet below ground surface (bgs). Publicly available groundwater data indicate that groundwater may be encountered approximately 60 feet bgs (Attachment S). It is noted that shallow/perched groundwater fluctuations may occur due to seasonal variations in the amount of rainfall, runoff, and other factors that were not evident at the time the borings were performed.

4.5.C Changes to and from Existing Condition

4.5.C.1 Changes to the Existing Condition from the Proposal

Could the activities associated with the proposal result in changes to the existing condition for this topic.

☐ No	☒ Yes	
	Topical Area/issue	**Changes**
	Surface-water runoff	The Project may result in some changes to the stormwater drainage as a result of new impervious surfaces developed as part of this proposal (e.g., gravel roads, foundations for solar array posts, battery storage container pads, pads for substation components, etc.). Although typically classified as impervious surfaces, stormwater will generally infiltrate through the gravel roads, but at a reduced rate compared to most soils in the area. The approximately 4,573-acre Project Area includes all of the Project facilities, including the solar PV system and DC-coupled

		BESS, Project substation, transmission line, O&M building, and associated access roads. Impervious surfaces generally include gravel access roads, inverters, and the substation area. The Project under the solar modules will be converted to grassland conditions within the fenced boundary around the proposed impervious surfaces. Due to the area between and beneath the panels being vegetated, panels are not considered an impervious surface. A Preliminary Stormwater Management Report is provided in Attachment J. Erosion control measures have been incorporated into the Project design to address construction runoff. The Project will also prepare an ESCP, Construction Stormwater Pollution Prevention Plan (SWPPP), Operations SWPPP, and Vegetation and Weed Management Plan prior to construction that will include measures to minimize soil erosion and stormwater runoff. Overall, impervious surfaces are a low percentage of the total Project Area (approximately 3 percent of the Project Area; see Part 2, Section B.2). Impervious surfaces include the substation, inverters, and permanent roads. Furthermore, the Project will be designed and constructed to comply with Benton County and Ecology requirements in retaining stormwater on-site and maintaining natural drainage patterns for conveyance of upland flow. The Project's ESCP, Construction SWPPP, Operations SWPPP, and Vegetation and Weed Management Plan will include measures to minimize the rate of stormwater that will be discharged due to these impervious surfaces. The proposed substation and O&M building will be a raised pad, and runoff from this area will sheet flow to a proposed detention basin to the east. Minimal grading is proposed across the solar array areas. Drainage patterns will remain the same with the addition of detention basins that outlet similar to existing conditions. Stormwater management practices including detention basins are proposed on site to meet the requirements of the state. Other stormwater measures are proposed to route water through the site including culverts and low water crossings. Grading in small portions of the Project Area will impact areas of slopes greater than 15 percent slopes as discussed in Section 4.1 Earth. The Stormwater Management Plan, Erosion Control Plan, and specific BMPs will address these areas to prevent erosion and stabilize changes to local topography and drainage patterns. The Preliminary Stormwater Management Report analysis shows low to moderate water depths and velocities (Exhibits 6 through 7A, Attachment J) across the majority of the Project Area. During a 100-year storm, the flood depths across the majority of the Project Area are less than 0.5 foot with velocities less than 1 foot per second, with the exception of within and adjacent to Dry Creek where the depths can reach as high as 6 feet. Several

		concentrated flow paths in the southern portion of the Project Area have higher flood depths but are generally less than 2.5 feet. Minimal scour is expected onsite except within and adjacent to Dry Creek (Exhibit 8, Attachment J). The Preliminary Hydrology Report (Attachment K) concluded that the Project Area is suitable for the planned development, and hydrologic concerns can be addressed by either avoiding areas of high flood depths or through detailed engineering design. BCC 15.06.030 requires a critical area report to be prepared for certain activities when proposed in a Critical Aquifer Recharge Area. These activities include the following: *(1) Biosolids land application;* *(2) Critical material handling, generating, or use;* *(3) Dairy operation;* *(4) Feedlot of livestock/animal operation;* *(5) Landfill;* *(6) Mining and/or gravel pits;* *(7) Sanitary waste discharge;* *(8) Wood treatment facilities;* *(9) Storage, processing, or disposal of radioactive substances;* *(10) Above ground storage tanks, subject to WAC 173-303-640 as it now exists or may be hereinafter amended;* *(11) Below ground storage tanks, subject to WAC 173-360 as it now exists or may be hereinafter amended;* *(12) Hazardous waste generator (such as Boat or Motor Vehicle Repair Shops);* *(13) Junk yards and salvage yards;* *(14) Waste water application to land surface;* *(15) Commercial fertilizer storage;* *(16) Injection wells;* *(17) Sawmill;* *(18) Solid waste handling and recycling facility;* *(19) Cement and/or concrete plants;* *(20) Machine shops;* *(21) Chemical treatment and disposal facility; or* *(22) Any activities, particularly municipal, industrial, and commercial that involve the collection and storage of substances that, in sufficient quantity during an accidental or intentional release, would result in the impairment of the aquifer water to be used as potable drinking water liquids shall be regulated by this chapter.* The proposed solar energy facility and related or supporting activities do not meet any of the above definitions and are not substantially similar to any of the activities described. Therefore, a separate Critical Areas Report is not required. The proposed facilities do not pose a danger to critical aquifers because BMPs would be implemented as described in this section to manage stormwater and to prevent the release of any hazardous materials

		to the ground. Additionally, the proposed on-site septic system that will be located at the O&M building does not overlap with any critical aquifer recharge area per BCC 15.06.010. Based on the groundwater level of over 15.5 feet in depth identified in the Preliminary Geotechnical Report (Attachment E), the Project is not expected to impact groundwater. The slight increase in impervious surfaces (142 acres, or 3 percent of the Project Area) is not expected to impact recharge to groundwater or stream flows with the implementation of mitigation measures.

4.5.C.2 Changes to the Proposal from the Existing Condition

Would the existing condition for this topic have the potential to affect the proposal now or in the future?

☐ No	☐ Yes	
	Topical Area/issue	**Changes**
	Design considerations of stormwater runoff and erosion.	The existing stormwater runoff and erosion patterns will inform the final design of the Project. The Project's engineer will determine the final appropriate erosion and sediment control and drainage plans based on existing conditions and planned impervious surfaces. The Project will be designed to have the least impact to stormwater drainage patterns and erosion risk as feasible. The proposed Project will be designed to meet the requirements of the State of Washington for stormwater management. The proposed stormwater engineering includes proposed basins and crossings in order to maintain existing drainage patterns and reduce runoff rates. Detention basins will be provided at critical locations in the site to capture runoff to slow release rates for the site. Temporary basins will be used during construction with the final number of temporary basins dependent on final design. Based on the current Project design, a total of eight permanent detention basins will be provided at each discharge location that has an increase in runoff due to the proposed development in critical discharge locations. The final location of these permanent basins will be verified during final engineering. Crossings are proposed at new access roads to maintain existing drainage patterns through the proposed site. Internal crossings will be sized for either culverts or low water crossings. Culverts are sized for the 10-year 24-hour rain

		event with a 1-foot allowable head. The Preliminary Stormwater Management Report (Attachment J) summarizes the proposed culverts and low water crossings on site. Low water crossings will be sized to withstand the shear stress caused by flow during the 10-year 24-hour rainfall event. FLO2D models were created and analyzed to determine the shear stresses and lengths. The combination of crossing depths and the slope of the flow path at each crossing location were multiplied by the density of water to determine the expected shear stress. The final location and design of these crossings will verified during final engineering. As discussed in Part 3, Section 4, panel washing would not be expected to generate runoff from the site or cause erosion. If panel washing occurs, the wash water will not contain additives and will not be discharged into nearby water bodies (i.e., it is expected infiltrate into the ground surface at and near the point of application). The amount of water needed for cleaning is estimated to be approximately 120,000 gallons per year. All permanent Project components would avoid Dry Creek and the associated 100-year floodplain. The Project's transmission line will span Dry Creek and associated 100-year floodplain, which is located between the Project substation and the POI. A temporary 50-foot-wide access corridor across the floodplain will be used during construction of the overhead line. To minimize impacts to this area, only matting or other BMPs to prevent erosion along with vehicles equipped to carry the transmission wires (conductor, shield wire, etc.) will be allowed. Minimal grading on site and at proposed crossings will maintain existing drainage areas throughout the Project Area. Small areas of the Project with impacts to 15 percent (or greater) slopes would include specific BMPs to address any potential erosion and stability concerns during construction and prior to final site stabilization (refer to Part 4, Section 4.1 Earth). The proposed vegetative cover below the array and permanent detention basins will reduce runoff rates for the final conditions. Grassland is proposed below the solar array, which will allow for treatment using the Full Dispersion BMP. Based on Table 6.10 in the SWMMEW, a minimum of 20 percent grass cover is required on site. The Project will greatly exceed this minimum because only 3 percent of the Project Area would be permanently impacted, and vegetative cover would be established in areas of temporary disturbance and within the detention basins.

4.5.D Proposed Mitigation and Monitoring

☐ Check this box when all final proposed mitigation is described here, or the location of the mitigation information is referenced here.

Are you proposing any mitigation, either required in rules or proposed for impacts?

☐ No	☒ Yes		
	Mitigation	**Applicable law and how well it addresses the impact**	**Expert agency participation**
	Construction Stormwater General Permit	In compliance with WAC 173-200, the Applicant will obtain a Construction Stormwater General Permit (CSWGP) from Ecology. The CSWGP requires an ESCP and a SWPPP. Benton County has adopted Ecology's Stormwater Management Manual for Eastern Washington (SWMMEW) as their basis of design and review. In compliance with SWMMEW, the proposed development will require storage onsite for any increase in runoff for the 100-year, 24-hour storm. The basin design for any required storage will also follow the requirements outlined in the SWMMEW. As the Project design advances, the post-construction stormwater management should be reviewed in further detail with the County Engineer. The following requirements will be met for the Project: Stormwater quantity control will be provided so that proposed conditions peak runoff rates and volumes must be equal to or less than existing conditions. The 2-year, 10-year, 25-year, and 100-year 24-hour stormwater events must meet these requirements. The aim of Core Element #5 of the SWMMEW is to treat at minimum 90 percent of runoff from pollution-generating impervious surfaces (PGIS). A surface is considered a PGIS if it is being regularly used by vehicles. Since the access roads on the Project site are primarily for O&M, it is assumed that this Project is exempt from the Core Element #5 requirements. Water quality will be addressed using the Full Dispersion BMP (SWMMEW, Table 6.10).	Ecology

		Proposed culverts and low water crossings will be sized for the 10-year 24-hour stormwater event.	
	Best Management Practices - Stormwater	The ESCP and SWPPPs (both for construction and operation) will address stormwater runoff, flooding, and erosion to ensure compliance with state and federal water quality standards. The ESCP will include BMPs such as the appropriate use of silt fencing to avoid or eliminate runoff of contaminants. The SWPPPs will include BMPs from Ecology's Stormwater Management Manual for Eastern Washington (Ecology 2019). The Applicant will prepare and submit a Vegetation and Weed Management Plan to EFSEC prior to construction. The plan will be implemented to revegetate temporarily impacted areas and minimize erosion. Temporary basins and erosion control measures will be implemented during construction to protect existing discharge locations. Permanent basins will be provided at each discharge location that has an increase in runoff due to the proposed development in critical discharge locations. Each basin will have a minimum depth of 3.5 feet, a length-to-width ratio of 3:1 to 6:1, and a pond riser outlet structure to provide treatment per State of Washington requirements. These basin locations are shown in Exhibit 5 of Attachment J.	Ecology

	Preventative procedures to avoid spills	Substantial quantities of oils, fuels, and other potential contaminants are not expected to be stored on-site during construction or operation. The Applicant will prepare a Construction Phase SPCC Plan, consistent with requirements of 40 CFR Part 112, to prevent spills during construction and to identify measures to expedite the response to a release if one were to occur. Preventative procedures and rapid response measures will address and prevent potential water quality issues. The Applicant will also prepare an Operations Phase SPCC Plan in consultation with Ecology and pursuant to the requirements of CFR Part 112, Sections 311 and 402 of the Clean Water Act, Section 402 (a)(1) of the Federal Water Pollution Control Act, and RCW 90.48.080.	NA

4.5.E Effects on Other Environmental Elements not yet Discussed

Does any information provided for this topic affect other environmental elements (e.g. water, plants, animals, noise), that has not already been considered and discussed in this form?

☒ **No**	☐ **Yes**	
	Environmental Element	**Additional changes or effects**
	N/A	N/A

4.5.F References

Ecology (Washington State Department of Ecology). 2019. Stormwater Management Manual for Eastern Washington. Publication Number 18-10-044. August. Available online at: https://apps.ecology.wa.gov/publications/documents/1810044.pdf.

4.6 Water Quantity – Water Use

Part 4 Analysis is not required for this section.

4.7 Water Quantity – Runoff, Stormwater & Point Discharges

Part 4 Analysis is not required for this section.

4.8 Plants

4.8.A Studies

Describe any studies that have already been conducted or will be conducted related to this topic and provide the expected timing for the completion of studies to be completed.

Study name	Expected completion date	Expert agency participation Name, Title, and Involvement	Completed Y/N
Botanical Survey Report (Attachment F)	Complete (January 2022)	Prepared by: Tetra Tech, environmental consultant for the Applicant. Agency involvement: WDFW provided feedback on protocols and special status species in the Project vicinity.	Y
Botanical Survey Addendum	Complete (August 2022)	Prepared by: Tetra Tech, environmental consultant for the Applicant. Agency involvement: Tetra Tech discussed the planned spring 2022 surveys with WDFW prior to initiating field work.	Y
Habitat and General Wildlife Survey Report (Attachment G)	Complete (January 2022; revised October 2022)	Prepared by: Tetra Tech, environmental consultant for the Applicant. Agency involvement: WDFW provided feedback on protocols and special status species in the Project vicinity. WDFW requested that a small area initially classified as Eastside (Interior) Grasslands be reclassified as shrubsteppe habitat. This change was made in October 2022 and the revised report is included with this Revised ASC.	Y
Habitat and General Wildlife Survey Report Addendum	Complete (August 2022)	Prepared by: Tetra Tech, environmental consultant for the Applicant. Agency involvement: Tetra Tech discussed the planned spring 2022 surveys with WDFW.	Y
Wetland Delineation Report (Attachment I)	Complete (November 2021)	Prepared by: Tetra Tech, environmental consultant for the Applicant.	Y

☐ **Check this box when all proposed studies for this topic are completed**

4.8.B Existing Condition and Issues

Describe the existing condition for this topic, including any existing problems associated with the issue being discussed.

Topical area/issue	Existing Condition and Problems
U.S. Fish and Wildlife Service (USFWS) Federally Listed Plant Species	One federally listed threatened plant species, Umtanum dessert buckwheat (*Eriogonum codium*), is listed by the USFWS as known to occur within Benton County (USFWS 2022). However, this species has a highly restricted distribution, and the entire known population occurs in a 1.9-acre area on the eastern end of Umtanum Ridge within the Hanford Reach National Monument, which is more than 6 miles north of the Project Area (USFWS 2019). Additionally, the approximately 5 acres of designated critical habitat for Umtanum Desert buckwheat is restricted to this region along Umtanum Ridge (i.e., more than 6 miles north of the Project Area).
Washington Natural Heritage Program (WNHP) Special Status Vascular Plants	Of the 28 special status vascular plant species (i.e., species listed as endangered, threatened, or sensitive in Washington by the WNHP) known to occur or potentially occurring within Benton County (WNHP 2021a), 16 species were considered to have a potential of occurring within the Project Area based on the proximity of known occurrences (WNHP 2021b) and the anticipated likelihood of suitable habitat for these species to occur in the Project Area. The other 12 species were considered unlikely to occur because 1) the known range of the species does not overlap the Project Area, 2) the known occurrences of the species in Benton County are historical (i.e., have not been confirmed in over 40 years), and/or 3) suitable habitat for the species was not anticipated to occur in the Project Area (see Appendix A to Attachment F)[2]. Seven of the species listed as potentially occurring within the Project Area have been documented within 5 miles of the Project (WNHP 2021b): cespitose evening-primrose (*Oenothera cespitosa* subsp. *cespitosa*), Columbia milk-vetch (*Astragalus columbianus*), coyote tobacco (*Nicotiana attenuata*), desert cryptantha (*Cryptantha scoparia*), dwarf-evening primrose (*Eremothera pygmaea*), small-flower evening primrose (*Eremothera minor*), and Snake River cryptantha (*Cryptantha spiculifera*). An Element Occurrence (EO)[3] for one of these seven species, Columbia milkvetch, overlaps the Project Area. One special status vascular plant species, Columbia milk-vetch, was identified during the May 2021 surveys conducted for the Project. One population of this species consisting of approximately 125 plants occupying approximately 3 acres was

[2] The numbers of state endangered, threatened, and sensitive vascular species discussed in this paragraph are based on updated species lists (WNHP 2021a); therefore, the numbers are slightly different than those discussed in the Botanical Survey Report (Attachment F) prepared for the Project.

[3] An Element Occurrence is an "area of land and/or water in which a species or natural community is, or was present" (DNR 2018). The WNHP provides data on rare plants in Washington, including the locations of documented EOs for rare plant species. However, due to the sensitive nature of this information, rare plant EOs are buffered to protect the exact location of documented occurrences of rare plant populations.

	documented within the eastside (interior) grassland habitat on a slope and crest of a hill in the southwest portion of the spring 2021 survey area. Further details on this population are presented in Attachment F. Subsequent to the completion of botanical surveys in May 2021, the original Project Area was expanded by approximately 990 acres. Supplemental surveys for special status vascular plant species will be conducted within this area in the spring of 2022.
WNHP Special Status Nonvascular Species	Per WNHP (2021c), one special status nonvascular lichen, woven-spore lichen (*Texosporium sancti-jacobi*), is listed as known or potentially occurring in Benton County. This species is listed as threatened by the WNHP. Navel lichen grows in arid to semiarid shrub-steppe, grassland, scabland, or savannah vegetation communities (WNHP 2022). Most sites where this species is found are relatively undisturbed and dominated by native plants including sagebrush (*Artemisia tridentata*), bitterbrush (*Purshia tridentata*), Idaho fescue (*Festuca idahoensis*), and bluebunch wheatgrass (*Pseudoroegneria spicata*), and fire generally eliminates the species (WNHP 2022). In Washington, this species is currently known from four occurrences in Benton, Klickitat, and Yakima counties (WNHP 2022). Although the exact locations of these occurrences are not publicly available, the closest EO is approximately 5 miles from the Project Area.
Vegetation Types / WDFW Priority Habitats	Habitat surveys conducted by Tetra Tech identified nine habitat types within the Project Area (Attachment A, Figure A-8; Attachment G). These include: • Agricultural land • Developed/disturbed • Eastside (interior) grassland • Irrigated hedgerows • Non-native grassland and forbland • Planted grassland • Rabbitbrush shrubland • Shrub-steppe • Talus In general, habitat types were adapted from habitat classifications and descriptions found in Wildlife-Habitat Relationships in Oregon and Washington (Johnson and O'Neil 2001), the Priority Habitats and Species (PHS) List (WDFW 2008), and the WDFW Wind Power Guidelines (WDFW 2009). Table 4.8-1 lists the acres of each habitat type mapped within the Project Area. Three of the habitat types that occur within the Project Area (i.e., eastside [interior] grassland[4], shrub-steppe, and talus) are listed as Priority Habitats by the WDFW (WDFW 2008). As shown in Table 4.8-1, approximately 93, 63, and 3 acres of eastside (interior) grassland, shrub-steppe, and talus, respectively, occur within the Project Area. As shown in

[4] This habitat type is referred to as eastside steppe in the WDFW PHS list (WDFW 2008).

	Attachment A, Figure A-8, eastside (interior) grassland habitat is most prevalent in the southern and eastern portions of the Project Area, shrub-steppe habitat is most prevalent in the north-central portion, and talus slopes are found in the southwest corner. See the Wildlife and Habitat Survey Report (Attachment G) for additional details on habitat types observed within the Project Area as well as their distribution in the area.

Table 4.8-1. Habitat Types Mapped within the Project Area

Habitat Type	Acres within Project Area	Percent of Project Area
Planted grassland[1]	2,129	47
Non-native grassland and forbland	1,321	29
Agricultural land	793	17
Rabbitbrush shrubland	129	3
Eastside (interior) grassland[2/]	41	<1
Shrub-steppe[2/]	115	3
Developed/disturbed	33	1
Irrigated hedgerows	9	<1
Talus[2/]	3	<1
Total[3/]	**4,573**	**100**

Note: Acres in this table do not match those in the table in Part 2, Section B.2 because the table in Part 2 Section B.2 includes acres of wetlands and ephemeral streams mapped within the Project Area.

1/ Approximately 338 acres of planted grasslands mapped in the Project Area are currently enrolled in the Conservation Reserve Program (CRP).

2/ Listed as Priority Habitat by the WDFW (WDFW 2008)

3/ Totals may not sum exactly due to rounding

Invasive Plant Species	Eight state- and county-listed noxious weeds were observed in the Project survey area during botanical surveys conducted in May 2021: • Cereal rye (*Secale cereale*) • Diffuse knapweed (*Centaurea diffusa*) • Field bindweed (*Convolvulus arvensis*) • Jointed goatgrass (*Aegilops cylindrica*) • Medusahead (*Taeniatherum caput-medusae*) • Rush skeletonweed (*Chondrilla juncea*) • Russian olive (*Elaeagnus angustifolia*) • Russian thistle (*Rhaponticum* [*Acroptilon*] *repens*) Cereal rye and diffuse knapweed were abundant and frequently observed throughout the Project Area, and field bindweed and rush skeletonweed were commonly observed. Medusahead was observed in one location, and jointed goatgrass, Russian olive, and Russian knapweed were each observed in just one location within the Project Area. In addition to these eight species, several other non-native, invasive plant species, including blue mustard (*Chorispora tenella*), bulbous bluegrass (*Poa bulbosa*), cheatgrass (*Bromus tectorum*), common stork's bill (*Erodium cicutarium*), prickly lettuce (*Lactuca serriola*), tall tumblemustard (*Sisymbrium altissimum*), and yellow salsify (*Tragopon dubius*) were commonly observed within the Project Area. Although these

	species were found throughout the Project Area, they were most abundant in non-native grassland and forbland habitat and in the vicinity of agricultural fields or developed/disturbed areas. Appendix B of the Botanical Survey Report (Attachment F) provides a list of all vascular plant species observed within the Project Area and notes whether each species is native or non-native. As noted in the Botanical Survey Report prepared for the Project (Attachment F of the ASC), one observation of kochia (*Bassia scoparia*) was documented during field surveys. As shown in Figure 4 of the Botanical Survey Report, this observation is located along the northern portion of the Project Lease boundary and outside of the current Project Area. Kochia is the only noxious weed documented during field surveys that was observed in the Project Lease Boundary but not within the Project Area.
Fire	Fire has played an important role in shaping the environmental conditions and habitat types of an area. Several fire complexes have occurred within the Project Area between 1979 and 2020 (DNR 2021). The entire Project Area is located within the location of one or more of these fires. Part 4, Section 13 (Environmental Health – Hazardous Materials) describes the existing conditions related to historic fires in the area.

4.8.C Changes to and from Existing Condition

4.8.C.1 Changes to the Existing Condition from the Proposal

Could the activities associated with the proposal result in changes to the existing condition for this topic.

☐ No	☒ Yes	
	Topical Area/issue	**Changes**
	USFWS Federally Listed Plant Species	As noted in Section 4.8.B, federally listed plant species are not anticipated to occur in the Project Area, and none were observed during botanical surveys conducted for the Project (Attachment F). Therefore, federally listed plant species will not be affected by the Project.
	WNHP Special Status Vascular Plants	One special status vascular plant species, Columbia milk-vetch, was identified during surveys conducted for the Project in May of 2021 (Attachment F). The Project has been sited to avoid this population of Columbia milk-vetch, and the closest Project facilities are more than 150 feet from this population. No additional special status plant species were observed during supplemental surveys conducted in May 2022. Therefore, no direct or indirect impacts to this population are anticipated from construction and operation of the Project.

	WNHP Special Status Nonvascular Species	Species-specific surveys have not been conducted for special status nonvascular species within the Project area. However, suitable habitat for woven-spore lichen (i.e., relatively undisturbed shrub-steppe, grassland, scabland, or savannah vegetation communities) was not observed during botanical surveys conducted for the Project. Native shrub-steppe and grassland habitats observed within the Project Area were highly disturbed due to extensive cattle grazing. In addition, the entire Project Area has been impacted by at least one fire in the last 20 years (DNR 2021). Because woven-spore lichen is typically found in relatively undisturbed native vegetation communities and fire is believed to eliminate this species, it is highly unlikely that this species occurs within the Project Area. In addition, impacts to native shrub-steppe and eastside (interior) grassland communities were minimized during Project design, and less than 9 acres of these habitat types would be impacted during Project construction and operation. Therefore, impacts to woven-spore lichen are not anticipated.
	Vegetation Types / WDFW Priority Habitats	Construction and operation of the Project will result in permanent and temporary impacts on vegetation, as well as alterations to vegetation within the solar array's perimeter fence lines during the life of the Project. Permanent impact areas include locations where Project components will occur (e.g., solar array panel posts, permanent Project service roads, O&M building, collector substation area, poles for transmission line, inverter and transformer pads) and constitute a habitat loss during the life of the Project. Temporary impact areas include areas that will be disturbed during construction and revegetated following construction (e.g., collection lines, temporary access roads, and temporary work areas outside the perimeter fence lines and temporary laydown and pulling areas for the transmission line). Temporarily disturbed areas will be revegetated in accordance with the Vegetation and Weed Management Plan provided as Attachment U to this Revised ASC. Altered habitat impacts include lands within the perimeter fence lines minus any areas occupied by permanent Project structures. These areas will be revegetated either passively (i.e., allow species to colonize naturally) or actively (seeded with low-growing vegetation consisting of native species and/or a mix of native and desirable non-native, non-invasive species, which will result in permanently altered vegetation). A Draft Vegetation and Weed Management Plan has been prepared (see Attachment U) to describe the revegetation methods for the Project. This plan will be updated and finalized prior to construction. Table 4.8-2 lists the estimated acres of temporary and permanent impacts to habitat types and acres of altered habitat from construction and operation of the Project. The vast majority of impacts would occur to planted grassland, agriculture, and non-native grassland and forbland habitat types. As shown in this table, up to approximately 3 acres and 2 acres of eastside (interior) grassland and shrub-

steppe habitat, respectively, will be temporarily impacted by Project construction, 3 acres and less than 1 acre, respectively, would be permanently altered during operation, and less than 1 acre for both would be permanently impacted by operation of the Project.

The estimated acres of impact on each habitat type provided in Table 4.8-2 are based on the current Project design (Attachment A, Figure A-1). However, as discussed in Part 2, the exact locations of Project components may be revised during final Project design, and impacts from the Project could occur anywhere within the Project Area. Any relocations made to the Project layout will be designed to avoid or minimize impacts to special status species, Priority Habitats, and streams to the extent practical, and to comply with any conditions imposed in the Site Certification Agreement. The Project has already been designed to avoid talus by at least 125 feet; therefore, this Priority Habitat will not be affected by the Project, and any subsequent revisions to the Project layout will continue to avoid this habitat type.

Part 4, Section 4.9 contains additional information regarding impacts to habitat including those classified as Priority Habitats by the WDFW.

Table 4.8-2. Anticipated Impacts to Habitat Types from the Project

Habitat Type	Temporary Impacts (Acres)[1/]	Altered Habitat Impacts (Acres)[2/]	Permanent Impacts (Acres)[3/,4/]	Total[5/]
Planted grassland[6/]	66	1,439	81	**1,586**
Agricultural land	5	729	29	**764**
Non-native grassland and forbland	35	563	26	**623**
Rabbitbrush shrubland	3	85	4	**92**
Developed/disturbed	1	10	1	**11**
Irrigated hedgerow	<1	7	1	**8**
Eastside (interior) grassland	2	2	<1	**4**
Shrub-steppe	3	2	<1	**5**
Total[5/]	**115**	**2,836**	**141**	**3,093**

1/ Temporary impacts include collector lines, temporary access roads, and work areas located outside the solar array perimeter fence lines and laydown and pulling areas associated with the transmission line.
2/ Altered habitat impacts consist of all lands within the perimeter fence lines minus any areas occupied by permanent Project features/structures.
3/ Permanent impacts include solar array panel posts, inverter pads, permanent access roads, substation, O&M building, and poles for transmission line.
4/ An approximately 65-foot-by-135-foot area (or approximately 0.2 acre) of the impact footprint for road improvements at the intersection of Wautoma Road and SR 241 have not been mapped and are not included in this total.
5/ Totals may not sum exactly due to rounding.
6/ Approximately 8 acres of temporary impacts, 295 acres of altered habitat impacts, and 14 acres of permanent impacts listed under planted grassland would occur to lands currently enrolled in the CRP.

	Invasive Plant Species	Soil disturbance and the subsequent removal of vegetation during construction will increase the potential for the introduction and spread of noxious weeds and invasive species. The movement of construction and operation equipment and personnel also increases the potential for introduction and spread of noxious weed and invasive plant species. However, with the implementation of BMPs such as flagging the limits of construction to minimize vegetation removal and ground disturbance, and implementing measures described in the Vegetation and Weed Management Plan that will be prepared for the Project (see Part 4, Section 4.8.D), the Project is not expected to result in a significant increase in the introduction and spread of noxious weeds and invasive species.
	Fire	Fires (both those potentially generated by the Project as well as those generated by other factors) have the potential to directly affect botanical resources through alteration of habitats as well as destruction of plant species including special status plant species. Fire can also indirectly affect botanical resources by creating conditions for colonization or expansion of non-native, invasive plant species, such as cheatgrass. As described in Part 3, Section 4.13 (Environmental Health – Hazardous Materials), Part 3, Section 4.21 (Public Services and Facilities), and Part 4, Section 4.13 (Environmental Health – Hazardous Materials), the Project will implement measures to address fire risk. While the project site is in a remote area that is not part of a tax-supported fire protection district, the Applicant has had preliminary communication with the Benton County Fire Marshal, who provided suggestions on fire response measures that could be taken and agreed to further communications as the project develops. The Applicant has also reached out to the Bureau of Land Management and the Hanford Fire District and engaged in ongoing discussions with participating and adjacent landowners on potential fire response measures that could be employed by the Project, which could also provide a community benefit to the surrounding area. Prior to construction, the Applicant will develop an Emergency Management Plan and implement BMPs for fire prevention. The Applicant will coordinate with the Benton County Sheriff's Office, Benton County Emergency Management, and DNR Wildland Fire Management Division to collaboratively develop safety measures that will be incorporated into the Project's design and construction. The Applicant will also coordinate with these entities regarding necessary equipment or training, if any are identified as needed, that may be required to provide fire protection services to the Project. To further mitigate the need for fire protection services, the Project's facilities will include and incorporate multiple layers of protection to avoid failures and risks of fire or spills and will be designed to applicable

		requirements of the National Electric Code, National Fire Protection Association Standards, and Institute of Electrical and Electronics Engineers Standards. Access roads will be developed and maintained with an approximate 24-foot width to provide 1) sufficient access for fire fighters to the area and 2) additional fire breaks. In addition, the Project Area may also include a 10,000-gallon water cistern to store water for fire suppression needs. Vegetation management will also establish and maintain fire breaks around each solar array, PCS, the Project substation, and along the Project's fence line. The Applicant may also establish and maintain additional fire and fuel breaks (i.e., 100- to 150-foot-wide planted green strips) in key areas and have been in discussion with WDFW staff to continue green-stripping areas along the boundaries of the leased parcels. The implementation of these measures will minimize the risk of wildfires occurring and adversely affecting botanical resources.

4.8.C.2 Changes to the Proposal from the Existing Condition

Would the existing condition for this topic have the potential to affect the proposal now or in the future?

☐ No	☒ Yes	
	Topical Area/issue	**Changes**
	Vegetation Types / WDFW Priority Habitats	As noted in Part 2, Section A.2, the Applicant is requesting flexibility to microsite the Project and its associated supporting components anywhere within the Project Area. During final design, the Applicant will minimize impacts to eastside (interior) grassland and shrub-steppe habitat, where possible. In addition, the suite of measures discussed in Section 4.8.D below will provide additional habitat mitigation.

4.8.D Proposed Mitigation and Monitoring

☒ Check this box when all final proposed mitigation is described here, or the location of the mitigation information is referenced here.

Are you proposing any mitigation, either required in rules or proposed for impacts?

☐ No	☒ Yes		
	Mitigation	**Applicable law and how well it addresses the impact**	**Expert agency participation**
	Avoidance and Minimization Measures	During siting and design, the Applicant took several measures to avoid and minimize impacts to botanical resources. The Applicant minimized impacts to shrub-steppe habitat and will avoid talus slopes (i.e., Priority Habitats). As described above, the Applicant sited the Project to avoid the population of the	WDFW

		state sensitive Columbia milk-vetch documented during surveys conducted for the Project.	
	Habitat Management Plan	Per WAC 463-60-332(3) and consistent with requirements in the BCC 15.14.030 for the Applicant to provide a habitat assessment and discuss the habitat avoidance, minimization, and mitigation measures proposed for the Project, the Applicant has prepared a Draft Habitat Management Plan (Attachment M). This plan will provide details regarding mitigation measures for impacts to habitat types from Project construction and operation including impacts to "habitats and species off local importance" (i.e., shrub-steppe habitat), per BCC 15.14.030. A Final Habitat Management Plan will be prepared prior to construction.	WDFW
	Revegetation and Noxious Weed Control	Per RCW 17.10.140, the Applicant will develop a Vegetation and Weed Management Plan with input from EFSEC and the Benton County Noxious Weed Control Board prior to construction. The Vegetation and Weed Management Plan (Attachment U) addresses noxious weed prevention and control actions that would be implemented to avoid and minimize the potential for introduction or spread of weeds from Project construction and operation. Measures that would be implemented include requirement for all equipment entering the site to be inspected for invasive plant species and cleaning as needed, to avoid the introduction of invasive plant species; revegetating temporarily disturbed areas as soon as practicable following disturbance to minimize conditions favorable to weed germination; using only certified weed-free seed mixes; and monitoring for and treating observed infestations of noxious weeds. Herbicide and pesticide applications will be conducted in accordance with manufacturer instructions and all federal, state, and local laws and regulations; herbicides will only be directly applied to localized spots and will not be applied by broadcasting techniques (RCW 17.21).	EFSEC, Benton County Noxious Weed Control Board
	BMPs	The Applicant will implement the Project's ESCP, Construction SWPPP, and Permanent Stormwater Control Plan. These plans will help reduce erosion and impacts to vegetation.	Ecology; WDFW

4.8.E Effects on Other Environmental Elements not yet Discussed

Does any information provided for this topic affect other environmental elements (e.g. water, plants, animals, noise), that has not already been considered and discussed in this form?

☒ No	☐ Yes	
	Environmental Element	**Additional changes or effects**
	N/A	N/A

4.8.F References

DNR (Washington Department of Natural Resources). 2018. Washington Natural Heritage Program Element Occurrences – Summary. Available online at: https://www.arcgis.com/home/item.html?id=34fb23d474d14a55bfbf670d065209c3. Accessed March 2022.

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4.9 Animals

4.9.A Studies

Describe any studies that have already been conducted or will be conducted related to this topic and provide the expected timing for the completion of studies to be completed.

Study name	Expected completion date	Expert agency participation Name, Title, and Involvement	Completed Y/N
Wetland Delineation Report (Attachment I)	Complete (November 2021)	Prepared by: Tetra Tech, environmental consultant for the Applicant.	Y
Raptor Nest Survey Report (Attachment L)	Complete (January 2022)	Prepared by Tetra Tech, environmental consultant for the Applicant. Agency involvement: WDFW provided feedback on protocols and special status species in the Project vicinity.	Y
Habitat and General Wildlife Survey Report (Attachment G)	Complete (January 2022; revised October 2022)	Prepared by: Tetra Tech, environmental consultant for the Applicant. Agency involvement: WDFW provided feedback on protocols and special status species in the Project vicinity.	Y
Habitat and General Wildlife Survey Report Addendum	Complete (August 2022)	Prepared by: Tetra Tech, environmental consultant for the Applicant. Agency involvement: Tetra Tech discussed the planned spring 2022 surveys with WDFW prior to conducting surveys.	Y
Botanical Survey Report (Attachment F)	Complete (January 2022)	Prepared by: Tetra Tech, environmental consultant for the Applicant. Agency involvement: WDFW provided feedback on protocols and special status species in the Project vicinity.	Y
Botanical Survey Addendum	Complete (August 2022)	Prepared by: Tetra Tech, environmental consultant for the Applicant. Agency involvement: Tetra Tech discussed the planned spring 2022 surveys with WDFW prior to conducting surveys.	Y

☒ **Check this box when all proposed studies for this topic are completed**

4.9.B Existing Condition and Issues

Describe the existing condition for this topic, including any existing problems associated with the issue being discussed.

Topical area/issue	Existing Condition and Problems
Habitat Types	In consultation with WDFW and in compliance with WAC 463-60-332(1), the Applicant contracted with Tetra Tech to complete a Wildlife and Habitat Survey in 2021 (see Part 4.9.A above). Surveys were conducted within the Project Area from May 10 through 14, 2021, with additional surveys conducted on October 12 and 13, 2021. Details regarding these habitat/wildlife surveys are provided in the Habitat and General Wildlife Survey Report (Attachment G). Additional general wildlife observations will also be collected during the planned spring 2022 supplemental surveys for approximately 990 acres of the Project Area. Nine habitat types were identified and mapped within the Project Area: agriculture, developed/disturbed, eastside (interior) grassland, irrigated hedgerows, non-native grassland and forbland, planted grassland, rabbitbrush shrubland, shrub-steppe, and talus. In addition to these habitat types, 3 palustrine emergent wetlands and 34 ephemeral drainages were mapped within the Project Area (see Attachment I). Section 5.2.1 of the Wildlife and Habitat Survey Report (Attachment G) as well as Table 4.8-1 in Part 4 - Section 4.8 (Plants) provide detailed description of the habitat types found within the Project Area, as well as the amount of these habitat types that occur in the Project Area. Figure 3 in Attachment G depicts the locations of each habitat type within the Project Area. In general, habitat types were adapted from the habitat descriptions in Wildlife-Habitat Relationships in Oregon and Washington (Johnson and O'Neil 2001), the WDFW Priority Habitats and Species List (WDFW 2008), and the Washington Department of Fish and Wildlife Wind Power Guidelines (WDFW 2009).
Special Status Species	For this analysis, the term "special status species" includes federal and state endangered, threatened, proposed, and candidate species; species of concern; birds of conservation concern; and state sensitive and priority species. On March 8, 2021, the WDFW provided the applicant with a description of special-status wildlife that may occur in the Project vicinity. Appendix A to Attachment G provides the list of 26 special-status wildlife species identified as having the potential to occur in the area, which includes 18 birds, 6 mammals, and 2 reptiles. Section 4.1.2 in Attachment G lists the sources used to identify which special-status species have a potential to occur (e.g., the WDFW PHS database) as well as describes the coordination conducted with the WDFW prior to surveys to determine this list. Thirty-six bird species and one mammal species were observed within the Project Area during the Habitat and General Wildlife Survey (see Appendix C in Attachment G), and a total of 15 raptor nests were observed during the Raptor Nest Surveys (Attachment L). No federally threatened or endangered species were observed during these surveys; however, one State-listed species (i.e., ferruginous hawk) one State-candidate species (i.e., burrowing owl), three Priority Species (i.e., golden eagle, elk, and mule deer), and one

	bird of conservation concern (i.e., northern harrier) were observed during these surveys. • **Ferruginous Hawk**: A single ferruginous hawk was observed briefly soaring in an area of native grassland habitat in the far southwestern edge of the Project; however, there is neither appropriate nesting substrate nor an apparent sufficient prey base for larger raptors such as ferruginous hawks in the area (Katzner et al. 2020; Ng et al. 2020; Attachment L); this assumption of a lack of sufficient prey base is supported by the lack of detections of ground squirrel colonies or jackrabbits found during surveys. This single ferruginous hawk is likely associated with a known nest site located about 2 miles south of the Project Area. Furthermore, the WDFW indicated that they have visited historic nest sites in the hills south of the Project Area in 2021 and did not observe any occupied nests (pers Comm-J. Fidorra-WDFW). • **Greater Sage-Grouse (Columbia Basin DPS):** The Washington population in 2021 was estimated to be 775 birds. There are no known populations of greater sage-grouse in Benton County or suitable habitat within the Project Area. There are two remnant populations of the Columbia Basin DPS of greater sage-grouse: one in Douglas and Grant counties, and one on the Yakima Training Center in Yakima and Kittitas counties. Small, reintroduced populations occurred in Lincoln County and on the Yakama Indian Reservation in Yakima County but were lost to fires in 2019 and 2020 (WDFW 2015; Stinson 2021). • **Burrowing Owl**: The PHS database contains burrowing owl records that were documented in 2014 located approximately 0.25 mile north of the Project. In addition, one active burrowing owl nest was identified approximately 0.25 mile north of the Project Area during the Raptor Nest Surveys (Attachment L). Four additional active burrowing owl nests were observed in the center of the Project Area during surveys in 2022 (these observations were noted in a Wildlife Survey Addendum submitted in August 2022). The active burrowing owl burrows both in the PHS database and documented just north of the Project Area in 2021 and in the central portion of the Project Area in 2022 have been avoided through design modifications to all Project facilities including solar arrays, security fencing, access roads and collection lines. In addition, site-specific conservation measures developed in consultation with WDFW, such as ensuring that occupied burrows plus a 150-meter buffer would not be disturbed during the nesting period (February 15 through September 25), would be implemented. If avoidance is not possible, use or development of nearby natural or artificial burrow systems would be developed in coordination with WDFW. • **Golden Eagle**: A partial raptor carcass was found in the bottom of a small canyon below the talus slope identified during habitat surveys (see Appendix D - Photo 26 – in Attachment L). Most tail feathers, a partial wing (primaries), and scattered cluster of body feathers were found within an approximately 30-meter radius. The few pieces left of this scavenged carcass provided no other insight into potential cause of death. This carcass was determined to most likely be the

	remains of an adult golden eagle[5]. However, no observations of live golden eagles using the Project Area were recorded during surveys. • **Northern Harrier**: Northern harriers were commonly observed within the irrigated crop portions of the Project Area. • **Elk and Mule Deer**: Mule deer and elk scat were found scattered in the planted grassland, eastside grassland, and shrubland habitat areas within the Project Area. Scat was generally desiccated; mule deer scat was found more frequently than elk scat. Tracks of mule deer were identified; however, elk tracks were not definitively identified during the summer 2021 survey. Two groups of elk (consisting of approximately 70 individuals) were observed within the adjacent Hanford Site during the Raptor Nest Survey (Attachment L), outside the Project Area. Tracks leading from the Hanford Site to and from a watering structure within the Project were observed along game trails and along a two-track road within the Project Area. Potentially suitable habitat for these species is generally limited to portions of the Project Area that occur outside of agricultural or other developed/disturbed lands.
Fish	The Yakima River is the nearest downstream fish-bearing stream, approximately 21 miles downstream of the Project, as described in the ASC (Section 4.3B). Because the Project will not adversely impact ephemeral streams on site as described in the ASC (Section 4.3.C.1), and because the ephemeral streams on site lack connectivity to other intermittent, perennial, or fish-bearing streams, no adverse impacts to downstream fish would occur. As described in Section 4.3, two of the stream segments (ST-207/Dry Creek, and ST-217 in Attachment I) continue out of the Project Area. ST-217 is a tributary to ST-207/Dry Creek just outside of the Project Area. ST-207/Dry Creek connects to Cold Creek at 4.5 miles downstream from the Project Area. Cold Creek is uncategorized on the Washington Department of Natural Resources (DNR) stream typing maps and does not contain fish per the StreamNet database (DNR 2022; StreamNet 2022). The Cold Creek drainage continues about 21 miles downstream to the Yakima River. However, Cold Creek appears to no longer be directly connected to the Yakima River in the historical orthoimagery (Google 2022). The Horn Rapids Campground and Park as well as the Tapteal Water Trail Access Road cover the historical floodplain and confluence of Cold Creek and the Yakima River (Google 2022).
Non-Special Status Species	This analysis is primarily focused on special status species, as those are the taxa/species to which regulations apply. However, the species represented in the special status species list include a wide range of taxa/groups; including avian species, mammals (including bats), and reptiles. Attachment G to this ASC (Habitat and General Wildlife Survey Report), as well as the Wildlife Survey Addendum, list all wildlife species seen or heard during various survey efforts (See Appendix C of Attachment G and 2022 Addendum). Although no protocol-level surveys for bats were conducted, there is likely limited use of the area due to lack of day/night roosting or maternity structure for bats (e.g., caves, cliffs, buildings). Use by bats and other species,

[5] Primary length approximately 18 to 24 inches (at least 45 centimeters), tail feathers at approximately 10 to 12 inches (at least 25 centimeters), and overall coloration (USFWS 2020; Liguori et al. 2020).

	including most amphibians, is likely around the existing man-made water sources. There are approximately 113 acres (2 percent) of mapped shrub-steppe within the Project Boundary, of which up to approximately 4.2 acres may be impacted. Due to the limited amount of existing shrub-steppe, use by shrub-steppe obligate species is unlikely and none of those species were documented during surveys. As a result, the information provided for special status species can be used to determine the likelihood of similar non-special status species that occur as well as what potential impacts could be. Regardless of a species' "special status," all species that were either documented during surveys or have potential to occur were reviewed and potential impacts assessed.
Raptor Nests and General Avian Species	The Applicant contracted with Tetra Tech to complete a Raptor Nest Survey in 2021 (see Part 4.9.A above). Three rounds of ground-based raptor nest surveys were conducted within the Project Area; the first round of surveys was conducted on March 13, 2021, the second round was conducted in May 10-12, 2021, and the third round was conducted on October 2, 2021. A total of 15 nests were detected during the surveys, including three in-use burrowing owl nests, two in-use Swainson's hawk nests, one in-use red tailed hawk nest, one in-use great horned owl nest, five in-use common raven nests, and three small inactive nests with unknown species determinations. See Attachment L for a detailed discussion of the raptor nests observed during raptor nest surveys, tables outlining the results of the surveys, and nest status definitions. Use of the Project Area by general avian species was documented during the Habitat and General Wildlife Survey (see Attachment G). The highest avian diversity was observed near irrigated crops, home sites, at livestock ponds, and in the shrubs and trees (irrigated hedgerows) in the south section of the Project. In undeveloped areas where eastside grasslands, planted grasslands, rabbitbrush shrubland, and shrub-steppe were mapped, grassland species were observed including grasshopper sparrow, lark sparrow, vesper sparrow, long-billed curlew, horned lark, and western meadowlark. Avian species documented within the shrub-steppe habitats included horned lark, Western meadowlark, grasshopper sparrow, long-billed curlew, vesper sparrow, and lark sparrow; however, no sagebrush-associated or sagebrush-obligate species were observed in these areas (e.g., greater sage grouse, loggerhead shrike, sagebrush sparrow, sage thrasher). The Project Area primarily consists of non-native grassland and forbland, and horned larks were the most common species observed in these habitat types. See Attachment G for additional details regarding general avian species detected within the Project Area.
Fish	Three palustrine emergent wetlands and 34 ephemeral drainages were identified within the Project Area; however, the stream segments within the Project Area were not identified as fish streams (Attachment I).
Fish and Wildlife Conservation Areas	Per the Benton County Critical Area Regulations, "Fish and Wildlife Conservation Areas" include 1) areas where endangered, threatened, and sensitive species have a primary association[6]; 2) habitats and species of local importance; 3) waters of the state; 4) naturally occurring ponds under twenty acres and their submerged aquatic beds that provide fish or wildlife habitat[7]; 5) lakes, ponds, streams and rivers planted with native fish

[6] These areas are identified on the WDFW PHS Map.

[7] "Naturally occurring ponds" do not include ponds deliberately designed and created from dry sites such as canals, detention facilities, wastewater treatment facilities, farm ponds, temporary construction ponds (of less than 3 years'

	populations, including fish planted under the auspices of federal, state, local or tribal programs or which supports priority fish species as identified by the WDFW; 6) Washington State Wildlife Areas[8]; and 7) Washington State Natural Area Preserves and Natural Resource Conservation Areas [9]. All areas that meet one of more of these criteria are managed per the WDFW's management recommendations for priority habitat and species (see Chapter 15.08 of the Benton County Critical Area Regulations). The entire Project Area is designated by the State as an elk wintering area, and both talus slopes and shrub-steppe habitats are identified within the Project Area. These areas are classified by Benton County as a Fish and Wildlife Conservation Area. Also, the special status species occurrences (reported above in the Special Status Species section) would trigger the affected areas to be classified as Fish and Wildlife Conservation Areas per criteria 1 and 2. The emergent wetlands and 34 ephemeral drainages identified in Attachment I would also be classified as Fish and Wildlife Conservation Areas per criteria 3 through 5. Based on the extent of special status species occurrence, habitat types, and wildlife designations (e.g., elk wintering area) the entire Project Area would be classified by Benton County as a Fish and Wildlife Conservation Area.
Invasive Animal Species	No invasive animal species listed by WDFW are known to occur in the vicinity of the Project area. Potential habitat for invasive fish or aquatic invasive species (e.g., zebra and quagga mussels, European green crabs, or bullfrogs) is not present (Source: https://invasivespecies.wa.gov/find-a-priority-species/?_sft_priority-specietype=invasive-animals).
Big Game Habitats and Migration Routes	As described above (in the Special Status Species section) both elk and mule deer have been identified within and adjacent to the Project Area. The WDFW indicated that pronghorns do not use the Project Area (pers Comm-M. Ritter-WDFW). Big game habitat and potential migration corridors were reviewed to identify big game migration routes in the Project vicinity. The Project Area encompasses known migration routes for elk and mule deer, and use of the area by these species is expected to be high. The entire Project Area is designated by the State as an elk wintering area and tied to the Rattlesnake Hills elk herd (Hanford Site), which is considered a subpopulation of the Yakima herd. Movements into and out of the Hanford Site is a common occurrence seasonally; however, the Hanford Site is considered a core area, particularly the Cold Creek Valley area (WDFW 2002). As shown in Attachment A, Figure A-9, the southern and eastern portions of Project Area are identified as Habitat Concentration Area for elk per the Washington Connected Landscapes Project (WHCWG 2012) and as Priority Core Areas[10] by the Arid Lands Initiative Spatial Conservation Priorities report (ALI 2014). The southern and western portions of the Project Area are identified as Priority Linkage Areas[11] by the Arid Lands Initiative (ALI) (ALI 2014). The easternmost portion of the Project Area is identified as Landscape Integrity Core Area by the Washington Connected Landscapes

duration) and landscape amenities. However, naturally occurring ponds may include those artificial ponds intentionally created from dry areas in order to mitigate conversion of ponds, if permitted by a regulatory authority.

[8] As defined, established, and managed by the WDFW.

[9] As defined, established, and managed by the DNR.

[10] Priority Core Areas are a set of noncontiguous polygons of various sizes selected by modeling where local protection and restoration actions can best contribute to the ALI's overall goals).

[11] Priority Linkage Areas are area identified as important for maintaining movement opportunities for organisms or ecological processes (e.g., for animals to move to find food, shelter, or access to mates).

	Project (WHCWG 2012). As a result, the landscape around and encompassed by the Project likely serves as important winter and migration habitats for both elk and mule deer. It is anticipated that elk and mule deer (as well as other large bodies mammal species) currently use the various ephemeral drainages, manmade water sources (livestock ponds), game trails, as well as native habitat types located outside of agricultural use for migration corridors though the Project Area.
Noise, Light, and Glare	The Project Area is located in an area with agricultural development and accompanying existing sources of noise. Principal contributors to the existing acoustic environment likely include motor vehicle traffic, mobile farming equipment, farming activities such as plowing and irrigation, all-terrain vehicles, local roadways, rail movements, periodic aircraft flyovers, and natural sounds such as birds, insects, and leaf or vegetation rustle during elevated wind conditions. As noted in Part 4, Section 4.16a (Noise), existing ambient sound levels at the Project Area are expected to be approximately 50 A-weighted decibels (dBA) equivalent sound level (L_{eq}) during daytime hours and 40 dBA L_{eq} during nighttime hours (also see Attachment O).
Fire	Fire plays an important role in shaping the environmental conditions and habitat types of an area. Part 4, Section 13 (Environmental Health – Hazardous Materials) describes the existing conditions related to historic fires in the area.
Hazardous or toxic spills	Part 3, Sections 12 and 13, as well as Part 4, Section 13 provides information regarding the existing conditions regarding hazardous materials within the Project Area.

4.9.C Changes to and from Existing Condition

4.9.C.1 Changes to the Existing Condition from the Proposal

Could the activities associated with the proposal result in changes to the existing condition for this topic.

☐ No	☒ Yes	
	Topical Area/issue	**Changes**
	Habitat Types	As described in Part 4, Section 4.8 (Plants), the Project will result in three types of impacts to habitat—temporary, altered, and permanent—where Project construction and operations will occur. Table 4.8-2 in Part 4, Section 4.8 (Plants) lists the estimated acres of temporary, altered, and permanent impacts to the various habitat types that will result from the Project's construction and operation based on the current Project design (Attachment A, Figure A-1). However, as discussed in Part 2, the exact locations of Project components may be shifted or revised during final Project design, and impacts from the Project could occur anywhere within the Project Area because the Applicant is requesting flexibility to microsite the Project and its associated supporting components anywhere within the Project Area, provided the final layout does not exceed the values evaluated in this ASC and allowed for in the Site Certification Agreement. Following construction, areas within the solar array perimeter fence not permanently occupied by Project components will be

		revegetated with low-growing vegetation consisting of native species or desirable non-native, non-invasive species (e.g., species that would provide more rapid soil stabilization and vegetative cover than slower-growing native species), resulting in permanently altered vegetation. The altered vegetation community will be compatible with a solar facility and support an altered wildlife community (i.e., consisting of species that are able to pass over, under, or through the perimeter fence), retaining value to some wildlife species that are able to pass through/over the perimeter fence (e.g., small mammals, birds, and reptiles). The temporary, permanent, and altered habitat impacts as well as the associated Project mitigation needs are identified in Attachment M, Habitat Management Plan. These values may be adjusted in coordination with EFSEC and with input from WDFW. Habitat loss through conversion to agriculture, fire, fragmentation, and degradation are the major threats to wildlife in the state of Washington (WDFW 2015). The long-term conversion or loss of habitat associated with the footprint of the area occupied by Project components will create marginal additional habitat loss and fragmentation on the landscape; however, once constructed, the area may benefit over time from the removal of the effects from domestic grazing and limit potential effects from increased fire regimes in this area.
	Special Status Species	The Project has been designed to avoid and minimize impacts on habitats associated with the special status species that were observed during surveys and/or are known to occur in the Project vicinity. Talus slopes have been avoided by 125 feet, and as a result, no impacts are expected to this Priority Habitat, thus minimizing impacts to special status species associated with this habitat type. Burrowing owl nests have been avoided by a minimum of 100 feet to avoid and minimize potential effects to this species. Furthermore, impacts to shrub-steppe have been avoided and minimized to the extent feasible, thus minimizing impacts to special status species associated with this Priority Habitat type. Aside from the habitat loss and alteration described above, potential impacts to special status wildlife species include collisions with construction vehicles and equipment, and displacement due to avoidance of activity during Project construction and operation for more mobile wildlife. Removal of vegetation during the breeding season can result in destruction of nests and injury or death to birds or eggs. Special status raptors (e.g., golden eagle, northern harrier, and ferruginous hawk) will experience loss of foraging habitat as a result of the Project. The Project has the potential to affect habitats that are important to elk and mule deer during winter months as well as affect the migratory corridors for big game species (see further discussion below in the Big Game Habitats and Migration Routes section). Federally listed wildlife species are not anticipated to occur within the Project Area, and the Project does not contain USFWS-designated critical habitat.

	Raptor Nests and General Avian Species	If nest territories are occupied during construction, pairs associated with these nests could experience disturbance, particularly early in the breeding season during courtship, nest building, incubation, and brooding. Raptors within active territory could also experience a loss of foraging habitat if prey species are reduced within the pairs' home range. However, the vast majority of the habitat that will be impacted by the Project is agricultural land, which typically provides limited forage value to large raptors such as golden eagles, northern harriers, and ferruginous hawks, given the low prey availability in agricultural lands. Additionally, the Project avoids impacts on the talus slope (associated with the cliff nests) by 125 feet, limiting impacts to the ridgeline and shrub-steppe immediately adjacent to the ridge that likely supports raptor prey species. Avian collisions with solar modules during operation is possible, although the available data on avian mortality at utility scale solar energy sites suggest mortality at PV facilities is comparatively low. A study examining avian fatalities at two solar sites and one PV facility found the mortality rate at the PV facility in the study was significantly lower than at the two power tower facilities (Walston et al. 2016). More recently, Kosciuch et al. (2020) synthesized results from fatality monitoring studies at 10 PV solar facilities across southwest United States and calculated a high-end estimate of 2.5 birds per MW per year, but noted that an average annual fatality rate of 1.8 birds per MW per year was also calculated by excluding the one project in the Coastal California Bird Conservation Region that could be considered an outlier in the dataset. In Oregon, preliminary results of a fatality study at a 56-MW PV facility near Prineville detected only two fatalities on native birds, a horned lark and a dark-eyed junco, during 1 year of standardized searches (ODOE 2020). If any overhead power lines are required to connect the Project to the grid, these lines will be designed and constructed to minimize avian electrocution, according to guidelines outlined in Avian Power Line Interaction Committee standards (APLIC 2012).
	Fish	The stream segments within the Project Area were not identified as fish streams (see Attachment I); therefore, no effects to fish species are anticipated. However, the Project will implement a Construction SPCC Plan and an Operations SPCC Plan, as well as BMPs related to erosion control and prevention to avoid or minimize Project-related effects to waterbodies (see Sections 4.3 through 4.7).
	Fish and Wildlife Conservation Areas	As discussed above, impacts to talus slopes need be avoided during the Project design, and impacts to shrub-steppe habitats have been avoided and minimized to the extent feasible. The acreage of impact that will occur to shrub-steppe habitats is provided in Table 4.8-2 in Part 4, Section 4.8 (Plants). All Project-related impacts to habitat (i.e., temporary, altered, and permanent) will occur to areas identified by the State as elk wintering area. Project-related impacts to 1) areas where endangered, threatened, and sensitive species have a primary association, and 2) habitats and species of local importance are discussed above in the Special Status Species section.

		Project-related impacts on aquatic Fish and Wildlife Conservation Areas (i.e., waters of the state) are addressed in Part 4, Section 4.3.
	Big Game Habitats and Migration Routes	Development of the Project's perimeter fence will result in the Fenced Area having no habitat value for elk and mule deer (i.e., excluding them from the Fenced Area) because it will create an access barrier to areas within the fence. Also, as shown in Figure A-9 in Attachment A, the Project's perimeter fence will intersect and encompass important migratory areas for both elk and mule deer, including approximately 1,615 acres of Habitat Concentration Area, 864 acres of Landscape Integrity Core Area, 1,306 acres of Priority Core Areas, and 714 acres of Priority Linkage Areas. However, as shown in the following table, the vast majority of these areas consist of planted grasslands and non-native habitats (ranging from 74 to 97 percent of the designated migratory area within the Fenced Area), which may serve as lower quality habitat for big game species compared to native habitats.

Table 4.9-1. Acres of Big Game Migration Habitat Designation Encompassed by the Project's Perimeter Fence

Vegetation Type	Big Game Migration Habitat Designation			
	HCA	LICA	PCA	PLA
Agriculture	12	0	1	176
Developed/disturbed	2	1	2	3
Eastside (interior) grassland	3	1	3	<1
Non-native grassland and forbland	331	112	208	191
Planted grassland	1,184	728	1,013	327
Planted trees/windbreak	2	0	0.2	6
Rabbitbrush shrubland	81	22	79	11
Shrub-steppe	<1	<1	<1	0
Total	**1,615**	**864**	**1,306**	**714**

HCA = Habitat Concentration Area; LICA = Landscape Integrity Core Area; PCA = Priority Core Areas; PLA = Priority Linkage Areas.

The presence of the Project's perimeter fence may affect the movement patterns of elk and mule deer in the area. As discussed below (see Section 4.9.D), the Applicant has modified the layout of the Project's perimeter fence to include separate smaller fenced units versus one large fenced array in order to allow for elk and mule deer movement. The layout of the perimeter fence was also modified to maintain open access to the ephemeral drainages within the Project Area (see Attachment I) that are used by mule deer and elk; the existing transmission line ROWs through the Project would also be left unfenced to maintain movement corridors along these existing transmission lines. With the exception of fencing around the Project substation, which will extend to the ground, perimeter fencing will be designed to be an average of at least 4 inches above ground. The fence design may be revised further based on ongoing coordination with EFSEC and WDFW. The applicant is also in

		discussions with WDFW and affected landowners to identify potential locations outside of the fenced areas where existing artificial water sources (that were primarily developed for livestock) can be relocated in order to maintain wildlife access to these water sources (including access for elk and mule deer). These design changes to the fence as well as considerations regarding water sources in the area will minimize the effects that this Project may have to elk and mule deer movement patterns and habitat availability in the area.
	Noise, Light, and Glare	As described in Part 4, Section 4.16a (Noise) the Project is not expected to have significant noise impacts during operations. Potential impacts on wildlife during construction include general noise and visual disturbances from construction activity. Projected noise levels associated with expected Project construction equipment at 50 feet are identified in Table 6 in Attachment O. These noise levels could disturb wildlife, if present in the Project vicinity, within the anticipated 22-month construction period. In general, noise and visual disturbances may cause wildlife to avoid typical foraging and breeding areas, or distract them from those activities within those areas, which can result in reduced fitness. Construction equipment operates intermittently, and noise levels resulting from construction activities will vary depending on equipment and operations being performed. Loud construction activities are anticipated to be infrequent at the site, hours of construction will be limited, and noise mitigation measures will be implemented, which will minimize the impacts on wildlife from the temporary increase in noise due to construction (see Part 4, Section 4.16a [Noise] and Attachment O). For example, evening and nighttime construction activities will be avoided to the extent practicable, which will limit the impacts of construction noise to wildlife. Additional BMPs related to noise are listed in Part 4, Section 4.16a (Noise). Although wildlife species are susceptible to noise disturbances caused by humans and construction equipment, the BMPs listed in Part 4, Section 4.16a (Noise) will limit these impacts. Lighting can attract some species (e.g., avian species) to the Project Area, thereby exposing them to potential impacts. Lighting is needed at the O&M building for security and occasional after-hours work; however, the Applicant will limit the amount of lighting and will shield lighting as needed. In addition, applicable lighting will include motion detector-activated lighting to minimize the amount of time lights need to be active. Lighting is also needed at the Project substation in accordance with North American Electric Reliability Corporation (NERC) standards. Fatalities or injuries of water-associated birds (i.e., species that rely on water for foraging, reproduction, and/or roosting, such as herons and egrets) and water-obligate birds (i.e., species that cannot take flight from land, such as loons and grebes) has led some researchers to suggest that these species might interpret PV solar facilities as water (i.e., lake effect hypothesis; Kagan et al. 2014). Kosciuch et al. (2020) reviewed bird fatality data from 10 PV solar facilities in southwest United States; for facilities with multiple study years, each year was treated as a separate study, resulting in 13 “site-years.” Kosciuch et al. (2020) found that water-obligate birds occurred at 90 percent of site-years in the Sonoran and Mojave

		Desert Bird Conservation Region, and that adjusted composition (which takes into consideration searcher efficiency and carcass persistence per Huso [2011]) was higher for water associates and water obligates the closer the facility was to the Salton Sea, which serves as stop-over and wintering habitat for water birds. The sites farthest from the Salton Sea showed almost no contribution to adjusted composition of water associates and water obligates (i.e., no or relatively few birds in these groups were detected). The Project will be built with solar modules that are treated with an anti-reflective coating to minimize glare. Moreover, the Project does not occur near a large waterbody that serves as a major migratory stop-over site; therefore, water-associated and water-obligate species are not anticipated to be disproportionately affected by the Project.
	Fire	Fires (both those potentially generated by the Project as well as those generated by other factors) have the potential to directly affect botanical resources through alteration of habitats as well as destruction of plant species including special status plant species. Fire can also indirectly affect botanical resources by creating conditions for colonization or expansion of non-native, invasive plant species, such as cheatgrass. As described in Part 3, Section 4.13 (Environmental Health – Hazardous Materials), Part 3, Section 4.21 (Public Services and Facilities), and Part 4, Section 4.13 (Environmental Health – Hazardous Materials), the Project will implement measures to address fire risk. Prior to construction, the Applicant will develop an Emergency Management Plan and implement BMPs for fire prevention. The Applicant will coordinate with the Benton County Sheriff's Office, Benton County Emergency Management, and DNR Wildland Fire Management Division to collaboratively develop safety measures that will be incorporated into the Project's design and construction. The Applicant will also coordinate with these entities regarding necessary equipment or training, if any are identified as needed, that may be required to provide fire protection services to the Project. To further mitigate the need for fire protection services, the Project's facilities will incorporate multiple layers of protection to avoid failures and risks of fire or spills and will be designed to applicable requirements of the National Electric Code, National Fire Protection Association Standards, and Institute of Electrical and Electronics Engineers Standards. Access roads will be developed and maintained with an approximate 24-foot width to provide 1) sufficient access for fire fighters to the area and 2) additional fire breaks. In addition, the Project may also include a 10,000-gallon water cistern to store water for fire suppression needs. Vegetation management will also establish and maintain fire breaks around each solar array, PCS, the Project substation, and along the Project's fence line. The Applicant may also establish and maintain additional fire and fuel breaks (i.e., 100- to 150-foot-wide planted green strips) in key areas and have been in discussion with WDFW staff to continue green-stripping areas along the boundaries of the leased parcels. The implementation of these measures will minimize the risk of wildfires occurring and adversely affecting wildlife in the region.

	Hazardous or toxic spills	As demonstrated in Part 4, Section 4.13 (Environmental Health – Hazardous Materials) the risk of hazardous or toxic spills at the Project is low. The Applicant will prepare both a Construction SPCC Plan and an Operations SPCC Plan. The SPCC Plans will be implemented during construction and operation to reduce the likelihood of an accidental release of a hazardous or regulated liquid and, in the event such a release occurs, to expedite the response to and remediation of the release. Implementation of these measures will minimize the risk that an accidental release of a hazardous or regulated liquid will affect wildlife species.

4.9.C.2 Changes to the Proposal from the Existing Condition

Would the existing condition for this topic have the potential to affect the proposal now or in the future?

☐ No	☐ Yes	
	Topical Area/issue	**Changes**
	Habitat	The Applicant has revised the Project layout to avoid Fish and Wildlife Conservation Areas in the Project Area to the extent feasible. This includes completely avoiding talus slopes by 125 feet, avoiding burrowing owl nests by 2,800 feet along the northern Project boundary, as well as minimizing the extent of shrub-steppe habitats that will be affected. Also, as discussed in Part 4 - Section 4.3, waters and wetlands were avoided to the extent feasible.
	Big Game Habitats and Migration Routes	The Applicant has modified the layout of the Project's perimeter fence to include separate smaller fenced units versus one large fenced array in order to allow for wildlife movement through the area. The layout of the perimeter fence was also modified to maintain open access to the ephemeral drainages within the Project Area (see Attachment I), which are used by mule deer and elk for movement corridors as well as for water sources; the existing transmission line ROWs through the project would also be left unfenced to maintain movement corridors along these existing transmission lines. With the exception of fencing around the Project substation, which will extend to the ground, perimeter fencing will be designed to be an average of at least 4 inches above ground. The fence design may be revised further based on ongoing coordination with EFSEC and WDFW. The applicant is also in discussions with WDFW and affected landowners to see if existing artificial water sources that were primarily developed for livestock can be moved outside of the fenced areas in order to maintain wildlife access (including elk and mule deer) to these water sources.

4.9.D Proposed Mitigation and Monitoring

☐ Check this box when all final proposed mitigation is described here, or the location of the mitigation information is referenced here.

Are you proposing any mitigation, either required in rules or proposed for impacts?

☐ No	☐ Yes		
	Mitigation	**Applicable law and how well it addresses the impact**	**Expert agency participation**
	Avoidance and Minimization Measures	During siting and design, the Applicant took several measures to avoid and minimize impacts to wildlife and habitat. The Applicant coordinated with WDFW prior to conducting surveys, and used the feedback obtained during this coordination to inform surveys and the assessment of impacts. As described above, the Applicant avoided talus slopes (i.e., a Priority Habitat) by 125 feet and burrowing owl nests by 2,800 feet along the northern Project boundary and minimized impacts to shrub-steppe habitat to the extent feasible. Additionally, the Project is sited primarily on currently disturbed lands, which minimizes impacts to wildlife and habitat. The Applicant has modified the layout of the Project's perimeter fence to include separate smaller fenced units versus one large fenced array in order to allow for wildlife movement through the area. The layout of the perimeter fence was also modified to maintain open access to the ephemeral drainages within the Project Area (see Attachment I) that are used by mule deer and elk for movement corridors as well as for water sources; the existing transmission line ROWs through the project would also be left unfenced to maintain movement corridors along these existing transmission lines. With the exception of fencing around the Project substation, which will extend to the ground, perimeter fencing will be designed to be at least 4 inches above ground. The fence design may be revised further based on ongoing coordination with EFSEC and WDFW. The applicant is also in discussions with WDFW and affected landowners to see if existing artificial water sources that were primarily developed for livestock can be moved outside of the fenced areas in order to maintain wildlife access (including access for elk and mule deer) to these water sources. All Project facilities, including solar arrays, security fencing, access roads and collection lines, currently avoid all active burrowing owl burrows documented in the central portion of the Project Area during 2022 surveys. These burrows will be monitored. In addition, the	WDFW

		following measures would be implemented (see Attachment M): • Conduct preconstruction surveys to ensure that occupied burrows are not disturbed during the nesting season (February 15 through September 25) unless a qualified biologist approved by the WDFW verifies through non-invasive methods that either: (1) burrowing owls are not present; (2) the birds have not begun egg-laying and incubation; (3) that juveniles from the occupied burrows are foraging independently and are capable of independent survival; or (4) have dispersed from the site. • A no disturbance buffer of a minimum of 150 meters (~500 feet) would apply to any occupied burrow during the nesting period, from February 15 through September 25, or until burrowing owls have dispersed from the site. • If avoidance is not possible; use or development of nearby natural or artificial burrow systems would be developed in coordination with WDFW.	
	Construction and Operations BMPs	Unnecessary lighting will be turned off at night to limit attraction of migratory birds to the area. This includes using lights with timed shutoff, downward-directed lighting to minimize horizontal or skyward illumination, and avoidance of steady-burning, high-intensity lights. If construction occurs during the bird nesting season, nest clearance surveys will be conducted prior to site disturbance. Evening and nighttime construction activities will be avoided to the extent practicable, which will limit the impacts of construction noise to wildlife. Prior to construction, construction personnel will be instructed on wildlife resource protection measures, including: 1) applicable federal and state laws (e.g., those that prohibit animal collection or removal); and 2) the importance of these resources and the purpose and necessity of protecting these resources. Construction personnel will be trained in the following areas when appropriate: awareness of biological resources (including Priority Habitats and special status	WDFW

		species), potential bird nesting areas, and general wildlife issues. The Applicant will prepare an ESCP that would include BMPs to minimize surface water runoff and soil erosion. Appropriate stormwater management practices will be implemented in accordance with the SWPPPs. The Applicant will prepare SPCC Plans to be implemented during construction and operation to reduce the likelihood of an accidental release of a hazardous or regulated liquid and, in the event such a release occurs, to expedite the response to and remediation of the release (see Part 4, Section 4.3 for more details). Vehicle speeds will be limited to 25 miles per hour on internal Project access roads to avoid wildlife collisions. Existing posted speed limits on county and private roads will be followed outside of the Project Area. If any overhead power lines are required to connect the Project to the grid, these lines will be designed and constructed to minimize avian electrocution, according to guidelines outlined in Avian Power Line Interaction Committee standards (APLIC 2012). Fire hazards from vehicles and human activities will be reduced via use of spark arrestors on power equipment, avoiding driving vehicles off roads, and allowing smoking only in designated areas per the requirements of WAC 463-60-352. The Applicant will prepare an Emergency Management Plan that contains fire safety measures, which will be developed with input from applicable agencies (see the “Fire” section above for more details). Following decommissioning, reclamation of the Project Area will begin as quickly as possible to reduce the likelihood of ecological resource impacts in disturbed areas. Section 4.8.D contains additional measures targeted at successfully restoring vegetation communities. Implementation of these Vegetation mitigation measures will have indirect benefits to wildlife species as well.	
	Compensatory Mitigation	In order to achieve “no net loss of habitat functions and values” as required by WAC 463-62-040, the Applicant will continue to work with the WDFW and EFSEC to determine	WDFW

		appropriate compensatory mitigation. The Applicant has prepared a Draft Habitat Management Plan (Attachment M), which provides a framework for determining the compensatory mitigation required to achieve "no net loss." A Final Wildlife Habitat Management and Mitigation Plan will be prepared prior to construction.	

4.9.E Effects on Other Environmental Elements not yet Discussed

Does any information provided for this topic affect other environmental elements (e.g. water, plants, animals, noise), that has not already been considered and discussed in this form?

☒ No	☐ Yes	
	Environmental Element	**Additional changes or effects**
	N/A	

4.9.F References

ALI (Arid Lands Initiative). 2014. Spatial Conservation Priorities in the Columbia Plateau Ecoregion: Methods and data used to identify collaborative conservation priority areas for the Arid Lands Initiative. Available online at: https://www.sciencebase.gov/catalog/folder/52050595e4b0403aa6262c64.

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4.10 Energy and Other Natural Resources

Part 4 Analysis is not required for this section.

4.11 Waste Management

Part 4 Analysis is not required for this section.

4.12 Environmental Health – Existing Site Contamination

Part 4 Analysis is not required for this section.

4.13 Environmental Health – Hazardous Materials

4.13.A Studies

Describe any studies that have already been conducted or will be conducted related to this topic and provide the expected timing for the completion of studies to be completed.

Study name	Expected completion date	Expert agency participation Name, Title, and Involvement	Completed Y/N
No direct studies have been conducted to date regarding the existing environmental contamination within the Project Area. A site-specific Phase 1 Environmental Site Assessment will be conducted prior to construction (refer to Part 1.E, List of Studies).			

☒ Check this box when all proposed studies for this topic are completed

4.13.B Existing Condition and Issues

Describe the existing condition for this topic, including any existing problems associated with the issue being discussed.

Topical area/issue	Existing Condition and Problems
Hazardous Materials	The Project Area contains a mix of dryland and irrigated agricultural use, rangeland, transmission and electrical infrastructure, and undeveloped areas. Based on available historic aerial imagery, the land use in the Project Area has been consistent with current conditions for at least the past 30 years (Google Earth 2022). As a result, historical use of organic and inorganic fertilizers, pesticides, or herbicides has likely occurred in agricultural production areas in the Project Area. The application of fertilizers, pesticides, and herbicides is assumed to have occurred according to manufacturer guidance, in a relatively uniform and generally consistent manner typical of agricultural practices. The concentrations of fertilizers and pesticides are likely to be similar to other dryland and irrigated agricultural operations. Risks to human health and the environment associated with soil disturbance during Project development are assumed to be low and similar to those associated with agricultural operations such as tiling. Therefore, potential past applications of fertilizer, herbicides, and pesticides pose little to no concern of adverse environmental impact with respect to Project development. No hazardous materials are known to be stored currently in the Project Area.
Existing infrastructure	There are five BPA transmission lines that cross through the Project leading to the Wautoma Substation (located on a federal parcel encompassed by the Project Lease Boundary): Schultz to Wautoma 500 kV, Hanford to Wautoma 500 kV (two lines), Wautoma to Knight 500 kV and Wautoma to Rock Creek 500 kV. An additional BPA line cuts through

	the middle of the Project Area trending northeast-southwest: Big Eddy to Midway 230 kV. Lastly, there are two BPA lines cutting through the northwest corner of the Project Area trending northeast-southwest: Midway to Grandview 115 kV and North Bonneville to Midway 230 kV. Water use for Project construction will be obtained from an existing on-site well with a valid water right (to be verified in coordination with Ecology) or will be hauled to the site from off-site sources with existing water rights (i.e., a municipal water source or vendor with a valid water right). Water use for Project operations will be obtained from an existing on-site well with a valid water right, or hauled to the site from off-site sources with existing water rights (i.e., a municipal water source or vendor with a valid water right), or obtained through a new permit-exempt groundwater well. The Applicant or the Applicant's construction contractor will verify the well location and availability of water from a permitted source prior to operations. No underground hazardous liquid (e.g., petroleum) or natural gas transmission pipelines are located within the Project Area or on surrounding properties (PHMSA 2022).
Risk of Fire or Explosion	The Project Area is located predominantly on vacant, undeveloped land that has been used for dryland and irrigated agricultural production and grazing. There are no residences in the Project Area; however, there are participating and non-participating residences in proximity to the Project. The Project's security fence is set back from the closest participating residence by approximately 500 feet and is set back from the closest non-participating residence by approximately 700 feet. No petroleum products or other flammable/explosive substances are stored within the Project Area. Wildland grass fires are the greatest existing fire risk in the vicinity of the Project Area. At the time of preparing this Application in April 2022, there are currently no active fire related incidents in the immediate vicinity of the Project (InciWeb 2022). However, the Project Area has a history of large fires, the most recent of which is the Cold Creek Fire from 2019. The entirety of the Project Area is located within the extent of one or more large fires. A list of large fires greater than 500 acres in the last 40 years and recorded within 10 miles of the Project Area follows below (WDNR 2022):

	<table><tr><th>Fire Name</th><th>Acres</th><th>Year</th><th>Cause</th><th>Overlaps With Project Area</th></tr><tr><td>Weather Station</td><td>4,915</td><td>2005</td><td>Misc.</td><td></td></tr><tr><td>Dry Creek Complex</td><td>48,902</td><td>2009</td><td>Unknown</td><td>Yes</td></tr><tr><td>Washout</td><td>596</td><td>2012</td><td>Unknown</td><td></td></tr><tr><td>241-BLM</td><td>4,614</td><td>2012</td><td>Unknown</td><td></td></tr><tr><td>Wautoma</td><td>67,291</td><td>2007</td><td>Misc.</td><td>Yes</td></tr><tr><td>Milepost 17</td><td>6,452</td><td>2007</td><td>Misc.</td><td></td></tr><tr><td>Range 12</td><td>176,581</td><td>2016</td><td>Unknown</td><td>Yes</td></tr><tr><td>400</td><td>26,087</td><td>2017</td><td>Unknown</td><td></td></tr><tr><td>Silver Dollar</td><td>31,740</td><td>2017</td><td>Unknown</td><td></td></tr><tr><td>L Rd SW</td><td>21,619</td><td>2018</td><td>Human</td><td></td></tr><tr><td>Cold Creek</td><td>41,712</td><td>2019</td><td>Unknown</td><td>Yes</td></tr><tr><td>Hanford</td><td>122,894</td><td>1984</td><td>Unknown</td><td>Yes</td></tr><tr><td>Lambing</td><td>9,451</td><td>1987</td><td>Unknown</td><td>Yes</td></tr><tr><td>Nake</td><td>1,578</td><td>1990</td><td>Unknown</td><td>Yes</td></tr><tr><td>Emerson</td><td>6,703</td><td>1990</td><td>Unknown</td><td></td></tr><tr><td>Rattlesnake</td><td>17,200</td><td>1992</td><td>Unknown</td><td></td></tr></table> Most materials used in construction of the Project will not be hazardous or dangerous, and the risk of fire will be low. However, the Project will include a PCS system with a DC-coupled BESS (distributed throughout the solar arrays) and/or an AC-coupled BESS (consolidated in a central location near the Project substation). These BESS options are described further in Part 2.A2 Project Description. The BESS units will be designed to incorporate multiple layers of protection to avoid failures and risks of fire or spills and will comply with the applicable requirements of the National Electric Code, National Fire Protection Association Standards, and Institute of Electrical and Electronics Engineers Standards.
Emergency Plans and Services	The Project is located outside of a Benton County fire district. Prior to construction, the Project will develop and maintain an Emergency Management Plan that will include BMPs for fire prevention. The Applicant will coordinate with Benton County Emergency Management and DNR Wildland Fire Management Division.

4.13.C Changes to and from Existing Condition

4.13.C.1 Changes to the Existing Condition from the Proposal

Could the activities associated with the proposal result in changes to the existing condition for this topic.

☐ No	☒ Yes	
	Topical Area/issue	**Changes**
	Hazardous Materials	Earthwork associated with Project construction will disturb soils and has the potential to expose soils that may contain remnants of past fertilizer, pesticide, and herbicide use. Potential risks associated with soil disturbance are expected to be low and similar to those associated with agricultural operations such as tiling. The Applicant or the Applicant's contractor will manage noxious weeds and control vegetation during construction and operations. The Project will only use herbicides that are approved for use in the state of Washington by the EPA and the Washington State Department of Agriculture. As needed, herbicides will be transported and applied to the Project Area but will not be stored in the Project Area. During construction, small amounts of hazardous materials (e.g., petroleum-based fuels, mineral-based transformer oils, and oil-based lubricants) will be transported, stored, or used to operate equipment. These materials will be stored in compliance with a SPCC Plan that follows the EPA Amended Spill Prevention, Control, and Countermeasure Rule issued in 2006 (EPA-550-F-06-008). The SPCC Plan provides preventative procedures and rapid response measures to handle hazardous spills if one were to occur, and reduce the risk of potential soil or groundwater contamination to negligible. Project operations will not require large quantities of fuels, oils, or chemicals in the Project Area, except those required for the operation of certain Project components where such substances are fully contained (e.g., transformers, inverters, back-up generators, and certain BESS equipment). As noted in Part 2, back-up power is planned to be supplied for the Project by 12-volt lead-acid cell battery packs. Lead-acid batteries contain sulfuric acid within sealed, leakproof exterior compartments. Under 40 CFR § 355, sulfuric acid is considered an extremely hazardous material by the EPA. If lead-acid batteries are used at the Project, secondary containment will be provided. The Applicant will report sulfuric acid as part of its annual Emergency Planning and Community Right-to-Know Act

		report to local emergency service providers. Lead-acid batteries will be replaced every 5 years or more frequently, as indicated by system controls. Replacement of lead-acid batteries will be handled by a qualified contractor and adhere to applicable regulations for transport and disposal, including, but not limited to, 49 CFR § 173.159.
	Risk of Fire or Explosion	Two types of fire risks might affect the Project include 1) fires that are caused by Project-related activities, and 2) fires that start outside of the Project Area and spread to the Project Area. With respect to the first type of risk, the Project could theoretically increase existing fire or explosion risk due to the introduction of potential ignition sources. Vehicles, equipment, human activities, and heat-producing Project components represent potential ignition sources; however, the risk of actual ignition is low. Oil-based materials will be used and stored in accordance with the SPCC Plan, applicable regulations, and best practices during both construction and operation of the Project. The BESS units will be designed to incorporate multiple layers of protection to avoid failures and risks of fire or spills and will comply with the applicable requirements of the National Electric Code, National Fire Protection Association Standards, and Institute of Electrical and Electronics Engineers Standards. Batteries may contain flammable liquids that can become hot during operation. To ensure safe handling these batteries contain individual, hermetically sealed cells that do not have any waste discharges and will not be opened in the Project Area for installation or maintenance purposes. In addition, each BESS will contain a fire suppression system that complies with National Fire Protection Association (NFPA) standards, specifically NFPA 855 “Standard for the Installation of Stationary Energy Storage Systems.” The fire suppression system will include sensing equipment and alarm systems with remote shut-off capabilities. Installation, maintenance, and decommissioning of BESS components will be done in compliance with applicable regulations, including 49 CFR §173.185, which regulates the transportation of lithium-ion batteries. Therefore, the potential ignition risk of either of these types of battery systems is low. Access roads will provide primary access to each of the solar array blocks, including each PCS, as well as the O&M and Project substation. The spacing between the rows of panels will allow for localized access within each of the solar array areas. The O&M building will be equipped with fire extinguishers as well as smoke detectors tied to the supervisory control and data acquisition (SCADA) system. In addition to fire extinguishers, the O&M building will have basic firefighting equipment for use on-site during maintenance activities including shovels, beaters, portable water for hand sprayers, and personal protective equipment. Also, the Project Area may include a 10,000-gallon water cistern to store water for fire suppression needs.

		Vegetation management will also establish and maintain fire breaks around each solar array, PCS, the Project substation, and along the Project's fence line. The Applicant may also establish and maintain fire and fuel breaks (i.e., 100- to 150-foot-wide planted green strips) in key areas and have been in discussion with WDFW staff to continue green-stripping areas along the boundaries of the leased parcels. The implementation of these measures will minimize the risk of wildfires occurring in the Project Area and Project Lease Boundary. The Project will develop and maintain an Emergency Management Plan (which will be developed and finalized prior to construction) and implement BMPs for fire prevention. The Applicant will coordinate with the Benton County Sheriff's Office, Benton County Emergency Management, and DNR Wildland Fire Management Division to collaboratively develop safety measures that will be incorporated into the Project's design and construction. The final layout will be provided to the Benton County Fire Marshal's Office. The Applicant will also coordinate with these entities regarding necessary equipment or training, if any are identified, that may be required to provide fire protection services to the Project. To further mitigate the need for fire protection services, the Project's facilities will include and incorporate multiple layers of protection to avoid failures, and risks of fire or spills will be designed to applicable requirements of the National Electric Code, National Fire Protection Association Standards, and Institute of Electrical and Electronics Engineers Standards. Furthermore, the Project's design will incorporate graveled areas around the O&M facility and substation, as well as graveled access roads and fire breaks, where applicable. With respect to the second type of risk, hot temperatures, arid conditions, and the presence of dry vegetation could lead to wildfires originating outside of the Project that could pose a risk to Project construction and components, including lithium-ion or flow batteries contained in the optional BESS. The Applicant will monitor wildfire activity during Project construction and operations; comply with the Benton County Wildlife Protection Plan (BCWPP 2005); and if necessary, the Applicant will modify Project activities, change the schedule, cease construction/operation activities, or take other action requested by emergency service providers to ensure the safety of Project personnel and avoid any interference with emergency fire/medical responders. During Project operations, there will be minimal fuel use on-site, and electrical equipment will be designed to reduce the potential for fire damage. Therefore, while the Project itself may be damaged in the event of a wildfire spreading across the site, it will not significantly change the risk posed by the wildfire to the surrounding vicinity.

	Existing Infrastructure	Water for operations use will either be obtained from an existing on-site well with a valid water right, hauled to the site from off-site sources with existing water rights (i.e., a municipal water source or vendor with a valid water right), or obtained through a new permit-exempt groundwater well. The Applicant or the Applicant's construction contractor will verify the well location and availability of water from a permitted source prior to operations. Since there are no underground hazardous liquid or natural gas transmission pipelines and none are proposed as part of the Project, no change to this existing condition will occur. The Project will introduce new subsurface infrastructure such as electrical collector lines and a 500-kV gen-tie line, which will connect to existing BPA substation and transmission infrastructure. Proposed subsurface infrastructure will not contain hazardous materials nor pose significant fire risk. No changes will occur to existing transmission lines outside of the gen-tie interconnection. The Applicant is coordinating with BPA regarding the proposed interconnection actions.
	Emergency Plans and Services	The Emergency Management Plan (developed prior to construction) will address worker health and safety, as well as fire prevention and control measures for construction and operation. Access roads will have a compacted gravel surface, with a permanent width of approximately 24 feet as well as the required clearance and turning radius needed for emergency response vehicles, in accordance with fire code. The final layout will be provided to the Benton County Fire Marshal's Office.

4.13.C.2 Changes to the Proposal from the Existing Condition

Would the existing condition for this topic have the potential to affect the proposal now or in the future?

☒ No	**☐ Yes**	
	Topical Area/issue	**Changes**
	N/A	N/A

The existing agricultural use of the Project Area will not significantly affect construction, operation, or decommissioning of the proposed Project. No underground hazardous liquid or natural gas transmission pipelines occur within the Project Area.

4.13.D Proposed Mitigation and Monitoring

☒ Check this box when all final proposed mitigation is described here, or the location of the mitigation information is referenced here.

Are you proposing any mitigation, either required in rules or proposed for impacts?

☐ No	☒ Yes		
	Mitigation	**Applicable law and how well it addresses the impact**	**Expert agency participation**
	Emergency Management Plan	Prior to Project construction and operations, the Applicant will develop an Emergency Management Plan to address worker health and safety, standards concerning potential release of hazardous materials, and fire prevention and control. This plan will provide safety guidelines and procedures for potential emergency-related incidents during the Project's construction, operation, and decommissioning phases. This includes coordination with emergency service providers and fire suppression measures associated with the Project. Specifically, the plan will be developed with input from, and in coordination with, the Benton County Emergency Management, Benton County Sherriff, Benton County Fire Marshall, and DNR Wildland Fire Management Division. Applicable laws/codes include: • WAC 463-60-352 (2 through 4), which addresses fire and explosion, hazardous materials release, and safety standards compliance. • WAC 463-60-352(6), which describes emergency plans to ensure public safety and environmental protection. • 49 CFR §173.185m, which regulates the transportation of lithium-ion batteries. • 49 CFR §173.159, which regulates the transportation of lead-acid batteries. • International Fire Code	Benton County Emergency Management, Benton County Sherriff, Benton County Fire Marshall, and DNR Wildland Fire Management Division

	Best Management Practices – Fire Prevention	To minimize the risk of fire or explosions, the Project will implement BMPs to be detailed in the Emergency Management Plan noted above. Typical BMPs will include, but are not limited to, the following: • Equip construction vehicles with fire extinguishers, spark arrestors and heat shields, as appropriate. • Establish roads before accessing the site to minimize vehicle contact with grass. • Use diesel construction vehicles instead of gasoline vehicles, where feasible, to prevent potential ignition by catalytic converters. • Prohibit vehicles from idling in grassy areas. • Restrict the use of high-temperature equipment in grassy areas. • Install lightning protection measures to protect generators and other equipment. • Install fire protection equipment in accordance with Washington state fire code. • Notify the local fire district of construction plans and access to Project equipment. • Provide mutual assistance in the case of fire in or around the Project during construction. • Monitor wildfire activity during Project construction and operations and, if necessary, modify Project activities, change the schedule, cease construction operations, or remove equipment. • Prevent and control potential fires inside the Project Area with trained staff who have 24-hour access to the site. A Vegetation and Weed Management Plan will be prepared and will includes revegetation management and noxious weed control measures.	Benton County Fire Marshall and DNR Wildland Fire Management Division

	BESS design	The BESS will contain a fire suppression and detection system in accordance with fire code and NFPA Standards, specifically NFPA 855 "Standard for the Installation of Stationary Energy Storage Systems." The system will include monitoring equipment and alarm systems with remote shut-off capabilities.	NFPA
	Construction Stormwater General Permit (CSWGP) , Construction Phase Stormwater Pollution Prevention Plan (SWPPP), and Erosion and Sediment Control Plan (ESCP)	As described in Part 4, Section 4.5, the Applicant will obtain a CSWGP from EFSEC, which requires a SWPPP and ESCP. These plans will contain measures to minimize the risk of spills and stormwater pollution, as well as to reduce the effects of erosion to ensure compliance with state and federal water quality standards. Applicable laws/codes include the following: • RCW 90.48, which establishes general stormwater permits for Ecology under the Water Pollution Control Act • WAC 173-201A, Water Quality Standards for Surface Waters of the State of Washington • Clean Water Act (33 United States Code 1251)	Ecology
	SPCC Plan	The Applicant will prepare an SPCC Plan, consistent with requirements of 40 CFR Part 112, to prevent spills during construction and to identify measures to expedite the response to a release if one were to occur. Preventative procedures and rapid response measures will address and prevent potential risks to water quality.	Ecology
	Use of approved herbicides	In compliance with RCW 17.10.140, the Applicant will only use herbicides that are approved for use in the state of Washington by the EPA.	EPA and the Benton County Noxious Weed Control Board

Consistent with WAC 463-60-352(2 through 4) and (6), the proposed mitigation described for the Project complies with existing regulations and provides measures to reduce the risk of fire and explosion; reduce potential hazardous releases to the environment that could affect the public; comply with applicable local, state, and federal safety standards; and implement the

Project's Emergency Management Plan. For the reasons provided, construction and operation of the Project poses minimal risk to environmental health.

4.13.E Effects on Other Environmental Elements not yet Discussed

Does any information provided for this topic affect other environmental elements (e.g. water, plants, animals, noise), that has not already been considered and discussed in this form?

☒ No	☐ Yes	
	Environmental Element	**Additional changes or effects**
	N/A	N/A

4.13.F References

BCWPP (Benton County Wildfire Protection Plan) 2005. Benton County , WA Community Wildfire Protection Plan. Available online at: https://www.dnr.wa.gov/publications/rp_burn_cwppbenton.pdf.

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4.14 Land Use, Natural Resource Lands, & Shoreline Compatibility

4.14.A Studies

Describe any studies that have already been conducted or will be conducted related to this topic and provide the expected timing for the completion of studies to be completed.

Study name	Expected completion date	Expert agency participation Name, Title, and Involvement	Completed Y/N
See Part 1, Section E (List of Studies)			

☐ **Check this box when all proposed studies for this topic are completed**

Response: There are no studies of the Project conducted solely for the purpose of land use; however, the studies listed in Part 1, Section E support findings of compliance in response to Benton County's applicable land use regulations. The Land Use Consistency Review (see Attachment D) provides cross-references to these studies, where applicable, that demonstrate local land use consistency and regulatory compliance.

4.14.B Existing Condition and Issues

Describe the existing condition for this topic, including any existing problems associated with the issue being discussed.

Topical area/issue	Existing Condition and Problems
Existing Land Ownership	The Project Lease Boundary includes 35 assessor parcels, all of which are in private ownership. The Applicant is also pursuing easements/crossing agreements with the Bonneville Power Administration (BPA) for Project access roads and collection line crossings of existing easements, as well as a transmission interconnection agreement. Refer to Part 1, Section A.4 for a description of the parcels in the Project Area. Lands to the east of the Project Area are part of the Hanford Reach National Monument (Rattlesnake Unit of the Fitzner/Eberhardt Arid Lands Ecology Reserve) and managed by the U.S. Fish and Wildlife Service. Lands to the north, west, and south include a mixture of Washington Department of Natural Resources (DNR), Bureau of Land Management BLM), and private lands. Northwest of the Project Area in Yakima County is the Department of Defense (U.S. Army) Yakima Training Center.
Existing Land Use	Existing land uses in the Project Area include dryland and irrigated agriculture, rangeland, undeveloped areas, local roads, electrical infrastructure (e.g., transmission and distribution lines, substations), and scattered unoccupied structures (e.g., agricultural storage). Adjacent land uses surrounding the Project Area are similar and

	also include scattered rural residences, vineyard, rangelands, state highways, and the Hanford Reach National Monument. Lands in the Project Area have historically been utilized for agricultural activities (crop cultivation and grazing), although the areas used for these activities have varied over time. Approximately 793 acres (17 percent) of the Project Area was mapped as current cultivated agricultural lands during the Project's 2021 Habitat and General Wildlife Survey (ASC Attachment G; Attachment A, Figure A-8). These cultivated agricultural lands consist of fallow and active wheat, irrigated alfalfa fields, livestock and horse pastures, and irrigated hedgerows. Water for irrigated lands in the Project Area is from an existing on-site well with a valid water right. Outside of these agricultural areas, approximately 3,740 acres (82 percent) of the Project Area was mapped as vegetated uplands, inclusive of 9 acres of irrigated hedgerows (i.e. windbreaks to crop lands). The remaining approximately 40 acres (1 percent) of the Project Area was mapped as developed, unvegetated, irrigated hedgerows, or wetlands and streams. The vegetated uplands include approximately 524 acres of lands currently enrolled in the Conservation Reserve Program (CRP). At this stage, the layout proposed in the ASC is at a preliminary stage. If all or a portion of the lands currently enrolled in CRP are included in the final layout, those lands will be removed from CRP. The remainder of the vegetated uplands consist of undeveloped rangelands, portions of which are used for sheep grazing. Agricultural lands in the Project Area were also assessed using the Washington Department of Agriculture 2021 agricultural land use data (WSDA 2021; Attachment D, Figure 2). Within the Project Area, WSDA agricultural land uses are mapped as 320 acres of cereal grain, 368 acres of hay/silage, 138 acres of pasture, and 1,086 acres of other. Within these 1,912 acres of agricultural lands mapped by WSDA, 756 acres are identified as irrigated lands (center pivot, drip, sprinkler, or wheel line irrigation types). The undeveloped rangelands are used for sheep grazing, and the landowners maintain several livestock tanks across the Project Area to support livestock. Currently, the landowner uses approximately 30 acres for sheep lambing (approximately 1 to 1.5 months of the year). These 30 acres have been set aside from the project layout and will be retained by the landowner for this purpose. Once the lambing period is over, sheep are moved off the property onto separate parcels (held by the same landowner) on an adjacent ridge, for grazing. The Vegetation and Weed Management Plan (Attachment U) prescribes revegetation with species consistent with current habitat makeup; no changes to forage quality, post-decommissioning, are anticipated. Together with WDFW, the landowner will be included in discussions on vegetation strategy and species.

	Minimal agricultural-related structures (e.g., storage sheds, well house, etc.) occur in the Project Area. A hunting shed is located within the Project Area. No residences are located within the Project Area. The Project is accessed via SR 241 and Wautoma Road as described in Part 4 Section 4.20. There are several unpaved farm roads and transmission line access roads located within the Project Area. Lands to the south of the Project Area are mapped as other (non-irrigated) and undeveloped rangelands. Lands to the west of the Project Area include a small irrigated vineyard adjacent to the Project Area on Wautoma Road, as well as other (likely dryland wheat), non-irrigated pasture, and undeveloped rangelands. Lands to the north similarly include other (likely dryland wheat), non-irrigated pasture, and undeveloped rangelands. Approximately 1 mile north of the Project Area along SR 24 are additional irrigated vineyards and orchards. Non-agricultural lands uses to the south, west, and north of the Project Area include several rural residences, scattered unoccupied structures (e.g., agricultural storage), existing electrical transmission infrastructure (i.e., BPA Wautoma Substation and multiple transmission lines), local roads and state highways, and a small commercial area at the intersection of SR 241 and SR 24 north of the Project Area. Lands to the east of the Project Area are in the Hanford Reach National Monument (Rattlesnake Unit of the Fitzner/Eberhardt Arid Lands Ecology Reserve) and are not open to public use nor are used for agriculture. The Project Area is located in a rural, sparsely populated area of Benton County. The nearest residence is located approximately 500 feet from the security fence line and is a Project participant landowner. The Acoustic Assessment provided in Attachment O depicts the locations of participating and non-participating residences. The nearest nonparticipant residence is located approximately 700 feet from the security fence line. The closest developed area to the Project is the City of Sunnyside located approximately 12 miles south of the Project Area.
Electrical Infrastructure / Electrical Generation Capacity and Service	There is no current electrical generation service within the Project Area. There are five BPA transmission lines that cross through the Project leading to the BPA Wautoma Substation (located on a federal parcel encompassed by the Project Lease Boundary): Schultz-to-Wautoma 500-kV, Hanford-to-Wautoma 500-kV (two lines), Wautoma-to-Knight 500-kV, and Wautoma-to-Rock Creek 500-kV. An additional BPA line cuts through the middle of the Project Area trending northeast-southwest: Big Eddy-to-Midway

	230-kV. Lastly, there are two BPA lines cutting through the northwest corner of the Project Area trending northeast-southwest: Midway-to-Grandview 115-kV and North Bonneville-to-Midway 230-kV.
Benton Comprehensive Plan Designation	The Project Area and all surrounding non-federal lands are in the Benton County Comprehensive Plan Growth Management Act (GMA) Agricultural designation (Benton County 2021a): ***GMA Agriculture*** *(GMA AG) includes agricultural land (such as dryland and irrigated land) identified by the County based on the criteria established by the GMA. A GMA Agricultural District zone conserves agricultural lands by establishing a 20-acre minimum parcel size and (with exceptions e.g., resort destinations, wineries) limits the range of other land uses to those which are dependent upon, supportive of, ancillary to, or compatible with, agricultural production as the principal land use.*
Benton County Zoning District	The Project is located entirely on land zoned Growth Management Act Agricultural District (GMAAD), defined by Benton County Code (BCC; Benton County 2021b) (Attachment D, Figure 1). The Project is consistent with Benton County's definition of a "solar power generator facility, major" under BCC 11.03.010(167) as described in detail in the Land Use Consistency Review (see Attachment D). As defined in BCC 11.03.010(167), "Solar Power Generator Facility, Major" means the use of solar panels to convert sunlight directly or indirectly into electricity. Solar power generators consist of solar panels, charge controllers, inverters, working fluid system, and storage batteries. Major facilities are developed as the primary land use for a parcel on which it is located and does not meet the siting criteria for a minor facility in BCC 11.03.010(168). The Applicant began obtaining lease agreements for the Project Area in 2020. As part of early agency outreach, the Applicant contacted Benton County Planning Department on July 26, 2021, intending to introduce the Project and discuss the local permitting process. At this stage of early Project development, "solar power generation facility, major" was listed as an allowed use requiring a conditional use permit (CUP) in the GMAAD BCC 11.17.07(cc). No response to the Applicant's communications was received and the Applicant subsequently made the decision in the fall of 2021 to seek a Site Certification Agreement through EFSEC. At the time the Applicant first introduced the Project to EFSEC in August of 2021, the Project was a conditionally allowed use in the GMAAD. On December 21, 2021, Benton County passed Ordinance Amendment (OA) 2021-004, which among other changes, removed "solar power generation facility, major" from the list of uses requiring a CUP in the GMAAD zone and therefore prohibits this type of use

	in the GMAAD. The County stated this amendment was necessary to be consistent with the GMA and Comprehensive Plan and that the GMAAD would protect long-term commercially significant agricultural lands, limit incompatible and non-agricultural uses, conserve critical areas and habitat, protect visual resources, and protect rural character. Public testimony provided at the Planning Commission Hearing (November 30, 2021) and Benton County Board of Commissioners Hearing (December 21, 2021) on OA 2021-004 included testimony from multiple private landowners, solar energy developers, and advocacy groups in support of allowing solar development to occur on agricultural lands (Benton County 2021c,d). Despite testimony and discussion among commissioners about solar energy project compatibility in the GMAAD, the County ultimately approved OA 2021-004 and removed the County's authority to approve solar facilities on agricultural lands through a CUP. The regulatory background is discussed further in the Land Use Consistency Review (see Attachment D).
Natural Resource Lands under RCW 36.70A.030	There are no forest or mineral resource lands within the Project Area. Agricultural land is defined under RCW 36.70A.030(3) as "land primarily devoted to the commercial production of horticultural, viticultural, floricultural, dairy, apiary, vegetable, or animal products or of berries, grain, hay, straw, turf, seed, Christmas trees not subject to the excise tax imposed by RCW 84.33.100 through 84.33.140, finfish in upland hatcheries, or livestock, and that has long-term commercial significance for agricultural production." Per RCW 36.70A.170(1)(a), counties shall designate where appropriate, "Agricultural lands that are not already characterized by urban growth and that have long-term significance for the commercial production of food or other agricultural products." Benton County completed that designation analysis as described in the Comprehensive Plan (Benton County 2021a). Agricultural lands were designated based on the primary factors of urban growth (i.e., lands not already characterized by urban growth), production capability, and long-term commercial significance. Benton County's designation of agriculture lands of long-term commercial significance used the factors established in WAC 365-190-050(3) as well as County-specific supplemental factors as described in detail in the Land Use Consistency Review (Attachment D). Per the Comprehensive Plan, all lands within the GMA Agricultural designation, including those lands within the Project Area, are agricultural resource lands under RCW 36.70A.030.

Benton County Critical Areas	As listed in Part 2, Section B.6, the Project Area includes critical areas for wetlands, frequently flooded areas, aquifer recharge, geological hazards, and fish and wildlife habitat conservation. Further details regarding the existing conditions for these critical areas are provided in Part 4, Section 4.1, Section 4.3, Section 4.5, and Section 4.9.
Shoreline Master Program	There are no shorelines designated under the Benton County Shoreline Master Program within the Project Area.
Transportation, Utility, or Service Demands	Existing transportation conditions are discussed in Part 4, Section 4.20. Existing public service and utility conditions are discussed in Part 3, Sections 3.21 and 3.22, respectively. Where relevant for assessment of Benton County code criteria, aspects of transportation, public service, and utility conditions are also addressed in the Land Use Consistency Review (see Attachment D).

4.14.C Changes to and from Existing Condition

4.14.C.1 Changes to the Existing Condition from the Proposal

Could the activities associated with the proposal result in changes to the existing condition for this topic.

☐ No	☒ Yes	
	Topical Area/issue	**Changes**
	Changes to Land Ownership	Ownership of the land within the Project Lease Boundary will not change as a result of the Project. The Applicant has executed or is pursuing a Lease Agreement with each identified property owner. The Applicant is also pursuing easements/crossing agreements with the BPA for Project access roads and collection line crossings of existing easements, as well as a transmission interconnection agreement.
	Existing Land Use	Existing land uses in the Project Area include dryland and irrigated agriculture, rangeland, undeveloped areas, local roads, electrical infrastructure (e.g., transmission and distribution lines, substations), and scattered unoccupied structures (e.g., agricultural storage). Adjacent land uses surrounding the Project Area are similar and also include scattered rural residences, vineyard, rangelands, state highways, and Hanford Reach National Monument (Rattlesnake Unit of the Fitzner/Eberhardt Arid Lands Ecology Reserve). The Applicant believes the Project is compatible with surrounding agricultural uses because it minimizes impacts through implementation of environmental best practices related to noise, traffic, erosion control, stormwater

		management, dust mitigation, and noxious weed control. Additionally, excessive soil compaction will be limited by the implementation of construction and operations best management practices (BMPs). These BMPs would include: • Flag and prevent access to protected areas where no disturbance should occur, and areas where only minimal disturbance may occur. Protected soil organisms and seeds will remain available to colonize adjacent disturbed areas. • Where possible, mow vegetation rather than clearing and grubbing areas • Limit vehicular traffic to established access roads; place rock bases on access roads and prevent traffic on open soils • Salvage, separate, and replace topsoil • Where compaction has occurred, cultivate or decompact the subsoil to a minimum depth of 18 inches • Avoid earthwork activities in saturated conditions, which can produce deep soil compaction that is difficult to reverse without deep tillage practices • Implement a Vegetation and Weed Management Plan (Attachment U) The landowner has advised that topography and drainage are not factors that impact the economic viability of continued farming operations. The limiting factor is a lack of water. In such a dry climate with low annual rainfall, irrigation is required to support any crop production. The landowner has observed that water levels in the onsite wells are decreasing every year. Consequently, several years ago, the landowner had to switch from alfalfa to crops which required less water (barley hay, triticale, and wheat). It is anticipated that as the water table continues to decrease, no crop will be able to be supported/cultivated. The landowner anticipates that the suspension of irrigation for crops during the 30-50 year operational term of the Project will allow the water table to naturally recharge and that the economic viability of the farmlands will be improved following the Project's operational term. Lastly, minimal traffic impacts are expected during operation for the up to four maintenance employees.
	Electrical Infrastructure / Electrical Generation Capacity and Service	The Project will be a new source of clean, renewable electricity. The Project is designed to take advantage of the region’s renewable solar energy resources and adjacent transmission interconnection with the existing BPA transmission system. The existing BPA electrical transmission systems have sufficient electrical capacity to

		support the Project, and the Applicant is working with BPA to secure an interconnection request. In addition, construction of this renewable energy resource will help Washington meet its goal of 100 percent clean electricity supply as set forth in the Clean Energy Transformation Act, passed by the Washington legislature in 2019 (RCW 19.405.010).
	Benton County Comprehensive Plan Designation	The Applicant has carefully reviewed the goals and policies of the Comprehensive Plan and evaluated how they inform this ASC. The Project will be entirely located within the County's GMAAD zoning district, which is part of the County's GMA Agricultural land use designation in the Comprehensive Plan. As a "solar generation facility, major," the Project was previously an allowed conditional use in the GMAAD district prior to the adoption of OA 2021-004, and therefore was previously deemed compatible with surrounding land uses in the GMAAD district as long as certain conditions were met as required by the CUP process. In total, the 4,573-acre Project Area represents 0.7 percent of the 649,153 acres of lands in the GMA Agricultural designation (Benton County 2021b). Within the Project Area, the Project's security fenced area and permanent disturbance will occupy approximately 2,978 acres, or 0.5 percent of GMA Agricultural lands which would be a de minimis reduction of farmland utilized for crop and livestock production throughout Benton County. Section 2.0 of the Land Use Consistency Review (Attachment D) demonstrates further how the proposed Project is consistent with applicable Comprehensive Plan (Benton County 2021b) goals and policies.
	Benton County Zoning District	Section 3.0 of the Land Use Consistency Review (Attachment D) describes how the proposed Project is consistent with the County's zoning code requirements that are applicable to the Project in the GMAAD zoning district. Despite the adoption of OA 2021-004, the Applicant demonstrates the Project is able to meet the lot, building, and setback requirements of the conditional use and general use regulations that would have been required prior to OA 2021-004.
	Natural Resource Lands under RCW 36.70A.030	Agricultural land is defined under RCW 36.70A.030(3) as "land primarily devoted to the commercial production of horticultural, viticultural, floricultural, dairy, apiary, vegetable, or animal products or of berries, grain, hay, straw, turf, seed, Christmas trees not subject to the excise tax imposed by RCW 84.33.100 through 84.33.140, finfish in upland hatcheries, or livestock, and that has long-term commercial significance for agricultural production." Per RCW 36.70A.170(1)(a), counties shall designate where

		appropriate, “Agricultural lands that are not already characterized by urban growth and that have long-term significance for the commercial production of food or other agricultural products.” The Project is designed to be compatible with ongoing agricultural activities. Operation of the Project will not conflict with agricultural uses on surrounding lands and represents compatible use in the GMA Agricultural lands designation. As stated above, the permanent disturbance will occupy approximately 2,978 acres, or 0.5 percent of GMA Agricultural lands which would be a de minimis reduction of farmland utilized for crop and livestock production throughout Benton County. The Applicant analyzed the NRCS soil classifications and determined that of the acres within the Fenced Area classified by NRCS as prime farmland if irrigated, only 690 acres are irrigated and should be considered prime farmland. The Project has been designed to avoid impacts to the majority of acres within the Project Area that would be designated Farmland of Unique Importance or Farmland of Statewide Importance. See Table 1 in Attachment D for additional detail. The Project will obtain water for construction and operation from existing sources with a verified water right. Anticipated water needs are described in Part 4.3 of the ASC and are substantially less than typical farm operations. Section 2.0 of the Land Use Consistency Review (Attachment D) demonstrates further how the proposed Project is consistent with applicable Comprehensive Plan (Benton County 2021b) goals and policies specifically related to Natural Resource Lands.
	Benton County Critical Areas	The Land Use Consistency Review (see Attachment D) demonstrates that the Project will comply with Benton County’s applicable critical area regulations. Additional details regarding critical areas are provided in Part 4, Section 4.1, Section 4.3, Section 4.5, and Section 4.9.
	Shoreline Master Program	Since no designated shorelines are present within the Project Area, the Project will not change the existing condition for this topic.
	Transportation, Utility, or Service Demands	Potential impacts to transportation conditions are discussed in Part 4, Section 4.20. Impacts to public services and utilities are discussed in Part 3, Sections 3.21 and 3.22, respectively. Where relevant for assessment of Benton County code criteria, aspects of the transportation, public service, and utility impact analyses are also incorporated in the Land Use Consistency Review (see Attachment D). Overall, the Project is not anticipated to significantly increase demands on transportation, public services, or utilities. Construction traffic is expected to be within the

		capacity of existing roadways and will not block or obstruct access to surrounding lands. A Traffic Control Plan will be developed with input from the Washington State Department of Transportation, Benton County, and Yakima County. Operational traffic generated by up to four staff and annual panel washing will be negligible. The existing capacity of local public services and utilities will accommodate the limited extent of such services needed for the Project, and no mitigation will be required.

4.14.C.2 Changes to the Proposal from the Existing Condition

Would the existing condition for this topic have the potential to affect the proposal now or in the future?

☒ No	☐ Yes	
	Topical Area/issue	**Changes**
	The current land use of the Project Area does not affect the Project. The Project Area was selected for its favorable site suitability characteristics, including high solar energy resource, topography, proximity to electrical infrastructure, compatibility with allowed uses on surrounding lands, and low resource conflicts. Further, as a "solar generation facility, major," the Project was previously an allowed conditional use in the GMAAD district prior to OA 2021-004. The Project's inconsistency with Benton County's recently amended zoning regulations for the GMAAD does not change the siting considerations or Project's compatibly with surrounding land uses. As described above, the Project was designed to meet the setback and other land use restrictions in the GMAAD. Similarly, those setback and land use restrictions would make conflicting land uses, such as those that would block the Project site's solar exposure or disrupt access to the Project Area for operations and maintenance, unlikely.	

4.14.D Proposed Mitigation and Monitoring

☒ Check this box when all final proposed mitigation is described here, or the location of the mitigation information is referenced here.

Are you proposing any mitigation, either required in rules or proposed for impacts?

☒ No	☐ Yes		
	Mitigation	**Applicable law and how well it addresses the impact**	**Expert agency participation**
	Based on the information provided above in Section 4.14.C and in the Land Use Consistency Review (see Attachment D), the Project will have no significant adverse effects on land use. Therefore, no land use mitigation or monitoring measures are proposed. Mitigation measures specific to other topics (e.g., wetlands and surface waters, wildlife habitat, or geological hazards) are addressed in their respective resource sections in Part 3 and Part 4 of this application and are summarized in Part 2, Section A.5.		

4.14.E Effects on Other Environmental Elements not yet Discussed

Does any information provided for this topic affect other environmental elements (e.g. water, plants, animals, noise), that has not already been considered and discussed in this form?

☒ No	☐ Yes	
	Environmental Element	**Additional changes or effects**
	N/A	N/A

4.14.F References

Benton County. 2021a. Benton County Countywide Comprehensive Plan. Last Amended January, 2021. Available online at: https://co.benton.wa.us/pview.aspx?id=1425.

Benton County. 2021b. Benton County Code. Current through Ordinance Amendment 2021-004 passed December 2021. Available online at: https://co.benton.wa.us/pview.aspx?catid=45&id=1541.

Benton County. 2021c. Benton County Planning Commission Meeting Audio, November 30, 2021. Available online at: https://www.co.benton.wa.us/agendaArchive.aspx?categoryid=1204&year=2021.

Benton County. 2021d. Benton County Planning Commission Meeting Minutes, December 21, 2021. Available online at: https://www.co.benton.wa.us/agendaArchive.aspx?categoryid=1181&year=2021.

WSDA (Washington Department of Agriculture). 2021. Agricultural Land Use Data. Available at: https://agr.wa.gov/departments/land-and-water/natural-resources/agricultural-land-use.

4.15 Housing

Part 4 Analysis is not required for this section.

4.16a Noise

4.16a.A Studies

Describe any studies that have already been conducted or will be conducted related to this topic and provide the expected timing for the completion of studies to be completed.

Study name	Expected completion date	Expert agency participation Name, Title, and Involvement	Completed Y/N
Acoustic Assessment Report (Attachment O)	Complete (April 2022)	Tetra Tech, environmental consultant for the Applicant	Y

☒ Check this box when all proposed studies for this topic are completed

4.16a.B Existing Condition and Issues

Describe the existing condition for this topic, including any existing problems associated with the issue being discussed.

Topical area/issue	Existing Condition and Problems
Regulatory	There are no noise regulations at the federal level with numerical decibel limits applicable to the Project; however, there are regulations at the state and county level. Environmental noise limits are established by WAC 173-60, which places limits on sounds crossing property boundaries based on the Environmental Designation for Noise Abatement (EDNA) of the sound source and the receiving properties. Daytime (7:00 a.m. – 10:00 p.m.) and nighttime (10:00 p.m. – 7:00 a.m.) limits are prescribed. The WAC regulatory limits are absolute and independent of the existing acoustic environment; therefore, a baseline noise survey is not requisite to determine conformance. The applicable WAC regulatory limits are further described in the Acoustic Assessment Report (Attachment O). Chapter 8.04 of the BCC provides numerical decibel limits. Chapter 6A.15 in the BCC regulates noise as a public nuisance and does not provide numerical decibel limits.
Existing Conditions	As described above, a baseline noise survey is not needed to demonstrate compliance with the WAC noise regulations. The existing ambient acoustic environment in the vicinity of the Project was estimated with a method published by the Federal Highway Administration (FHWA) in its Transit Noise and Vibration Impact Assessment (FHWA 2006). This document presents the general assessment of existing noise exposure based on the population density per square mile and proximity to area sound sources such as roadways and rail lines. The proposed Project is approximately 10 miles (16.2 kilometers) southeast of the city of Desert Aire, which has a population density of 2,288 per square mile according to the U.S. Census Bureau (2020); however, based on review of aerial imagery and County records, the population density within 2 kilometers of the Project is much less. Using the FHWA method and Census data for Desert Aire, ambient sound levels near the Project

	area are approximately 50 A-weighted decibel (dBA) equivalent sound level (L_{eq}) during daytime hours, 45 dBA L_{eq} during evening hours, and 50 dBA L_{eq} during nighttime hours.

4.16a.C Changes to and from Existing Condition

4.16aC.1 Changes to the Existing Condition from the Proposal

Could the activities associated with the proposal result in changes to the existing condition for this topic.

☐ No	☒ Yes	
	Topical Area/issue	**Changes**
	Construction	Acoustic emission levels for activities associated with Project construction were analyzed in Attachment O based on typical ranges of energy equivalent noise levels at construction sites, as documented by the EPA's (1980) "Construction Noise Control Technology Initiatives." The EPA methodology distinguishes between type of construction and construction stage. Using those energy equivalent noise levels as input to a basic propagation model, construction noise levels were calculated at a series of set reference distances. Construction was organized in the following work stages: site preparation and grading, trenching and road construction, equipment installation, and commissioning. Expected noise levels generated during each of these work stages are provided in the Acoustic Assessment Report (Attachment O). Project construction may cause short-term, but unavoidable, noise impacts that could be loud enough at times to temporarily interfere with speech communication outdoors, and indoors with windows open. Noise levels resulting from the construction activities will vary significantly depending on several factors such as the type and age of equipment, specific equipment manufacture and model, the operations being performed, and the overall condition of the equipment and exhaust system mufflers.
	Operation	Attachment O presents modeling results for sound levels that are anticipated to be generated by the Project. Operational sound levels were analyzed using Cadna-A (Computer Aided Noise Abatement), an acoustic modeling software

		program that conforms with the International Organization for Standardization (ISO) 9613, Part 2: “Attenuation of Sound during Propagation Outdoors” (ISO 1989). The method described in this standard calculates sound attenuation under weather conditions that are favorable for sound propagation, such as for downwind propagation or atmospheric inversion, conditions which are typically considered worst-case. The Project’s general arrangement was reviewed and directly imported into the acoustic model so that on-site equipment could be easily identified, buildings and structures could be added, and sound emission data could be assigned to sources as appropriate. The primary noise sources during operations are the solar array inverters and their integrated step-up transformers, BESS units, and collector substation transformers. The Project layout includes 159 step-up transformers distributed throughout the solar array areas. BESS units will either be positioned in groups of four at each step-up transformer location, or will be located in an approximately 16-acre area southwest of the substation. Both options for battery storage and their associated sound emissions were considered in the acoustic analysis. Sound emissions will be associated with the solar array transformers and inverters. Electronic noise from inverters can be audible but is often reduced by a combination of shielding, noise cancellation, filtering, and noise suppression. Substations have switching, protection, and control equipment, as well as power transformers, which generate the sound generally described as a low humming. The two transformer cores are the principal noise source at the Project substation, and cooling equipment (fans and pumps) are also noise components at this location. In addition, a short (0.25 mile) 500-kV transmission line will be a part of the Project. Details pertaining the transmission line have not been finalized, but the audible sound level associated with transmission line operation under foul weather conditions was conservatively estimated at 69 dBA at a distance of 50 feet from the transmission line, and this has been incorporated into the acoustic modeling analysis.

		Reference sound power levels input to CadnaA were provided by equipment manufacturers, based on information contained in reference documents or developed using empirical methods. Broadband (dBA) sound pressure levels were calculated for expected normal Project operations assuming that all components identified previously are operating continuously and concurrently at the representative manufacturer-rated sound power level. It is expected that all sound-producing equipment will operate during both daytime and nighttime periods. After calculation, the sound energy was then summed to determine the equivalent continuous A-weighted downwind sound pressure level at a point of reception. Attachment O provides modeling results in both visual (i.e., sound contour) and tabular formats, providing received sound levels resulting from operation at discrete noise sensitive receptors (NSRs; i.e., non-participating residences) and at adjacent property lines containing non-participating residences. Incorporating a number of conservative assumptions, acoustic modeling results indicate that the Project will comply with the 50 dBA nighttime limit at all non-participating NSRs implementing either BESS design configuration. In addition, the Project is predicted to comply with all the applicable WAC regulatory limits at the Project Lease Boundary implementing either BESS design configuration.

4.16a.C.2 Changes to the Proposal from the Existing Condition

Would the existing condition for this topic have the potential to affect the proposal now or in the future?

☒ No	**☐ Yes**	
	Topical Area/issue	**Changes**
	N/A	N/A

4.16a.D Proposed Mitigation and Monitoring

☒ Check this box when all final proposed mitigation is described here, or the location of the mitigation information is referenced here.

Are you proposing any mitigation, either required in rules or proposed for impacts?

☐ No	☒ Yes		
	Mitigation	**Applicable law and how well it addresses the impact**	**Expert agency participation**
	BMPs-Noise	WAC 173-60-050 exempts temporary construction noise from the state noise limits; however, BMPs will be implemented to reduce off-site construction noise impacts. Since construction equipment operates intermittently, and the types of machines in use at the Project change with the stage of construction, noise emitted during construction will be mobile and highly variable, making it challenging to control. Project construction will generally occur during the day, Monday through Friday. Furthermore, reasonable efforts will be made to minimize the impact of noise resulting from construction activities, including implementation of standard noise reduction measures listed below. Due to the infrequent nature of loud construction activities at the site, the limited hours of construction, and the implementation of noise mitigation measures, the temporary increase in noise due to construction is considered to be a less than significant impact. The construction management protocols will include the following noise mitigation measures to minimize noise impacts: • Maintain construction tools and equipment in good operating order according to manufacturers' specifications. • Limit use of major excavating and earth-moving machinery to daytime hours. • To the extent practicable, schedule construction activity during normal working hours on weekdays when higher sound levels are typically present and are found acceptable. Some limited activities, such as concrete pours, will be required to occur continuously until completion.	EFSEC

		• Equip any internal combustion engine used for any purpose on the job or related to the job with a properly operating muffler that is free from rust, holes, and leaks. • For construction devices that use internal combustion engines, ensure the engine's housing doors are kept closed, and install noise-insulating material mounted on the engine housing consistent with manufacturers' guidelines, if possible. • Limit possible evening shift work to low-noise activities such as welding, wire pulling, and other similar activities, together with appropriate material-handling equipment. • Use a complaint resolution procedure to address any noise complaints received from residents.	

4.16a.E Effects on Other Environmental Elements not yet Discussed

Does any information provided for this topic affect other environmental elements (e.g. water, plants, animals, noise), that has not already been considered and discussed in this form?

☒ No	☐ Yes	
	Environmental Element	**Additional changes or effects**
	N/A	N/A

4.16a.F References

EPA (U.S. Environmental Protection Agency). 1980. Construction Noise Control Technology Initiatives. Technical Report No. 1789. Prepared by ORI, Inc. Prepared for USEPA, Office of Noise Abatement and Control. September 1980. Available at: http://www.nonoise.org/epa/Roll5/roll5doc22.pdf.

FHWA (Federal Highway Administration). 2006. FHWA Roadway Construction Noise Model User's Guide, FHWA-HEP-05-054, January.

ISO (International Organization for Standardization). 1989. Standard ISO 9613-2 Acoustics – Attenuation of Sound during Propagation Outdoors. Part 2 General Method of Calculation. Geneva, Switzerland.

U.S. Census Bureau. 2020. Population and Housing Unit Estimates Datasets. Retrieved from http://www.census.gov/lprograms-suurveys/popest/data/data-sets.html.

4.16b Light, Glare, and Aesthetics

4.16b.A Studies

Describe any studies that have already been conducted or will be conducted related to this topic and provide the expected timing for the completion of studies to be completed.

Study name	Expected completion date	Expert agency participation Name, Title, and Involvement	Completed Y/N
Visual Impact Assessment (Attachment P)	Complete (April 2022)	Prepared by Tetra Tech, environmental consultant for the Applicant.	Y
Solar Glare Analysis Report (Attachment H)	Complete (April 2022)	Prepared by Tetra Tech, environmental consultant for the Applicant.	Y
Solar Glare Reports (Attachment H, Appendix A)	Complete (March 2022)	Prepared by Tetra Tech, environmental consultant for the Applicant.	Y
Federal Aviation Administration (FAA) Notice Criteria Tool (Attachment H, Appendix B)	Complete (March 2022)	Prepared by Tetra Tech, environmental consultant for the Applicant.	Y

☒ Check this box when all proposed studies for this topic are completed

4.16b.B Existing Condition and Issues

Describe the existing condition for this topic, including any existing problems associated with the issue being discussed.

Topical area/issue	Existing Condition and Problems
General description of site	The Project Lease Boundary is an approximately 5,852-acre area that includes the Project Area (approximately 4,573 acres).
Visual Setting	As described in the Visual Impact Assessment (Attachment P), the visual setting of the Project Area is agricultural land with a mix of irrigated cropland, dryland agriculture, and open rangeland with a low number of related agricultural buildings and rural residential development. There is an existing substation facility surrounded by the two most northeastern Project parcels with existing transmission lines crossing the northern end of the Project Area. The Project Area is situated on private land with scattered WDNR- and BLM-managed land within an approximately 2-mile vicinity. The Hanford Reach National Monument is approximately 1 mile east of the Project Area; however, this nearby area of the Monument is part of the Fitzner-Eberhardt Arid Lands Ecology Reserve, use of which is

	limited to agency-approved ecological research and environmental education activities (USFWS 2022). No designated federal, state, or local public recreation areas were identified within a 2-mile buffer of the Project Area. No roads in the vicinity of the Project Area have been identified as scenic roads or byways (FHWA 2022). There are a handful of rural residences adjacent to the Project Area and approximately 1 to 3 miles to the north. The nearest developed communities are Desert Aire, Washington, approximately 11 miles to the north/northwest, and Sunnyside, Washington, approximately 12 miles to the southwest. The Project site can be accessed from the north from SR 24 to SR 241 (Hanford Road) onto Wautoma Road, or from the south off of SR 241 (Hanford Road) and again onto Wautoma Road. SR 24 is 0.8 mile to the north of the Project Area. SR 241 runs adjacent to the Project Area to the west. Wautoma Road partially bisects the Project Area. Another major transportation route, SR 240, is approximately 5.5 miles to the east. Existing sources of artificial light in the Project Area are limited to structural lighting at scattered residential locations and security lighting from the existing substation. Mobile sources of light and glare originate from automobile traffic on surrounding roadways. Sources of glare in the Project Area include windows and reflective building materials such as metal roofs or siding.
Visibility of the site	The Visual Impact Assessment (Attachment P) determined that visibility of the Project Area varies between directional viewpoints. From viewpoints to the west, north, and south, depending on the intervening terrain, views of the Project Area tend to only be available within a couple miles from the Project Area. From viewpoints to the east, views of the Project Area may be available from a greater distance, but in general, also tend to be limited to a short distance from the Project Area due to intervening terrain.

4.16b.C Changes to and from Existing Condition

4.16b.C.1 Changes to the Existing Condition from the Proposal

Could the activities associated with the proposal result in changes to the existing condition for this topic.

☐ No	☒ Yes	
	Topical Area/issue	**Changes**
	Views	Depending on the viewpoint, views of the Project Area will shift from agricultural fields, local roadways, and existing substation and electrical transmission lines to solar arrays and supporting

		components associated with a solar energy generation facility. These views will be experienced primarily by drivers traveling on SR 241 and Wautoma Road and residents of residences located within a mile of the Project Area. The Project Area will also be visible very briefly from SR 24. Attachment P identifies five key observation points (KOPs) that were selected to assess the level of visual change resulting from the Project using the BLM contrast rating system (BLM 1986) (see Figure 3 in Attachment P). This system uses criteria to evaluate the degree of visual contrast (i.e., none, weak, moderate, and strong) and was followed to objectively measure potential changes to the visual environment. The BLM's contrast rating system is summarized in Section 4 of Attachment P. The five selected KOPs provide views of each side of the Project Area from publicly accessible locations. Factors considered in the selection of the KOPs included locations with sensitive viewers (e.g., local residences, recreationists, and motorists) and potential for the Project Area to be visible (e.g., distance and view angle). Potential visual impacts at each KOP are evaluated using the BLM contrast rating system (see Section 7 of Attachment P). The Project will result in weak to strong contrast with the surrounding landscape based on the addition of the Project's structural components. The Project would not be visible from viewing locations to the east along SR 240 because of distance and the screening of the Project by terrain. Views along SR 241 are limited to approximately 1 mile to the north or south of the Project Area due to screening of the Project by terrain. From viewpoints to the south and west, views of the Project from SR 241 would be mostly limited to the edges of the Project closest to SR 241. Project facilities would screen views of the remainder of the Project to the east, though some additional Project facilities located at higher elevations could be visible. From the northern terminus of SR 241 and from the residences west of SR 241, the higher elevations will provide a more expansive view of the Project. Views from Wautoma Road and the adjacent residences are mostly limited to the closest edges of the Project. Views of the Project from the adjacent residences will be mostly obscured by existing structures and trees adjacent to the residences. Where the Project is visible, the Project components would be consistent with other horizontal and vertical lines and geometric shapes visible throughout the landscape (e.g. existing fencing, roadway, substation, transmission towers and lines, utility poles and lines, agricultural structures) and would not block views of the surrounding hills. Views of the Project would attract attention and co-dominate or dominate the

		landscape. Depending on the proximity, the Project would result in weak to strong contrasts with the existing landscape. See Attachment P for a detailed analysis of the KOPs, including representative visual simulations of how the Project may appear in the region (see Figures 9 and 10 of Attachment P).
	Light	The Project is not expected to create a substantial new source of nighttime lighting. The Project will provide external safety lighting for both normal and emergency conditions at the primary access points, Project substation, BESS, and O&M building. However, lighting will be designed to provide the minimum illumination needed to achieve safety and security and will be downward-facing and shielded to focus illumination in the immediate area. Therefore, the Project will not introduce a source of light that will significantly impact views in the area.
	Glare	The glare analysis conducted for the Project analyzed potential glare hazards to residents and motorists in the area. No glare impacts were predicted for SR 240, SR 241, SR 24, or receptor residences. See Attachment H for further discussion of the glare analysis and the modeling results. Therefore, the Project will not introduce a source of glare that will significantly impact motorists, residents, or views in the area.

4.16b.C.2 Changes to the Proposal from the Existing Condition

Would the existing condition for this topic have the potential to affect the proposal now or in the future?

☒ No	**☐ Yes**	
	Topical Area/issue	**Changes**
	N/A	N/A

4.16b.D Proposed Mitigation and Monitoring

☒ Check this box when all final proposed mitigation is described here, or the location of the mitigation information is referenced here.

Are you proposing any mitigation, either required in rules or proposed for impacts?

☐ No	**☒ Yes**		
	Mitigation	**Applicable law and how well it addresses the impact**	**Expert agency participation**
	Management Practices – Light, Glare and Aesthetics	The Facility will implement BMPs including: • Downward-directed lighting to minimize horizontal or skyward illumination, and avoidance of	N/A

		steady-burning, high-intensity lights. • Utilizing solar panels with an anti-reflective coating to minimize glare. • Maintenance of revegetated surfaces until the vegetation has been established.	

4.16b.E Effects on Other Environmental Elements not yet Discussed

Does any information provided for this topic affect other environmental elements (e.g. water, plants, animals, noise), that has not already been considered and discussed in this form?

☒ No	**☐ Yes**	
	Environmental Element	**Additional changes or effects**
	N/A	N/A

4.16b.F References

BLM (Bureau of Land Management). 1986. Visual Resource Inventory. BLM Manual Handbook H-8410-1.

FHWA (Federal Highway Administration). 2022. America's Byways, California, Central Valley Section Map. Available online at: https://www.fhwa.dot.gov/byways/states/WA (Accessed February 11, 2022).

USFWS (U.S. Fish and Wildlife Service). 2022. Hanford Reach National Monument. Accessing the Monument. Available online at: https://www.fws.gov/refuge/Hanford_Reach/Visit/Access.html.

4.17 Recreation

Part 4 Analysis is not required for this section.

4.18 Archaeological and Historical Resources

4.18.A Studies

Describe any studies that have already been conducted or will be conducted related to this topic and provide the expected timing for the completion of studies to be completed.

Study name	Expected completion date	Expert agency participation Name, Title, and Involvement	Completed Y/N
Cultural Resources Survey for the Wautoma Solar Project, Benton County, Washington (Attachment Q)	Complete (May 2024)	Prepared by Tetra Tech, environmental consultant for the Applicant. DAHP and Yakama Nation have reviewed and provided comments and DAHP has concurred with the revised report (provided as Confidential Attachment Q).	Y

☒ **Check this box when all proposed studies for this topic are completed**

4.18.B Existing Condition and Issues

Describe the existing condition for this topic, including any existing problems associated with the issue being discussed.

Topical area/issue	Existing Condition and Problems
Site Conditions from Cultural Resources Survey	The Project Area covers approximately 4,573 acres of private land. Approximately 4,788 acres, inclusive of the Project Area, were surveyed for cultural resources in September and October of 2021 and July of 2023, including subsurface boundary probing of identified archaeological resources and systematic probing to assess the potential for buried resources (Survey Area). Additionally, an aboveground reconnaissance of historic property sites in the Survey Area as well as on adjacent parcels was conducted. The surveys identified 29 archaeological and historical resources. Within the Survey Area, 17 archaeological sites, 3 isolated finds, and 7 historic property sites were identified. Two additional historic property sites were identified through the aboveground reconnaissance survey on adjacent parcels. The 17 archaeological sites include 1 historic cistern and historic refuse scatter, 6 historic refuse scatters, 7 pre-contact lithic scatters, 1 historic wagon and cart, and 2 multi-component sites (one with a historic bridge abutment with associated historic refuse scatter and pre-contact lithic scatter, and the other with a historic

	refuse scatter and pre-contact lithic scatter). The 3 isolated finds are all pre-contact lithic flakes. The seven historic property sites include five BPA transmission lines and two historic buildings. The five transmission lines are the Midway-Grandview No. 1, Wautoma-Knight No. 1, North Bonneville-Midway No. 1, Wautoma-Rock Creek No. 1, and the Wine Country-Midway No. 1. The two historic building sites include the Robert Ranch (WA-KB-06) which is located on four parcels, both in the Survey Area and on adjacent parcels, and a small cabin (WA-KB-07). An additional two historic building sites were identified on adjacent parcels (WA-KB-V01 and WA-KB-V04). The following provides details regarding National Register of Historic Places (NRHP) recommendations for the identified resources: • Sites 45BN2211, 45BN2197, 45BN2199, 45BN2200, 45BN2201, 45BN2206, and 45BN2207are historic-era archaeological sites that have been recommended not eligible for listing on the NRHP, and therefore, pending concurrence from DAHP, would not require an archaeological excavation permit under RCW 27.53.060. • Eight precontact sites, one historic period site, one multi-component site, and three isolated finds were recorded that are potentially eligible for listing on the NRHP or are protected under RCW 27.53. These include sites 45BN1286, 45BN2121, 45BN2195, 45BN2196, 45BN2198, 45BN2202, 45BN2203, 45BN2204, 45BN2205, and 45BN2212, and IFs 45BN2208, 45BN2209, and 45BN2210. These archaeological resources require an archaeological excavation permit under RCW 27.53.060 if they cannot be avoided by the Project. The boundaries of these sites have been confirmed with subsurface probing. These resources should be protected during Project construction and operation with a 30-meter buffer perimeter that is flagged for avoidance prior to construction. • Five BPA transmission lines are located within the Survey Area. The North Bonneville-Midway No. 1, Midway-Grandview No. 1 line, Wine Country-Midway No. 1 line, and the Wautoma-Knight No. 1 line have been evaluated and are eligible or potentially eligible for listing in the NRHP within the context of the Multiple Property Documentation form prepared for the BPA Pacific Northwest Transmission system. Since these three transmission lines are eligible for listing in the NRHP under Criterion A, based on their association with the BPA, impacts to these transmission lines must be considered. No direct impacts are expected as

	part of this Project. Indirect impacts as a result of the change in setting will not be adverse. Interconnection to the BPA system is not within the scope of this assessment and will be conducted by the BPA. • The Wautoma-Rock Creek No. 1 does not meet the criteria of NRHP eligibility to be considered for listing under the BPA Multiple Property Documentation, and is not individually eligible for listing because it lacks integrity. No further measures are necessary to protect this resource. • None of the historic building sites were found to be eligible for listing in the NRHP. No further measures are necessary to protect these resources.

4.18.C Changes to and from Existing Condition

4.18.C.1 Changes to the Existing Condition from the Proposal

Could the activities associated with the proposal result in changes to the existing condition for this topic.

☐ **No**	☒ **Yes**	
	Topical Area/issue	**Changes**
	Disturbance of archaeological and historic property sites.	The Project has been designed to avoid direct impacts to cultural resources that are eligible or unevaluated/potentially eligible for listing on the NRHP. As currently designed, the Project has no direct impacts to such resources, which are avoided by a minimum of 30 meters. These resources include the following: 45BN1286, 45BN2121, 45BN2195, 45BN2196, 45BN2198, 45BN2202, 45BN2203, 45BN2204, 45BN2205, and 45BN2212, and IFs 45BN2208, 45BN2209, and 45BN2210, the Midway-Grandview No. 1 line, Wine Country-Midway No. 1 line, and the Wautoma-Knight No. 1 line. Seven archaeological sites are not avoided by the current design: 45BN2211, 45BN2197, 45BN2199, 45BN2200, 45BN2201, 45BN2206, and 45BN2207. These sites are historic-era refuse scatters or farm equipment pieces that have been recommended in confidential Attachment Q as not eligible for listing on the NRHP. The sites are not considered significant register-eligible resources and any impacts on them would not be considered significant impacts and would not require a permit under RCW 27.53. If any pre-contact-era archaeological site or any NRHP-eligible or unevaluated/potentially eligible historic-era site would be impacted by the Project's final design, the

		Applicant would obtain a DAHP excavation permit and perform all necessary archaeological work in order to comply with RCW 27.53.

4.18.C.2 Changes to the Proposal from the Existing Condition

Would the existing condition for this topic have the potential to affect the proposal now or in the future?

☐ No	☒ Yes	
	Topical Area/issue	**Changes**
	Avoidance of significant impacts to archaeological and historical resources.	As currently proposed, the Project has been designed to avoid a 30-meter buffer around NRHP-listed or unevaluated/ potentially eligible resources. The Applicant re-designed portions of the Project to avoid archaeological and historical sites following completion of the survey. If any pre-contact-era archaeological resource or an NRHP-eligible historic-era archaeological resource is impacted by the Project's final design, the Applicant would obtain a DAHP excavation permit and perform all necessary archaeological work in order to comply with RCW 27.53.

4.18.D Proposed Mitigation and Monitoring

☐ Check this box when all final proposed mitigation is described here, or the location of the mitigation information is referenced here.

Are you proposing any mitigation, either required in rules or proposed for impacts?

☐ No	☒ Yes		
	Mitigation	**Applicable law and how well it addresses the impact**	**Expert agency participation**
	Avoidance of Protected Sites	Given protection under RCW 27.53 of sites 45BN1286, 45BN2121, 45BN2195, 45BN2196, 45BN2198, 45BN2202, 45BN2203, 45BN2204, 45BN2205, and 45BN2212, and IFs 45BN2208, 45BN2209, and 45BN2210, these archaeological resources are recommended to be avoided by the Project's final layout. A minimum avoidance buffer of 30 meters (100 feet) around the sites has been recommended in confidential Attachment Q	DAHP, Confederated Tribes and Bands of the Yakama Nation

		and is achieved in the current Project design. If avoidance of these buffers is infeasible during final design, monitoring of construction activities within the buffer may be necessary. If avoidance of the sites themselves is infeasible, additional testing and excavation may be required under an Excavation Permit from DAHP under RCW 27.53. If impacts cannot be avoided, mitigation may be required and would be coordinated with DAHP and interested tribes.	
	Archaeological Excavation Permit	Pre-contact archaeological sites, regardless of register eligibility, or NRHP-eligible or unevaluated historic-era archaeological sites that cannot be avoided in the Project's final layout/design, require an archaeological excavation permit from DAHP under RCW 27.53.060 before they can be disturbed. This requirement is limited to the site boundaries themselves. Based on the register eligibility evaluations in confidential Attachment Q, no such sites will be impacted by the current design and no permit is necessary for the current design.	DAHP, Confederated Tribes and Bands of the Yakama Nation
	Unanticipated Discovery Plan	In the event unrecorded archaeological resources are identified during Project construction or operation, work within 30 meters (100 feet) of the find should be halted and directed away from the discovery until it can be assessed in accordance with steps in the Unanticipated Discovery Plan (provided as Appendix G in Attachment Q). This appendix to the Cultural Resources Report does not contain any confidential information and can be shared with Project personnel and contractors.	DAHP, County, Confederated Tribes and Bands of the Yakama Nation
	Continued Coordination with Native Americans	Only regulatory agencies can formally consult with tribes. Informal communications are included with this ASC as part of resource identification efforts and as due diligence.	DAHP, County, Confederated Tribes and Bands of the Yakama Nation

4.18.E Effects on Other Environmental Elements not yet Discussed

Does any information provided for this topic affect other environmental elements (e.g. water, plants, animals, noise), that has not already been considered and discussed in this form?

☒ No	☐ Yes	
	Environmental Element	**Additional changes or effects**
	N/A	N/A

4.18.F References

Rooke, Lara, Brady Berger, Sydni Kitchel, and Kaley Brown. 2021. Cultural Resources Survey for the Wautoma Solar Project, Benton County, WA. Prepared for Innergex by Tetra Tech, Bothell, WA.

4.19 Cultural Resources

4.19.A Studies

Describe any studies that have already been conducted or will be conducted related to this topic and provide the expected timing for the completion of studies to be completed.

Study name	Expected completion date	Expert agency participation Name, Title, and Involvement	Completed Y/N
Cultural Resources Survey for the Wautoma Solar Project, Benton County, Washington. (Attachment Q)	Complete (May 2024)	Washington Department of Archaeology and Historic Preservation has concurred with the cultural resource survey report.	Y

☒ Check this box when all proposed studies for this topic are completed

4.19.B Existing Condition and Issues

Describe the existing condition for this topic, including any existing problems associated with the issue being discussed.

Topical area/issue	Existing Condition and Problems
Existing tribal hunting or fishing rights	The Project consists of private land owned primarily by the Roberts Ranch (Roberts Family), non-tribal members. The Roberts Family does not allow tribal hunting and fishing on their property. Therefore, tribal hunting and fishing do not occur within the Project Area.
Existing tribal plant gathering	As stated above, the Project consists of private land owned by non-tribal members. Therefore, tribal plant gathering does not occur within the Project Area.
Tribal cultural sites	Nine of the archaeological sites identified by the cultural resources survey within the Survey Area are pre-contact-era sites associated with Native American activities. The Yakama Nation has affirmed to EFSEC that there are traditional cultural properties (TCPs) within the vicinity of the Project area.
A usual and accustomed area	According to DAHP's interactive map of Tribal Areas of Interest, the Project is within the usual and accustomed area of the Confederated Tribes of the Warm Springs Reservation of Oregon, Wanapum, and Yakama Nation.
Material culture artifacts	Archaeological sites are representations of Native American material culture that contain artifacts. Nine of the archaeological sites identified by the cultural resources survey of the Project are pre-contact-era sites associated with Native American activities.
Activities on the site could impede views of tribal cultural sites	The Yakama Nation has affirmed to EFSEC that there are TCPs within the vicinity of the Project area.

4.19.C Changes to and from Existing Condition

4.19.C.1 Changes to the Existing Condition from the Proposal

Could the activities associated with the proposal result in changes to the existing condition for this topic.

☒ No	☐ Yes	
	Topical Area/issue	**Changes**
	Tribal cultural sites	The Project has been designed to avoid direct impacts to all cultural resources that are eligible for listing on the NRHP when feasible. As currently designed, the Project has no direct impacts to such resources. However, as the design progresses, the Project layout may be changed such that impacts to the resources are created. The Applicant would continue to engage with the Tribes regarding the archaeological sites and the potential impacts of the Project on these sites (see Section 4.19.D below). If any protected sites are impacted by the Project, the Applicant would obtain a Department of Archaeology and Historic Preservation (DAHP) excavation permit and perform all necessary archaeological work in order to comply with Revised Code of Washington (RCW) 27.53.

4.19.C.2 Changes to the Proposal from the Existing Condition

Would the existing condition for this topic have the potential to affect the proposal now or in the future?

☐ No	☒ Yes	
	Topical Area/issue	**Changes**
	Tribal cultural sites	As currently proposed, the Project has been designed to avoid cultural sites, including avoidance of all resources that are eligible or potentially eligible for the NRHP or are protected under RCW 27.53. The Applicant re-designed portions of the Project to avoid cultural sites following completion of the survey.

4.19.D Proposed Mitigation and Monitoring

☐ **Check this box when all final proposed mitigation is described here, or the location of the mitigation information is referenced here.**

Are you proposing any mitigation, either required in rules or proposed for impacts?

☐ No	☒ Yes		
	Mitigation	**Applicable law and how well it addresses the impact**	**Expert agency participation**
	See mitigation measures listed in 4.18.D. Coordination and open communications will continue with interested tribes during Project permitting and design to incorporate tribal input regarding avoidance of potential impacts to cultural resources, including traditional use areas or other areas of significance to tribes. Lines of communication will remain open to better facilitate any response to unanticipated discoveries during construction.		DAHP, Confederated Tribes and Bands of the Yakama Nation

4.19.E Effects on Other Environmental Elements not yet Discussed

Does any information provided for this topic affect other environmental elements (e.g. water, plants, animals, noise), that has not already been considered and discussed in this form?

☒ No	☐ Yes	
	Environmental Element	**Additional changes or effects**
	N/A	N/A

4.20 Traffic and Transportation

4.20.A Studies

Describe any studies that have already been conducted or will be conducted related to this topic and provide the expected timing for the completion of studies to be completed.

Study name	Expected completion date	Expert agency participation Name, Title, and Involvement	Completed Y/N
No studies are proposed for traffic and transportation.			

☒ Check this box when all proposed studies for this topic are completed

4.20.B Existing Condition and Issues

Describe the existing condition for this topic, including any existing problems associated with the issue being discussed.

Topical area/issue	Existing Condition and Problems
Transportation Systems	Figure A-10 in Attachment A shows the road network in the Project vicinity. Access to the Project is via SR 241 to Wautoma Road. SR 241 is classified by the Washington State Department of Transportation (WSDOT) as a Rural Major Collector by the WSDOT Functional Classification Map (2022). Wautoma Road is classified by Benton County Public Works Department Public Works Map (2022) as a Rural Local Access road. The intersection of Wautoma Road and SR 241 is located in Yakima County. Access to Wautoma Road would occur solely from SR 241, and SR 241 will be accessed mostly from the north via SR 24 and, to a lesser extent, from the south at the town of Sunnyside. Access to SR 24 will occur via SR 240 from Richland, as well as via I 82 from Yakima. SR 24 to SR 241 would be the preferred route for the limited oversize deliveries for Project construction, such as support poles for the transmission line or the main power transformers. The roads leading to the Project Area are paved and include I-82, SR 240, SR 24, and SR 241. The regional highways and local streets that may be used by workers coming from homes or hotels to the Project Area are paved. The intersection with SR 24 and SR 241 is a two-way stop-controlled four-leg intersection. Section 4.20.C below provides a summary of anticipated Project construction routes. The assessment provided in this section relies on WSDOT data, as well as aerial and street imagery provided by Google Earth Pro (2022). Based on a review of this imagery and information provided on the WSDOT Corridor Sketch Summary Viewer (WSDOT 2022a), a summary of road conditions (all asphalt) by route follows:

	• SR 24: Mostly good to very good condition, with less than 5 percent of the route considered fair condition (per SR 24 Corridor Sketch Summary 2018). • SR 241: Appears to be in fair to good condition by aerial and street imagery, although the street imagery is dated 2012. No WSDOT ratings are available. • SR 240: Approximately 80 percent good to very good condition, with over 15 percent in fair condition and under 5 percent poor and very poor condition (per SR 240 Corridor Sketch Summary 2018). • I-82: Approximately 80 percent good to very good condition, with approximately 15 percent fair and 5 percent poor and very poor (per I-82 Corridor Sketch Summary 2018). • Wautoma Road: Appears to be in fair to good condition by aerial and street imagery, although the street imagery is dated 2012. Traffic counts have not been collected in direct association with the Project. However, available data regarding traffic levels from the WSDOT Traffic GeoPortal (WSDOT 2022b) and from the Yakima County Transportation Department (pers. comm., B. Sheffield February 2, 2022) are as follows (WSDOT 2022b): • Wautoma Road: 53 Average Daily Traffic (ADT) near the intersection with SR 241. (2014) • SR 241: 1,400 ADT near the intersection with SR 24. (2020) • SR 24: 3,100 ADT near the intersection with SR 241. Near the intersection with I-82, the ADT is 19,000. (2020) • SR 240: 4,500 ADT near the intersection with SR 24. (2020) • I-82: 42,000 to 46,000 ADT near the intersection with SR 24. (2020) Traffic data are not available for other roads in the Project Area. WSDOT generically classifies state highways in rural areas with a level of service “C” as acceptable, indicating speeds near free flow but restricted freedom to maneuver. Site-specific level of service information for the state routes near the Project have not been developed by WSDOT, and Yakima and Benton Counties do not maintain information for state highways. However, it is anticipated that the actual level of service in the vicinity of the Project is closer to “B” or “A”, indicating relatively free flow of traffic most of the time. Based on WSDOT Corridor Sketch Summaries, I-82 and SR 241 perform non-congested along 100 percent of the route, while SR 24 and SR 240 perform non-congested along approximately 90 percent of the routes, with approximately 10 percent of each road considered congested on a regular basis.

Waterborne, Air, and Rail Traffic	There are no shipping ports near the Project. However, the Ports of Seattle, Vancouver, or Portland are the most likely ports to receive solar equipment, which will then be trucked to the Project Area. The Port of Seattle is approximately 140 miles northwest (180 miles driving distance) from the Project. The Port of Portland is approximately 206 miles west of the Project via roadways. The Port of Vancouver is approximately 315 miles northwest of the Project via roadways. Air transportation is not anticipated for use in Project construction or operation. The Yakima Air Terminal in the city of Yakima provides air service to Seattle. Union Pacific Railroad's network includes a track between Wallula and the city of Yakima, which is to the west and south of the Project. Rail transportation is not anticipated for use in Project construction or operation.
Public and Pedestrian Traffic	The traffic access route consists of interstate highways and rural state routes that are not in areas associated with public transit, pedestrian demand, or pedestrian-oriented land use.
Parking	No designated parking areas are currently present at the Project location.
Movement of People or Goods	The existing conditions related to the movement of people and goods near the Project is described above, under "Transportation Systems," "Waterborne Air and Rail Traffic," and "Public and Pedestrian Traffic."
Transportation Hazards	Given the mountainous terrain along transportation routes, steep grades and winding sections of roads are occasionally present along the access routes. Inclement weather such as snow and icy conditions may also contribute to hazards on steep and winding roads.

4.20.C Changes to and from Existing Condition

4.20.C.1 Changes to the Existing Condition from the Proposal

Could the activities associated with the proposal result in changes to the existing condition for this topic.

☐ No	☒ Yes	
	Topical Area/issue	**Changes**
	Transportation Systems	**Improvements** There are no anticipated changes or improvements to existing transportation infrastructure except for the proposed access locations on SR 241 and Wautoma Road. New service roads constructed for the Project will be private and internal to the Project Area. These roads will be inside the Project fence line and will not provide any new travel routes for area residents. The

		Applicant will obtain County Right-of-Way Access Permits and a WSDOT Right-of-Way Access Permit for the proposed Project approaches on county and state routes based on final design. **Construction** During the estimated 22-month construction period, Project construction would add a peak of 1,210 one-way vehicle trips (i.e., 605 round trips) and an average of 588 one-way vehicle trips (i.e., 294 round trips) per day. Peak traffic numbers would occur over a 3-month period, with the numbers tapering up and down before and after the peak. The primary source of construction traffic would be worker commutes to the Project, originating from nearby communities including Yakima, Sunnyside, and Richland/Tri-Cities. Based off available lodging and housing, the worker commutes were divided as follows: • 60 percent of workers commute from Richland/Tri-City area • 35 percent of workers commute from Yakima • 5 percent of workers commute from Sunnyside or neighboring communities The trip estimate is based on the Project's estimated peak and average workforces, with a carpool factor of zero (to assume worst-case scenario), an average of 20 heavy truck equipment deliveries per day (peak of 35), and an average of 44 water truck deliveries per day (peak of 55). It is likely that some carpooling will occur, which would reduce the trips generated by worker commutes. Construction traffic would include heavy-duty trucks, such as semi-trailer dump trucks and 40-foot container trucks, that would be carrying gravel and other materials required to improve or construct new access roadways. These heavy-duty trucks would also provide concrete for component foundations and materials for the solar module blocks themselves. In addition to concrete and gravel, water trucks delivering water to the Project would be required. An average capacity of 4,000 gallons per water truck was assumed for trip generation calculations. Water would be needed for dust control during road construction and for the temporary concrete batch plant (see Section 2.B.8.d). Semi-trailer flat beds carrying electrical equipment and materials required for solar panel construction and power transmission equipment also will be necessary. These truck delivery and water truck trips are expected to occur during off-peak hours throughout the workday. All truck deliveries are assumed to come from west of the Project along the interstates, and then SR 24 to SR 241, given the location of the Port of Seattle. It is assumed construction crews will drive pick-up trucks to and from the Project.

		During the 22-month construction period, traffic on SR 241 in the vicinity of the Project would increase from an average of 1,400 trips per day to an average of 1,978 trips per day. The majority of these trips would consist of worker commute vehicles during the morning and evening commute times. Worker commutes would add up to approximately 225 vehicles to SR 241 during the morning commute and again in the evening, with approximately 95 percent of the workers arriving from the north (Richland or Yakima areas) and 5 percent arriving from the south (Sunnyside area). Equipment deliveries are expected to be approximately 35 per day during 7 months of peak construction activity and would taper before and after the peak construction activity, averaging 20 truck deliveries per day over the life of the Project. Water truck deliveries are expected to be an average of 44 per day and a peak of 55 per day. As a conservative assumption for this application, water truck deliveries are assumed to come either from the Moxee, Washington or Sunnyside, Washington areas. Equipment and water truck deliveries will occur during off-peak hours. Given the current uncongested nature of SR 241, the temporary increase in traffic counts, and anticipated traffic control measures described below, significant impact to traffic flow is not expected. Traffic on SR 24 would also increase temporarily during construction. ADT on SR 24 west of the intersection with SR 241 would increase from 3,100 to an average of 3,386 near the Project, while east of the intersection with SR 241, the increase would be from 3,100 to an average of 3,370. The western portion of SR 24 near I-82 at Yakima is the most congested portion of the road with a current ADT of 19,000, which is estimated to increase to an average ADT of 19,198 during construction. This equates to an approximately 1 percent increase, primarily consisting of passenger vehicle traffic for worker commutes. Additional delays during construction could occur on SR 24 near I-82, but given the percentage of traffic increase, these delays would be minimal. Significant impact to traffic flow along the remaining portions of SR 24 are not expected given the uncongested nature of the current state. SR 240 would likewise see an increase of traffic counts during construction. Existing traffic counts near SR 24 reveal an ADT of 4,500, which would increase to average of 4,770 during construction. Similar to SR 24, SR 240 has a currently congested portion at I-182 near Richland. It is safe to assume that some of the worker traffic would travel to the Project from areas north of I-182; therefore, only a relatively small increase in traffic would be seen on the busiest portions of SR 240. The remaining stretch of SR 240 toward SR 24 is considered uncongested, and the increase in traffic due to construction of the Project is not likely to change this current uncongested status.

		Some worker commuting traffic and truck deliveries from Yakima will travel along I-82 near SR 24. Considering the current 42,000 to 46,000 trips per day on I-82, the possibility of an additional 198 trips would not significantly impact the current uncongested state of this roadway. The timing of peak construction activity on site may overlap with the harvest season; however, harvest vehicles typically travel throughout the day and are not limited to prime commuting hours, which is when the highest impact of workers commuting to the Project will occur. **Operations** Operations traffic would be negligible since there will be four or fewer permanent employees. The limited number of daily trips anticipated during Project operations would be negligible relative to current and projected level of services (LOS). Panel washing is expected to occur for approximately 2 to 3 weeks each year as part of the operations and maintenance phase. It is assumed the permanent operations employees would be utilized for the panel washing, and therefore, no additional worker trips are expected. Water truck trips may be required to bring water to the site for panel washing. If required, water truck deliveries are estimated to occur 1 to 2 times per day during panel washing. These deliveries will likely be during off-peak hours.
	Waterborne, Air, and Rail Traffic	No changes will occur to waterborne traffic as a result of Project construction or operation because the Port of Seattle is of sufficient size to accommodate any solar equipment that may be shipped to the Project. No changes will occur to rail or air traffic as a result of Project construction or operation because construction and operation of the Project would not use these modes of transportation. Furthermore, the glare analysis (see Part 4, Section 4.16b, and Attachment H) concluded that no glare hazard will exist for air traffic or roadways as a result of solar panel operations.
	Public and Pedestrian Traffic	No changes will occur to the routing of public transit or the use of pedestrian and bike routes as a result of Project construction or operations. Also, none of these facilities are located close to the Project site.
	Parking	During construction, workers would park in designated areas of the construction site, off public roads. Construction would not adversely affect the availability of parking for other users because no parking is currently available. Parking needs during operations would be limited to occasional use by up to four employees at the O&M building. The Project will have a gravel parking area at the O&M building to accommodate these employees. As the O&M building is internal

		to the Project, no vehicular backing up or maneuvering would occur within a public right-of-way.
	Movement of People or Goods	Improvements to the two Project approaches along SR 241 may temporarily impede traffic along that roadway. Therefore, a Traffic Control Plan will be prepared for approval by WSDOT. Similarly, a Traffic Control Plan will be created in coordination with Benton and Yakima Counties for construction of approaches along Wautoma Road. Post construction Project operations will not affect the movement of people or goods within or surrounding the Project Area.
	Transportation Hazards	By complying with local, state, or federal requirements related to traffic and transportation, the Project will not restrict vehicular use or increase local safety hazards. Furthermore, Project construction routes were chosen to minimize the use of urban roads to the extent possible. The Applicant will obtain oversize and overweight haul permits in compliance with WSDOT and Benton County requirements to safely haul equipment on highways and county roads. The Applicant will also obtain applicable permits from WSDOT, Benton County, and Yakima County for access to public road right-of-way. A Traffic Control Plan will be prepared in coordination with WSDOT and the Benton and Yakima Counties Public Works Departments to mitigate transportation hazards during the construction of Project accesses to public right-of-way. As described in Part 4, Section 4.13.C.1, the Project's BESS components would be delivered to the Project in compliance with 49 CFR §173.185, which regulates the transportation of lithium-ion batteries. For these reasons, the Project will not result in significant transportation hazards or impacts to traffic safety.

4.20.C.2 Changes to the Proposal from the Existing Condition

Would the existing condition for this topic have the potential to affect the proposal now or in the future?

☒ No	**☐ Yes**	
	Topical Area/issue	**Changes**
	N/A	N/A

4.20.D Proposed Mitigation and Monitoring

☒ Check this box when all final proposed mitigation is described here, or the location of the mitigation information is referenced here.

Are you proposing any mitigation, either required in rules or proposed for impacts?

☐ No	☒ Yes		
	Mitigation	**Applicable law and how well it addresses the impact**	**Expert agency participation**
	WSDOT Oversize and Overweight Permit	A permit will be obtained for heavy or oversized loads in accordance with WSDOT regulations including RCW 46.44 and WAC 468-38.	WSDOT
	WSDOT Right of Way Access Permit	Per WAC 468-51, the Applicant will obtain a General Permit from WSDOT to upgrade the portion of the approach off SR 241 that is within the WSDOT right-of-way.	WSDOT
	Benton County and/or Yakima County Right of Way Access Permit	Based on final Project design, the Applicant will obtain access permits to construct approaches to County road right-of-way from Benton and Yakima Counties pursuant to County Standards.	Benton County Public Works Department, Yakima County Public Works Department
	Traffic Control Plan	A Traffic Control Plan will be prepared in consultation with WSDOT for traffic management during improvement of highway access. This plan would contain measures to facilitate safe movement of vehicles in the vicinity of the construction zone and would be in accordance with 23 CFR §655 Subpart F that provides for the Federal Highway Administration to maintain the Manual on Uniform Traffic Control Devices for Streets and Highways, which defines standards for traffic control. A Traffic Control Plan will be prepared in coordination with Benton County and Yakima County Public Works Departments for traffic management during construction and for construction of access approaches from county right-of-way.	WSDOT, Benton County Public Works Department, Yakima County Public Works Department

4.20.E Effects on Other Environmental Elements not yet Discussed

Does any information provided for this topic affect other environmental elements (e.g. water, plants, animals, noise), that has not already been considered and discussed in this form?

☒ No	☐ Yes	
	Environmental Element	**Additional changes or effects**
	N/A	N/A

4.20.F References

Benton County Public Works. 2022. Public Works Map. Available online at: https://bentonco.maps.arcgis.com/apps/webappviewer/index.html?id=6c2cc10410ad4009b53d3a7779c96b5e.

Google Earth. 2022. Aerial Imagery for the Wautoma Solar Project Area. Image date April 2021. Accessed February 16, 2022.

WSDOT (Washington State Department of Transportation). 2022a. Corridor Sketch Summary Map. Available online at: https://wsdot.maps.arcgis.com/apps/View/index.html?appid=fc716ce9593943198c491c383fc1c009.

WSDOT. 2022b. Traffic GeoPortal. Accessed February 2022. Available online at: https://www.wsdot.wa.gov/data/tools/geoportal/?config=traffic.

WSDOT. 2022. Functional Classification Map. Available online at: https://wsdot.maps.arcgis.com/home/webmap/viewer.html?layers=5fa0e9671d104edfadb7fa4e7f9ed17f.

Yakima County Transportation Department. 2022. Personal communication from Brett Sheffield of the Yakima County Transportation Department via email dated February 2, 2022, regarding traffic counts for Wautoma Road.

4.21 Public Services and Facilities

Part 4 Analysis is not required for this section.

4.22 Utilities

Part 4 Analysis is not required for this section.

ATTACHMENT A: PROJECT MAPS

Wautoma Solar

Figure A-1
Preliminary Site Plan

BENTON AND YAKIMA COUNTIES, WA

Wautoma Substation Access Road

Site Entrance

Wautoma Substation

241

Site Entrance

Wautoma Rd

Yakima County

Benton County

- Project Lease Boundary
- Project Area

Base Map

- Existing Transmission Lines
- Roads
- County Boundary

Preliminary Site Plan

- Solar Array
- Access Roads
- Security Fence
- Collection Lines (Underground)
- Transmission Line (Overhead)
- Inverters
- O&M Facility
- Project Substation

INNERGEX

TETRA TECH

Reference Map

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Wautoma Solar

Figure A-1
Preliminary Site Plan
Sheet 1 of 8

BENTON AND YAKIMA COUNTIES, WA

- Project Lease Boundary
- Project Area

Base Map
- Existing Transmission Lines
- Roads
- County Boundary

Preliminary Site Plan
- Solar Array
- Access Roads
- Security Fence
- Collection Lines (Underground)
- Transmission Line (Overhead)
- Inverters
- O&M Facility
- Project Substation

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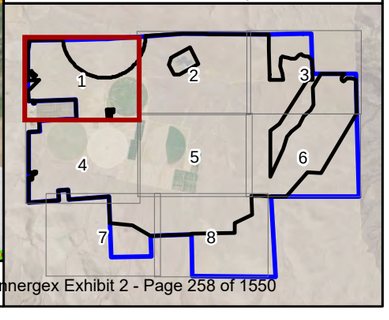

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Wautoma Solar

Figure A-1
Preliminary Site Plan
Sheet 2 of 8

BENTON AND YAKIMA COUNTIES, WA

- Project Lease Boundary
- Project Area

Base Map

- Existing Transmission Lines
- Roads
- County Boundary

Preliminary Site Plan

- Solar Array
- Access Roads
- Security Fence
- Collection Lines (Underground)
- Transmission Line (Overhead)
- Inverters
- O&M Facility
- Project Substation

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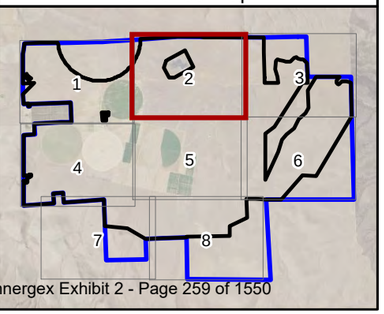

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Wautoma Solar

Figure A-1
Preliminary Site Plan
Sheet 3 of 8

BENTON AND YAKIMA COUNTIES, WA

- Project Lease Boundary
- Project Area

Base Map
- Existing Transmission Lines
- Roads
- County Boundary

Preliminary Site Plan
- Solar Array
- Access Roads
- Security Fence
- Collection Lines (Underground)
- Transmission Line (Overhead)
- Inverters
- O&M Facility
- Project Substation

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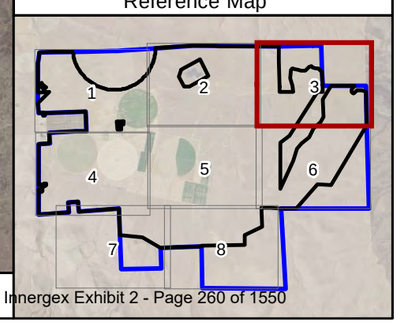
Reference Map



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Wautoma Solar

Figure A-1
Preliminary Site Plan
Sheet 4 of 8

BENTON AND YAKIMA COUNTIES, WA

Yakima County
Benton County

- Project Lease Boundary
- Project Area

Base Map
- Existing Transmission Lines
- Roads
- County Boundary

Preliminary Site Plan
- Solar Array
- Access Roads
- Security Fence
- Collection Lines (Underground)
- Transmission Line (Overhead)
- Inverters
- O&M Facility
- Project Substation

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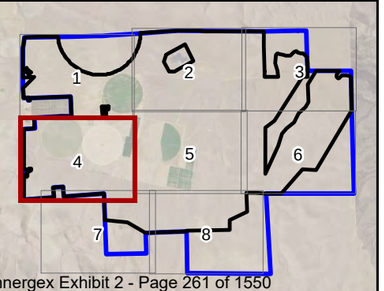
Reference Map



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Wautoma Solar

Figure A-1
Preliminary Site Plan
Sheet 5 of 8

BENTON AND YAKIMA COUNTIES, WA

- Project Lease Boundary
- Project Area

Base Map

- Existing Transmission Lines
- Roads
- County Boundary

Preliminary Site Plan

- Solar Array
- Access Roads
- Security Fence
- Collection Lines (Underground)
- Transmission Line (Overhead)
- Inverters
- O&M Facility
- Project Substation

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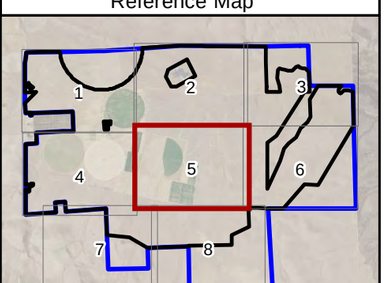
Reference Map



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Wautoma Solar

Figure A-1
Preliminary Site Plan
Sheet 6 of 8

BENTON AND YAKIMA COUNTIES, WA

- Project Lease Boundary
- Project Area

Base Map

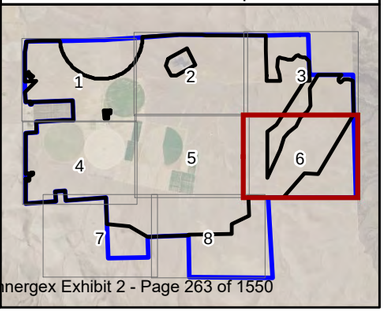
- Existing Transmission Lines
- Roads
- County Boundary

Preliminary Site Plan

- Solar Array
- Access Roads
- Security Fence
- Collection Lines (Underground)
- Transmission Line (Overhead)
- Inverters
- O&M Facility
- Project Substation

INNERGEX TETRA TECH

Reference Map



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Wautoma Solar

Figure A-1
Preliminary Site Plan
Sheet 7 of 8

BENTON AND YAKIMA COUNTIES, WA

- Project Lease Boundary
- Project Area

Base Map

- Existing Transmission Lines
- Roads
- County Boundary

Preliminary Site Plan

- Solar Array
- Access Roads
- Security Fence
- Collection Lines (Underground)
- Transmission Line (Overhead)
- Inverters
- O&M Facility
- Project Substation

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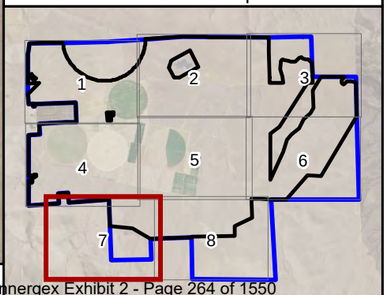
TETRA TECH

Reference Map



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Wautoma Solar

Figure A-1
Preliminary Site Plan
Sheet 8 of 8

BENTON AND YAKIMA COUNTIES, WA

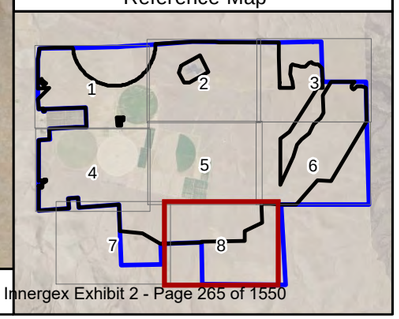
- Project Lease Boundary
- Project Area

Base Map
- Existing Transmission Lines
- Roads
- County Boundary

Preliminary Site Plan
- Solar Array
- Access Roads
- Security Fence
- Collection Lines (Underground)
- Transmission Line (Overhead)
- Inverters
- O&M Facility
- Project Substation

INNERGEX TETRA TECH

Reference Map



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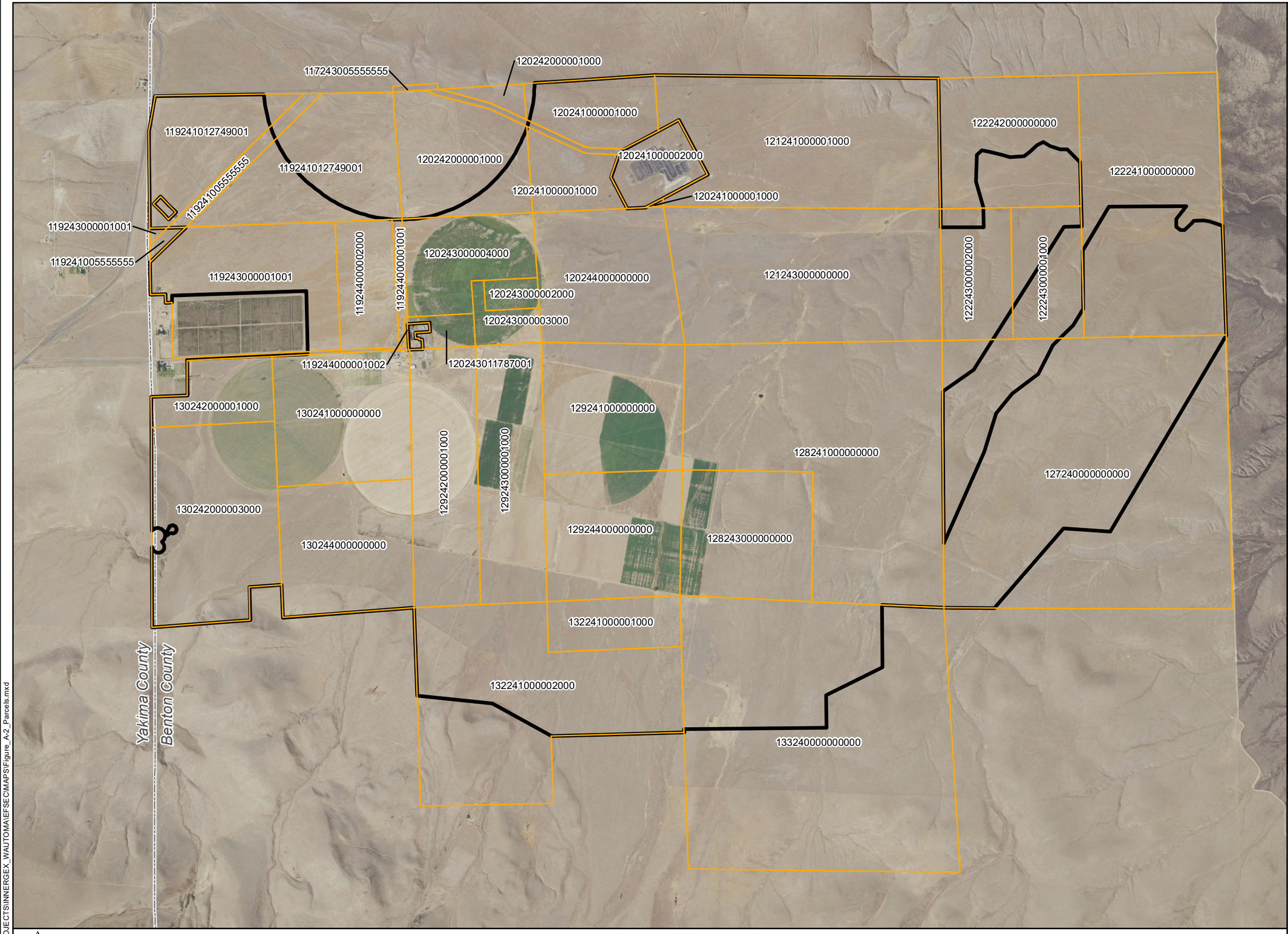
Wautoma Solar

Figure A-2
Assessors Parcels

BENTON AND YAKIMA COUNTIES, WA



Project Area

Project Lease Boundary Parcels

County Boundary

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TETRA TECH

Reference Map

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Wautoma Solar

Figure A-3
Soils

BENTON AND YAKIMA COUNTIES, WA

Project Area

County Boundary

Yakima County

Benton County

Soil Unit: Soil Name		
BmAB: Burke silt loam, 0 to 5 percent slopes	HeE: Hezel loamy fine sand, 0 to 30 percent slopes	ScAB: Scooteney silt loam, 0 to 5 percent slopes
BnB: Burke silt loam, shallow, 0 to 5 percent slopes	KnE: Kiona very stony silt loam, 0 to 30 percent slopes	ShAB: Shano silt loam, 0 to 5 percent slopes
EuAB: Esquatzel silt loam, 0 to 5 percent slopes	KnF: Kiona very stony silt loam, 30 to 65 percent slopes	SnE2: Shano very fine sandy loam, 15 to 30 percent slopes, eroded
FeC: Finley fine sandy loam, 0 to 15 percent slopes	ReB: Ritzville silt loam, 0 to 5 percent slopes	WdAB: Warden silt loam, 0 to 5 percent slopes
FfE: Finley stony fine sandy loam, 0 to 30 percent slopes	ReE3: Ritzville silt loam, 15 to 30 percent slopes, severely eroded	WdE3: Warden silt loam, 15 to 30 percent slopes, severely eroded
	ReF: Ritzville silt loam, 30 to 65 percent slopes	WfC2: Warden very fine sandy loam, 0 to 15 percent slopes

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TETRA TECH

Reference Map

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0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

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Wautoma Solar

Figure A-4
Project Topography and Geologic Hazards

BENTON AND YAKIMA COUNTIES, WA

- Project Area
- Fenced Area
- WADNR LiDAR Slopes >15%
- Benton County Combined Erosion Hazard and Slopes > 15%
- Yakima County Critical Areas: Alluvial Fan Intermediate Risk

INNERGEX

TETRA TECH

Reference Map

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Wautoma Solar

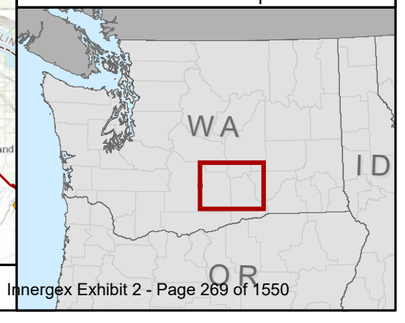
Figure A-5
Historic Earthquake Locations

BENTON AND YAKIMA COUNTIES, WA

- Project Area
- 25-mile Buffer
- Pacific Northwest Seismic Network Earthquakes Greater Than Magnitude 1
- Active Faults
- County Boundary

INNERGEX TETRA TECH

Reference Map



Kittitas County
Yakima County
Grant County
Adams County
Benton County
Franklin County
West Valley
Yakima
Sunnyside
Richland
Pasco
Kennewick
Beverly
Othello
Mattawa
Wapato
Harrah
Zillah
Toppenish
Granger
Outlook
Grandview
Mabton
Prosser
Benton City
Union Gap
Terrace Heights
Selah
Parker
Yakima Firing Center
Hanford Nuclear Reservation
Saddle Mt Nat'l Wildlife Refuge
Palouse to Cascades State Park
Columbia National Wildlife Refuge
Toppenish National Wildlife Refuge
Yakama Nation Reservation
SADDLE MOUNTAINS
WAHLUKE SLOPE
UMTANUM RIDGE
YAKIMA RIDGE
RATTLESNAKE HILLS
SNIPES MOUNTAIN
HORSE HEAVEN HILLS
COLD CREEK VALLEY
MOXEE VALLEY
YAKIMA VALLEY
Umtanum Creek
Johnson Creek
North Fork Lmuma Creek
Lmuma Creek
Hanson Creek
Wenas Creek
Selah Creek
Yakima River
Satus Creek
Dry Creek
Logy Creek
Harlan Rd
Yakima Scenic Byway
4191 ft
3428 ft
1633 ft
2202 ft

1:350,000 NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 5 10 20 Miles

Source: WDNR

R:\PROJECTS\INNERGEX_WAUTOMA\EFSEC\MAPS\Figure_A-5_Geologic_Hazards.mxd

Wautoma Solar

Figure A-6
Surface Waters and Floodplain

BENTON AND YAKIMA COUNTIES, WA

- Project Area
- Security Fence
- Permanent Footprint
- County Boundary
- Ephemeral Stream
- Wetland
- FEMA 1% Annual Chance Flood Hazard Area

INNERGEX

TETRA TECH

Reference Map

Yakima County

Benton County

1:22,000

NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\INNERGEX_WAUTOMA\EFSEC\MAPS\Figure_A-6_Surface_Waters_Field.mxd

Wautoma Solar

Figure A-7
Critical Aquifer Recharge Areas

BENTON AND YAKIMA COUNTIES, WA

- Project Area
- Security Fence
- Permanent Footprint
- County Boundary

Benton County CARA

- Alluvial Soil
- 100 Year Flood Zone
- Combined Hydrologic Soil Group A & Irrigated Ag

Yakima County

Benton County

INNERGEX

TETRA TECH

Reference Map

1:24,000

NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 0.25 0.5 1 Miles

R:\PROJECTS\INNERGEX_WAUTOMA\EFSEC\MAPS\Figure_A-7_CARA.mxd

Wautoma Solar

Figure A-8
Habitat Types
within the Project Area

BENTON AND YAKIMA COUNTIES, WA

Project Area

County Boundary

Habitat Types

- Agricultural land
- Developed/disturbed
- Eastside (interior) grassland
- Irrigated hedgerow
- Non-native grassland and forbland
- Planted grassland
- Rabbitbrush shrubland
- Shrub-steppe
- Talus

INNERGEX

TETRA TECH

Reference Map

Yakima County

Benton County

1:22,000

NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\INNERGEX_WAUTOMA\EFSEC\MAPS\Figure_A-8_Habitat.mxd

Wautoma Solar

Figure A-9

Big Game Habitat Areas in the Project Area

BENTON AND YAKIMA COUNTIES, WA

Project Area
Solar Array
Security Fence
County Boundary
WHCWG (2010) Statewide
Elk Habitat Concentration Area
Mule Deer Habitat Concentration Area
WHCWG (2012) Columbia Plateau
Landscape Integrity Core Area
Arid Lands Initiative (2014)
Priority Core Area
Priority Linkage Area

INNERGEX
TETRA TECH

Reference Map

Yakima County
Benton County

1:23,817
NAD 1983 StatePlane Washington South FIPS 4602 Feet
0 0.25 0.5 1 Miles
NOT FOR CONSTRUCTION

R:\PROJECTS\INNERGEX_WAUTOMA\EFSEC\MAPS\Figure_A-9_Big_Game_Habitat.mxd

Wautoma Solar

Figure A-10
Transportation Routes

BENTON AND YAKIMA COUNTIES, WA

- Project Area
- County Boundary
- Airport
- Railroad
- Interstate
- Highway

INNERGEX

TETRA TECH

Reference Map

Kittitas County
Yakima County
Grant County
Adams County
Benton County
Franklin County
Yakima
Yakima Air Terminal
Selah
Zillah
Sunnyside
Grandview
Prosser
Mattawa
Othello
Benton City
Richland
Tri-Cities Airport
Pasco
Kennewick
Yakima Firing Center
Hanford Nuclear Reservation
Saddle Mt Nat'l Wildlife Refuge
Palouse to Cascades State Park
Yakima Nation Reservation
Toppenish National Wildlife Refuge
SADDLE MOUNTAINS
WAHLUKE SLOPE
UMTANUM RIDGE
YAKIMA RIDGE
RATTLESNAKE HILLS
COLD CREEK VALLEY
YAKIMA VALLEY
MOXEE VALLEY
SNIPES MOUNTAIN
HORSE HEAVEN HILLS
MISSOURI FLATS
North Fork Lmuma Creek
Lmuma Creek
Hanson Creek
Selah Creek
Wenas Creek
Satus Creek
Logy Creek
Yakima River
821
12
82
97
22
223
241
243
24
26
17
240
225
224
182
395
221

1:330,000 NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 5 10 20 Miles

R:\PROJECTS\INNERGEX_WAUTOMA\IEFSEC\MAPS\Figure_A-10_Transportation.mxd

ATTACHMENT B: PROJECT TYPICALS

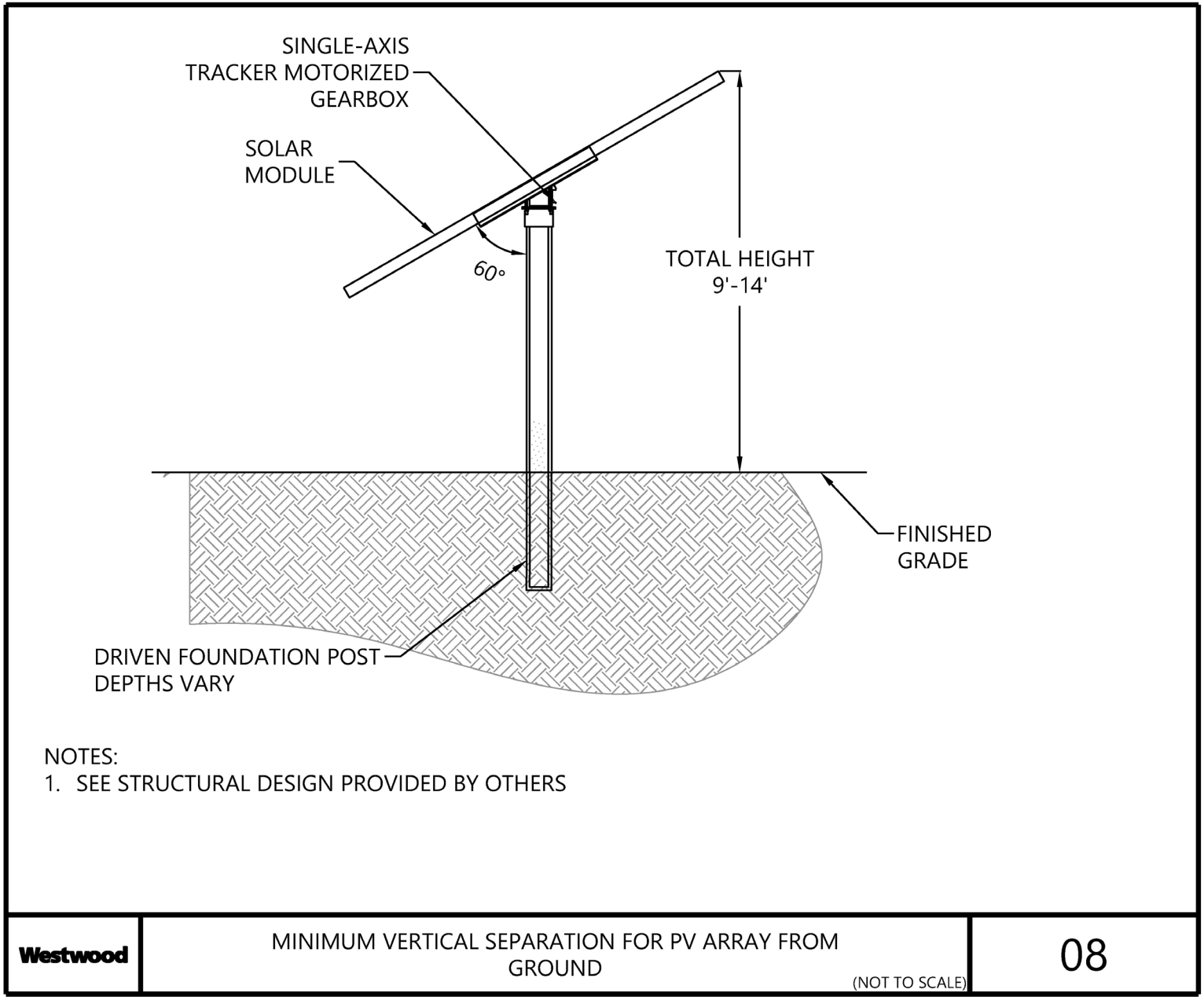
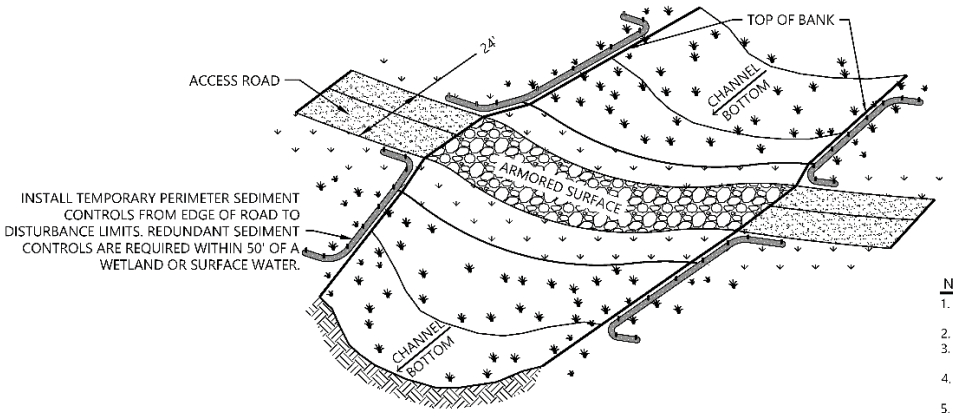
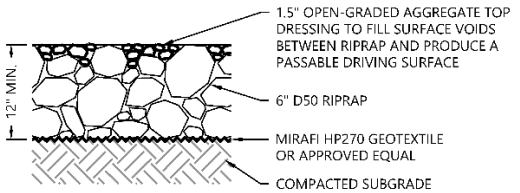


Figure B-1. PV Panel and Racking System



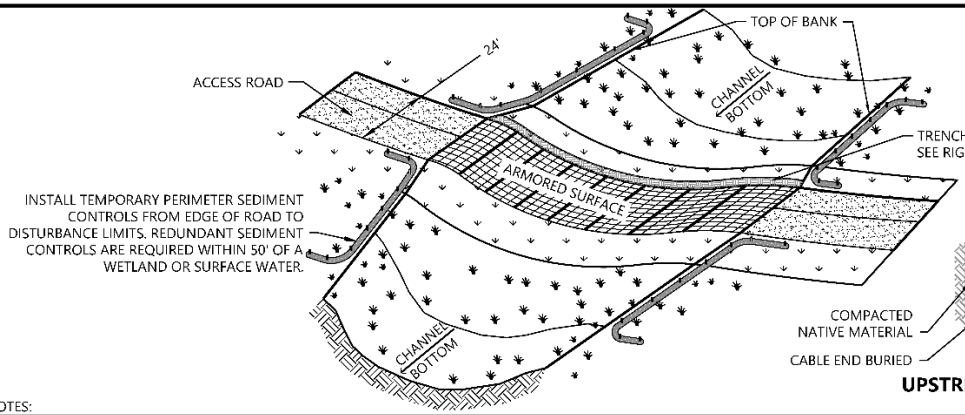


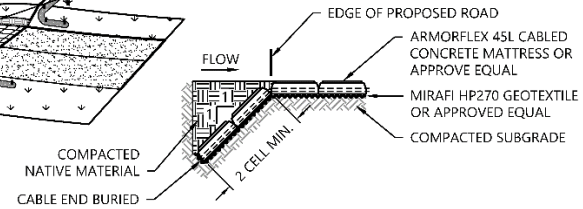
STANDARD DUTY ARMORED SURFACE

NOTES:

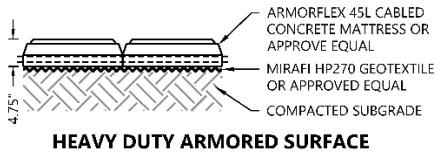
1. CHANNEL SIDE SLOPES MAY REQUIRE MODIFICATION TO CONSTRUCT THE ACCESS ROAD THROUGH THE CHANNEL TO MEET DELIVERY REQUIREMENTS.
2. THE ACCESS ROAD SHALL CROSS THE CHANNEL AS CLOSE TO 90-DEGREES AS POSSIBLE.
3. THE FINISHED ACCESS ROAD SURFACE SHALL BE AT AN ELEVATION THAT ALLOWS WATER TO FLOW THROUGH THE CHANNEL UNIMPEDED AND WITHOUT PONDING UPSTREAM OF ROAD OR ON THE ROAD SURFACE.
4. ARMORED SURFACE SHALL EXTEND THROUGH THE CHANNEL BOTTOM AND UP THE CHANNEL SIDE SLOPES TO THE OBSERVED TOP OF BANK OF THE CHANNEL, UNLESS OTHERWISE NOTED.
5. PERIMETER SEDIMENT CONTROL MAY CONSIST OF SILT FENCE, FIBERLOGS (BIOROLLS), WOOD MULCH BERMS, OR TOPSOIL BERMS. REFER TO APPROPRIATE DETAIL FOR INSTALLATION REQUIREMENTS. REDUNDANT PERIMETER SEDIMENT CONTROLS ARE REQUIRED WITHIN 50' OF A WETLAND OR SURFACE WATER.
6. STABILIZE DISTURBED GROUND IN ACCORDANCE WITH THE SWPPP.
7. CROSSING MAY BE INSTALLED DURING THE PROJECT RESTORATION PHASE. IF INSTALLED DURING CONSTRUCTION, MONITOR THE CROSSING FOR DAMAGE FROM CONSTRUCTION TRAFFIC. ADDITIONAL MAINTENANCE OR REPAIRS MAY BE REQUIRED.

Westwood	STANDARD DUTY LOW WATER CROSSING	NOT TO SCALE	ST01

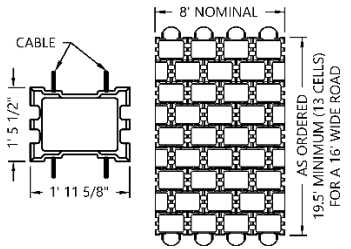




UPSTREAM EDGE TERMINATION



HEAVY DUTY ARMORED SURFACE



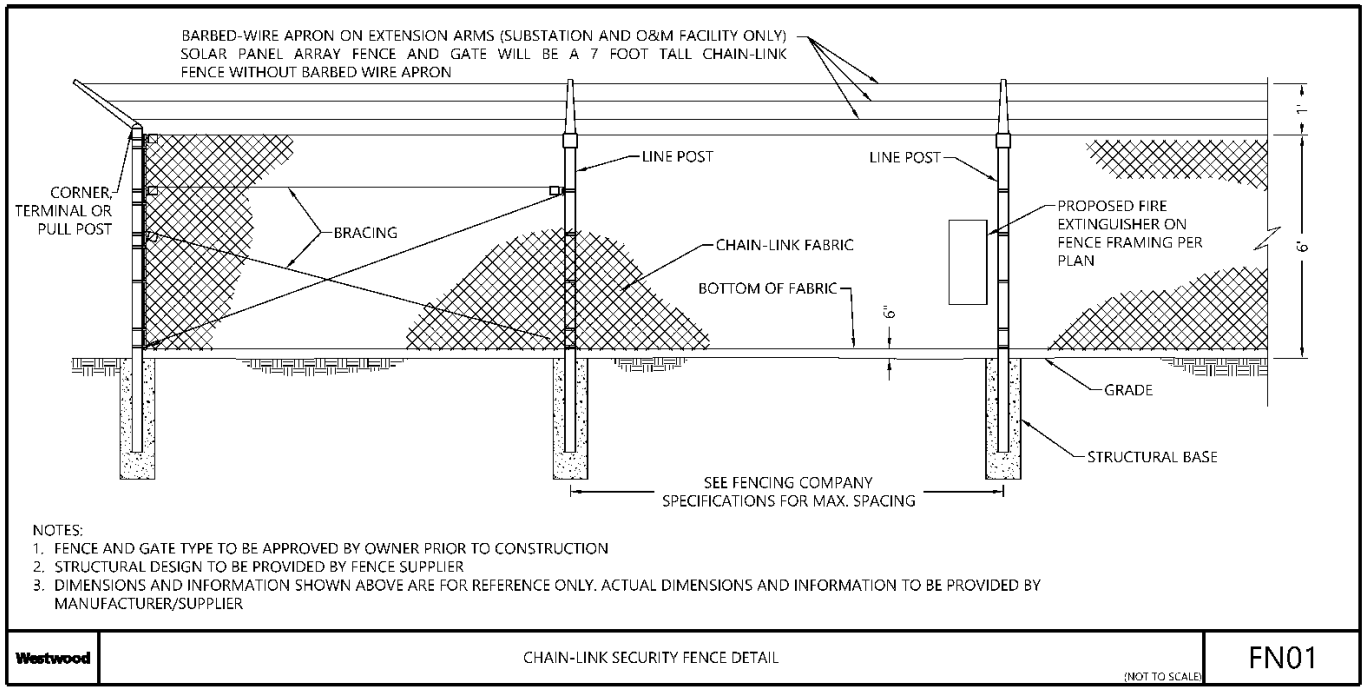
TYP. ARMORFLEX 45L DIMENSIONS

NOTES:

1. REFER TO MANUFACTURER'S INSTALLATION RECOMMENDATIONS.
2. CHANNEL SIDE SLOPES MAY REQUIRE MODIFICATION TO CONSTRUCT THE ACCESS ROAD THROUGH THE CHANNEL TO MEET DELIVERY REQUIREMENTS.
3. THE ACCESS ROAD SHALL CROSS THE CHANNEL AS CLOSE TO 90-DEGREES AS POSSIBLE.
4. THE FINISHED ACCESS ROAD SURFACE SHALL BE AT AN ELEVATION THAT ALLOWS WATER TO FLOW THROUGH THE CHANNEL UNIMPEDED AND WITHOUT PONDING UPSTREAM OF ROAD OR ON THE ROAD SURFACE.
5. ARMORED SURFACE SHALL EXTEND THROUGH THE CHANNEL BOTTOM AND UP THE CHANNEL SIDE SLOPES TO THE OBSERVED TOP OF BANK OF THE CHANNEL, UNLESS OTHERWISE NOTED.
6. PERIMETER SEDIMENT CONTROL MAY CONSIST OF SILT FENCE, FIBERLOGS (BIOROLLS), WOOD MULCH BERMS, OR TOPSOIL BERMS. REFER TO APPROPRIATE DETAIL FOR INSTALLATION REQUIREMENTS. REDUNDANT PERIMETER SEDIMENT CONTROLS ARE REQUIRED WITHIN 50' OF A WETLAND OR SURFACE WATER.
6. STABILIZE DISTURBED GROUND IN ACCORDANCE WITH THE SWPPP.
7. CROSSING MAY BE INSTALLED DURING THE PROJECT RESTORATION PHASE. IF INSTALLED DURING CONSTRUCTION, MONITOR THE CROSSING FOR DAMAGE FROM CONSTRUCTION TRAFFIC. ADDITIONAL MAINTENANCE OR REPAIRS MAY BE REQUIRED.

Westwood	HEAVY DUTY LOW WATER CROSSING	NOT TO SCALE	ST02

Figure B-2. Access Road



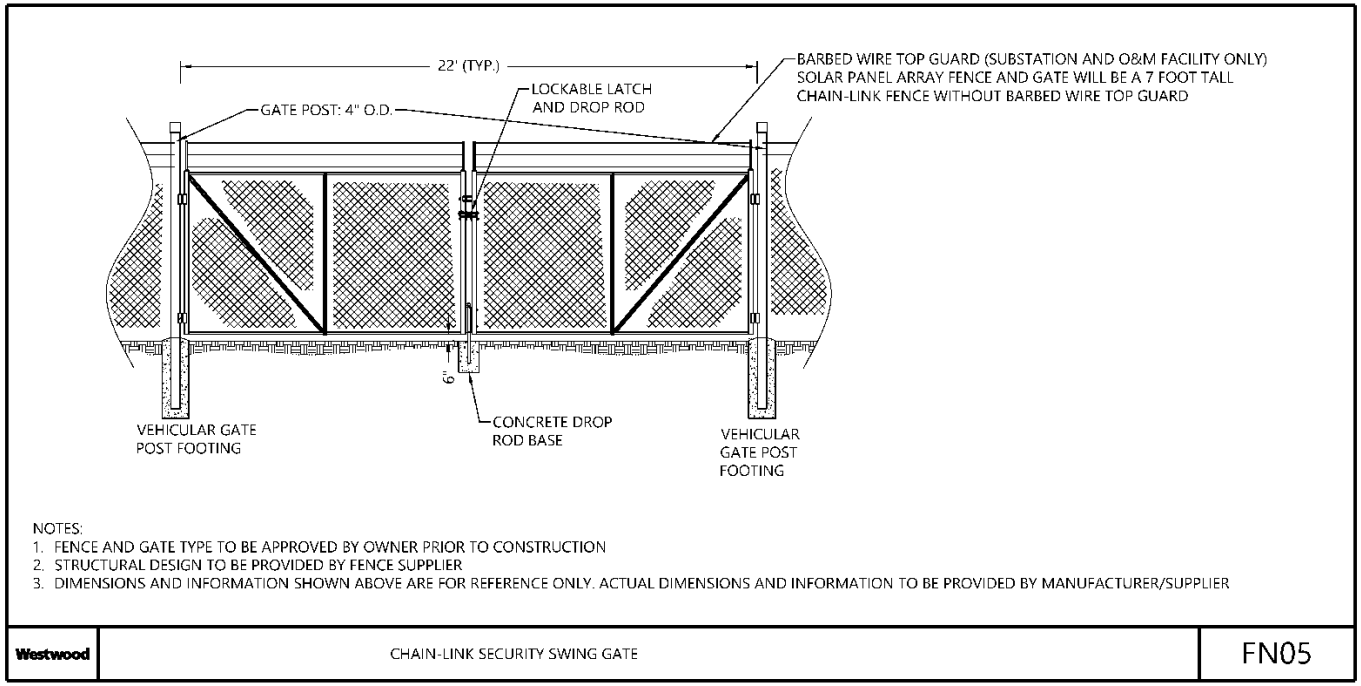


Figure B-3. Fence

ATTACHMENT C: LEGAL DESCRIPTION

Project Parcels

Assessor Parcel Number[1/]	Property Owner	Mailing Address					PLSS	Legal Description
		Street	City	State	Zip	County		
119241012749001	Ford, Robert and Marilyn	208303 Highway 241	Sunnyside	WA	98944	Benton	T12N R24E S19	SHORT PLAT #2749; LOT 1; 9/3/2003; AF#03-043722. RECORDED IN VOLUME 1 OF SHORT PLATS, PAGE 2749, RECORDS OF BENTON COUNTY, WASHINGTON.
119243000001001	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S19	THE SOUTHWEST QUARTER OF SECTION 19, TOWNSHIP 12 NORTH, RANGE 24 EAST, W.M. EXCEPT THAT PORTION OF GOVERNMENT LOT 4 (SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER) OF SAID SECTION 19 DESCRIBED AS FOLLOWS; BEGINNING AT THE SOUTHWEST CORNER OF SAID
119244000001001	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S19	SECTION 19 TWNSHIP 12 RANGE 24 DEFINED AS FOLLOWS: THE EAST 200 FEET OF THE EAST ONE/HALF OF THE SOUTHEAST QUARTER 3/9/77 EXCEPT THE EAST 46 FEET OF THE SOUTH 519.37 FEET OF THE SE 1/4 AND EXCEPT THE EAST 76 FEET OF THE SOUTH 654.85 FEET OF THE SE 1/4
119244000001002	Wautoma Valley LLC	5305 MacLaren CT	Yakima	WA	98908	Benton	T12N R24E S19	SECTION 19 TWNSHIP 12 RANGE 24 DAF: THE EAST 76 FEET OF THE SOUTH 654.85 FEET OF THE SE 1/4 AND THE WEST 124 FEET OF THE EAST 200 FEET OF THE SOUTH 60 FEET AND LESS ANY PORTIONS LYING WITHIN LOTS 1, 2, & 3 OF SHORT PLAT #1787
119244000002000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S19	SECTION 19 TOWNSHIP 12 NORTH RANGE 24: THE EAST ONE/HALF OF THE SOUTHEAST QUARTER, EXCEPT THE EAST 200 FEET THEREOF. RESTRICTIVE COVENANT 3-19-79.
120241000001000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S20	Section 20 Township 12 Range 24 Quarter NE:THE NORTHWEST QUARTER. ACCESS ROAD EASEMENT 3-16-67. SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD 11-20-70. MINERAL QUIT CLAIM DEED 4-22-83. EASEMENT 11-20-70. (4) MINERAL QUIT CLAIM DEED 1-19-83.
120242000001000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S20	Section 20 Township 12 Range 24 Quarter NE: THE NORTHEAST QUARTER, SUBJECT TO TRANSMISSION LINE EASEMENT 7-20-50, 10-13-50, 1-20-67. TRANSMISSION LINE EASEMENT. MINERAL RIGHTS RESERVED. (4) MINERAL, QUIT CLAIM DEED 1-19-83, 4-22-83. *EXCEPT THAT
120243000002000	Roberts Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S20	SECTION 20 TOWNSHIP 12 NORTH RANGE 24: THE NORTH 610 FEET OF THE EAST 1075 FEET OF THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER. CERTIFICATE OF GROUND WATER RIGHTS 12-12-56. MINERAL QUIT CLAIM DEED 4-22-83. (4) MINERAL QUIT CLAIM DEED 1-19-83
120243000003000	Roberts Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S20	SECTION 20 TOWNSHIP 12 NORTH RANGE 24: THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER, LESS THE NORTH 610 FEET OF THE EAST 1075 FEET THEREOF. CERTIFCATE OF GROUND WATER RIGHT 12-12-56. MINERAL QUIT CLAIM DEED 4-22-83. (4) MINERAL QUIT CLAIM DEED
120243000004000	Roberts Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S20	SECTION 20 TWP 12 RANGE 24 DAF:THE N 1/2 OF THE SW AND THE SW SW EXCEPT LOTS 1, 2, & 3 OF SHORT PLAT #1787 CERTIFICATE OF GROUND WATER RIGHT 12/12/56 MINERAL QUIT CLAIM DEED 4/22/83 (4) MINERAL QUIT CLAIM DEED 1/19/83 RESTRICTIVE COVENANT A#92-5720
120243011787001	Roberts Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S20	SHORT PLAT #1787 LOT 1 (.04 ACRES OF THIS LOT CROSSES THE SECTION LINE INTO SECTION 19 TWP 12 RANGE 24)
120244000000000	Roberts Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S20	SECTION 20 TOWNSHIP 12 NORTH RANGE 24: THE SOUTHEAST QUARTER, SUBJECT TO TRANSMISSION LINE EASEMENT 6-9-50, 1-20-67. TRANSMISSION LINE EASEMENT. MINERAL, QUIT CLAIM DEED 4-22-83. (4) MINERAL QUIT CLAIM DEED 1-19-83
121241000001000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S21	Section 21 Township 12 Range 24 Quarter NE: THE NORTH ONE/HALF THEREOF: TRANSMISSION LINE EASEMENT 1-20-67. (4) MINERAL, QUIT CLAIM DEED 1-19-83. PERPETUAL EASEMENT AND RIGHT-OF-WAY FOR ELECTRICAL POWER TRANSMISSION. *EXCEPT THAT PORTION LYING
121243000000000	Roberts Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S21	SECTION 21 TOWNSHIP 12 NORTH RANGE 24: THE SOUTH ONE/HALF THEREOF: TRANSMISSION LINE EASEMENT 1-20-67. (4) MINERAL, QUIT CLAIM DEED 1-19-83.
122241000000000	Robert, Et Al Michael V	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S22	THE EAST HALF OF SECTION 22, TOWNSHIP 12 NORTH, RANGE 24: TOGETHER WITH EASEMENTS 4/9/75 PER PERSONAL REPRESENTATIVE'S DEED AN UNDIVIDED ONE-QUARTER INTEREST IN ALL OF THE OIL, GAS, AND MINERAL RIGHTS AF#2007-023170, 07/17/2007.
122242000000000	High Valley Land LLC	1221 Plateau Dr	Richland	WA	99352	Benton	T12N R24E S22	SECTION 22 TOWNSHIP 12 NORTH RANGE 24: THE NORTHWEST QUARTER SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD, 4-9-75. (4) MINERAL QUIT CLAIM DEED 1-19-83.
122243000001000	High Valley Land LLC	1221 Plateau Dr	Richland	WA	99352	Benton	T12N R24E S22	SECTION 22 TOWNSHIP 12 NORTH RANGE 24: THE EAST ONE/HALF OF THE SOUTHWEST QUARTER MINERAL RIGHTS RESERVED 7-15-65.
122243000002000	High Valley Land LLC	1221 Plateau Dr	Richland	WA	99352	Benton	T12N R24E S22	SECTION 22 TOWNSHIP 12 NORTH RANGE 24: THE WEST ONE/HALF OF THE SOUTHWEST QUARTER MINERAL RIGHTS RESERVED 7-15-65.
127240000000000	High Valley Land LLC	1221 Plateau Dr	Richland	WA	99352	Benton	T12N R24E S27	SECTION 27 TOWNSHIP 12 NORTH RANGE 24: ALL SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD, 4-9-75. MINERAL RIGHTS RESERVED. (4) MINERAL, QUIT CLAIM DEED 1-19-83.
128241000000000	Roberts Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S28	SECTION 28 TOWNSHIP 12 NORTH RANGE 24: THE NORTHEAST QUARTER: THE NORTHWEST QUARTER: THE SOUTHEAST QUARTER. SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD, 4-9-75 MINERAL QUIT CLAIM DEED 4-22-83. (4) MINERAL QUIT CLAIM DEED 1-9-83.
128243000000000	Roberts Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S28	SECTION 28 TOWNSHIP 12 NORTH RANGE 24: THE SOUTHWEST QUARTER MINERAL DEED 11-25-81. TOGETHER WITH EASEMENTS 4-9-75.
129241000000000	Robert, Jean Emile	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S29	SECTION 29 TOWNSHIP 12 NORTH RANGE 24: THE NORTHEAST QUARTER: SUBJECT TO TRANSMISSION LINE EASEMENT 4-11-51, 2-13-51, 1-20-67 CERTIFICATE OF WATER RIGHT 10-27-77. SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD, 4-9-75. MINERAL QUIT CLAIM DEED 4-22-83
129242000001000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S29	SECTION 29 TOWNSHIP 12 NORTH RANGE 24: THE WEST ONE/HALF OF THE WEST ONE/HALF THEREOF: SUBJECT TO TRANSMISSION LINE EASEMENT 6-9-50, 1-20-67, 7-15-65. CERTIFICATE OF WATER RIGHT 10-27-77, 1-20-78. SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD, 4-9-75.
129243000001000	Roberts Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S29	SECTION 29 TOWNSHIP 12 NORTH RANGE 24: THE EAST ONE/HALF OF THE WEST ONE/HALF THEREOF: SUBJECT TO TRANSMISSION LINE EASEMENT 9-18-50, 7-15-65, 1-20-67. CERTIFICATE OF WATER RIGHT 10-27-77, 1-20-78. SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD,
129244000000000	Robert, Robin	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S29	SECTION 29 TOWNSHIP 12 NORTH RANGE 24: THE SOUTHEAST QUARTER TOGETHER WITH EASEMENTS 4-9-75.
130241000000000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S30	SECTION 30 TOWNSHIP 12 NORTH RANGE 24: THE NORTHEAST QUARTER CERTIFICATE OF WATER RIGHT 1-20-78, 8-25-78. SUBJECT TO WATER AND WELL AGREEMENT 4-22-76. MINERAL RIGHTS RESERVED 3-9-64. SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD, 4-9-75. BENTON
130242000001000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S30	SECTION 30 TOWNSHIP 12 NORTH RANGE 24: THE NORTH ONE/HALF OF THE NORTHWEST QUARTER, EXCEPT THE NORTH 723 FEET OF THE WEST 723 FEET THEREOF. MINERAL QUIT CLAIM DEED 4-22-83. (4) MINERAL QUIT CLAIM DEED 1-19-83.
130242000003000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S30	SECTION 30 TOWNSHIP 12 NORTH RANGE 24: THE WEST ONE/HALF, EXCEPT THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER, AND LESS THE NORTH ONE/HALF OF THE NORTHWEST QUARTER. REA EASEMENT 11-13-56. CERTIFICATE OF WATER RIGHT 10-27-77.
130244000000000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S30	SECTION 30 TOWNSHIP 12 NORTH RANGE 24: THE SOUTHEAST QUARTER, SUBJECT TO TRANSMISSION LINE EASEMENT 2-13-51. CERTIFICATE OF WATER RIGHT 1-20-78. SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD, 4-9-75. MINERAL QUIT CLAIM DEED 4-22-83. (4) MINERAL QUIT
132241000001000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S32	SECTION 32 TOWNSHIP 12 NORTH RANGE 24: THE NORTH 60 ACRES OF THE NORTHEAST QUARTER MINERAL QUIT CLAIM DEED 4-22-83. (4) MINERAL QUIT CLAIM DEED 1-19-83.
132241000002000	Wautoma Energy LLC	2448 76th Ave SE Suite 220	Mercer Island	WA	98040	Benton	T12N R24E S32	SECTION 32 TOWNSHIP 12 NORTH RANGE 24: THE NORTH ONE/HALF OF THE SOUTHWEST QUARTER: THE NORTHWEST QUARTER: THE SOUTH 100 ACRES OF THE NORTHEAST QUARTER: TRANSMISSION LINE EASEMENT 9-18-50, 2-15-65, 1-20-67. MINERAL QUIT CLAIM DEED 4-22-83. (4) MINERAL
133240000000000	Roberts Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S33	SECTION 33 TOWNSHIP 12 NORTH RANGE 24: ALL MINERAL QUIT CLAIM DEED 4-22-83. (4) MINERAL QUIT CLAIM DEED 1-19-83.
119241005555555[2/]	United States Government (BPA)	-	-	-	-	-	T12N R24E S19	Tract ID Provided by BPA: B-C-128-A-416
117243005555555 3/	United States Government (BPA)	-	-	-	-	-	T12N R24E S17	--
120241000002000[4/]	United States Government (BPA)	PO Box 61409	Vancouver	WA	98666	Benton	T12N R24E S20, 21	Section 20 Township 12 Range 24 Quarter NE: (WAUT-SS-1) A tract of land in the East half of the Northeast Quarter of Section 20 and the West half of the Northwest Quarter of Section 21, all in Township 12 North, Range 24 East, Willamette Meridian,

1/ Assessor parcel information is based on current Benton County assessment records last updated by the County on 3/3/2022.

2/ Parcel associated with the easement for access road and collection across an existing transmission line in the northwest corner of the Project.

3/ Parcel associated with the Wautoma Substation access road and access to the northern solar array and point of interconnection (POI).

4/ Parcel associated with the transmission line POI at the Wautoma Substation and access road to the northern solar array and POI.

Abutting Parcels

Assessor Parcel Number[1/]	Property Owner	Mailing Address					PLSS	Legal Description
		Street	City	State	Zip	County		
104141000000000	Roberts Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T11N R24E S4	SECTION 4 TOWNSHIP 11 NORTH RANGE 24: THAT PORTION DEFINED AS FOLLOWS LOTS 1 AND 2: THE SOUTH ONE/HALF OF THE NORTHEAST QUARTER: AND THE SOUTHEAST QUARTER RAILROAD RIGHT OF WAY, QUIT CLAIM DEED TO GOVERNMENT, 3-21-69.
104142000000000	Roberts Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T11N R24E S4	SECTION 4 TOWNSHIP 11 NORTH RANGE 24: LOTS 3 AND 4: THE SOUTH ONE/HALF OF THE NORTHWEST QUARTER: AND THE SOUTHWEST QUARTER RAILROAD RIGHT OF WAY, QUIT CLAIM DEED TO GOVERNMENT, 3-21-69.
115240000000000	Zirkle Four Feathers Vineyards LL	PO Box 190	Selah	WA	98942	Benton	T12N R24E S15	SECTION 15 TOWNSHIP 12 NORTH RANGE 24: ALL TRANSMISSION LINE EASEMENT 8-30-66. DECLARATION OF TAKING OF EASEMENT 7-18-72.
116240000000000	State of Washington	DNR State Land Division PO Box 47016	Olympia	WA	98504	Benton	T12N R24E S16	SECTION 16 TOWNSHIP 12 NORTH RANGE 24: ALL, SUBJECT TO EASEMENT TO GOVERNMENT 4-9-52. TRANSMISSION LINE EASEMENT. ROAD EASEMENT 12-19-66. AMENDED TRANSMISSION LINE EASEMENT 6-8-72.
117240000000000	Balmelli, Joseph and Donna	132 Newaukum Valley Rd	Chehalis	WA	98532	Benton	T12N R24E S17	SECTION 17 TOWNSHIP 12 NORTH RANGE 24: ALL, LESS RIGHT OF WAY TO U.S. GOVERNMENT. SUBJECT TO TRANSMISSION LINE EASEMENT 1-5-51. TRANSMISSION LINE EASEMENT 8-30-66. ACCESS ROAD EASEMENT AF#2003-044364 DATED 9/12/03. LESS THE SOUTHERLY 120 FEET OF THE
118244005555555	TBD					Benton	T12N R24E S16	--
130243000000000	Griffith, Jack E	4205 Rd 111	Pasco	WA	99301	Benton	T12N R24E S30	SECTION 30 TOWNSHIP 12 NORTH RANGE 24: THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER.
131241000000000	Wautoma Valley LLC	5305 MacLaren CT	Yakima	WA	98908	Benton	T12N R24E S31	SECTION 31 TOWNSHIP 12 NORTH RANGE 24: THE EAST ONE/HALF. SUBJECT TO TRANSMISSION LINE EASEMENT 6-9-50, 1-20-67, 7-15-65. MINERAL QUIT CLAIM DEED 4-22-83. (4) MINERAL QUIT CLAIM DEED 1-19-83.
131242000000000	Wautoma Valley LLC	5305 MacLaren CT	Yakima	WA	98908	Benton	T12N R24E S31	SECTION 31 TOWNSHIP 12 NORTH RANGE 24: THE WEST ONE/HALF, FRACTIONAL
132243000001000	Wautoma Valley LLC	5305 MacLaren CT	Yakima	WA	98908	Benton	T12N R24E S32	SECTION 32 TOWNSHIP 12 NORTH RANGE 24: THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER. MINERAL QUIT CLAIM DEED 4-22-83.
132243000002000	Wautoma Valley LLC	5305 MacLaren CT	Yakima	WA	98908	Benton	T12N R24E S32	SECTION 32 TOWNSHIP 12 NORTH RANGE 24: THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER. MINERAL QUIT CLAIM DEED 4-22-83. (4) MINERAL QUIT CLAIM DEED 1-19-83.
132244000000000	Wautoma Valley LLC	5305 MacLaren CT	Yakima	WA	98908	Benton	T12N R24E S32	SECTION 32 TOWNSHIP 12 NORTH RANGE 24: THE SOUTHEAST QUARTER MINERAL QUIT CLAIM DEED 4-22-83. (4) MINERAL QUIT CLAIM DEED 1-19-83.
134241000000000	Roberts Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S34	SECTION 34 TOWNSHIP 12 NORTH RANGE 24: THE NORTHEAST QUARTER MINERAL QUIT CLAIM DEED 4-22-83 (4) MINERAL QUIT CLAIM DEED, 1-19-83.
134242000000000	Roberts Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S34	SECTION 34 TOWNSHIP 12 NORTH RANGE 24: THE NORTHWEST QUARTER MINERAL QUIT CLAIM DEED 4-22-83. (4) MINERAL QUIT CLAIM DEED 1-19-83.
134243000000000	Roberts Ranch 5+1 LLC	1521 Wautoma Rd	Sunnyside	WA	98944	Benton	T12N R24E S34	SECTION 34 TOWNSHIP 12 NORTH RANGE 24: THE SOUTH ONE/HALF SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD. MINERAL RIGHTS RESERVED
23122411004	Wautoma Valley LLC	5305 MacLaren CT	Yakima	WA	98908	Yakima	T12N R23E S24	TH PT NE1/4 NE1/4 LY SE'LY OF CO RD
23122414005	Stuckrath-Myers LLC	310 South Bradley St	Chelan	WA	98816	Yakima	T12N R23E S24	TH PT NE1/4 SE1/4 LY E OF HWY 241
23122441003	Stuckrath-Myers LLC	310 South Bradley St	Chelan	WA	98816	Yakima	T12N R23E S24	TH PT NE1/4 SE1/4 LY E OF HWY 241
23122444002	Stuckrath-Myers LLC	310 South Bradley St	Chelan	WA	98816	Yakima	T12N R23E S24	TH PT SE1/4 SE1/4 LY E OF HWY 241
23122511401	Western Land & Cattle LLC	1509 Maires Rd	Yakima	WA	98908	Yakima	T12N R23E S25	YAKIMA SPRING VALLEY HIGHLANDS: LOTS 1 THRU 16 BLK 4
23122541406	Wolf Lake Inc					Yakima	T12N R23E S25	YAKIMA SPRING VALLEY HIGHLANDS: LOT 16 BLK 5
23122541409	Western Land & Cattle LLC	1509 Maires Rd	Yakima	WA	98908	Yakima	T12N R23E S25	YAKIMA SPRING VALLEY HIGHLANDS: LOTS 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, & 15 OF BLK 5

ATTACHMENT D: LAND USE CONSISTENCY REVIEW

Wautoma Solar Energy Project
Draft Land Use Consistency Review

Prepared for:

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Prepared by:

April 2022

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Acronyms and Abbreviations

Applicant	Innergex Renewable Development USA, LLCASC Certification	Application for Site
BCC	Benton County Code	
BESS	battery energy storage system	
BPA	Bonneville Power Administration	
Comprehensive Plan	Benton County Comprehensive Plan	
County	Benton County	
CUP	conditional use permit	
DC	direct current	
DNR	Washington Department of Natural Resources	
EFSEC	Energy Facility Site Evaluation Council	
ESCP	Erosion and Sediment Control Plan	
FWHCA	fish and wildlife habitat conservation area	
GMA	Growth Management Act	
GMAAD	Growth Management Act Agricultural District	
HPA	Hydraulic Project Approval	
kV	kilovolt	
NFPA	National Fire Protection Association	
Ns	Non-Fish Seasonal	
O&M	operations and maintenance	
OA	Ordinance Amendment	
POI	Point of Interconnection	
Project	Wautoma Solar Energy Project	
PV	photovoltaic	
RCW	Revised Code of Washington	
ROW	right-of-way	
SEPA	State Environmental Policy Act	
SR	State Route	
SWPPP	Stormwater Pollution Prevention Plan	

UGA	Urban Growth Area
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife

1.0 Introduction

Innergex Renewable Development USA, LLC (Applicant) proposes to construct and operate the Wautoma Solar Energy Project (Project). The Project is a 470-megawatt[1] solar photovoltaic (PV) generation facility coupled with a 4-hour battery energy storage system (BESS) sized to the maximum capacity of the Project, as well as related interconnection and ancillary support infrastructure, located in unincorporated Benton County, Washington. The Applicant has elected to seek Project approval by the Governor upon a favorable recommendation of a Site Certification Agreement (SCA) by Washington State's Energy Facility Site Evaluation Council (EFSEC) and is submitting a streamlined solar Application for Site Certification (ASC). Pursuant to Revised Code of Washington (RCW) 80.50.040, RCW 80.50.110, and WAC 463-28, EFSEC may recommend to the Governor that he permit and authorize an energy generation facility with appropriate consideration of the Project's consistency with the Benton County land use regulations. As such, the EFSEC Site Certification Agreement process takes the place of the County review process. To support the land use analysis in Section 4.14 of the ASC, this Land Use Consistency Review has been prepared to address applicable Benton County Code (BCC) provisions (Benton County 2021a, as specified below) and Benton County Comprehensive Plan goals and policies (Benton County 2021b). Because demonstrating compliance often requires detailed information covered elsewhere in the ASC, the following review includes cross-references to other sections of the ASC, reports, and supporting studies for further analysis and documentation.

The siting of energy facilities in Washington is an area of law occupied by the state under RCW 80.50.110. Nevertheless, as is demonstrated in the materials below, this Project can be rendered consistent with Benton County planning and zoning provisions through the careful conditioning of the SCA. While the Applicant is seeking preemption for the reasons discussed herein, it respectfully requests that the EFSEC council preempt applicable Benton County land use plans and zoning ordinances pursuant to Washington Administrative Code (WAC) 463-26-050 and recommend to the Governor the approval of an SCA conditioned to preserve the goals and values of Benton County.

The Project's solar PV system will convert energy from the sun into electric power. The solar PV system will consist of a series of solar PV panels mounted on a solar tracker racking system and related electrical equipment. The system includes the solar panels, tracker racking system, posts, collector lines, and power conversion systems, which consists of the DC-coupled BESS, inverters, and transformers. The DC-coupled BESS can either store direct current (DC) electricity for future use or convert DC electricity to alternating current (AC) electricity and send the AC electricity to the step-up transformer as required based on grid demand. The solar PV system is further described in Part 2, Section A.2.a of the ASC.

The Project also includes the following supporting components: Project substation, overhead 500-kilovolt (kV) transmission line, operations and maintenance (O&M) building, associated Project

[1] Megawatt rating provided in alternating current (MWac)

access roads, and perimeter security fencing. Chain-link fencing will be installed around the perimeter of the solar array, Project substation, and O&M building area. The Point of Interconnection (POI) is the Bonneville Power Administration (BPA) transmission system at the BPA Wautoma Substation. An approximately 0.25-mile-long overhead 500-kV transmission line will extend from the Project substation to the POI. Project-supporting components are further described in Part 2, Section A.2.a of the ASC.

The Project's construction is anticipated to begin in the second quarter of 2024, with a Commercial Operations Date planned for the first quarter of 2026 (22-month construction schedule).

1.1 Project Purpose

In 2019, Washington passed Senate Bill 5116, the Clean Energy Transformation Act (CETA) codified at RCW 19.405, which requires state utilities to meet 100% of their load with carbon-free resources by 2045. Clean electricity will allow Washington residents and businesses to power their buildings and homes, vehicles, and appliances with carbon free resources, such as wind and solar. Reductions in fossil fuel will improve health of communities, grow the economy, create family-sustaining jobs, and enable the state to achieve its long-term climate goals. The introduction of CETA is a major reason why Innergex is now actively searching for new business opportunities in Washington. Advancement in solar photovoltaic technology over the last ten years has led to significant decreases in solar equipment pricing. As a result, new facilities such as Wautoma Solar represent an effective option to meeting Washington state's clean energy goals. These goals outlined in the CETA are also closely aligned with Innergex's own goals.

Innergex believes in a better world where abundant renewable energy promotes healthier communities and creates shared prosperity. Innergex contributes to this vision by leveraging its long-term commercial commitment, proven expertise, entrepreneurial spirit, and innovative approach. We remain committed to responsible growth that balances people, our planet, and prosperity. The Project will make major direct and indirect contributions to the local community. Landowners participating in the Project will receive direct compensation in the form of long-term land lease payments. Furthermore, the Project will also pay property tax to Benton County which will increase the County's tax base revenues and will benefit County residents significantly for the life of the project. When operational, the Project will be a relatively quiet renewable energy facility with limited visual impacts and will be a major source of clean power in the region.

1.2 Project Overview

The Project is generally located 12.5 miles northeast of the city of Sunnyside and 1 mile south of the State Route (SR) 241 and SR 24 interchange in Benton County, Washington, adjacent to and east of the Yakima/Benton County boundary (ASC Attachment A, Figure A-1). Part 1 Section A.4 of the Applicant's streamlined solar ASC identifies the 35 private land assessor parcels encompassed by the approximately 5,852-acre Project Lease Boundary. Within the Project Lease Boundary, the proposed Project is sited within the smaller approximately 4,573-acre Project Area. The Project

Area is the focus of analysis provided in this Land Use Consistency Review and is defined and described in Part 2 Section A.2.a of the Applicant's streamlined solar ASC.

The ASC uses the following terms to describe areas associated with Project development:

- **Project Lease Boundary**: The approximately 5,852-acre area that encompasses 35 privately owned assessor parcels that the Applicant has executed or is pursuing a lease agreement with the underlying property owner (ASC Attachment A, Figure A-2). Construction and operation of the Project are limited to the Project Area described below and shown on Figure A-1 in ASC Attachment A.

- **Project Area:** The approximately 4,573-acre area that includes all of the Project facilities, including solar PV system and DC-coupled BESS, Project substation, transmission line, O&M building, and associated access roads.

Current land uses in the Project Area include irrigated agriculture, rangeland, undeveloped land, local roads, and existing electrical utility infrastructure. Lands to the north, west, and south are zoned for agricultural purposes in Benton and Yakima counties with similar land uses as the Project Lease Boundary, as well as some non-agricultural uses including several rural residences. The Hanford Reach National Monument Rattlesnake Unit (which is not open to the public) is located east of the Project Lease Boundary.

The Applicant is considering various design layouts within the Project Area. The preliminary layout of the PV solar system and supporting components accounts for the Project's generating capacity, topography, and other constraints; however, the precise equipment and layout have not yet been finalized and the Applicant seeks to permit a range of technology to preserve design flexibility. Therefore, this ASC analyzes the largest anticipated Project footprint within the Project Area. While final Project design is not anticipated to disturb the entire Project Area, the entire Project Area is evaluated to allow for design flexibility. For these reasons, the Applicant is requesting flexibility to microsite[2] the Project and its associated supporting components anywhere within the Project Area, provided the final layout does not exceed the Project Area evaluated in this ASC and allowed for in the Site Certification Agreement.

1.3 Regulatory Context

The Project is located entirely on land zoned Growth Management Act Agricultural District (GMAAD) by Benton County Code (BCC; Benton County 2021a) (Figure 1). The Project is consistent with Benton County's definition of a "solar power generator facility, major" under BCC 11.03.010(167)), as described in Section 3.0 below.

The Applicant began obtaining lease agreements for the Project Area in 2020. As part of early agency outreach, the Applicant contacted Benton County Commissioners and Planning Department

[2] Micrositing is the process of placing facilities (such as solar panels) in locations that achieve optimal power production while considering land constraints such as terrain and sensitive environmental areas.

on July 26, 2021, via email, intending to introduce the Project and discuss the local permitting process. At this stage of early Project development, "solar power generation facility, major" was listed as an allowed use requiring a conditional use permit (CUP) in the GMAAD BCC 11.17.07(cc). However, a response to the Applicant's communications was not received from the Benton County Planning Department at that time. The Applicant made the decision in the fall of 2021 to seek a Site Certification Agreement through EFSEC. At the time the Applicant first introduced the Project to EFSEC in August of 2021, the Project was an allowed use with a CUP in the GMAAD. As part of the outreach efforts described in the ASC, the Applicant conducted a virtual public meeting on April 11, 2022. Benton County Planning Department staff attended this meeting. Subsequently, the Benton County Administrator agreed to facilitate a presentation to the Benton County Board of Commissioners. This presentation is anticipated to take place at a regularly scheduled commissioners meeting in May 2022.

In December of 2021, prior to submittal of this ASC, the BCC was amended to remove "solar power generation facility, major" from the list of permitted uses with the issuance of a CUP in the GMAAD. Based on review of the public record of the ordinance amendment, the County's abrupt regulatory change appears to have been motivated by an increase in renewable energy interest in Benton County and concerns regarding agricultural and rural land use impacts, particularly as it relates to wind development on lands in the GMAAD. The following section provides a summary of the Benton County Ordinance amendment to the GMAAD and the current status of this regulatory shift as of this ASC submittal.

1.3.1 Benton County Ordinance Amending GMA Agricultural District

On December 21, 2021, Benton County Board of County Commissioners adopted Ordinance Amendment (OA) 2021-004, which among other changes, removed "solar power generation facility, major" from the list of uses allowed with a CUP in the GMAAD zone and therefore prohibits this type of use in the GMAAD. Prior to December 21, 2021, the Project would have been an allowed use upon receipt of a CUP in the GMAAD per BCC 11.17.07(cc). Prior to OA 2021-004, Benton County landowners had the ability to diversify use of their land with solar generation facilities that allowed for additional economic opportunities for County residents through increased tax base revenues.

Benton County Community Development Director, Greg Wendt, presented at the December 21, 2021 Board of County Commissioner hearing and stated this amendment was necessary to be consistent with the Growth Management Act (GMA) and Benton County Comprehensive Plan (Comprehensive Plan; Benton County 2021b) and that the amendment is necessary to ensure the GMAAD would protect long-term commercially significant agricultural lands, limit incompatible and non-agricultural uses, conserve critical areas and habitat, protect visual resources, and protect rural character (Benton County 2021c and 2021d). This Land Use Consistency Review and the detailed analysis provided in the ASC and associated attachments demonstrate how the Project's design, best management practices, and mitigation measures are compatible with these stated goals for protection of the GMAAD.

Further, public testimony provided at the Planning Commission Hearing (November 30, 2021) and Board of Benton County Commissioners Hearing (December 21, 2021) on OA 2021-004 included testimony from multiple private landowners, solar energy developers, and advocacy groups in support of allowing solar development to occur on agricultural lands (Benton County 2021c and 2021d). As is noted in the testimony audio and minutes from the two hearings, there was extensive discussion between those providing testimony and the commissioners about the various ways in which solar energy projects may in fact be a compatible use with agriculture when reviewed on a case-by-case basis. Testimony and discussion included the topics of landowner rights and the highest and best use of private land, local economic benefits, low visual impact of solar facilities as compared to wind facilities, and advancements in agrivoltaics concepts and compatible agricultural or grazing activities.

Despite testimony and discussion among commissioners about solar energy project compatibility in the GMAAD, the County Board of County Commissioners ultimately adopted OA 2021-004 and removed the County's authority to approve solar facilities on agricultural lands through a CUP. As noted in the meeting minutes from the Board of County Commissioners meetings, "Commissioner Delvin saw this as an opportunity to review our ordinances and identify areas within our region for boundaries to see what the future approach could be. He stated there was time to plan" (Benton County 2021d). No further discussion of solar development and land use compatibility is reflected in publicly available agendas and meeting minutes for the Planning Commission and Board of Benton County Commissioners since the respective hearings on November 30, 2021 and December 21, 2021. The Applicant is unaware of further updates or planning processes for development of "solar power generation facility, major" uses in Benton County.

Though the Project is currently not in compliance with BCC 11.17 after the passage of OA 2021-004, the Applicant demonstrates below in Sections 2 and 3 how the Project is substantially consistent with the applicable standards of the Comprehensive Plan and BCC. Based on the primacy of the state when siting energy facilities as provided by RCW 80.50.110(1), and the state's express preemption and occupation of the field pursuant to RCW 80.50.110(2), the Applicant is therefore requesting preemption of the local land use regulations under WAC 463-28-020.

1.4 Energy Facility Site Evaluation Council Review

As discussed above in Section 1.0, the Applicant has elected to seek Project approval under the jurisdiction of Washington EFSEC. As such, the EFSEC Site Certification Agreement process takes the place of the County review process. Pursuant to Revised Code of Washington (RCW) 80.50.040, RCW 80.50.110, and WAC 463-28, EFSEC is allowed to recommend that the Governor permit and authorize an energy generation facility with appropriate consideration of the Project's consistency with the Benton County land use regulations. To support the land use analysis in Section 4.14 of the ASC, this attachment has been prepared to address applicable BCC provisions (Benton County 2021a, as specified below) and Comprehensive Plan goals and policies (Benton County 2021b).

As discussed below in Section 2.0, the proposed Project is consistent with the Benton County Comprehensive Plan as it will promote green infrastructure that is compatible with agricultural

uses and diversifies the economic base. Section 3.0 demonstrates that construction and operation of the Project comports with applicable provisions of the BCC, including meeting the evaluation criteria for conditional uses. The Project is consistent with the purposes of the GMAAD, and prior to the adoption of OA 2021-004, complied with all applicable substantive BCC provisions and development standards as described in Section 3.0 below. Accordingly, the Project is substantially consistent with local land use policies and regulations adopted as of the ASC submittal. As such, the Applicant respectfully requests the Council's recommendation to the Governor that he approve an appropriately conditioned SCA consistent with Ch. 80.50 RCW.

2.0 Consistency with Benton County Comprehensive Plan Goals and Policies

The following section demonstrates that the proposed Project is consistent with applicable Comprehensive Plan (Benton County 2021b) goals and policies. The Applicant has carefully reviewed the goals and policies of the Comprehensive Plan and evaluated how they inform this ASC. The Comprehensive Plan was developed to 1) reflect the County's values and plan for future growth consistent with the GMA, and 2) guide County decisions on land use, transportation, infrastructure, housing, economic development, and the environment. A comprehensive plan is not a development regulation and cannot itself control land development. In contrast, development regulations are the requirements "placed on development or land use activities" (RCW 36.70A.040(4) and (7)). These requirements include the BCC Title 3, 6, 6A, 11, and 15 as addressed in Section 3.0 below.

2.1 Chapter 2 Goals and Policies

2.1.1 Land Use

LU Goal 1: Ensure that land uses are compatible with surrounding uses that maintain public health, safety, and general welfare.

> ***Policy 1: Maintain a mix of land uses that supports the character of each rural community.***
>
> ***Policy 3: Maximize the opportunities for compatible development within land use designations to serve a multitude of compatible uses and activities.***
>
> ***Policy 7. Encourage "green infrastructure" in new developments and redevelopments to address storm water runoff.***

Response:

The Project will be entirely located within the County's GMAAD zoning district and within the County's Comprehensive Plan GMA Agricultural designation. As a "solar generation facility, major," the Project was previously an allowed conditional use in the GMAAD district prior to the adoption of OA 2021-004, and therefore was previously deemed compatible with surrounding land uses in the GMAAD district as long as certain conditions were met as required by the CUP process. In total,

the Project Area within the GMAAD represents 0.7 percent of the 649,153 acres of land designated as GMAAD in the County (Benton County 2021b). Within the Project Area, the Project's security fenced area and permanent disturbance will occupy approximately 2,978 acres[3], or 0.5 percent of GMA Agricultural lands. Since the permanent disturbance reflects a small percentage of the total GMA Agricultural Lands, the Project supports the aims of LU Goal 1, Policy 1 by providing mix of land uses that does not detract from the larger rural community.

The Project Area was selected by the Applicant for its favorable site suitability characteristics, including high solar energy resource, topography, proximity to electrical infrastructure, compatibility with allowed uses on surrounding lands, and low resource conflicts. These site suitability characteristics maximize the compatible development by taking advantage of existing electric infrastructure (i.e. existing BPA substation and transmission lines) and is therefore supportive of LU Goal 1, Policy 3.

Existing land uses in the Project Area include dryland and irrigated agriculture, rangeland, undeveloped areas, local roads, electrical infrastructure (e.g., transmission and distribution lines, substations), and scattered unoccupied structures (e.g., agricultural storage). Adjacent land uses surrounding the Project Area are similar and also include scattered rural residences, vineyard, rangelands, state highways, and Hanford Reach National Monument (Rattlesnake Unit of the Fitzner/Eberhardt Arid Lands Ecology Reserve). Refer to responses below to NR Goal 1 in Section 2.1.3 and response to 11.50.040(d)(1) in Section 3.4.4 for detailed discussion of existing land uses and compatibility with allowed uses.

Project components will be designed in a manner as to minimize contrast with the surrounding vicinity. This will include measures such as using non-reflective materials and finishes on Project components and revegetating temporarily impacted areas as analyzed in detail in Part 4, Section 4.16 of the ASC, and the accompanying Visual Impact Assessment (ASC Attachment P) and Solar Glare Analysis (ASC Attachment H). As discussed in Part 3, Section 3.21 and Section 3.22 of the ASC, the Project will not have a significant adverse impact on existing public facilities or services. The Applicant will bear the costs of providing the necessary utilities and related services for the Project. Unlike other land uses such as residential development typically proposed outside urban areas, the Project will not impose these costs on the County. As discussed in Part 4, Section 4.13 of the ASC, most materials used in construction of the Project will not be hazardous or dangerous, and the risk of fire will be low. Project design incorporates measures to avoid failures and risks of fire or spills and will comply with the applicable requirements of the National Electric Code, National Fire Protection Association (NFPA) standards, and Institute of Electrical and Electronics Engineers Standards. Prior to construction, the Project will develop and maintain an Emergency Management Plan based on final design and input from local services providers that will include best management practice for fire prevention. The Applicant will also coordinate with Benton County Emergency Management and Washington Department of Natural Resources (DNR) Wildland Fire

[3] The 2,978 acre total includes 2,974 acres within the Project's security fence and 4 acres of permanent disturbance outside the security fence associated with access roads.

Management Division regarding potential fire issues, locations and dimensions of access gates and internal access roads, and other issues.

Following construction, the Project will be operated and maintained by up to four employees. Operation of the Project will not interfere with surrounding land uses and represents compatible development with surrounding uses, including the agricultural activities. Project design incorporates environmental best practices and complies with state stormwater permitting requirements.

LU Goal 1, Policy 7 encourages "green infrastructure" in stormwater design. "Green infrastructure" is not defined in the Comprehensive Plan but is assumed to refer to stormwater management approaches that protect, restore, and mimic natural water cycles. As stated above, the Project design incorporates environmental best practices and complies with state stormwater permitting requirements. In general, there will be minimal grading across the site, and existing drainage patterns and natural infiltration will be retained. See ASC Part 3, Section 5, and Part 4, Section 4.5 for more details on the Project's stormwater design. Due to the Project's "green infrastructure" stormwater designs, the Project is consistent with LU Goal 1, Policy 7. Similar to the County's encouragement of "green infrastructure", the State of Washington's CETA encourages development of green energy sources (i.e. non-carbon emitting energy sources). The Project's production of clean renewable solar energy supports the State's goal to source the State's electricity customers with 100% renewable, non-carbon emitting electricity by 2045.

For the reasons stated above, the Project is consistent with this goal and corresponding policies of the Comprehensive Plan.

LU Goal 2: Follow controlling law and constitutional requirements, both state and federal, to ensure the appropriate protection of private property rights.

> ***Policy 1: Prevent regulations that create undue adverse economic impacts, or unnecessarily restrict the use of private property.***

Response:

Implementation of the Project will also support the long-term economic sustainability of participating landowners via direct lease payments, while agricultural activities allowed on lands surrounding the Project Area could continue unimpeded. Prior to OA 2021-004, Benton County landowners had the ability to diversify use of their land with solar generation facilities that allowed for additional economic opportunities for County residents through increased tax base revenues. . Landowners who testified at the Benton County Commissioner hearing that resulted in zoning that newly prohibited "solar power generation facility, major" as a use in the GMAAD district noted that the lease payments from the solar facility will supplement farming income with a fixed income stream, thus supporting their families and communities and allowing them to continue to manage their lands for current and future agricultural uses. In an ever-changing market, agricultural landowners have the discretion to choose what resources will be the most profitable to harvest on their lands – whether it is choosing a crop type to grow, what livestock to graze, or choosing to lease a portion of their lands for solar energy harvesting, and using the income stream to support

their other agricultural lands. Approval of the Project will support the long-term economic sustainability of participating landowners, and therefore, the Project is consistent with this goal and corresponding policy of the Comprehensive Plan.

2.1.2 Communities Outside UGAs

LU Goal 5: Identify the location, site planning, and density of new non-farm development outside of UGAs to protect existing agriculture from incompatible adjacent land uses.

> ***Policy 1: Establish compatible land uses adjacent to areas designated as GMA Agriculture to minimize conflicts associated with farm activities such as spray, dust, noise, odors, and liability.***

Response:

The Project is located outside of an Urban Growth Area (UGA) and is entirely within and adjacent to GMAAD land. The solar use will not be in conflict with agricultural activities such as spray, dust, noise, odors, and liability. These activities are not incompatible with solar operations because operation of a solar energy facility requires minimal on-site activities and staff. Regarding the Project's potential indirect impacts to surrounding agricultural activities such as dust, traffic, or spread of noxious weeds, best management practices, detailed further in Part 2 Section A.5 of the streamlined ASC, will be implemented and maintained as needed to avoid and minimize these potential impacts to agricultural activities. Once commissioned, the Project will be largely self-sufficient except for routine operations and maintenance activities by up to four operations employees and annual panel washing over a 2 to 3-week period. For these reasons, the Project is consistent with this goal and corresponding policy of the Comprehensive Plan.

2.1.3 Natural Resource Lands

NR Goal 1: Conserve and maintain agricultural land of long-term commercial significance as the local natural resource most essential for sustaining the County's agricultural economy.

> ***Policy 1: Conserve areas designated "GMA Agriculture" in the Comprehensive Plan for a broad range of agricultural uses to the maximum extent possible and protect these areas from the encroachment of incompatible uses.***
>
> ***Policy 3: Recognize that only uses related or ancillary to, supportive of, complimentary to, and/or not in conflict with agricultural activities are appropriate in areas designated GMA Agriculture.***

Response:

Existing Land Uses in the Project Area: The Project will be entirely located within the County's GMAAD zoning district, which is part of the County's GMA Agricultural land use designation in the Comprehensive Plan (Figure 1). In total, the 4,573-acre Project Area represents 0.7 percent of the 649,153 acres of lands in the GMA Agricultural designation (Benton County 2021b). Within the Project Area, the Project's security fenced area and permanent disturbance will occupy approximately 2,978 acres, or 0.5 percent of GMA Agricultural lands which would be a de minimis

reduction of farmland utilized for crop and livestock production throughout Benton County. The Project will not conflict with adjacent agricultural activities, as it will not limit or impact current or future farm activities on the surrounding land due to the implementation of best management practices, detailed further in Part 2 Section A.5 of the streamlined ASC, and will not diminish the opportunity for neighboring parcels to expand, purchase, or lease any vacant land available for farming.

Approximately 793 acres (17 percent) of the Project Area was mapped as current cultivated agricultural or pasture lands during the Project's 2021 Habitat and General Wildlife Survey (refer to ASC Part 2 Section B.2 Surface Types and Acreages and ASC Attachment G; Figure 2). These agricultural lands consist of fallow and active wheat, irrigated alfalfa fields, livestock and horse pastures. Water for irrigated lands in the Project Area is from an existing on-site well with a valid water right. Outside of these cultivated and pastured agricultural areas, approximately 3,740 acres (82 percent) of the Project Area was mapped as vegetated uplands, inclusive of 9 acres of irrigated hedgerows (i.e. windbreaks to crop lands). The remaining approximately 40 acres (1 percent) of the Project Area was mapped as developed, unvegetated, or wetlands and streams. The vegetated uplands include approximately 524 acres of lands currently enrolled in the Conservation Reserve Program (CRP). The remainder of the vegetated uplands consist of undeveloped rangelands, portions of which are used for sheep grazing. The landowners maintain several livestock tanks across the Project Area to support livestock.

Agricultural lands in the Project Area were also assessed using the Washington Department of Agriculture (WSDA) 2021 agricultural land use data (WSDA 2021; Figure 2). Within the Project Area, WSDA agricultural land uses are mapped as 320 acres of cereal grain, 368 acres of hay/silage, 138 acres of pasture, and 1,086 acres of other. Within these 1,912 acres of agricultural lands mapped by WSDA, 756 acres are identified as irrigated lands (center pivot, drip, sprinkler, or wheel line irrigation types). Lands to the south of the Project Area are mapped by WSDA as other (non-irrigated) and include undeveloped rangelands. Lands to the west of the Project Area include a small irrigated vineyard adjacent to the Project Area on Wautoma Road, "other" (likely dryland wheat) crop lands as identified by the WSDA database, non-irrigated pasture west of the Project Area. Undeveloped rangelands are also present west of the Project Area. Lands to the north similarly include other crop lands (likely dryland wheat), non-irrigated pasture, and undeveloped rangelands. Approximately 1 mile north of the Project Area along SR 24 are additional irrigated vineyards and orchards.

Non-agricultural land uses to the south, west, and north of the Project Area include several rural residences, scattered unoccupied structures (e.g., agricultural storage), existing electrical transmission infrastructure (i.e. BPA Wautoma Substation and multiple transmission lines), local roads and state highways, and a small commercial area at the intersection of SR 241 and SR 24 north of the Project Area. Lands to the east of the Project Area are in the Hanford Reach National Monument (Rattlesnake Unit of the Fitzner/Eberhardt Arid Lands Ecology Reserve) and are not open to public use or used for agriculture.

Agricultural Land of Long-term Commercial Significance: The Growth Management Act statutory definition of long-term commercial significance in WAC 365-196-200(12) is:

> *"Long-term commercial significance" includes the growing capacity, productivity, and soil composition of the land for long-term commercial production, in consideration with the land's proximity to population areas, and the possibility of more intense uses of the land.*

When developing the Comprehensive Plan, Benton County evaluated long-term commercial significance using the following criteria (Benton County 2021b):

> *Long-term commercial significance for agriculture was evaluated by applying several different considerations determined to be most applicable to Benton County resource lands, and generally consistent with guidance provided in WAC 365-190-050(3)(c), but also supplemented by information important to local conditions such as precipitation patterns. These considerations included:*
>
> - *Water availability/precipitation*
> - *Parcel size*
> - *Nearby UGAs, settlement patterns, land use, land values, and development permits*
> - *Land in the Conservation Reserve Program or conservation land*
> - *Prime farmlands*
> - *Pesticide restrictions*
> - *Public facilities and proximity to markets*
> - *Tax status*

The Comprehensive Plan's reference to WAC 365-190 refers to the minimum guidelines to classify agriculture, forest, mineral lands and critical areas under WAC 365-190-050(3)(c) and includes the following nonexclusive criteria for determining long-term commercial significance:

> *(i) The classification of prime and unique farmland soils as mapped by the Natural Resources Conservation Service;*
>
> *(ii) The availability of public facilities, including roads used in transporting agricultural products;*
>
> *(iii) Tax status, including whether lands are enrolled under the current use tax assessment under chapter 84.34 RCW and whether the optional public benefit rating system is used locally, and whether there is the ability to purchase or transfer land development rights;*
>
> *(iv) The availability of public services;*
>
> *(v) Relationship or proximity to urban growth areas;*
>
> *(vi) Predominant parcel size;*
>
> *(vii) Land use settlement patterns and their compatibility with agricultural practices;*
>
> *(viii) Intensity of nearby land uses;*

(ix) History of land development permits issued nearby;

(x) Land values under alternative uses; and

(xi) Proximity to markets.

Further, WAC 365-190-050(5) guides the designation of long-term commercial significance by the following:

> *When applying the criteria in subsection (3)(c) of this section, the process should result in designating an amount of agricultural resource lands sufficient to maintain and enhance the economic viability of the agricultural industry in the county over the long term; and to retain supporting agricultural businesses, such as processors, farm suppliers, and equipment maintenance and repair facilities.*

The Project Area contains several of the significance factors described in the Comprehensive Plan and quoted above, including parcel size, land use and settlement patterns, lands enrolled in CRP, and prime farmlands. The Project Area is in an isolated area of Benton County outside of a UGA. Development on surrounding lands is minimal and primarily consists of agricultural uses as described above. The Project Lease Boundary parcels are mostly large parcels (see ASC Attachment A, Figure A-2). Lands in the Project Area have also historically been utilized for agricultural activities (crop cultivation and grazing), although the areas used for these activities have varied over time. As described above, the Project's 2021 General Habitat and Wildlife survey mapped approximately 794 acres of the Project Area as cultivated agricultural (ASC Attachment G). Approximately 3,731 acres were mapped in the survey as vegetated uplands, portions of which are used for sheep grazing. Approximately 756 acres of the Project Area are mapped as irrigated by WSDA (WSDA 2021). Additionally, 524 acres of the Project Area are currently enrolled in CRP (see Figure 2). According to the Natural Resources Conservation Service, approximately 3,328 acres or 73 percent of the mapped soil units in the Project Area are classified as prime farmland if irrigated[4] and an additional 15 percent (689 acres) are classified as farmland of unique[5] or of statewide importance[6] (refer to Table 1, Figure 3 and ASC Attachment E). However, of the 3,328 acres classified by the NRCS as prime farmland if irrigated, only 724 of these acres are irrigated. Therefore, only 724 acres should be considered prime farmland and the remaining acres should not be considered prime farmland as they are not irrigated and have no history of being irrigated. Areas with soils suitable to crop production are limited by existing site drainage patterns, consisting of

[4]*Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses.* (NRSC 2022)
[5]*Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables.* (NRSC 2022)
[6]*Land that does not meet the criteria for prime or unique farmland is considered to be farmland of statewide importance for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.* (NRSC 2022)

multiple ephemeral streams, Dry Creek and associated 100-year floodplain, as well as areas with steeper slopes in the southern and eastern portions of the Project Area. Figure 3 overlays NRCS mapped soil units with areas mapped by WSDA as irrigated and shows the Project fence line and permanent disturbance footprint (e.g. paved or compacted surfaces such as access roads, inverter pads, O&M building, substation). Table 1 provides a breakdown of NRCS soil classifications within the Project Area, Project fence line, and Project permanent disturbance footprint. As noted in Figure 3 and Table 1, the Project fence line excludes most (85.8 percent) of the farmland of unique importance located in the Project Area and excludes about half (53.7 percent) of the farmland of statewide importance located in the Project Area. Of the 724 acres of prime farmland that is irrigated, 689.9 acres are located within the fence line and only 25.4 acres are covered by the Project's permanent disturbance footprint (i.e. inverters and access roads) while the remainder will be located in areas where the solar arrays are sited which will undergo minimal grading and compression and will be available for farm use after the Project is decommissioned at the end of its useful life. The Project's permanent disturbance areas will occupy a minimal amount of prime farmland and/or farmland of unique or statewide importance.

Table 1. NRCS Soil Classifications within the Project Area, Fence Line, and Permanent Impact Footprint

NRCS Soil Classification	Acres within Project Area	Acres within Project Fence Line	Acres within Permanent Disturbance Footprint[1]
Prime farmland if irrigated (located within areas of irrigation per WSDA [2] data)	724	699	25
Prime farmland if irrigated (located outside areas of irrigation per WSDA [2] data)	2,604	1,864	92
Farmland of unique importance	425	60	5
Farmland of Statewide Importance	264	122	10
Not Prime Farmland	556	229	9
Total	4,573	2,974	141

Notes:
1: Permanent disturbance footprint includes paved and/or compacted surfaces including driveways, access roads, inverters, O&M building, substation.
2: Source: WSDA 2021

Regarding the WAC 365-190-050(3)(c) criteria of availability of public services, proximity to markets, and the Comprehensive Plan's considerations of water availability and precipitation, the Project Area is less suitable for agricultural uses than other areas of the County within the GMAAD and GMA Agriculture land use designation. The Project Area is located near several transportation routes, including SR 24, SR 241, and SR 240; however, processing centers and other agricultural-related commercial services are located approximately 12 miles south of the Project Area near the

larger concentrated areas of agricultural lands along Interstate 84 and along the Yakima River. The Project Area is located outside of an irrigation district and irrigation is supplied by two irrigation wells within the Project Area. The Applicant is working with the landowner to provide continued access to the irrigation wells during Project construction and operations (refer to the discussion below in response to Policy 4). As described in the ASC Attachment I Wetland Delineation Report, the total precipitation for water year 2020 to 2021 was 5.34 to 8.76 inches. The annual precipitation of the area is a limiting factor to crop cultivation on non-irrigated lands. The non-irrigated lands may be suitable to dryland wheat and grazing, as evidenced by historic grazing uses in the Project Area. Stock tanks and suitable forage are still necessary for the productivity of rangelands. The Applicant is working with the landowners to identify areas within the Project Lease Boundary that are suitable for grazing during Project operations, including relocating stock tanks to outside of the Project security fence.

Following the guidance in WAC 365-190-050(5), the County's process of designating agricultural areas of long-term commercial significance using the criteria in WAC 365-190-050(3)(c) should result in "designating an amount of agricultural resource lands sufficient to maintain and enhance the economic viability of the agricultural industry in the county over the long term…" (WAC 365-190-050(5)). As described above, the Project's security fenced area and permanent disturbance will occupy approximately 2,978 acres, or 0.5 percent of the 649,153 acres of land designated as GMAAD in the County (Benton County 2021b). The small area of land that will be occupied by the Project, combined with the isolated nature of the lands, site topography and drainage limitations, distance to markets, and lack of annual precipitation, are not representative of resource lands necessary to maintain and enhance the economic viability of the agricultural industry in the County over the long term.

While lands in the Project Area are located in the GMAAD and GMA Agricultural land use designation and have a history of agricultural use, when reviewing under the factors and guidelines described above, the Applicant urges the EFSEC council to carefully consider the factors that inform the designated use of this land, and the *de minimis* amount of land the Project Area represents among the hundreds of thousands of acres of GMAAD-zoned land in this county and the relatively small contribution it makes to the economic viability of the agricultural industry in the County over the long term.

Compatibility with Allowed Uses on Surrounding Lands: As a "solar generation facility, major," the Project was previously an allowed conditional use in the GMAAD district prior to the adoption of OA 2021-004. Therefore, subject to the conditions of approval, the County previously found a "solar generation facility, major" as a compatible use in the GMAAD district. The Project Area was selected by the Applicant for its favorable site suitability characteristics, including high solar energy resource, topography, proximity to electrical infrastructure, compatibility with allowed uses on surrounding lands, and low resource conflicts. The Project's location away from population centers and co-location with existing electrical transmission infrastructure (i.e. BPA Wautoma Substation and multiple transmission lines) is ideal to avoid conflicts with other land uses, as well as to minimize impacts to natural and cultural resources.

The Applicant posits, and believes the EFSEC council can conclude, that the Project is not incompatible with surrounding agricultural land uses and would not conflict with surrounding agricultural activities during the construction and operational periods for the following reasons:

- During construction, impacts on agricultural land uses, including the cultivation of crops, vineyard and orchard operations, and rangelands on lands located to the west, north, and south of the Project Area will be minimized through the implementation of environmental best practices as described in the ASC in Part 2, Section A.5, Part 3, and Part 4.
    - Noise: Project construction may result in short-term noise impacts from construction equipment during the approximately 22-month construction period. Reasonable efforts will be made to minimize the impact of noise resulting from construction activities, including implementation of standard noise reduction measures as described in the ASC Part 4, Section 4.16a.
    - Traffic: As described in Part 4, Section 4.20 of the ASC and described in Section 3.4.4 below, Project construction will involve a temporary increase in traffic to the site for delivery of materials and worker transportation. While traffic will increase temporarily during construction, peak vehicular and truck traffic is not expected to have a significant impact on SR 241, SR 24, and SR 240. Construction traffic will not block or obstruct access to surrounding lands. The timing of peak construction activity may overlap with the harvest season; however, harvest vehicles typically travel throughout the day and are not limited to prime commuting hours, which is when the highest impact of workers commuting to the Project will occur.
    - Erosion Control, Stormwater Management, and Dust Mitigation: The Applicant will implement erosion control, stormwater management measures, and dust control measures to minimize the runoff and soil erosion (refer to ASC Part 4, Sections 4.1, 4.2 and 4.5). Dust will be mitigated using standard dust control practices including, but not limited to, spraying water or a binding agent, and/or applying gravel as necessary. Depending on soil moisture levels, up to approximately of 53 million gallons of water could be used throughout construction for dust suppression.
    - Noxious Weed Control: Following construction, temporarily disturbed areas will be revegetated in accordance with a Vegetation and Weed Management Plan that will be developed and submitted to EFSEC prior to construction (refer to ASC Part 4, Section 4.8). Best management practices, such as flagging the limits of construction to minimize vegetation removal and ground disturbance, and implementing measures described in the Project Vegetation and Weed Management Plan, will be uses to control and manage noxious weeds on site to prevent spread onto nearby properties.
- Following construction, the Project will be operated and maintained by up to four employees. Operation of the Project will consist of routine maintenance activities and panel washing once per year. Impacts to agricultural uses on adjacent lands during operations will be limited to minimal vehicle and truck traffic on area roadways associated with four

operations employees and water delivery truck traffic during a 2- to 3-week period once per year for panel washing (refer to ASC Part 4, Section 4.20). Operations traffic will not block or obstruct access to surrounding lands and therefore will not impact agricultural activities. Overall, sound emissions associated with the operations of the Project are expected to remain at a low level and will comply with the applicable WAC 173-60, which establishes noise limits (refer to ASC Part 4, Section 16a and ASC Attachment O). The Project will also implement a Vegetation and Weed Management Plan to control noxious weeds. The plan will be developed in coordination with EFSEC and Benton Country Noxious Weed Control Board.

Operation of the Project will not conflict with agricultural uses on surrounding lands and represents compatible use in the GMA Agricultural lands designation. Refer to the response to BCC 11.50.040(d) in Section 3.4.4 below for additional discussion on compatibility with allowed uses in the GMAAD.

Implementation of the Project will also support the long-term economic sustainability of participating landowners via direct lease payments, while agricultural activities allowed on lands surrounding the Project Area could continue unimpeded. The Applicant is working with the Project landowners to determine suitable areas for sheep grazing post-construction within the undeveloped portions of the Project Lease Boundary. The Applicant is committed to working with the landowners to continue their long-standing tradition of grazing and will also support relocating livestock tanks to areas outside of the Project fence line.

As demonstrated throughout the ASC and this Land Use Consistency Review, Project design incorporates environmental best practices and the Applicant has developed measures to avoid, mitigate, or minimize (to the greatest extent reasonable) potential conflicts with agricultural activities on surrounding lands. For these reasons, the Project is consistent with this goal and corresponding policies of the Comprehensive Plan.

Policy 4: Apply development standards that conserve water resources when reviewing proposed new non-agricultural developments to sustain the ability of the regional agricultural economy to expand and respond to new market conditions and opportunities.

The Project will obtain water for construction and operation from existing sources with a verified water right. Anticipated water needs are noted in Part 3 and Part 4 of the ASC. Water use during construction will primarily be associated with dust control and is estimated at approximately 53 million gallons over the approximately 22-month construction period, or approximately 80,000 gallons per day. During operations, the Project is expected to use less than the groundwater permit-exempt well threshold of 5,000 gallons per day, and actual water use is estimated to be approximately 120,000 gallons per year. This total includes the water use related to the panel washing (i.e., if 20 percent of the PV panels are washed once per year). Because the Project will obtain water from sources with a verified water right, none of the Project's water requirements will impair the ability of nearby agricultural uses to meet their operational needs and the Project will not conflict with any water rights in the vicinity of the Project Area.

The Project's construction and operations water use represents a de minimis amount of the 42 million gallons of groundwater withdrawn per day for crops in Benton County (USGS 2018). Given the minimal water required for the Project operations, this non-agricultural land use will help sustain the ability of the agricultural economy to expand by reducing the water use in this area, thus freeing up more water to be used on agricultural lands with more long-term commercial significance than the lands within the Project Area.

For the reasons stated above, the Project is consistent with this goal and corresponding policies of the Comprehensive Plan.

2.1.4 Water Resources

WR Goal 2: Protect and enhance surface and groundwater water quality for human health, drinking water supply, and to meet water quality standards.

> ***Policy 1: Prohibit developments which have the potential for significant individual or cumulative impacts on ground and surface water quality; or alternatively, site and design developments to avoid or mitigate such impacts.***

Response:

The Project will not have a significant individual or cumulative impact on ground and surface water quality. Design of the Project includes avoidance of wetlands and waters of the U.S. and compliance with state stormwater permit requirements. As stated above, the anticipated groundwater use represents a fraction of the groundwater withdrawals per day for crops in Benton County. The amount of water used for annual panel washing will easily infiltrate into the vegetated ground around the panels and is not expected to run off to surface water bodies nor impact aquifers. Furthermore, washing of solar panels, if required, will be done with water only, and no surfactants or other chemicals will be added. Because the panel wash water will not contain added chemicals and the water is expected to evaporate with only minimal amounts potentially reaching the ground, no mitigation will be required and there will be no impact on the receiving environment from panel washing. The analysis in Part 4, Section 4.3 of the ASC provides the full extent of waterbodies and floodplains within the Project Area, details of the methods used to confirm the extent of waterbodies within the Project Area (based on the wetland delineation), description of the impacts the Project will have on ephemeral waterbodies and floodplains, and the proposed mitigation strategies that will be implemented. For these reasons, the Project is consistent with this goal and corresponding policy of the Comprehensive Plan.

2.1.5 Critical Areas

CA Goal 1: Protect the functions and values of critical areas within the county with land use decision-making and development review.

> ***Policy 1: Apply standards, regulations, and mitigation strategies to development during the permitting and development approval process that protects critical areas functions and values.***

Policy 2: Encourage new development and redevelopment in UGAs and large developments outside of UGAs to comply with low impact development standards as applicable.

Response:

The Project has been designed to avoid and minimize impacts to Critical Areas, as described in the relevant portions of the ASC. Site-specific investigations for critical areas have been completed for the Project Area and the results are summarized in Part 4, Section 4.1, Section 4.3, Section 4.5, Section 4.8, and Section 4.9 of the ASC. Further, Section 3.5 below describes the Project's compliance with Benton County's Critical Area Ordinance and demonstrates how the Project will protect critical areas functions and values. The Project is located outside the UGA and is designed following low-impact development practices to the greatest extent practicable, including but not limited to minimizing impervious surfaces and using energy efficient technology. For these reasons, the Project is consistent with this goal and corresponding policies of the Comprehensive Plan.

CA Goal 4: Sustain a diverse, productive, and high-quality natural environment for the use, health, and enjoyment of County residents.

Policy 1: Work with private and public property owners during development to ensure protection and appropriate use of the County's natural resources.

Response:

The Applicant is working with all participating private landowners and Project stakeholders, including BPA for the transmission interconnection and Project easements, to ensure natural resource protection and agreed-upon appropriate measures to reduce or avoid natural resource impacts. For these reasons, the Project is consistent with this goal and corresponding policy of the Comprehensive Plan.

CA Goal 5: Achieve balance among economic uses of land and critical areas protection

Policy 1: Work with state, federal, and local agencies and other County stakeholders regarding the application of environmental protection laws and regulations.

Response:

As demonstrated above, the Project promotes economic use of the lands in the Project Area while protecting critical areas. Through the ASC and required Project permits and approvals, applicable environmental protection laws and regulations will be applied to the Project. For these reasons, the Project is consistent with this goal and corresponding policies of the Comprehensive Plan.

2.1.6 Economic Development

ED Goal 1: Create a balanced and diverse economy that provides an opportunity to make economic and lifestyle choices for Benton County residents.

Policy 1: Promote industries that are diverse and support an agriculture-based economy.

Policy 4: Facilitate economic growth and prosperity while preserving the existing rural quality of life and character, as it is defined by rural residents.

Response:

The Project represents a diverse, valuable addition to the economy that is compatible with the surrounding agricultural uses as described above in response to NR Goal 1 and in Section 3.4.4 below. Solar energy generation as proposed through this Project creates new economic activity in the County and supports the long-term economic sustainability of participating landowners via direct lease payments. The Applicant prepared a Socioeconomic Review (Attachment N) for consideration under WAC 463-60-535. The document contains information about population and labor force impacts as well as housing. The Project will also provide Benton County with additional tax revenue. The property tax payments to the County from the proposed Project will generate an estimated $80 million dollars over the life of the Project. Actual payments will be determined by Benton County in accordance with their rate schedule. These payments represent an increase over current tax revenues from the affected properties and represent a substantial contribution to Benton County. As a result, the community can benefit from an increased, stable funding source for services such as public safety and education. For these reasons, the Project is consistent with this goal and corresponding policy of the Comprehensive Plan.

ED Goal 2: Expand employment opportunities in unincorporated Benton County.

Policy 1: Maintain and protect the agricultural economic base of Benton County.

Response:

As stated above, the Project is designed to be compatible with ongoing agricultural activities and adds a new, diverse source of revenue to landowners that helps to maintain and protect the agricultural economic base. The Project Area was selected by the Applicant for its favorable site suitability characteristics, including high solar energy resource, topography, proximity to electrical infrastructure, compatibility with allowed uses on surrounding lands, and low resource conflicts. The Project will have a number of benefits to the local community and Washington state. Based on similar projects, it is anticipated that the construction of the Project will support approximately 515 jobs during peak construction and up to 4 permanent jobs during operations. Most construction workers will be employees of construction and equipment manufacturing companies under contract to the Applicant. The construction workers will consist of approximately 45 to 65 percent of locally hired workers and a limited number of specialized workers for specific construction tasks (for example, construction management). The Applicant will solicit experienced Washington-based contractors with the goal of hiring construction workers from local communities. Job creation has a multiplier effect within the local community, increasing business for local restaurants, hotels, and retail establishments. Workers employed in service of the construction of the proposed Project would spend portions of their salaries in local communities, creating “induced” economic benefits at various local area businesses, especially retail, lodging, and food and entertainment establishments. For these reasons, the Project is consistent with these goals and corresponding policies of the Comprehensive Plan.

2.1.7 Parks, Recreation, Open Space, and Historic Preservation

PL Goal 3: Conserve visually prominent naturally vegetated steep slopes and elevated ridges that define the Columbia Basin landscape and are uniquely a product of the ice age floods.

> ***Policy 1: Identify and preserve historically significant structures and sites whenever feasible.***
>
> ***Policy 2: Encourage the public and/or private acquisition of the prominent ridges within unincorporated Benton County as Open Space Conservation, in order to preserve views, protect native habitat, and provide for public access and recreation associated with these landscapes.***
>
> ***Policy 3: Pursue a variety of means and mechanisms such as the preparation of specific and area plans, conservation easements, clustered developments, land acquisitions and trades, statutory requirements to protect the natural landform and vegetative cover of the Rattlesnake uplift formation, notably Rattlesnake, Red, Candy, and Badger mountains and the Horse Heaven Hills.***

Response:

As described in the response below to PL Goal 4, the Project will be designed to avoid any historically significant structures and sites, and the Applicant has coordinated with local tribes to ensure protection of historic and cultural resources. Regarding prominent ridges in unincorporated Benton County, the Project is located entirely on private lands and does not limit access to these areas. The closest designated open space is located approximately 25 miles to the southeast of the Project Area north of West Richland. The Rattlesnake Hills, as identified on the Comprehensive Plan maps, are located approximately 12 miles to the southeast of the Project Area (also north of West Richland). Lands to the east of the Project Area are in the Hanford Reach National Monument (Rattlesnake Unit of the Fitzner/Eberhardt Arid Lands Ecology Reserve) and are not open to public use. The Project does not preclude the ability of the County to acquire ridgelines for the stated purposes of Policy 2 and Policy 3.

In regard to views in the surrounding vicinity of the Project, the Project components will be designed in a manner as to minimize contrast as analyzed in detail in Part 4, Section 4.16 of the ASC and the accompanying Visual Impact Assessment (ASC Attachment P) and Solar Glare Analysis (ASC Attachment H). Depending on the proximity, the Project will introduce weak to strong contrast with the surrounding landscape. Based on the Project's viewshed analysis (see ASC Attachment P), visibility of the Project Area varies between viewpoints. From viewpoints to the west, north, and south, depending on the intervening terrain, views of the Project Area tend to only be available within a couple miles from the Project Area. From viewpoints to the east, views of the Project Area may be available from a greater distance, but in general, also tend to be limited to a short distance from the Project Area due to intervening terrain. Where the Project is visible, the Project components will be consistent with other horizontal and vertical lines and geometric shapes visible throughout the landscape lines (fencing, roadway, substation, transmission towers and lines, utility poles and lines, agricultural structures) and will not block views of the surrounding hills. The

Project will not introduce a source of glare that would significantly impact motorists, residents, or views in the area. Additionally, the Project will not introduce a source of light that would significantly impact views in the area.

PL Goal 4: Preserve significant historic structures, districts, and cultural resources that are unique to Benton County.

Policy 1: Coordinate with local tribes to protect historic and cultural resources.

Policy 2: Preserve archaeologically significant sites by siting and designing development to avoid or mitigate impacts.

PL Goal 5: Identify, preserve, and protect historic, cultural, and archaeological resources found to be significant by recognized local, state, tribal or federal processes.

Policy 3: Preserve areas that contain valuable historical or archaeological sites of federal, state, tribal, or local significance including those maintained in the Department of Archaeology and Historic Preservation's database, areas known only to tribes and areas of higher risk potential. Maintain and enforce development code provisions that require conditioning of project approval on findings made by a professional archaeologist for development activities on sites of known cultural, historical, or archaeological significance.

Response:

A Cultural Resources Survey Report is provided as ASC Attachment Q (Confidential) and provided to the Department of Archaeology and Historic Preservation for review as part of the ASC process. See Part 4, Sections 4.18 and 4.19 for detailed discussion of historic and cultural resources. The Project will be designed to avoid any historically significant structures and sites. The Applicant has coordinated with local tribes to ensure protection of historic and cultural resources, including ongoing communication with the Confederated Tribes of Warm Springs, Wanapum Tribe, Samish Indian Nation, Confederated Tribes and Bands of the Yakama Nation, Confederated Tribes of the Colville Reservation, and the Confederated Tribes of the Umatilla Indian Reservation. For these reasons, the Project is consistent with these goals and corresponding policies of the Comprehensive Plan.

2.1.8 Utilities

UE Goal 1: Ensure utilities support the land use and economic development goals of the County.

Policy 1: Siting of proposed public facilities should be consistent with adopted land use policies.

UE Goal 3: Facilitate efficiency in utility land use and development.

Policy 3: Facilitate maintenance and rehabilitation of existing utility systems and facilities and encourage the use of existing transmission/distribution corridors.

Response:

The Project will comply with applicable development standards and criteria for a "solar energy generation facility, major" as described below in Section 3, including but not limited to BCC Title 11 Zoning and conditional use standards and criteria for approval. Solar energy is a clean, renewable form of energy generation with recognized local, regional, and global environmental benefits. The State of Washington has set a target to transition the state's electricity supply to 100 percent carbon-neutral by 2030 and 100 percent carbon-free by 2045 (RCW 19.405.010). The Project will contribute to meeting this state goal. The Project Area was selected in large part due its proximity to existing electrical and transmission infrastructure, including the BPA Wautoma Substation and several transmission line corridors. The Project will include an approximately 0.25-mile long overhead 500-kV transmission line extending from the Project substation to the point of interconnection with the existing BPA transmission system at the BPA Wautoma Substation, which is located in on BPA federal lands surrounded by the Project Area as shown in the Preliminary Site Plan (ASC Attachment A Figure A-1).

Electricity connections for the Project will be provided by Benton Rural Electric Association before the start of operations, and communications will be provided by a local utility. During construction, water will be obtained from a source with verified water rights. Best management practices will be employed to manage stormwater within the Project Area (see ASC Part 3, Section 5, and Part 4, Section 4.5). Portable toilets will be used for sanitary waste. A licensed hauler will be used to transport and dispose of construction waste in accordance with applicable laws. Recycling will be implemented to the extent practicable. During operations, the Project will utilize an on-site well and will require less than 5,000 gallons per day of domestic water use at the O&M building (as discussed in ASC Part 3, Sections 4, 6, and 22).

Construction and operation of the Project will not have a significant adverse impact on existing public facilities or services, and the Applicant will bear the costs of providing the necessary utilities and related services for the Project. For these reasons, the Project is consistent with these goals and corresponding policies of the Comprehensive Plan.

3.0 County Code Provisions

This section provides the Applicant's responses demonstrating that the Project complies with applicable provisions of the BCC. RCW 80.50.040 and 80.50.110 as well as WAC 463-28 allow EFSEC to authorize an energy generation facility, with appropriate consideration of the Project's consistency with the Comprehensive Plan and land use regulations as necessary to understand the

"local governmental or community interests affected."[7] The provisions addressed below are based on the Applicant's review of the BCC. The provisions as they appear in the BCC are copied below in italics, with some titles abbreviated. Except where otherwise noted, BCC provisions are current for 2021 (Benton County 2021a). The provisions below are followed by the Applicant's response and statement of compliance.

3.1 Title 3 Building and Construction

3.1.1 Chapter 3.04 Building Code, 3.08 Plumbing Code, 3.12 Mechanical Code. 3.14 Energy Code, 3.16 Fire Code, and 3.18 Minimum Standards for Roads.

Response:

Construction and operation of the Project will comply with all applicable sections of the County's Building Code (BCC 3.04), Plumbing Code (BCC 3.08), Mechanical Code (BCC 3.12), Energy Code (BCC 3.14), Fire Code (BCC 3.16), and Minimum Standards for Roads (BCC 3.18). These are understood to apply primarily to the Project's O&M building and access roads. As a condition of approval, the Applicant or its licensed construction contractor will obtain all related County permits prior to construction, including but not limited to a Building Permit, Road Approach Permit, Oversized Load Permit, Right of Way Encroachment Permit, and Franchise Agreement (with the Department of Public Works). Grading and excavation plans will be prepared by a qualified engineer to show property limits, existing and proposed contours, proposed limits of excavation and grading, and existing structures or sensitive resources that will be flagged off and avoided. The Applicant will work with EFSEC staff and the County to ensure information needed is provided for review and approval prior to construction. These plans will be provided to EFSEC as part of coordinating compliance with BCC Title 3 Building and Construction as a condition of approval. Therefore, the Project will comply with these requirements.

[7] *See*, RCW 80.50.110 Chapter governs and supersedes other law or regulations—Preemption of regulation and certification by state. (1) If any provision of this chapter is in conflict with any other provision, limitation, or restriction which is now in effect under any other law of this state, or any rule or regulation promulgated thereunder, this chapter shall govern and control and such other law or rule or regulation promulgated thereunder shall be deemed superseded for the purposes of this chapter.(2) The state hereby preempts the regulation and certification of the location, construction, and operational conditions of certification of the energy facilities included under RCW 80.50.060 as now or hereafter amended. *See also*, RCW 80.50.090, authorizing the Energy Facility Site Evaluation Council to "determine whether or not the proposed site is consistent and in compliance with city, county, or regional land use plans ***or*** zoning ordinances." [Emphasis added].

3.1.2 Chapter 3.26 Flood Damage Prevention

Response:

Construction and operation of the Project will comply with all applicable sections of BCC Chapter 3.26. No structures or permanent impacts are proposed within a special flood hazard area. Only limited temporary impacts (i.e., one temporary stream crossing) will occur within an area of special flood hazard, with no fill placed within an area of special flood hazard, and that location will be restored to pre-Project condition with no impacts to flood capacity or flood levels. Further, matting would be placed to minimize disturbance to the flood hazard area. The Applicant will coordinate with Benton County and obtain a Special Flood Hazard Development Permit prior to any development occurring within an area of special flood hazard. Therefore, the Project will comply with BCC 3.26.

3.2 Title 6 Health, Welfare and Sanitation

3.2.1 Chapter 6.35 BCC Environmental Policy

Section 6.35.065 Environmental Checklist

(a) A completed environmental checklist (or a copy), in the form provided in WAC 197-11-960, shall be filed at the same time as an application for a permit, license, certificate, or other approval not specifically exempted in this chapter; except, a checklist is not needed if the county and applicant agree an EIS is required, SEPA compliance has been completed, or SEPA compliance has been initiated by another agency. The county shall use the environmental checklist to determine the lead agency and, if the county is the lead agency, to determine the responsible official and to make the threshold determination.

(b) For private proposals, the county will require the applicant to complete the environmental checklist, providing assistance as necessary. For county proposals, the department initiating the proposal shall complete the environmental checklist for that proposal.

Response:

The Applicant has elected to pursue siting the Project under EFSEC's jurisdiction, and therefore, EFSEC serves as the lead agency for the Washington State Environmental Policy Act (SEPA) compliance. Information needed for a SEPA determination is incorporated in Part 3 and Part 4 of the ASC. EFSEC will prepare a SEPA checklist form per WAC 197-11-960 with reference to corresponding sections of Part 3 and Part 4 as appropriate. Therefore, the Project will comply with the County's SEPA checklist requirement.

3.3 Title 6A Public Nuisance Noise

3.3.1 Chapter 6A.15 BCC Public Nuisance - Noise

Section 6A.15.040 Public Nuisance Noise – Unlawful

It is unlawful for any person to make, continue, or cause to be made or continued or to allow to originate from his or her personal or real property any public nuisance noise which:

(a) is plainly audible within any dwelling unit which is not the source of the sound or is generated within two hundred (200) feet of any dwelling; and,
(b) either annoys, disturbs, injures or endangers the health, comfort, repose, peace or safety of others.

Section 6A.15.050 Exemptions

The following sounds are exempt from the provisions of this ordinance and are not public nuisance noises:

(g) sounds originating from harvesting, farming, ranching, agricultural, industrial or commercial activities;
(k) sounds created by construction or refuse removal equipment;

Response:

Sounds generated by the Project will be classified as exempt from the Benton County's public nuisance noise provisions because they would be limited to sounds originating from industrial or commercial activities (BCC 6A.015.050(g)) and sounds created by construction or refuse removal equipment (BCC 6A.015.050(k)). The Project is required to comply with Washington State noise regulations under WAC 173-60 and is evaluated pursuant to the applicable state requirements in Section 4.16 of the ASC and ASC Attachment O Acoustic Assessment. Therefore, the Project will satisfy the County's applicable noise provisions under BCC 6A.015.040.

3.4 Title 11 Zoning

The Project is located within the County's GMAAD zoning district. No overlay districts apply to the Project Area. This section addresses the County's zoning code requirements that are applicable to the Project in the GMAAD zoning district. As noted earlier, pursuant to RCW 80.50.040, RCW 80.50.110, and WAC 463-28, EFSEC may authorize an energy generation facility with appropriate consideration of the Project's consistency with the Comprehensive Plan and land use regulations as necessary to understand the "local governmental or community interests affected."

3.4.1 Chapter 11.03 BCC Definitions

11.03.010 Definitions

(53) "Compatibility" means the congruent arrangement of land uses and/or project elements to avoid, mitigate, or minimize (to the greatest extent reasonable) conflicts.

(57) "Conditional Use Permit" means a permit which is granted for a conditional use. The term "conditional use" means a use subject to specified conditions which may be permitted in one (1) or more classifications as defined by this title but which use, because of characteristics peculiar to it, or because of size, technological processes or type of equipment, or because of the exact location with reference to surroundings, streets and existing improvements or demands upon public facilities, or impacts to ground or surface water requires a special

degree of control to make such uses consistent with and compatible to other existing or permissible uses in the same zone or zones, and to assure that such use shall not be adverse to the public interest.

(167) "Solar Power Generator Facility, Major" means the use of solar panels to convert sunlight directly or indirectly into electricity. Solar power generators consist of solar panels, charge controllers, inverters, working fluid system, and storage batteries. Major facilities are developed as the primary land use for a parcel on which it is located and does not meet the siting criteria for a minor facility in BCC 11.03.010(168).

(182) "Utility Substation Facility" means above or below ground structures that are necessary to provide or facilitate distribution, transmission, or metering of water, gas, sewage, and/or electric energy. Such facilities may consist of, but are not limited to, the following:

(a) Water, gas, and electrical distribution or metering lines and sites;

Response:

The Project's solar PV system will convert energy from the sun into electric power. The solar PV system will consist of a series of solar PV panels mounted on a solar tracker racking system and related electrical equipment. The system includes the solar panels, tracker racking system, posts, collector lines, inverters, transformers, and BESS. The BPA Wautoma Substation already exists, and the Project includes a short 500-kV transmission line from the Project substation to the existing Wautoma Substation. The solar PV system will be the primary land use for the Project and therefore meets the definition of a "solar power generator facility, major" and includes utility components meeting the definitions of "utility substation facility".

3.4.2 Chapter 11.17 BCC Growth Management Act Agricultural District

11.17.070 Uses Requiring a Conditional Use Permit.

The following uses may be permitted within the GMA Agricultural District if a conditional use permit is issued by the Hearings Examiner after notice and public hearing as provided by BCC 11.50.040:

~~(z) Solar power generator facility, major.~~[8]

Response:

The Applicant posits that these materials demonstrate how the proposed Project remains consistent with the BCC, including the zoning provisions of BCC Ch. 11.17, despite the adoption of OA 2021-004.

As stated above, the proposed Project will consist of a series of solar PV panels mounted on a solar tracker racking system and related electrical equipment and meets the County definition of a "solar power energy facility, major" (see BCC 11.03.010(167)).

[8] Use was removed from BCC 11.17.070 per OA 2021-004 in December 21, 2021.

11.17.090 Lot Requirements.

All lands, structures and uses in the GMA Agricultural District shall conform to the following lot requirements unless otherwise excepted as provided in BCC 11.17.100:

(a) The size of a lot in the GMA Agricultural District shall be a minimum of twenty (20) acres (1/32 of a section).

(b) Each lot in the GMA Agricultural District shall have:

(1) An average lot width of not less than one hundred sixty-five (165) feet;

(2) a minimum depth of one hundred sixty-five (165) feet;

(3) a minimum frontage of ninety (90) feet on a road or access easement to a public road right-of-way. [Ord. 611 (2018) § 65]

Response:

The Project is designed to meet or exceed the minimum lot size and dimensional standards of 165 feet width and 165 feet depth, with a minimum frontage of 90 feet along SR 241 and Wautoma Road. Therefore, the Project will comply with this requirement.

11.17.110 Building Requirements

All lands, structures and uses in the GMA Agricultural District shall conform to the following building requirements:

(a) No residential building shall have a height greater than thirty-five (35) feet.

(b) Development on land shall be in compliance with Chapter 15.02 BCC, Chapter 15.04 BCC, Chapter 15.06 BCC, Chapter 15.08 BCC, Chapter 15.12 BCC, and Chapter 15.14 BCC. [Ord. 611 (2018) § 67]

Response:

There are no residential structures proposed by the Project. The Project's O&M building will have a maximum height of 20 feet. There are no residential buildings proposed. Section 3.4 details compliance with Chapter 15.02 BCC, Chapter 15.04 BCC, Chapter 15.06 BCC, Chapter 15.08 BCC, Chapter 15.12 BCC, and Chapter 15.14 BCC. Therefore, the Project will comply with this requirement.

11.17.120 Setback Requirements

All lands, structures, and uses in the GMA Agricultural District shall conform to the following minimum setback requirements; unless otherwise excepted as provided in BCC 11.17.130:

(a) Each structure on a lot shall have a front yard setback of fifty-five (55) feet from the centerline of any city, county, or state road right of way of sixty (60) feet or less in width, twenty-five (25) feet from the property line bordering any road wider than sixty (60) feet, and twenty-five (25) feet from the legally-established boundary line of any access and/or combined access and utility easement adjacent to or within the property.

(b) Each structure on a lot shall have a setback of twenty (20) feet from its rear and side lot line(s).

(c) Those enclosures used in commercial dairy, hog, poultry, and rabbit operations, the propagation of fur bearing species for commercial purposes, or livestock auction yard shall have setbacks of one hundred (100) feet from all property lines; and a five hundred (500) foot setback from any existing residential structure on adjacent property not under common ownership with the operator of the facility. [Ord. 611 (2018) § 68]

Response:

The Project is designed to meet or exceed the applicable front, rear, and side setback standards listed above. The County defines both "Front Yard" and "Setback, Front" under BCC 11.03.010(77) and (161), respectively. The front yard is "the required open space between the front property line and the nearest part of any building on the lot" (BCC 11.03.010(77)). The front setback is the "minimum horizontal distance measured perpendicularly from the centerline of the adjacent right-of-way to the nearest wall of the structure" (BCC 11.03.010(161)). Based on the preliminary layout shown on the Preliminary Site Plan (ASC Attachment A Figure A-1), no Project solar arrays or walled structures will be located within 55 feet from the centerline of any city, county, or state road right-of-way of 60 feet or less in width, 25 feet from the property line bordering any road wider than 60 feet, and 25 feet from the legally established boundary line of any known access or combined access and utility easement adjacent to or within the Project Lease Boundary.

The County defines the side and rear setbacks as the "minimum horizontal distance measured perpendicularly from the nearest property line to the nearest wall of the structure" (BCC 11.03.010(162)). The Preliminary Site Plan (Attachment A Figure A-1) was designed with all Project components at least 20 feet from parcel lines outside of the Project Lease Boundary. While solar array components and security fencing will cross side and rear lot lines, these components are not walled structures; therefore, the side and rear setbacks under BCC 11.17.120(b) do not apply to the proposed solar arrays within the Project Lease Boundary. The proposal does not involve commercial dairy, hog, poultry, rabbit operations, fur-bearing species, or livestock auction. Therefore, the Project will comply with this requirement.

3.4.3 Chapter 11.42 BCC General Use Regulations

11.42.100 Solar Power Generator Facility – Major and Minor

(b) Major Facilities. Systems that solely serve offsite uses are utility-scale solar facilities sited on a parcel as the principal use.

(1) Setbacks: Shall meet the minimum zoning setbacks for the zoning district in which located.

(2) Height: Twenty (20) feet maximum.

(3) Lot Coverage: The surface area of a ground-mounted system, regardless of the mounted angle, shall be calculated as part of the overall lot coverage for the zoning district in which located.

Response:

As stated in Section 3.4.2, the Project is designed to meet or exceed the applicable front, rear, and side setback standards of the GMAAD. Project buildings will not exceed the maximum height limit of 20 feet for major facilities. The O&M building is a single-story facility with a maximum height of 20 feet. The solar array will be a maximum of 15 feet above ground at full tilt and the BESS units and transformers are approximately 11 to 12 feet in height. The Project substation equipment will generally range in height from 15 feet to 25 feet above ground level and the Project's transmission line structures will be approximately 60 to 150 feet tall. These proposed electrical infrastructure heights are consistent with the existing electrical transmission infrastructure within and adjacent to the Project Area, including the existing BPA Wautoma Substation and several transmission lines.

As defined in BCC Chapter 11.03.010(104), "lot coverage" means the percentage of area of a lot that is occupied by a primary building or structure and its accessory buildings or structures, not including uncovered patios, driveways, open steps and buttresses, terraces, and ornamental features projecting from buildings or structures which are not otherwise supported by the ground. Per the general use regulations in BCC 11.42.100(a)(3), lot coverage for "solar power generator facilities, major" "shall be calculated as part of the overall lot coverage for the zoning district in which located." There are no maximum lot coverage requirements in the GMAAD. The Project's lot coverage for each of the Project parcels is provided below for demonstrative purposes. Based on the Project's footprint within each of the parcels included in the Project, the lot coverage will range from approximately 0.06 to 5.6 percent. Lot coverage compliance will be verified prior to construction based on the final Project design within the Project Area. Table 2 presents specific calculations of impervious footprint by parcel. Therefore, the Project will comply with the requirements for setback, building height, and lot coverage as required under BCC 11.42.100.

Table 2. Permanent (Impervious) Footprint by Parcel ID

Parcel ID	Permanent Impact (acres)	Parcel Total (acres)	Percent of Parcel Impacted
119241005555555	0.142	26.245	0.54
119241012749001	5.296	271.002	1.95
119243000001001	2.310	205.619	1.12
119244000001001	0.234	10.713	2.18
119244000002000	2.863	68.357	4.19
120241000001000	0.679	125.672	0.54
120241000002000	0.032	57.724	0.06
120243000002000	0.847	15.056	5.63
120243000003000	0.224	24.403	0.92
120243000004000	2.866	98.277	2.92
120244000000000	3.738	168.397	2.22
121241000001000	7.381	316.487	2.33
121243000000000	15.521	330.685	4.69
122241000000000	4.416	340.376	1.30
122243000001000	1.182	85.478	1.38
122243000002000	2.546	85.465	2.98
127240000000000	13.684	711.207	1.92
128241000000000	16.542	466.842	3.54
128243000000000	4.507	153.752	2.93
129241000000000	7.403	166.099	4.46
129242000001000	6.619	157.389	4.21
129243000001000	8.126	157.726	5.15
129244000000000	4.961	157.154	3.16
130241000000000	5.553	162.405	3.42
130242000001000	2.253	62.197	3.62
130242000003000	5.271	221.930	2.38
130244000000000	4.207	158.540	2.65
132241000001000	2.167	62.169	3.49
132241000002000	3.233	347.653	0.93
133240000000000	5.674	660.856	0.86

(4) Visibility:

(i) Solar facilities with panels located at least one hundred fifty (150) feet from an adjacent public street right-of-way, residentially zoned property, or residential use shall not require screening.

(ii) Solar facilities with panels located less than one hundred fifty (150) feet from an adjacent public street right-of-way, residentially zoned property, or residential use shall require screening. Screening is to include a perimeter landscape buffer as determined by the Planning Administrator through the required conditional use permit process.

Response:

As shown on the Preliminary Site Plan (Attachment A, Figure A-1), the majority of the Project is not adjacent to roadways. A portion of Wautoma Road that currently provides access to a participating landowner residence and that will be used to access the Project Area is located within 150 feet of some proposed panel locations. However, the Applicant does not believe screening along this portion of Wautoma Road is necessary since the participating landowners will be the only road

users impacted along this segment of Wautoma Road. All solar panels are sited over 150 feet from houses and there are no residentially zoned parcels near the Project (all zoning is GMAAD, see Figure 1). The nearest residence is located approximately 500 feet from the security fence line and is a participating landowner (see ASC Attachment P Visual Impact Assessment). The nearest nonparticipant residence is located approximately 700 feet from the security fence line (see ASC Attachment P Visual Impact Assessment). Therefore, the Project will comply with this requirement.

(5) Solar facilities are to be equipped with a non-reflective finish/coating.

Response:

The Project will utilize solar planes with an anti-reflective coating to minimize glare. Refer to Part 4, Section 4.16 and ASC Attachment H Solar Glare Analysis for discussion of predicted glare impacts. The glare analysis conducted for the Project analyzed potential glare hazards to residents and motorists in the area. Therefore, the Project will comply with this requirement.

3.4.4 Chapter 11.50 BCC Variance and Conditional Use

11.50.040 Conditional Use

(a) Conditional Use Permit-General Standards. The conditional use permit application process allows the Hearings Examiner to review the location and design of certain proposed uses, the configuration of improvements, and the potential impacts on the surrounding area. The application process also allows the Hearings Examiner to ensure that development in each zoning district protects the integrity of that district. The notice, hearing, decision and enforcement procedures are as set forth herein and in BCC 11.50.050. Certain uses are classified as conditional uses because of their unusual nature, infrequent occurrence, special requirements, or potentially significant impacts to the environment, public infrastructure or adjacent properties, and/or possible safety hazards and other similar reasons. Once granted, a conditional use permit may be transferred by a holder thereof after written notice to the Hearings Examiner; provided the use and location must remain the same and the transferee must continue to comply with the conditions of the permit and, if applicable, the requirements set forth in Chapter 11.51 BCC.

Response:

Prior to OA 2021-004, the Project was a conditional use in the GMAAD. The Applicant has elected to seek Project approval under the jurisdiction of EFSEC, and therefore, the EFSEC Site Certification Agreement process takes the place of the County review process. This Land Use Consistency Review demonstrates how the Project is consistent with a "solar power generator facility, major" as a conditional use in the GMAAD. Specifically, the Project's compatibly with surrounding land uses is addressed in response to item 11.50.040(d)(1). The Project's potential impacts on the surrounding area, including impacts to the environment, public infrastructure or adjacent properties, and/or possible safety hazards are described throughout Sections 2.0 and 3.0 of this Land Use Consistency Review and in the ASC Parts 2, 3, and 4.

(b) Conditional Use Application Required—Non-Refundable Application Fee. The Planning Department shall provide application forms for conditional use permits and prescribe the type of information to be provided in the application. No application shall be processed unless it complies with the requirements of this section. A completed application for a conditional use permit shall be filed with the Planning Department accompanied by a non-refundable fee as set by resolution of the Board of County Commissioners.

Response:

The EFSEC Site Certification Agreement process takes the place of the County review process since the Applicant has elected to seek Project approval under the jurisdiction of EFSEC.

(c) Conditional Use Application-Site Plan Required. The Planning Department shall require the applicant to submit an application and a site plan as part of the application whenever such a permit is required for that use under the applicable zoning district. The application and site plan shall contain the following information:

(1) Identify the proposed use and associated facilities, together with the names, addresses and telephone numbers of the owner or owners of record of the land and of the applicant, and, if applicable, the names, addresses and telephone numbers of the architect, planner, designer, and/or engineer;

(2) The proposed use or uses of the land and buildings; and,

(3) A site plan drawing or drawings at a scale of not less than one inch equals fifty feet (1"=50'), unless an alternate scale is approved by the Planning Administrator. The site plan drawing(s) shall include the following:

(i) Location of all existing and proposed structures, including, but not limited to, buildings, fences, culverts, bridges, roads and streets;

(ii) Boundaries, dimensions and square footage of the parcel or parcels involved;

(iii) All setback lines;

(iv) All areas, if any, to be preserved as buffers or to be dedicated to a public, private or community use, or for open space under the provisions of this title;

(v) All existing and proposed easements;

(vi) Location of all utility structures and lines;

(vii) All means of vehicular and pedestrian ingress and egress to and from the site and the size and location of driveways;

(viii) Location and design of off-street parking areas showing their size and locations of internal circulation and parking spaces;

(ix) Location of all loading/unloading areas, including, but not limited to, loading platforms and loading docks where trucks will load or unload;

(x) Topographic maps, when the Planning Administrator deems the maps necessary for adequate review, which delineate existing and proposed contours, at intervals of two (2) feet and show the location of existing lakes, streams, and storm water drainage systems from existing and proposed structures, together with an estimate of existing maximum storm runoff, and any other information deemed pertinent for adequate review.

(xi) Identification of all special districts, such as fire, school, sewer, drainage improvements, and irrigation districts, in which the proposed use would be located; and,

(xii) The proposed number of square feet of paved or covered surfaces, whether covered by buildings, driveways, parking lots or any other structure covering land.

Response:

The Preliminary Site Plan is provided in ASC Attachment A Figure A-1 and is based on the current stage of the engineering design process, with additional details described in Section 2.0 and Section 3.0 of this Land Use Consistency Review. The final layout may differ from the Preliminary Site Plan following micrositing; however, the proposed Project Area encompasses the full extent of land area that could include Project improvements and facilities. A detailed Project Description that identifies the proposed uses of land, buildings, and associated facilities for the Project is provided in Part 2 of the ASC. Names and addresses of the owners of record of the land and of the applicant are provided with the Part 1 of the ASC.

The Applicant will design and implement stormwater drainage systems in consultation with a professional engineer. A drainage and erosion control plan will be covered by the Erosion and Sediment Control Plan (ESCP) and Stormwater Pollution Prevention Plan (SWPPP) required for National Pollutant Discharge Elimination System permitting, which will be provided to EFSEC for review and approval prior to construction. The ESCP and SWPPP will be prepared by a qualified engineer to show proposed construction best management practices and stormwater management methods that the Applicant proposes to implement throughout construction, and proposed drainage patterns that will be maintained throughout Project operation. Additional details on stormwater runoff are provided in the ASC Part 4, Section 4.5.

The permanent footprint of the Project will be approximately 6.2 million square feet (142 acres). This is the proposed number of square feet of paved or covered surfaces, whether covered by buildings, driveways, parking lots, or any other structure covering land, as well as graveled access roads. Therefore, the Project will comply with these site plan requirements.

(d) Conditional Use-Permit Granted or Denied. A conditional use permit shall be granted only if the Hearings Examiner can make findings of fact based on the evidence presented sufficient to allow the Hearings Examiner to conclude that, as conditioned, the proposed use:

(1) Is compatible with other uses in the surrounding area or is no more incompatible than are any other outright permitted uses in the applicable zoning district;

Response:

Under BCC 11.03.010(53) "compatibility" "means the congruent arrangement of land uses and/or project elements to avoid, mitigate, or minimize (to the greatest extent reasonable) conflicts." Typically, compatibility with "other uses in the surrounding area" is judged by whether the Project will have a substantiated negative impact on the ability of surrounding landowners to maintain their existing use of the land, including the ongoing use for agricultural activities and residential uses. Generally, the question of compatibility is measured by whether the Project would undermine existing uses or cause any increase in the costs of agricultural uses and practices of the land.

The Project will be entirely located within the County's GMAAD zoning district, which is part of the County's GMA Agricultural land use designation in the Comprehensive Plan (see Figure 1). In total, the 4,573-acre Project Area represents 0.7 percent of the 649,153 acres of lands in the GMA Agricultural designation (Benton County 2021b). Within the Project Area, the Project's security fenced area and permanent disturbance will occupy approximately 2,978 acres, or 0.5 percent of GMA Agricultural lands.

The Project is designed to be compatible with ongoing agricultural activities and adds a new diverse source of revenue to landowners. The Project Area was selected by the Applicant for its favorable site suitability characteristics, including high solar energy resource, topography, proximity to electrical infrastructure, compatibility with allowed uses on surrounding lands, and low resource conflicts. Lands to the north, west, and south are zoned for agricultural purposes in Benton and Yakima counties with similar land uses as the Project Area. Lands to the west of the Project Area include a small irrigated vineyard adjacent to the Project Area on Wautoma Road, as well as other (likely dryland wheat), non-irrigated pasture, and undeveloped rangelands. Lands to the north similarly include other (likely dryland wheat), non-irrigated pasture, and undeveloped rangelands. Approximately 1 mile north of the Project Area along SR 24 are additional irrigated vineyards and orchards. Non-agricultural land uses to the south, west, and north of the Project Area include several rural residences, scattered unoccupied structures (e.g., agricultural storage), existing electrical transmission infrastructure (i.e. BPA Wautoma Substation and multiple transmission lines), local roads and state highways, and a small commercial area at the intersection of SR 241 and SR 24 north of the Project Area. Lands to the east of the Project Area are in the Hanford Reach National Monument (Rattlesnake Unit of the Fitzner/Eberhardt Arid Lands Ecology Reserve) and are not open to public use or used for agriculture.

The operation of the Project will be compatible with surrounding agricultural uses as described above in Section 2.0 in response to NR Goal 1 and will in no way force changes of uses on surrounding lands. The proposed solar and battery storage uses will have minimal construction and operations impacts to agricultural uses as described below, while enabling a highly beneficial use for clean energy.

The Project's compatibility with agricultural uses in the GMAAD is addressed throughout this Land Use Consistency Review in Sections 2 and 3, which details the approach to compatibility issues such as noise, traffic, erosion control, stormwater management, dust mitigation, and noxious weed

control. Best management practices will be implemented and maintained as needed to avoid and minimize potential impacts to the surrounding environment.

A summary of the Project's construction and operations impacts as it relates to agriculture uses is summarized here. The Project will have some short-term impacts to surrounding agricultural lands during construction from equipment noise and vehicle and truck traffic; however, these impacts will not significantly impact agricultural activities and will not block or obstruct access to surrounding lands. The timing of peak construction activity may overlap with the harvest season; however, harvest vehicles typically travel throughout the day and are not limited to prime commuting hours, which is when the highest impact of workers commuting to the Project will occur. To minimize impacts of Project construction traffic on local farmers and residents, a Traffic Control Plan will be prepared in coordination with WSDOT and Benton County and Yakima County Public Works Departments for traffic management during construction and for construction of access approaches from county right-of-way. The Applicant will also implement best management practices to minimize erosion, stormwater runoff, and dust during construction. Following construction, temporarily disturbed areas will be revegetated and a Vegetation and Weed Management Plan will be implemented to control the spread of noxious weeds. During operations, routine maintenance activities and truck traffic associated with panel washing will have a minimal impact on roadways and will not block or obstruct access to surrounding lands or conflict with agricultural uses.

Project components will also be designed in a manner as to minimize contrast with the surrounding vicinity as analyzed in detail in Part 4, Section 4.16 of the ASC and the accompanying Visual Impact Assessment (ASC Attachment P) and Solar Glare Analysis (ASC Attachment H). Where the Project is visible, the Project components will be consistent with other horizontal and vertical lines and geometric shapes visible throughout the landscape lines (fencing, roadway, substation, transmission towers and lines, utility poles and lines, agricultural structures) and will not block views of the surrounding hills. The Project will not introduce a source of glare that will significantly impact motorists, residents, or views in the area. Additionally, the Project will not introduce a source of light that will significantly impact views in the area.

The short-term construction impacts associated with the Project are similar to those impacts associated with the development of other non-agricultural uses that continue to be allowed in the GMAAD as permitted outright or through administrative review or CUP.[9] The construction of these other non-agricultural uses currently allowed in the GMAAD would result in similar construction

[9] Other non-agricultural uses that are allowed or an accessory use in the GMAAD include uses such as personal airstrips, public or quasi-public buildings and yards and utility buildings (including substations and distributions facilities), schools and churches, commercial and private kennels, hazardous waste treatment and on-site storage facilities, and "solar power generator facilities, minor" (Refer to BCC 11.17 for a complete list of uses in GMAAD.). Non-agricultural uses that are subject to planning administrative review and approval or a CUP include multiple detached dwelling units; child day care facilities; non-commercial sand and gravel pits and other mineral extraction; home occupations; communication facilities; solid waste treatment facilities and disposal sites; off-site hazardous waste treatment and storage facilities; and commercial sand and gravel pits, stone quarries, other mineral extraction, and asphalt and/or concrete batching plants.

impacts to agricultural uses on surrounding lands as the Project, including short-term impacts related to noise, dust, and traffic. However, unlike some of the more intensive land uses allowed in the GMAAD (either through administrative review or CUP), such as sand and gravel pits and other mineral extraction, only minor earthwork is required across the Project Area to install the PV panel arrays. Following construction, the Project's permanent footprint will be limited to 142 acres, primarily consisting of access roads, O&M building, and the Project substation footprint. The small area of permanent disturbance and types of facilities occupying the permanent disturbance is similar to that of other allowed uses in the GMAAD, including public or quasi-public buildings and yards and utility buildings. Unlike some of the conditional uses allowed in the GMAAD, the Project's the limited permanent disturbance footprint will allow for agricultural land uses to return to the Project Area after Project decommissioning.

During operations, the Project's impacts will be minimal in comparison to those of other uses such as hazardous waste treatment and on-site storage facilities, sand and gravel pits and other mineral extraction, and solid waste treatment facilities and disposal sites which continue to be allowed as accessory uses or allowed through a planning administrative review and approval or a CUP. Operations noise from the Project will comply with the environmental noise limits established by WAC 173-60 as described in the ASC Part 4, Section 16a. The Project will not produce odors or have long-term dust and other air emissions, and operations-related traffic will be minimal and will not block or obstruct access to surrounding lands. The Project will not have long-term impacts on surface waters or groundwater quality as described in the ASC Part 3, and Part 4, Section 4.3, and Section 4.5.

As demonstrated throughout the ASC and this Land Use Consistency Review, the Applicant has developed measures to avoid, mitigate, or minimize (to the greatest extent reasonable) potential conflicts with surrounding agricultural uses. For the reasons described above, the Project is compatible with other land uses in the GMAAD and complies with BCC 11.50.040(d)(1).

> *(2) Will not materially endanger the health, safety, and welfare of the surrounding community to an extent greater than that associated with any other permitted uses in the applicable zoning district;*

Response:

The Project will not endanger the health, safety, and welfare of the surrounding community, which is comprised of primarily undeveloped lands, agricultural uses, and scattered residences. Insofar as the Project's effect on public services and facilities that support the public health, safety and welfare, as described in the ASC Part 3, Section 21, the Project is a largely self-sufficient solar power generating facility (with up to four permanent employees) and is therefore unlikely to directly or indirectly increase use of public services and facilities during construction or operation. As evaluated in the ASC Part 3, Section 12, hazardous materials are unlikely to occur within the Project Area, and risks to human health and the environment associated with soil disturbance during Project construction are assumed to be low and similar to those associated with agricultural activities. Further, as described below in response to BCC 11.50.404(d)(4) and in ASC Part 4, Section 4.13, the Project will comply with fire safety measures, spill control measures, and

regulations for solar energy generation facilities. The Project will develop and maintain an Emergency Management Plan (which will be developed and finalized prior to construction) and implement best management practices for fire prevention. Therefore, the Project complies with BCC 11.50.040(d)(2).

> *(3) Would not cause the pedestrian and vehicular traffic associated with the use to conflict with existing and anticipated traffic in the neighborhood to an extent greater than that associated with any other permitted uses in the applicable zoning district;*

Response:

As described in Part 4, Section 20 of the ASC, Project construction will involve temporary increased traffic to the site for delivery of materials and worker transportation, and an improvement to the approach off SR 241 to the Project, as well as new approach construction along Wautoma Road. While traffic will increase temporarily during construction, peak vehicular and truck traffic is not expected to have a significant impact on SR 241, SR 24, and SR 240. The Project's vehicle and truck traffic is not likely to change the current uncongested status of the SR 241, SR 24, and SR 240 road segments, with the exception of some minor delays near congested intersections at Interstate 84 and Interstate 182. Construction traffic will not block or obstruct access to surrounding lands. The timing of peak construction activity may overlap with the harvest season; however, harvest vehicles typically travel throughout the day and are not limited to prime commuting hours, which is when the highest impact of workers commuting to the Project will occur. A Traffic Control Plan will be prepared for traffic management during construction. During Project operations, traffic will be limited to periodic maintenance visits and commutes of two to four operations and maintenance employees and potentially one to two water truck delivers per day over a 2- to 3-week period each year. During construction and operations, the Project will not restrict vehicular use of roadways exterior to the Project Area or create local safety hazards and will not conflict with local, state, or federal requirements related to traffic and transportation. Therefore, the Project complies with BCC 11.50.040(d)(3).

> *(4) Will be supported by adequate service facilities and would not adversely affect public services to the surrounding area; and*

Response:

As discussed in Part 3, Section 3.21 and Section 3.22 of the ASC, the Project will not have a significant adverse impact on existing public facilities or services. The Applicant will bear the costs of providing the necessary utilities and related services for the Project. Unlike other land uses such as residential development typically proposed outside urban areas, the Project will not impose these costs on the County. As discussed in Part 4, Section 4.13 of the ASC, most materials used in construction of the Project will not be hazardous or dangerous, and the risk of fire will be low. Design of the Project incorporates measures to avoid failures and risks of fire or spills and will comply with the applicable requirements of the National Electric Code, NFPA standards, and Institute of Electrical and Electronics Engineers Standards. Prior to construction, the Project will develop and maintain an Emergency Management Plan based on final design and input from local

services providers that will include best management practice for fire prevention. The Applicant will also coordinate with Benton County Emergency Management and DNR Wildland Fire Management Division regarding potential fire issues, locations and dimensions of access gates and internal access roads, and other issues. The Applicant will also coordinate with these entities regarding necessary equipment or training, if any are identified, that may be required to provide fire protection services to the Project. Furthermore, the Project's design will incorporate graveled areas around the O&M building and substation, as well as graveled access roads and fire breaks, where applicable.

A small increase in the number of police calls for service may occur during Project construction as a result of Project-related traffic and temporary on-site workforce. Long-term demand for police services is expected to be minimal. The Project will be secured with fencing that may be topped with barbed wire if needed for security purposes, and gates will be padlocked. Since the Project will result in minimal in-migration of residents (see ASC Attachment N Socioeconomic Review), other public services such as transit, health care, schools, or other general services in the County will not be affected by the Project.

Electricity connections for the Project will be provided by Benton Rural Electric Association before the start of operations, and communications will be provided by a local utility. During construction, water will be obtained from a source with verified water rights suitable for the uses proposed herein. Best management practices will be employed to manage stormwater within the Project Area (see Part 3, Section 5, and Part 4, Section 4.5, for more information). Portable toilets will be used for sanitary waste. A licensed hauler will be used to transport and dispose of construction waste in accordance with applicable laws. Recycling will be implemented to the extent practicable. During operations, the Project will utilize an on-site well and will require less than 5,000 gallons per day of domestic water use at the O&M building (as discussed in Part 3, Sections 4, 6, and 22). Therefore, the Project complies with BCC 11.50.040(d)(4).

> *(5) Would not hinder or discourage the development of permitted uses on neighboring properties in the applicable zoning district as a result of the location, size or height of the buildings, structures, walls, or required fences or screening vegetation to a greater extent than other permitted uses in the applicable zoning district.*

Response:

The location, size, and height of all proposed structures comply with the applicable standards of the GMAAD and "solar power generation facilities, major" as described above. The Project is designed to meet or exceed the applicable front, rear, and side setback standards of the GMAAD. Project buildings will not exceed the maximum height limit of 20 feet for major facilities. The O&M building is a single-story facility with a maximum height of 20 feet. The solar array will be a maximum of 15 feet above ground at full tilt and the BESS units and transformers are approximately 11 to 12 feet in height. The Project substation equipment will generally range in height from 15 feet to 25 feet above ground level and the Project's transmission line structures will be approximately 60 to 150 feet tall. These proposed electrical infrastructure heights are consistent with the existing electrical transmission infrastructure within and adjacent to the Project Area, including the existing BPA

Wautoma Substation and several transmission lines. Therefore, the Project complies with BCC 11.50.040(d)(5).

3.5 Title 15 Environment

3.5.1 Chapter 15.02 General Provisions

15.02.080 Jurisdiction – Critical Areas.

> *(a) The County shall regulate all uses, activities, and developments within, adjacent to, or likely to affect, one or more critical areas, consistent with the best available science and the provisions herein. Benton County's critical areas maps depict the approximate location and extent of known critical areas and are displayed on various inventory maps at the County Planning Department.*
>
> *(b) Critical areas regulated by this chapter include:*
>
> > *(1) Wetlands;*
> >
> > *(2) Critical aquifer recharge areas;*
> >
> > *(3) Frequently flooded areas;*
> >
> > *(4) Geologically hazardous areas; and*
> >
> > *(5) Fish and wildlife habitat conservation areas.*
>
> *(c) All areas within unincorporated Benton County meeting the definition of one or more critical areas, regardless of any formal identification, are hereby designated critical areas and are subject to the provisions of this chapter. [Ord. 609 (2018) § 9]*

Response:

In fulfillment of BCC 15.02, 15.04, 15.06, 15.08, and 15.14, site-specific investigations for critical areas have been completed for the Project area, and results are summarized in Part 4, Section 4.1, Section 4.3, and Section 4.9 of the ASC. Both the site investigations and associated report sections were completed by qualified professionals with relevant expertise in geological hazards, wetlands and waters, and wildlife habitat. These materials are provided with the ASC for EFSEC's review and are thus also available for the County's and general public's review. Therefore, the Project will comply with BCC 15.02.080.

15.02.190 Critical Area Report – Requirements.

> *(a) Preparation by Qualified Professional. If required by the Planning Administrator in accordance with General Requirements—Critical Area Project Review Process (BCC 15.02.170), the applicant shall submit a critical area report prepared by a qualified professional as defined herein.*
>
> *(b) Incorporating Best Available Science. The critical area report shall use scientifically valid methods and studies in the analysis of critical area data and field reconnaissance and*

reference the source of science used. The critical area report shall evaluate the proposal and all probable impacts to critical areas in accordance with the provisions of this chapter.

(c) Minimum Report Contents. At a minimum, the report shall contain the following:

(1) The name and contact information of the applicant, a description of the proposal, and identification of the permit requested;

(2) A copy of the site plan for the development proposal including: A map to scale depicting critical areas, buffers, the development proposal, and any areas to be cleared;

(3) The dates, names, and qualifications of the persons preparing the report and documentation of any fieldwork performed on the site;

(4) Identification and characterization of all critical areas, wetlands, water bodies, and buffers adjacent to the proposed project area;

(5) A statement specifying the accuracy of the report, and all assumptions made and relied upon;

(6) An assessment of the probable cumulative impacts to critical areas resulting from development of the site and the proposed development;

(7) An analysis of site development alternatives;

(8) A description of reasonable efforts made to apply mitigation sequencing pursuant to mitigation sequencing (BCC 15.02.220) to avoid, minimize, and mitigate impacts to critical areas;

(9) Plans for adequate mitigation, as needed, to offset any impacts, in accordance with mitigation plan requirements (BCC 15.02.230), including but not limited to:

(i) The impacts of any proposed development within or adjacent to a critical area or buffer on the critical area; and

(ii) The impacts of any proposed alteration of a critical area or buffer on the development proposal, other properties and the environment.

(10) A discussion of the performance standards applicable to the critical area and proposed activity;

(11) Financial guarantees to ensure compliance;

(12) Critical area reports for two or more types of critical areas must meet the report requirements for each relevant type of critical area;

(13) Unless otherwise provided, a critical area report may be supplemented by or composed, in whole or in part, of any reports or studies required by other laws and regulations or previously prepared for and applicable to the development proposal site, as approved by the Planning Administrator; and

(14) Any additional information required for the critical area as specified in this chapter. [Ord. 609 (2018) § 20]

Response:

The information in Part 4, Section 4.1, Section 4.3, Section 4.8, and Section 4.9 of the ASC and the supporting studies, including the Wetland Delineation Report (Attachment I), Wildlife and General Wildlife Survey Report (Attachment G), Botanical Survey Report (Attachment F), Draft Habitat Management Plan (Attachment M), and Preliminary Geotechnical Engineering Report (Attachment S), meet the criteria for critical areas reports established in BCC 15.02.190, including preparation by qualified professionals, incorporation of best available science, and inclusion of all required minimum contents. Therefore, the Project will comply with BCC 15.02.190.

15.02.210 Mitigation Requirements.

(a) The applicant shall avoid all impacts that degrade the functions and values of a critical area or areas. Unless otherwise provided in this chapter, if alteration to the critical area is unavoidable, all adverse impacts to or from critical areas and buffers resulting from a development proposal or alteration shall be mitigated using the best available science in accordance with an approved critical area report and SEPA documents, so as to result in no net loss of critical area functions and values.

(b) Mitigation shall be in-kind and on-site, when possible, and sufficient to maintain the functions and values of the critical area, and to prevent risk from a hazard posed by a critical area.

(c) Mitigation shall not be implemented until after County approval of a critical area report that includes a mitigation plan, and mitigation shall be in accordance with the provisions of the approved critical area report. [Ord. 609 (2018) § 22]

Response:

The Applicant will employ a suite of measures, including actions to avoid, minimize, and mitigate impacts and thus maintain the functions and values of critical areas. During construction, mitigation actions and best management practices will be implemented, such as revegetating disturbed soils to minimize erosion/runoff, and implementing an ESCP, SWPPP, and Vegetation and Weed Management Plan. Summaries of mitigation measures are provided in Part 2, Section A.5, and Part 4, Sections 4.1, 4.3, 4.5, 4.8, and 4.9 of the ASC, which include the avoidance of impacts to critical areas to the extent possible and follows the mitigation sequencing specified in BCC 15.02.220. Additionally, as described in more detail in the response to BCC 15.14.030 below, the Draft Habitat Management Plan (Attachment M) provides a framework for determining the compensatory mitigation required to achieve "no net loss." Therefore, the Project will comply with BCC 15.02.210.

15.02.220 Mitigation Sequencing.

Applicants shall demonstrate that all reasonable efforts have been examined with the intent to avoid and minimize impacts to critical areas. When an alteration to a critical area is

proposed, such alteration shall be avoided, minimized, or compensated for in the following sequential order of preference:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action;

(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps, such as project redesign, relocation, or timing, to avoid or reduce impacts;

(c) Rectifying the impact to wetlands, critical aquifer recharge areas, frequently flooded areas, and habitat conservation areas by repairing, rehabilitating, or restoring the affected environment to the historical conditions or the conditions existing at the time of the initiation of the project;

(d) Minimizing or eliminating the hazard by restoring or stabilizing the hazard area through engineered or other methods;

(e) Reducing or eliminating the impact or hazard over time by preservation and maintenance operations during the life of the action;

(f) Compensating for the impact to wetlands, critical aquifer recharge areas, frequently flooded areas, and habitat conservation areas by replacing, enhancing, or providing substitute resources or environments; and

(g) Monitoring the hazard or other required mitigation and taking remedial action when necessary.

Mitigation for individual actions may include a combination of the above measures. [Ord. 609 (2018) § 23]

Response:

The mitigation measures summarized in Part 2, Section A.5 and Part 4, Sections 4.1, 4.3, 4.5, 4.8, and 4.9 of the ASC, as well as in the Draft Habitat Management Plan (Attachment M), follow the sequencing described in BCC 15.02.220. Impacts will be avoided where possible. When avoidance is not possible, impacts will be minimized and rectified through repair, rehabilitation, or restoration, preserved and maintained through Project operations, and mitigated. Therefore, the Project will comply with BCC 15.02.220.

3.5.2 Chapter 15.04 BCC Wetlands

15.04.010 Designation, Rating, and Mapping Wetlands

(a) Designating Wetlands. Wetlands are those areas, designated in accordance with WAC 173-22-035 and the Federal Wetlands Delineation Manual (1987, as now existing and hereafter amended) that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions. All areas meeting the wetland designation criteria in the Federal Wetlands Delineation Manual and

applicable regional supplements, regardless of any formal identification, are hereby designated critical areas and are subject to the provisions of this chapter.

(b) Wetlands Rating Categories: Wetlands shall be rated according to Ecology's Washington State Wetland Rating System for Eastern Washington - Revised (Ecology Publication #14-06-030), or as revised by the Washington State Department of Ecology. Wetland rating categories shall be applied as the wetland exists at the time of the adoption of this chapter or as it exists at the time of an associated permit application. Wetland rating categories shall not change due to illegal modifications. Wetlands shall be rated according to the following categories:

(1) Category I Wetlands. Those wetlands scoring a "Category I" rating under the Ecology Wetlands Rating System.

(2) Category II Wetlands: Those wetlands scoring a "Category II" rating under the Ecology Wetlands Rating System;

(3) Category III Wetlands: Those wetlands scoring a "Category III" rating under the Ecology Wetlands Rating System; and

(4) Category IV Wetlands: Those wetlands scoring a "Category IV" rating under the Ecology Wetlands Rating System.

15.04.030 Critical Area Report—Additional Requirements for Wetlands.

In addition to the general critical area report requirements of BCC 15.02.190, critical area reports for wetlands must meet the requirements of this section.

Response:

The Applicant has performed site-specific desktop and field inspections for wetlands to determine the extent of wetlands within the Project Area. A wetland and waters delineation was conducted for the full Project area, including field investigations conducted from March 15 to 18, and October 4 to 5, 2021. The surveys were conducted by a qualified biologist/wetlands specialist in accordance with the U.S. Army Corps of Engineers Wetland Delineation Manual and regional supplement for the arid west (USACE 1987, 2008). Three wetlands were found within the Project Area, all the result of leaks in an irrigation pipeline adjacent to a farm road. The only surface water features within the Project Area are ephemeral streams (i.e., no intermittent or perennial streams); a total of 34 ephemeral stream segments were identified during field surveys. None of the ephemeral stream segments are fish-bearing and all of these ephemeral streams lack connectivity to other intermittent, perennial, or fish-bearing streams (Part 4, Section 4.3 of the streamlined solar ASC). See ASC Attachment I (Wetland Delineation Report) for a detailed description of wetland and water determination methods and results, including maps. The Applicant has provided all required components identified in BCC 15.04.030 in the streamlined ASC Part 3, Section 3, and Part 4, Section 4.3, and in Attachment I (Wetland Delineation Report). Because there are no impacts proposed within wetlands or wetland buffers, no wetlands mitigation is required. Therefore, the Project complies with BCC 15.04.010 and 15.04.030.

15.04.040 Performance Standards—General Requirements

(a) Activities may only be permitted in a wetland or wetland buffer if the applicant can show that the proposed activity will not degrade the functions and functional performance of the wetland and other critical areas.

(b) Wetland Buffers. The following buffer widths have been established in accordance with the best available science. They are based on the category of wetland and the habitat score as determined by a qualified wetland professional using the Washington State Wetland Rating System for Eastern Washington (Ecology Publication #14-06-030, or as revised and approved by Ecology). The standard buffer widths are provided in Table 15.04.040-1 below.

(1) The use of the standard buffer widths requires the implementation of the measures in Table 15.04.040-2, where applicable, to minimize the impacts of the adjacent land uses.

(2) If an applicant chooses not to apply the minimization measures in Table 15.04.040-2, then a 33% increase in the width of all buffers is required. For example, a 75-foot standard buffer would become a 100-foot buffer if the minimization measures are not implemented.

(3) The standard buffer widths assume that the buffer is vegetated with a native plant community appropriate for the ecoregion. If the buffer is unvegetated, sparsely vegetated, or vegetated with invasive species that do not perform needed functions, the buffer should either be planted to create the appropriate plant community in accordance with subsection (i) below, or the buffer should be widened to ensure that adequate functions of the buffer are provided.

(i) In lieu of increasing the buffer width where existing buffer vegetation is inadequate to protect the wetland functions and values, implementation of a buffer planting plan may substitute. Existing buffer vegetation is considered "inadequate" and will need to be enhanced through additional native plantings and (if appropriate) removal of non-native plants when: (1) non-native or invasive plant species provide the dominant cover, (2) vegetation is lacking due to disturbance and wetland resources could be adversely affected, or (3) enhancement plantings in the buffer could significantly improve buffer functions

(4) Measurement of Wetland Buffers. All buffers shall be measured from the wetland boundary as surveyed in the field.

(5) Increased Wetland Buffer Widths. The Planning Administrator may require increased buffer widths in accordance with the recommendations of an experienced, qualified professional wetland scientist, and the best available science on a case-by-case basis when a larger buffer is necessary to protect wetland functions and values based on site-specific characteristics. …

(c) Wetland Buffer Width Averaging. The Planning Administrator may allow modification of the standard wetland buffer width in accordance with an approved critical area report and

the best available science on a case-by-case basis by averaging buffer widths. Averaging of buffer widths may only be allowed where a qualified professional wetland scientist demonstrates that:

(1) It will not reduce wetland functions or functional performance;

(2) The wetland contains variations in sensitivity due to existing physical characteristics or the character of the buffer varies in slope, soils, or vegetation, and the wetland would benefit from a wider buffer in places and would not be adversely impacted by a narrower buffer in other places;

(3) The total area contained in the buffer area after averaging is no less than that which would be contained within the standard buffer; and

(4) The buffer width is not reduced to less than seventy-five (75) percent of the standard width or thirty-five (35) feet whichever is less.

(d) Buffer Uses. The following uses may be permitted within a wetland buffer in accordance with the review procedures of this chapter, provided they are not prohibited by any other applicable law and they are conducted in a manner so as to minimize impacts to the buffer and adjacent wetland:

(1) Conservation and Restoration Activities. Conservation or restoration activities aimed at protecting the soil, water, vegetation, or wildlife.

(2) Passive Recreation. In the outer twenty-five (25) percent of wetland buffers, passive recreation facilities designed and in accordance with an approved critical area report, including pedestrian-only walkways, trails and wildlife viewing structures constructed with a surface that does not interfere with the permeability.

(3) Stormwater Management Facilities. Stormwater management facilities, limited to stormwater dispersion outfalls and bioswales, may be allowed within the outer twenty-five (25) percent of the buffer of Category III or IV wetlands, provided that:

(i) No other location is feasible; and

(ii) The location of such facilities will not degrade the functions or values of the wetland. [Ord. 609 (2018) § 34]

Response:

The Project has applied wetland and stream buffer widths as defined in BCC 15.14.040. BCC 15.14.040 requires 50-foot buffers on Non-Fish Seasonal (Ns) streams without adjacent slopes of 10 percent or greater and 100-foot buffers on all Ns streams with adjacent slopes of 10 percent or greater. All of the streams within the Project area are considered Ns pending confirmation of the wetland delineation by the Washington State Department of Ecology (ASC Attachment I). The Project has been designed to avoid wetlands, and no wetland or wetland buffers impacts (temporary or permanent) will occur. For ephemeral streams anticipated to be impacted by the Project's final design, the Applicant has prepared a Joint Aquatic Resources Permit Application (JARPA) (ASC Attachment T) to submit with the ASC. The Applicant understands that WDFW will

make a determination on whether a Hydraulic Project Approval (HPA) is required on the basis of a review of this application and determine if mitigation is required. Therefore, the Project complies with BCC 15.04.040.

3.5.3 Chapter 15.06 BCC Aquifer Recharge Areas

15.06.010 Critical Aquifer Recharge Areas – Classification and Designation

Critical aquifer recharge areas (CARAs) are those areas with a critical recharging effect on aquifers used for potable water as defined by WAC 365-190-030(2), as it now exists or may be hereinafter amended.

(a) Classification: Lands shall be classified as having either a high, moderate, or low susceptibility as determined by local conditions and the criteria provided in WAC 365-190-100, as it now exits or may hereafter amended.

(b) Designation: All lands classified as having moderate to high susceptibility are hereby designated as critical aquifer recharge areas. Critical aquifer recharge areas in Benton County include:

(1) Areas with high susceptibility:

(i) All floodplains and floodways for all rivers, creeks and wetlands mapped by local, state, and federal agencies; or

(ii) Areas of high groundwater identified by the Benton Franklin Health District where there exists inadequate depth to groundwater for the placement of a waste drainfield.

(2) Areas with moderate susceptibility:

(i) Any areas with both of the following characteristics: Hydrologic A soils as identified in the Natural Resource Conservation Service Benton County Soil Survey and irrigated lands;

(ii) Designated wellhead protection areas. Includes Group A public water supply wells and those Group B wells with a wellhead protection plan filed with the Benton Franklin Health District;

(iii) Areas within one hundred (100) feet of all irrigation district main canals (one hundred (100) feet from edge of canal); or

(iv) Areas with alluvial soils. [Ord. 609 (2018) § 37]

Response:

Per BCC 15.06.010, Benton County has identified lands classified as having moderate to high susceptibility, which are hereby designated as critical aquifer recharge areas. Locations and extents of areas meeting the BCC 15.06.010 criteria for critical aquifer recharge areas were identified from Benton County information and confirmed with desktop and field surveys. See Part 4, Section 4.5 of the streamlined ASC and Attachment E (Preliminary Geotechnical Report), Attachment I (Wetland Delineation Report), and Attachment K (Preliminary Hydrology Report) for additional details. Based on available County data, the Project area contains areas of high and moderate susceptibility

in the form of 100-year flood zone, combined hydrologic soil group A and irrigated agriculture, as well as alluvial soil. See Part 4, Section 4.5 of the streamlined ASC and Attachment E (Preliminary Geotechnical Report), Attachment I (Wetland Delineation Report), and Attachment K (Preliminary Hydrology Report) for additional details. Therefore, Chapter 15.06 applies to the Project.

15.06.030 Activities Requiring a Critical Area Report.

(a) Critical area reports are required for the following activities and similar activities as determined by the Planning Administrator when these activities are proposed to be located in a critical aquifer recharge area:

(1) Biosolids land application;

(2) Critical material handling, generating, or use;

(3) Dairy operation;

(4) Feedlot or livestock/animal operation;

(5) Landfill;

(6) Mining and/or gravel pits;

(7) Sanitary waste discharge;

(8) Wood treatment facilities;

(9) Storage, processing, or disposal of radioactive substances;

(10) Above ground storage tanks, subject to WAC 173-303-640 as it now exists or may be hereinafter amended;

(11) Below ground storage tanks, subject to WAC 173-360 as it now exists or may be hereinafter amended;

(12) Hazardous waste generator (such as Boat or Motor Vehicle Repair Shops);

(13) Junk yards and salvage yards;

(14) Waste water application to land surface;

(15) Commercial fertilizer storage;

(16) Injection wells;

(17) Sawmill;

(18) Solid waste handling and recycling facility;

(19) Cement and/or concrete plants;

(20) Machine shops;

(21) Chemical treatment and disposal facility; or

(22) Any activities, particularly municipal, industrial, and commercial that involve the collection and storage of substances that, in sufficient quantity during an accidental or

intentional release, would result in the impairment of the aquifer water to be used as potable drinking water liquids shall be regulated by this chapter. [Ord. 609 (2018) § 39]

Response:

The Project does not propose to conduct any of the activities identified in BCC 15.06.030 within a critical aquifer recharge area. The proposed on-site septic system that will be located at the O&M building does not overlap with any critical aquifer recharge area per BCC 15.06.010, and is mapped per BCC 15.06.020. Although a critical areas report is not required per BCC 15.06.030, the streamlined solar ASC and attachments provide all of the requirements in BCC 15.06.040 for a critical area report for this resource. Therefore, the Project complies with BCC 15.06.050.

15.06.040 Critical Area Report-Additional Requirements for Critical Aquifer Recharge Areas.

In addition to the general critical area report requirements of BCC 15.02.190, critical area reports for critical aquifer recharge areas must meet the requirements of this section.

(a) Preparation by a Qualified Professional. A critical area report for critical aquifer recharge areas shall be prepared by a qualified professional who has training and experience in preparing hydrogeological reports. A qualified professional shall meet the standard specified in BCC 15.02.070(57).

(b) Area Addressed in Critical Area Report. The following areas shall be addressed in a critical area report for critical aquifer recharge areas:

(1) A detailed narrative describing the project, including, but not limited to, associated grading and filling, structures, utilities, and those activities, practices, materials, or chemicals that have a potential to adversely affect the quantity or quality of underlying aquifers;

(2) Site plan indicating the location of all proposed improvements and aquifer recharge areas;

(3) A hydrogeological evaluation that includes at a minimum, a description and/or evaluation of the following:

(i) Site location, topography, drainage and surface water bodies;

(ii) Soils and geologic units underlying the site;

(iii) Groundwater characteristics of the area, including flow direction, gradient, and existing groundwater quality;

(iv) Location and characteristics of wells and springs within 300 feet of the perimeter of the property;

(v) Evaluation of existing on-site groundwater recharge;

(vi) Evaluation of the potential impact of the proposed development on groundwater quality, both short and long term, based on an assessment of the

cumulative impacts of the proposal in combination with existing and potential future land use activities; and

(vii) A proposed mitigation plan. [Ord. 609 (2018) § 40]

Response:

Although a critical areas report is not required per BCC 15.06.030, the ASC and attachments address all of the elements required in BCC 15.06.040. The detailed narrative, site plan, and hydrogeological elements are included in Part 4.5 of the ASC and Attachment E (Preliminary Geotechnical Report), which were prepared by qualified professionals. Therefore, the Project complies with BCC 15.06.040.

15.06.050 Performance Standards-General Requirements.

(a) Activities may only be permitted in a critical aquifer recharge area if the applicant can show that the proposed activity will not cause contaminants to enter the aquifer and that the proposed activity will not adversely affect the recharging of the aquifer.

(b) Proposed groundwater uses must provide evidence that the proposed water source is physically and legally available and meets drinking water standards.

(c) Groundwater uses, withdrawals, and recharge must be consistent with RCW 90.44.050 and with applicable rules adopted pursuant to RCW 90.22 and 90.54 when making decisions under RCW 19.27.097 and RCW 58.17.110. [Ord. 609 (2018) § 41]

Response:

As discussed in greater detail in Part 3, Section 4, and Part 4, Section 4.5 of the ASC, Project activities are not expected to impact aquifers. No groundwater was encountered across the Project site during geotechnical investigations, and static groundwater levels in nearby water well logs are reported to vary from 65 to 429 feet (see Attachment E, Preliminary Geotechnical Report). Options for sourcing construction water include obtaining water from an existing on-site well with a valid water right (to be verified in coordination with the Washington State Department of Ecology) or purchasing water from a permitted off-site source (i.e., municipal water source or vendor with a valid water right). Water use for Project operations will either be obtained from an existing on-site well with a valid water right, hauled to the site from off-site sources with existing water rights (i.e., a municipal water source or vendor with a valid water right), or obtained through a new permit-exempt groundwater well. If a new well is proposed, it will comply with RCW 90.44.050 and related requirements. Therefore, the Project complies with BCC 15.06.050.

3.5.4 Chapter 15.08 BCC Frequently Flooded Areas

15.08.010 Frequently Flooded Areas – Designation

Frequently flooded areas shall be those floodways and associated floodplains designated by the Federal Emergency Management Agency (FEMA) flood hazard classifications as delineated on the most current available Flood Insurance Rate Maps (FIRM) for Benton County, or as subsequently revised by FEMA, as being within the 100-year flood plain. [Ord. 609 (2018) § 42]

15.08.030 Frequently Flooded Areas – Regulation

> *Frequently flooded areas are those same areas regulated by the Flood Damage Prevention Ordinance, Chapter 3.26 of the Benton County Code, as it now exists or may be hereinafter amended, and are protected through regulations provided in that Chapter. [Ord. 609 (2018) § 44]*

Response:

The Project's compliance with Benton County's Flood Damage Prevention Ordinance is described in Section 3.1.2. There is one mapped Zone A (100-year floodplain) associated with the named ephemeral stream, Dry Creek, which crosses through the northern portion of the Project Area. The transmission line will span Dry Creek and associated 100-year floodplain, which is located between the Project substation and the POI. A temporary 50-foot-wide access corridor across the floodplain will be used during construction of the overhead line. To minimize impacts to this area, only vehicles equipped to carry the transmission wires (conductor, shield wire, etc.) and matting will be allowed. See Part 4, Section 4.3 for the full extent of waterbodies and floodplains within the Project Area, details of the methods used to confirm the extent of waterbodies within the Project Area (based on the wetland delineation), description of the impacts the Project will have on ephemeral waterbodies and floodplains, and the proposed mitigation strategies that will be implemented. The Project will obtain a Special Flood Hazard Development Permit from Benton County for the proposed transmission line construction corridor.

3.5.5 Chapter 15.12 BCC Geologically Hazardous Areas

15.12.010 Geologically Hazardous Areas

> *Geologically hazardous areas include areas susceptible to erosion, land sliding, bluff failures, or other geological events. Such areas pose a threat to the health and safety of citizens when incompatible development is sited in areas of significant hazard. Such incompatible development may not only place itself at risk, but also may increase the hazard to surrounding development and use. [Ord. 609 (2018) § 45]*

15.12.020 Designation of Specific Hazard Maps

> *Geologically hazardous areas are designated as those areas that are susceptible to one or more of the following types of hazards:*
>
> *(a) Erosion Hazard Areas.*
>
> *(1) Slopes between 15 percent and 39 percent;*
>
> *(2) Slopes 40 percent or greater; or*
>
> *(3) Slopes 15 percent or greater that contain soils or soils complexes identified by the U.S. Department of Agriculture's Natural Resource Conservation Service or the Soil Survey for Benton County as having, "severe" or "very severe" erosion hazard potential.*
>
> *(b) Landslide Hazard Areas.*

(1) Slopes 15 percent or greater that have a relatively permeable geologic unit overlying a relatively impermeable unit and have springs or ground water seeps;

(2) Slopes 40 percent or greater with a vertical relief of 10 or more feet except areas composed of competent rock and properly engineered slopes designed and approved by a geotechnical engineer licensed in the state of Washington and experienced with the site;

(3) Potentially unstable slopes resulting from rapid river or stream incision, river or stream bank erosion, or undercutting by wave action. These include slopes exceeding 10 feet in height adjacent to rivers, streams, lakes and shorelines with more than a 35 percent gradient;

(4) Areas that have shown evidence of historic failure or instability, including, but not limited to, back-rotated benches on slopes; areas with structures that exhibit structural damage such as settling and racking of building foundations; and areas that have toppling, leaning, or bowed trees caused by ground surface movement;

(5) Slopes having gradients steeper than 80 percent subject to rock fall during seismic shaking;

(6) Areas that are at risk of mass wasting due to seismic forces;

(7) Areas of historical landslide movement; or

(8) Areas mapped by the State of Washington Department of Natural Resources as landslides or landslide deposits.

(9) Areas identified as landslide runout areas or areas at the top and sides of landslide hazards likely to slide.

(c) Seismic hazard areas shall include areas subject to a severe risk of earthquake damage as a result of seismically induced ground shaking, differential settlement, slope failure, settlement, lateral spreading, mass wasting, surface faulting or soil liquefaction. They include areas identified by the State of Washington Department of Natural Resources as having liquefaction susceptibility of moderate, moderate to high, and/or high.

(d) Other Hazard Areas. Geologically hazard areas shall include those areas subject to severe risk of damage as a result of other geological events including mass wasting, debris flows, rock falls and differential settlement. [Ord. 609 (2018) § 46]

Response:

The Applicant reviewed available County data to identify mapped geologically hazardous areas (as defined under BCC 15.12.010 and designated under BCC 15.12.020) within the Project Area, and results are summarized in Part 4, Section 4.1 of the ASC. As mapped, geologically hazardous areas are present with the Project Area, and the Applicant has completed additional investigations as due diligence to inform Project design, described in the response below. Therefore, Chapter 15.12 applies to review of the proposed Project.

15.12.040 Critical Area Report – Additional Requirements for Geologically Hazardous Areas – Geotechnical Engineering Report

In addition to the general critical area report requirements of BCC 15.02.190, critical area reports for geologically hazardous areas shall meet the requirements of this section. This section shall apply to those hazards identified in BCC 15.12.020(a)(2), (b), (c), and (d).

(a) Preparation by a Qualified Professional. A critical area report for geologically hazardous areas shall be prepared by a qualified professional who has training and experience in preparing reports for the relevant type of hazard. A qualified professional shall meet the standard specified in BCC 15.02.070(57).

(b) Geotechnical Engineering Report. The technical information for a project which has the potential to be damaged by a geologically hazardous area shall include a geotechnical engineering report, prepared by a qualified professional as described in subsection (a). The qualified professional shall present and include the following information:

(1) Site Plan. The report shall include a copy of the site plan for the proposal showing:

(i) The height of slope, slope gradient, and cross section of the project area;

(ii) The location and description of surface water runoff;

(iii) The location of springs, seeps, or other surface expressions of ground water on or within two hundred feet of the project area or that have potential to be affected by the proposal;

(iv) Proposed development, including the location of existing and proposed structures, fill, storage of materials, and drainage facilities, with dimensions indicating distances to the floodplain, if available;

(v) Clearing limits; and

(vi) The topography, in five-foot contours, or as deemed appropriate by the Planning Administrator, of the project area and all hazard areas addressed in the report.

(2) Geotechnical Analysis. The geotechnical analysis shall specifically include:

(i) A description of the extent and type of vegetative cover;

(ii) A description of subsurface conditions based on data from site-specific explorations;

(iii) An estimate of load capacity including surface and ground water conditions, public and private sewage disposal systems, fills and excavations and all structural development;

(iv) An estimate of slope stability and the effect construction and placement of structures will have on the slope over the estimated life of the structure;

(v) An estimate of the bluff retreat rate that recognizes and reflects potential catastrophic events such as seismic activity or a one hundred year storm event;

(vi) Consideration of the run-out hazard of landslide debris and/or the impacts of landslide run-out on down slope properties;

(vii) A study of slope stability including an analysis of proposed angles of cut and fill and site grading;

(viii) Recommendations for building limitations, structural foundations, and an estimate of foundation settlement; and

(ix) An analysis of proposed surface and subsurface drainage, and the vulnerability of the site to erosion.

(3) Geotechnical Engineering Report. The qualified professional shall provide engineering recommendations for the following:

(i) Parameters for design of site improvements including appropriate foundations and retaining structures. These should include allowable load and resistance capacities for bearing and lateral loads, installation considerations, and estimates of settlement performance;

(ii) Recommendations for drainage and subdrainage improvements;

(iii) Earthwork recommendations including clearing and site preparation criteria, fill placement and compaction criteria, temporary and permanent slope inclinations and protection, and temporary excavation support, if necessary;

(iv) Mitigation of adverse site conditions including slope stabilization measures and seismically unstable soils, if appropriate; and

(v) The report shall make a recommendation for the minimum building setback from any geologic hazard based upon the geotechnical analysis.

(4) Seismic Hazard Areas. A critical area report for a seismic hazard area shall also meet the following requirements:

(i) The site map shall show all known and mapped faults within two hundred feet of the project area or that have potential to be affected by the proposal;

(ii) The analysis shall include a complete discussion of the potential impacts of seismic activity on the site (for example, forces generated, fault displacement and liquefaction potential); and

(iii) Where liquefaction risks of high, moderate to high or moderate exist, the report shall address soil and structural mitigation measures. [Ord. 609 (2018) § 48]

15.12.050 Critical Area Report – Additional Requirements for Geologically Hazardous Areas – Geotechnical Engineering Risk Assessment

In addition to the general critical area report requirements of BCC 15.02.190, critical area reports for those hazards in BCC 15.12.020(a)(1), must meet the requirements of this section.

(a) Preparation by a Qualified Professional. A critical area report for geologically hazardous areas shall be prepared by a qualified professional who has training and experience in preparing reports for the relevant type of hazard. A qualified professional shall meet the standard specified in BCC 15.02.070(57).

(b) Geotechnical Engineering Risk Assessment: The technical information for a project shall include a geotechnical engineering risk assessment, prepared by a qualified professional as described in Subsection (a). The qualified professional shall present and include the following information:

(1) Site Plan. The assessment shall include a copy of the site plan for the proposal showing:

(i) The height of slope and slope gradient of the project area;

(ii) The location of springs, seeps, or other surface expressions of ground water on or within two hundred feet of the project area or that have potential to be affected by the proposal;

(iii) The location and description of surface water runoff;

(iv) The top and toe of all unstable slopes and locations of erosion hazard areas;

(vi) Proposed development, including the location of existing and proposed structures, fill, storage of materials, and drainage facilities, with dimensions indicating distances to the floodplain, if available; and

(vii) Clearing limits.

(2) A description of the geology of the site and the proposed development;

(3) An assessment of the potential impact the project may have on the hazard area;

(4) An assessment of what potential impact the hazard area may have on the project;

(5) Appropriate mitigation measures, if any;

(6) A determination by the qualified professional as to whether further analysis is necessary. If further analysis is necessary, a geotechnical engineering report, pursuant to BCC 15.12.040 is required; and

(7) The assessment must be signed by and bear the seal of the engineer or geologist that prepared it.

(c) If additional hazards are identified at the activity site, a geotechnical engineering report, pursuant to BCC 15.12.040 is required. [Ord. 609 (2018) § 49]

15.12.060 Performance Standards – General Requirements

(a) If it is determined by the geotechnical engineering report that either the proposed development or adjacent properties will be at risk of damage from the geologic hazard, or that the project will increase the risk of occurrence of the hazard, and there are no adequate mitigation measures to alleviate the risks, the proposed development cannot be approved by the Planning Administrator.

(b) Development and grading plans shall comply with Benton County Building Department and Benton-Franklin Health District requirements. Additional permits may apply.

(c) Development activities within seismic hazard areas shall comply with the following:

(1) All new development shall conform to the applicable provisions of the International Building Code (Benton County Building Code, BCC 3.04), as existing and hereafter amended by Benton County, which contains structural standards and safeguards to reduce risks from seismic activity.

(2) Construction of commercial, industrial, public assembly, or any publicly owned building shall comply with the requirements of BCC 15.12.040 which includes the submittal of a geotechnical report. The results or conclusions of the evaluation shall be considered a condition of development approval. [Ord. 609 (2018) § 50]

Response:

Portions of the Project Area are mapped by Benton County as geologically hazardous areas, including areas of combined erosion hazard and steep slopes greater than 15 percent, moderate to high liquefaction, and alluvial fan intermediate risk. The Applicant has prepared a Preliminary Geotechnical Report that describes the geology, soils, topography, and existing erosion patterns of the Project Area (Attachment S). The Preliminary Geotechnical Report provides information regarding geologic hazards that may affect the Project, including seismic hazards (e.g., ground shaking, surface fault rupture, soil liquefaction, and other secondary earthquake-related hazards), slope instability, flooding, ground subsidence, collapsible soils, corrosive soils, and erosion. Part 4, Section 4.1 of the ASC and associated figures in ASC Attachment A describes the geological and soil conditions within the Project Area, including any geologically hazardous area designated by Benton County as critical areas, impacts to the Project associated with potential geological hazards, and mitigation strategies that will be implemented to minimize the risks associated with these areas. Prior to construction, an updated geotechnical engineering report will be developed based on near-final design to ensure that the final Project design incorporates all techniques, specifications, and mitigation measures necessary to alleviate geological hazard risks. The updated report will be provided to EFSEC for review as a condition of approval. Therefore, the Project will comply with BCC Chapter 15.12.

3.5.6 Chapter 15.14 BCC Fish and Wildlife Conservation Areas

15.14.010 Designation of Fish and Wildlife Habitat Conservation Areas

(a) Fish and wildlife habitat conservation areas include:

(1) Areas where federal or state designated endangered, threatened, and sensitive species have a primary association.

(i) Federal designated endangered and threatened species are those fish, wildlife, and plant species identified by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service that are in danger of extinction or threatened to become endangered. The U.S. Fish and Wildlife Service and the National Marine Fisheries Service should be consulted as necessary for current federal listing status.

(ii) State designated endangered, threatened, and sensitive species are those fish, wildlife and plant species identified by the Washington State Department of Fish and Wildlife and/or State of Washington Natural Heritage Program. The State of Washington's Department of Fish and Wildlife and/or Natural Heritage Program maintains the most current listing and should be consulted as necessary for current state listing status.

(2) State priority habitats and areas associated with state priority species. (i) State of Washington Priority Habitats and Species are considered priorities for conservation and management.

The State of Washington's Department of Fish and Wildlife should be consulted for current listing of priority habitats and species.

(3) Habitats and species of local importance. Benton County designates the following as a habitat and species of local importance: (i) Shrub-steppe habitat. Critical to supporting priority species in Benton County, shrub-steppe habitat as identified by the Washington State Department of Fish and Wildlife and included in the State Priority Habitats and Species List.

(4) Waters of the state, as defined in RCW 90.48.020, as it now exists or may be hereinafter amended, and include lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and water courses in Washington State.

(i) For the purposes of this chapter, Benton County hereby adopts the water typing system specified in WAC 222-16-030 as existing and hereafter amended.

(5) Naturally occurring ponds under twenty acres and their submerged aquatic beds that provide fish or wildlife habitat. These do not include ponds deliberately designed and created from dry sites such as canals, detention facilities, wastewater treatment facilities, farm ponds, temporary construction ponds (of less than three years duration) and landscape amenities. However, naturally occurring ponds may include those artificial ponds intentionally created from dry areas in order to mitigate conversion of ponds, if permitted by a regulatory authority;

(6) Lakes, ponds, streams and rivers planted with native fish populations, including fish planted under the auspices of federal, state, local or tribal programs or which supports priority fish species as identified by the Washington State Department of Fish and Wildlife;

(7) Washington State Wildlife Areas are defined, established, and managed by the Washington State Department of Fish and Wildlife;

(8) Washington State Natural Area Preserves and Natural Resource Conservation Areas are defined, established, and managed by the Washington State Department of Natural Resources; and

(b) All areas meeting one or more of these criteria, regardless of any formal identification, are hereby designated fish and wildlife habitat conservation areas and are subject to the provisions of this chapter and shall be managed consistent with the best available science.

(c) Fish and wildlife habitat conservation areas does not include such artificial features or constructs as irrigation delivery systems, irrigation infrastructure, irrigation canals, or drainage ditches that lie within the boundaries of, and are maintained by, a port district or an irrigation district or company. [Ord. 609 (2018) § 51]

Response:

The Project Area includes fish and wildlife habitat conservation areas (FWHCAs) as identified through desktop and field survey information (see below) consistent with BCC 15.14.010 and 15.14.020. The Project will include disturbance in areas considered FWHCAs as defined by the Critical Areas Ordinance. Impacts to FWHCAs are described in ASC Part 4, Section 4.3, Section 4.8, and Section 4.9, along with the supporting Wetland Delineation Report (ASC Attachment I), Habitat and General Wildlife Survey Report (ASC Attachment G), and Botanical Survey Report (ASC Attachment F). Further, the Draft Habitat Management Plan (ASC Attachment M) addresses mitigation for impacts to FWHCAs. Therefore, Chapter 15.14 applies to the Project.

15.14.030 Critical Area Report – Additional Requirements for Habitat Conservation Areas

In addition to the general critical area report requirements of BCC 15.02.190, critical area reports for fish and wildlife habitat conservation areas must meet the requirements of this section. Critical area reports for two or more types of critical areas must meet the report requirements for each relevant type of critical area.

(a) Preparation by a Qualified Professional. A critical areas report for a fish and wildlife habitat conservation area shall be prepared by a qualified professional with experience preparing reports for the relevant type of habitat. A qualified professional shall meet the standard specified in BCC 15.02.070(57).

(b) Areas Addressed in Critical Area Report. The following areas shall be addressed in a critical area report for habitat conservation areas:

(1) The project area of the proposed activity;

(2) All habitat conservation areas and recommended buffers within three-hundred (300) feet; and

(3) All shoreline areas, floodplains, other critical areas, and related buffers within three-hundred (300) feet.

(c) Habitat Assessment. A habitat assessment is an investigation of the project area to evaluate the potential presence or absence of designated critical fish or wildlife species or habitat. A critical area report for a habitat conservation area shall contain an assessment of habitats including the following site and proposal related information at a minimum:

(1) Detailed description of vegetation on and adjacent to the project area and its associated buffer;

(2) Identification of any species of local importance, priority species, or endangered, threatened, sensitive, or candidate species that have a primary association with habitat on or adjacent to the project area, and assessment of potential project impacts to the use of the site by the species;

(3) A discussion of any federal, state, or local special management recommendations, including Washington Department of Fish and Wildlife habitat management recommendations, that have been developed for species or habitats located on or adjacent to the project area;

(4) A detailed discussion of the direct and indirect potential impacts on habitat by the project, including potential impacts to water quality;

(5) A discussion of measures, including avoidance, minimization, and mitigation, proposed to preserve existing habitats and restore any habitat that was degraded prior to the current proposed land use activity and to be conducted in accordance with mitigation sequencing BCC 15.02.220;

(6) A discussion of ongoing management practices that will protect habitat after the project site has been developed, including proposed monitoring and maintenance programs; and

(7) Agency Consultation May Be Required. When appropriate due to the type of habitat or species present or the project area conditions, the Planning Administrator may also require the critical area report/habitat assessment to include a request for consultation with the Washington State Department of Fish and Wildlife or the local Confederated Indian Tribe or other appropriate agency. [Ord. 609 (2018) § 53]

Response:

A Draft Habitat Management Plan (Attachment M) has been prepared for the Project by a qualified biologist per BCC 15.02.070(57). This plan provides a framework for determining the compensatory mitigation required to achieve "no net loss." The standard of "no net loss of habitat functions and values" is required by WAC 463-62-040. The Applicant will employ a suite of measures, including actions to avoid, minimize, and mitigate impacts. See further description of techniques and measures in Part 2, Section A.5; Part 4, Section 4.9; and Attachment M).

The Draft Habitat Management Plan (ASC Attachment M) addresses Project monitoring and reporting measures to verify the extent of onsite impacts and documentation of post-construction recovery of areas disturbed temporarily or altered as a result of the Project (see Sections 7.2 and 7.5 of ASC Attachment M). These monitoring results will be reported to EFSEC. The Applicant will work with EFSEC and WDFW to determine appropriate mitigation. The Applicant will continue to coordinate with EFSEC and WDFW on the Draft Habitat Mitigation Plan and with a goal of completing these discussions prior to EFSEC's completion of SEPA review. Once determined, a

description of the agreed-upon mitigation will be provided to EFSEC as supplemental information in the form of a Final Habitat Management Plan prior to construction, as a condition of approval. The Final Habitat Management Plan will be based on final Project design impacts and will be consistent with Chapter 15.14 BCC, WAC 463-62-040, WAC 463-60-332(3), and the WDFW mitigation policy. Reports attached to the ASC or to be provided prior to construction are being submitted in electronic format to EFSEC. The Applicant will provide related geographic information system data to EFSEC upon request. Therefore, the Project complies with BCC 15.14.030.

15.14.040 Performance Standards – General Requirements

> *(a) Alterations shall not degrade the functions and values of habitat. A habitat conservation area may be altered only if the proposed alteration of the habitat or the mitigation proposed does not degrade the quantitative and qualitative functions and values of the habitat. All new structures and land alterations shall be prohibited from habitat conservation areas, except in accordance with this chapter.*
>
> *(b) Nonindigenous Species. No plant, wildlife, or fish species not indigenous to the region shall be introduced into a habitat conservation area unless authorized by a state or federal permit or approval.*
>
> *(c) Mitigation and Contiguous Corridors. Mitigation sites shall be located to preserve or achieve contiguous wildlife habitat corridors in accordance with a mitigation plan that is part of an approved critical area report to minimize the isolating effects of development on habitat areas, so long as mitigation of aquatic habitat is located within the same aquatic ecosystem as the area disturbed.*
>
> *(d) Approvals of Activities. The Planning Administrator shall condition approvals of activities allowed within or adjacent to a habitat conservation area or its buffers, as necessary to minimize or mitigate any potential adverse impacts. Conditions shall be based on the best available science and may include, but are not limited to, the following:*
>
> > *(1) Establishment of buffer zones;*
> >
> > *(2) Preservation of critically important vegetation and/or habitat features such as snags and downed wood;*
> >
> > *(3) Limitation of access to the habitat area, including fencing to deter unauthorized access;*
> >
> > *(4) Seasonal restriction of construction activities;*
> >
> > *(5) Establishment of a duration and timetable for periodic review of mitigation activities; and*
> >
> > *(6) Requirement of a performance bond, when necessary, to ensure completion and success of proposed mitigation.*
>
> *(e) Mitigation and Equivalent or Greater Biological Functions. Mitigation of alterations to habitat conservation areas shall achieve equivalent or greater biologic and hydrologic*

functions and shall include mitigation for adverse impacts upstream or downstream of the development proposal site. Mitigation shall address each function affected by the alteration to achieve functional equivalency or improvement on a per-function basis.

(f) Approvals and the Best Available Science. Any approval of alterations or impacts to a habitat conservation area shall be supported by the best available science.

(g) Buffers.

(1) Establishment of Buffers. Required buffer areas for activities adjacent to habitat conservation areas to protect habitat conservation areas are as set forth in this section (g). Buffers shall consist of an undisturbed area of native vegetation or areas identified for restoration established to protect the integrity, functions, and values of the affected habitat. Required buffer widths reflect the sensitivity of the habitat and the type and intensity of human activity proposed to be conducted nearby and shall be consistent with the management recommendations issued by the Washington State Department of Fish and Wildlife.

(2) Rivers, Lakes, Ponds, and Streams. Waterbodies classified by the water typing system specified in WAC 222-16-030 have the following minimum riparian buffer requirements consistent with State Department of Fish and Wildlife recommendations:

(i) Type S (Shorelines of the State) Standard Buffer Width: Type S waters are protected by the Benton County Shoreline Master Program, as existing and hereafter amended, rather than this chapter.

(ii) Type F (Fish) Standard Buffer Width: Seventy-five (75) feet on parcels without streams with adjacent slopes of ten percent (10%) or greater. For parcels that have streams with adjacent slopes of ten percent (10%) or greater the buffer shall be one hundred (100) feet.

(iii) Type Np (Non-Fish Perennial) and type Ns (Non-Fish Seasonal) Standard Buffer Width: Fifty (50) feet on parcels without streams with adjacent slopes of ten percent (10%) or greater. For parcels that have streams with adjacent slopes of ten percent (10%) or greater the buffer shall be one hundred (100) feet.

(3) Buffer Width Averaging. With written approval of the Planning Administrator, riparian buffer widths may be modified at various points in accordance with an approved critical area report and the best available science on a case-by-case basis by requesting buffer widths be applied on an averaging basis. Averaging of buffer widths may only be allowed where a qualified professional demonstrates that:

(i) It will not reduce riparian functions or functional performance;

(ii) The riparian area contains variations in sensitivity due to existing physical characteristics or the character of the buffer varies in slope, soils, or vegetation, and the riparian area would benefit from a wider buffer in places and would not be adversely impacted by a narrower buffer in other places;

(iii) The total area contained in the buffer area after averaging is no less than that which would be contained within the standard buffer under subsection (g)(2) above; and

(iv) The buffer width is not reduced more than twenty five percent of the standard width or fifteen (15) feet, whichever is less.

(4) Measurement.

(i) Buffers for rivers, lakes, ponds, and streams shall be measured in all directions from the ordinary highwater mark (OHWM) as identified in the field; and

(ii) Buffers for other habitat types shall be measured in all directions from the habitat boundary, as mapped by the Washington State Department of Fish and Wildlife or a qualified professional pursuant to BCC 15.14.030(a).

(5) Seasonal Restrictions. When a species is more susceptible to adverse impacts during specific periods of the year, seasonal restrictions may apply. Larger buffers may be required and activities may be further restricted during the specified season. [Ord. 609 (2018) § 54; Ord. 637 (2021) § 2]

15.14.050 Performance Standards – Specific Habitats

(a) Endangered, threatened, and sensitive species.

(1) No development shall be allowed within a habitat conservation area or buffer with which state or federal endangered, threatened, or sensitive species have a primary association, unless provided for through a federal or state permit, or other approval.

(2) Whenever activities are proposed adjacent to a habitat conservation area with which state or federally endangered, threatened, or sensitive species have a primary association, such area shall be protected through the application of protection measures in accordance with a critical area report prepared by a qualified professional and submitted to the county. Approval for alteration of land adjacent to the habitat conservation area or its buffer shall not occur prior to consultation with the Washington State Department of Fish and Wildlife and the appropriate federal agency. [Ord. 609 (2018) § 55]

Response:

Figures showing proposed Project facilities and their relationship to habitat conservation areas are included in the Wetland Delineation Report (ASC Attachment I), Habitat and General Wildlife Survey Report (ASC Attachment G), and Botanical Survey Report (ASC Attachment F). The Project has applied wetland and stream buffer widths as defined in BCC 15.14.040. The Project has been designed to avoid wetlands, and no wetland or wetland buffers impacts (temporary or permanent) are proposed in the current Project layout. For ephemeral streams anticipated to be impacted by the Project's final design, the Applicant has prepared a Joint Aquatic Resources Permit Application (JARPA) (ASC Attachment T) to submit with the ASC. The Applicant understands that WDFW will

make a determination on whether a HPA is required on the basis of a review of this application and determine if mitigation is required. For the above reasons, the Project will comply with both 15.14 BCC and WAC 463-60-332 that require a fish and wildlife habitat management and mitigation plan, and the "no net loss" standard under WAC 463-62-040.

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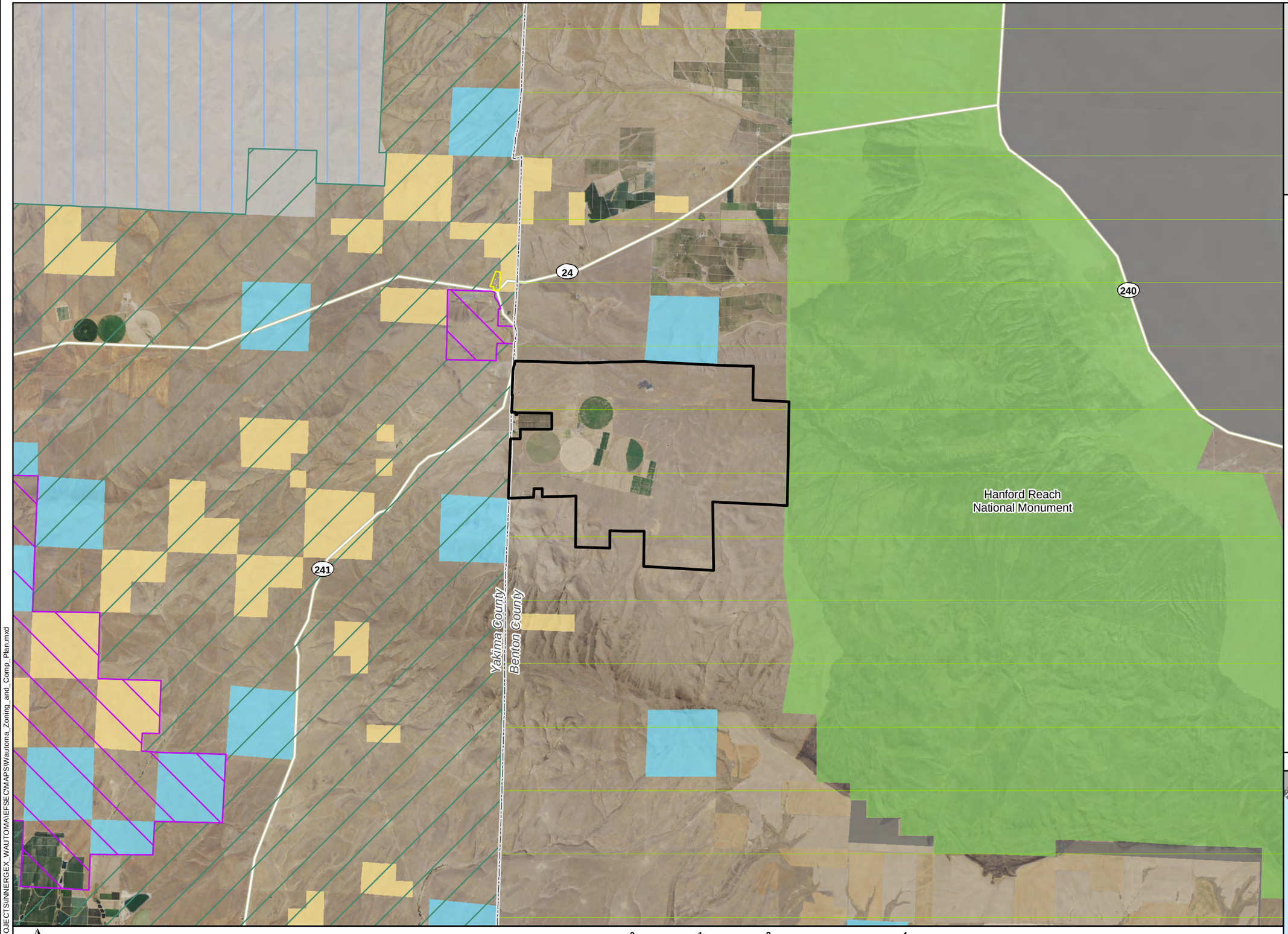
FIGURES

Wautoma Solar

Figure 1.

Zoning and Comprehensive Plan Designation

BENTON AND YAKIMA COUNTIES, WA



- Project Lease Boundary
- County Boundary

Benton County Zoning

- GMAAD/GMA Agriculture

Yakima County Zoning

- Agriculture
- Federal/Yakima Training Center
- Highway Commercial
- Remote/Limited Development

Land Ownership

- BLM
- DOD
- DOE
- USFWS
- WADNR

INNERGEX TETRA TECH

Reference Map

1:85,000 NAD 1983 UTM Zone 11N

0 1 2 4 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\INNERGEX_WAUTOMA\EFSEC\MAPS\Wautoma_Zoning_and_Comp_Plan.mxd

Wautoma Solar

Figure 2.

WSDA Cropland Data

BENTON AND YAKIMA COUNTIES, WA

- Project Lease Boundary
- Project Area
- Project Area 5-mile Buffer
- County Boundary
- 2021 Habitat Survey Mapped Agriculture
- CRP Land

WSDA 2021 Cropland Data

- Cereal Grain
- Hay/Silage
- Orchard
- Pasture
- Vineyard
- Other

INNERGEX TETRA TECH

Reference Map

1:85,000 NAD 1983 UTM Zone 11N

0 1 2 4 Miles

NOT FOR CONSTRUCTION

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Wautoma Solar

Figure 3.

Prime Farmland

BENTON AND YAKIMA COUNTIES, WA

- Project Area
- Fenceline
- Permanent Impacts
- County Boundary

NRCS Farmland Classification

- Prime farmland if irrigated
- Farmland of statewide importance
- Farmland of unique importance
- Not prime farmland

WSDA 2021 Cropland Data

- Irrigated

INNERGEX

TETRA TECH

Reference Map

241

Yakima County

Benton County

1:22,000

NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

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ATTACHMENT E: SOIL TABLE

Table E-1. Soils in the Project Area

Soil Unit Number	Soil Name	Acres in Project Area	Percent of Project Area	Wind Erodibility Group	Water Erodibility K Factor	Slopes Greater Than 30%	Primary Soil Type	Bedrock or Restrictive Layer Expected at Less Than 60 in	Farmland Classification
BmAB	Burke silt loam, 0 to 5 percent slopes	15.42	0.34	5	0.49	No	silt loam	25in	Prime farmland if irrigated
BnB	Burke silt loam, shallow, 0 to 5 percent slopes	17.26	0.3	5	0.64	No	silt loam	17in	Not prime farmland
EuAB	Esquatzel silt loam, 0 to 5 percent slopes	97.38	2.13	3	0.55	No	silt loam	> 80 in	Prime farmland if irrigated
FeC	Finley fine sandy loam, 0 to 15 percent slopes	128.16	2.80	3	0.28	No	fine sandy loam	> 80 in	Farmland of statewide importance
FfE	Finley stony fine sandy loam, 0 to 30 percent slopes	359.09	7.85	5	0.17	No	fine sandy loam	> 80 in	Not prime farmland
HeE	Hezel loamy fine sand, 0 to 30 percent slopes	28.83	0.63	2	0.32	No	loamy fine sand	> 80 in	Not prime farmland
KnE	Kiona very stony silt loam, 0 to 30 percent slopes	52.55	1.15	7	0.20	No	very stony silt loam	> 80 in	Not prime farmland
KnF	Kiona very stony silt loam, 30 to 65 percent slopes	58.82	1.29	7	0.20	Yes	very stony silt loam	> 80 in	Not prime farmland
ReB	Ritzville silt loam, 0 to 5 percent slopes	766.10	16.75	5	0.55	No	silt loam	> 80 in	Prime farmland if irrigated
ReE3	Ritzville silt loam, 15 to 30 percent slopes, severely eroded	49.65	1.09	5	0.55	No	silt loam	> 80 in	Farmland of unique importance
ReF	Ritzville silt loam, 30 to 65 percent slopes	39.36	0.86	5	0.55	Yes	silt loam	> 80 in	Not prime farmland
ScAB	Scooteney silt loam, 0 to 5 percent slopes	216.81	4.74	5	0.55	No	silt loam	> 80 in	Prime farmland if irrigated
ShAB	Shano silt loam, 0 to 5 percent slopes	0.86	0.02	5	0.55	No	silt loam	> 80 in	Prime farmland if irrigated
SnE2	Shano very fine sandy loam, 15 to 30 percent slopes, eroded	16.37	0.36	3	0.49	No	very fine sandy loam	> 80 in	Farmland of unique importance
WdAB	Warden silt loam, 0 to 5 percent slopes	2231.30	48.79	5	0.43	No	silt loam	> 80 in	Prime farmland if irrigated
WdE3	Warden silt loam, 15 to 30 percent slopes, severely eroded	359.10	7.85	5	0.43	No	silt loam	> 80 in	Farmland of unique importance
WfC2	Warden very fine sandy loam, 0 to 15 percent slopes	136.04	2.97	3	0.49	No	very fine sandy loam	> 80 in	Farmland of statewide importance
	Total	**4,573.01**	**100**						
	Soil types with moderate to high water erosion potential	**3,945.65**	**86.28**						
	Soils types with slopes greater than 30%	**98.18**	**2.15**						
	Soils that are primarily silt loam	**3,904.61**	**85.38**						
	Soils with restrictive layer reported at less than 25 inches	**32.68**	**0.71**						

Source: Natural Resources Conservation Services. 2022. Web Soil Survey Application: Benton County Area, Washington (WA605). Available online at: https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

ATTACHMENT F: BOTANICAL SURVEY REPORT WITH ADDENDUM

Wautoma Solar Energy Project
Botanical Survey Report

Prepared for:

INNERGEX

Innergex Renewable Development USA, LLC
3636 Nobel Drive, Suite 260
San Diego, CA 92122

Prepared by:

TETRA TECH

April 2022

CONFIDENTIAL BUSINESS INFORMATION

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Figure 4. Noxious Weeds Observed within the Spring 2021 Survey Area

Appendices

Appendix A. Rare Vascular Plant Species with Potential to Occur within the Project

Appendix B. Vascular Plants Observed During 2021 Field Surveys

Appendix C. Site Photographs

Acronyms and Abbreviations

EO	Element Occurrence
GPS	global positioning system
Innergex	Innergex Renewable Development USA, LLC
IPaC	Information for Planning and Consultation
NHD	National Hydrography Dataset
Project	Wautoma Solar Project
Tetra Tech	Tetra Tech, Inc.
USFWS	U.S. Fish and Wildlife Service
WNHP	Washington Natural Heritage Program

1.0 Introduction

Innergex Renewable Development USA, LLC (Innergex) plans to develop the Wautoma Solar Project (Project) located in Benton County, Washington approximately 12.5 miles northeast of the city of Sunnyside (Figure 1).

As part of its environmental due diligence, Innergex contracted Tetra Tech, Inc. (Tetra Tech) to conduct botanical surveys for the Project. The purpose of the botanical surveys was to document the presence of rare vascular plant species and noxious weeds within the Project Survey Area in support of permitting requirements for the proposed Project.

2.0 Description of the Survey Area

Botanical surveys were conducted in early May 2021 within the approximately 3,830-acre area shown as the "Spring 2021 Survey Area" on Figure 1. Following these surveys, the Project was expanded by approximately 990 acres. Botanical surveys will be conducted in the expanded area in the spring of 2022 (i.e., Spring 2022 Survey Area, Figure 1). This report will be supplemented with the results of the Spring 2022 surveys.

3.0 Agency Coordination

Innergex and Tetra Tech met virtually with the Washington Department of Fish and Wildlife (WDFW) on March 8, 2021, to introduce the Project and discuss planned wildlife, habitat, and rare plant surveys. At the meeting, WDFW concurred with the survey timing and survey approach. A summary of this meeting is provided as Appendix B to the Habitat and General Wildlife Survey Report prepared for the Project (Tetra Tech 2022).

4.0 Methods

4.1 Background Review

4.1.1 Rare Plants

Prior to conducting field surveys, Tetra Tech conducted a pre-field review of existing information on rare vascular plant species with the potential to occur in Benton County and the Survey Area. For purposes of this report, the term "rare plant" includes federally listed and candidate vascular plant species, as well as vascular plant species that are listed in Washington state as endangered, threatened, or sensitive by the Washington Natural Heritage Program (WNHP). Specific sources of information that were reviewed prior to conducting field surveys included the following:

- U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) query for Benton County (USFWS 2021a)

- WNHP Rare Vascular and Nonvascular Species, County Lists (WNHP 2021a)
- Washington Vascular Plant Species of Special Concern (WHNP 2019)
- WNHP Element Occurrence database of rare and imperiled species and plant communities (WNHP 2021b)
- Online Field Guide to the Rare Plants of Washington (WNHP 2021c)
- Wautoma Solar Project Critical Issues Analysis (Tetra Tech 2020)
- USFWS National Wetlands Inventory (USFWS 2021b)
- U.S. Geological Survey National Hydrography Dataset (NHD; USGS 2021)
- Aerial imagery of the Survey Area (GoogleEarth Pro 2021)

Based on review of the above sources, Tetra Tech compiled a list of rare plant species known to occur or with the potential to occur in the Survey Area (Appendix A). As further detailed in Appendix A, each of the species identified as potentially occurring within the Survey Area was assigned a "likelihood of occurrence" (i.e., highly unlikely, low, moderate, high) based on the proximity of known occurrences, whether the known occurrences in Benton County are historical occurrences, and the likelihood of suitable habitat occurring within the Survey Area.

Prior to conducting field surveys, Tetra Tech completed a review of existing literature, herbarium records, and other sources to generate fact sheets or "field guides" for each rare plant species known to occur, or with the potential to occur, within the Survey Area. These fact sheets were used by the surveyors in the field and included the following:

- Photographs of each species and its habitat
- Information detailing habitat associations
- Range and flowering period
- Identifying features
- Characteristics distinguishing the target species from similar species within its range

4.1.2 Noxious Weeds

Prior to field surveys, Tetra Tech reviewed lists of species designated as noxious weeds in Washington state and Benton County (BCNWCB 2020; WSNWCB 2021). Additionally, existing literature and other sources were reviewed to familiarize surveyors with identification of designated noxious weeds that would potentially be encountered within the Survey Area.

4.2 Field Surveys

Tetra Tech conducted botanical surveys within the Spring 2021 survey area May 10–14, 2021. This survey period was chosen to coincide with the identification period for the vast majority of the rare plant species with a potential to occur within the Spring 2021 Survey Area. Supplemental botanical surveys are planned in the spring of 2022 for the expanded Spring 2022 Survey Area Figure 1).

4.2.1 Rare Plants

Field surveys were conducted using the focused intuitive controlled survey method, which is a standard and commonly accepted survey protocol (USFS and BLM 1999). This method incorporates meandering transects that traverse the survey area and targets the full array of major vegetation types (with the exception of agricultural fields as they do not support rare plant species and are exposed to ongoing active disturbances on a regular basis), aspects, topographical features, habitats, and substrate types. The distribution of survey effort is based on habitat conditions observed in the field, surveyor experience, and knowledge of rare plant species and their habitats. Areas that provide marginal potential habitat for rare plant species (e.g., areas dominated by non-native species) are surveyed with less intensity than areas of high-potential habitat for rare plant species (e.g., intact shrub-steppe habitat).

While traversing the Survey Area, the surveyors searched for rare plant species, and when the surveyors arrived at an area of high-potential habitat for rare plant species, they conducted a complete survey for the rare species (i.e., the entire area of high-potential habitat is surveyed). Because this method focuses survey efforts on the parts of the landscape most likely to support rare plant species, surveyors were required to be familiar with all information in each species' fact sheet before beginning surveys.

When surveyors encountered a rare plant species, they recorded the global positioning system (GPS) location with a tablet using ArcGIS Collector software and an external GPS receiver capable of sub-meter accuracy. For individual plants or small patches of individuals, surveyors took a single GPS point. For numerous plants over a larger area, they mapped a polygon that encompassed all individuals. Surveyors completed WNHP rare plant sighting forms for each population (copies available upon request) and took photographs to serve as digital specimen vouchers to illustrate identifying characteristics, plant habits, and habitat.

Data for each population included the following:

- Species phenology
- Number of plants observed
- Habitat information and associated species
- Visible threats
- Representative photos of individuals and habitat

During surveys, Tetra Tech maintained a running list of vascular plant species encountered and made informal collections of unknown species for later identification. Identification was verified through the use of appropriate plant keys—in particular, *Flora of the Pacific Northwest* (Hitchcock and Cronquist 2018). The final vascular plant species list for the Survey Area is included as Appendix B in this report.

4.2.2 Noxious Weeds

Noxious weed surveys were conducted concurrently with rare plant surveys. Tetra Tech recorded observations of state- and Benton County-listed noxious weeds (BCNWCB 2020; WSNWCB 2021). When a noxious weed was encountered in the Survey Area, the location was recorded with a GPS point and the species, estimated size of infestation (i.e., less than 0.1 acre, 0.1 to 1.0 acre, or 1 to 5 acres), and relative abundance (i.e., sparse [only a few individuals noted or low cover of species in area], common [many individuals of the species noted in area], or very high cover [dense population of the species]) was recorded.

5.0 Results and Discussion

5.1 Background Review

5.1.1 Rare Plants

Based on the background review of existing information, one federally listed threatened plant species, the Umtanum desert buckwheat (*Eriogonum codium*), is known to occur within Benton County (USFWS 2021a). However, this species has a highly restricted distribution, and the entire known population occurs in a 1.9-acre area on the eastern end of Umtanum Ridge within the Hanford Reach National Monument, which is more than 6 miles north of the Survey Area (Figure 2; USFWS 2019). Additionally, the approximately 5 acres of designated critical habitat for Umtanum Desert buckwheat is restricted to this region along Umtanum Ridge (i.e., well outside the Survey Area).

Including Umtanum desert buckwheat, which in addition to being federally listed as threatened is also considered a state endangered species, 29 state endangered, threatened, or sensitive vascular plant species are known to occur or potentially occur within Benton County (WNHP 2021a). Appendix A provides the list of the 29 special status plant species known or potentially occurring in Benton County, as well as their state and federal status, preferred habitat, likelihood of occurring in the Survey Area, and recommended survey period. Seven of these species listed as potentially occurring within the Survey Area have been documented within 5 miles of the Survey Area (Figure 2; WNHP 2021b). These include: cespitose evening-primrose (*Oenothera cespitosa* subsp. *cespitosa*), Columbia milk-vetch (*Astragalus columbianus*), coyote tobacco (*Nicotiana attenuata*), desert cryptantha (*Cryptantha scoparia*), dwarf-evening primrose (*Eremothera pygmaea*), small-flower evening primrose (*Eremothera minor*), and Snake River cryptantha (*Cryptantha spiculifera*). An Element Occurrence (EO)[1] for one of these seven species, Columbia milkvetch, overlaps the Survey Area (Figure 2).

[1] An Element Occurrence is an "area of land and/or water in which a species or natural community is, or was present" (DNR 2018). The WNHP provides data on rare plants in Washington, including the locations of documented EOs for rare plant species. However, due to the sensitive nature of this information, rare plant EOs are buffered to protect the exact location of documented occurrences of rare plant populations.

5.1.2 Noxious Weeds

Based on the background review, 155 species are currently designated as noxious weeds in Washington state, and 124 species are currently designated as noxious weeds in Benton County (BCNWCB 2020; WSNWCB 2021). Per the WSNWCB (2021), the following are the definitions for each class of noxious weed:

- **Class A Weeds**: Non-native species whose distribution in Washington is still limited. Preventing new infestations and eradicating existing infestations are the highest priority. Eradication of all Class A plants is required by law.
- **Class B Weeds**: Non-native species presently limited to portions of the state. Species are designated for required control in regions where they are not yet widespread. Preventing new infestations in these areas is a high priority. In regions where a Class B species is already abundant, control is decided at the local level, with containment as the primary goal.
- **Class C Weeds**: Noxious weeds that are typically widespread in Washington or are of special interest to the state's agricultural industry. The Class C status allows county weed boards to require control if locally desired, or they may choose to provide education or technical consultation.

5.2 Field Surveys

5.2.1 Rare Plants

Tetra Tech documented one special-status plant species, the state sensitive Columbia milk-vetch, within the Spring 2021Survey Area (Figure 3). Columbia milk-vetch is a perennial forb in the pea (Fabaceae) family, which occurs on sandy or gravelly loams, silts, rocky silt loams, and lithosol soils in shrub-steppe habitats (WNHP 2021c). One population of Columbia milk-vetch, consisting of approximately 125 plants occupying approximately 3 acres, was documented within eastside (interior) grassland habitat on a slope and crest of a hill in the southwest portion of the Spring 2021 Survey Area.

Columbia milk-vetch plants were found to occur on the hillcrest and south- and southeast-facing aspects and on relatively steep rocky slopes (i.e., 10 to 15 degrees). Approximately 65 percent of observed plants were vegetative, and the other 35 percent were in fruit. Visible threats to this population included the presence of non-native invasive plant species and moderate grazing. Associated species included the native perennial grasses and forbs bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), Carey's balsamroot (*Balsamorhiza careyana*), large-fruit desert-parsley (*Lomatium macrocarpum*), and woolly plantain (*Plantago patagonica*), and the non-native grasses and forbs cheatgrass (*Bromus tectorum*), bulbous bluegrass (*Poa bulbosa*), common stork's-bill (*Erodium cicutarium*), jagged chickweed (*Holosteum umbellatum*), and yellow salsify (*Tragopogon dubius*). Representative

photos of individuals and habitat of Columbia milk-vetch observed within the Spring 2021 Survey Area are provided in Appendix C.

Columbia milkvetch was not observed in the location where the EO for this species overlaps the Project area. The polygon for that EO is large (and is centered outside the Spring 2021 Survey Area) and thus likely includes a buffer to protect the exact location of the rare plant and/or to account for uncertainty in the mapping. As a result, the specific occurrence location is likely outside the Spring 2021 Survey Area.

5.2.2 Noxious Weeds

Tetra Tech observed nine state- and/or county-listed noxious weed species during field surveys. Table 1 lists the noxious weed species observed, their noxious weed designation, and the frequency of observations. Figure 4 shows the locations of noxious weeds observed during field surveys.

Two noxious weed species were abundant throughout the Spring 2021 Survey Area: diffuse knapweed and cereal rye. Diffuse knapweed was observed throughout the majority of the Spring 2021 Survey Area, but was most abundant in the eastern portion (Figure 4). Infestations ranged from small (less than 0.1 acre) to large (greater than 1 acre) patches that consisted of sparse scattered individuals to areas with relatively high cover of diffuse knapweed. Tetra Tech documented cereal rye throughout all but the northern portion of the Spring 2021 Survey Area. Most infestations of cereal rye were large (greater than 1 acre) and dense (high cover). In some areas, cereal rye formed almost a complete monoculture in the locations where it was observed.

Table 1. Noxious Weeds Observed within the Spring 2021 Survey Area

Scientific Name	Common Name	State Status/ County Status[1]	Frequency of Observations
Aegilops cylindrica	jointed goatgrass	Class C / Class C	Observed in one location in Spring 2021 Survey Area.
Bassia (Kochia) scoparia	kochia	Class B / Class B	Observed in one location in Spring 2021 Survey Area.
Centaurea diffusa	diffuse knapweed	Class B / Class B	Abundant. Frequently observed in Spring 2021 Survey Area.
Chondrilla juncea	rush skeletonweed	Class B / Class B	Commonly observed in Spring 2021 Survey Area.
Convolvulus arvensis	field bindweed	Class C / Class C	Commonly observed in Spring 2021 Survey Area.
Elaeagnus angustifolia	Russian olive	Class C / Not listed	Observed in one location in Spring 2021 Survey Area.
Rhaponticum (*Acroptilon*) *repens*	Russian knapweed	Class B / Class B	Observed in one location in Spring 2021 Survey Area.
Secale cereale	cereal rye	Class C / Class C	Abundant. Frequently observed in Spring 2021 Survey Area.
Taeniatherum caput-medusae	medusahead	Class C / Class C	Observed in two locations in Spring 2021 Survey Area.

[1] Definitions for noxious weed statuses are provided in Section 4.1.2

Both rush skeletonweed and field bindweed were commonly observed in the Spring 2021 Survey Area (Figure 4). Observations of rush skeletonweed typically consisted of small (less than 0.1 acre), sparse infestations; however, a few larger (0.1 to 1.0 acre) denser infestations were observed in the eastern portion of the Spring 2021 Survey Area. Field bindweed was observed throughout the Spring 2021 Survey Area, with the exception of the northern portion of the Spring 2021 Survey Area. Observations ranged from small (less than 0.1 acre) to medium sized (0.1 to 1.0 acre) relatively dense infestations.

The remaining five noxious weeds—jointed goatgrass, kochia, medusahead, Russian knapweed, and Russian olive—were observed in only one or two locations in the Spring 2021 Survey Area (Figure 4). One large (1 to 5 acres) infestation of jointed goatgrass was observed in the northeast corner of the Spring 2021 Survey Area, and one small (less than 0.1 acre) infestation of kochia was observed in the northern portion of the Spring 2021 Survey Area. Russian knapweed and Russian olive were also only observed in one location. Each was observed in the southeastern portion of the Spring 2021 Survey Area, and both infestations were medium-sized (0.1 to 1.0 acre). Medusahead was observed in two locations: 1) a small (less than 0.1 acre) infestation in the western portion of the Spring 2021 Survey Area, and 2) a medium-sized (0.1 to 1.0 acre) infestation in the southeast portion of the Spring 2021 Survey Area.

6.0 Conclusion and Recommendations

Botanical surveys in 2021 documented one population of the state sensitive species Columbia milkvetch within the Spring 2021 Survey Area. This population consisted of approximately 125 individuals and covered approximately 3 acres. Nine noxious weeds were documented during field surveys, several of which were common or abundant within the Spring 2021 Survey Area.

In order to avoid and minimize direct and indirect effects, it is recommended that known populations of Columbia milkvetch, plus a 100-foot buffer, be avoided by construction and operation of the Project. Additional surveys are planned for the spring of 2022 within the Spring 2022 Survey Area (Figure 1). If additional rare plant populations are documented in this area, it is recommended that these additional populations, plus a 100-foot buffer, be avoided during Project construction and operation.

In order to minimize the introduction and spread of noxious weeds and invasive plants, it is recommended that a Noxious Weed Management Plan be prepared prior to construction of the Project. This plan should include measures (e.g., cleaning of construction vehicles) that should be implemented during Project construction and operation to prevent and minimize the introduction and spread of noxious weeds and invasive plants.

7.0 References

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Figures

Wautoma Solar

Figure 1
Project Location

BENTON AND YAKIMA COUNTIES, WA

Spring 2021 Survey Area
Spring 2022 Survey Area
County Boundary

Grant County
Yakima County
Benton County
Granger
Sunnyside
243
24
240
241
223
82

INNERGEX
TETRA TECH

Reference Map

1:150,000
NAD 1983 StatePlane Washington South FIPS 4602 Feet
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Wautoma Solar

Figure 2
Documented Occurrences of Rare Plant Species in the Vicinity of the Project

BENTON AND YAKIMA COUNTIES, WA

- Spring 2021 Survey Area
- Spring 2022 Survey Area
- 5-mile Buffer
- County Boundary

WNHP Rare Plant Occurrences

- Cespitose evening-primrose *(Oenothera cespitosa subsp. cespitosa)*
- Columbia milkvetch *(Astragalus columbianus)*
- Coyote tobacco *(Nicotiana attenuata)*
- Desert cryptantha *(Cryptantha scoparia)*
- Dwarf evening-primrose *(Eremothera pygmaea)*
- Small-flower evening-primrose *(Eremothera minor)*
- Snake River cryptantha *(Cryptantha spiculifera)*
- Umtanum desert buckwheat *(Eriogonum codium)*

INNERGEX TETRA TECH

Reference Map

Yakima County

Benton County

1:95,000 NAD 1983 StatePlane Washington South FIPS 4602 Feet

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Figure 3 contains confidential information and is not included in this version.

Wautoma Solar

Figure 4
Noxious Weeds Observed within the Spring 2021 Survey Area

BENTON AND YAKIMA COUNTIES, WA

Spring 2021 Survey Area
Spring 2022 Survey Area

Noxious Weed
- Cereal rye *(Secale cereale)*
- Diffuse knapweed *(Centaurea diffusa)*
- Field bindweed *(Convolvulus arvensis)*
- Jointed goatgrass *(Aegilops cylindrica)*
- Kochia *(Bassia scoparia)*
- Medusahead *(Taeniatherum caput-medusae)*
- Rush skeletonweed *(Chondrilla juncea)*
- Russian knapweed *(Rhaponticum repens)*
- Russian olive *(Elaeagnus angustifolia)*

Size of Infestation
- < 0.1 acre
- 0.1-1 acre
- 1-5 acres

INNERGEX TETRA TECH

Reference Map

241

Yakima County
Benton County

1:22,000 NAD 1983 StatePlane Washington South FIPS 4602 Feet

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Appendix A.

Rare Vascular Plant Species with Potential to Occur within the Project Area

Appendix B.

Vascular Plants Observed During 2021 Field Surveys

Appendix C.

Site Photographs

Photo 1. Columbia milkvetch in fruit.

Photo 2. Columbia milkvetch in fruit.

Photo 3. Vegetative individual of Columbia milkvetch with rabbit droppings.

Photo 4. Columbia milkvetch habitat.

Photo 5. Columbia milkvetch habitat.

Wautoma Solar Project
Botanical Survey Addendum

Prepared for:

INNERGEX

Innergex Renewable Development USA, LLC
3636 Nobel Drive, Suite 260
San Diego, CA 92122

Prepared by:

TETRA TECH

August 2022

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Appendices

Appendix A. Rare Vascular Plant Species with Potential to Occur within the Spring 2022 Survey Area

Appendix B. Vascular Plants Observed During 2022 Field Surveys

Acronyms and Abbreviations

GPS	global positioning system
Innergex	Innergex Renewable Development USA, LLC
IPaC	Information for Planning and Consultation
NHD	National Hydrography Dataset
Project	Wautoma Solar Project
Spring 2021 Survey Area	the approximately 3,830-acre area where the botanical surveys were originally conducted
Spring 2022 Survey Area	the additional 990 acres where the botanical surveys were conducted
Tetra Tech	Tetra Tech, Inc.
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife
WNHP	Washington Natural Heritage Program

1.0 Introduction

Innergex Renewable Development USA, LLC (Innergex) plans to develop the Wautoma Solar Project (Project) located in Benton County, Washington, approximately 12.5 miles northeast of the city of Sunnyside (Figure 1; figures are located at the back of this report).

As part of its environmental due diligence, Innergex contracted Tetra Tech, Inc. (Tetra Tech) to conduct botanical surveys for the Project. The purpose of the botanical surveys was to document the presence of rare vascular plant species and noxious weeds within the Project survey area in support of permitting requirements for the proposed Project.

2.0 Description of the Survey Area

Botanical surveys were conducted in early May 2021 within the approximately 3,830-acre area shown as the "Spring 2021 Survey Area" on Figure 1 of the April 2022 Wautoma Solar Project Botanical Survey Report (Tetra Tech 2022a), which was included as Appendix F of the Application for Site Certification (Tetra Tech 2022b). Following these surveys, the Project was expanded by approximately 990 acres. Botanical surveys were conducted in the expanded area in May 2022 (i.e., the Spring 2022 Survey Area, Figure 1). This addendum presents the results of the spring 2022 surveys.

3.0 Agency Coordination

Innergex and Tetra Tech met virtually with the Washington Department of Fish and Wildlife (WDFW) on March 8, 2021, to introduce the Project and discuss planned wildlife, habitat, and rare plant surveys. At the meeting, WDFW concurred with the survey timing and survey approach. A summary of this meeting is provided as Appendix B to the Habitat and General Wildlife Survey Report prepared for the Project (Tetra Tech 2022c).

4.0 Methods

4.1 Background Review

4.1.1 Rare Plants

Prior to conducting field surveys, Tetra Tech conducted a pre-field review of existing information on rare vascular plant species with the potential to occur in Benton County and the Spring 2022 Survey Area. For purposes of this report, the term "rare plant" includes federally listed and candidate vascular plant species, as well as vascular plant species that are listed in Washington state as endangered, threatened, or sensitive by the Washington Natural Heritage Program

(WNHP). Specific sources of information that were reviewed prior to conducting field surveys included the following:

- U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) query for Benton County (USFWS 2022a)
- WNHP Vascular Plant Species of Conservation Concern List (WNHP 2021a)
- Washington Vascular Plant Species of Special Concern (WHNP 2019)
- WNHP Element Occurrence database of rare and imperiled species and plant communities (WNHP 2022)
- Online Field Guide to the Rare Plants of Washington (WNHP 2021b)
- USFWS National Wetlands Inventory (USFWS 2022b)
- U.S. Geological Survey National Hydrography Dataset (NHD; USGS 2022)
- Aerial imagery of the Spring 2022 Survey Area (Google Earth Pro 2022)

Based on review of the above sources, Tetra Tech compiled a list of rare plant species known to occur or with the potential to occur in the Spring 2022 Survey Area (Appendix A). As further detailed in Appendix A, each of the species identified as potentially occurring within the Spring 2022 Survey Area was assigned a "likelihood of occurrence" (i.e., highly unlikely, low, moderate, high) based on the proximity of known occurrences, whether the known occurrences in Benton County are historical occurrences, and the likelihood of suitable habitat occurring within the Spring 2022 Survey Area.

Prior to conducting field surveys, Tetra Tech completed a review of existing literature, herbarium records, and other sources to generate fact sheets or "field guides" for each rare plant species known to occur, or with the potential to occur, within the Spring 2022 Survey Area. These fact sheets were used by the surveyors in the field and included the following:

- Photographs of each species and its habitat
- Information detailing habitat associations
- Range and flowering period
- Identifying features
- Characteristics distinguishing the target species from similar species within its range

4.1.2 Noxious Weeds

Prior to field surveys, Tetra Tech reviewed lists of species designated as noxious weeds in Washington state and Benton County (BCNWCB 2022; WSNWCB 2021). Additionally, existing literature and other sources were reviewed to familiarize surveyors with identification of designated noxious weeds that would potentially be encountered within the Spring 2022 Survey Area.

4.2 Field Surveys

Tetra Tech conducted botanical surveys within the Spring 2022 Survey Area on May 9 and 10, 2022. This survey period was chosen to coincide with the identification period for the vast majority of the rare plant species with a potential to occur within the Spring 2022 Survey Area.

4.2.1 Rare Plants

Field surveys were conducted using the focused intuitive controlled survey method, which is a standard and commonly accepted survey protocol (USFS and BLM 1999). This method incorporates meandering transects that traverse the survey area and targets the full array of major vegetation types (with the exception of agricultural fields since they do not support rare plant species and are exposed to ongoing active disturbances on a regular basis), aspects, topographical features, habitats, and substrate types. The distribution of survey effort is based on habitat conditions observed in the field, surveyor experience, and knowledge of rare plant species and their habitats. Areas that provide marginal potential habitat for rare plant species (e.g., areas dominated by non-native species) are surveyed with less intensity than areas of high-potential habitat for rare plant species (e.g., intact shrub-steppe habitat).

While traversing the Spring 2022 Survey Area, the surveyors searched for rare plant species, and when the surveyors arrived at an area of high-potential habitat for rare plant species, they conducted a complete survey for the rare species (i.e., the entire area of high-potential habitat is surveyed). Because this method focuses survey efforts on the parts of the landscape most likely to support rare plant species, surveyors were required to be familiar with all information in each species' fact sheet before beginning surveys.

When surveyors encountered a rare plant species, they recorded the global positioning system (GPS) location with a tablet using ArcGIS Collector software and an external GPS receiver capable of sub-meter accuracy. For individual plants or small patches of individuals, surveyors took a single GPS point. For numerous plants over a larger area, they mapped a polygon that encompassed all individuals. Surveyors completed WNHP rare plant sighting forms for each population (copies available upon request) and took photographs to serve as digital specimen vouchers to illustrate identifying characteristics, plant habits, and habitat.

Data for each population included the following:

- Species phenology
- Number of plants observed
- Habitat information and associated species
- Visible threats
- Representative photos of individuals and habitat

During surveys, Tetra Tech maintained a running list of vascular plant species encountered and made informal collections of unknown species for later identification. Identification was verified

through the use of appropriate plant keys—in particular, *Flora of the Pacific Northwest* (Hitchcock and Cronquist 2018). The final vascular plant species list for the Spring 2022 Survey Area is included as Appendix B in this report.

4.2.2 Noxious Weeds

Noxious weed surveys were conducted concurrently with rare plant surveys. Tetra Tech recorded observations of state- and Benton County-listed noxious weeds (BCNWCB 2022; WSNWCB 2021). When a noxious weed was encountered in the Spring 2022 Survey Area, the location was recorded with a GPS point and the species, estimated size of infestation (i.e., less than 0.1 acre, 0.1 to 1.0 acre, or 1 to 5 acres), and relative abundance (i.e., sparse [only a few individuals noted or low cover of species in area], common [many individuals of the species noted in area], or very high cover [dense population of the species]) was recorded.

5.0 Results and Discussion

5.1 Background Review

5.1.1 Rare Plants

Based on the background review of existing information, one federally listed threatened plant species, the Umtanum desert buckwheat (*Eriogonum codium*), is known to occur within Benton County (USFWS 2022a). However, this species has a highly restricted distribution, and the entire known population occurs in a 1.9-acre area on the eastern end of Umtanum Ridge within the Hanford Reach National Monument, which is more than 6 miles north of the Spring 2022 Survey Area (Figure 2; USFWS 2019). Additionally, the approximately 5 acres of designated critical habitat for Umtanum Desert buckwheat is restricted to this region along Umtanum Ridge (i.e., well outside the Spring 2022 Survey Area).

Including Umtanum desert buckwheat, which in addition to being federally listed as threatened is also considered a state endangered species, 27 state endangered, threatened, or sensitive vascular plant species are known to occur or potentially occur within Benton County (WNHP 2021a). Appendix A provides the list of the 27 special status plant species known or potentially occurring in Benton County, as well as their state and federal status, preferred habitat, likelihood of occurring in the Spring 2022 Survey Area, and recommended survey period. Seven of these species listed as potentially occurring within the Spring 2022 Survey Area have been documented within 5 miles of the Spring 2022 Survey Area (Figure 2; WNHP 2022). These include cespitose evening-primrose (*Oenothera cespitosa* subsp. *cespitosa*), Columbia milk-vetch (*Astragalus columbianus*), coyote tobacco (*Nicotiana attenuata*), desert cryptantha (*Cryptantha scoparia*), dwarf-evening primrose (*Eremothera pygmaea*), small-flower evening primrose (*Eremothera minor*), and Snake River

cryptantha (*Cryptantha spiculifera*). An Element Occurrence[1] for one of these seven species, Columbia milkvetch, overlaps the Spring 2021 Survey Area (Figure 2). In addition, a population of Columbia milkvetch was observed in the southwestern portion of the Spring 2021 Survey Area (Tetra Tech 2022a).

5.1.2 Noxious Weeds

Based on the background review, 155 species are currently designated as noxious weeds in Washington state, and 129 species are currently designated as noxious weeds in Benton County (BCNWCB 2022; WSNWCB 2021). Per the WSNWCB (2021), the following are the definitions for each class of noxious weed:

- **Class A Weeds**: Non-native species whose distribution in Washington is still limited. Preventing new infestations and eradicating existing infestations are the highest priority. Eradication of all Class A plants is required by law.
- **Class B Weeds**: Non-native species presently limited to portions of the state. Species are designated for required control in regions where they are not yet widespread. Preventing new infestations in these areas is a high priority. In regions where a Class B species is already abundant, control is decided at the local level, with containment as the primary goal.
- **Class C Weeds**: Noxious weeds that are typically widespread in Washington or are of special interest to the state's agricultural industry. The Class C status allows county weed boards to require control if locally desired, or they may choose to provide education or technical consultation.

5.2 Field Surveys

5.2.1 Rare Plants

Tetra Tech did not observe any special status plant species within the Spring 2022 Survey Area. In addition, minimal suitable habitat for any of the special-status plant species with potential to occur was observed.

5.2.2 Noxious Weeds

Tetra Tech observed three state- and/or county-listed noxious weed species within the Spring 2022 Survey Area. Table 1 lists the noxious weed species observed, their noxious weed designation, and the frequency of observations. Figure 3 shows the locations of noxious weeds observed during field surveys.

[1] An Element Occurrence is an "area of land and/or water in which a species or natural community is, or was present" (DNR 2018). The WNHP provides data on rare plants in Washington, including the locations of documented EOs for rare plant species. However, due to the sensitive nature of this information, rare plant EOs are buffered to protect the exact location of documented occurrences of rare plant populations.

Two noxious weed species were commonly observed in the Spring 2022 Survey Area: diffuse knapweed (*Centaurea diffusa*) and cereal rye (*Secale cereale*). Diffuse knapweed was observed in both the western and eastern portions of the Spring 2022 Survey Area, but was most abundant in the eastern portion (Figure 3). Infestations ranged from small (less than 0.1 acre) to large (greater than 1 acre) patches that consisted of sparse scattered individuals to areas with relatively high cover of diffuse knapweed. Tetra Tech documented infestations of cereal rye in both the eastern and western portions of the Spring 2022 Survey Area. Most infestations of cereal rye were large (greater than 1 acre) and dense (high cover). In some areas, cereal rye formed almost a complete monoculture in the locations where it was observed.

Two observations of field bindweed (*Convolvulus arvensis*) were observed during surveys, both within the southwestern portion of the Spring 2022 Survey Area (Figure 3). Both of these infestations were between 0.1 and 1 acre in size in which individuals of field bindweed were commonly observed.

Table 1. Noxious Weeds Observed within the Spring 2022 Survey Area

Scientific Name	Common Name	State Status/ County Status[1]	Frequency of Observations
Centaurea diffusa	diffuse knapweed	Class B / Class B	Commonly observed in Spring 2022 Survey Area.
Convolvulus arvensis	field bindweed	Class C / Class C	Observed in two locations in the Spring 2022 Survey Area.
Secale cereale	cereal rye	Class C / Class C	Commonly observed in Spring 2022 Survey Area.

[1] Definitions for noxious weed statuses are provided in Section 4.1.2

6.0 Conclusion and Recommendations

Botanical surveys in 2022 did not document any special status vascular plant species within the Spring 2022 Survey Area. Three noxious weeds were documented during field surveys, two of which were common within the Spring 2022 Survey Area.

In order to minimize the introduction and spread of noxious weeds and invasive plants, it is recommended that a Noxious Weed Management Plan be prepared prior to construction of the Project. This plan should include measures (e.g., cleaning of construction vehicles) that should be implemented during Project construction and operation to prevent and minimize the introduction and spread of noxious weeds and invasive plants.

7.0 References

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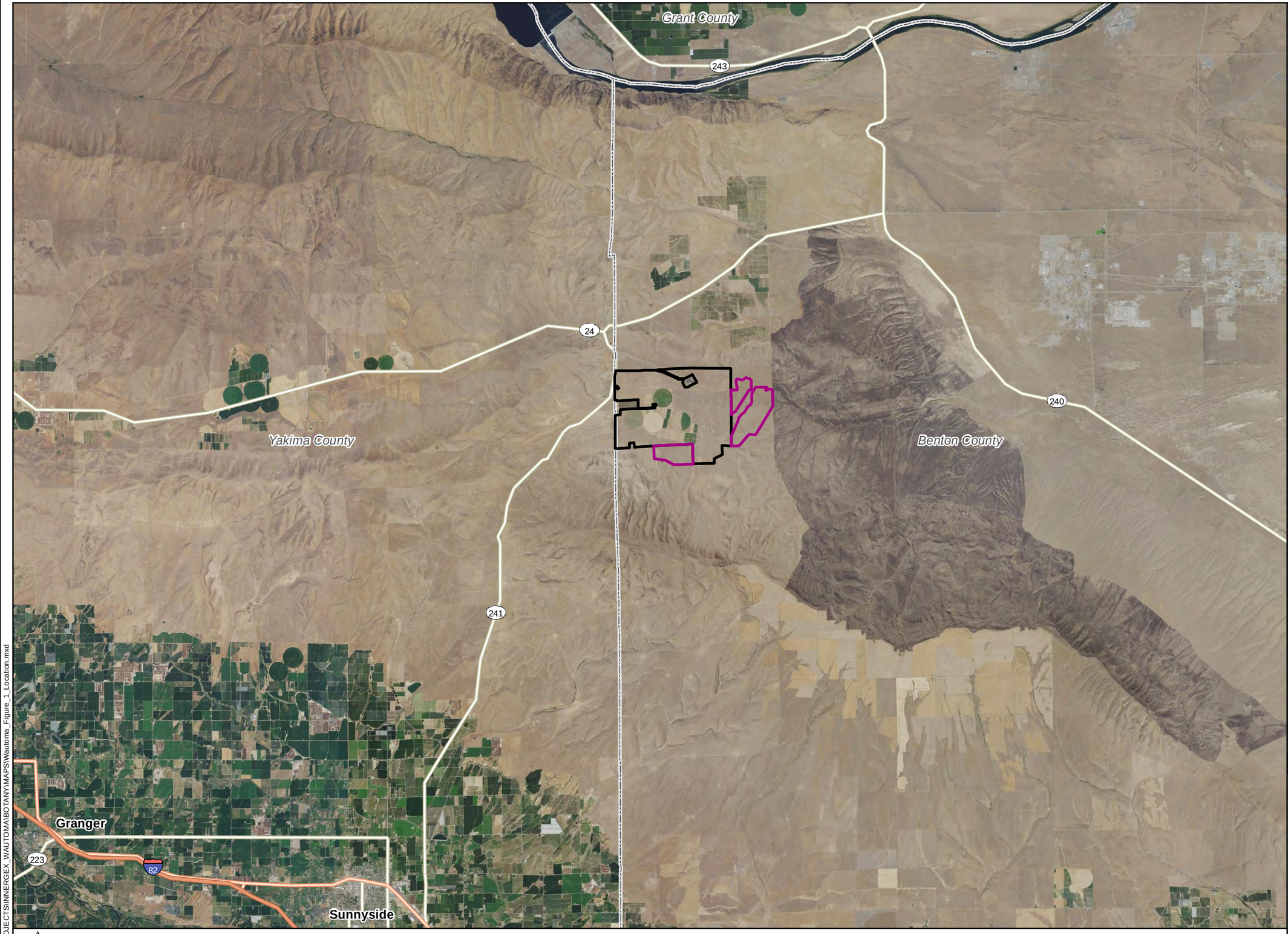
Figures

Wautoma Solar

Figure 1
Project Location

BENTON AND YAKIMA COUNTIES, WA



- Spring 2021 Survey Area
- Spring 2022 Survey Area
- County Boundary

INNERGEX TETRA TECH

Reference Map

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Wautoma Solar

Figure 2
Documented Occurrences of Rare Plant Species in the Vicinity of the Project

BENTON AND YAKIMA COUNTIES, WA

Spring 2021 Survey Area
Spring 2022 Survey Area
5-mile Buffer
County Boundary

WNHP Rare Plant Occurrences

- Cespitose evening-primrose *(Oenothera cespitosa subsp. cespitosa)*
- Columbia milkvetch *(Astragalus columbianus)*
- Coyote tobacco *(Nicotiana attenuata)*
- Desert cryptantha *(Cryptantha scoparia)*
- Dwarf evening-primrose *(Eremothera pygmaea)*
- Small-flower evening-primrose *(Eremothera minor)*
- Snake River cryptantha *(Cryptantha spiculifera)*
- Umtanum desert buckwheat *(Eriogonum codium)*

INNERGEX TETRA TECH

Reference Map

Yakima County

Benton County

1:95,000 NAD 1983 StatePlane Washington South FIPS 4602 Feet

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Wautoma Solar

Figure 3
Noxious Weeds Observed within the Spring 2022 Survey Area

BENTON AND YAKIMA COUNTIES, WA

Spring 2021 Survey Area

Spring 2022 Survey Area

Noxious Weed

- Cereal rye *(Secale cereale)*
- Diffuse knapweed *(Centaurea diffusa)*
- Field bindweed *(Convolvulus arvensis)*

Size of Infestation

- < 0.1 acre
- 0.1-1 acre
- 1-5 acres

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Reference Map

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Yakima County

Benton County

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NAD 1983 StatePlane Washington South FIPS 4602 Feet

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Wautoma Solar

Figure 4
Noxious Weeds Observed within the Spring 2021 Survey Area

BENTON AND YAKIMA COUNTIES, WA

Spring 2021 Survey Area
Spring 2022 Survey Area

Noxious Weed
- Cereal rye *(Secale cereale)*
- Diffuse knapweed *(Centaurea diffusa)*
- Field bindweed *(Convolvulus arvensis)*
- Jointed goatgrass *(Aegilops cylindrica)*
- Kochia *(Bassia scoparia)*
- Medusahead *(Taeniatherum caput-medusae)*
- Rush skeletonweed *(Chondrilla juncea)*
- Russian knapweed *(Rhaponticum repens)*
- Russian olive *(Elaeagnus angustifolia)*

Size of Infestation
- < 0.1 acre
- 0.1-1 acre
- 1-5 acres

INNERGEX TETRA TECH

Reference Map

241
Yakima County
Benton County

1:22,000 NAD 1983 StatePlane Washington South FIPS 4602 Feet 0 0.25 0.5 1 Miles

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Appendix A.

Rare Vascular Plant Species with Potential to Occur within the Project Area

Table A-1. Rare Vascular Plant Species with Potential to Occur within the Spring 2022 Survey Area[1]

Scientific name **(Common Name)**	**State Status/ Federal Status[2]**	**Habitat Characteristics[3]**	**Likelihood of Occurrence Based on Background Review**	**Survey Period[4]**
Aliciella leptomeria (Great Basin gilia)	S / --	Open, sandy and rocky areas in sagebrush steppe and other open habitats from low to middle elevations. Substrates are often hard, gravelly or sandy, fine reddish to blackish basalt soils, or fine non-basalt gravel with caliche fragments. Associated species include *Artemisia tridentata, Grayia spinosa, Purshia tridentata, Bromus tectorum, Poa secunda, Gilia sinuata, Dieteria canescens,* and *Mentzelia albicaulis*. Elev. 470–1,140 feet.	Low to moderate; suitable habitat potentially present in Survey Area.	April – June
Ammania robusta (grand redstem)	S / --	Shoreline and islands along the Columbia River, in riparian mudflats dominated by annual species. Also known from lakeshores in the channeled scablands and other wet places, often where alkaline. Sites are inundated until midsummer and periodically throughout the growing season. Associated species include *Cyperus* spp., *Eleocharis acicularis*, *Limosella aquatica*, *Lindernia dubia*, *Rotala ramosior*, and occasionally *Rorippa columbiae*.	Highly unlikely; suitable habitat not likely to occur within Survey Area.	May – June
Astragalus columbianus (Columbian milkvetch)	S / --	Shrub-steppe habitats on sandy or gravelly loams, silts, rocky silt loams, and lithosols. Associated species include *Artemisia tridentata, A. rigida, Bromus tectorum Pseudoroegneria spicata, Astragalus caricinus, A. purshii, A. speirocarpus, A. succumbens*, *Erigeron filifolius, E. poliospermus,* and *Phlox longifolia*. Elev. 420–2,320 feet.	High; known occurrence within Survey Area.	Mid-April – mid-June
Astragalus misellus var. *pauper* (pauper milk-vetch)	T / --	Open ridgetops and upper slopes, rarely middle and lower slopes, along western margin of the Columbia Basin province. In *Artemisia tridentata/ Pseudoroegneria spicata* community. Associated species include *Artemisia rigida*, *A. tridentata, Poa secunda*, *Pseudoroegneria spicata, Astragalus purshii*, *Crepis atribarba, C. occidentalis, Erigeron linearis*, *Eriogonum sphaerocephalum*, *Lomatium macrocarpum*, *Phlox longifolia*, and *P. hoodii*. Elev. 500–3,280 feet.	Highly unlikely; known occurrences in Benton County are historical occurrences[5].	April – June
Calyptridium roseum (rosy pussypaws)	S / --	Sagebrush desert to arid montane forest, in sandy to gravelly soils. In Washington, grows in very dry shrub-steppe, in low swales in dark sandy soil among big sagebrush. In spring, the swale microsites may be moister than the surrounding habitat. Associated species include *Artemisia tridentata, Bromus tectorum, Poa secunda, Aliciella leptomeria*, *Greeneocharis circumscissa, Holosteum umbellatum, Draba verna, Erythranthe suksdorfii, Loeflingia squarrosa* subsp. *squarrosa,* and *Microsteris gracilis*. Elev. 525 feet.	Low to moderate; suitable habitat potentially present in Spring 2022 Survey Area.	May – June
Cryptantha leucophaea (gray cryptantha)	T / --	Sandy substrates, especially sand dunes that have not been completely stabilized. Appears to be restricted to areas where there is still some wind-derived movement of open sand. Associated species include *Artemisia tridentata, Purshia tridentata, Achnatherum hymenoides, Hesperostipa comata, Poa secunda, Astragalus succumbens, Chaenactis douglasii, Eriogonum niveum, Oenothera pallida,* and *Penstemon attenuates*. Elev. 300–2,500 feet.	Highly unlikely; regional endemic from Columbia and lower Yakima Rivers.	May – June

Scientific name **(Common Name)**	**State Status/ Federal Status[2]**	**Habitat Characteristics[3]**	**Likelihood of Occurrence Based on Background Review**	**Survey Period[4]**
Cryptantha scoparia (desert cryptantha)	S / --	Dry, open slopes in the valleys, plains and foothills, common among sagebrush. In Washington, grows on south-facing slopes and ridges between small canyons with fine, dry silt and talus. Sites may be a little more alkaline than surrounding areas. Associated species include *Artemisia tridentata, Krascheninnikovia lanata, Bromus hordeaceus, Bromus tectorum, Pseudoroegneria spicata, Epilobium minutum, Eriogonum niveum,* and *Eriophyllum lanatum.* Elev. 1,200–2,100 feet.	Moderate; known occurrence within 5 miles and suitable habitat potentially present in Low to moderate; suitable habitat potentially present within Spring 2022 Survey Area.	April – June
Cryptantha spiculifera (Snake River cryptantha)	S / --	Sandy knolls and badlands and talus at low elevations; dry, open, flat or sloping areas in stable or stony soils. Associated species include *Artemisia rigida*, *A. tridentata*, *Ericameria nauseosa*, *Salvia dorrii*, *Poa secunda, Pseudoroegneria spicata*, *Eriogonum sphaerocephalum*, and *Lupinus sericeus.* Elev. 450–3,500 feet.	Moderate; known occurrence within 5 miles and suitable habitat potentially present in Low to moderate; suitable habitat potentially present within Spring 2022 Survey Area.	May – July
Cuscuta denticulata (desert dodder)	S / --	Parasitic on a variety of native shrubs in desert areas, including sagebrush (*Artemisia* spp.) and rabbitbrush (*Chrysothamnus/Ericameria* spp.). Associated species include *Artemisia tridentata, Achnatherum hymenoides, Bromus tectorum, Poa secunda, Astragalus caricinus, Cymoperus terebinthinus, Erigeron poliospermus,* and *Helianthus cusickii*. Elev. 880–1,089 feet.	Low to moderate; suitable habitat potentially present within Spring 2022 Survey Area.	July – August
Eleocharis coloradoensis (dwarf spike-rush)	S / --	Fresh to brackish bare wet soil, inland. Fresh or brackish drying lake and pond margins, stream beds, flood plains, vernal pools, irrigation ditches, tidal wetlands. Elev. 0–6,900 feet.	Highly unlikely; suitable habitat unlikely to be present in Spring 2022 Survey Area.	Spring – fall
Eremogone franklinii var. thompsonii (Thompson's sandwort)	S / --	Sand dunes, scabland, and sagebrush slopes. Associated species include: *Purshia tridentata, Poa canbyi* and other bunchgrasses.	Low; limited suitable habitat potentially present in Spring 2022 Survey Area.	May – June
Eremothera minor (small-flower evening-primrose)	S / --	Sagebrush desert, often where vernally moist; silty washes, gravelly basalt slopes, sandy and alkaline soils, and dry rocky hillsides; often with considerable cover of bare soil or cryptogramic crust. Associated species include *Artemisia tridentata, Ericameria nauseosa, Purshia tridentata, Bromus tectorum,* and *Poa secunda*. Elev. 460–1,140 feet.	High; known occurrence within 5 miles and suitable habitat likely present in Spring 2022 Survey Area.	May – early June
Eremothera pygmaea (dwarf evening-primrose)	S / --	Sagebrush steppe, on unstable soil or gravel in steep talus, dry washes, banks, and roadcuts. Associated species include *Artemisia tridentata, Bromus tectorum, Cryptantha* spp., *Eriogonum* spp., *Mentzelia* spp., *Microgilia minutiflora, Neoholmgrenia (Camissonia) andina*, and *Salsola tragus*. Elev. 450–2,050 feet.	Moderate; known occurrence within 5 miles and suitable habitat potentially present in Spring 2022 Survey Area.	Flowers April – June; Fruits June – August

Scientific name **(Common Name)**	**State Status/ Federal Status[2]**	**Habitat Characteristics[3]**	**Likelihood of Occurrence Based on Background Review**	**Survey Period[4]**
Eriogonum codium (Umtanum desert buckwheat)	E / T	Endemic to a very narrow range in Benton County. The only known population of this species occurs on flat to gently sloping microsites near the top of the steep, north-facing basalt cliffs overlooking the Columbia River. Associated species include *Grayia spinosa, Salvia dorrii*, *Bromus tectorum, Cryptantha pterocarya, Eremothera minor*, and *Phacelia linearis*.	Highly unlikely; endemic to narrow range in northern Benton County.	May – August
Erythranthe suksdorfii (Suksdorf's monkeyflower)	S / --	Open, moist, or rather dry places, from the valleys and foothills to moderate or occasionally high elevations in the mountains. Occurs in seasonally moist swales, drainages, or vernal pools in shrub-steppe vegetation. Microhabitats are often disturbed by small erosive events (i.e., slumps, slides, bioturbidity, and frost boils). Associated species include *Artemisia tridentata, Juniperus communis*. *Philadelphus lewisii, Bromus tectorum, Poa secunda, Camissonia hilgardii, Collomia linearis*, *Cryptantha ambigua*, *Draba verna*, *Eriogonum* spp., *Erythranthe floribunda, E. breviflora, Microsteris gracilis*, *Plectritis macrocera*, and *Ranunculus testiculatus*. Elev. 430–7,100 feet.	Low to moderate; suitable habitat potentially present within Spring 2022 Survey Area.	Mid-April – approx. June
Hypericum majus (Canadian St. John's-wort)	S / --	Along ponds, lakesides, riparian habitats, or other low, wet places (FACW species). In Washington, occurs in habitats that are completely submerged during portions of the growing season or periodically inundated from water controlled by hydroelectric dams. Associated species include: *Carex* spp., *Equisetum* spp., *Juncus bufonius, J. tenuis,* and *J. articulatus*. Elev. 50–2,340 feet.	Highly unlikely; suitable habitat unlikely to occur within Spring 2022 Survey Area.	July – September
Leymus flavescens (yellow wildrye)	E / --	Sand dunes and open sandy flats, and ditch- and roadbanks, of the Snake and Columbia river valleys. The species has also been found on sandy roadsides.	Highly unlikely; suitable habitat unlikely to occur within Spring 2022 Survey Area.	June – July
Lipocarpha aristulata (awned halfchaff sedge)	S / --	Wet soil and mud, often comprised of fine sand and silt, in bottomlands, sandbars, beaches, shorelines, stream banks, ponds, and ditches. In Washington, grows along shorelines and islands below high water at elevations up to 500 feet. Associated species include: *Ammannia robusta, Cyperus* spp., *Eleocharis* spp., *Juncus* spp., *Limosella* spp., *Lindernia dubia, Rorippa columbiae.* and *Rotala ramosior*.	Highly unlikely; suitable habitat unlikely to occur within Spring 2022 Survey Area.	June – August
Loeflingia squarrosa (spreading pygmyleaf)	S / --	Low swales and shallow vernal pools in sandy and silty areas. The Washington populations were found during an unusually wet year in swales and vernally wet areas with a great diversity of annuals in an otherwise arid environment. Associated species include *Artemisia tridentata, Bromus tectorum, Poa secunda, Ambrosia acanthicarpa, Epilobium minutum, Erythranthe suksdorfii, Gnaphalium palustre, Gilia sinuata, Greeneocharis circumscissa, Holosteum umbellatum, Juncus bufonius,* and *Microsteris gracilis.* Elev. 430–580 feet.	Low; limited suitable habitat likely to occur within Spring 2022 Survey Area.	May
Lomatium tuberosum (Hoover's desert-parsley)	S / --	Rocky slopes and loose basalt talus in sagebrush steppe, typically on east- to north-facing slopes. Associated species include *Artemisia rigida, Poa secunda, Pseudoroegneria spicata, Allium acuminatum, Delphinium nuttalianum, Eriogonum niveum,* and *Galium aparine*. Elev. 460–4,000 feet.	Low; limited suitable habitat likely to occur within Spring 2022 Survey Area.	March – April (flowers); fruits mature in May

Scientific name **(Common Name)**	**State Status/ Federal Status[2]**	**Habitat Characteristics[3]**	**Likelihood of Occurrence Based on Background Review**	**Survey Period[4]**
Mimetanthe pilosa (false monkeyflower)	S / --	Moist, sandy or gravelly soils, especially by small streams, seeps, springs, and disturbed areas. Elev. 1,000–4,500 feet.	Highly unlikely; known occurrence in Benton County is historical.	May – July
Myosurus alopecuroides (foxtail mousetail)	T / --	Obligate vernal pool species; found on hard, bare, desiccated clay in sparsely vegetated areas of shallow pools. Associated species include *Deschampsia danthonioides, Myosurus minimus, Navarretia leucocephala, Plagiobothrys* spp., and *Polygonum polygaloides* subsp. *confertiflorum.* Elev. 250–2,500 feet.	Low; limited suitable habitat likely to occur within Spring 2022 Survey Area.	March – June
Nicotiana attenuata (coyote tobacco)	S / --	Dry, sandy bottom lands, dry rocky washes, and in other dry open places. Associated species include *Artemisia tridentata, Ericameria* spp., *Bromus tectorum, Leymus cinereus*, *Achillea millefolium*, *Centaurea diffusa*, *Mentzelia laevicaulis, Solanum triflorum*, and *Verbascum thapsus*. Elev. 320–2,640 feet.	High; known occurrence within 5 miles and suitable habitat likely present in Spring 2022 Survey Area.	June – September
Oenothera cespitosa subsp. *cespitosa* (cespitose evening-primrose)	S / --	Open sagebrush desert; on loose talus slopes, steep, sandy or gravelly slopes, road cuts, and dry hills; as well as along the flat river terrace of the Columbia River. It occurs within general areas dominated by *Artemisia tridentata* or *Artemisia rigida*. Other associated species include *Ericameria nauseosa*, *Eriogonum douglasii* and *E. niveum, Achnatherum thurberianum*, *A. hymenoides*, *Hesperostipa comata*, *Koeleria macrantha*, *Poa secunda*, *Astragalus purshii*, *A. succumbens*, *Balsamorhiza careyana*, *Chaenactis douglasii, Comandra umbellate, Cryptantha pterocarya, Erigeron filifolius, Phacelia hastata,* and *Cymopterus terebinthina*. Elev. 410–1,800 feet.	Low to moderate; known occurrence within 5 miles and suitable habitat potentially present in Spring 2022 Survey Area.	Late-April – June
Rorippa columbiae (Columbia yellowcress)	T / --	Riverbanks, permanent lakes, snow-fed lakes, and streams, internally-drained lakes with extended periods of dryness, wet meadows, and ditches. All known sites are inundated for at least part of the year. Soil types include clay, sand, gravel, sandy silt, cobblestones, and rocks. All sites in Washington occur along the Columbia River, in the lowest vegetated riparian zone.	Highly unlikely; suitable habitat not likely to occur within Survey Area and all known sites in Washington are along Columbia River.	April – October
Sabulina nuttallii var. *fragilis* (Nuttall's sandwort)	T / --	Open, gravelly benches, dry rocky areas, or limestone talus from open sagebrush hills to alpine slopes. In Washington, this taxon has been found on desert ridges of raised basalt, talus, outcrops, and in rocky to gravelly or sandy soil. Associated species include: *Ericameria nauseosa Grayia spinosa, Purshia tridentata, Salvia dorrii, Pseudoroegneria spicata, Balsamorhiza careyana, Eriogonum microthecum,* and *Lomatium macrocarpum.*	Low; limited suitable habitat potentially present within Spring 2022 Survey Area.	May – August
Sabulina pusilla dwarf sandwort	S / --	Extant occurrences in Washington are found on dry, sparsely vegetated, compacted orange basalt gravel within sagebrush communities and vernally wet areas (Fertig and Kleinknecht 2020). Associated species include *Poa secunda, Salvia dorrii, Lomatium macrocarpum, Elymus elymoides, Balsamorhiza careyana, Astragalus purshii, Draba verna, and Bromus tectorum*. Historical populations have been reported from dry, rocky southeast slopes and hillsides. Elev. 490-800 ft.	Low; limited suitable habitat likely to occur within Spring 2022 Survey Area	April – June

[1] Table based on the WNHP's Rare Vascular and Nonvascular Species List for Benton County (WNHP 2021)

[2] State Status: WNHP (2019) provides the following explanation of state status:
E = Endangered, in danger of becoming extinct or extirpated from Washington

T = Threatened, likely to become Endangered in Washington
S = Sensitive, vulnerable or declining and could become Endangered or Threatened in Washington
X = Possibly extinct or extirpated from Washington State (includes state historical species).
Federal Status: E = Listed endangered.

[3] Sources: Burke Museum 2022; FNA 1993+; Hitchcock and Cronquist 2018; WNHP 2019; WNHP 2021b.
[4] Sources: Burke Museum 2022; WNHP 2021b.
[5] Historical occurrence is one that has not been reconfirmed for 40 or more years, or the species is extirpated from the county (WNHP 2021a).

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Appendix B.

Vascular Plants Observed During 2022 Field Surveys

Scientific Name	Common Name	Family	Type	Non-native	Noxious Weed Class Benton County / Washington State	Synonyms / Notes
Achillea millefolium	common yarrow	Asteraceae	forb			
Achnatherum hymenoides	Indian rice grass	Poaceae	grass			
Achnatherum thurberianum	Thurber's rice grass	Poaceae	grass			
Agoseris grandiflora	bigflower agoseris	Asteraceae	forb			
Agoseris heterophylla	annual agoseris	Asteraceae	forb			
Agropyron cristatum	crested wheatgrass	Poaceae	grass	x		
Amsinckia spp.	fiddleneck	Boraginaceae	forb			
Antennaria dimorpha	low pussytoes	Asteraceae	forb			
Artemisia tridentata	big sagebrush	Asteraceae	shrub			
Artemisia tripartita	threetip sagebrush	Asteraceae	shrub			
Astragalus purshii	woollypod milkvetch, Pursh's milk-vetch	Fabaceae	forb			
Astragalus spaldingii	Spalding's milkvetch	Fabaceae	forb			
Astragalus speirocarpus	curve-pod milk-vetch	Fabaceae	forb			
Balsamorhiza careyana	Carey's balsamroot	Asteraceae	forb			
Bromus tectorum	cheatgrass	Poaceae	grass	x		
Calochortus macrocarpus var. *macrocarpus*	sagebrush mariposa lily	Liliaceae	forb			
Caragana arborescens	Siberian peashrub	Fabaceae	shrub	x		
Centaurea diffusa	diffuse knapweed	Asteraceae	forb	x	Class B / Class B	
Chaenactis douglasii	Douglas' dustymaiden, dusty maidens	Asteraceae	forb			
Chenopodium album	lambsquartesr, pigweed	Amaranthaceae	forb	x		
Chorispora tenella	crossflower, blue mustard	Brassicaceae	forb	x		
Chrysothamnus viscidiflorus	yellow rabbitbrush, green rabbitbrush	Asteraceae	shrub			
Cirsium undulatum	wavy leaf thistle	Asteraceae	forb			
Claytonia rubra	red miners lettuce, cushion miner's lettuce,	Montiaceae	forb			
Convolvulus arvensis	field bindweed	Convolvulaceae	forb	x	Class C / Class C	
Conyza canadensis	horseweed, Canadian fleabane	Asteraceae	forb			
Crepis spp.	hawksbeard	Asteraceae	forb			
Cryptantha flaccida	weakstem cat's-eye, flaccid cryptantha	Boraginaceae	forb			
Cymopterus terebinthinus	turpentine spring parsley, turpentine wavewing	Apiaceae	forb			*Pteryxia terebinthina*
Descurainia pinnata	western tansymustard	Brassicaceae	forb			
Dieteria canescens	hoary-aster	Asteraceae	forb			*Machaeranthera canescens*
Draba verna	spring whitlow-grass	Brassicaceae	forb	x		
Elymus elymoides	squirreltail	Poaceae	grass			
Epilobium brachycarpum	tall annual willowherb	Onagraceae	forb			
Ericameria nauseosa	rubber rabbitbrush, gray rabbitbrush	Asteraceae	shrub			
Erigeron filifolius	threadleaf fleabane	Asteraceae	forb			
Erigeron piperianus	Piper's fleabane	Asteraceae	forb			
Erigeron poliospermus	cushion fleabane	Asteraceae	forb			
Erigeron pumilus	shaggy fleabane	Asteraceae	forb			
Eriogonum strictum var. *proliferum*	strict buckwheat	Polygonaceae	forb/subshrub			
Erodium cicutarium	redstem, common stork's bill, crane's-bill	Geraniaceae	forb	x		
Festuca idahoensis	Idaho fescue	Poaceae	grass			
Grayia spinosa	spiny hopsage	Amaranthaceae	shrub			
Greeneocharis circumscissa	cushion cryptantha, matted cryptantha	Boraginaceae	forb			
Helianthus cusickii	Cusick's sunflower	Asteraceae	forb			
Hesperostipa comata	needle-and-thread grass	Poaceae	grass			
Holosteum umbellatum	jagged chickweed	Caryophyllaceae	forb	x		
Lactuca serriola	prickly lettuce	Asteraceae	forb	x		
Lagophylla ramosissima	slender hareleaf, branched lagophylla	Asteraceae	forb			
Lappula longispinus	long-spined stickseed	Boraginaceae	forb	x		
Lepidium perfoliatum	clasping-leaved peppergrass	Brassicaceae	forb	x		
Linum lewisii var. *lewisii*	wild blue flax, prairie flax	Linaceae	forb			
Lithospermum ruderale	western gromwell, western stoneseed	Boraginaceae	forb			
Lomatium macrocarpum	large-fruit desert-parsley, bigseed lomatium	Apiaceae	forb			
Lomatium papilioniferum	butterfly bearing biscuit-root	Apiaceae	forb			*Lomatium grayi*

Scientific Name	Common Name	Family	Type	Non-native	Noxious Weed Class Benton County / Washington State	Synonyms / Notes
Lomatium triternatum	triternate biscuit-root	Apiaceae	forb			
Lupinus sulphureus var. *subsaccatus*	sulphur lupine, Bingen lupine	Fabaceae	forb			
Madia exigua	threadstem madia, little tarplant, little tarweed	Asteraceae	forb			
Malva neglecta	dwarf mallow	Malvaceae	forb	x		
Medicago sativa	alfalfa	Fabaceae	forb	x		
Microsteris gracilis	slender phlox	Polemoniaceae	forb			Phlox gracilis
Mentzelia laevicaulis	giant blazing-star	Loasaceae	forb			
Opuntia columbiana	Columbia prickly-pear	Cactaceae	cactus			
Phaceliea linearis	thread-leaf phacelia, thread-leaf scorpion-weed	Hydrophyllaceae	forb			
Phlox longifolia	long-leaf phlox	Polemoniaceae	forb			
Plagiobothrys tenellus	Pacific popcorn-flower, slender popcorn-flower	Boraginaceae	forb			
Plantago patagonica	woolly plantain, indianwheat plantain	Plantaginaceae	forb			
Poa bulbosa	bulbous bluegrass	Poaceae	grass	x		
Poa secunda ssp. *juncifolia*	big bluegrass, Nevada bluegrass, alkali bluegrass	Poaceae	grass			*Poa ampla*
Poa secunda ssp. *secunda*	Sandberg bluegrass, curly bluegrass	Poaceae	grass			
Polygonum aviculare	prostrate knotweed	Polygonaceae	forb	x		
Pseudoroegneria spicata	bluebunch wheatgrass	Poaceae	grass			
Rumex venosus	veiny dock, winged dock	Polygonaceae	forb			
Secale cereale	cereal rye	Poaceae	grass	x	Class C / Class C	
Sisymbrium altissimum	tall tumblemustard	Brassicaceae	forb	x		
Sphaeralcea munroana	Munro's globemallow, white-stemmed globemallow	Malvaceae	forb			
Tetradymia canescens	gray horsebrush, spineless horsebrush	Asteraceae	shrub			
Thinopyrum ponticum	tall wheatgrass; Eurasian quack grass	Poaceae	grass	x		*Elymus elongatus*, *Elytrigia pontica*
Tragopogon dubius	yellow salsify	Asteraceae	forb	x		
Triteleia grandiflora	blue-lily, Douglas' brodiaea	Asparagaceae	forb			
Vulpia bromoides	brome fescue	Poaceae	grass	x		
Vulpia microstachys	small fescue	Poaceae	grass			

ATTACHMENT G: HABITAT AND GENERAL WILDLIFE SURVEY REPORT REVISED PLUS ADDENDUM

Wautoma Solar Energy Project
Habitat and General Wildlife Survey Report

Prepared for:

INNERGEX

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Prepared by:

TETRA TECH

Revised October 2022

CONFIDENTIAL BUSINESS INFORMATION

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Appendices

Appendix A. Special Status Wildlife Species with Potential to Occur at the Project

Appendix B. WDFW Meeting Notes

Appendix C. Wildlife Species and Sign Observed During 2021 Field Surveys

Appendix D. Site Photographs

Acronyms and Abbreviations

GPS	global positioning system
Innergex	Innergex Renewable Development USA, LLC
IPaC	Information for Planning and Consultation
PHS	Priority Habitats and Species
Project	Wautoma Solar Energy Project
Tetra Tech	Tetra Tech, Inc.
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife

1.0 Introduction

Innergex Renewable Development USA, LLC (Innergex) plans to develop the Wautoma Solar Energy Project (Project) located in Benton County, Washington approximately 12.5 miles northeast of the city of Sunnyside (Figure 1).

As part of its environmental due diligence, Innergex contracted Tetra Tech, Inc. (Tetra Tech) to conduct habitat and wildlife surveys for the Project. The purpose of the habitat and wildlife surveys was to document the presence of special status and other wildlife species as well as map and characterize habitat in the approximately 4,819-acre Survey Area. For this report, the term "special status wildlife species" includes federal and state endangered, threatened, proposed, and candidate species; species of concern; birds of conservation concern; and state sensitive and priority species. This Habitat and General Wildlife Survey Report was developed to support Project permitting and inform potential avoidance, minimization, and mitigation measures.

2.0 Description of the Survey Area

Habitat and wildlife surveys were conducted in early May 2021 (i.e., Spring 2021 Survey Area; Figure 1), which generally overlaps with the activity and/or breeding periods of the special status wildlife species identified as having the potential to occur at the Project (Appendix A). Early May is also an appropriate time of year to identify plant species in order to accurately characterize habitat in the Survey Area. Subsequent to the completion of habitat and wildlife surveys in May 2021, the original Survey Area was expanded by approximately 990 acres. Additional habitat surveys were conducted within this additional 990 acres in mid-October 2021 (i.e., Fall 2021 Survey Area; Figure 1). Tetra Tech conducted additional habitat and general wildlife surveys within the 'Fall 2021 Survey Area' in May 2022. A supplement to this report (Tetra Tech, August 2022) was prepared to provide the results of these surveys.

3.0 Agency Coordination

Innergex and Tetra Tech met virtually with the Washington Department of Fish and Wildlife (WDFW) on March 8, 2021, to introduce the Project and discuss planned wildlife, habitat, and rare plant surveys. At the meeting, WDFW concurred with the habitat and wildlife survey timing and survey approach, and gave a verbal description of special-status wildlife that may occur in the Project vicinity. A summary of this meeting is provided in Appendix B. The input from WDFW provided during this meeting was used to inform the habitat and wildlife background review and field surveys. The Applicant met with representatives of EFSEC and WDFW on August 18, 2022, to discuss the findings of these additional surveys as well as the proposed Draft Habitat Management Plan. During this meeting, WDFW suggested that the Applicant review the area currently classified as eastside (interior) grassland habitat where some burned sagebrush was documented and

consider reclassifying it to shrub-steppe. WDFW provided formal comments on this report to EFSEC on August 30, 2022. This report has been revised to address those comments.

4.0 Methods

4.1 Background Review

4.1.1 Habitat

Prior to conducting field surveys, Tetra Tech conducted a desktop review of existing information to identify potential habitat types that might be encountered within the Survey Area. Sources that were utilized for the preliminary desktop habitat evaluation are presented in Table 1.

Table 1. Sources Utilized for Preliminary Desktop Habitat Evaluation

Source and Citation	Information Provided in Dataset
WDFW PHS database (WDFW 2021a,b)	Locations of Priority Habitats and Habitat Features within and adjacent to the Survey Area. Priority habitats and features are "habitat types or elements with unique or significant value to a diverse assemblage of species" and are considered priorities for conservation and management in Washington (WDFW 2008).
National Land Cover Database land cover data (Homer et al. 2020)	Land cover types (e.g., shrub/scrub, cultivated crops, grassland/ herbaceous), based on land cover modeling, mapped within and adjacent to the Survey Area.
USFWS National Wetlands Inventory (USFWS 2021a)	Locations of known or potential wetlands within the Survey Area.
U.S. Geological Survey National Hydrography Dataset (USGS 2021)	Locations of known or potential rivers, streams, drainages, ponds, canals, or lakes within the Survey Area.
Google Earth Pro (Google Earth Pro 2021)	Aerial imagery used to determine potential boundaries between land cover and vegetation types within the Survey Area based on aerial signatures of land cover and vegetation types.
Management recommendations for Washington's priority habitats (Azerrad et al. 2011)	Provides protocols for identifying and mapping shrub-steppe over broad landscapes.
Wildlife-habitat Relationships in Oregon and Washington (Johnson and O'Neil 2001)	Provides descriptions of habitat types found in Oregon and Washington, including those found in the Columbia Plateau ecoregion.
Ecological Systems of Washington State, A Guide to Identification (Rocchio and Crawford 2015)	Provides descriptions of ecological systems and vegetation types found within Washington.
WDFW Wildlife Wind Power Guideline habitat types (WDFW 2009)	Provides descriptions of various habitat types found within eastern Washington.
Washington Large Fires 1973-2020 (DNR 2021)	Provides the locations and boundaries of large (typically over 100 acres) fires in Washington state between 1973 and 2019. Used to determine locations of past fires within and adjacent to the Survey Area that may have resulted in changes to vegetation within the Survey Area.
SAGEMAP Sagebrush Habitat (USGS 2011)	Locations of potential sagebrush habitat within and adjacent to the Survey Area.

4.1.2 Wildlife

Prior to conducting field surveys, Tetra Tech conducted a desktop review of existing information to identify special status wildlife species with the potential to occur at the Project. Tetra Tech reviewed habitat and range information for special status wildlife species known to occur in Benton County and the Columbia Plateau Ecoregion to develop the list of species that had the potential to occur at the Project. Species were eliminated from consideration if their habitat was absent from the Survey Area (e.g., perennial streams and riparian vegetation as determined via desktop sources and confirmed during March 2021 wetlands and waters surveys; Tetra Tech 2022a) or if their current range did not overlap with the Project (e.g., pygmy rabbit [*Brachylagus idahoensis*]).

Specific sources of information that were reviewed prior to conducting field surveys are presented in Table 2.

Table 2. Sources Utilized for Special Status Wildlife Species Evaluation

Source and Citation	Information Provided in Dataset
Tetra Tech Wautoma Solar Wetland Delineation Report (Tetra Tech 2022a)	Presence/absence of appropriate habitat for aquatic and riparian associated wildlife species.
U.S. Fish and Wildlife Service (USFWS) federally listed species list for Project location in Benton County (USFWS 2021b)	List of species and other resources such as critical habitat under USFWS jurisdiction that are known or expected to occur on or near the Project.
USFWS Birds of Conservation Concern (USFWS 2021c)	List of federal bird species of concern in Bird Conservation Region 9 (Great Basin).
Washington State Listed and Candidate Species (WDFW 2020)	List of Washington state Endangered, Threatened, Candidate, and Sensitive species.
WDFW Priority Habitats and Species (PHS) List (WDFW 2008)	List of wildlife species identified by WDFW as priorities for conservation and management. Priority species include State Endangered, Threatened, Sensitive, and Candidate species; animal aggregations (e.g., heron colonies, bat colonies) considered vulnerable; and species of recreational, commercial, or tribal importance that are vulnerable.
WDFW PHS on the Web (WDFW 2021a)	Publicly available records of PHS in the Project vicinity.
WDFW Threatened and Endangered Species Profiles (WDFW 2021c)	Reference for individual Washington state Threatened, Endangered, and Candidate species including population size, description, range, climate change sensitivity, and conservation status, threats, and actions needed.
WDFW PHS Distribution by County (WDFW 2021d)	PHS with distribution in Benton County.

In addition to reviewing publicly available sources, Tetra Tech consulted with WDFW (Appendix B) and submitted a formal request to the WDFW to obtain site-specific records of PHS within 5 miles of the Project for raptor nests and within 1 mile of the Project for all other resources (WDFW 2021b; Figure 2), based on the Project boundary at the time of the request. Based on review of the above sources, Tetra Tech compiled a list of special status wildlife species known to occur or with the potential to occur at the Project (Appendix A). This list was reviewed prior to conducting field surveys to ensure surveyor familiarity with the relevant species. The USFWS Birds of Conservation

Concern List was updated in June 2021, following surveys at the Project (USFWS 2021c). Consequently, the list of special status wildlife species and their statuses presented in Appendix A have been updated to reflect these updates.

4.2 Field Surveys

4.2.1 Habitat

Tetra Tech conducted habitat surveys concurrently with wildlife and rare plant surveys (rare plant surveys are addressed under separate cover [Tetra Tech 2022b]), which consisted of biologists walking meandering transects in non-cultivated land within the Survey Area. Field surveys were conducted by a team of two biologists familiar with eastern Washington Columbia Plateau Ecoregion habitats, WDFW priority habitats (WDFW 2008), and the WDFW Wind Power Guidelines habitat categories[1] (WDFW 2009).

During field surveys, habitat types within the Survey Area were documented, mapped, and characterized. In general, habitat types were adapted from habitat descriptions in the Wildlife-Habitat Relationships in Oregon and Washington publication (Johnson and O'Neil 2001), the Priority Habitats and Species List (WDFW 2008), and the WDFW Wind Power Guidelines (WDFW 2009). To help map habitat types, biologists collected global positioning system (GPS) points at each change in habitat type encountered. Dominant plant species and other habitat characteristics (e.g., percent cover of native and non-native species, disturbances noted) observed at these habitat points were recorded to accurately classify and describe habitat types. In addition, the biologists scanned the adjacent landscape from vantage points that allowed views across the landscape to help map habitat boundaries.

Habitat boundaries were either digitized in the field using aerial photos on Samsung Galaxy tablets using ArcGIS Collector software and/or drawing habitat boundaries (based on data collected in the field) in Google Earth that were then digitized following the field surveys. A minimum mapping unit of 1 acre was implemented, except for priority habitat types such as shrub-steppe and talus, which were mapped to the finest scale at which these features were meaningfully discernable.

4.2.2 Wildlife

Tetra Tech conducted wildlife surveys concurrently with habitat and rare plant surveys (rare plant surveys are addressed under separate cover [Tetra Tech 2022b]). Field surveys were conducted by a team of two biologists familiar with wildlife species found in the Eastern Washington Columbia Plateau Ecoregion. Biologists walked meandering transects within non-cultivated land throughout the Survey Area. The biologists alternately scanned the landscape, the sky, and the ground looking

[1] The WDFW Wind Power Guidelines (WDFW 2009) provide specific management recommendations, alternatives for site assessment, and mitigation options and construction alternatives for avoiding impacts to Washington's wildlife resources and habitat for proposed wind power projects. Currently, there are no similar guidelines for solar power projects.

for wildlife species and recognizable signs of wildlife (e.g., scat, tracks, burrows, and nests). Surveys began early in the morning and continued through late afternoon to capture optimal wildlife activity levels in this region. Areas unlikely to support special status wildlife species (i.e., cultivated land and developed areas) were surveyed primarily from vehicles by driving paved, gravel, and two-track roads. These areas were surveyed on foot in situations where the full extent was not visible from the vehicle, areas of potential habitat or nesting opportunities for special status wildlife species were identified, or areas of adjacent habitat required categorization.

The biologists focused on species occurrences and habitat suitability for special status wildlife species with the potential to occur at the Project (Appendix A), and prioritized surveys and habitat suitability evaluations for the following special status wildlife species identified by WDFW during pre-survey coordination (Appendix B):

- ferruginous hawk (*Buteo regalis*) and burrowing owl (*Athene cunicularia*) (i.e., state endangered and candidate bird species);
- black-tailed jackrabbit (*Lepus californicus*), white-tailed jackrabbit (*Lepus townsendii*), and Townsend's ground squirrel (*Urocitellus townsendii nancyae*) (i.e., state candidate mammal species and prey for ferruginous hawks); and
- elk (*Cervus elaphus)*.

For instance, concentrated areas of small rodent burrows with the potential to be occupied by Townsend's ground squirrels, if identified in the field, would be targeted for further investigation. Methods consistent with those described in Cranna and Nugent (2016) would be employed (a combination of visual investigation and attempts to elicit the calls of maternal females). Similarly, areas of potentially suitable habitat for sagebrush-associated or sagebrush-obligate avian species, if identified, would be targeted for additional investigation (e.g., an opportunistic point-count survey). A single point-count is not appropriate for characterizing the entire avian community using the Project or the habitat type, but does provide additional insight into avian use in a target habitat. Because sagebrush-associated species of concern are primarily songbirds (e.g., loggerhead shrike [*Lanius ludovicianus]*, sagebrush sparrow [*Artemisiospiza nevadensis]*, and sage thrasher *[Oreoscoptes montanus]),* a supplemental point-count or point-counts would be conducted in the morning when songbirds are generally more active and vocal. The biologist would survey from a single location for 1 hour in the morning, using binoculars and a spotting scope. The biologist would record each species detected by sight or sound, and the approximate number of each species detected.

Tetra Tech and Innergex met with WDFW staff on March 8, 2021, prior to conducting field surveys, and received concurrence that the wildlife surveys as proposed, including methods, timing, and extent, were appropriate (Appendix B).

The biologists maintained a running list of all wildlife species observed, and when a special status wildlife species or recognizable sign was encountered, they recorded 1) the GPS location of the wildlife or sign with a Samsung Galaxy tablet using ArcGIS Collector software, and 2) information on the number of individuals and their behavior as applicable. Following field surveys, the digitized data were downloaded and processed in a geographic information system (GIS), and were reviewed for quality control and assurance.

5.0 Results and Discussion

5.1 Background Review

5.1.1 Habitat

The desktop review confirmed the absence of USFWS Critical Habitat within the Survey Area (USFWS 2021b). The PHS query identified three priority habitats within 1 mile of the Survey Area: a talus slope located east of the Survey Area, a freshwater emergent wetland located south of the Survey Area, and shrub-steppe habitat located to the west, northwest, and east of the Survey Area (Figure 2; WDFW 2021b). No priority habitats were identified within the Survey Area based on existing databases; however, shrub-steppe habitat was identified just to the east of the Survey Area. Multiple intermittent streams are identified within the Survey Area based on the National Hydrography Dataset (USGS 2021). The National Wetlands Inventory maps many riverine wetlands, primarily associated with NHD-mapped streams, within the Survey Area (USFWS 2021a). Terrestrial habitat types identified as potentially occurring in the Survey Area included agriculture, developed, non-native grassland and forbland, planted grassland, shrub-steppe, and talus. Several fire complexes were identified as having occurred within the Survey Area between 1979 and 2020 including the following: the 1984 Hanford Fire, the 1987 Lambing Fire, the 1990 Nake Fire, the 2007 Wautoma Fire, the 2009 Dry Creek Complex, and the 2016 Range 12 Fire (DNR 2021). The entire Survey Area is located within the extent of one or more of these fires. SAGEMAP data identified sagebrush habitat as present in scattered locations, primarily in the northern and western portions of the Survey Area (USGS 2011).

5.1.2 Wildlife

Tetra Tech identified 26 special status wildlife species with potential to occur at the Project, including 18 birds, 6 mammals, and 2 reptiles (Appendix A). Of these 26 species, 4 species are state listed as threatened and endangered as designated in WAC 220-610-010 and 220-200-100 while none are federally listed as threatened or endangered under the federal Endangered Species Act. A query of USFWS Information for Planning and Consultation (IPaC) data identified three federally listed species with potential to occur on or near the Project (Columbia Basin pygmy rabbit, yellow-billed cuckoo *[Coccyzus americanus]*, and bull trout *[Salvelinus confluent]*; USFWS 2021b); however, these species were eliminated from consideration based on a lack of suitable habitat within the Survey Area (i.e., perennial streams and riparian vegetation; Tetra Tech 2022a) or lack of current range overlap with the Project (i.e., pygmy rabbit, whose only remaining population in Washington is located in Douglas County; WDFW 2021c,d). The desktop review also identified golden eagle *(Aquila chrysaetos)* as having potential to occur at the Project (USFWS 2021b); this species is federally protected under the Bald and Golden Eagle Protection Act.

The results of the PHS query identified a single record of one special status wildlife species within 1 mile of the Project. This record (i.e., multiple burrowing owl burrows) was documented in 2014 and

is located approximately 0.25 mile north of the Project (Figure 2; WDFW 2021b). The PHS database had eight additional nest records of raptors tracked by PHS within 5 miles of the Project, including five ferruginous hawk (*Buteo regalis*) nests and three prairie falcon (*Falco mexicanus*) nests. The PHS query also identified that the Project occurs within elk winter range, which covers the entirety of the Survey Area (WDFW 2021b).

Raptor nests identified at the Project are further addressed in the Raptor Nest Survey Report (Tetra Tech 2022c), which describes ground-based raptor nest surveys conducted from May 9 to May 12, 2021.

5.2 Field Surveys

Tetra Tech conducted habitat and wildlife surveys and rare plant surveys (rare plant surveys are addressed under separate cover [Tetra Tech 2022b]) within the Survey Area from May 10 through May 15, 2021 (Spring 2021 Survey Area). Additional habitat surveys were conducted within the Supplemental Survey Area on October 12 and 13, 2021 (Fall 2021 Survey Area). Results of the habitat and wildlife field surveys are provided in the following sections. Weather conditions during the spring 2021 surveys were optimal for detecting wildlife during surveys, with no rain and low wind. Supplemental surveys within the Fall 2021 Survey Area, conducted in May 2022, are addressed in a Supplemental Report (Tetra Tech 2022).

5.2.1 Habitat

Biologists mapped nine habitat types within the Survey Area: agriculture, developed/disturbed, eastside (interior) grassland, irrigated hedgerows, non-native grassland and forbland, planted grassland, rabbitbrush shrubland, shrub-steppe, and talus. Table 3 lists the acres of each habitat type found within the Survey Area while Figure 3 displays the location of the habitat types mapped within the Survey Area. Each of these habitat types is briefly described below. Representative photos of select habitat types are provided in Appendix D.

Table 3. Habitat Types Mapped within the Survey Area

Habitat Type	Acres in Survey Area	Percent of Survey Area
Planted grassland	2,180	45
Non-native grassland and forbland	1,519	32
Agricultural land	793	16
Rabbitbrush shrubland	131	3
Eastside (interior) gassland[1]	41	<1
Shrub-steppe[1]	118	2
Developed/disturbed	25	1
Irrigated hedgerows	9	<1
Talus[1]	4	<1
Total[2]	**4,819**	**100**

[1] Listed as a High Priority Habitat or Priority Habitat Feature by the WDFW (WDFW 2008).
[2] Totals may not sum exactly due to rounding.

In general, habitat types were adapted from the habitat descriptions in Wildlife-Habitat Relationships in Oregon and Washington (Johnson and O'Neil 2001), the WDFW Priority Habitats and Species List (WDFW 2008), and the Washington Department of Fish and Wildlife Wind Power Guidelines (WDFW 2009). In addition to the nine habitat types listed in Table 3, three palustrine emergent wetlands and 34 ephemeral drainages were mapped within the Survey Area; these drainages are discussed in the Wetland Delineation Report prepared for the Project (Tetra Tech 2022a).

5.2.1.1 Planted Grassland

Planted grassland was the most prevalent habitat type within the Survey Area. Although this habitat type was observed in locations throughout the Survey Area, it was most widespread in the eastern portion of the Survey Area (Figure 3). Areas mapped as planted grassland in the eastern portion of the Survey Area are currently enrolled in the Conservation Reserve Program (CRP; L. O'Neill, personal communication, March 16, 2022). In total, approximately 524 acres are enrolled in the CRP. Areas mapped as planted grassland in the central and western portions of the Survey Area are not currently enrolled in the CRP program (L. O'Neill, personal communication, March 5, 2021). However, these areas are presumed to be restoration plantings on former agricultural land or land disturbed by wildfire due to the shape of the fields and the plant species present (described below).

Areas mapped as planted grassland included areas where the dominant planted grass species observed was the non-native grass crested wheatgrass (*Agropyron cristatum*), areas consisting predominantly of native grass cultivars including bluebunch wheatgrass (*Pseuodoroegneraia spicata*) and big bluegrass (*Poa secunda* ssp. *juncifolia*), and areas where crested wheatgrass and native perennial grass cultivars were both common. In addition to planted grasses, relatively high cover of the non-native grasses bulbous bluegrass (*Poa bulbosa*) and cheatgrass (*Bromus tectorum*) was typically observed in planted grassland habitat. Rubber rabbitbrush (*Ericameria nauseosa*) was also occasionally observed in this habitat type; however, areas mapped as planted grassland typically contained less than 10 percent cover of rabbitbrush. Areas where high cover of rabbitbrush (i.e., greater than approximately 10 percent cover) was observed were mapped as the rabbitbrush shrubland habitat type (see Section 4.2.1.4). Forb cover and diversity was typically low in areas mapped as planted grassland. Forbs that were observed included the native forbs hawksbeard (*Crepis* spp.) and fiddleneck (*Amsinckia* spp.) and the non-native forbs common stork's bill (*Erodium cicutarium*) and tall tumblemustard (*Sisymbrium altissimum*).

The quality of planted grassland habitat type varied, with some areas, such as in the south-central and southeastern portion of the Survey Area, containing a higher predominance of native species such as bluebunch wheatgrass, big bluegrass, and hawksbeard and lower cover of non-native invasive species. Other areas of planted grassland habitat, such as in the northwestern portion of the Survey Area, contained a high predominance of non-native species including the planted perennial grass crested wheatgrass, as well as higher cover of non-native invasive species such as bulbous bluegrass, cheatgrass, common stork's bill, and tall tumblemustard.

This habitat type is not readily classified according to Johnson and O'Neil (2001); however, it most readily falls into the "Unimproved Pasture" subtype of the "Agriculture, Pastures, and Mixed

Environs" habitat type (Johnson and O'Neil 2001). Per Johnson and O'Neil (2001), unimproved pastures include "*…rangelands planted to exotic grasses that are found on private land, state wildlife areas, federal wildlife refuges and U.S. Department of Agriculture Conservation Reserve Program (CRP) sites*." Although some areas mapped as planted grassland consisted predominantly of native grass species (versus exotic grasses noted in the description of unimproved pasture), as noted above, areas mapped as planted grassland in the eastern portion of the Survey Area are enrolled in the CRP. The areas mapped as planted grassland that are not enrolled in the CRP are likely restoration plantings and were likely planted to restore areas burned during past wildfires.

5.2.1.2 Non-Native Grassland and Forbland

Non-native grassland and forbland was the second most prevalent habitat type within the Survey Area. This habitat type was noted throughout the Survey Area; however, it was most widespread in the northern portion of the Survey Area (Figure 3). Much of the area mapped as non-native grassland appeared to be used to graze livestock including cattle, goats, and sheep, and heavy grazing was noted in some of these areas (Appendix D, Photos 4 and 5). Other areas mapped as non-native grassland and forbland include areas around the edge of agricultural fields and within and along drainages and upland swales in the southern and central portions of the Survey Area.

Dominant species found in the non-native grassland and forbland habitat included non-native grasses such as bulbous bluegrass, cereal rye (*Secale cereale*), and cheatgrass as well as non-native forbs including blue mustard (*Chorispora tenella*), common stork's bill, tall tumblemustard (*Sisymbrium altissimum*), and yellow salsify (*Tragopogon dubius*). Although native grasses and forbs, including bluebunch wheatgrass, Sandberg bluegrass (*Poa secunda* ssp. *secunda*), and fiddleneck also occasionally occurred in this habitat type, they typically represented a small percentage of the overall vegetative cover in the area. The non-native grassland and forbland habitat type is most readily classified as the "modified grassland" and "unimproved pasture" subtypes of the "Agriculture, Pasture, and Mixed Environs" habitat type as described in Johnson and O'Neil (2001).

5.2.1.3 Agricultural Land

Agricultural land primarily occurs in the central portion of the Survey Area (Figure 3). Agricultural land within the Survey Area consisted of fallow and active wheat and irrigated alfalfa fields and livestock and horse pastures.

5.2.1.4 Rabbitbrush Shrubland

The rabbitbrush shrubland habitat type was mapped in several locations in the southern and eastern portions of the Survey Area (Figure 3). Areas mapped as rabbitbrush shrubland in the southcentral and northeastern portions of the Survey Area were similar to the planted grassland habitat type described above, with the exception that cover of rubber rabbitbrush and green rabbitbrush (*Chrysothamnus viscidiflorus*) typically exceeded 10 percent. It is unknown whether rabbitbrush was planted in these areas or has established naturally. Similar to the planted grassland habitat type, areas of rabbitbrush shrubland in the southeastern portion of the Survey Area are not readily classified according to Johnson and O'Neil (2001); however, they most readily

fall into the "Unimproved Pasture" subtype of the "Agriculture, Pastures, and Mixed Environs" habitat type. Rubber rabbitbrush is an early seral species that readily colonizes disturbed sites, such as areas disturbed by overgrazing or fire, or consist of abandoned agricultural lands (Faber et al. 2013; Tirmenstein 1999; USDA 2017). If not intentionally planted, rabbitbrush likely colonized these areas following the planting of grasses.

In addition to rabbitbrush, other species commonly observed in rabbitbrush shrubland habitat in the southeast and northeast portions of the Survey Area included cultivars of the native grasses big bluegrass and bluebunch wheatgrass and the non-native grasses crested wheatgrass, cheatgrass, and bulbous bluegrass. Similar to the planted grassland habitat type, forb cover and diversity was low in this habitat type; however, common forbs that were observed included the native forbs hawksbeard, hoary-aster (*Dieteria canescens*), lupine (*Lupinus* spp.), and threadleaf fleabane (*Erigeron filifolius*), and the non-native forbs common stork's bill and tall tumblemustard.

The areas mapped as rabbitbrush shrubland in the southwestern portion of the Survey Area were primarily located along drainages and adjacent hillslopes adjacent to and above areas of planted grassland habitat (Appendix D, Photo 13). Rabbitbrush may have colonized these areas following past wildfires, including the 2016 Range 12 Fire. Dominant species in areas of rabbitbrush shrubland habitat in the southwestern portion of the Survey Area included rubber rabbitbrush, bulbous bluegrass, cheatgrass, Sandberg bluegrass, common stork's-bill, hawksbeard, long-leaf phlox (*Phlox longifolia*), lupine, and tall tumblemustard.

5.2.1.5 Eastside (Interior) Grassland

Eastside (interior) grassland was mapped in several locations in the Survey Area (Figure 3). Within the Survey Area, this habitat type was primarily found on hillslopes and crests of hills where topography precludes agricultural production.

Common species observed in eastside (interior) grasslands within the Survey Area included the following native grasses and forbs: bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), needle-and-thread (*Hesperostipa comata*), Sandberg bluegrass (*Poa secunda* ssp. *secunda*), Carey's balsamroot (*Balsamorhiza careyana*), desert-parsley (*Lomatium* spp.), threadleaf fleabane, long-leaf phlox, lupine, woolly plantain (*Plantago patagonica*), as well as the following non-native grasses: bulbous bluegrass and cheatgrass.

Shrub cover was absent or sparse (i.e., less than five percent cover) and consisted of scattered green rabbitbrush and rubber rabbitbrush shrubs. Remnant dead shrubs, presumably of big sagebrush (*Artemesia tridentata*), were observed in this habitat type in the southwest portion of the Survey Area; however, no live big sagebrush shrubs were observed. These shrubs were likely killed in the 2016 Range 12 Fire. This area containing remnant dead shrubs was included in the shrub-steppe habitat classification below.

Although signs of grazing were present, eastside (interior) grassland in the southwest and eastern portions of the Survey Area were more intact (e.g., lower cover of non-native species, less signs of grazing) than the eastside (interior) grassland habitat observed in the central portion of the Survey

Area. Eastside (interior) grassland habitat in the central portion of the Survey Area was noted as having high cover of non-native species and was more heavily grazed by livestock.

5.2.1.6 Shrub-steppe

Approximately 63 acres (2 percent) of the north-central portion of the Survey Area was mapped as shrub-steppe habitat (Figure 3). This habitat type was characterized by an open to relatively dense (i.e., 5 to 50 percent) cover of native shrubs and was patchy in its distribution. Big sagebrush was the most dominant shrub species in this habitat type. Other shrub species observed within this sagebrush shrub-steppe habitat included rubber rabbitbush, green rabbitbrush, and threetip sagebrush (*Artemisia tripartita*). An additional 35 acres (1 percent) in the southwest portion of the Survey Area contained burned shrubs, likely killed in the 2016 Range 12 Fire.

Grasses commonly observed in this shrub-steppe habitat included the native grasses Sandberg bluegrass and squirreltail (*Elymus elymoides*), as well as the non-native grasses bulbous bluegrass, cheatgrass, and crested wheatgrass. Similar to other habitat types in the Survey Area, forb cover and diversity in this habitat type was low. The forbs that were observed include the native forbs hawksbeard, hoary-aster, threadleaf fleabane, and woollypod milkvetch (*Astragalus purshii*).

Patches of shrub-steppe habitat within the Survey Area were found along hillslopes and crests of hills or along ephemeral drainages. In general, shrub-steppe habitat within the Survey Area was heavily degraded due to livestock grazing and presence of non-native species. In addition, past wildfires have not only resulted in total loss of shrub-steppe habitat in the Survey Area, but have also degraded and reduced the size of the remaining patches of shrub-steppe.

5.2.1.7 Developed/disturbed

Developed/disturbed habitat identified within the Survey Area included roads, structures, and other areas disturbed in association with agricultural and ranching activities, and portions of the existing Black Rock substation. The majority of the areas mapped as developed/disturbed were unvegetated or sparsely vegetated. However, where present, vegetation within developed areas was dominated by non-native invasive species such as bulbous bluegrass, cheatgrass, common stork's bill, and tall tumblemustard.

5.2.1.8 Irrigated Hedgerows

Two irrigated hedgerows were mapped within the Survey Area (Figure 3). These areas provide wildlife habitat bordering the irrigated croplands, although recent fires have destroyed the hedgerow on the southwest side of the Survey Area. Tree and shrub species observed in these hedgerows include black locust (*Robinia pseudoacaca*), elm (*Ulmus* spp.), rose (*Rosa* spp.), Russian-olive (*Elaeagnus angustifolia*), and western juniper (*Juniperus occidentals*). This habitat type is most readily classified as agricultural land per Johnson and O'Neil (2001) because it is intentionally cultivated and irrigated; however, it was mapped separately due to the presence of shrub and tree species not observed in other agricultural lands. In addition, this area provides additional habitat for wildlife that is not found in other agricultural lands mapped within the Survey Area.

5.2.1.9 Talus

One small (approximately 4 acres) area of talus was mapped in the southwestern portion of the Survey Area (Figure 3). Additional talus was noted west of the Survey Area, based on observations from within the Survey Area. This habitat type includes sparsely vegetated scree and talus on steep slopes. Vegetation was primarily located in between patches of talus and scree (Appendix D, Photos 2 and 23) and consisted primarily of native and non-native grasses including bluebunch wheatgrass, bulbous bluegrass, cheatgrass, needle-and-thread, and Sandberg bluegrass. Forbs that were observed include butterfly bearing biscuit-root (*Lomatium papilioniferum*) and Carey's balsamroot.

5.2.2 Wildlife

Tetra Tech observed 36 bird species and 1 mammal species within the Survey Area during surveys (Appendix C). Of these 37 species, 1 bird species (ferruginous hawk) has a special status (designated state threatened at the time of surveys and subsequently up-listed to endangered; Appendix C; Figure 3; Appendix D, Photo 24; WDFW 2021e). No federally threatened or endangered species were observed. Burrowing owls (a state candidate species) were observed outside the Survey Area during raptor nest surveys and are addressed in the Raptor Next Survey Report (Tetra Tech 2022c). Additional burrowing owls were found in May 2022 within the Project area, in burrows initially thought to contain coyotes (Tetra Tech 2022[LF1]). In the Survey Area, wildlife use in general was concentrated near manmade features, particularly associated with water sources. Irrigation pipes across the Project are deployed in both concentrated ways (crop irrigation infrastructure and livestock ponds) and indirect ways (leaks), providing water for plants, animals, and insects.

5.2.2.1 Birds

The highest bird diversity was observed near irrigated crops, near home sites, at livestock ponds, and in the shrubs and trees (irrigated hedgerows) in the south section of the Project. Common ravens (*Corvus corax)* and red-tailed hawks (*Buteo jamaicensis*) were documented nesting on transmission towers (Tetra Tech 2022c). Swainson's hawks *(Buteo swainsoni)*, western kingbirds (*Tyrannus verticalis)*, Brewer's blackbirds (*Euphagus cyanocephalus)*, mourning doves (*Zenaida macroura)*, and black-billed magpies (*Pica hudsonia)* nest in irrigated hedgerows. Red-winged blackbirds (*Agelaius phoeniceus*) and savannah sparrows (*Passerculus sandwichensis*) called from irrigated crops where Northern harriers *(Circus hudsonius)* were also primarily observed. Killdeer (*Charadrius vociferus*) chicks and a pair of green-winged teal (*Anas crecca*) flushed from the edge of a livestock pond. European honeybees (*Apis mellifera*) congregated at the leaking joints of irrigation pipes. At home sites, species including American robins (*Turdus migratorious)*, house finches (*Haemorhous mexicanus)*, California quail (*Callipepla californica)*, house sparrows (*Passer domesticus)*, yellow warblers (*Setophaga petechia)*, and American goldfinches (*Spinus tristis*) were heard and seen.

In undeveloped areas where eastside grasslands, planted grasslands, rabbitbrush shrubland and shrub-steppe were mapped (Figure 3), grassland species were observed including grasshopper sparrow (*Ammodramus savannarum)*, lark sparrow (*Chondestes grammacus)*, vesper sparrow (*Pooecetes gramineus)*, long-billed curlew (*Numenius americanus)*, horned lark (*Eremophila alpestris)*, and western meadowlark (*Sturnella neglecta)*. A single turkey vulture (*Cathartes aura)* was observed soaring over a grassland area. Swainson's and red-tailed hawks were occasionally observed soaring over grassland and shrubland areas but were primarily observed hunting the irrigated crops. A single adult ferruginous hawk was observed soaring in the southwest portion of the Project, approximately 2 miles due north of a PHS nest location on Rattlesnake Ridge (Figures 2 and 3; Appendix D, Photo 24). No ferruginous hawk nests were located at the Project during raptor nest surveys (Tetra Tech 2022c).

During habitat surveys, an area of shrub-steppe habitat with a big sagebrush and threetip sagebrush component was identified in the northeastern section of the Project. This is the only area within the Project with the potential to support sagebrush-associated or sagebrush-obligate species; therefore, an hour-long point-count was conducted in this area on May 14, 2021 from 6:10 a.m. to 7:10 a.m. to determine whether any of these species were present (Figure 3; Appendix D, Photo 25). Species documented during this observation period were horned lark, Western meadowlark, grasshopper sparrow, long-billed curlew, vesper sparrow, and lark sparrow. No sagebrush-associated or sagebrush-obligate species were heard or seen (e.g., greater sage grouse [*Centrocercus urophasianus],* loggerhead shrike, sagebrush sparrow, sage thrasher).

In the northern portion of the Survey Area, where non-native grassland and forbland is the dominant habitat type, few individual birds were observed. Species observed in these areas were primarily horned larks, but a single long-billed curlew was also observed. Common ravens were also observed in these areas near the substation where nests occur on transmission towers. During raptor nest surveys, active burrowing owl burrows were documented approximately 0.25 mile north of the Project (Tetra Tech 2022c); however, no active or potentially active burrowing owl burrows were found within the Survey Area during the raptor nest, habitat, or wildlife surveys (where biologists scanned the Project while surveying on foot, scanned the terrain with binoculars and a spotting scope to identify potential burrows at a distance, and investigated potential locations as necessary).

A partial raptor carcass was found in the bottom of a small canyon below the talus slope identified during habitat surveys (Appendix D, Photo 26). Most tail feathers, a partial wing (primaries), and scattered cluster of body feathers were found within an approximately 30-meter radius. The few pieces left of this scavenged carcass provided no other insight into potential cause of death. This carcass is most likely the remains of an adult golden eagle[2]. No observations of golden eagles using the Survey Area were recorded during surveys.

[2] Primary length approximately 18 to 24 inches (at least 45 centimeters), tail feathers at approximately 10 to 12 inches (at least 25 centimeters), and overall coloration (USFWS 2020; Liguori et al. 2020).

5.2.2.2 Mammals

Biologists observed one large mammal species (i.e., coyote [*Canis latrans]*) during surveys at the Project. An active coyote den area was identified in an area of planted grassland, in the soft bank of an ephemeral drainage. Two adults and four pups were observed emerging from two den entrances. Several other similar burrows were observed at the Project but appeared inactive upon investigation. During supplemental surveys in May 2022, an area that was mapped in 2021 as containing coyote dens was found to contain active burrowing owls. This location is shown on Figure 2 of the revised Wildlife and Habitat Survey Report (Tetra Tech, October 2022; confidential).

The Project is in heavy use by domestic sheep and cows. Fresh tracks and droppings of these species are ubiquitous and continuously refreshed, likely obscuring sign of other species less frequently present, or which are present in smaller numbers than the domestic herds. Mule deer (*Odocoileus hemionus*) and elk scat were found scattered in the planted grassland, eastside grassland, and shrubland habitat areas. Scat was generally desiccated. Mule deer scat was found more frequently than elk scat. Tracks of mule deer were identified; however, elk tracks were not definitively identified during the summer 2021 survey. Similar to observations of birds, the most abundant mammal signs were found either at water sources or along game trails leading to water sources (including signs of coyote, mountain lion [*Puma concolor]*, mule deer, other small mammals).

During a supplemental raptor nest survey performed on October 2, 2021, within the Fall 2021 Survey Area, two groups of elk were observed within the adjacent Hanford Site, outside the Survey Area. Using binoculars and a high-powered spotting scope, biologists observed a total of approximately 70 individuals. Tracks leading from the Hanford Site to and from a watering structure within the Project were observed along game trails and along a two-track within the Survey Area.

No small mammals were observed; however, small mammal scat and sign were observed. Rabbit scat was observed in only one location in an area of eastside grassland on a hilltop in the southwestern edge of the Project. No jackrabbits were observed. Biologists identified one small rodent colony that was investigated for potential occupancy by Townsend's ground squirrels. This colony occupied an approximately 10-square-meter area and was composed of 20 or more burrows. Burrow entrances were clear of cobwebs and vegetation, trails were visible connecting burrow to burrow, and small rodent scat was observed near burrow entrances and in the trails. On May 15, 2021, at 6:00 a.m., a biologist sat approximately 50 to 100 meters away from the colony with a spotting scope and remained still, listening and watching, until 7:00 a.m. No rodents were detected. The biologist then approached the colony to potentially elicit alarm calls from maternal females (Cranna and Nugent 2016). No calls were heard and no rodents were observed. Burrows were later determined to be 1 to 2 inches in diameter on average, generally considered too small for Townsend's ground squirrels (Appendix D, Photo 27; Cranna and Nugent 2016).

6.0 Conclusions and Recommendations

Biologists mapped nine habitat types within the Survey Area. The vast majority (approximately 93 percent) of the Survey Area consisted of three habitat types: planted grassland, non-native grassland and forbland, and agriculture. The other six habitat types composed the remaining approximately 7 percent of the Survey Area.

Three of the nine habitat types mapped within the Survey Area are considered Priority Habitats or Priority Habitat Features by the WDFW, including eastside (interior) grassland (i.e., eastside steppe), shrub-steppe, and talus (WDFW 2008). A total of approximately 162 acres (3 percent of the Survey Area) consisted of Priority Habitats or Features.

Biologists observed 36 bird species and 1 mammal species during surveys, including 1 special status bird species (Appendix C). A single ferruginous hawk was observed briefly soaring in an area of native grassland habitat in the far southwestern edge of the Project; however, there is neither appropriate nesting substrate nor an apparent prey base for larger raptors such as ferruginous hawks and golden eagles in most of the Project (Katzner et al. 2020; Ng et al. 2020; Tetra Tech 2022c). No ground squirrel colonies were located, and no jackrabbits were observed. However, raptor nest survey results and small rodent sign indicate that there is a sufficient prey base to support medium-sized raptors such as red-tailed hawks and Swainson's hawks. The presence of active burrowing owl burrows both in the PHS database and during surveys immediately north of the Project suggest that this species has the potential to occur within the Project (Tetra Tech 2022c). No large, contiguous areas of tall, dense sagebrush appropriate for sagebrush species was mapped, and no sagebrush-associated wildlife species were observed.

Prior to surveys, WDFW and PHS data indicated that the Project may be important to elk, particularly in the winter. During surveys, suitable habitat for two priority big game species was documented (i.e., mule deer and elk), and indirect evidence (i.e., scat, tracks) indicate that these species use the Project Potentially suitable habitat for these species is generally limited to portions of the Survey Area that occur outside of agricultural or other developed land.

Based on the results of the habitat and general wildlife surveys, the following measures are recommended for the Project to avoid and minimize impacts to habitat and wildlife species:

- Prepare a Habitat Mitigation Plan that outlines measures that would be taken to avoid, minimize, and mitigate for impacts to wildlife habitat from construction and operation of the Project.

Additional recommendations specific to rare plants and raptors are provided in the Botanical Survey Report (Tetra Tech 2021b) and the Raptor Nest Survey Report (Tetra Tech 2022c) as well as addenda to the Botanical Survey Report and Wildlife/Habitat Survey Report (Tetra Tech, 2022) .

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Figures

Wautoma Solar

Figure 1
Project Location

BENTON AND YAKIMA COUNTIES, WA

Grant County
Yakima County
Benton County
Granger
Sunnyside
243
24
240
241
223
82

Spring 2021 Survey Area
Fall 2021 Survey Area
County Boundary

INNERGEX
TETRA TECH

Reference Map

R:\PROJECTS\INNERGEX_WAUTOMA\BOTANY\MAPS\Wautoma_Figure_1_Location.mxd

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NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 1 2 4 Miles

NOT FOR CONSTRUCTION

Figure 2 contains confidential information and is not included in this version.

Figure 3 contains confidential information and is not included in this version.

Appendix A. Special Status Wildlife Species With Potential to Occur at the Project

Special Status Wildlife Species with Potential to Occur at the Project

Common Name	Scientific Name	Federal Status[1]	State Status[2]
Birds			
American white pelican	*Pelecanus erythrorhynchos*	-	T, PS
bald eagle	*Haliaeetus leucocephalus*	BGEPA	PS
burrowing owl	*Athene cunicularia*	-	C, PS
chukar	*Alectoris chukar*	-	PS
ferruginous hawk[3]	*Buteo regalis*	-	E, PS
golden eagle	*Aquila chrysaetos*	BGEPA	PS
great blue heron	*Ardea Herodias*	-	PS
greater sage-grouse (Columbia Basin DPS)	*Centrocercus urophasianus*	WL (CON)	T, PS
loggerhead shrike	*Lanius ludovicianus*	-	C, PS
northern harrier	*Circus cyaneus*	BCC (BCR 9)	-
prairie falcon	*Falco mexicanus*	-	PS
ring-necked pheasant	*Phasianus colchicus*	-	PS
sagebrush sparrow	*Artemisiospiza nevadensis*	-	C, PS
sage thrasher	*Oreoscoptes montanus*	BCC (BCR 9)	C, PS
sandhill crane	*Antigone canadensis*	-	E, PS
short-eared owl	*Asio flammeus flammeus*	BCC (CON)	-
tundra swan	*Cygnus columbianus*	-	PS
Vaux's swift	*Chaetura vauxi*	-	C, PS
Mammals			
black-tailed jackrabbit	*Lepus californicus*	-	C, PS
elk	*Cervus elaphus*	-	PS
mule deer	*Odocoileus hemionus hemionus*	-	PS
Townsend's big-eared bat	*Corynorhinus townsendii*	-	C, PS
Townsend's ground squirrel	*Urocitellus townsendii nancyae*	-	C, PS
white-tailed jackrabbit	*Lepus townsendii*	-	C, PS
Reptiles and Amphibians			
sagebrush lizard	*Sceloporus graciosus*	-	C, PS
striped whipsnake	*Masticophis taeniatus*	-	C, PS

Sources: USFWS 2021b,c; WDFW 2008, 2020, 2021a,b,c,d,e.

1. U.S. Fish and Wildlife Service: BCC = Bird of Conservation Concern, BGEPA = Bald and Golden Eagle Protection Act, WL = Watch List, CON = Continental scale, BCR 9 = Bird Conservation Region 9 (Great Basin).
2. Washington Department of Fish and Wildlife: E = Endangered, T = Threatened, C = Candidate, PS = Priority Species.
3. WDFW voted to update the status of ferruginous hawk from Threatened to Endangered on August 27, 2021 (WDFW 2021e).

Appendix B. WDFW Meeting Notes

TETRA TECH

Introduction Summary

To:	Michael Ritter / Washington Department of Fish and Wildlife Jason Fidorra / Washington Department of Fish and Wildlife
Cc:	Julia Mancinelli/Innergex Renewable Energy Inc. (Innergex) Laura O'Neill/Innergex
From:	Amy Bensted / Tetra Tech Linnea Fossum / Tetra Tech
Meeting Date:	March 8, 2021
Subject:	Wautoma Solar Project Introduction

A summary of the meeting to introduce the Wautoma Solar Project (Project) to the Washington Department of Fish and Wildlife (WDFW) is provided below with discussion items and follow-up:

Project Overview. Innergex is proposing to build and operate the Project located in unincorporated Benton County, Washington.

- The Project would consist of a solar photovoltaic system coupled with a battery energy storage system as well as ancillary support infrastructure (network of AC and DC electrical collector lines, substation, overhead transmission line, project access roads, and temporary laydown).
- Innergex intends to permit the Project either through the Washington Energy Facility Site Evaluation Council or through a Benton County Conditional Use Permit.

Overview of Previous Surveys and Findings. Tetra Tech described the results of the desktop review conducted in 2020, which informed survey planning for 2021.

- No federally threatened and endangered species are likely to occur. One state threatened species, ferruginous hawk, is known to occur in the Project vicinity.
- The Project is within an elk regular concentration area during winter. Additional Priority Habitat and Species (PHS) occurrences in the vicinity of the Project (but outside the Project Area) include a burrowing owl breeding area, shrub-steppe, and talus slopes.
- One rare plant, Columbia milkvetch (state sensitive), has been documented within the proposed Project Area per the Washington Natural Heritage Program.

Planned Raptor Nest, Wildlife, Habitat, and Rare Plant Surveys. Tetra Tech will complete raptor nest, wildlife, habitat, and rare plant surveys in spring 2021, in addition to wetland surveys.

Tetra Tech, Inc.
1750 S Harbor Way, Suite 400, Portland, OR 97201
Tel 503.221.8636 Fax 503.227.1287 www.tetratech.com

Raptor nests surveys will include the following:

- Ground-based surveys within 0.5-miles of the Project Area, with two survey rounds: one in March and one in April or May (at least 30 days after the initial survey).

Habitat, general wildlife, and rare plant surveys will be conducted concurrently and consist of the following:

- Surveys will be conducted in early May to early June (currently scheduled to start May 10), within the Project Area.
- Habitat will be mapped and characterized consistent with the WDFW wind power guidelines and Johnson & O'Neil (2001).
- Surveyors will document special status species if observed (e.g., burrowing owl, ferruginous hawk, ground squirrel) as well as wildlife in general (e.g., elk) and sign, and noxious weeds (as identifiable during the survey period).
- Surveyors will use intuitive meander transect methods.

Summary of Discussion and Follow-up. WDFW concurred that the planned surveys as described are appropriate and provided a verbal description of known raptor nest locations (e.g., ferruginous hawk) in the Project vicinity as well as a special status wildlife that may occur.

- The WDFW internal PHS database did not identify nests within the raptor nest survey area (i.e., 0.5-mile buffer on the Project).
- WDFW noted the area is important to elk and that there may be Townsend's ground squirrels and jackrabbits (which are prey species for ferruginous hawks) in the Project vicinity, which will be important to document during Project surveys. WDFW concurred that the currently planned survey start date of May 10 should capture ground squirrels if present.

WDFW noted that vegetated green strips have been planted in the area in conjunction with private landowners to reduce fires.

- WDFW described that these are typically 100 to 150 foot strips of native and non-native bunchgrasses and forbs that stay green late enough into the season to reduce the spread of wildfires.
- There is limited firefighter access in the area so green strips may be a good addition to solar development.

WDFW will provide the following if feasible:

- WDFW will look into expediting Tetra Tech's PHS request (if possible) and/or provide nest locations directly to Tetra Tech to inform raptor nest surveys.
- WDFW will share the approximate locations of vegetated green strips with Innergex.

From:	Bensted, Amy
To:	Ritter, Michael W (DFW); Jason.Fidorra@dfw.wa.gov
Cc:	Laura O"Neill; Julia Mancinelli; Fossum, Linnea
Subject:	Wautoma Solar introduction summary
Date:	Friday, March 12, 2021 2:00:00 PM
Attachments:	SUMMARY_Wautoma_Solar_WDFW-Intro_03-08-2021.pdf image002.jpg

Mike and Jason,

Thanks for the call on Monday regarding Wautoma Solar surveys. Attached is a summary of the call including a couple follow-up items. Please let us know if you see anything that needs revision or clarification.

We look forward to continuing to work with you on this project.

Thanks,
Amy

Amy Bensted (she/her) | Senior Biologist
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Appendix C. Wildlife Species and Sign Observed During 2021 Field Surveys

Wildlife Species and Sign Observed During 2021 Field Surveys

Common Name	Scientific Name	Individual Observed	Sign Observed	Federal Status[1]	State Status[2]
Birds					
American goldfinch	*Spinus tristis*	X	-		
American robin	*Turdus migratorious*	X	-	-	-
barn swallow	*Hirundo rustica*	X	-	-	-
black-billed magpie	*Pica hudsonia*	X	-	-	-
Brewer's blackbird	*Euphagus cyanocephalus*	X	-	-	-
Bullock's oriole	*Icterus bullockii*	X	-	-	-
California quail	*Callipepla californica*	X	-	-	-
cliff swallow	*Petrochelidon pyrrhonota*	X	-	-	-
common raven	*Corvus corax*	X	-	-	-
Eurasian collared dove[3]	*Streptopelia decaocto*	X	-	-	-
European starling[3]	*Sturnus vulgaris*	X	-	-	-
ferruginous hawk[4]	*Buteo regalis*	X	-	-	E, PS
golden-crowned kinglet	*Regulus satrapa*	X	-	-	-
golden eagle	*Aquila chrysaetos*	-	X	BGEPA	PS
grasshopper sparrow	*Ammodramus savannarum*	X	-	-	-
great-horned owl	*Bubo virginianus*	X	-	-	-
green-winged teal	*Anas crecca*	X	-	-	-
horned lark	*Eremophila alpestris*	X	-	-	-
house finch	*Haemorhous mexicanus*	X	-	-	-
house sparrow[3]	*Passer domesticus*	X	-	-	-
killdeer	*Charadrius vociferus*	X	-	-	-
lark sparrow	*Chondestes grammacus*	X	-	-	-
long-billed curlew	*Numenius americanus*	X	-	-	-
mourning dove	*Zenaida macroura*	X	-	-	-
northern harrier	*Circus cyaneus*	X	-	BCC (BCR 9)	-
red-breasted nuthatch	*Sitta canadensis*	X	-	-	-
red-tailed hawk	*Buteo jamaicensis*	X	-	-	-
red-winged blackbird	*Agelaius phoeniceus*	X	-	-	-
rock pigeon[3]	*Columba livia*	X	-	-	-
savannah sparrow	*Passerculus sandwichensis*	X	-	-	-
Swainson's hawk	*Buteo swainsoni*	X	-	-	-
turkey vulture	*Cathartes aura*	X	-	-	-
vesper sparrow	*Pooecetes gramineus*	X	-	-	-
western kingbird	*Tyrannus verticalis*	X	-	-	-

Common Name	Scientific Name	Individual Observed	Sign Observed	Federal Status[1]	State Status[2]
western meadowlark	*Sturnella neglecta*	X	-	-	-
yellow warbler	*Setophaga petechia*	X	-	-	-
Mammals					
coyote	*Canis latrans*	X	X	-	-
mountain lion	*Puma concolor*	-	X	-	-
mule deer	*Odocoileus hemionus*	-	X	-	PS
Rocky Mountain elk	*Cervus canadensis nelsoni*	-	X	-	PS
Unknown rodent sp.	-	-	X	-	-
Reptiles					
Unknown snake sp.	-	X	-	-	-

Sources: USFWS 2021b,c; WDFW 2008, 2020, 2021a,b,c,d,e.

1. Federal Status: BCC = Bird of Conservation Concern, BGEPA = Bald and Golden Eagle Protection Act, WL = Watch List, CON = Continental scale, BCR 9 = Bird Conservation Region 9 (Great Basin).

2. Washington Department of Fish and Wildlife: T = Threatened, C= Candidate, PS = Priority Species.

3. Bird species not protected by the Migratory Bird Treaty Act (MBTA).

4. WDFW voted to update the status of ferruginous hawk from Threatened to Endangered on August 27, 2021 (WDFW 2021e).

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Photo 3. Planted grassland dominated by crested wheatgrass in central portion of Survey Area.

Photo 4. Heavily grazed non-native grassland and forbland in northwest portion of Survey Area.

Photo 5. Heavily grazed non-native grassland and forbland in northeast portion of Survey Area.

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Photo 15. Eastside grassland in southeast portion of Survey Area .

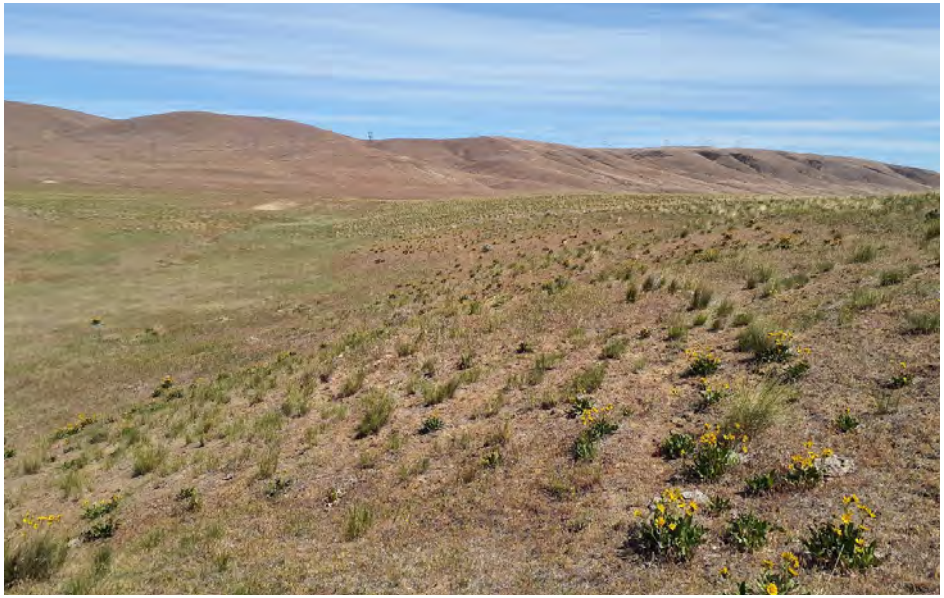

Photo 16. Heavily grazed eastside (interior) grassland in along hillslope in central-western portion of Survey Area .

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Photo 18. Shrub-steppe on hilltop in central-eastern portion of Survey Area.

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Photo 26. Golden eagle carcass.

Photo 27. Rodent burrow.

Wautoma Solar Project
Wildlife Survey Addendum

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August 2022

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Appendix A. Special Status Wildlife Species with Potential to Occur at the Project

Appendix B. Wildlife Species Observed During 2022 Field Surveys

Acronyms and Abbreviations

ASC	Application for Site Certification
GPS	global positioning system
Innergex	Innergex Renewable Development USA, LLC
Project	Wautoma Solar Project
Spring 2021 Survey Area	the approximately 3,830-acre area where the habitat and wildlife surveys were originally conducted
Spring 2022 Survey Area	the additional 990 acres where the habitat surveys were conducted
Tetra Tech	Tetra Tech, Inc.
WDFW	Washington Department of Fish and Wildlife

1.0 Introduction

Innergex Renewable Development USA, LLC (Innergex) plans to develop the Wautoma Solar Project (Project) located in Benton County, Washington approximately 12.5 miles northeast of the city of Sunnyside (Figure 1; figures are located at the back of this report).

As part of its environmental due diligence, Innergex contracted Tetra Tech, Inc. (Tetra Tech) to conduct general wildlife surveys for the Project. The purpose of the wildlife surveys was to document the presence of special status wildlife species within the Project 2022 survey area in support of permitting requirements for the proposed Project.

2.0 Description of the Survey Area

Habitat and wildlife surveys were conducted in early May 2021 within the approximately 3,830-acre area shown as the "Spring 2021 Survey Area" on Figure 1. Following these surveys, the Project was expanded by approximately 990 acres. Habitat surveys were conducted within the expanded area in the fall of 2021 (Tetra Tech 2022a) and habitat typing was completed for the entire Project and included in Appendix G of the Application for Site Certification (ASC; Tetra Tech 2022b). No changes to the habitat types documented during the 2021 survey efforts were necessary during the 2022 surveys; therefore, no supplemental habitat information is provided in this addendum. Additional wildlife surveys within the expanded area were completed in May 2022 (i.e., the Spring 2022 Survey Area, Figure 1). This addendum presents the results of the spring 2022 wildlife surveys.

3.0 Agency Coordination

Innergex and Tetra Tech met virtually with the Washington Department of Fish and Wildlife (WDFW) on March 8, 2021, to introduce the Project and discuss planned wildlife, habitat, and rare plant surveys. At the meeting, WDFW concurred with the survey timing and survey approach. A summary of this meeting is provided as Appendix B to the April 2022 Habitat and General Wildlife Survey Report (Tetra Tech 2022a). Additional coordination is expected as part of the ASC process.

4.0 Methods

Additional wildlife surveys within the expanded area (i.e., the Spring 2022 Survey Area, Figure 1) was completed in May 2022 concurrently with the botanical surveys (botanical surveys are addressed under separate cover [Tetra Tech 2022c]). Field surveys were conducted by a team of two biologists familiar with wildlife species found in the Eastern Washington Columbia Plateau Ecoregion. Biologists walked meandering transects throughout the Spring 2022 Survey Area. The biologists alternately scanned the landscape, the sky, and the ground looking for wildlife species and recognizable signs of wildlife (e.g., scat, tracks, burrows, and nests). Surveys began early in the

morning and continued through late afternoon to capture optimal wildlife activity levels in this region.

Wildlife surveys conducted within the Spring 2022 Survey Area were based on pre-field desktop research, previous surveys focused on species occurrences and habitat suitability for special status wildlife species with the potential to occur at the Project (Tetra Tech 2022a, Appendix A), and discussions with WDFW during survey coordination (Tetra Tech 2022a, Appendix B). Based on 2021 surveys and discussions with WDFW, the following special status species were known to occur or had potential to occur in the vicinity of the Spring 2022 Survey Area:

- Ferruginous hawk (*Buteo regalis*)
- Burrowing owl (*Athene cunicularia*)
- Black-tailed jackrabbit (*Lepus californicus*)
- White-tailed jackrabbit (*Lepus townsendii*),
- Townsend's ground squirrel (*Urocitellus townsendii nancyae*)
- Elk (*Cervus elaphus)*

Similar to the 2021 surveys, biologists maintained a running list of all wildlife species observed, and when a special status wildlife species or recognizable sign was encountered, they recorded 1) the GPS location of the wildlife or sign with a Samsung Galaxy tablet using ArcGIS Collector software, and 2) information on the number of individuals and their behavior as applicable. Following field surveys, the digitized data were downloaded and processed in a geographic information system, and were reviewed for quality control and assurance.

4.1 Field Surveys

Tetra Tech conducted wildlife surveys within the Spring 2022 Survey Area on May 9 and 10, 2022, and these surveys were completed concurrently with the botanical surveys. Field surveys were conducted by a team of two biologists familiar with wildlife species found in the Eastern Washington Columbia Plateau Ecoregion. Biologists walked meandering transects within non-cultivated land throughout the Survey Area. The biologists alternately scanned the landscape, the sky, and the ground looking for wildlife species and recognizable signs of wildlife (e.g., scat, tracks, burrows, and nests). Surveys began early in the morning and continued through late afternoon to capture optimal wildlife activity levels in this region. Areas unlikely to support special status wildlife species (i.e., cultivated land and developed areas) were surveyed primarily from vehicles by driving paved, gravel, and two-track roads. These areas were surveyed on foot in situations where the full extent was not visible from the vehicle, areas of potential habitat or nesting opportunities for special status wildlife species were identified, or areas of adjacent habitat required categorization.

5.0 Results and Discussion

Appendix A describes the special status wildlife species with the potential to occur at the Project, and there have been no changes to this list between 2021 and 2022. In addition, raptor nests identified at the Project are addressed in the Raptor Nest Survey Report (Tetra Tech 2022d), which describes ground-based raptor nest surveys conducted from May 9 to May 12, 2021.

5.1 Field Surveys

Previous wildlife survey information within the Survey Area was collected from May 10-15, 2021 (Spring 2021 Survey Area), and incidental wildlife information was collected during habitat surveys on October 12 and 13, 2021 (Fall 2021 Survey Area).

Weather conditions during the spring 2022 surveys were optimal for detecting wildlife during surveys, with no rain and low wind. Appendix B lists all species documented during the spring 2022 survey effort. Tetra Tech directly observed 31 wildlife species or their sign (27 avian species and 4 mammals). No federally threatened or endangered species were observed; however, a new location of burrowing owls (a state candidate species) was documented within the Spring 2021 Survey Area while transiting between this area and the Spring 2022 Survey Area. This observation is described further below.

5.1.1 Birds

The majority of the expanded areas are mapped as non-native grassland and forbland or planted grasslands with small pockets of eastside (interior) grassland and rabbitbrush shrubland. Surveys completed in 2021 indicated that the highest bird diversity was observed near irrigated crops, near home sites, at livestock ponds, and in the shrubs and trees (irrigated hedgerows) in the southern portion of the Project.

Five new avian species were documented (visual and auditory) within the Spring 2022 Survey Areas: brown-headed cowbird (*Molothrus ater*), Lewis' woodpecker (*Melanerpes lewis*), Townsend's solitaire (*Myadestes townsendi*), white-crowned sparrow (*Zonotrichia leucophrys*), and yellow-rumped warbler (*Setophaga cornota*).

With the exception of locating new burrowing owl burrows, no new raptor species or nests were documented within the Spring 2022 Survey Area; however, northern harrier (*Circus hudsonius*), red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsoni*), and Turkey vulture (*Cathartes aura*) were observed in flight. Burrowing owls were documented using at least four burrows during the 2022 surveys. These new active burrows are located near the center of the Spring 2021 Survey Area (Figure 2). The owls were observed while in transit through the Spring 2021 Survey Area to the Spring 2022 Survey Area. At least one, and possibly two, of these burrows were active coyote den in 2021 (Tetra Tech 2022d).

5.1.2 Mammals

Additional burrows were documented within the Spring 2022 Survey Area boundaries that were indicative of American badger. A partial jackrabbit carcass (i.e., spine and hind legs with some fir remaining around the foot pads) was documented within the southern portion of the Spring 2022 Survey Area, along with deer and elk sign. Coyote was documented during the 2022 surveys, but no new den sites were noted.

6.0 Conclusion and Recommendations

Biologists observed 27 bird species and 5 mammal species during surveys conducted in the spring of 2022. This includes 5 avian species that had not previously been documented during the surveys in 2021.

No ground squirrel colonies were located and no live jackrabbits were observed; however, as stated in Appendix G of the ASC, general wildlife and raptor nest survey results completed in 2021 indicate that there is sufficient small mammal sign to provide a sufficient prey base to support medium-sized raptors such as red-tailed hawks and Swainson's hawks.

Four new active burrowing owl burrows were documented near the center of the Spring 2021 Survey Area. Avoidance, minimization, and mitigation measures will be discussed with WDFW and incorporated into an updated Habitat Mitigation Plan as appropriate.

7.0 References

Tetra Tech. 2022a. Wautoma Solar Project Habitat and General Wildlife Survey Report. Prepared for Innergex Renewable Development USA, LLC. April.

Tetra Tech. 2022b. Application for Site Certification. Prepared for Innergex Renewable Development USA, LLC. Submitted to the Washington Energy Facility Siting Evaluation Council. May.

Tetra Tech. 2022c. Wautoma Solar Project Botanical Survey Addendum. Prepared for Innergex Renewable Development USA, LLC. August 2022.

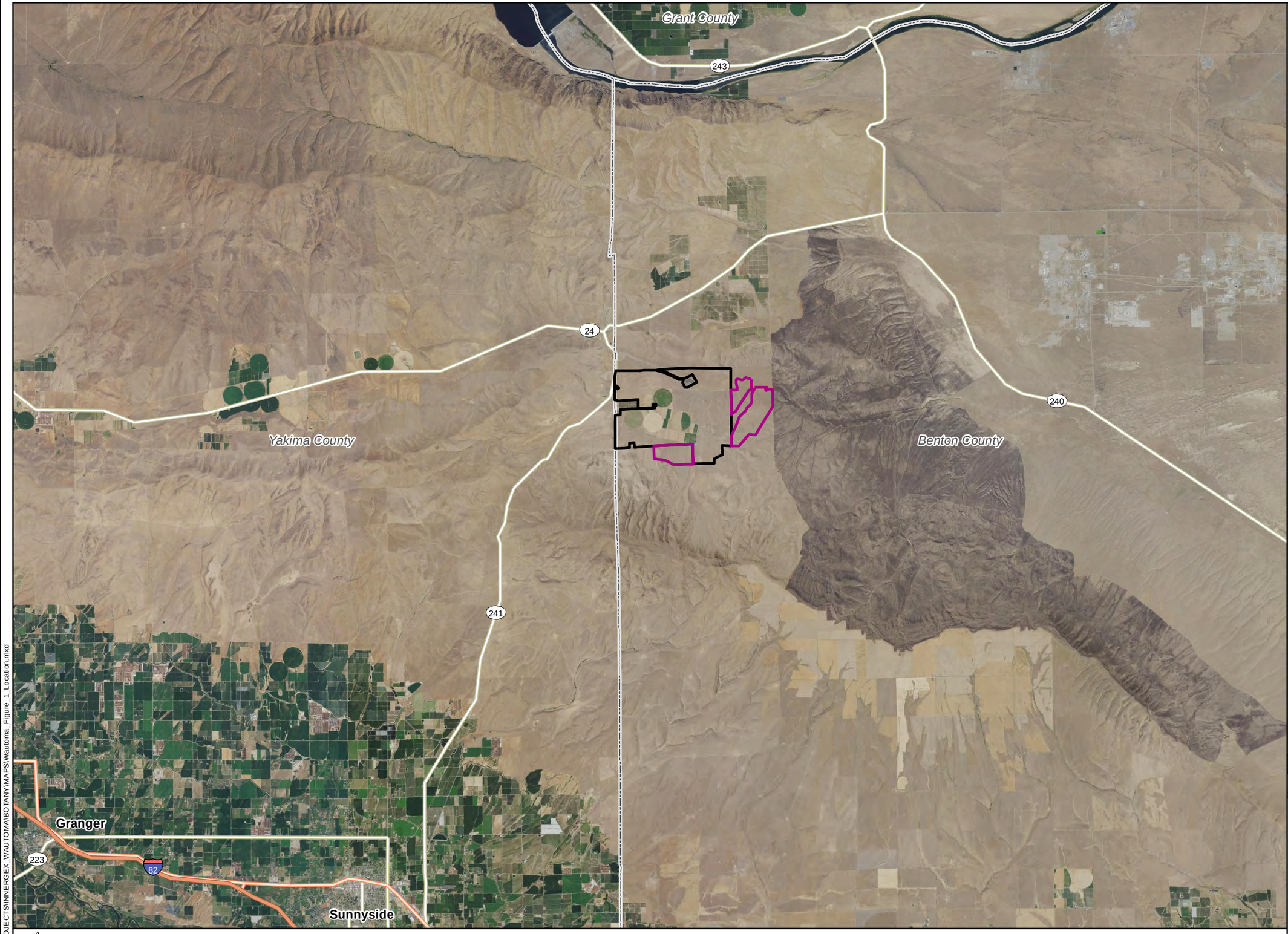
Tetra Tech. 2022d. 2021 Raptor Nest Survey Report for the Wautoma Solar Project. Prepared for Innergex Renewable Development USA, LLC. January 2022.

Figures

Wautoma Solar

Figure 1
Project Location

BENTON AND YAKIMA COUNTIES, WA



- Spring 2021 Survey Area
- Spring 2022 Survey Area
- County Boundary

INNERGEX TETRA TECH

Reference Map

1:150,000 NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 1 2 4 Miles

NOT FOR CONSTRUCTION

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Wautoma Solar

Figure 2
WDFW Priority Habitats and Species Records and Documented Species within the Survey Area

BENTON AND YAKIMA COUNTIES, WA

- Spring 2021 Survey Area
- Spring 2022 Survey Area
- PHS Search Area
- County Boundary

Tt Documented Species and Habitat

- Burrowing Owl Burrow
- Ferruginous hawk
- Jackrabbit spp. Carcass
- Shrub-steppe
- Talus

PHS Raptor Nest

- Ferruginous hawk
- Prairie falcon
- Ferruginous hawk Home Range

PHS Occurrence

- Burrowing Owl Burrow Documented in 2021
- Freshwater Emergent Wetland
- Elk Wintering Area
- Shrub-steppe
- Talus

CONFIDENTIAL
WDFW PHS Data Product

INNERGEX TETRA TECH

Reference Map

Yakima County
Benton County

1:48,000 NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 0.5 1 2 Miles

Source: WDFW PHS

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Appendix A.

Special Status Wildlife Species with Potential to Occur at the Project

Special Status Wildlife Species with Potential to Occur at the Project

Common Name	Scientific Name	Federal Status[1]	State Status[2]
Birds			
American white pelican	*Pelecanus erythrorhynchos*	-	T, PS
bald eagle	*Haliaeetus leucocephalus*	BGEPA	PS
burrowing owl	*Athene cunicularia*	-	C, PS
chukar	*Alectoris chukar*	-	PS
ferruginous hawk	*Buteo regalis*	-	E, PS
golden eagle	*Aquila chrysaetos*	BGEPA	PS
great blue heron	*Ardea Herodias*	-	PS
greater sage-grouse (Columbia Basin DPS)	*Centrocercus urophasianus*	WL (CON)	T, PS
loggerhead shrike	*Lanius ludovicianus*	-	C, PS
northern harrier	*Circus cyaneus*	BCC (BCR 9)	-
prairie falcon	*Falco mexicanus*	-	PS
ring-necked pheasant	*Phasianus colchicus*	-	PS
sagebrush sparrow	*Artemisiospiza nevadensis*	-	C, PS
sage thrasher	*Oreoscoptes montanus*	BCC (BCR 9)	C, PS
sandhill crane	*Antigone canadensis*	-	E, PS
short-eared owl	*Asio flammeus*	BCC (CON)	-
tundra swan	*Cygnus columbianus*	-	PS
Vaux's swift	*Chaetura vauxi*	-	C, PS
Mammals			
black-tailed jackrabbit	*Lepus californicus*	-	C, PS
elk	*Cervus elaphus*	-	PS
mule deer	*Odocoileus hemionus*	-	PS
Townsend's big-eared bat	*Corynorhinus townsendii*	-	C, PS
Townsend's ground squirrel	*Urocitellus townsendii nancyae*	-	C, PS
white-tailed jackrabbit	*Lepus townsendii*	-	C, PS
Reptiles and Amphibians			
sagebrush lizard	*Sceloporus graciosus*	-	C, PS
striped whipsnake	*Masticophis taeniatus*	-	C, PS

Sources: USFWS 2021, 2022; WDFW 2008, 2020, 2021a,b,c,d

1. U.S. Fish and Wildlife Service: BCC = Bird of Conservation Concern, BGEPA = Bald and Golden Eagle Protection Act, WL = Watch List, CON = Continental scale, BCR 9 = Bird Conservation Region 9 (Great Basin)

2. Washington Department of Fish and Wildlife: E = Endangered, T = Threatened, C = Candidate, PS = Priority Species

References:

USFWS (U.S. Fish and Wildlife Service). 2021. Birds of Conservation Concern 2021. United States Department of Interior, Fish and Wildlife Service, Migratory Birds Program, Arlington, Virginia. 48 pp. Available online at: https://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php. Accessed August 2021.

USFWS. 2022. IPaC – Information for Planning and Consultation: Species list for Project location in Benton County, Washington. Available online at: https://ipac.ecosphere.fws.gov/location/R4XYUVU5BFDZTJZSRYT2BEW434/resources. Accessed May 2022.

WDFW (Washington Department of Fish and Wildlife). 2008. Priority Habitats and Species List, Revised March 2022. Available online at: https://wdfw.wa.gov/sites/default/files/publications/00165/wdfw00165.pdf Accessed May 2022.

WDFW. 2020. State Listed Species and State Candidate Species, Revised March 2022. Available online at: https://wdfw.wa.gov/sites/default/files/2020-02/statelistedcandidatespecies_02272020.pdf. Accessed May 7, 2021.

WDFW. 2021a. Priority Habitats and Species (PHS) on the Web. Available online at: https://wdfw.wa.gov/conservation/phs/. Accessed May 2022.

WDFW. 2021b. Priority Habitats and Species database query results. Provided by WDFW October 26, 2021.

WDFW. 2021c. Threatened and endangered species profiles. Available online at: https://wdfw.wa.gov/species-habitats/at-risk/listed. Accessed May 2022.

WDFW. 2021d. 2021 PHS Distribution by County Spreadsheet. Available online at: https://wdfw.wa.gov/publications/00165. Accessed May 2022.

Appendix B.

Wildlife Species Observed During 2022 Field Surveys

Wildlife Species and Sign Observed During 2022 Field Surveys

Common Name	Scientific Name	Directly Observed	Sign Observed	Federal Status[1]	State Status[2]
Birds					
American robin	*Turdus migratorious*	X	-	-	-
barn swallow	*Hirundo rustica*	X	-	-	-
black-billed magpie	*Pica hudsonia*	X	-	-	-
brown-headed cowbird	*Molothrus ater*	X	-	-	-
burrowing owl	*Athene cunicularia*	X	X		C, PS
common raven	*Corvus corax*	X	-	-	-
European starling[3]	*Sturnus vulgaris*	X	-	-	-
grasshopper sparrow	*Ammodramus savannarum*	X	-	-	-
horned lark	*Eremophila alpestris*	X	-	-	-
house finch	*Haemorhous mexicanus*	X	-	-	-
house sparrow[3]	*Passer domesticus*	X	-	-	-
killdeer	*Charadrius vociferus*	X	-	-	-
lark sparrow	*Chondestes grammacus*	X	-	-	-
Lewis' woodpecker	*Melanerpes lewis*	X		BCC (BCR 9)	C, PS
long-billed curlew	*Numenius americanus*	X	-	-	-
mourning dove	*Zenaida macroura*	X	-	-	-
northern harrier	*Circus cyaneus*	X	-	BCC (BCR 9)	-
red-tailed hawk	*Buteo jamaicensis*	X	-	-	-
red-winged blackbird	*Agelaius phoeniceus*	X	-	-	-
savannah sparrow	*Passerculus sandwichensis*	X	-	-	-
Swainson's hawk	*Buteo swainsoni*	X	-	-	-
Townsend's solitaire	*Myadestes townsendi*	X			
turkey vulture	*Cathartes aura*	X	-	-	-
western kingbird	*Tyrannus verticalis*	X	-	-	-
western meadowlark	*Sturnella neglecta*	X	-	-	-
white-crowned sparrow	*Zonotrichia leucophrys*	X			
yellow-rumped warbler	*Setophaga cornata*	X			
Mammals					
American badger	*Taxidea taxus*		X	-	C, PS-
coyote	*Canis latrans*	X	X	-	-
mule deer	*Odocoileus hemionus*	-	X	-	PS
Rocky Mountain elk	*Cervus canadensis nelsoni*	-	X	-	PS
unidentified jackrabbit (partial carcass)	*Lepus spp.*		X		C, PS

Sources: USFWS 2021, 2022; WDFW 2008, 2020, 2021a,b,c,d

1. Federal Status: BCC = Bird of Conservation Concern, BCR 9 = Bird Conservation Region 9 (Great Basin), BGEPA = Bald and Golden Eagle Protection Act

2. Washington Department of Fish and Wildlife: C= Candidate, PS = Priority Species

3. Bird species not protected by the Migratory Bird Treaty Act.

Common Name	Scientific Name	Directly Observed	Sign Observed	Federal Status[1]	State Status[2]

References:

USFWS (U.S. Fish and Wildlife Service). 2021. Birds of Conservation Concern 2021. United States Department of Interior, Fish and Wildlife Service, Migratory Birds Program, Arlington, Virginia. 48 pp. Available online at: https://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php. Accessed August 2021.

USFWS. 2022. IPaC – Information for Planning and Consultation: Species list for Project location in Benton County, Washington. Available online at: https://ipac.ecosphere.fws.gov/location/R4XYUVU5BFDZTJZSRYT2BEW434/resources. Accessed May 2022.

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WDFW. 2021a. Priority Habitats and Species (PHS) on the Web. Available online at: https://wdfw.wa.gov/conservation/phs/. Accessed May 2022.

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WDFW. 2021d. 2021 PHS Distribution by County Spreadsheet. Available online at: https://wdfw.wa.gov/publications/00165. Accessed May 2022.

Wautoma Solar Energy Project
Solar Glare Analysis

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Prepared by:

April 2022

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Appendix A: Sandia Glare Analysis Reports
Appendix B: FAA Notice Criteria Tool

Acronyms and Abbreviations

Applicant	Innergex Renewable Development USA, LLC
ATC	air traffic control
ATCT	Air Traffic Control Tower
BESS	battery energy storage system
CFR	Code of Federal Regulations
DNI	direct normal irradiance
FAA	Federal Aviation Administration
MWac	megawatt of alternating current
NCT	Notice Criteria Tool
O&M	operations and maintenance
OEG	Obstruction Evaluation Group
Project	Wautoma Solar Energy Project
PV	photovoltaic
SAT	Single-axis trackers
SGHAT	Solar Glare Hazard Analysis Tool
SR	State Route

1.0 Overview

Innergex Renewable Development USA, LLC (the Applicant) proposes to construct and operate the Wautoma Solar Energy Project (Project). The Project is a 470-megawatt[1] solar photovoltaic (PV) generation facility coupled with a 4-hour battery energy storage system (BESS) sized to the maximum capacity of the Project, as well as related interconnection and ancillary support infrastructure, located in unincorporated Benton County, Washington (Figure 1).

2.0 Project Location and Site Setting

2.1 Location

The Project is generally located 12.5 miles northeast of the city of Sunnyside and 1 mile south of the State Route (SR) 241 and SR 24 interchange in Benton County, Washington.

This following terms are used to describe areas associated with Project development:

- **Project Lease Boundary**: The approximately 5,852-acre area that encompasses 35 privately owned assessor parcels that the Applicant has executed or is pursuing a Lease Agreement with the underlying property owner (Figure 2). Construction and operation of the Project are limited to the Project Area described below.

- **Project Area:** The approximately 4,573-acre area that includes all of the Project facilities, including solar PV system and BESS, Project substation, transmission line, operations and maintenance (O&M) building, and associated access roads.

2.2 Existing Setting

Current land uses in the Project Area include irrigated agriculture, rangeland, undeveloped land, local roads, and existing electrical utility infrastructure. Lands to the north, west, and south are zoned for agricultural purposes in Benton and Yakima counties with similar land uses as the Project Lease Boundary, as well as several rural residences. The Hanford Reach National Monument Rattlesnake Unit is located to the east.

The Project is located entirely on parcels in unincorporated Benton County within the Growth Management Act Agricultural District zone, defined by Benton County Code.

[1] Megawatt rating provided in alternating current (MWac)

3.0 Glare Analysis

3.1 Background

Tetra Tech conducted a glare analysis of the proposed Project (Appendix A). The Federal Aviation Administration (FAA) developed a Technical Guidance for Evaluating Selected Solar Technologies on Airports in 2018 and a final policy in 2021.

As an industry standard, the term "glint and glare analysis" is typically used to describe an analysis of potential ocular impacts to defined receptors. ForgeSolar defines glint and glare in the following statement:

> *Glint is typically defined as a momentary flash of bright light, often caused by a reflection off a moving source. A typical example of glint is a momentary solar reflection from a moving car. Glare is defined as a continuous source of bright light. Glare is generally associated with stationary objects, which, due to the slow relative movement of the sun, reflect sunlight for a longer duration* (Sandia Laboratories 2016).

Based on the ForgeSolar definitions of glint and glare and the unlikelihood that the Project's solar modules would rotate faster than the relative daily motion of the sun, the potential reflectance from the Project modeled throughout this report will be referred to as glare.

3.2 Regulatory

The FAA developed Technical Guidance for Evaluating Selected Solar Technologies on Airports in 2018 and finalized it in 2021 with 14 Code of Federal Regulations (CFR) Part 77 (86 FR 25801) (FAA 2021). The FAA's technical guidance is in addition to FAA regulatory guidance under 78 FR 63276 Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports (collectively referred to as FAA Guidance). The FAA Guidance recommends that glare analyses should be performed on a site-specific basis using the Sandia Laboratories Solar Glare Hazard Analysis Tool (SGHAT). This guidance applies to solar facilities located on federally obligated airport property; it is not mandatory for a proposed solar installation that is not on an airport (and for which a Form 7460-1 is filed with FAA pursuant to CFR Title 14 Part 77.9, as discussed below), but is considered to be an industry best practice for solar facilities in general. The SGHAT is the standard for measuring potential ocular impact as a result of solar facilities (78 FR 63276).

According to 78 FR 63276, the FAA has determined that "glint and glare from solar energy systems could result in an ocular impact to pilots and/or air traffic control (ATC) facilities and compromise the safety of the air transportation system" (FAA 2013). With the updated final FAA policy with 86 FR 25801, the narrative states that:

> *FAA has subsequently concluded that in most cases, the glint and glare from solar energy systems to pilots on final approach is similar to glint and glare pilots routinely experience from water bodies, glass facade buildings, parking lots, and similar features. However, FAA has continued to receive reports of potential glint and glare from on-airport solar energy systems on personnel working in Air Traffic Control Tower (ATCT) cabs. Therefore, FAA has determined the scope of agency policy should be focused on the impact of on-airport solar*

> *energy systems to federally-obligated towered airports, specifically the airport's ATCT cab* (FAA 2021).

The FAA has developed the following criteria for analysis of solar energy projects located on jurisdictional airports:

- No potential for glint or glare in the existing or planned ATC tower cab.
- Glint or glare along the final approach path for any existing landing threshold or future landing thresholds (including any planned interim phases of the landing thresholds) as shown on the current FAA-approved Airport Layout Plan is allowed. The final approach path is defined as 2 miles from 50 feet above the landing threshold using a standard three-degree glidepath.

3.3 Methodology

3.3.1 FAA Notice Criteria Tool

The online FAA Notice Criteria Tool (NCT) reports whether a proposed structure is in proximity to a jurisdictional air navigation facility and if formal submission to the FAA Obstruction Evaluation Group (OEG) under CFR Title 14 Part 77.9 (Safe, Efficient Use, and Preservation of the Navigable Airspace) is recommended (FAA 2010). The NCT also identifies final approach flight paths that may be considered vulnerable to a proposed structure's impact on navigation signal reception. The NCT was used to determine if the proposed Project is located within an FAA-identified impact area based on the Project area boundaries and height above ground surface (FAA 2022). The FAA NCT report stated that the Project Area does not exceed notice criteria (see Appendix B). Based on this information, there is no need to submit to FAA OEG.

3.3.2 Sandia Laboratories Solar Glare Hazard Analysis Tool

Tetra Tech used the SGHAT technology as part of an online tool (GlareGauge) developed by Sandia National Laboratories and hosted by ForgeSolar (Sandia Laboratories 2016). GlareGauge provides a quantitative assessment of the following:

- When and where glare has the potential to occur throughout the year for a defined solar array polygon; and
- Potential effects on the human eye at locations where glare is predicted.

The following statement was issued by Sandia Laboratories regarding the SGHAT technology:

> *Sandia developed SGHAT v. 3.0, a web-based tool and methodology to evaluate potential glint/glare associated with solar energy installations. The validated tool provides a quantified assessment of when and where glare will occur, as well as information about potential ocular impacts. The calculations and methods are based on analyses, test data, a database of different photovoltaic module surfaces (e.g. anti-reflective coating, texturing), and models developed over several years at Sandia. The results are presented in a simple easy-to-interpret plot that*

specifies when glare will occur throughout the year, with color indicating the potential ocular hazard (Sandia Laboratories 2016).

Note that technology changes continue to occur to address issues such as reflectivity. The model, therefore, presents a conservative assessment based on simplifying assumptions inherent in the model as well as industry improvements since the most recent update of such assumptions.

Based on the predicted retinal irradiance (intensity) and subtended angle (size/distance) of the glare source to receptor, the GlareGauge categorizes potential glare where it is predicted by the model to occur in accordance with three tiers of severity (ocular hazards) that are shown by different colors in the model output:

- Red glare: glare predicted with a potential for permanent eye damage (retinal burn)
- Yellow glare: glare predicted with a potential for temporary after-image
- Green glare: glare predicted with a low potential for temporary after-image

These categories of glare are calculated using a typical observer's blink response time, ocular transmission coefficient (the amount of radiation absorbed in the eye prior to reaching the retina), pupil diameter, and eye focal length (the distance between where rays intersect in the eye and the retina). As a point of comparison, direct viewing of the sun without a filter is considered to be on the border between yellow glare and red glare, while typical camera flashes are considered to be lower tier yellow glare (approximately 3 orders of magnitude less than direct viewing of the sun). Upon exposure to yellow glare, the observer may experience a temporary spot in their vision temporarily lasting after the exposure. Upon exposure to green glare, the observer may experience a bright reflection but typically no spot lasting after exposure.

3.3.3 Glare Analysis Assumptions

The GlareGauge model is bound by conservative limitations. The following assumptions provide a level of conservatism to the GlareGauge model:

- The GlareGauge model simulates solar arrays as infinitesimally small modules within planar convex polygons exemplifying the tilt and orientation characteristics defined by the user. Gaps between modules, variable heights of the solar array within the polygons, and supporting structures are not considered in the analysis. Since the actual module rows will be separated by open space, this model assumption could result in indication of glare in locations where solar modules will not be located. In addition, the supporting structures are considered to have reflectivity values that are negligible relative to the module surfaces included in the model.
- The GlareGauge model assumes that the observation point receptor can view the entire solar array segment when predicting glare minutes. However, it may be that the receptor at the observation point may only be able to view a small portion (typically the most proximal edge) of the solar array segment. Therefore, the predicted glare minutes and intensity from a specific solar array to a specific observation point are conservative because the observer will likely not experience glare from the entire solar array segment at once.

- The GlareGauge model does not consider obstacles (either man-made or natural) between the defined solar arrays and the receptors such as vegetative screening (existing or planted), buildings, topography, etc. Where such features exist, they would screen views of the Project, thus minimizing or eliminating glare from those locations.
- The GlareGauge model does not consider the potential effect of shading from existing topography between the sun and the Project outside of the defined areas.
- The direct normal irradiance (DNI) is defined as variable using a typical clear day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum of 1,000 watts per square meter at solar noon. The irradiance profile uses the coordinates from Google Maps and a sun position algorithm to scale the DNI throughout the year. The actual daily DNI would be affected by precipitation, cloud cover, atmospheric attenuation (radiation intensity affected by gaseous constituents), and other environmental factors not considered in the GlareGauge model. This may result in modeled predicted glare occurrences when in fact the glare is not actually occurring due to cloud cover, rain, or other atmospheric conditions.

Hazard zone boundaries shown in the Glare Hazard plots are an approximation; actual ocular impacts encompass a continuous, not discrete, spectrum.

3.3.4 Glare Analysis Methodology

The SGHAT (GlareGauge) was used to evaluate the potential for glare in areas surrounding the Project (Appendix A). The Project layout inputted into the GlareGauge model consists of 18 separate "PV Array Areas," which are segmented polygons generally representative of the proposed Project layout (Figure 1).

Two separate glare analyses were conducted that included three proximal segmented vehicular traffic routes and four observation points (Figure 2). The observation points correspond with four non-participating receptor residence locations as shown on Figure 2. The two analyses differ in the height assumed for these points with Analysis Scenario 1 representing the point of view from an average first floor residential/commercial structure and typical commuter car, while Analysis Scenario 2 represents the point of view from an average second floor residential/commercial structure and typical semi-tractor-trailer truck.

The glare analysis represents single-axis trackers, or SAT systems, which follow the rotation of the sun along the east-west axis throughout the day. SAT arrays are typically oriented with their axis of rotation aligned north to south. The rotation angles over which the modules track the sun was set to +/- 60° east to west.

3.4 Glare Impacts

Glare impact analysis was conducted for the two analysis scenarios (see Appendix A). There was no glare predicted for Analysis Scenario 1 (average first floor residential/commercial structure and typical commuter car) or Analysis Scenario 2 (average second floor residential/commercial structure and typical semi-tractor-trailer truck). SAT systems may reduce glare for nearby

receptors because they typically reduce the incidence angle between the modules and the sun, yielding smaller glancing angles and a higher vertical trajectory for glare reflections.

As previously noted, the GlareGauge model does not account for varying ambient conditions (i.e., cloudy days, precipitation); atmospheric attenuation; screening due to existing topography not located within the defined array layouts; or existing vegetation or structures (including fences or walls); therefore, the predicted results are considered to be conservative.

Based on the results of the FAA NCT, the Project does not need to formally file with the FAA OEG because it did not exceed notice criteria.

4.0 References

FAA (Federal Aviation Administration) 2010. CFR Title 14 Part 77.9 Notice of Proposed Construction or Alteration Requiring Notice.

FAA. 2013. Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports. 78 FR 63276. October 23, 2013.

FAA. 2021. FAA Policy: Review of Solar Energy System Projects on Federally-Obligated Airports. 86 FR 25801. May 11, 2021.

FAA. 2022. Federal Aviation Administration Notice Criteria Tool. Obstruction Evaluation Version 2018.1.4. Accessed online at: https://oeaaa.faa.gov/oeaaa/external/gisTools/gisAction.jsp?action=showNoNoticeRequiredToolForm.

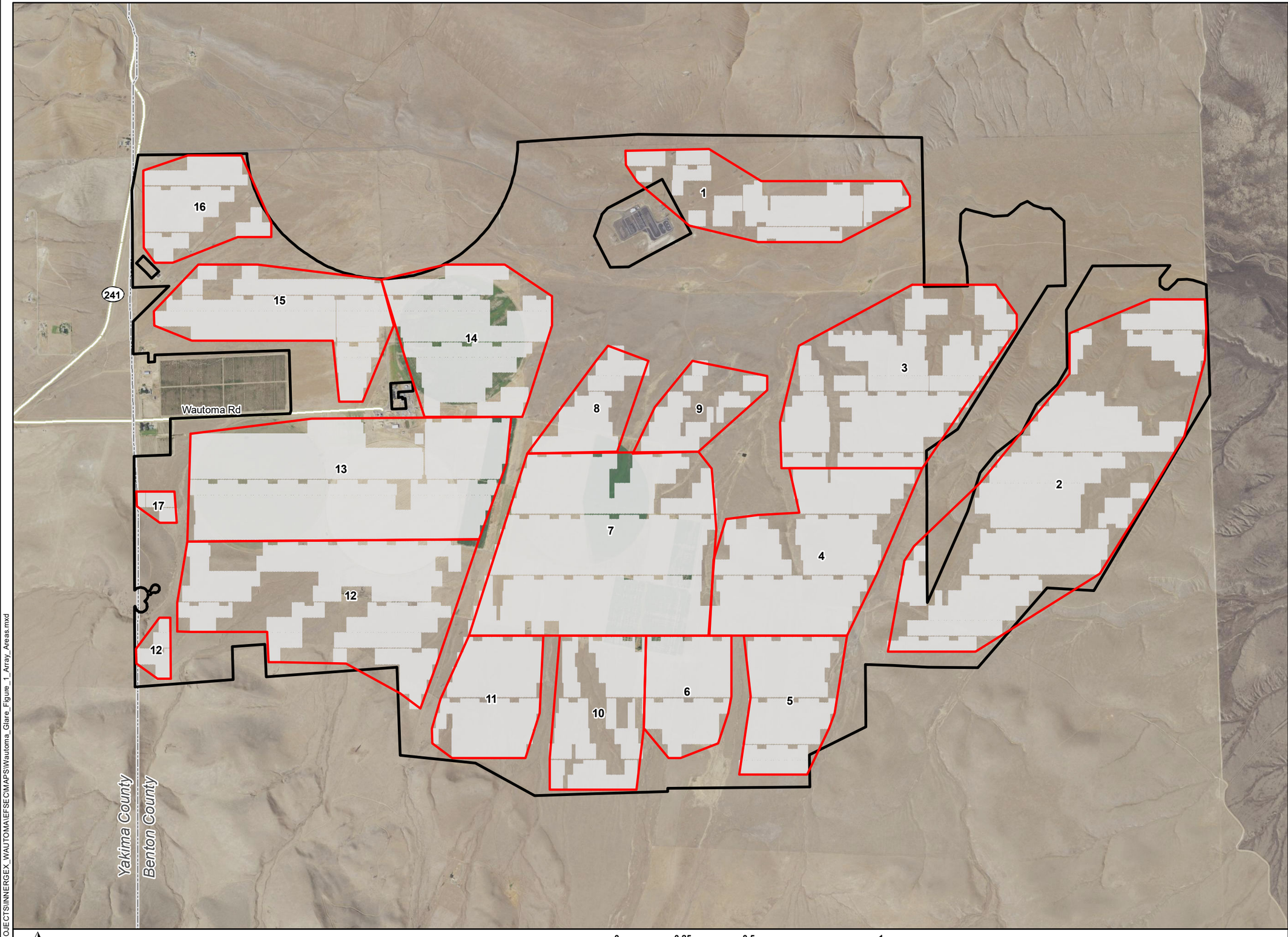
Sandia Laboratories. 2016. Sandia Solar Glare Hazard Analysis Tool, GlareGauge hosted by ForgeSolar. Accessed online at: https://www.forgesolar.com/.

Figures

Wautoma Solar

Figure 1
PV Array Areas

BENTON AND YAKIMA COUNTIES, WA



- Project Area
- Solar Array
- Array Analysis Areas
- County Boundary

INNERGEX TETRA TECH

Reference Map

1:22,000 NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

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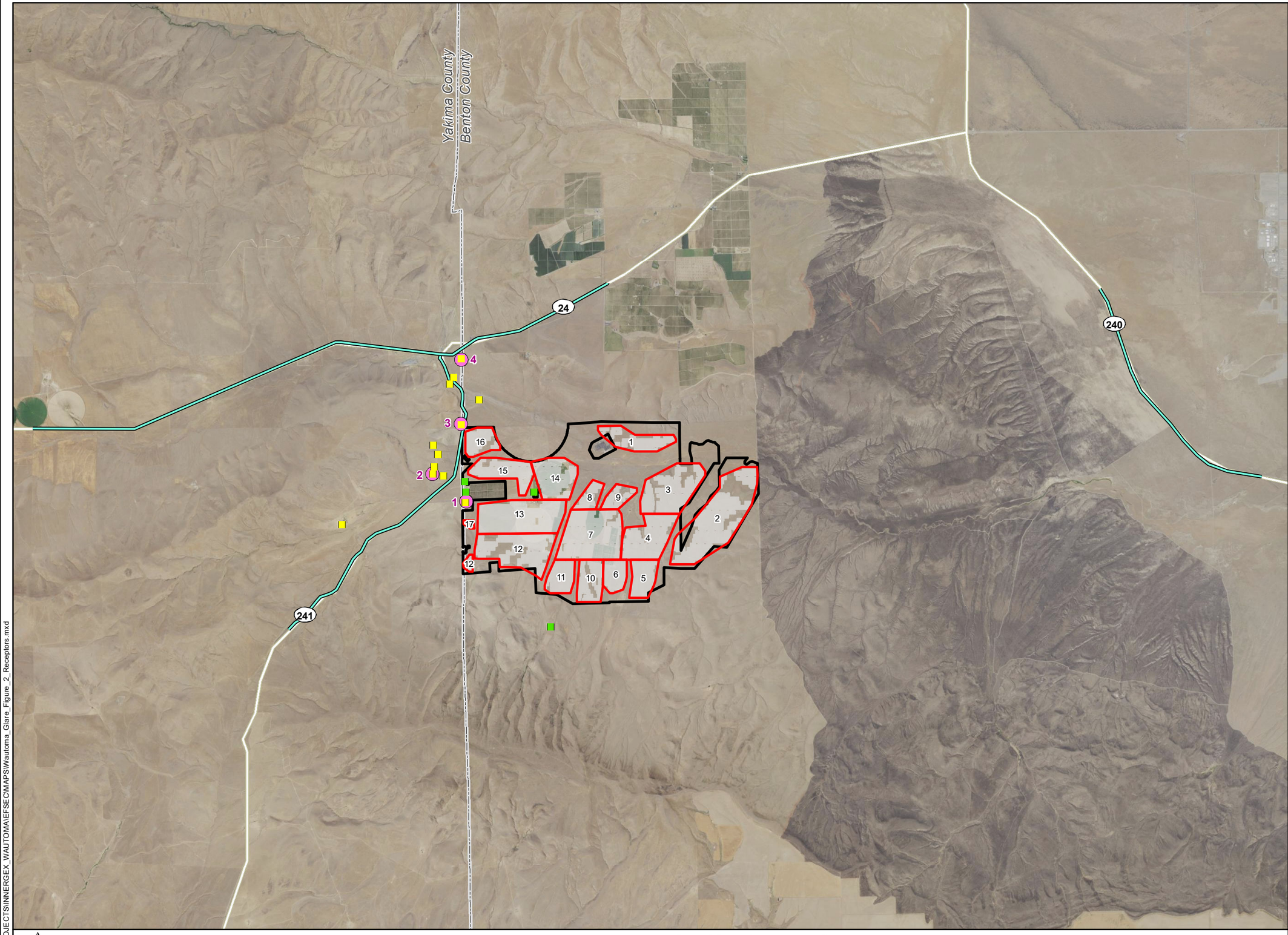
Wautoma Solar

Figure 2
Receptors

BENTON AND YAKIMA COUNTIES, WA



- Project Area
- Solar Array
- Array Analysis Areas
- Participating Receptor
- Non-Participating Receptor
- Observation Point
- State Highway
- Road Segment Analyzed
- County Boundary

INNERGEX TETRA TECH

Reference Map

1:80,000 NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 0.5 1 2 Miles

NOT FOR CONSTRUCTION

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Appendix A: Sandia Glare Analysis Reports

FORGESOLAR GLARE ANALYSIS

Project: **Cypress Creek**
Site configuration: **Wautoma Analysis 1 04122022**
Analysis conducted by Drew Timmis (drew.timmis@tetratech.com) at 12:56 on 12 Apr, 2022.

U.S. FAA 2013 Policy Adherence

The following table summarizes the policy adherence of the glare analysis based on the 2013 U.S. Federal Aviation Administration Interim Policy 78 FR 63276. This policy requires the following criteria be met for solar energy systems on airport property:

- No "yellow" glare (potential for after-image) for any flight path from threshold to 2 miles
- No glare of any kind for Air Traffic Control Tower(s) ("ATCT") at cab height.
- Default analysis and observer characteristics (see list below)

ForgeSolar does not represent or speak officially for the FAA and cannot approve or deny projects. Results are informational only.

COMPONENT	STATUS	DESCRIPTION
Analysis parameters	PASS	Analysis time interval and eye characteristics used are acceptable
2-mile flight path(s)	N/A	No flight paths analyzed
ATCT(s)	N/A	No ATCT receptors designated

Default glare analysis parameters and observer eye characteristics (for reference only):

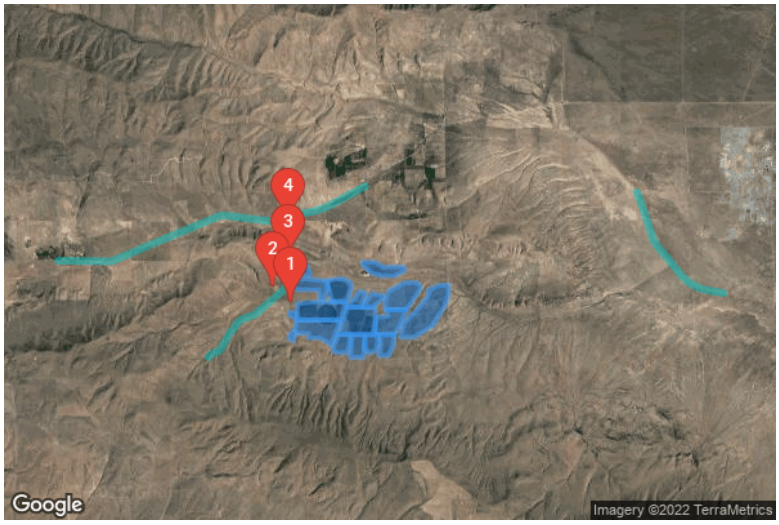
- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

FAA Policy 78 FR 63276 can be read at https://www.federalregister.gov/d/2013-24729

SITE CONFIGURATION

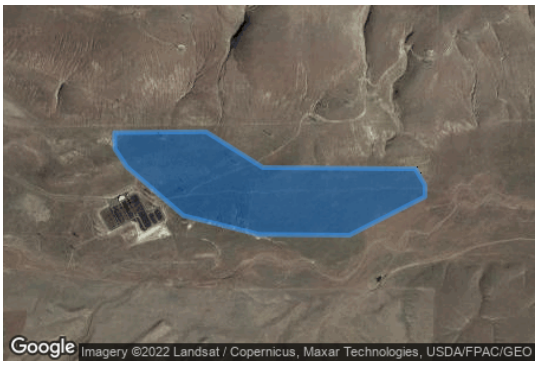
Analysis Parameters

DNI: peaks at 1,000.0 W/m^2
Time interval: 1 min
Ocular transmission coefficient: 0.5
Pupil diameter: 0.002 m
Eye focal length: 0.017 m
Sun subtended angle: 9.3 mrad
Site Config ID: 67483.11533
Methodology: V2



PV Array(s)

Name: PV array 1
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.519418	-119.835278	1063.05	5.40	1068.45
2	46.519465	-119.828639	1055.05	5.40	1060.45
3	46.517683	-119.824512	1021.03	5.40	1026.43
4	46.517617	-119.813423	980.05	5.40	985.45
5	46.516793	-119.812729	946.05	5.40	951.45
6	46.516225	-119.812736	935.05	5.40	940.45
7	46.514313	-119.818217	946.05	5.40	951.45
8	46.514352	-119.824817	970.19	5.40	975.59
9	46.515286	-119.830262	997.05	5.40	1002.45
10	46.517719	-119.834392	1022.88	5.40	1028.28
11	46.518626	-119.835261	1042.52	5.40	1047.92

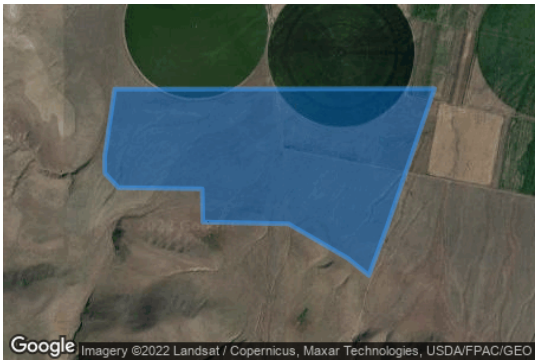
Name: PV array 10
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492876	-119.840810	1104.30	5.40	1109.70
2	46.492836	-119.833948	1103.24	5.40	1108.64
3	46.487755	-119.834186	1182.53	5.40	1187.93
4	46.484399	-119.834843	1255.12	5.40	1260.52
5	46.484439	-119.841704	1244.99	5.40	1250.39
6	46.486160	-119.841683	1212.70	5.40	1218.10

Name: PV array 11
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

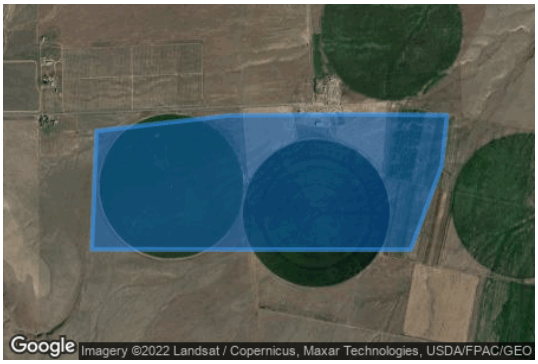
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492917	-119.848023	1115.49	5.40	1120.89
2	46.492883	-119.842130	1107.03	5.40	1112.43
3	46.488623	-119.842445	1169.86	5.40	1175.26
4	46.486171	-119.843618	1222.15	5.40	1227.55
5	46.486204	-119.849423	1245.20	5.40	1250.60
6	46.487033	-119.850997	1240.64	5.40	1246.04
7	46.487825	-119.851014	1225.33	5.40	1230.73
8	46.489460	-119.850290	1186.50	5.40	1191.90

Name: PV array 12
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



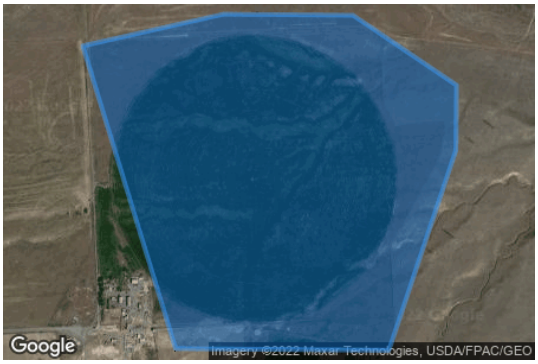
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.488922	-119.851996	1211.16	5.40	1216.56
2	46.491463	-119.850623	1151.03	5.40	1156.43
3	46.498229	-119.847233	1071.13	5.40	1076.53
4	46.498200	-119.870450	1217.24	5.40	1222.64
5	46.494828	-119.871187	1287.29	5.40	1292.69
6	46.494019	-119.871171	1308.65	5.40	1314.05
7	46.493295	-119.870192	1318.88	5.40	1324.28
8	46.493236	-119.864098	1239.05	5.40	1244.45
9	46.491581	-119.864056	1244.39	5.40	1249.79
10	46.491493	-119.857833	1216.22	5.40	1221.62
11	46.489779	-119.853541	1213.60	5.40	1219.00

Name: PV array 13
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



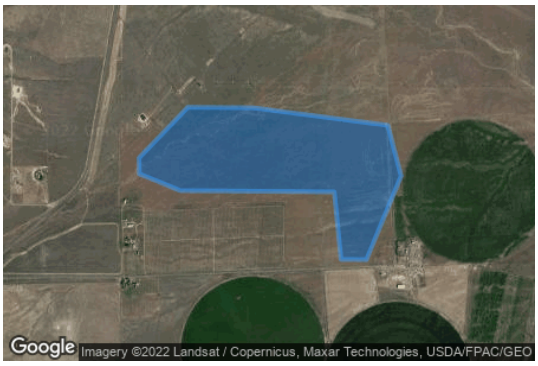
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.498200	-119.870312	1219.25	5.40	1224.65
2	46.498180	-119.847146	1071.25	5.40	1076.65
3	46.502347	-119.844896	1050.53	5.40	1055.93
4	46.504886	-119.844514	1043.64	5.40	1049.04
5	46.504925	-119.851377	1054.96	5.40	1060.36
6	46.504866	-119.860353	1093.79	5.40	1099.19
7	46.504100	-119.869980	1153.24	5.40	1158.64

Name: PV array 14
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.504925	-119.851377	1054.81	5.40	1060.21
2	46.504881	-119.843634	1039.87	5.40	1045.27
3	46.509866	-119.841198	1028.36	5.40	1033.76
4	46.511478	-119.841178	1009.76	5.40	1015.16
5	46.513221	-119.844941	1036.83	5.40	1042.23
6	46.513248	-119.849632	1036.88	5.40	1042.28
7	46.512457	-119.854746	1065.78	5.40	1071.18

Name: PV array 15
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

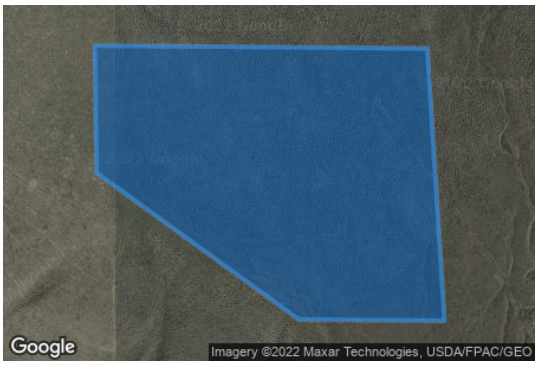


Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.509938	-119.853781	1064.50	5.40	1069.90
2	46.505772	-119.856295	1079.09	5.40	1084.49
3	46.505783	-119.858142	1089.01	5.40	1094.41
4	46.509146	-119.858631	1084.87	5.40	1090.27
5	46.509208	-119.869806	1050.57	5.40	1055.97
6	46.510044	-119.872789	1168.71	5.40	1174.11
7	46.510836	-119.872806	1167.94	5.40	1173.34
8	46.513358	-119.869257	1132.93	5.40	1138.33
9	46.513332	-119.864566	1111.49	5.40	1116.89
10	46.512457	-119.854746	1065.48	5.40	1070.88

Name: PV array 16
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

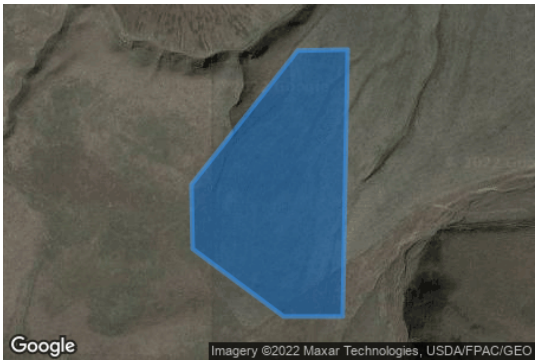
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.518553	-119.873551	1124.45	5.40	1129.86
2	46.519353	-119.870021	1103.73	5.40	1109.13
3	46.519330	-119.865770	1089.45	5.40	1094.85
4	46.515633	-119.863435	1094.46	5.40	1099.86
5	46.514841	-119.863444	1097.21	5.40	1102.61
6	46.514856	-119.866084	1110.91	5.40	1116.31
7	46.513486	-119.871295	1141.51	5.40	1146.91
8	46.513494	-119.872703	1144.76	5.40	1150.16
9	46.514319	-119.873574	1141.44	5.40	1146.84

Name: PV array 17
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



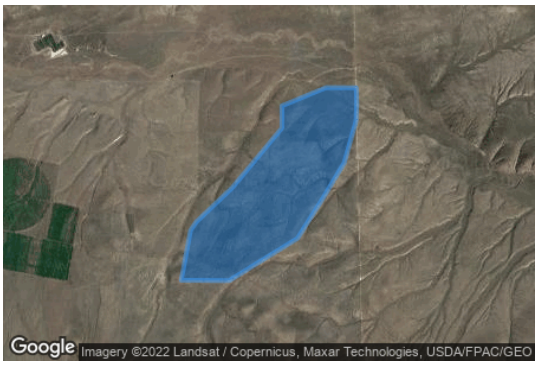
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.500942	-119.874303	1176.45	5.40	1181.85
2	46.500925	-119.871285	1179.42	5.40	1184.82
3	46.499230	-119.871129	1203.26	5.40	1208.66
4	46.499237	-119.872449	1201.33	5.40	1206.73
5	46.500149	-119.874286	1182.92	5.40	1188.32

Name: PV array 18
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



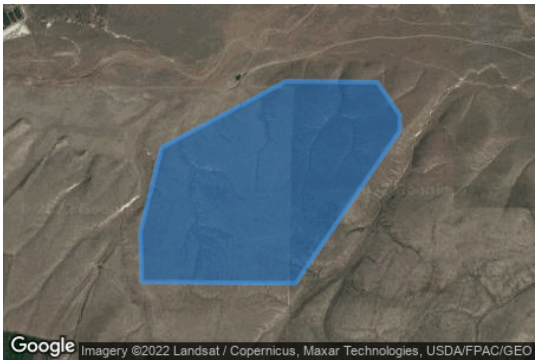
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492353	-119.874467	1374.91	5.40	1380.32
2	46.491555	-119.874446	1382.72	5.40	1388.12
3	46.490713	-119.872794	1401.04	5.40	1406.44
4	46.490713	-119.871721	1394.50	5.40	1399.90
5	46.494037	-119.871632	1319.94	5.40	1325.34
6	46.494024	-119.872539	1333.24	5.40	1338.64

Name: PV array 2
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.509195	-119.800170	1712.97	5.40	1718.37
2	46.511028	-119.793712	1855.47	5.40	1860.87
3	46.511001	-119.789373	2000.86	5.40	2006.26
4	46.509389	-119.789306	2100.83	5.40	2106.23
5	46.507668	-119.789417	2191.34	5.40	2196.74
6	46.503498	-119.791143	2390.50	5.40	2395.90
7	46.500156	-119.794090	2281.15	5.40	2286.55
8	46.496000	-119.797927	2425.13	5.40	2430.53
9	46.491798	-119.807835	2303.99	5.40	2309.39
10	46.491840	-119.814784	2213.16	5.40	2218.56
11	46.496804	-119.813428	2195.98	5.40	2201.38
12	46.497619	-119.812626	2192.87	5.40	2198.27
13	46.501030	-119.807392	2087.01	5.40	2092.41
14	46.506988	-119.800172	1934.89	5.40	1940.29

Name: PV array 3
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.511944	-119.812619	1594.47	5.40	1599.87
2	46.511903	-119.805993	1692.00	5.40	1697.40
3	46.510254	-119.804342	2014.11	5.40	2019.51
4	46.509462	-119.804352	1988.23	5.40	1993.63
5	46.501885	-119.811928	1835.91	5.40	1841.31
6	46.501952	-119.823102	1705.10	5.40	1710.50
7	46.504466	-119.823185	1549.70	5.40	1555.10
8	46.508637	-119.821637	1474.03	5.40	1479.43

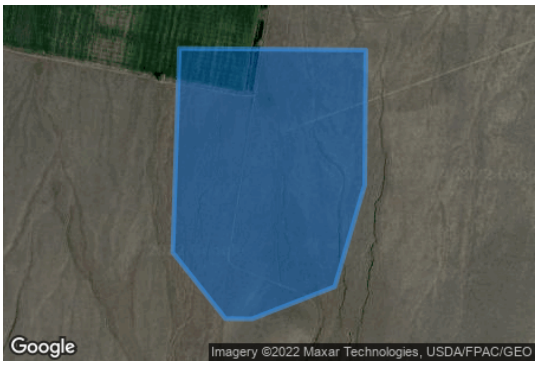
Name: PV array 4
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.501948	-119.822486	1065.13	5.40	1070.53
2	46.501885	-119.811928	1048.71	5.40	1054.11
3	46.496088	-119.815608	1069.83	5.40	1075.23
4	46.492742	-119.818026	1106.54	5.40	1111.94
5	46.492807	-119.829022	1099.23	5.40	1104.63
6	46.496957	-119.828557	1070.05	5.40	1075.45
7	46.499186	-119.827535	1041.49	5.40	1046.89
8	46.499395	-119.824981	1069.48	5.40	1074.88
9	46.499485	-119.821725	1062.62	5.40	1068.02

Name: PV array 5
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

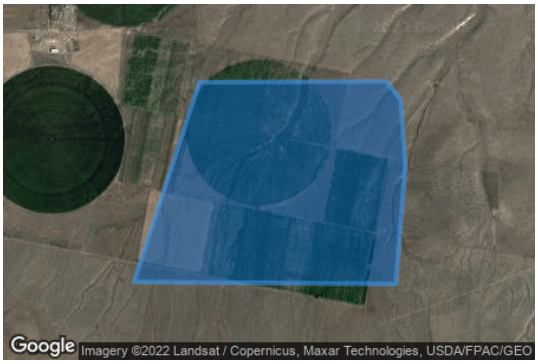
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492742	-119.818026	1107.38	5.40	1112.78
2	46.488486	-119.819047	1146.48	5.40	1151.88
3	46.487669	-119.819497	1161.15	5.40	1166.55
4	46.485139	-119.821288	1179.77	5.40	1185.17
5	46.485170	-119.826653	1214.13	5.40	1219.53
6	46.489427	-119.825721	1149.58	5.40	1154.98
7	46.492791	-119.826207	1106.29	5.40	1111.69

Name: PV array 6
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492836	-119.833948	1103.20	5.40	1108.60
2	46.492796	-119.827174	1103.83	5.40	1109.23
3	46.489436	-119.827216	1149.64	5.40	1155.04
4	46.486901	-119.828303	1190.43	5.40	1195.83
5	46.486100	-119.831304	1209.48	5.40	1214.88
6	46.486105	-119.832271	1211.64	5.40	1217.04
7	46.487755	-119.834186	1182.61	5.40	1188.01

Name: PV array 7
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492917	-119.848023	1115.08	5.40	1120.48
2	46.492807	-119.829022	1101.23	5.40	1106.63
3	46.498622	-119.828334	1041.88	5.40	1047.28
4	46.500345	-119.828489	1035.15	5.40	1040.55
5	46.501957	-119.828645	1203.65	5.40	1209.05
6	46.502893	-119.829690	1026.52	5.40	1031.92
7	46.502862	-119.843267	1037.85	5.40	1043.25

Name: PV array 8
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.508726	-119.836772	1020.94	5.40	1026.34
2	46.507888	-119.833588	1019.95	5.40	1025.35
3	46.502930	-119.836112	1033.42	5.40	1038.82
4	46.502862	-119.843267	1037.20	5.40	1042.60

Name: PV array 9
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.502814	-119.834908	1033.64	5.40	1039.04
2	46.505344	-119.833118	1027.71	5.40	1033.11
3	46.507867	-119.830095	1004.15	5.40	1009.55
4	46.507013	-119.824183	997.71	5.40	1003.11
5	46.506221	-119.824193	1005.16	5.40	1010.56
6	46.502893	-119.829690	1025.80	5.40	1031.20

Discrete Observation Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (ft)	Height (ft)
OP 1	1	46.504524	-119.873315	1171.36	6.00
OP 2	2	46.510264	-119.882975	1359.86	6.00
OP 3	3	46.519947	-119.874721	1143.93	6.00
OP 4	4	46.533278	-119.874839	1291.04	6.00

Route Receptor(s)

Name: Highway 24
Path type: Two-way
Observer view angle: 50.0°

Note: Route receptors are excluded from this FAA policy review. Use the 2-mile flight path receptor to simulate flight paths according to FAA guidelines.

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.519890	-119.997670	1634.52	5.00	1639.52
2	46.519624	-119.969346	1545.69	5.00	1550.69
3	46.522814	-119.958274	1481.59	5.00	1486.59
4	46.530815	-119.930637	1417.09	5.00	1422.09
5	46.536424	-119.910981	1355.33	5.00	1360.33
6	46.536454	-119.909351	1351.83	5.00	1356.83
7	46.533974	-119.880254	1274.23	5.00	1279.23
8	46.533915	-119.878065	1291.74	5.00	1296.74
9	46.534092	-119.876563	1304.75	5.00	1309.75
10	46.537074	-119.869697	1431.58	5.00	1436.58
11	46.537605	-119.864332	1471.77	5.00	1476.77
12	46.538314	-119.859526	1461.48	5.00	1466.48
13	46.539436	-119.854934	1451.11	5.00	1456.11
14	46.541827	-119.848153	1438.48	5.00	1443.48
15	46.547110	-119.833991	1479.68	5.00	1484.68

Name: Highway 240
Path type: Two-way
Observer view angle: 50.0°

Note: Route receptors are excluded from this FAA policy review. Use the 2-mile flight path receptor to simulate flight paths according to FAA guidelines.

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.507988	-119.642617	614.88	5.00	619.88
2	46.509081	-119.651157	629.17	5.00	634.17
3	46.509731	-119.655105	631.02	5.00	636.02
4	46.511591	-119.660555	632.99	5.00	637.99
5	46.513777	-119.664160	636.20	5.00	641.20
6	46.518177	-119.669524	637.60	5.00	642.60
7	46.525766	-119.678580	639.25	5.00	644.25
8	46.527125	-119.679867	637.13	5.00	642.13
9	46.543066	-119.687721	641.81	5.00	646.81
10	46.545008	-119.688950	643.74	5.00	648.74

Name: Highway 241
Path type: Two-way
Observer view angle: 50.0°

Note: Route receptors are excluded from this FAA policy review. Use the 2-mile flight path receptor to simulate flight paths according to FAA guidelines.

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.484548	-119.917503	1864.29	5.00	1869.29
2	46.485405	-119.916366	1839.71	5.00	1844.71
3	46.485966	-119.915229	1820.79	5.00	1825.79
4	46.486306	-119.913813	1800.68	5.00	1805.68
5	46.486676	-119.912375	1780.42	5.00	1785.42
6	46.487414	-119.911066	1760.79	5.00	1765.79
7	46.488936	-119.909628	1726.39	5.00	1731.39
8	46.493589	-119.906023	1615.97	5.00	1620.97
9	46.493944	-119.905530	1606.37	5.00	1611.37
10	46.494815	-119.904135	1581.04	5.00	1586.04
11	46.497133	-119.901981	1542.39	5.00	1547.39
12	46.498373	-119.899771	1501.10	5.00	1506.11
13	46.499378	-119.895780	1433.76	5.00	1438.76
14	46.500013	-119.893119	1395.77	5.00	1400.77
15	46.500338	-119.892282	1382.41	5.00	1387.41
16	46.508564	-119.878442	1218.39	5.00	1223.40
17	46.509524	-119.876961	1195.26	5.00	1200.26
18	46.510292	-119.876489	1189.17	5.00	1194.17
19	46.521780	-119.873421	1130.93	5.00	1135.93
20	46.522489	-119.873485	1130.79	5.00	1135.79
21	46.523449	-119.874429	1131.99	5.00	1136.99
22	46.524113	-119.874580	1131.08	5.00	1136.08
23	46.525560	-119.874172	1129.08	5.00	1134.08
24	46.526623	-119.874322	1140.42	5.00	1145.42
25	46.527627	-119.875266	1154.05	5.00	1159.05
26	46.529088	-119.877970	1179.84	5.00	1184.84
27	46.531421	-119.879343	1218.33	5.00	1223.34
28	46.532484	-119.880309	1239.69	5.00	1244.69
29	46.533148	-119.880545	1257.80	5.00	1262.80
30	46.533783	-119.880480	1272.13	5.00	1277.13

GLARE ANALYSIS RESULTS

Summary of Glare

PV Array Name	Tilt (°)	Orient (°)	"Green" Glare min	"Yellow" Glare min	Energy kWh
PV array 1	SA tracking	SA tracking	0	0	-
PV array 10	SA tracking	SA tracking	0	0	-
PV array 11	SA tracking	SA tracking	0	0	-
PV array 12	SA tracking	SA tracking	0	0	-
PV array 13	SA tracking	SA tracking	0	0	-
PV array 14	SA tracking	SA tracking	0	0	-
PV array 15	SA tracking	SA tracking	0	0	-
PV array 16	SA tracking	SA tracking	0	0	-
PV array 17	SA tracking	SA tracking	0	0	-
PV array 18	SA tracking	SA tracking	0	0	-
PV array 2	SA tracking	SA tracking	0	0	-
PV array 3	SA tracking	SA tracking	0	0	-
PV array 4	SA tracking	SA tracking	0	0	-
PV array 5	SA tracking	SA tracking	0	0	-
PV array 6	SA tracking	SA tracking	0	0	-
PV array 7	SA tracking	SA tracking	0	0	-
PV array 8	SA tracking	SA tracking	0	0	-
PV array 9	SA tracking	SA tracking	0	0	-

Total annual glare received by each receptor

Receptor	Annual Green Glare (min)	Annual Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Results for: PV array 1

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 10

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 11

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 12

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 13

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 14

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 15

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 16

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 17

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 18

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 2

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 3

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 4

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 5

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 6

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 7

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 8

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 9

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover and geographic obstructions.
Several calculations utilize the PV array centroid, rather than the actual glare spot location, due to V1 algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Glare vector plots are simplified representations of analysis data. Actual glare emanations and results may differ.
The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual results and glare occurrence may differ.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

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FORGESOLAR GLARE ANALYSIS

Project: **Cypress Creek**
Site configuration: **Wautoma Analysis 2 04122022**
Analysis conducted by Drew Timmis (drew.timmis@tetratech.com) at 13:16 on 12 Apr, 2022.

U.S. FAA 2013 Policy Adherence

The following table summarizes the policy adherence of the glare analysis based on the 2013 U.S. Federal Aviation Administration Interim Policy 78 FR 63276. This policy requires the following criteria be met for solar energy systems on airport property:

- No "yellow" glare (potential for after-image) for any flight path from threshold to 2 miles
- No glare of any kind for Air Traffic Control Tower(s) ("ATCT") at cab height.
- Default analysis and observer characteristics (see list below)

ForgeSolar does not represent or speak officially for the FAA and cannot approve or deny projects. Results are informational only.

COMPONENT	STATUS	DESCRIPTION
Analysis parameters	PASS	Analysis time interval and eye characteristics used are acceptable
2-mile flight path(s)	N/A	No flight paths analyzed
ATCT(s)	N/A	No ATCT receptors designated

Default glare analysis parameters and observer eye characteristics (for reference only):

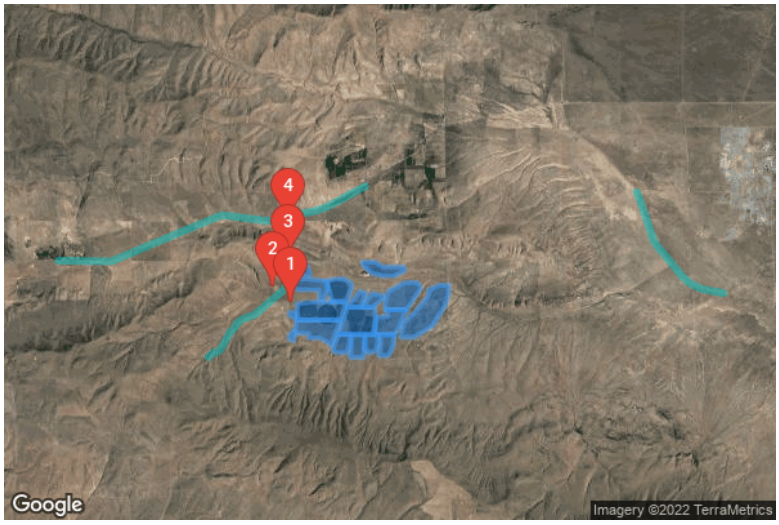
- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

FAA Policy 78 FR 63276 can be read at https://www.federalregister.gov/d/2013-24729

SITE CONFIGURATION

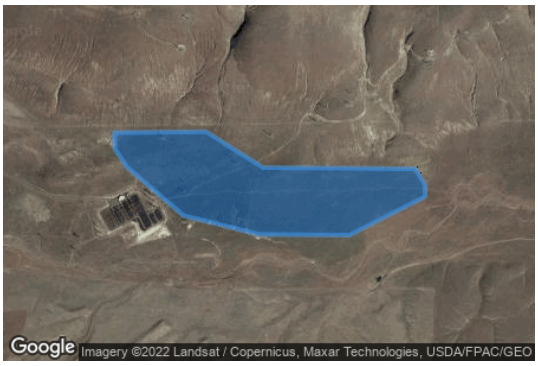
Analysis Parameters

DNI: peaks at 1,000.0 W/m^2
Time interval: 1 min
Ocular transmission coefficient: 0.5
Pupil diameter: 0.002 m
Eye focal length: 0.017 m
Sun subtended angle: 9.3 mrad
Site Config ID: 67484.11533
Methodology: V2



PV Array(s)

Name: PV array 1
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.519418	-119.835278	1063.05	5.40	1068.45
2	46.519465	-119.828639	1055.05	5.40	1060.45
3	46.517683	-119.824512	1021.03	5.40	1026.43
4	46.517617	-119.813423	980.05	5.40	985.45
5	46.516793	-119.812729	946.05	5.40	951.45
6	46.516225	-119.812736	935.05	5.40	940.45
7	46.514313	-119.818217	946.05	5.40	951.45
8	46.514352	-119.824817	970.19	5.40	975.59
9	46.515286	-119.830262	997.05	5.40	1002.45
10	46.517719	-119.834392	1022.88	5.40	1028.28
11	46.518626	-119.835261	1042.52	5.40	1047.92

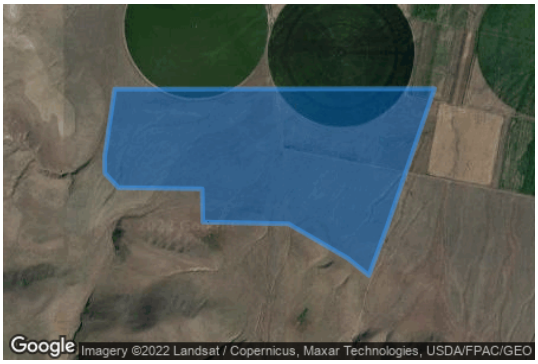
Name: PV array 10
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492876	-119.840810	1104.30	5.40	1109.70
2	46.492836	-119.833948	1103.24	5.40	1108.64
3	46.487755	-119.834186	1182.53	5.40	1187.93
4	46.484399	-119.834843	1255.12	5.40	1260.52
5	46.484439	-119.841704	1244.99	5.40	1250.39
6	46.486160	-119.841683	1212.70	5.40	1218.10

Name: PV array 11
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

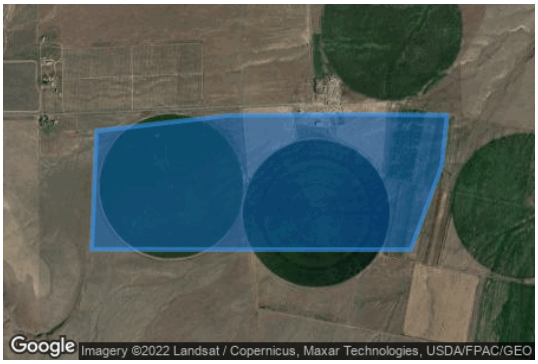
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492917	-119.848023	1115.49	5.40	1120.89
2	46.492883	-119.842130	1107.03	5.40	1112.43
3	46.488623	-119.842445	1169.86	5.40	1175.26
4	46.486171	-119.843618	1222.15	5.40	1227.55
5	46.486204	-119.849423	1245.20	5.40	1250.60
6	46.487033	-119.850997	1240.64	5.40	1246.04
7	46.487825	-119.851014	1225.33	5.40	1230.73
8	46.489460	-119.850290	1186.50	5.40	1191.90

Name: PV array 12
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



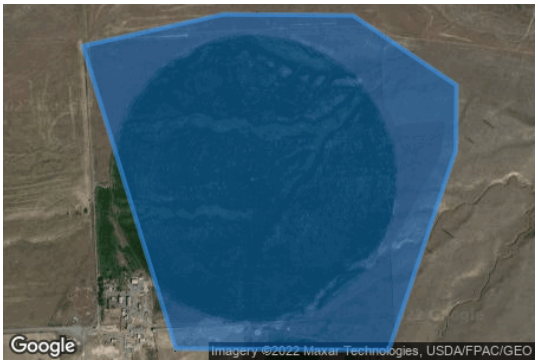
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.488922	-119.851996	1211.16	5.40	1216.56
2	46.491463	-119.850623	1151.03	5.40	1156.43
3	46.498229	-119.847233	1071.13	5.40	1076.53
4	46.498200	-119.870450	1217.24	5.40	1222.64
5	46.494828	-119.871187	1287.29	5.40	1292.69
6	46.494019	-119.871171	1308.65	5.40	1314.05
7	46.493295	-119.870192	1318.88	5.40	1324.28
8	46.493236	-119.864098	1239.05	5.40	1244.45
9	46.491581	-119.864056	1244.39	5.40	1249.79
10	46.491493	-119.857833	1216.22	5.40	1221.62
11	46.489779	-119.853541	1213.60	5.40	1219.00

Name: PV array 13
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



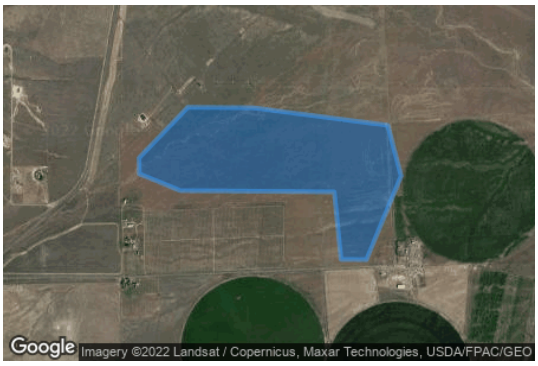
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.498200	-119.870312	1219.25	5.40	1224.65
2	46.498180	-119.847146	1071.25	5.40	1076.65
3	46.502347	-119.844896	1050.53	5.40	1055.93
4	46.504886	-119.844514	1043.64	5.40	1049.04
5	46.504925	-119.851377	1054.96	5.40	1060.36
6	46.504866	-119.860353	1093.79	5.40	1099.19
7	46.504100	-119.869980	1153.24	5.40	1158.64

Name: PV array 14
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.504925	-119.851377	1054.81	5.40	1060.21
2	46.504881	-119.843634	1039.87	5.40	1045.27
3	46.509866	-119.841198	1028.36	5.40	1033.76
4	46.511478	-119.841178	1009.76	5.40	1015.16
5	46.513221	-119.844941	1036.83	5.40	1042.23
6	46.513248	-119.849632	1036.88	5.40	1042.28
7	46.512457	-119.854746	1065.78	5.40	1071.18

Name: PV array 15
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

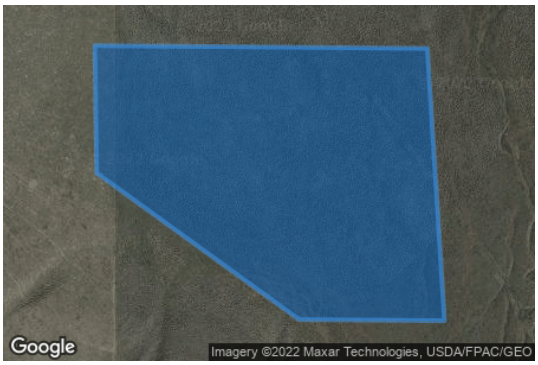


Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.509938	-119.853781	1064.50	5.40	1069.90
2	46.505772	-119.856295	1079.09	5.40	1084.49
3	46.505783	-119.858142	1089.01	5.40	1094.41
4	46.509146	-119.858631	1084.87	5.40	1090.27
5	46.509208	-119.869806	1050.57	5.40	1055.97
6	46.510044	-119.872789	1168.71	5.40	1174.11
7	46.510836	-119.872806	1167.94	5.40	1173.34
8	46.513358	-119.869257	1132.93	5.40	1138.33
9	46.513332	-119.864566	1111.49	5.40	1116.89
10	46.512457	-119.854746	1065.48	5.40	1070.88

Name: PV array 16
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

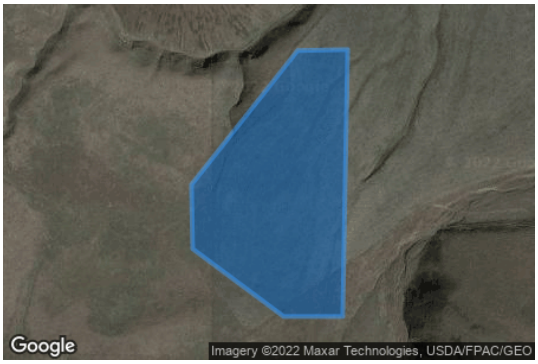
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.518553	-119.873551	1124.45	5.40	1129.86
2	46.519353	-119.870021	1103.73	5.40	1109.13
3	46.519330	-119.865770	1089.45	5.40	1094.85
4	46.515633	-119.863435	1094.46	5.40	1099.86
5	46.514841	-119.863444	1097.21	5.40	1102.61
6	46.514856	-119.866084	1110.91	5.40	1116.31
7	46.513486	-119.871295	1141.51	5.40	1146.91
8	46.513494	-119.872703	1144.76	5.40	1150.16
9	46.514319	-119.873574	1141.44	5.40	1146.84

Name: PV array 17
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



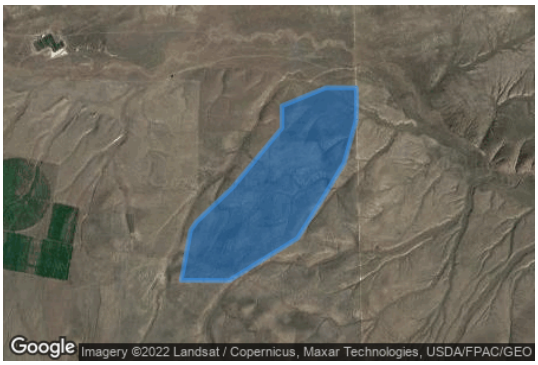
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.500942	-119.874303	1176.45	5.40	1181.85
2	46.500925	-119.871285	1179.42	5.40	1184.82
3	46.499230	-119.871129	1203.26	5.40	1208.66
4	46.499237	-119.872449	1201.33	5.40	1206.73
5	46.500149	-119.874286	1182.92	5.40	1188.32

Name: PV array 18
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



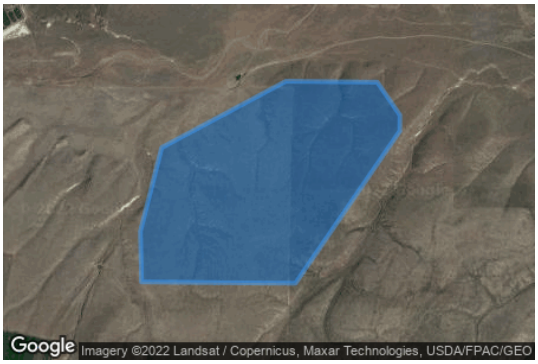
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492353	-119.874467	1374.91	5.40	1380.32
2	46.491555	-119.874446	1382.72	5.40	1388.12
3	46.490713	-119.872794	1401.04	5.40	1406.44
4	46.490713	-119.871721	1394.50	5.40	1399.90
5	46.494037	-119.871632	1319.94	5.40	1325.34
6	46.494024	-119.872539	1333.24	5.40	1338.64

Name: PV array 2
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.509195	-119.800170	1712.97	5.40	1718.37
2	46.511028	-119.793712	1855.47	5.40	1860.87
3	46.511001	-119.789373	2000.86	5.40	2006.26
4	46.509389	-119.789306	2100.83	5.40	2106.23
5	46.507668	-119.789417	2191.34	5.40	2196.74
6	46.503498	-119.791143	2390.50	5.40	2395.90
7	46.500156	-119.794090	2281.15	5.40	2286.55
8	46.496000	-119.797927	2425.13	5.40	2430.53
9	46.491798	-119.807835	2303.99	5.40	2309.39
10	46.491840	-119.814784	2213.16	5.40	2218.56
11	46.496804	-119.813428	2195.98	5.40	2201.38
12	46.497619	-119.812626	2192.87	5.40	2198.27
13	46.501030	-119.807392	2087.01	5.40	2092.41
14	46.506988	-119.800172	1934.89	5.40	1940.29

Name: PV array 3
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.511944	-119.812619	1594.47	5.40	1599.87
2	46.511903	-119.805993	1692.00	5.40	1697.40
3	46.510254	-119.804342	2014.11	5.40	2019.51
4	46.509462	-119.804352	1988.23	5.40	1993.63
5	46.501885	-119.811928	1835.91	5.40	1841.31
6	46.501952	-119.823102	1705.10	5.40	1710.50
7	46.504466	-119.823185	1549.70	5.40	1555.10
8	46.508637	-119.821637	1474.03	5.40	1479.43

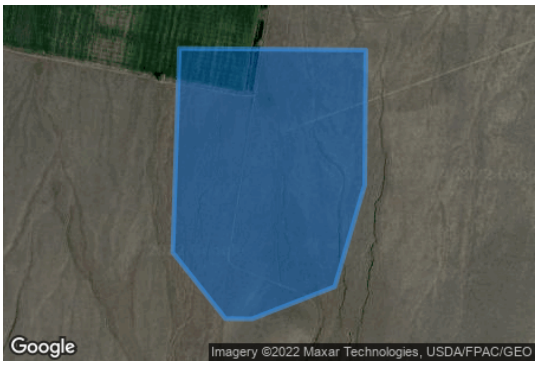
Name: PV array 4
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.501948	-119.822486	1065.13	5.40	1070.53
2	46.501885	-119.811928	1048.71	5.40	1054.11
3	46.496088	-119.815608	1069.83	5.40	1075.23
4	46.492742	-119.818026	1106.54	5.40	1111.94
5	46.492807	-119.829022	1099.23	5.40	1104.63
6	46.496957	-119.828557	1070.05	5.40	1075.45
7	46.499186	-119.827535	1041.49	5.40	1046.89
8	46.499395	-119.824981	1069.48	5.40	1074.88
9	46.499485	-119.821725	1062.62	5.40	1068.02

Name: PV array 5
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

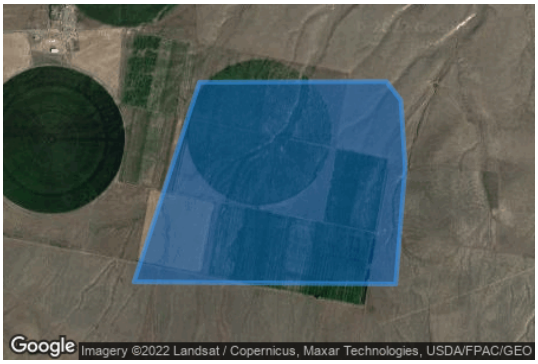
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492742	-119.818026	1107.38	5.40	1112.78
2	46.488486	-119.819047	1146.48	5.40	1151.88
3	46.487669	-119.819497	1161.15	5.40	1166.55
4	46.485139	-119.821288	1179.77	5.40	1185.17
5	46.485170	-119.826653	1214.13	5.40	1219.53
6	46.489427	-119.825721	1149.58	5.40	1154.98
7	46.492791	-119.826207	1106.29	5.40	1111.69

Name: PV array 6
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492836	-119.833948	1103.20	5.40	1108.60
2	46.492796	-119.827174	1103.83	5.40	1109.23
3	46.489436	-119.827216	1149.64	5.40	1155.04
4	46.486901	-119.828303	1190.43	5.40	1195.83
5	46.486100	-119.831304	1209.48	5.40	1214.88
6	46.486105	-119.832271	1211.64	5.40	1217.04
7	46.487755	-119.834186	1182.61	5.40	1188.01

Name: PV array 7
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492917	-119.848023	1115.08	5.40	1120.48
2	46.492807	-119.829022	1101.23	5.40	1106.63
3	46.498622	-119.828334	1041.88	5.40	1047.28
4	46.500345	-119.828489	1035.15	5.40	1040.55
5	46.501957	-119.828645	1203.65	5.40	1209.05
6	46.502893	-119.829690	1026.52	5.40	1031.92
7	46.502862	-119.843267	1037.85	5.40	1043.25

Name: PV array 8
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.508726	-119.836772	1020.94	5.40	1026.34
2	46.507888	-119.833588	1019.95	5.40	1025.35
3	46.502930	-119.836112	1033.42	5.40	1038.82
4	46.502862	-119.843267	1037.20	5.40	1042.60

Name: PV array 9
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.502814	-119.834908	1033.64	5.40	1039.04
2	46.505344	-119.833118	1027.71	5.40	1033.11
3	46.507867	-119.830095	1004.15	5.40	1009.55
4	46.507013	-119.824183	997.71	5.40	1003.11
5	46.506221	-119.824193	1005.16	5.40	1010.56
6	46.502893	-119.829690	1025.80	5.40	1031.20

Discrete Observation Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (ft)	Height (ft)
OP 1	1	46.504524	-119.873315	1171.36	16.00
OP 2	2	46.510264	-119.882975	1359.86	16.00
OP 3	3	46.519947	-119.874721	1143.93	16.00
OP 4	4	46.533278	-119.874839	1291.04	16.00

Route Receptor(s)

Name: Highway 24
Path type: Two-way
Observer view angle: 50.0°

Note: Route receptors are excluded from this FAA policy review. Use the 2-mile flight path receptor to simulate flight paths according to FAA guidelines.

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.519890	-119.997670	1634.52	9.00	1643.52
2	46.519624	-119.969346	1545.69	9.00	1554.69
3	46.522814	-119.958274	1481.59	9.00	1490.59
4	46.530815	-119.930637	1417.09	9.00	1426.09
5	46.536424	-119.910981	1355.33	9.00	1364.33
6	46.536454	-119.909351	1351.83	9.00	1360.83
7	46.533974	-119.880254	1274.23	9.00	1283.23
8	46.533915	-119.878065	1291.74	9.00	1300.74
9	46.534092	-119.876563	1304.75	9.00	1313.75
10	46.537074	-119.869697	1431.58	9.00	1440.58
11	46.537605	-119.864332	1471.77	9.00	1480.77
12	46.538314	-119.859526	1461.48	9.00	1470.48
13	46.539436	-119.854934	1451.11	9.00	1460.11
14	46.541827	-119.848153	1438.48	9.00	1447.48
15	46.547110	-119.833991	1479.68	9.00	1488.68

Name: Highway 240
Path type: Two-way
Observer view angle: 50.0°

Note: Route receptors are excluded from this FAA policy review. Use the 2-mile flight path receptor to simulate flight paths according to FAA guidelines.

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.507988	-119.642617	614.88	9.00	623.88
2	46.509081	-119.651157	629.17	9.00	638.17
3	46.509731	-119.655105	631.02	9.00	640.03
4	46.511591	-119.660555	632.99	9.00	641.99
5	46.513777	-119.664160	636.20	9.00	645.20
6	46.518177	-119.669524	637.60	9.00	646.60
7	46.525766	-119.678580	639.25	9.00	648.25
8	46.527125	-119.679867	637.13	9.00	646.13
9	46.543066	-119.687721	641.81	9.00	650.81
10	46.545008	-119.688950	643.74	9.00	652.74

Name: Highway 241
Path type: Two-way
Observer view angle: 50.0°

Note: Route receptors are excluded from this FAA policy review. Use the 2-mile flight path receptor to simulate flight paths according to FAA guidelines.

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.484548	-119.917503	1864.29	9.00	1873.29
2	46.485405	-119.916366	1839.71	9.00	1848.71
3	46.485966	-119.915229	1820.79	9.00	1829.79
4	46.486306	-119.913813	1800.68	9.00	1809.68
5	46.486676	-119.912375	1780.42	9.00	1789.42
6	46.487414	-119.911066	1760.79	9.00	1769.79
7	46.488936	-119.909628	1726.39	9.00	1735.39
8	46.493589	-119.906023	1615.97	9.00	1624.97
9	46.493944	-119.905530	1606.37	9.00	1615.37
10	46.494815	-119.904135	1581.04	9.00	1590.04
11	46.497133	-119.901981	1542.39	9.00	1551.39
12	46.498373	-119.899771	1501.10	9.00	1510.11
13	46.499378	-119.895780	1433.76	9.00	1442.76
14	46.500013	-119.893119	1395.77	9.00	1404.77
15	46.500338	-119.892282	1382.41	9.00	1391.41
16	46.508564	-119.878442	1218.39	9.00	1227.40
17	46.509524	-119.876961	1195.26	9.00	1204.26
18	46.510292	-119.876489	1189.17	9.00	1198.17
19	46.521780	-119.873421	1130.93	9.00	1139.93
20	46.522489	-119.873485	1130.79	9.00	1139.79
21	46.523449	-119.874429	1131.99	9.00	1140.99
22	46.524113	-119.874580	1131.08	9.00	1140.09
23	46.525560	-119.874172	1129.08	9.00	1138.08
24	46.526623	-119.874322	1140.42	9.00	1149.42
25	46.527627	-119.875266	1154.05	9.00	1163.05
26	46.529088	-119.877970	1179.84	9.00	1188.84
27	46.531421	-119.879343	1218.33	9.00	1227.34
28	46.532484	-119.880309	1239.69	9.00	1248.69
29	46.533148	-119.880545	1257.80	9.00	1266.80
30	46.533783	-119.880480	1272.13	9.00	1281.13

GLARE ANALYSIS RESULTS

Summary of Glare

PV Array Name	Tilt (°)	Orient (°)	"Green" Glare min	"Yellow" Glare min	Energy kWh
PV array 1	SA tracking	SA tracking	0	0	-
PV array 10	SA tracking	SA tracking	0	0	-
PV array 11	SA tracking	SA tracking	0	0	-
PV array 12	SA tracking	SA tracking	0	0	-
PV array 13	SA tracking	SA tracking	0	0	-
PV array 14	SA tracking	SA tracking	0	0	-
PV array 15	SA tracking	SA tracking	0	0	-
PV array 16	SA tracking	SA tracking	0	0	-
PV array 17	SA tracking	SA tracking	0	0	-
PV array 18	SA tracking	SA tracking	0	0	-
PV array 2	SA tracking	SA tracking	0	0	-
PV array 3	SA tracking	SA tracking	0	0	-
PV array 4	SA tracking	SA tracking	0	0	-
PV array 5	SA tracking	SA tracking	0	0	-
PV array 6	SA tracking	SA tracking	0	0	-
PV array 7	SA tracking	SA tracking	0	0	-
PV array 8	SA tracking	SA tracking	0	0	-
PV array 9	SA tracking	SA tracking	0	0	-

Total annual glare received by each receptor

Receptor	Annual Green Glare (min)	Annual Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Results for: PV array 1

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 10

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 11

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 12

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 13

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 14

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 15

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 16

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 17

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 18

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 2

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 3

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 4

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 5

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 6

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 7

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 8

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 9

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover and geographic obstructions.
Several calculations utilize the PV array centroid, rather than the actual glare spot location, due to V1 algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Glare vector plots are simplified representations of analysis data. Actual glare emanations and results may differ.
The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual results and glare occurrence may differ.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

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Appendix B: FAA Notice Criteria Tool

Notice Criteria Tool

Notice Criteria Tool - Desk Reference Guide V_2018.2.0

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference CFR Title 14 Part 77.9.

You must file with the FAA at least 45 days prior to construction if:

- your structure will exceed 200ft above ground level
- your structure will be in proximity to an airport and will exceed the slope ratio
- your structure involves construction of a traverseway (i.e. highway, railroad, waterway etc...) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b)
- your structure will emit frequencies, and does not meet the conditions of the FAA Co-location Policy
- your structure will be in an instrument approach area and might exceed part 77 Subpart C
- your proposed structure will be in proximity to a navigation facility and may impact the assurance of navigation signal reception
- your structure will be on an airport or heliport
- filing has been requested by the FAA

If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport construction.

The tool below will assist in applying Part 77 Notice Criteria.

Latitude:	46 Deg 29 M 57.76 S N
Longitude:	119 Deg 50 M 21.42 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	1047 (nearest foot)
Structure Height :	12 (nearest foot)
Traverseway:	No Traverseway (Additional height is added to certain structures under 77.9(c)) User can increase the default height adjustment for Traverseway, Private Roadway and Waterway
Is structure on airport:	(•) No ( ) Yes

Results

You do not exceed Notice Criteria.

Wautoma Solar Energy Project
Wetland Delineation Report

Prepared for:

Innergex Renewable Development USA, LLC
3636 Nobel Drive, Suite 260,
San Diego, CA 92122

Prepared by:

November 2021

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Appendix A. Data Sheets
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Acronyms and Abbreviations

AW Supplement	*Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West* (Version 2.0)
Innergex	Innergex Renewable Development USA, LLC
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
GPS	global positioning system
LRR	Land Resource Region
NI	No Wetland Species Indicator
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate
PEM	Palustrine Emergent
Project	Wautoma Solar Energy Project
Tetra Tech	Tetra Tech, Inc.
UPL	Upland
USDA	U.S. Department of Agriculture
WETS	Climate Analysis for Wetlands Tables

1.0 Introduction

Innergex Renewable Development USA, LLC (Innergex) plans to develop the Wautoma Solar Energy Project (Project) located in Benton County, Washington. As part of its environmental due diligence, Innergex contracted Tetra Tech, Inc. (Tetra Tech) to conduct wetland and other waters delineation surveys and subsequent reporting. Field surveys were completed in March and October of 2021, these areas are identified in the attached maps as Spring 2021 and Fall 2021 respectively.

2.0 Landscape Setting and Land Use

2.1 Project Study Area

The 4,819-acre Project Study Area is in Sections 19 through 22, 27 through 30, 32, and 33. of Township 12 North, Range 24 (Figure 1). The Project Study Area is contained within parcels owned by private individuals. A map of the Project Study Area containing the tax lots is provided as Figure 2. The Project is approximately 16 miles northeast of Sunnyside, Washington and adjacent to the Rattlesnake Hills Research Natural Area.

2.2 Landscape Setting

The Project Study Area is located within the Level III Columbia Plateau Ecoregion, and within the further subdivided Level IV, Yakima Folds Ecoregion (Thorson et al. 2003). In addition, the Project is within U.S. Department of Agriculture (USDA) Land Resource Region (LRR) B, Northwestern Wheat and Range Region (NRCS 2006). LRR B, Northwestern Wheat and Range Region, overlaps within the Project Study Area with LRR B, Columbia/Snake River Plateau Region, in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0) (USACE 2008) (AW Supplement).

The Project Study Area is in a basin created by the cataclysmic floods during the last Ice-Age (IAFI 2021). The soils are formed from lacustrine deposits left behind from Lake Lewis before it drained (Rigby and Othberg 1979). The drainages are alluvial and drain towards the valley bottom but often spread out and no longer have bed or banks before they reach Dry Creek (ephemeral) which drains the small basin that contains the Project Study Area.

2.2.1 Vegetation

Plant species names and associated wetland indicator status ratings are from the State of Washington 2018 Wetland Plant List (USACE 2018). The following wetland indicator ratings are ordered according to the percent likelihood of the plant occurring in wetlands, from most likely to least likely: Obligate (OBL), Facultative Wetland (FACW), Facultative (FAC), Facultative Upland (FACU), and Upland (UPL). Species with an indicator of NI (No Indicator) refers to plants that are not listed in the wetland plant list and are thereby considered to be Upland plants.

Woody vegetation commonly observed in Project Study Area included three-tip sagebrush (*Artemisia tripartita,* NI), big sagebrush (*Artemisia tridentata,* UPL), yellow rabbitbrush (*Chrysothamnus viscidiflorus,* NI), rubber rabbitbrush (*Ericameria nauseosa,* NI), and bitterbrush (*Purshia tridentata,* NI).

Herbaceous species documented in upland areas included crested wheatgrass (*Agropyron cristatum*, NI), bluebunch wheatgrass (*Pseudoroegneria spicata,* NI), medusahead grass (*Taeniatherum caput-medusae,* NI), bulbous bluegrass (*Poa bulbosa,* FACU), cheatgrass (*Bromus tectorum,* NI), and common yarrow (*Achillea millefolium,* FACU).

2.2.2 Priority Habitats and Species

The Washington State Department of Ecology requests information on priority habitats and species from the Washington Department of Fish and Wildlife. Surveys for specialized habitats and species are being assessed as part of separate reports in support of this Project and can be made available as requested.

2.3 Land Use

Much of the Project Study Area is being used to graze livestock including cattle, goats, and sheep. The land that is not actively being grazed is either irrigated cropland or in well-maintained stands of native grasses, shrubs, and forbs. The stands of native plants are presumed to be a restoration planting on former cropland due to the shape of the field and the species present. There are some irrigated hedgerows that are intended to provide wildlife habitat bordering the irrigated croplands, although recent fires have destroyed the hedgerows on the southwest side of the Project Study Area.

Also present in several locations around the site are temporary livestock watering ponds. The farmer and landowner use buried pipelines from springs located in the hills to fill low spots around the Project Study Area. He fills them only for a few weeks at a time when the cattle are present in that section of the rotationally grazed range areas.

2.4 NWI and NRCS Soils

Prior to field work, Tetra Tech reviewed the National Wetlands Inventory (NWI), hydric soils data, and aerial photographs to identify potential wetlands and other waters, as described below.

2.4.1 National Wetlands Inventory Data

Desktop review of NWI data indicates that there are riverine wetlands but no depressional wetlands within the Project Study Area (USFWS 2021). The NWI data is shown in Figure 3.

2.4.2 Hydric Soils Data

Seventeen soil map units are mapped in the Project Study Area (Table 1 and Figure 4). The dominant soil in the Project Study Area is Warden silt loam, zero to 5 percent slopes covering approximately 49 percent of the Project Study Area. Only one soil had a hydric component, the Scooteney silt loam, which is considered 2 percent hydric. Soils must have at least 33 percent hydric components to be minimally considered "partially hydric"; therefore, this soil does not meet hydric criteria (NRCS 2018).

Table 1. Soils Mapped in the Study Area

Map Unit Code	Map Unit Name	Acres	Percent of the Study Area	Percent Hydric Soil
BmAB	Burke silt loam, 0 to 5 percent slopes	15.42	<0%	0%
BnB	Burke silt loam, shallow, 0 to 5 percent slopes	17.25	<0%	0%
EuAB	Esquatzel silt loam, 0 to 5 percent slopes	174.01	4%	0%
FeC	Finley fine sandy loam, 0 to 15 percent slopes	128.45	3%	0%
FfE	Finley stony fine sandy loam, 0 to 30 percent slopes	460.50	10%	0%
HeE	Hezel loamy fine sand, 0 to 30 percent slopes	28.83	1%	0%
KnE	Kiona very stony silt loam, 0 to 30 percent slopes	53.81	1%	0%
KnF	Kiona very stony silt loam, 30 to 65 percent slopes	64.22	1%	0%
ReB	Ritzville silt loam, 0 to 5 percent slopes	766.02	16%	0%
ReE3	Ritzville silt loam, 15 to 30 percent slopes, severely eroded	49.81	1%	0%
ReF	Ritzville silt loam, 30 to 65 percent slopes	39.27	1%	0%
ScAB	Scooteney silt loam, 0 to 5 percent slopes	216.81	4%	2%
ShAB	Shano silt loam, 0 to 5 percent slopes	0.87	<0%	0%
SnE2	Shano very fine sandy loam, 15 to 30 percent slopes, eroded	16.64	<0%	0%
WdAB	Warden silt loam, 0 to 5 percent slopes	2,291.06	49%	0%
WdE3	Warden silt loam, 15 to 30 percent slopes, severely eroded	358.63	7%	0%
WfC2	Warden very fine sandy loam, 0 to 15 percent slopes	137.45	3%	0%

3.0 Site Alterations

Site alterations are those activities that that directly or indirectly impact wetlands and other waters such that the function or area of the feature changes significantly. A significant alteration would be one that renders the feature non-functioning, or one that changes the boundaries. Land use in the Project Study Area is generally dominated by grazing and irrigated cropping where the native

vegetation has been removed or is significantly disturbed. There are two-track roads throughout the Project Study Area, which potentially may have disrupted the hydrology of the site.

4.0 Precipitation Data and Analysis

Precipitation data for the period preceding and during field work were collected from the National Weather Service, Yakima, Washington Station (NOAA 2021). Data from the Natural Resource Conservation Service Climate Analysis for Wetlands Tables (WETS) Station, Prosser, were used to compare historical precipitation data with recent water records (NRCS 2021). Average historical monthly precipitation data were obtained from the WETS Table for Prosser (Table 2) for the period of 1971 to 2021 (NRCS 2021). Average annual precipitation in this area is between 8 and 12 inches (PRISM Climate Group 2021).

During the 6-day span preceding field work on March 15–18, 2021, 0.04 inches of precipitation was measured. Monthly precipitation for March 2021 was 12 percent of the average 0.66 inches, that normally falls this month. During the 6-day span preceding field work on October 4-5, 2021, 0.07 inches of precipitation was measured. Monthly precipitation for September 2021 was 105 percent of the average 0.41 inches, that normally falls this month.

For the Water Year October 2020 through October 2021, precipitation was 61 percent of average with above-average precipitation for the months of November, January, February, and September that helped mitigate for below-average precipitation in other months. Based on the precipitation data for the Water Year for the 3 months prior to the site visits, it was estimated that groundwater was about average or slightly below what is usually encountered at this time of year (Table 2).

The lower-than-normal precipitation levels did not affect the delineation of waters as determinations of intermittent versus ephemeral stream were made using indicators described in the Streamflow Duration Assessment Method for the Pacific Northwest (SDAM) (Nadeau 2015). The SDAM relies on multiple indicators independent of the presence or absence of surface hydrology, including indicators of macroinvertebrates, wetland plants in or near the streambed, and channel slope.

Table 2. Precipitation Data – Current and Historical (Inches)

Precipitation	Oct. 2020	Nov. 2020	Dec. 2020	Jan. 2021	Feb. 2021	Mar. 2021	Apr. 2021	May 2021	June 2021	July 2021	Aug. 2021	Sept. 2021	Oct. 2021	Water Year 2020-2021 Total
Recorded Monthly Precipitation Totals[1] (inches); (Yakima, WA)[1]	0.20	1.15	0.58	1.52	0.94	0.08	0.04	0.05	0.18	0.01	0.03	0.43	0.13	5.34
WETS Average Monthly Precipitation[2] (inches); (Prosser, WA)[2]	0.71	0.92	1.27	0.99	0.72	0.66	0.60	0.69	0.58	0.20	0.30	0.41	0.71	8.76
Recorded Precipitation Relative to WETS Average Monthly Precipitation	28%	125%	46%	154%	130%	12%	7%	7%	31%	5%	10%	105%	33%	61%

1. NOAA 2021
2. WETS Table for Prosser, Washington, 1971-2021

5.0 Methods

5.1 Pre-field Work

In preparation for the field work, Tetra Tech reviewed NWI, hydric soils data, and aerial photographs to identify potential wetlands and other waters, as described in the preceding sections. Tetra Tech prepared digital field maps with these data and uploaded these maps onto a Samsung Android data collection tablet to assist field staff in identifying the locations of probable wetlands and non-wetland waters within or adjacent to the Project Study Area.

Wetlands and surface water data were obtained from NWI (USFWS 2021). Soils data were obtained from the NRCS Web Soil Survey (NRCS 2021a). The historical orthoimagery available on Google Earth Pro was used to identify aerial signatures of wetlands and waters. The Washington Natural Heritage Program (WNHP 2018) data was used to determine if natural heritage features associated with wetlands exist in or near the Project Study Area. No natural heritage features-associated wetlands were noted as occurring in the Project Study Area.

The following guidance documents and procedures were reviewed:

- Arid West Supplement (USACE 2008)
- Wetlands Delineation Manual, Technical Report Y-87-1 (the Manual) (USACE 1987)
- Streamflow Duration Assessment Method for the Pacific Northwest (Nadeau 2015)
- Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979)
- Washington State Wetland Rating System for Eastern Washington 2014 Update (Hruby 2014)

5.2 Field Work

Field investigations for the delineation of wetlands and other waters included pedestrian surveys within the Project Study Area. Tetra Tech conducted the field delineations on March 15 to 18, and October 4 to 5, 2021. The desktop wetland data were used to focus the wetland delineations, while the desktop surface water data were used to focus the non-wetlands water evaluation as necessary.

5.2.1 Wetland Delineations

Wetland presence was determined as per methods in the Manual and the Arid West Supplement. Three field indicators of wetlands (i.e., hydrophytic vegetation, hydric soils, and wetland hydrology) must be present to make a positive wetland determination. Wetland classifications were based on Classification of Wetlands and Deepwater Habitats of the United States, and rated using the Washington State Rating System for Eastern Washington (Cowardin et al. 1979; Hruby 2014). The

rating system categorizes wetlands based on specific attributes such as rarity; sensitivity to disturbance; and water quality, hydrologic, and habitat functions. Field evaluations for potential wetlands were conducted using the following guidelines:

- Sample plots were established in all features identified by NWI data (USFWS 2021). The sample plot was located within the feature where it was judged most likely to have wetland characteristics (i.e., the lowest or most green place).
- Paired sample plots were established in logical locations to document wetland boundaries.
- The number of sample plots established in wetlands was commensurate with the size and complexity of the wetland, and whether the wetland was bordered by upland or another wetland with a different Cowardin et al. (1979) classification; the number of sample plots per wetland ranged from one to several.
- Photographs were taken to document wetland and upland conditions at the wetland boundary.
- Each wetland boundary was recorded as a polygon using survey grade Juniper Geode global positioning system (GPS) units. Details on mapping methods are presented in Section 8.0.

5.2.2 Non-wetland Waters Evaluations

Non-wetland waters were evaluated using the following criteria:

- Stream channels less than 6 feet in width were mapped along their centerline, and streams greater than 6 feet in width were mapped at their ordinary high water lines for each bank.
- Flow duration for the stream channels was determined using criteria in the Streamflow Duration Assessment Methodology.
- Stream channels were classified following the Washington Department of Natural Resources interim water typing system (WAC 222-16-031). Water type classifications are based primarily on fish use and flow regime, as well as other values including water supply use.
- Several of the streams originated in the wetland study area; these were mapped from the point at which a defined channel with evidence of regular flow was present.

6.0 Description of Wetlands and Other Non-wetland Waters

All wetlands and non-wetland waters evaluated in the Project Study Area are depicted in the Figure 5 map set. The Arid West Region Wetland Determination Data Sheets are found in Appendix A.

6.1 Wetlands

There are 3, palustrine emergent wetlands in the Project Study Area. They are labeled WT-500, WT-501, and WT-502 and depicted in Figures 5-4, 5-5, and 5-7. An irrigation line that lies across the

southern end of a crop field leaks at each of the joints. The wetlands were found at three junctures in the pipeline that intersected with swale features at a point where the irrigation pipe is not lying flat on the ground. Cattails were observed growing in the damp soils.

The predominant herbaceous vegetation observed in the Palustrine Emergent (PEM) wetlands was broad-leaf cattail (*Typha latifolia*, OBL).

None of the temporary livestock watering ponds met hydric soil or vegetation criteria, most likely due to the short duration of water being on site.

6.2 Non-wetland Waters

There are 34 ephemeral streams within the Project Study Area. The topography within the Project Study Area is the relatively flat bottom between two ridges. The majority of the water ways originate in the alluvial fans coming off the hills into the Project Study Area and dissipate before joining the ephemeral drainages present on the valley floor.

The Project Study Area is contained in a watershed listed by StreamNet as having no suitable fish habitat. The ephemeral drainages within the Project Study Area eventually lead about 24 miles downstream to the Yakima River, which is habitat for Chinook, coho, steelhead salmon, and bull trout. All stream segments within the Project Study Area were determined to be ephemeral, and while non-perennial stream designation would not directly exclude fish, it would greatly limit their ability to occupy areas well upstream of the consistently perennial flowing portions of the drainage in this dry warm area of the state.

None of the Project stream segments would be considered fish streams due to one or more of the following factors:

- Small drainage basins, which adversely affect flow maintenance and channel size;
- Small channels that limit rearing and holding pool habitat;
- Lack of a consistent water source;
- Lack of riparian vegetation and substrate, which also affect habitat quality and quantity; and
- Their long distances (e.g., more than 1 river mile) from areas reasonably considered to have fish presence.

7.0 Deviation from NWI

The wetlands shown on the NWI in this Project Study Area are all riverine, the three wetlands found within the Project Study Area are palustrine emergent wetlands isolated from the drainages.

8.0 Mapping Methods

Wetland boundaries, photograph locations, and sample plot locations were recorded using Juniper Geode series GPS units, configured to differentially correct positions in real-time using the Satellite

Based Augmentation System, which typically results in positional error of less than 1 meter (Juniper Systems 2019).

Wetland boundaries were recorded as polygon features using GPS units set to collect vertices every 2 seconds. Field staff walked the perimeter of the wetland with the GPS unit in hand, at a pace consistent with creating an accurate representation of the wetland feature. The location of sample plots was recorded as a point feature consisting of the average of 30 GPS-recorded positions.

9.0 Results and Conclusions

Using methods recommended in the Manual and AW Supplement, 3 wetlands and 34 ephemeral streams were delineated and documented in the Project Study Area. The total area of preliminary jurisdictional wetlands reported within the Project Study Area boundary is 0.10 acres (Table 3). The total preliminary jurisdictional waters reported within the Project Study Area boundary is 4.17 acres (Table 4).

The wetland identified in this report will likely be subject to regulations by the Washington State Department of Ecology even though they are caused by irrigation leaks. Wetlands that result from agricultural activities must be "dry" for a minimum of 3 years to be considered upland.

Table 3. Summary of Wetlands

Feature Name	Feature Type	Ecology Rating		Acreage
		Total	Category	
WT-500	Palustrine Emergent Wetland	10	IV	0.06
WT-501	Palustrine Emergent Wetland	10	IV	0.01
WT-502	Palustrine Emergent Wetland	10	IV	0.03
Total Wetland Acreage				**0.10**

Table 4. Summary of Other Water Features

Feature Name	Feature Type	Acreage
ST-200	Ephemeral Stream	0.02
ST-201	Ephemeral Stream	0.01
ST-202	Ephemeral Stream	0.01
ST-203	Ephemeral Stream/Erosional Feature	0.07
ST-204	Ephemeral Stream	0.02
ST-205	Ephemeral Stream	0.03
ST-206	Ephemeral Stream	0.01
ST-207	Ephemeral Stream	1.65
ST-208	Ephemeral Stream	0.03
ST-209	Ephemeral Stream	0.17
ST-210	Ephemeral Stream	0.11
ST-211	Ephemeral Stream	0.12
ST-212	Ephemeral Stream	0.04
ST-213	Ephemeral Stream	0.02
ST-214	Ephemeral Stream	0.09
ST-215	Ephemeral Stream	0.12
ST-216	Ephemeral Stream	0.16
ST-217	Ephemeral Stream	0.13
ST-218	Ephemeral Stream	0.13
ST-219	Ephemeral Stream	0.09
ST-220	Ephemeral Stream	0.04
ST-221	Ephemeral Stream	0.18
ST-222	Ephemeral Stream	0.17
ST-700	Ephemeral Stream	0.07
ST-701	Ephemeral Stream	0.11
ST-702	Ephemeral Stream	0.06
ST-703	Ephemeral Stream	0.05
ST-704	Ephemeral Stream	0.03
ST-705	Ephemeral Stream	0.07
ST-706	Ephemeral Stream	0.07
ST-707	Ephemeral Stream	0.10
ST-708	Ephemeral Stream	0.04

ST-709	Ephemeral Stream	0.02
ST-710	Ephemeral Stream	0.05
	Total Other Waters Acreage	**4.17**

10.0 Disclaimer

This report documents the investigation, best professional judgment, and conclusions of the investigator. It is correct and complete to the best of my knowledge. It should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and potentially subject to modification until it has been reviewed and approved in writing by the U.S. Army Corps of Engineers and the Washington State Department of Ecology.

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Figures

Figure 1. Project Location
Figure 2. Tax Lot Map
Figure 3. NWI and NHD Map
Figure 4. NRCS Soils Map
Figure 5. Delineated Wetlands and Waters Mapbook

Wautoma Solar

Figure 1
Project Location

BENTON AND YAKIMA COUNTIES, WA

- Spring 2021 Survey Area
- Fall 2021 Survey Area
- County Boundary
- Township/Range Boundary
- Section Boundary

INNERGEX

TETRA TECH

Reference Map

13 18 17 16 15 14
24 19 20 21 22 23
241
25 30 29 28 27 26
36 31 32 33 34 35
Yakima County
Benton County
R23E
R24E
T12N
T11N
01 06 05 04 03 02

1:24,000

NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 0.25 0.5 1 Miles

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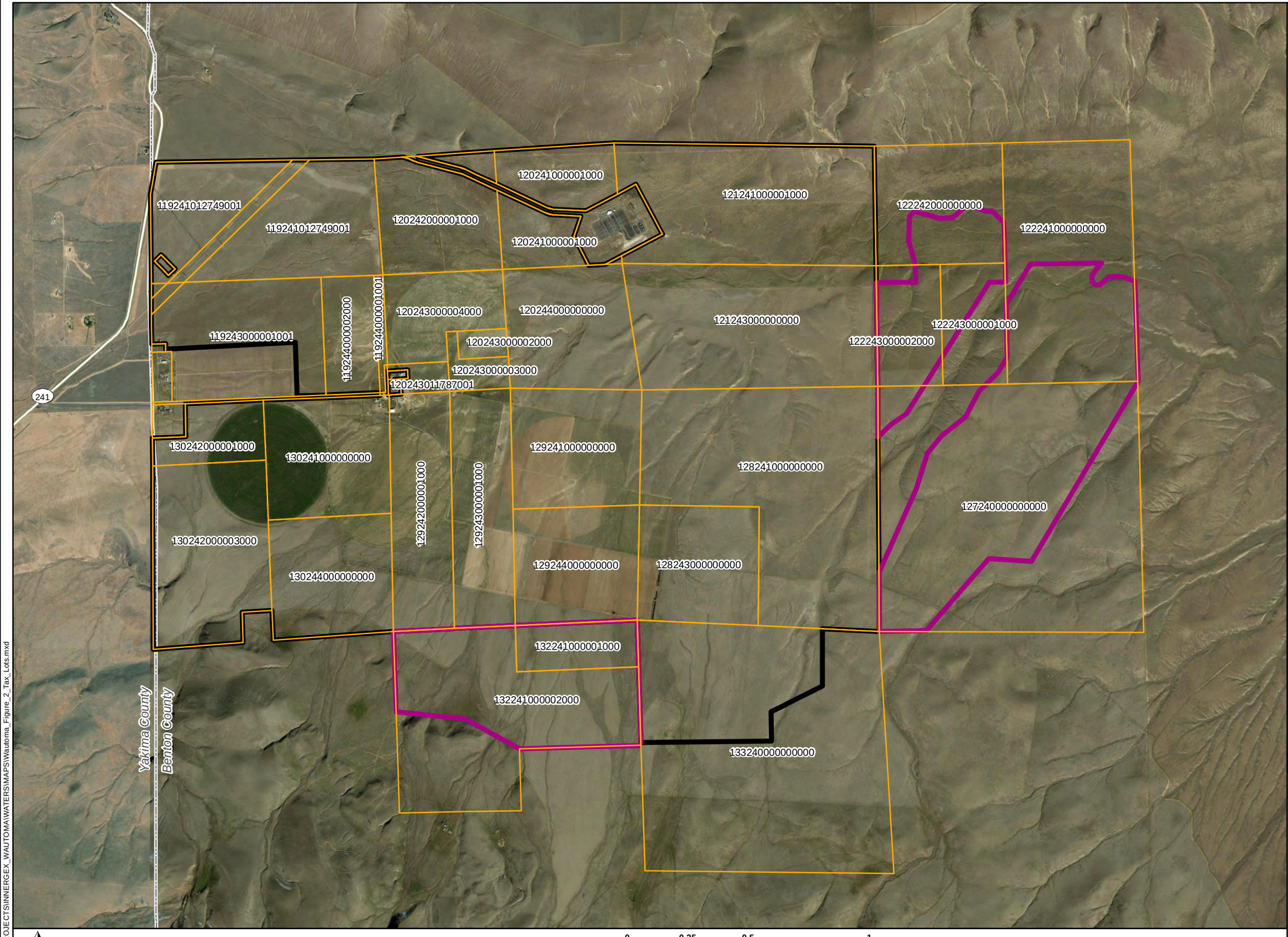
Wautoma Solar

Figure 2
Tax Lots

BENTON AND YAKIMA COUNTIES, WA



Spring 2021 Survey Area
Fall 2021 Survey Area
Tax Lot
County Boundary

INNERGEX
TETRA TECH

Reference Map

1:24,000

NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 0.25 0.5 1 Miles

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Wautoma Solar

Figure 3
NWI and NHD

BENTON AND YAKIMA COUNTIES, WA

Spring 2021 Survey Area
Fall 2021 Survey Area
County Boundary

NHD Flowlines
- Perennial Stream
- Intermittent Stream

NWI Wetland Type
- Freshwater Emergent Wetland
- Riverine

Dry Creek

Yakima County
Benton County

INNERGEX
TETRA TECH

Reference Map

1:24,000

NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 0.25 0.5 1 Miles

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Wautoma Solar

Figure 4
Soils

BENTON AND YAKIMA COUNTIES, WA

Spring 2021 Survey Area
Fall 2021 Survey Area
County Boundary

Yakima County
Benton County
241

Soil Unit: Soil Name	
BmAB: Burke silt loam, 0 to 5 percent slopes	ReE3: Ritzville silt loam, 15 to 30 percent slopes, severely eroded
BnB: Burke silt loam, shallow, 0 to 5 percent slopes	ReF: Ritzville silt loam, 30 to 65 percent slopes
EuAB: Esquatzel silt loam, 0 to 5 percent slopes	ScAB: Scooteney silt loam, 0 to 5 percent slopes
FeC: Finley fine sandy loam, 0 to 15 percent slopes	ShAB: Shano silt loam, 0 to 5 percent slopes
FfE: Finley stony fine sandy loam, 0 to 30 percent slopes	SnE2: Shano very fine sandy loam, 15 to 30 percent slopes, eroded
HeE: Hezel loamy fine sand, 0 to 30 percent slopes	WdAB: Warden silt loam, 0 to 5 percent slopes
KnE: Kiona very stony silt loam, 0 to 30 percent slopes	WdE3: Warden silt loam, 15 to 30 percent slopes, severely eroded
KnF: Kiona very stony silt loam, 30 to 65 percent slopes	WfC2: Warden very fine sandy loam, 0 to 15 percent slopes
ReB: Ritzville silt loam, 0 to 5 percent slopes	

1:24,000 NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 0.25 0.5 1 Miles

INNERGEX TETRA TECH

Reference Map

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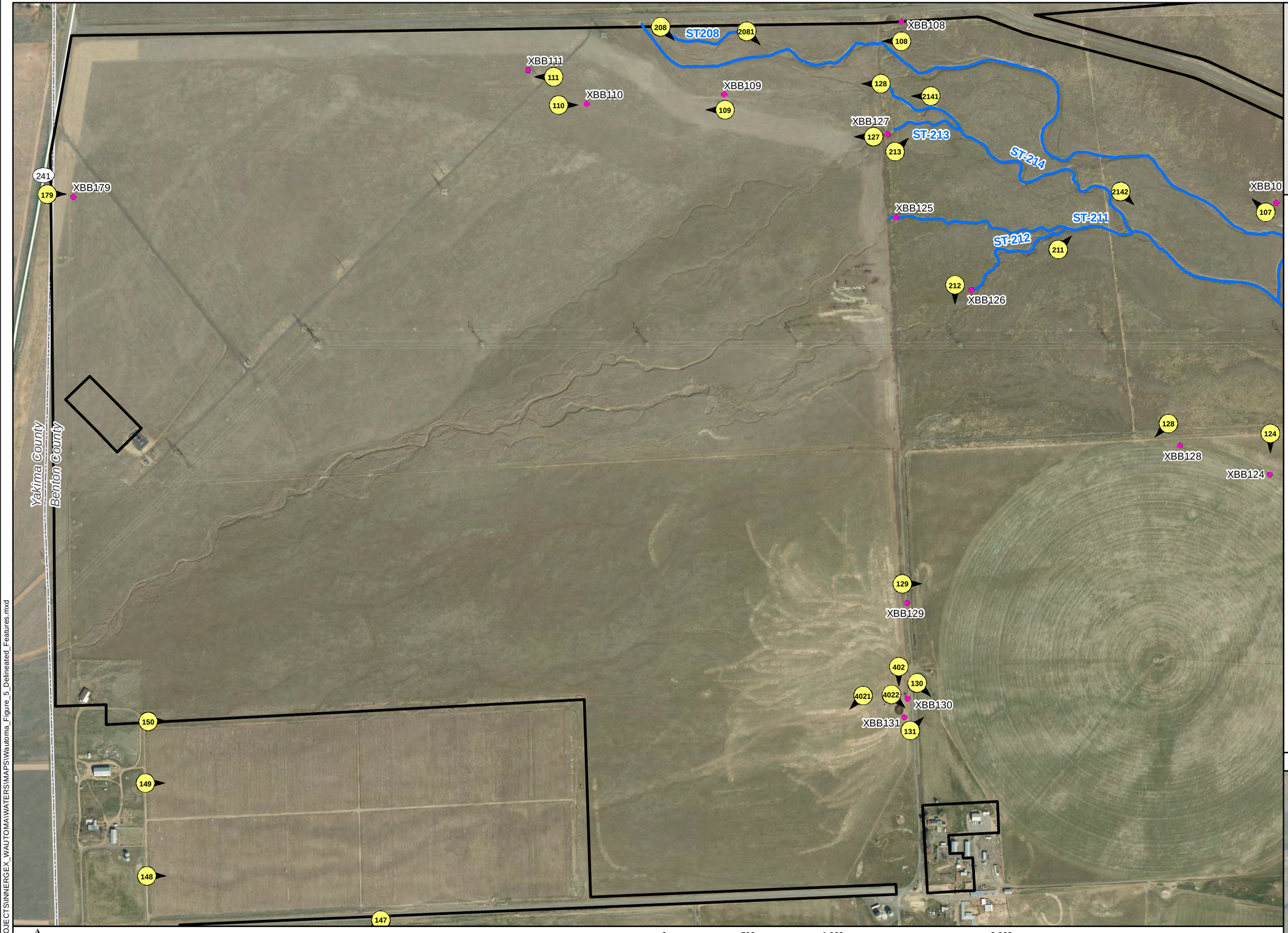
Wautoma Solar

Figure 5-1
Delineated Waters and Wetlands

BENTON AND YAKIMA COUNTIES, WA



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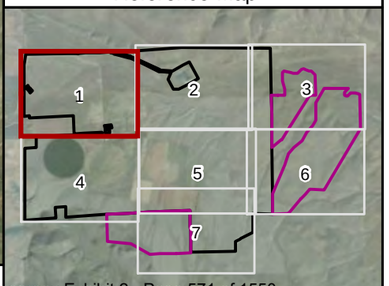
0 500 1,000 2,000 Feet

- Spring 2021 Survey Area
- Fall 2021 Survey Area
- County Boundary
- 100 Photo Location and Direction
- XBB Point
- Ephemeral Stream
- Wetland

INNERGEX TETRA TECH

Reference Map



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Wautoma Solar

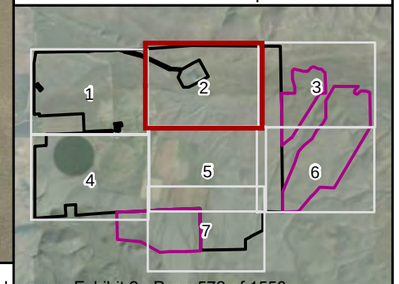
Figure 5-2
Delineated Waters and Wetlands

BENTON AND YAKIMA COUNTIES, WA

- Spring 2021 Survey Area
- Fall 2021 Survey Area
- County Boundary
- 100 Photo Location and Direction
- XBB Point
- Ephemeral Stream
- Wetland

INNERGEX TETRA TECH

Reference Map



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0 500 1,000 2,000 Feet

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Wautoma Solar

Figure 5-3
Delineated Waters and Wetlands

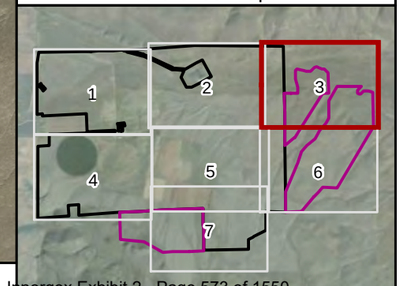
BENTON AND YAKIMA COUNTIES, WA

- Spring 2021 Survey Area
- Fall 2021 Survey Area
- County Boundary
- Photo Location and Direction
- XBB Point
- Ephemeral Stream
- Wetland

INNERGEX

TETRA TECH

Reference Map



205 ST205 204 ST204 203 ST203 2041 XBB103 XBB102 206 ST206 207 2071 114 XBB114 4001 XBB112 XBB113 400 113 112 4002 XBB606 606 2071 ST207 ST704 XBB605 605 704 ST705 705 XBB607 607 XBB617 617 XBB609 609 608 706 ST706

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0 500 1,000 2,000 Feet

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Wautoma Solar

Figure 5-4
Delineated Waters and Wetlands

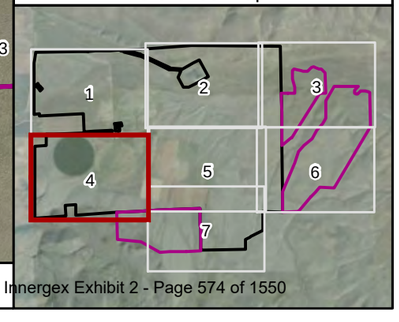
BENTON AND YAKIMA COUNTIES, WA

- Spring 2021 Survey Area
- Fall 2021 Survey Area
- County Boundary
- Photo Location and Direction
- XBB Point
- Ephemeral Stream
- Wetland

INNERGEX

TETRA TECH

Reference Map



Yakima County

Benton County

ST-222

ST-221

ST-10

WT-500

XBB164

XBB165

XBB163

1:6,500

NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 500 1,000 2,000 Feet

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Wautoma Solar

Figure 5-5
Delineated Waters and Wetlands

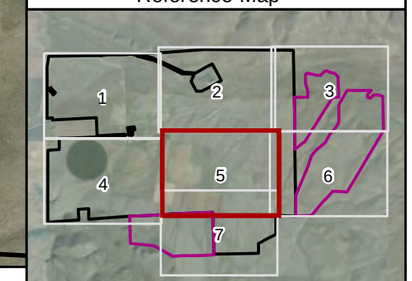
BENTON AND YAKIMA COUNTIES, WA

- Spring 2021 Survey Area
- Fall 2021 Survey Area
- County Boundary
- Photo Location and Direction
- XBB Point
- Ephemeral Stream
- Wetland

INNERGEX

TETRA TECH

Reference Map



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NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 500 1,000 2,000 Feet

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Wautoma Solar

Figure 5-6
Delineated Waters and Wetlands

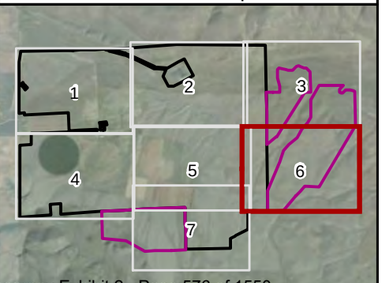
BENTON AND YAKIMA COUNTIES, WA

- Spring 2021 Survey Area
- Fall 2021 Survey Area
- County Boundary
- Photo Location and Direction (100)
- XBB Point
- Ephemeral Stream
- Wetland

INNERGEX

TETRA TECH

Reference Map



XBB153 (153)
XBB152 (152)
XBB151 (151)
XBB610 (610)
XBB611 (611)
XBB612 (612)
XBB613 (613)
XBB614 (614)
XBB615 (615)
XBB616 (616)
ST706
ST707
ST709
ST217
ST708
707
709
217
708

1:6,500

NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 500 1,000 2,000 Feet

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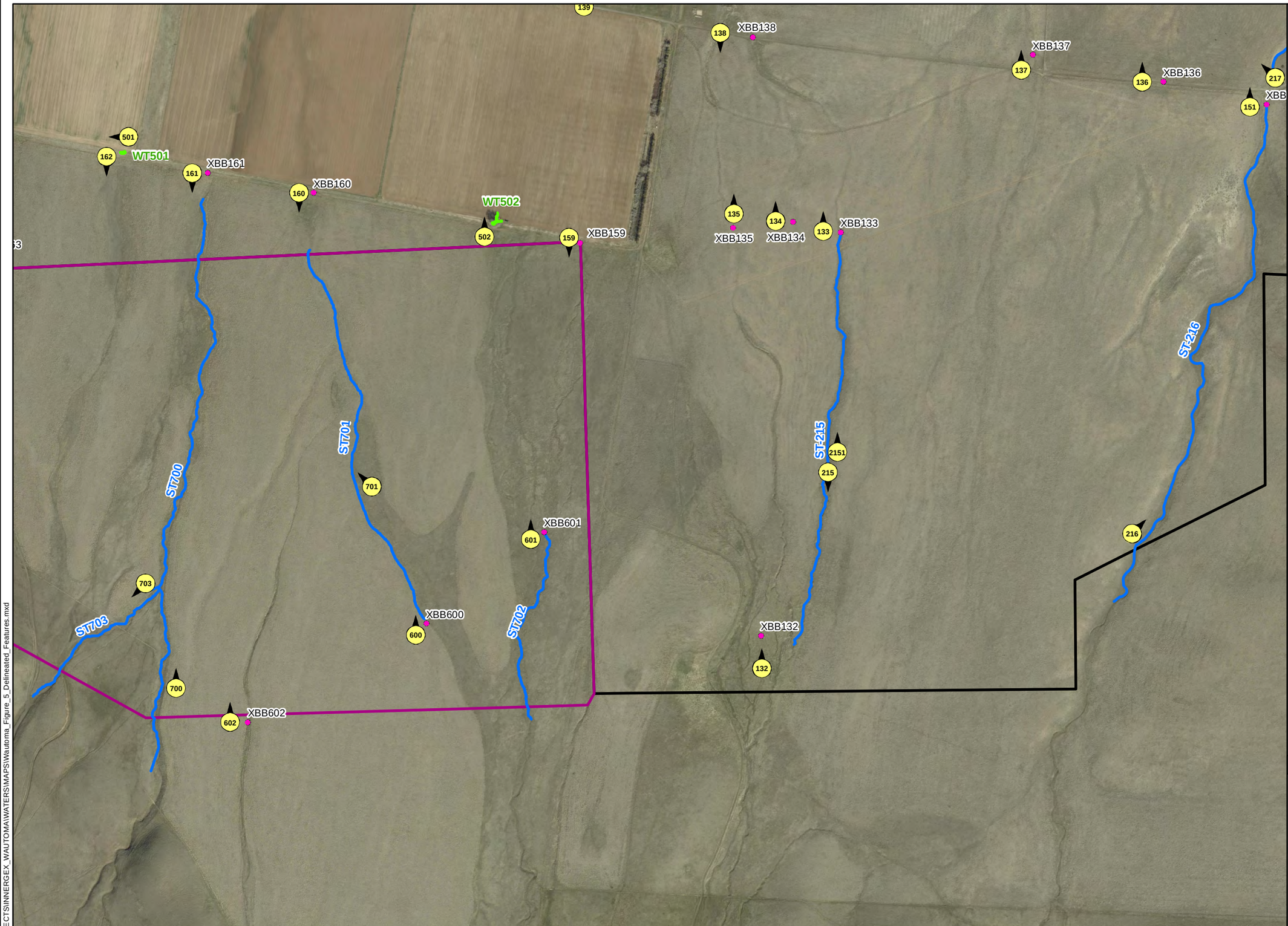
Wautoma Solar

Figure 5-7
Delineated Waters and Wetlands

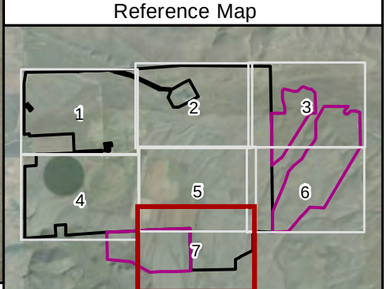
BENTON AND YAKIMA COUNTIES, WA



Spring 2021 Survey Area
Fall 2021 Survey Area
County Boundary
100 Photo Location and Direction
XBB Point
Ephemeral Stream
Wetland

INNERGEX
TETRA TECH

Reference Map



1:6,500 NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 500 1,000 2,000 Feet

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Appendix A:

Data Sheets

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Arid West Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Wautoma Solar City/County: Benton County Sampling Date: 3/17/2021
Applicant/Owner: Innergex State: WA Sampling Point: WT-500
Investigator(s): Jessica Taylor/Katie Pyne Section, Township, Range: Section 20, Township 12, Range 24 East
Landform (hillside, terrace, etc.): valley floor Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): LRR B Lat: 46.494387° Long: -119.848297° Datum: NAD83
Soil Map Unit Name: ReB Ritzville Silt Loam, 0 to 5 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X
Hydric Soil Present? Yes ____ No X
Wetland Hydrology Present? Yes ____ No X

Is the Sampled Area within a Wetland? **Yes** ____ **No** X

Remarks:
Upland site adjacent to irrigation induced wetland

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ =Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ =Total Cover		
Herb Stratum (Plot size: 5)			
1. *Bromus tectorum*	80	Yes	UPL
2. *Festuca idahoensis*	10	No	FACU
3. *Pseudoroegneria spicata*	10	No	UPL
4.			
5.			
6.			
7.			
8.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ =Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	90	x 5 =	450
Column Totals:	100 (A)		490 (B)

Prevalence Index = B/A = 4.90

Hydrophytic Vegetation Indicators:
____ Dominance Test is >50%
____ Prevalence Index is ≤3.0[1]
____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:

SOIL

Sampling Point: SS5001

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/4	100					silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock

Depth (inches): 8

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Arid West Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Wautoma Solar City/County: Benton County Sampling Date: 3/17/2021
Applicant/Owner: Innergex State: WA Sampling Point: WT-500
Investigator(s): Jessica Taylor/Katie Pyne Section, Township, Range: Section 20, Township 12, Range 24 East
Landform (hillside, terrace, etc.): Valley bottom Local relief (concave, convex, none): concave Slope (%): 3
Subregion (LRR): LRR B Lat: 46.494387° Long: -119.848297° Datum: NAD83
Soil Map Unit Name: ReB Ritzville Silt Loam, 0 to 5 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Wetland occurs where there the joint in the irrigation pipeline is leaking. The leak has been there long enough to create hydric soils.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____	=Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____	=Total Cover	
Herb Stratum (Plot size: 5)			
1. *Typha latifolia*	40	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	40	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____	=Total Cover	

% Bare Ground in Herb Stratum 60 % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	40 (A)		40 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:
X Dominance Test is >50%
X Prevalence Index is ≤3.0[1]
____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling Point: SS500

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 4/3	80	10YR 4/6	20	C	PL	silt loam	
10-15	10YR 4/4	100					silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- x Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Soils do not meet hydric soil indicators due to seasonally ponded soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- X Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Arid West Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Wautoma Solar Project City/County: Benton County Sampling Date: 10/5/21
Applicant/Owner: Innergex State: WA Sampling Point: SS501u
Investigator(s): Jessica Taylor and Katie Pyne Section, Township, Range: S29 T12N R24E
Landform (hillside, terrace, etc.): field Local relief (concave, convex, none): concave Slope (%): 1
Subregion (LRR): LRR B Lat: 46°29'35.78"N Long: 119°50'36.01"W Datum: NAD83
Soil Map Unit Name: Warden silt loam, 0 to 5 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes No X
Hydric Soil Present? Yes No X
Wetland Hydrology Present? Yes No X

Is the Sampled Area within a Wetland? **Yes** **No** X

Remarks:
upland plot

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5)			
1. *Verbascum thapsus*	5	No	FACU
2. *Cynodon dactylon*	60	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	65 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 35 % Cover of Biotic Crust

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	65	x 4 =	260
UPL species	0	x 5 =	0
Column Totals:	65 (A)		260 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **No** X

Remarks:

SOIL

Sampling Point: SS501u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/3	100					silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Arid West Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Wautoma Solar Project City/County: Benton County Sampling Date: 10/5/21
Applicant/Owner: Innergex State: WA Sampling Point: SS501w
Investigator(s): Jessica Taylor and Katie Pyne Section, Township, Range: S29 T12N R24E
Landform (hillside, terrace, etc.): field Local relief (concave, convex, none): concave Slope (%): 1
Subregion (LRR): LRR B Lat: 46°29'35.78"N Long: 119°50'36.01"W Datum: NAD83
Soil Map Unit Name: Warden silt loam, 0 to 5 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:
Wetland is at joint in irrigation pipeline that has a steady leak. Wetland vegetation was obvious in the fall but was not observed during spring site visits. Aquatic insects (water boatmen) were present in standing water.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ =Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ =Total Cover		
Herb Stratum (Plot size: 5)			
1. *Typha latifolia*	40	Yes	OBL
2. *Echinochloa crus-galli*	30	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	70 =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ =Total Cover		

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	30	x 2 =	60
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	70 (A)		100 (B)

Prevalence Index = B/A = 1.43

Hydrophytic Vegetation Indicators:
X Dominance Test is >50%
X Prevalence Index is ≤3.0[1]
____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling Point: SS501w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/1	100					silt loam	
6-16	10YR 4/3	100					silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Soils are different than surrounding soils which are 10YR 4/3 with no stratification in the profile. Wetland area has obligate wetland vegetation and aquatic insects.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 2

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? Yes X No ___ Depth (inches): 4

(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Arid West Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Wautoma Solar Project City/County: Benton County Sampling Date: 10/5/21
Applicant/Owner: Innergex State: WA Sampling Point: SS502u
Investigator(s): Jessica Taylor and Katie Pyne Section, Township, Range: S29 T12N R24E
Landform (hillside, terrace, etc.): field Local relief (concave, convex, none): flat Slope (%): 1
Subregion (LRR): LRR B Lat: 46°29'31.71"N Long: 119°50'4.52"W Datum: NAD83
Soil Map Unit Name: Scooteney silt loam, 0 to 5 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ____
Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X
Hydric Soil Present? Yes ____ No X
Wetland Hydrology Present? Yes ____ No X

Is the Sampled Area within a Wetland? **Yes** ____ **No** X

Remarks:
Upland plot for wetland found at leak in irrigation pipeline.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ulmus pumila*	30	Yes	UPL
2.			
3.			
4.			
	30 =Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5)			
1. *Cynodon dactylon*	60	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	60 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	60	x 4 =	240
UPL species	30	x 5 =	150
Column Totals:	90 (A)		390 (B)

Prevalence Index = B/A = 4.33

Hydrophytic Vegetation Indicators:
____ Dominance Test is >50%
____ Prevalence Index is ≤3.0[1]
____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:

SOIL

Sampling Point: SS502u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/3	100					silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock

Depth (inches): 12

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Arid West Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Wautoma Solar Project City/County: Benton County Sampling Date: 10/5/21
Applicant/Owner: Innergex State: WA Sampling Point: SS502w
Investigator(s): Jessica Taylor and Katie Pyne Section, Township, Range: S29 T12N R24E
Landform (hillside, terrace, etc.): field Local relief (concave, convex, none): flat Slope (%): 1
Subregion (LRR): LRR B Lat: 46°29'31.71"N Long: 119°50'4.52"W Datum: NAD83
Soil Map Unit Name: Scooteney silt loam, 0 to 5 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:
Wetland is at joint in irrigation pipeline that has a steady leak. Wetland vegetation was obvious in the fall but was not observed during spring site visits. Aquatic insects (water boatmen) were present in standing water.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ulmus pumila*	50	Yes	UPL
2.			
3.			
4.			
	50 =Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5)			
1. *Typha latifolia*	20	Yes	OBL
2. *Echinochloa crus-galli*	20	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	40 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 60 % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	20	x 2 =	40
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	50	x 5 =	250
Column Totals:	90 (A)		310 (B)
Prevalence Index = B/A =			3.44

Hydrophytic Vegetation Indicators:
X Dominance Test is >50%
____ Prevalence Index is ≤3.0[1]
____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling Point: SS502w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/1	100					silt loam	
3-5	10YR 3/3	100					silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock

Depth (inches): 5

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Soils are different than surrounding soils and have horizons present. There are also obligate wetland vegetation and aquatic insects present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	X	No		Depth (inches): 4
Water Table Present?	Yes		No	X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches): 6

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland name or number WT500

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): WT500 Date of site visit: 3/17/21

Rated by Jess Taylor and Katie Pyne Trained by Ecology? __ Yes x No Date of training_____

HGM Class used for rating Depressional Wetland has multiple HGM classes?____Y __x__N

NOTE: **Form is not complete without the figures requested** (*figures can be combined*).
Source of base aerial photo/map USDA NAIP 2018

OVERALL WETLAND CATEGORY IV (based on functions x or special characteristics___)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 22-27

_____**Category II** – Total score = 19-21

_____**Category III** – Total score = 16-18

___x___**Category IV** – Total score = 9-15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H M **L**	H M **L**	H M **L**	
Landscape Potential	H M **L**	H **M** L	H M **L**	
Value	H M **L**	H M **L**	H M **L**	**TOTAL**
Score Based on Ratings	3	4	3	10

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY *Circle the appropriate category*
Vernal Pools	**II** **III**
Alkali	**I**
Wetland of High Conservation Value	**I**
Bog and Calcareous Fens	**I**
Old Growth or Mature Forest – slow growing	**I**
Aspen Forest	**I**
Old Growth or Mature Forest – fast growing	**II**
Floodplain forest	**II**
None of the above	x

Wetland name or number WT500

Maps and figures required to answer questions correctly for Eastern Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	N/A
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	N/A
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	5
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	5
Map of the contributing basin	D 5.3	1
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	5
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	Attached
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	Attached

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of wetland vs. width of stream *(can be added to another figure)*	R 4.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	L 1.1, L 4.1, H 1.1, H 1.5	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	

Wetland name or number WT500

HGM Classification of Wetland in Eastern Washington

For questions 1-4, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-4 apply, and go to Question 5.

1. Does the entire unit **meet both** of the following criteria?
   ___The vegetated part of the wetland is on the water side of the Ordinary High Water Mark of a body of permanent open water (without any plants on the surface) that is at least 20 ac (8 ha) in size
   ___At least 30% of the open water area is deeper than 10 ft (3 m)

   NO – go to 2 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

2. Does the entire wetland unit **meet all** of the following criteria?
   ___The wetland is on a slope (*slope can be very gradual*),
   ___The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks;
   ___The water leaves the wetland **without being impounded**.

   NO – go to 3 YES – The wetland class is **Slope**
   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).

3. Does the entire wetland unit **meet all** of the following criteria?
   ___ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river;
   ___ The overbank flooding occurs at least once every 10 years.

   NO – go to 4 YES – The wetland class is **Riverine**
   NOTE: The Riverine wetland can contain depressions that are filled with water when the river is not flooding.

4. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

   NO – go to 5 YES – The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-4 APPLY TO DIFFERENT AREAS IN THE WETLAND UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

Wetland name or number WT500

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the wetland unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM Class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine (the riverine portion is within the boundary of depression)	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine

*If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number WT500

DEPRESSIONAL WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland has no surface water outlet points = 5 Wetland has an intermittently flowing outlet points = 3 Wetland has a highly constricted permanently flowing outlet points = 3 Wetland has a permanently flowing, unconstricted, surface outlet points = 1	3
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions of soils)* YES = 3 NO = 0	0
D 1.3. Characteristics of persistent vegetation (Emergent, Scrub-shrub, and/or Forested Cowardin classes) Wetland has persistent, ungrazed, vegetation for > $^2/_3$ of area points = 5 Wetland has persistent, ungrazed, vegetation from $^1/_3$ to $^2/_3$ of area points = 3 Wetland has persistent, ungrazed vegetation from $^1/_{10}$ to < $^1/_3$ of area points = 1 Wetland has persistent, ungrazed vegetation < $^1/_{10}$ of area points = 0	1
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.* Area seasonally ponded is > ½ total area of wetland points = 3 Area seasonally ponded is ¼ - ½ total area of wetland points = 1 Area seasonally ponded is < ¼ total area of wetland points = 0	1
Total for D 1 Add the points in the boxes above	5

Rating of Site Potential If score is: ___ **12- 16 = H** ___ **6- 11 = M** _X_ **0- 5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	0
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1- D 2.3? Source_____ Yes = 1 No = 0	0
Total for D 2 Add the points in the boxes above	0

Rating of Landscape Potential If score is: ___ **3 or 4 = H** ___ **1 or 2 = M** _X_ **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, or lake that is on the 303(d) list? Yes = 1 No = 0	0
D 3.2. Is the wetland in a basin or sub-basin where water quality is an issue in some aquatic resource [303(d) list, eutrophic lakes, problems with nuisance and toxic algae]? Yes = 1 No = 0	0
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the drainage or basin in which the wetland is found*)? Yes = 2 No = 0	0
Total for D 3 Add the points in the boxes above	0

Rating of Value If score is: ___ **2-4 = H** ___ **1 = M** _X_ **0 = L** *Record the rating on the first page*

Wetland name or number WT500

DEPRESSIONAL WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce flooding and erosion.	Points (only 1 score per box)
D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland has no surface water outlet points = 8 Wetland has an intermittently flowing outlet points = 4 Wetland has a highly constricted permanently flowing outlet points = 4 Wetland has a permanently flowing unconstricted surface outlet points = 0 *(If outlet is a ditch and not permanently flowing treat wetland as "intermittently flowing")*	4
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or deepest part (if dry).* Seasonal ponding: > 3 ft above the lowest point in wetland or the surface of permanent ponding points = 8 Seasonal ponding: 2 ft - < 3 ft above the lowest point in wetland or the surface of permanent pondingpoints = 6 The wetland is a headwater wetland points = 4 Seasonal ponding: 1 ft - < 2 ft points = 4 Seasonal ponding: 6 in - < 1 ft points = 2 Seasonal ponding: < 6 in or wetland has only saturated soils points = 0	0
Total for D 4 Add the points in the boxes above	4

Rating of Site Potential If score is: ___ **12-16 = H** ___ **6-11 = M** _x_ **0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0
D 5.2. Is > 10% of the area within 150 ft of the wetland in a land use that generates runoff? Yes = 1 No = 0	0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses? Yes = 1 No = 0	1
Total for D 5 Add the points in the boxes above	1

Rating of Landscape Potential If score is: ___ **3 = H** _x_ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. The wetland is in a landscape that has flooding problems. Choose the description that best matches conditions around the wetland being rated. *Do not add points. Choose the highest score if more than one condition is met.* The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds), AND Flooding occurs in sub-basin that is immediately down-gradient of wetland points = 2 Surface flooding problems are in a sub-basin farther down-gradient points = 1 The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ points = 0 There are no problems with flooding downstream of the wetland points = 0	0
D 6.2. Has the site has been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for D 6 Add the points in the boxes above	0

Rating of Value If score is: ___ **2-4 = H** ___ **1 = M** _x_ **0 = L** *Record the rating on the first page*

Wetland name or number WT500

RIVERINE WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
R 1.0. Does the site have the potential to improve water quality?	
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event: Depressions cover >$^1/_3$ area of wetland points = 6 Depressions cover > $^1/_{10}$ area of wetland points = 3 Depressions present but cover < $^1/_{10}$ area of wetland points = 1 No depressions present points = 0	
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height; **not** Cowardin classes): Forest or shrub > $^2/_3$ the area of the wetland points = 10 Forest or shrub $^1/_3$ – $^2/_3$ area of the wetland points = 5 Ungrazed, herbaceous plants > $^2/_3$ area of wetland points = 5 Ungrazed herbaceous plants $^1/_3$ – $^2/_3$ area of wetland points = 2 Forest, shrub, and ungrazed herbaceous < $^1/_3$ area of wetland points = 0	
Total for R 1 Add the points in the boxes above	

Rating of Site Potential If score is: **12-16 = H** **6-11 = M** **0-5 = L** *Record the rating on the first page*

R 2.0. Does the landscape have the potential to support the water quality function of the site?	
R 2.1. Is the wetland within an incorporated city or within its UGA? Yes = 2 No = 0	
R 2.2. Does the contributing basin include a UGA or incorporated area? Yes = 1 No = 0	
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years? Yes = 1 No = 0	
R 2.4. Is > 10% of the area within 150 ft of wetland in land uses that generate pollutants Yes = 1 No = 0	
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1-R 2.4? Source_____ Yes = 1 No = 0	
Total for R 2 Add the points in the boxes above	

Rating of Landscape Potential If score is: **3-6 = H** **1 or 2 = M** **0 = L** *Record the rating on the first page*

R 3.0. Is the water quality improvement provided by the site valuable to society?	
R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi? Yes = 1 No = 0	
R 3.2. Does the river or stream have TMDL limits for nutrients, toxics, or pathogens? Yes = 1 No = 0	
R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? A*nswer YES if there is a TMDL for the drainage in which wetland is found*. Yes = 2 No = 0	
Total for R 3 Add the points in the boxes above	

Rating of Value If score is: **2-4 = H** **1 = M** **0 = L** *Record the rating on the first page*

Wetland name or number WT500

RIVERINE WETLANDS **Hydrologic Functions** - Indicators that site functions to reduce flooding and stream erosion	Points (only 1 score per box)
R 4.0. Does the site have the potential to reduce flooding and erosion?	
R 4.1. Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average width of stream between banks).* If the ratio is more than 2 points = 10 If the ratio is 1-2 points = 8 If the ratio is ½-<1 points = 4 If the ratio is ¼-< ½ points = 2 If the ratio is < ¼ points = 1	
R 4.2. Characteristics of plants that slow down water velocities during floods: *Treat large woody debris as forest or shrub. Choose the points appropriate for the best description (polygons need to have > 90% cover at person height. These are NOT Cowardin classes)*. Forest or shrub for more than $^2/_3$ the area of the wetland points = 6 Forest or shrub for >$^1/_3$ area OR emergent plants > $^2/_3$ area points = 4 Forest or shrub for > $^1/_{10}$ area OR emergent plants > $^1/_3$ area points = 2 Plants do not meet above criteria points = 0	
Total for R 5 Add the points in the boxes above	

Rating of Site Potential If score is: ___**12-16 = H** ___**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

R 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
R 5.1. Is the stream or river adjacent to the wetland downcut? Yes = 0 No = 1	
R 5.2. Does the up-gradient watershed include a UGA or incorporated area? Yes = 1 No = 0	
R 5.3. Is the up-gradient stream or river controlled by dams? Yes = 0 No = 1	
Total for R 5 Add the points in the boxes above	

Rating of Landscape Potential If score is: ___**3 = H** ___**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

R 6.0. Are the hydrologic functions provided by the site valuable to society?	
R 6.1. Distance to the nearest areas downstream that have flooding problems? *Choose the description that best fits the site.* The sub-basin immediately down-gradient of site has surface flooding problems that result in damage to human or natural resources points = 2 Surface flooding problems are in a basin farther down-gradient points = 1 No flooding problems anywhere downstream points = 0	
R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	
Total for R 6 Add the points in the boxes above	

Rating of Value If score is: ___**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number WT500

LAKE FRINGE WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality.	Points (only 1 score per box)
L 1.0. Does the site have the potential to improve water quality?	
L 1.1. Average width of plants along the lakeshore *(use polygons of Cowardin classes)*: Plants are more than 33 ft (10 m) wide — points = 6 Plants are more than 16 ft (5 m) and < 33 ft (10 m) wide — points = 3 Plants are more than 6 ft (2 m) and < 16 ft (5 m) wide — points = 1 Plants are less than 6 ft wide — points = 0	
L 1.2. Characteristics of the plants in the wetland: Choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. *These are not Cowardin classes. Area of cover is total cover in the wetland, but it can be in patches. Herbaceous does not include aquatic bed*. Cover of herbaceous plants is > 90% of the vegetated area — points = 6 Cover of herbaceous plants is > $^{2}/_{3}$ of the vegetated area — points = 4 Cover of herbaceous plants is > $^{1}/_{3}$ of the vegetated area — points = 3 Other plants that are not aquatic bed > $^{2}/_{3}$ wetland — points = 3 Other plants that are not aquatic bed in > $^{1}/_{3}$ vegetated area — points = 1 Aquatic bed plants and open water cover > $^{2}/_{3}$ of the wetland — points = 0	
Total for L 1 — Add the points in the boxes above	

Rating of Site Potential If score is: **8-12 = H** **4-7 = M** **0-3 = L** *Record the rating on the first page*

L 2.0. Does the landscape have the potential to support the water quality function of the site?	
L 2.1. Is the lake used by power boats? Yes = 1 No = 0	
L 2.2. Is > 10% of the area within 150 ft of wetland on the upland side in land uses that generate pollutants? Yes = 1 No = 0	
L 2.3. Does the lake have problems with algal blooms or excessive plants such as milfoil? Yes = 1 No = 0	
Total for L 2 — Add the points in the boxes above	

Rating of Landscape Potential If score is: **2 or 3 = H** **1 = M** **0 = L** *Record the rating on the first page*

L 3.0. Is the water quality improvement provided by the site valuable to society?	
L 3.1. Is the lake on the 303(d) list of degraded aquatic resources? Yes = 1 No = 0	
L 3.2. Is the lake in a sub-basin where water quality is an issue (at least one aquatic resource in the basin is on the 303(d) list)? Yes = 1 No = 0	
L 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? *Answer YES if there is a TMDL for the lake or basin in which wetland is found.* Yes = 2 No = 0	
Total for L 3 — Add the points in the boxes above	

Rating of Value If score is: **2-4 = H** **1 = M** **0 = L** *Record the rating on the first page*

Wetland name or number WT500

LAKE FRINGE WETLANDS **Hydrologic Functions** - Indicators that the wetland unit functions to reduce shoreline erosion	Points (only 1 score per box)
L 4.0. Does the site have the potential to reduce shoreline erosion?	
L 4.1. Distance along shore and average width of Cowardin classes along the lakeshore (**do not** include Aquatic Bed): *Choose the highest scoring description that matches conditions in the wetland.* > ¾ of distance is Scrub-shrub or Forested at least 33 ft (10 m) wide — points = 6 > ¾ of distance is Scrub-shrub or Forested at least 6 ft (2 m) wide — points = 4 > ¼ distance is Scrub-shrub or Forested at least 33 ft (10 m) wide — points = 4 Plants are at least 6 ft (2 m) wide (do not include Aquatic Bed) — points = 2 Plants are less than 6 ft (2 m) wide (do not include Aquatic Bed) — points = 0	

Rating of Site Potential If score is: ___**6 = M** ___**0-5 = L** *Record the rating on the first page*

L 5.0. Does the landscape have the potential to support hydrologic functions of the site?	
L 5.1. Is the lake used by power boats with more than 10 hp? Yes = 1 No = 0	
L 5.2. Is the fetch on the lake side of the wetland at least 1 mile in distance? Yes = 1 No = 0	
Total for L 5 — Add the points in the boxes above	

Rating of Landscape Potential If score is: ___**2 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

L 6.0. Are the hydrologic functions provided by the site valuable to society?	
L 6.1. Are there resources, both human and natural, along the shore that can be impacted by erosion? If more than one resource is present, choose the one with the highest score. There are human structures or old growth/mature forests within 25 ft of OHWM of the shore in the wetland — points = 2 There are nature trails or other paths and recreational activities within 25 ft of OHWM — points = 1 Other resources that could be impacted by erosion — points = 1 There are no resources that can be impacted by erosion along the shores of the wetland — points = 0	

Rating of Value If score is: ___**2 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number WT500

SLOPE WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of average slope of wetland: *(a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance*) Slope is 1% or less points = 3 Slope is > 1% - 2% points = 2 Slope is > 2% - 5% points = 1 Slope is greater than 5% points = 0	
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or tureorganic *(use NRCS definitions)*: Yes = 3 No = 0	
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. *Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.* Dense, uncut, herbaceous plants > 90% of the wetland area points = 6 Dense, uncut, herbaceous plants > ½ of area points = 3 Dense, woody, plants > ½ of area points = 2 Dense, uncut, herbaceous plants > ¼ of area points = 1 Does not meet any of the criteria above for plants points = 0	
Total for S 1 Add the points in the boxes above	

Rating of Site Potential If score is: ___**12 = H** ___**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

S 2.0. Does the landscape have the potential to support the water quality function at the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? Yes = 1 No = 0	
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources _____ Yes = 1 No = 0	
Total for S 2 Add the points in the boxes above	

Rating of Landscape Potential If score is: ___**1-2 = M** ___**0 = L** *Record the rating on the first page*

S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly to a stream, river, or lake that is on the 303(d) list (*within 1 mi*)? Yes = 1 No = 0	
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? *At least one aquatic resource in the basin is on the 303(d) list*. Yes = 1 No = 0	
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the drainage or basin in which wetland is found*)? Yes = 2 No = 0	
Total for S 3 Add the points in the boxes above	

Rating of Value If score is: ___**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number WT500

SLOPE WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce flooding and erosion	Points (only 1 score per box)
S 4.0. Does the site have the potential to reduce flooding and erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. *Stems of plants should be thick enough (usually > $^1/_8$ in), or dense enough, to remain erect during surface flows*. Dense, uncut, **rigid** plants cover > 90% of the area of the wetland points = 1 All other conditions points = 0	

Rating of Site Potential If score is: ___**1 = M** ___**0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses that generate excess surface runoff? Yes = 1 No = 0	

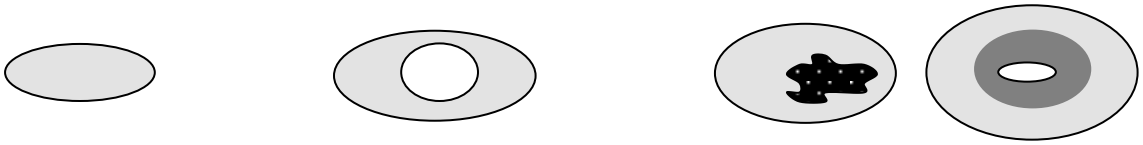
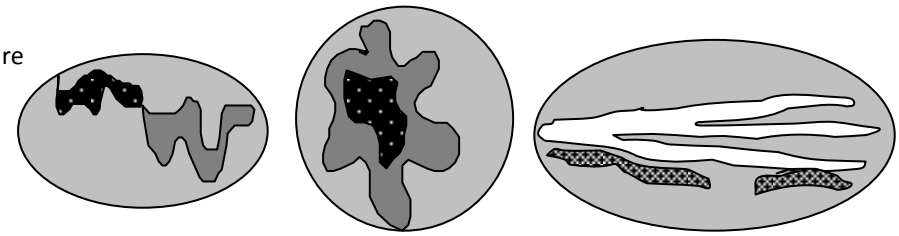
Rating of Landscape Potential If score is: ___**1 = M** ___**0 = L** *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has surface flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 Surface flooding problems are in a sub-basin farther down-gradient points = 1 No flooding problems anywhere downstream points = 0	
S 6.2. Has the site been identified as important for flood storage and flood conveyance in a regional flood control plan? Yes = 2 No = 0	
Total for S 6 Add the points in the boxes above	

Rating of Value If score is: ___**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number WT500

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	(only 1 score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	
H 1.1. Structure of the plant community: *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac.* ____Aquatic bed __x__Emergent plants 0-12 in (0-30 cm) high are the highest layer and have > 30% cover __x__Emergent plants >12-40 in (>30-100 cm) high are the highest layer with >30% cover ____Emergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover ____Scrub-shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) 4 or more checks: points = 3 3 checks: points = 2 2 checks: points = 1 1 check: points = 0	1
H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 No = 0	0
H 1.3. Surface water H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac **OR** 10% of its area during the March to early June **OR** in August to the end of September? ***A**nswer YES for Lake Fringe wetlands*. Yes = 3 points & go to H 1.4 No = go to H 1.3.2 H 1.3.2. Does the wetland have an intermittent or permanent, and unvegetated stream within its boundaries, or along one side, over at least ¼ ac or 10% of its area? *Answer yes only if H 1.3.1 is No*. Yes = 3 No = 0	0
H 1.4. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. D*ifferent patches of the same species can be combined to meet the size threshold. You do not have to name the species.* *Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Russian olive, Phragmites, Canadian thistle, yellow-flag iris, and saltcedar (Tamarisk)* # of species __3__ Scoring: > 9 species: points = 2 4-9 species: points = 1 < 4 species: points = 0	0
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. *Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points **Low** = 1 point **Moderate** = 2 points All three diagrams in this row are **High** = 3 points  Riparian braided channels with 2 classes	Figure__ 1

Wetland name or number WT500

H 1.6. Special habitat features *Check the habitat features that are present in the wetland. The number of checks is the number of points.* ____Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface ponding or in stream. __X__Cattails or bulrushes are present within the wetland. ____Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge. __X__Emergent or shrub vegetation in areas that are permanently inundated/ponded. ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 45 degree slope) OR signs of recent beaver activity ____ Invasive species cover less than 20% in each stratum of vegetation *(canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)*	2
Total for H 1 Add the points in the boxes above	4

Rating of Site Potential If score is: ___**15-18 = H** ___**7-14 = M** __X__**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1. Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is: *Calculate:* % undisturbed habitat __0__ **+** [(% moderate and low intensity land uses)/2] 50 = __0__ % > $^1/_3$ (33.3%) of 1 km Polygon points = 3 20-33% of 1km Polygon points = 2 10-19% of 1km Polygon points = 1 <10% of 1km Polygon points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. *Calculate:* % undisturbed habitat __0__ **+** [(% moderate and low intensity land uses)/2] 50 = __0__ % Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches points = 2 Undisturbed habitat 10 - 50% and > 3 patches points = 1 Undisturbed habitat < 10% of Polygon points = 0	0
H 2.3. Land use intensity in 1 km Polygon: > 50% of Polygon is high intensity land use points = (- 2) Does not meet criterion above points = 0	0
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. *Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs* Yes = 3 No = 0	0
Total for H 2 Add the points in the boxes above	0

Rating of Landscape Potential If score is: ___**4-9 = H** ___**1-3 = M** __X__**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose the highest score that applies to the wetland being rated* Site meets ANY of the following criteria: points = 2 — It has 3 or more priority habitats within 100 m (see Appendix B) — It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) — It is mapped as a location for an individual WDFW species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats within 100 m (see Appendix B) points = 1 Site does not meet any of the criteria above points = 0	0

Rating of Value If score is: ___**2 = H** ___**1 = M** __X__**0 = L** *Record the rating on the first page*

Wetland name or number WT500

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All wetlands should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Vernal pools Is the wetland **less than 4000 ft²**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input. — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *If you find perennial, obligate, wetland plants, the wetland is probably NOT a vernal pool*. — The soil in the wetland is shallow [< 1 ft (30 cm)deep] and is underlain by an impermeable layer such as basalt or clay. — Surface water is present for less than 120 days during the wet season. Yes **–** Go to **SC 1.1** No = **Not a vernal pool** SC 1.1. Is the vernal pool relatively undisturbed in February and March? Yes **–** Go to **SC 1.2** No = **Not a vernal pool with special characteristics**	
SC 1.2. Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 mi (other wetlands, rivers, lakes etc.)? Yes = **Category II** No = **Category III**	**Cat. II** **Cat. III**
SC 2.0. Alkali wetlands Does the wetland meet **one** of the following criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 and 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meet two of the following three sub-criteria? — Salt encrustations around more than 75% of the edge of the wetland — More than ¾ of the plant cover consists of species listed on Table 4 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. Yes = **Category I** No= **Not an alkali wetland**	**Cat. I**
SC 3.0. Wetlands of High Conservation Value (WHCV) SC 3.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to **SC 3.2** No – Go to **SC 3.3** SC 3.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = **Category I** No = **Not a WHCV** SC 3.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 3.4** No = **Not a WHCV** SC 3.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and it is listed on their website? Yes = **Category I** No =**Not a WHCV**	**Cat. I**

Wetland name or number WT500

SC 4.0 Bogs and Calcareous Fens Does the wetland (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens? *Use the key below to identify if the wetland is a bog or calcareous fen.* ***If you answer yes you will still need to rate the wetland based on its functions.*** SC 4.1. Does an area within the wetland have organic soil horizons (i.e., layers of organic soil), either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? *See Appendix C for a field key to identify organic soils*. Yes – Go to **SC 4.3** No – Go to **SC 4.2** SC 4.2. Does an area within the wetland have organic soils, either peats or mucks, that are less than 16 in deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 4.3** No = **Is not a bog for rating** SC 4.3. Does an area within the wetland have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes = **Category I bog** No – Go to **SC 4.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog. SC 4.4. Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No – Go to **SC 4.5** SC 4.5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes = **Is a Calcareous Fen for purpose of rating** No – Go to **SC 4.6** SC 4.6. Do the species listed in Table 6 comprise at least 10% of the total plant cover in an area of peats and mucks, AND one of the two following conditions is met: — Marl deposits [calcium carbonate ($CaCO_3$) precipitate] occur on the soil surface or plant stems — The pH of free water is ≥ 6.8 AND electrical conductivity is ≥ 200 uS/cm at multiple locations within the wetland Yes = **Is a Category I calcareous fen** No = **Is not a calcareous fen**	**Cat. I** **Cat. I**

SC 5.0. Forested Wetlands Does the wetland have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified that a forested class is present in question H 1.1*) — The wetland is within the 100 year floodplain of a river or stream — Aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species — There is at least ¼ ac of trees (even in wetlands smaller than 2.5 ac) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* Yes – Go to **SC 5.1** No = **Not a forested wetland with special characteristics**	
SC 5.1. Does the wetland have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*)? Yes = **Category I** No – Go to **SC 5.2**	**Cat. I**
SC 5.2. Does the wetland have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species? Yes = **Category I** No – Go to **SC 5.3**	**Cat. I**
SC 5.3. Does the wetland have at least ¼ acre with a forest canopy where more than 50% of the tree species (by cover) are fast growing species (*see Table 7*)? Yes = **Category II** No – Go to **SC 5.4**	**Cat. II**
SC 5.4. Is the forested component of the wetland within the 100 year floodplain of a river or stream? Yes = **Category II** No = **Not a forested wetland with special characteristics**	**Cat. II**
Category of wetland based on Special Characteristics *Choose the highest rating if wetland falls into several categories* If you answered No for all types, enter "Not Applicable" on Summary Form	N/A

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland: ***NOTE:*** *This question is independent of the land use between the wetland and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Old-growth/Mature forests:** Old-growth east of Cascade crest – Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.

— **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

— **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

— **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 12 in (30 cm)in eastern Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

— **Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).

— **Eastside Steppe:** Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum* spp.).

— **Juniper Savannah:** All juniper woodlands.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

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Wetland name or number WT501

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): WT501 Date of site visit: 10/5/21

Rated by Jess Taylor and Katie Pyne Trained by Ecology? __ Yes x No Date of training_____

HGM Class used for rating Depressional Wetland has multiple HGM classes?____Y __x__N

NOTE: **Form is not complete without the figures requested** (*figures can be combined*).
Source of base aerial photo/map USDA NAIP 2018

OVERALL WETLAND CATEGORY IV (based on functions x or special characteristics___)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 22-27

_____**Category II** – Total score = 19-21

_____**Category III** – Total score = 16-18

___x___**Category IV** – Total score = 9-15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H M (L)	H M (L)	H M (L)	
Landscape Potential	H M (L)	H (M) L	H M (L)	
Value	H M (L)	H M (L)	H M (L)	**TOTAL**
Score Based on Ratings	3	4	3	10

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY *Circle the appropriate category*
Vernal Pools	**II** **III**
Alkali	**I**
Wetland of High Conservation Value	**I**
Bog and Calcareous Fens	**I**
Old Growth or Mature Forest – slow growing	**I**
Aspen Forest	**I**
Old Growth or Mature Forest – fast growing	**II**
Floodplain forest	**II**
None of the above	x

Wetland name or number WT501

Maps and figures required to answer questions correctly for Eastern Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	N/A
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	N/A
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	N/A
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	5
Map of the contributing basin	D 5.3	1
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	5
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	Attached
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	Attached

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of wetland vs. width of stream *(can be added to another figure)*	R 4.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	L 1.1, L 4.1, H 1.1, H 1.5	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	

Wetland name or number WT501

HGM Classification of Wetland in Eastern Washington

For questions 1-4, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-4 apply, and go to Question 5.

1. Does the entire unit **meet both** of the following criteria?
   ___The vegetated part of the wetland is on the water side of the Ordinary High Water Mark of a body of permanent open water (without any plants on the surface) that is at least 20 ac (8 ha) in size
   ___At least 30% of the open water area is deeper than 10 ft (3 m)

   NO – go to 2 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

2. Does the entire wetland unit **meet all** of the following criteria?
   ___The wetland is on a slope (*slope can be very gradual*),
   ___The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks;
   ___The water leaves the wetland **without being impounded**.

   NO – go to 3 YES – The wetland class is **Slope**
   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).

3. Does the entire wetland unit **meet all** of the following criteria?
   ___ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river;
   ___ The overbank flooding occurs at least once every 10 years.

   NO – go to 4 YES – The wetland class is **Riverine**
   NOTE: The Riverine wetland can contain depressions that are filled with water when the river is not flooding.

4. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

   NO – go to 5 YES – The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-4 APPLY TO DIFFERENT AREAS IN THE WETLAND UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the wetland unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM Class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine (the riverine portion is within the boundary of depression)	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine

*If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number WT501

DEPRESSIONAL WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland has no surface water outlet points = 5 Wetland has an intermittently flowing outlet points = 3 Wetland has a highly constricted permanently flowing outlet points = 3 Wetland has a permanently flowing, unconstricted, surface outlet points = 1	3
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions of soils)* YES = 3 NO = 0	0
D 1.3. Characteristics of persistent vegetation (Emergent, Scrub-shrub, and/or Forested Cowardin classes) Wetland has persistent, ungrazed, vegetation for > $^2/_3$ of area points = 5 Wetland has persistent, ungrazed, vegetation from $^1/_3$ to $^2/_3$ of area points = 3 Wetland has persistent, ungrazed vegetation from $^1/_{10}$ to < $^1/_3$ of area points = 1 Wetland has persistent, ungrazed vegetation < $^1/_{10}$ of area points = 0	1
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.* Area seasonally ponded is > ½ total area of wetland points = 3 Area seasonally ponded is ¼ - ½ total area of wetland points = 1 Area seasonally ponded is < ¼ total area of wetland points = 0	1
Total for D 1 Add the points in the boxes above	5

Rating of Site Potential If score is: ___ **12- 16 = H** ___ **6- 11 = M** _X_ **0- 5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	0
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1- D 2.3? Source_____ Yes = 1 No = 0	0
Total for D 2 Add the points in the boxes above	0

Rating of Landscape Potential If score is: ___ **3 or 4 = H** ___ **1 or 2 = M** _X_ **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, or lake that is on the 303(d) list? Yes = 1 No = 0	0
D 3.2. Is the wetland in a basin or sub-basin where water quality is an issue in some aquatic resource [303(d) list, eutrophic lakes, problems with nuisance and toxic algae]? Yes = 1 No = 0	0
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the drainage or basin in which the wetland is found*)? Yes = 2 No = 0	0
Total for D 3 Add the points in the boxes above	0

Rating of Value If score is: ___ **2-4 = H** ___ **1 = M** _X_ **0 = L** *Record the rating on the first page*

Wetland name or number WT501

DEPRESSIONAL WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce flooding and erosion.	Points (only 1 score per box)
D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland has no surface water outlet points = 8 Wetland has an intermittently flowing outlet points = 4 Wetland has a highly constricted permanently flowing outlet points = 4 Wetland has a permanently flowing unconstricted surface outlet points = 0 *(If outlet is a ditch and not permanently flowing treat wetland as "intermittently flowing")*	4
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or deepest part (if dry).* Seasonal ponding: > 3 ft above the lowest point in wetland or the surface of permanent ponding points = 8 Seasonal ponding: 2 ft - < 3 ft above the lowest point in wetland or the surface of permanent ponding points = 6 The wetland is a headwater wetland points = 4 Seasonal ponding: 1 ft - < 2 ft points = 4 Seasonal ponding: 6 in - < 1 ft points = 2 Seasonal ponding: < 6 in or wetland has only saturated soils points = 0	0
Total for D 4 Add the points in the boxes above	4

Rating of Site Potential If score is: ___ **12-16 = H** ___ **6-11 = M** _X_ **0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0
D 5.2. Is > 10% of the area within 150 ft of the wetland in a land use that generates runoff? Yes = 1 No = 0	0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses? Yes = 1 No = 0	1
Total for D 5 Add the points in the boxes above	1

Rating of Landscape Potential If score is: ___ **3 = H** _X_ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. The wetland is in a landscape that has flooding problems. Choose the description that best matches conditions around the wetland being rated. *Do not add points. Choose the highest score if more than one condition is met.* The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds), AND Flooding occurs in sub-basin that is immediately down-gradient of wetland points = 2 Surface flooding problems are in a sub-basin farther down-gradient points = 1 The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ points = 0 There are no problems with flooding downstream of the wetland points = 0	0
D 6.2. Has the site has been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for D 6 Add the points in the boxes above	0

Rating of Value If score is: ___ **2-4 = H** ___ **1 = M** _X_ **0 = L** *Record the rating on the first page*

Wetland name or number WT501

RIVERINE WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
R 1.0. Does the site have the potential to improve water quality?	
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event: Depressions cover > $^1/_3$ area of wetland points = 6 Depressions cover > $^1/_{10}$ area of wetland points = 3 Depressions present but cover < $^1/_{10}$ area of wetland points = 1 No depressions present points = 0	
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height; **not** Cowardin classes): Forest or shrub > $^2/_3$ the area of the wetland points = 10 Forest or shrub $^1/_3$ – $^2/_3$ area of the wetland points = 5 Ungrazed, herbaceous plants > $^2/_3$ area of wetland points = 5 Ungrazed herbaceous plants $^1/_3$ – $^2/_3$ area of wetland points = 2 Forest, shrub, and ungrazed herbaceous < $^1/_3$ area of wetland points = 0	
Total for R 1 Add the points in the boxes above	

Rating of Site Potential If score is: **12-16 = H** **6-11 = M** **0-5 = L** *Record the rating on the first page*

R 2.0. Does the landscape have the potential to support the water quality function of the site?	
R 2.1. Is the wetland within an incorporated city or within its UGA? Yes = 2 No = 0	
R 2.2. Does the contributing basin include a UGA or incorporated area? Yes = 1 No = 0	
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years? Yes = 1 No = 0	
R 2.4. Is > 10% of the area within 150 ft of wetland in land uses that generate pollutants Yes = 1 No = 0	
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1-R 2.4? Source_____ Yes = 1 No = 0	
Total for R 2 Add the points in the boxes above	

Rating of Landscape Potential If score is: **3-6 = H** **1 or 2 = M** **0 = L** *Record the rating on the first page*

R 3.0. Is the water quality improvement provided by the site valuable to society?	
R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi? Yes = 1 No = 0	
R 3.2. Does the river or stream have TMDL limits for nutrients, toxics, or pathogens? Yes = 1 No = 0	
R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? *Answer YES if there is a TMDL for the drainage in which wetland is found*. Yes = 2 No = 0	
Total for R 3 Add the points in the boxes above	

Rating of Value If score is: **2-4 = H** **1 = M** **0 = L** *Record the rating on the first page*

Wetland name or number WT501

RIVERINE WETLANDS **Hydrologic Functions** - Indicators that site functions to reduce flooding and stream erosion	Points (only 1 score per box)
R 4.0. Does the site have the potential to reduce flooding and erosion?	
R 4.1. Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average width of stream between banks).* If the ratio is more than 2 — points = 10 If the ratio is 1-2 — points = 8 If the ratio is ½-<1 — points = 4 If the ratio is ¼-< ½ — points = 2 If the ratio is < ¼ — points = 1	
R 4.2. Characteristics of plants that slow down water velocities during floods: *Treat large woody debris as forest or shrub. Choose the points appropriate for the best description (polygons need to have > 90% cover at person height. These are NOT Cowardin classes)*. Forest or shrub for more than $^2/_3$ the area of the wetland — points = 6 Forest or shrub for >$^1/_3$ area OR emergent plants > $^2/_3$ area — points = 4 Forest or shrub for > $^1/_{10}$ area OR emergent plants > $^1/_3$ area — points = 2 Plants do not meet above criteria — points = 0	
Total for R 5 — Add the points in the boxes above	

Rating of Site Potential If score is: ___**12-16 = H** ___**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

R 5.0. Does the landscape have the potential to support the hydrologic functions of the site?		
R 5.1. Is the stream or river adjacent to the wetland downcut?	Yes = 0 No = 1	
R 5.2. Does the up-gradient watershed include a UGA or incorporated area?	Yes = 1 No = 0	
R 5.3. Is the up-gradient stream or river controlled by dams?	Yes = 0 No = 1	
Total for R 5	Add the points in the boxes above	

Rating of Landscape Potential If score is: ___**3 = H** ___**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

R 6.0. Are the hydrologic functions provided by the site valuable to society?		
R 6.1. Distance to the nearest areas downstream that have flooding problems? *Choose the description that best fits the site.* The sub-basin immediately down-gradient of site has surface flooding problems that result in damage to human or natural resources — points = 2 Surface flooding problems are in a basin farther down-gradient — points = 1 No flooding problems anywhere downstream — points = 0		
R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?	Yes = 2 No = 0	
Total for R 6	Add the points in the boxes above	

Rating of Value If score is: ___**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number WT501

LAKE FRINGE WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality.	Points (only 1 score per box)
L 1.0. Does the site have the potential to improve water quality?	
L 1.1. Average width of plants along the lakeshore *(use polygons of Cowardin classes)*: Plants are more than 33 ft (10 m) wide — points = 6 Plants are more than 16 ft (5 m) and < 33 ft (10 m) wide — points = 3 Plants are more than 6 ft (2 m) and < 16 ft (5 m) wide — points = 1 Plants are less than 6 ft wide — points = 0	
L 1.2. Characteristics of the plants in the wetland: Choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. *These are not Cowardin classes. Area of cover is total cover in the wetland, but it can be in patches. Herbaceous does not include aquatic bed*. Cover of herbaceous plants is > 90% of the vegetated area — points = 6 Cover of herbaceous plants is > $^{2}/_{3}$ of the vegetated area — points = 4 Cover of herbaceous plants is > $^{1}/_{3}$ of the vegetated area — points = 3 Other plants that are not aquatic bed > $^{2}/_{3}$ wetland — points = 3 Other plants that are not aquatic bed in > $^{1}/_{3}$ vegetated area — points = 1 Aquatic bed plants and open water cover > $^{2}/_{3}$ of the wetland — points = 0	
Total for L 1 — Add the points in the boxes above	

Rating of Site Potential If score is: **8-12 = H** **4-7 = M** **0-3 = L** *Record the rating on the first page*

L 2.0. Does the landscape have the potential to support the water quality function of the site?	
L 2.1. Is the lake used by power boats? Yes = 1 No = 0	
L 2.2. Is > 10% of the area within 150 ft of wetland on the upland side in land uses that generate pollutants? Yes = 1 No = 0	
L 2.3. Does the lake have problems with algal blooms or excessive plants such as milfoil? Yes = 1 No = 0	
Total for L 2 — Add the points in the boxes above	

Rating of Landscape Potential If score is: **2 or 3 = H** **1 = M** **0 = L** *Record the rating on the first page*

L 3.0. Is the water quality improvement provided by the site valuable to society?	
L 3.1. Is the lake on the 303(d) list of degraded aquatic resources? Yes = 1 No = 0	
L 3.2. Is the lake in a sub-basin where water quality is an issue (at least one aquatic resource in the basin is on the 303(d) list)? Yes = 1 No = 0	
L 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? *Answer YES if there is a TMDL for the lake or basin in which wetland is found.* Yes = 2 No = 0	
Total for L 3 — Add the points in the boxes above	

Rating of Value If score is: **2-4 = H** **1 = M** **0 = L** *Record the rating on the first page*

Wetland name or number WT501

LAKE FRINGE WETLANDS **Hydrologic Functions** - Indicators that the wetland unit functions to reduce shoreline erosion	Points (only 1 score per box)
L 4.0. Does the site have the potential to reduce shoreline erosion?	
L 4.1. Distance along shore and average width of Cowardin classes along the lakeshore (**do not** include Aquatic Bed): *Choose the highest scoring description that matches conditions in the wetland.* > ¾ of distance is Scrub-shrub or Forested at least 33 ft (10 m) wide — points = 6 > ¾ of distance is Scrub-shrub or Forested at least 6 ft (2 m) wide — points = 4 > ¼ distance is Scrub-shrub or Forested at least 33 ft (10 m) wide — points = 4 Plants are at least 6 ft (2 m) wide (do not include Aquatic Bed) — points = 2 Plants are less than 6 ft (2 m) wide (do not include Aquatic Bed) — points = 0	

Rating of Site Potential If score is: ___**6 = M** ___**0-5 = L** *Record the rating on the first page*

L 5.0. Does the landscape have the potential to support hydrologic functions of the site?	
L 5.1. Is the lake used by power boats with more than 10 hp? Yes = 1 No = 0	
L 5.2. Is the fetch on the lake side of the wetland at least 1 mile in distance? Yes = 1 No = 0	
Total for L 5 — Add the points in the boxes above	

Rating of Landscape Potential If score is: ___**2 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

L 6.0. Are the hydrologic functions provided by the site valuable to society?	
L 6.1. Are there resources, both human and natural, along the shore that can be impacted by erosion? If more than one resource is present, choose the one with the highest score. There are human structures or old growth/mature forests within 25 ft of OHWM of the shore in the wetland — points = 2 There are nature trails or other paths and recreational activities within 25 ft of OHWM — points = 1 Other resources that could be impacted by erosion — points = 1 There are no resources that can be impacted by erosion along the shores of the wetland — points = 0	

Rating of Value If score is: ___**2 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number WT501

SLOPE WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of average slope of wetland: *(a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance*) Slope is 1% or less points = 3 Slope is > 1% - 2% points = 2 Slope is > 2% - 5% points = 1 Slope is greater than 5% points = 0	
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or tureorganic *(use NRCS definitions)*: Yes = 3 No = 0	
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. *Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.* Dense, uncut, herbaceous plants > 90% of the wetland area points = 6 Dense, uncut, herbaceous plants > ½ of area points = 3 Dense, woody, plants > ½ of area points = 2 Dense, uncut, herbaceous plants > ¼ of area points = 1 Does not meet any of the criteria above for plants points = 0	
Total for S 1 Add the points in the boxes above	

Rating of Site Potential If score is: ___**12 = H** ___**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

S 2.0. Does the landscape have the potential to support the water quality function at the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? Yes = 1 No = 0	
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources _____ Yes = 1 No = 0	
Total for S 2 Add the points in the boxes above	

Rating of Landscape Potential If score is: ___**1-2 = M** ___**0 = L** *Record the rating on the first page*

S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly to a stream, river, or lake that is on the 303(d) list (*within 1 mi*)? Yes = 1 No = 0	
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? *At least one aquatic resource in the basin is on the 303(d) list*. Yes = 1 No = 0	
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the drainage or basin in which wetland is found*)? Yes = 2 No = 0	
Total for S 3 Add the points in the boxes above	

Rating of Value If score is: ___**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number WT501

SLOPE WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce flooding and erosion	Points (only 1 score per box)
S 4.0. Does the site have the potential to reduce flooding and erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. *Stems of plants should be thick enough (usually > $^1/_8$ in), or dense enough, to remain erect during surface flows*. Dense, uncut, **rigid** plants cover > 90% of the area of the wetland points = 1 All other conditions points = 0	

Rating of Site Potential If score is: ___**1 = M** ___**0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses that generate excess surface runoff? Yes = 1 No = 0	

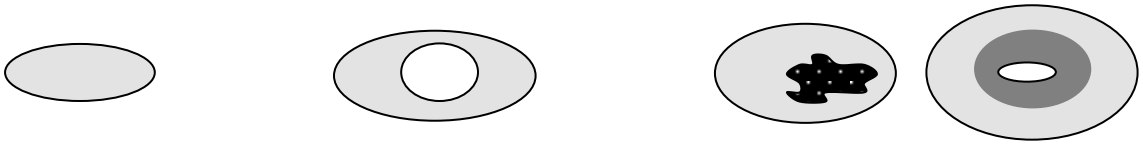
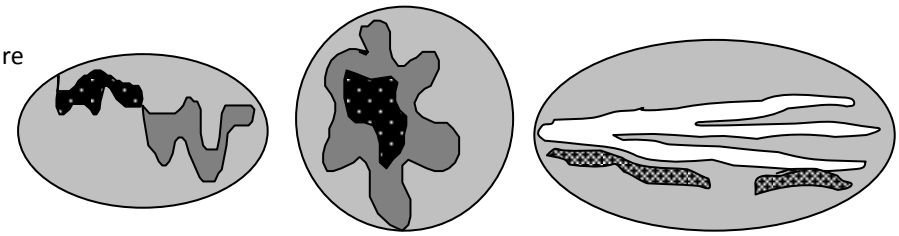
Rating of Landscape Potential If score is: ___**1 = M** ___**0 = L** *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has surface flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 Surface flooding problems are in a sub-basin farther down-gradient points = 1 No flooding problems anywhere downstream points = 0	
S 6.2. Has the site been identified as important for flood storage and flood conveyance in a regional flood control plan? Yes = 2 No = 0	
Total for S 6 Add the points in the boxes above	

Rating of Value If score is: ___**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number WT501

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	(only 1 score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	
H 1.1. Structure of the plant community: *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac.* ____Aquatic bed __x__Emergent plants 0-12 in (0-30 cm) high are the highest layer and have > 30% cover __x__Emergent plants >12-40 in (>30-100 cm) high are the highest layer with >30% cover ____Emergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover ____Scrub-shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) 4 or more checks: points = 3 3 checks: points = 2 2 checks: points = 1 1 check: points = 0	1
H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 No = 0	0
H 1.3. Surface water H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac **OR** 10% of its area during the March to early June **OR** in August to the end of September? ***A**nswer YES for Lake Fringe wetlands*. Yes = 3 points & go to H 1.4 No = go to H 1.3.2 H 1.3.2. Does the wetland have an intermittent or permanent, and unvegetated stream within its boundaries, or along one side, over at least ¼ ac or 10% of its area? *Answer yes only if H 1.3.1 is No*. Yes = 3 No = 0	0
H 1.4. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. D*ifferent patches of the same species can be combined to meet the size threshold. You do not have to name the species.* *Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Russian olive, Phragmites, Canadian thistle, yellow-flag iris, and saltcedar (Tamarisk)* # of species __3__ Scoring: > 9 species: points = 2 4-9 species: points = 1 < 4 species: points = 0	0
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. *Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points **Low** = 1 point **Moderate** = 2 points All three diagrams in this row are **High** = 3 points  Riparian braided channels with 2 classes	Figure__ 1

Wetland name or number WT501

H 1.6. Special habitat features *Check the habitat features that are present in the wetland. The number of checks is the number of points.* ____Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface ponding or in stream. __x__Cattails or bulrushes are present within the wetland. ____Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge. __x__Emergent or shrub vegetation in areas that are permanently inundated/ponded. ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 45 degree slope) OR signs of recent beaver activity ____ Invasive species cover less than 20% in each stratum of vegetation *(canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)*	2
Total for H 1 Add the points in the boxes above	4

Rating of Site Potential If score is: ___**15-18 = H** ___**7-14 = M** __x__**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1. Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is: *Calculate:* % undisturbed habitat __0__ **+** [(% moderate and low intensity land uses)/2] 50 = __0__ % > $^1/_3$ (33.3%) of 1 km Polygon points = 3 20-33% of 1km Polygon points = 2 10-19% of 1km Polygon points = 1 <10% of 1km Polygon points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. *Calculate:* % undisturbed habitat __0__ **+** [(% moderate and low intensity land uses)/2] 50 = __0__ % Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches points = 2 Undisturbed habitat 10 - 50% and > 3 patches points = 1 Undisturbed habitat < 10% of Polygon points = 0	0
H 2.3. Land use intensity in 1 km Polygon: > 50% of Polygon is high intensity land use points = (- 2) Does not meet criterion above points = 0	0
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. *Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs* Yes = 3 No = 0	0
Total for H 2 Add the points in the boxes above	0

Rating of Landscape Potential If score is: ___**4-9 = H** ___**1-3 = M** __x__**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose the highest score that applies to the wetland being rated* Site meets ANY of the following criteria: points = 2 — It has 3 or more priority habitats within 100 m (see Appendix B) — It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) — It is mapped as a location for an individual WDFW species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats within 100 m (see Appendix B) points = 1 Site does not meet any of the criteria above points = 0	0

Rating of Value If score is: ___**2 = H** ___**1 = M** __X__**0 = L** *Record the rating on the first page*

Wetland name or number WT501

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All wetlands should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Vernal pools Is the wetland **less than 4000 ft²**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input. — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *If you find perennial, obligate, wetland plants, the wetland is probably NOT a vernal pool*. — The soil in the wetland is shallow [< 1 ft (30 cm)deep] and is underlain by an impermeable layer such as basalt or clay. — Surface water is present for less than 120 days during the wet season. Yes **–** Go to **SC 1.1** No = **Not a vernal pool** SC 1.1. Is the vernal pool relatively undisturbed in February and March? Yes **–** Go to **SC 1.2** No = **Not a vernal pool with special characteristics**	
SC 1.2. Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 mi (other wetlands, rivers, lakes etc.)? Yes = **Category II** No = **Category III**	**Cat. II** **Cat. III**
SC 2.0. Alkali wetlands Does the wetland meet **one** of the following criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 and 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meet two of the following three sub-criteria? — Salt encrustations around more than 75% of the edge of the wetland — More than ¾ of the plant cover consists of species listed on Table 4 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. Yes = **Category I** No= **Not an alkali wetland**	**Cat. I**
SC 3.0. Wetlands of High Conservation Value (WHCV) SC 3.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to **SC 3.2** No – Go to **SC 3.3** SC 3.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = **Category I** No = **Not a WHCV** SC 3.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 3.4** No = **Not a WHCV** SC 3.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and it is listed on their website? Yes = **Category I** No =**Not a WHCV**	**Cat. I**

Wetland name or number WT501

SC 4.0 Bogs and Calcareous Fens Does the wetland (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens? *Use the key below to identify if the wetland is a bog or calcareous fen.* ***If you answer yes you will still need to rate the wetland based on its functions.*** SC 4.1. Does an area within the wetland have organic soil horizons (i.e., layers of organic soil), either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? *See Appendix C for a field key to identify organic soils*. Yes – Go to **SC 4.3** No – Go to **SC 4.2** SC 4.2. Does an area within the wetland have organic soils, either peats or mucks, that are less than 16 in deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 4.3** No = **Is not a bog for rating** SC 4.3. Does an area within the wetland have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes = **Category I bog** No – Go to **SC 4.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog. SC 4.4. Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No – Go to **SC 4.5** SC 4.5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes = **Is a Calcareous Fen for purpose of rating** No – Go to **SC 4.6** SC 4.6. Do the species listed in Table 6 comprise at least 10% of the total plant cover in an area of peats and mucks, AND one of the two following conditions is met: — Marl deposits [calcium carbonate ($CaCO_3$) precipitate] occur on the soil surface or plant stems — The pH of free water is ≥ 6.8 AND electrical conductivity is ≥ 200 uS/cm at multiple locations within the wetland Yes = **Is a Category I calcareous fen** No = **Is not a calcareous fen**	**Cat. I** **Cat. I**

SC 5.0. Forested Wetlands Does the wetland have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified that a forested class is present in question H 1.1*) — The wetland is within the 100 year floodplain of a river or stream — Aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species — There is at least ¼ ac of trees (even in wetlands smaller than 2.5 ac) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* Yes – Go to **SC 5.1** No = **Not a forested wetland with special characteristics**	
SC 5.1. Does the wetland have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*)? Yes = **Category I** No – Go to **SC 5.2** SC 5.2. Does the wetland have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species? Yes = **Category I** No – Go to **SC 5.3** SC 5.3. Does the wetland have at least ¼ acre with a forest canopy where more than 50% of the tree species (by cover) are fast growing species (*see Table 7*)? Yes = **Category II** No – Go to **SC 5.4** SC 5.4. Is the forested component of the wetland within the 100 year floodplain of a river or stream? Yes = **Category II** No = **Not a forested wetland with special characteristics**	**Cat. I** **Cat. I** **Cat. II** **Cat. II**
Category of wetland based on Special Characteristics *Choose the highest rating if wetland falls into several categories* If you answered No for all types, enter "Not Applicable" on Summary Form	N/A

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland: ***NOTE:*** *This question is independent of the land use between the wetland and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Old-growth/Mature forests:** Old-growth east of Cascade crest – Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.

— **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

— **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

— **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 12 in (30 cm)in eastern Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

— **Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).

— **Eastside Steppe:** Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum* spp.).

— **Juniper Savannah:** All juniper woodlands.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

Wetland name or number WT502

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): WT502 Date of site visit: 10/5/21

Rated by Jess Taylor and Katie Pyne Trained by Ecology? __ Yes x No Date of training_____

HGM Class used for rating Depressional Wetland has multiple HGM classes?____Y __x__N

NOTE: **Form is not complete without the figures requested** (*figures can be combined*).
Source of base aerial photo/map USDA NAIP 2018

OVERALL WETLAND CATEGORY IV (based on functions x or special characteristics___)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 22-27
_____**Category II** – Total score = 19-21
_____**Category III** – Total score = 16-18
___x___**Category IV** – Total score = 9-15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H M **L**	H M **L**	H M **L**	
Landscape Potential	H M **L**	H **M** L	H M **L**	
Value	H M **L**	H M **L**	H M **L**	**TOTAL**
Score Based on Ratings	3	4	3	10

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY *Circle the appropriate category*
Vernal Pools	**II** **III**
Alkali	**I**
Wetland of High Conservation Value	**I**
Bog and Calcareous Fens	**I**
Old Growth or Mature Forest – slow growing	**I**
Aspen Forest	**I**
Old Growth or Mature Forest – fast growing	**II**
Floodplain forest	**II**
None of the above	x

Wetland name or number WT502

Maps and figures required to answer questions correctly for Eastern Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	N/A
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	N/A
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	N/A
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	5
Map of the contributing basin	D 5.3	1
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	5
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	Attached
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	Attached

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of wetland vs. width of stream *(can be added to another figure)*	R 4.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	L 1.1, L 4.1, H 1.1, H 1.5	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	

Wetland name or number WT502

HGM Classification of Wetland in Eastern Washington

For questions 1-4, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-4 apply, and go to Question 5.

1. Does the entire unit **meet both** of the following criteria?
   ___The vegetated part of the wetland is on the water side of the Ordinary High Water Mark of a body of permanent open water (without any plants on the surface) that is at least 20 ac (8 ha) in size
   ___At least 30% of the open water area is deeper than 10 ft (3 m)

   NO – go to 2 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

2. Does the entire wetland unit **meet all** of the following criteria?
   ___The wetland is on a slope (*slope can be very gradual*),
   ___The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks;
   ___The water leaves the wetland **without being impounded**.

   NO – go to 3 YES – The wetland class is **Slope**
   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).

3. Does the entire wetland unit **meet all** of the following criteria?
   ___ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river;
   ___ The overbank flooding occurs at least once every 10 years.

   NO – go to 4 YES – The wetland class is **Riverine**
   NOTE: The Riverine wetland can contain depressions that are filled with water when the river is not flooding.

4. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

   NO – go to 5 YES – The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-4 APPLY TO DIFFERENT AREAS IN THE WETLAND UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

Wetland name or number WT502

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the wetland unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM Class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine (the riverine portion is within the boundary of depression)	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine

*If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number WT502

DEPRESSIONAL WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland has no surface water outlet points = 5 Wetland has an intermittently flowing outlet points = 3 Wetland has a highly constricted permanently flowing outlet points = 3 Wetland has a permanently flowing, unconstricted, surface outlet points = 1	3
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions of soils)* YES = 3 NO = 0	0
D 1.3. Characteristics of persistent vegetation (Emergent, Scrub-shrub, and/or Forested Cowardin classes) Wetland has persistent, ungrazed, vegetation for > $^2/_3$ of area points = 5 Wetland has persistent, ungrazed, vegetation from $^1/_3$ to $^2/_3$ of area points = 3 Wetland has persistent, ungrazed vegetation from $^1/_{10}$ to < $^1/_3$ of area points = 1 Wetland has persistent, ungrazed vegetation < $^1/_{10}$ of area points = 0	1
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.* Area seasonally ponded is > ½ total area of wetland points = 3 Area seasonally ponded is ¼ - ½ total area of wetland points = 1 Area seasonally ponded is < ¼ total area of wetland points = 0	1
Total for D 1 Add the points in the boxes above	5

Rating of Site Potential If score is: ___ **12- 16 = H** ___ **6- 11 = M** _X_ **0- 5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	0
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1- D 2.3? Source_____ Yes = 1 No = 0	0
Total for D 2 Add the points in the boxes above	0

Rating of Landscape Potential If score is: ___ **3 or 4 = H** ___ **1 or 2 = M** _X_ **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, or lake that is on the 303(d) list? Yes = 1 No = 0	0
D 3.2. Is the wetland in a basin or sub-basin where water quality is an issue in some aquatic resource [303(d) list, eutrophic lakes, problems with nuisance and toxic algae]? Yes = 1 No = 0	0
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the drainage or basin in which the wetland is found*)? Yes = 2 No = 0	0
Total for D 3 Add the points in the boxes above	0

Rating of Value If score is: ___ **2-4 = H** ___ **1 = M** _X_ **0 = L** *Record the rating on the first page*

Wetland name or number WT502

DEPRESSIONAL WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce flooding and erosion.	Points (only 1 score per box)
D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland has no surface water outlet points = 8 Wetland has an intermittently flowing outlet points = 4 Wetland has a highly constricted permanently flowing outlet points = 4 Wetland has a permanently flowing unconstricted surface outlet points = 0 *(If outlet is a ditch and not permanently flowing treat wetland as "intermittently flowing")*	4
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or deepest part (if dry).* Seasonal ponding: > 3 ft above the lowest point in wetland or the surface of permanent ponding points = 8 Seasonal ponding: 2 ft - < 3 ft above the lowest point in wetland or the surface of permanent ponding points = 6 The wetland is a headwater wetland points = 4 Seasonal ponding: 1 ft - < 2 ft points = 4 Seasonal ponding: 6 in - < 1 ft points = 2 Seasonal ponding: < 6 in or wetland has only saturated soils points = 0	0
Total for D 4 Add the points in the boxes above	4

Rating of Site Potential If score is: ___ **12-16 = H** ___ **6-11 = M** _X_ **0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0
D 5.2. Is > 10% of the area within 150 ft of the wetland in a land use that generates runoff? Yes = 1 No = 0	0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses? Yes = 1 No = 0	1
Total for D 5 Add the points in the boxes above	1

Rating of Landscape Potential If score is: ___ **3 = H** _X_ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. The wetland is in a landscape that has flooding problems. Choose the description that best matches conditions around the wetland being rated. *Do not add points. Choose the highest score if more than one condition is met.* The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds), AND Flooding occurs in sub-basin that is immediately down-gradient of wetland points = 2 Surface flooding problems are in a sub-basin farther down-gradient points = 1 The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ points = 0 There are no problems with flooding downstream of the wetland points = 0	0
D 6.2. Has the site has been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for D 6 Add the points in the boxes above	0

Rating of Value If score is: ___ **2-4 = H** ___ **1 = M** _X_ **0 = L** *Record the rating on the first page*

Wetland name or number WT502

RIVERINE WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
R 1.0. Does the site have the potential to improve water quality?	
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event: Depressions cover > 1/3 area of wetland points = 6 Depressions cover > 1/10 area of wetland points = 3 Depressions present but cover < 1/10 area of wetland points = 1 No depressions present points = 0	
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height; **not** Cowardin classes): Forest or shrub > 2/3 the area of the wetland points = 10 Forest or shrub 1/3 – 2/3 area of the wetland points = 5 Ungrazed, herbaceous plants > 2/3 area of wetland points = 5 Ungrazed herbaceous plants 1/3 – 2/3 area of wetland points = 2 Forest, shrub, and ungrazed herbaceous < 1/3 area of wetland points = 0	
Total for R 1 Add the points in the boxes above	

Rating of Site Potential If score is: **12-16 = H** **6-11 = M** **0-5 = L** *Record the rating on the first page*

R 2.0. Does the landscape have the potential to support the water quality function of the site?	
R 2.1. Is the wetland within an incorporated city or within its UGA? Yes = 2 No = 0	
R 2.2. Does the contributing basin include a UGA or incorporated area? Yes = 1 No = 0	
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years? Yes = 1 No = 0	
R 2.4. Is > 10% of the area within 150 ft of wetland in land uses that generate pollutants Yes = 1 No = 0	
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1-R 2.4? Source_____ Yes = 1 No = 0	
Total for R 2 Add the points in the boxes above	

Rating of Landscape Potential If score is: **3-6 = H** **1 or 2 = M** **0 = L** *Record the rating on the first page*

R 3.0. Is the water quality improvement provided by the site valuable to society?	
R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi? Yes = 1 No = 0	
R 3.2. Does the river or stream have TMDL limits for nutrients, toxics, or pathogens? Yes = 1 No = 0	
R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? A*nswer YES if there is a TMDL for the drainage in which wetland is found*. Yes = 2 No = 0	
Total for R 3 Add the points in the boxes above	

Rating of Value If score is: **2-4 = H** **1 = M** **0 = L** *Record the rating on the first page*

Wetland name or number WT502

RIVERINE WETLANDS **Hydrologic Functions** - Indicators that site functions to reduce flooding and stream erosion	Points (only 1 score per box)
R 4.0. Does the site have the potential to reduce flooding and erosion?	
R 4.1. Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average width of stream between banks).* If the ratio is more than 2 — points = 10 If the ratio is 1-2 — points = 8 If the ratio is ½-<1 — points = 4 If the ratio is ¼-< ½ — points = 2 If the ratio is < ¼ — points = 1	
R 4.2. Characteristics of plants that slow down water velocities during floods: *Treat large woody debris as forest or shrub. Choose the points appropriate for the best description (polygons need to have > 90% cover at person height. These are NOT Cowardin classes)*. Forest or shrub for more than $^2/_3$ the area of the wetland — points = 6 Forest or shrub for >$^1/_3$ area OR emergent plants > $^2/_3$ area — points = 4 Forest or shrub for > $^1/_{10}$ area OR emergent plants > $^1/_3$ area — points = 2 Plants do not meet above criteria — points = 0	
Total for R 5 — Add the points in the boxes above	

Rating of Site Potential If score is: ___**12-16 = H** ___**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

R 5.0. Does the landscape have the potential to support the hydrologic functions of the site?		
R 5.1. Is the stream or river adjacent to the wetland downcut?	Yes = 0 No = 1	
R 5.2. Does the up-gradient watershed include a UGA or incorporated area?	Yes = 1 No = 0	
R 5.3. Is the up-gradient stream or river controlled by dams?	Yes = 0 No = 1	
Total for R 5	Add the points in the boxes above	

Rating of Landscape Potential If score is: ___**3 = H** ___**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

R 6.0. Are the hydrologic functions provided by the site valuable to society?		
R 6.1. Distance to the nearest areas downstream that have flooding problems? *Choose the description that best fits the site.* The sub-basin immediately down-gradient of site has surface flooding problems that result in damage to human or natural resources — points = 2 Surface flooding problems are in a basin farther down-gradient — points = 1 No flooding problems anywhere downstream — points = 0		
R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?	Yes = 2 No = 0	
Total for R 6	Add the points in the boxes above	

Rating of Value If score is: ___**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number WT502

LAKE FRINGE WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality.	Points (only 1 score per box)
L 1.0. Does the site have the potential to improve water quality?	
L 1.1. Average width of plants along the lakeshore *(use polygons of Cowardin classes)*: Plants are more than 33 ft (10 m) wide — points = 6 Plants are more than 16 ft (5 m) and < 33 ft (10 m) wide — points = 3 Plants are more than 6 ft (2 m) and < 16 ft (5 m) wide — points = 1 Plants are less than 6 ft wide — points = 0	
L 1.2. Characteristics of the plants in the wetland: Choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. *These are not Cowardin classes. Area of cover is total cover in the wetland, but it can be in patches. Herbaceous does not include aquatic bed*. Cover of herbaceous plants is > 90% of the vegetated area — points = 6 Cover of herbaceous plants is > $^{2}/_{3}$ of the vegetated area — points = 4 Cover of herbaceous plants is > $^{1}/_{3}$ of the vegetated area — points = 3 Other plants that are not aquatic bed > $^{2}/_{3}$ wetland — points = 3 Other plants that are not aquatic bed in > $^{1}/_{3}$ vegetated area — points = 1 Aquatic bed plants and open water cover > $^{2}/_{3}$ of the wetland — points = 0	
Total for L 1 — Add the points in the boxes above	

Rating of Site Potential If score is: ___**8-12 = H** ___**4-7 = M** ___**0-3 = L** *Record the rating on the first page*

L 2.0. Does the landscape have the potential to support the water quality function of the site?	
L 2.1. Is the lake used by power boats? Yes = 1 No = 0	
L 2.2. Is > 10% of the area within 150 ft of wetland on the upland side in land uses that generate pollutants? Yes = 1 No = 0	
L 2.3. Does the lake have problems with algal blooms or excessive plants such as milfoil? Yes = 1 No = 0	
Total for L 2 — Add the points in the boxes above	

Rating of Landscape Potential If score is: ___**2 or 3 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

L 3.0. Is the water quality improvement provided by the site valuable to society?	
L 3.1. Is the lake on the 303(d) list of degraded aquatic resources? Yes = 1 No = 0	
L 3.2. Is the lake in a sub-basin where water quality is an issue (at least one aquatic resource in the basin is on the 303(d) list)? Yes = 1 No = 0	
L 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? *Answer YES if there is a TMDL for the lake or basin in which wetland is found.* Yes = 2 No = 0	
Total for L 3 — Add the points in the boxes above	

Rating of Value If score is: ___**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number WT502

LAKE FRINGE WETLANDS **Hydrologic Functions** - Indicators that the wetland unit functions to reduce shoreline erosion	Points (only 1 score per box)
L 4.0. Does the site have the potential to reduce shoreline erosion?	
L 4.1. Distance along shore and average width of Cowardin classes along the lakeshore (**do not** include Aquatic Bed): *Choose the highest scoring description that matches conditions in the wetland.* > ¾ of distance is Scrub-shrub or Forested at least 33 ft (10 m) wide — points = 6 > ¾ of distance is Scrub-shrub or Forested at least 6 ft (2 m) wide — points = 4 > ¼ distance is Scrub-shrub or Forested at least 33 ft (10 m) wide — points = 4 Plants are at least 6 ft (2 m) wide (do not include Aquatic Bed) — points = 2 Plants are less than 6 ft (2 m) wide (do not include Aquatic Bed) — points = 0	

Rating of Site Potential If score is: ___**6 = M** ___**0-5 = L** *Record the rating on the first page*

L 5.0. Does the landscape have the potential to support hydrologic functions of the site?	
L 5.1. Is the lake used by power boats with more than 10 hp? Yes = 1 No = 0	
L 5.2. Is the fetch on the lake side of the wetland at least 1 mile in distance? Yes = 1 No = 0	
Total for L 5 — Add the points in the boxes above	

Rating of Landscape Potential If score is: ___**2 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

L 6.0. Are the hydrologic functions provided by the site valuable to society?	
L 6.1. Are there resources, both human and natural, along the shore that can be impacted by erosion? If more than one resource is present, choose the one with the highest score. There are human structures or old growth/mature forests within 25 ft of OHWM of the shore in the wetland — points = 2 There are nature trails or other paths and recreational activities within 25 ft of OHWM — points = 1 Other resources that could be impacted by erosion — points = 1 There are no resources that can be impacted by erosion along the shores of the wetland — points = 0	

Rating of Value If score is: ___**2 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number WT502

SLOPE WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of average slope of wetland: *(a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance*) Slope is 1% or less — points = 3 Slope is > 1% - 2% — points = 2 Slope is > 2% - 5% — points = 1 Slope is greater than 5% — points = 0	
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or tureorganic *(use NRCS definitions)*: Yes = 3 No = 0	
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. *Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.* Dense, uncut, herbaceous plants > 90% of the wetland area — points = 6 Dense, uncut, herbaceous plants > ½ of area — points = 3 Dense, woody, plants > ½ of area — points = 2 Dense, uncut, herbaceous plants > ¼ of area — points = 1 Does not meet any of the criteria above for plants — points = 0	
Total for S 1 — Add the points in the boxes above	

Rating of Site Potential If score is: ___**12 = H** ___**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

S 2.0. Does the landscape have the potential to support the water quality function at the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? Yes = 1 No = 0	
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources _____ Yes = 1 No = 0	
Total for S 2 — Add the points in the boxes above	

Rating of Landscape Potential If score is: ___**1-2 = M** ___**0 = L** *Record the rating on the first page*

S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly to a stream, river, or lake that is on the 303(d) list (*within 1 mi*)? Yes = 1 No = 0	
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? *At least one aquatic resource in the basin is on the 303(d) list*. Yes = 1 No = 0	
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the drainage or basin in which wetland is found*)? Yes = 2 No = 0	
Total for S 3 — Add the points in the boxes above	

Rating of Value If score is: ___**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number WT502

SLOPE WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce flooding and erosion	Points (only 1 score per box)
S 4.0. Does the site have the potential to reduce flooding and erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. *Stems of plants should be thick enough (usually > $^1/_8$ in), or dense enough, to remain erect during surface flows*. Dense, uncut, **rigid** plants cover > 90% of the area of the wetland points = 1 All other conditions points = 0	

Rating of Site Potential If score is: ___**1 = M** ___**0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses that generate excess surface runoff? Yes = 1 No = 0	

Rating of Landscape Potential If score is: ___**1 = M** ___**0 = L** *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has surface flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 Surface flooding problems are in a sub-basin farther down-gradient points = 1 No flooding problems anywhere downstream points = 0	
S 6.2. Has the site been identified as important for flood storage and flood conveyance in a regional flood control plan? Yes = 2 No = 0	
Total for S 6 Add the points in the boxes above	

Rating of Value If score is: ___**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

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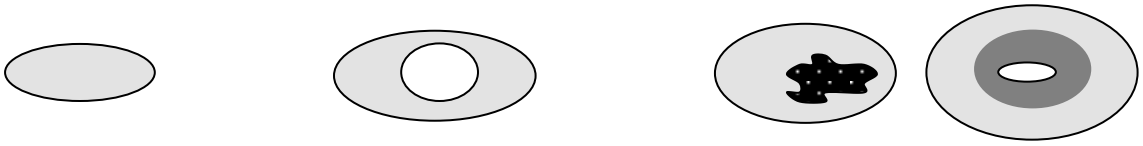
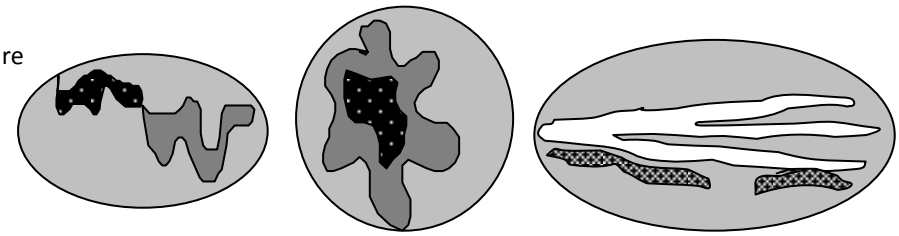
These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	(only 1 score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	
H 1.1. Structure of the plant community: *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac.* ____Aquatic bed __x__Emergent plants 0-12 in (0-30 cm) high are the highest layer and have > 30% cover __x__Emergent plants >12-40 in (>30-100 cm) high are the highest layer with >30% cover ____Emergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover ____Scrub-shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) 4 or more checks: points = 3 3 checks: points = 2 2 checks: points = 1 1 check: points = 0	1
H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 No = 0	0
H 1.3. Surface water H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac **OR** 10% of its area during the March to early June **OR** in August to the end of September? ***A**nswer YES for Lake Fringe wetlands*. Yes = 3 points & go to H 1.4 No = go to H 1.3.2 H 1.3.2. Does the wetland have an intermittent or permanent, and unvegetated stream within its boundaries, or along one side, over at least ¼ ac or 10% of its area? *Answer yes only if H 1.3.1 is No*. Yes = 3 No = 0	0
H 1.4. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. D*ifferent patches of the same species can be combined to meet the size threshold. You do not have to name the species.* *Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Russian olive, Phragmites, Canadian thistle, yellow-flag iris, and saltcedar (Tamarisk)* # of species __3__ Scoring: > 9 species: points = 2 4-9 species: points = 1 < 4 species: points = 0	0
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. *Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points **Low** = 1 point **Moderate** = 2 points All three diagrams in this row are **High** = 3 points  Riparian braided channels with 2 classes	Figure__ 1

Wetland name or number WT502

H 1.6. Special habitat features *Check the habitat features that are present in the wetland. The number of checks is the number of points.* ____Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface ponding or in stream. __X__Cattails or bulrushes are present within the wetland. ____Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge. __X__Emergent or shrub vegetation in areas that are permanently inundated/ponded. ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 45 degree slope) OR signs of recent beaver activity ____ Invasive species cover less than 20% in each stratum of vegetation *(canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)*	2
Total for H 1 Add the points in the boxes above	4

Rating of Site Potential If score is: ___**15-18 = H** ___**7-14 = M** __X__**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1. Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is: *Calculate:* % undisturbed habitat __0__ **+** [(% moderate and low intensity land uses)/2] 50 = __0__ % > $^{1}/_{3}$ (33.3%) of 1 km Polygon points = 3 20-33% of 1km Polygon points = 2 10-19% of 1km Polygon points = 1 <10% of 1km Polygon points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. *Calculate:* % undisturbed habitat __0__ **+** [(% moderate and low intensity land uses)/2] 50 = __0__ % Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches points = 2 Undisturbed habitat 10 - 50% and > 3 patches points = 1 Undisturbed habitat < 10% of Polygon points = 0	0
H 2.3. Land use intensity in 1 km Polygon: > 50% of Polygon is high intensity land use points = (- 2) Does not meet criterion above points = 0	0
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. *Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs* Yes = 3 No = 0	0
Total for H 2 Add the points in the boxes above	0

Rating of Landscape Potential If score is: ___**4-9 = H** ___**1-3 = M** __X__**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose the highest score that applies to the wetland being rated* Site meets ANY of the following criteria: points = 2 — It has 3 or more priority habitats within 100 m (see Appendix B) — It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) — It is mapped as a location for an individual WDFW species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats within 100 m (see Appendix B) points = 1 Site does not meet any of the criteria above points = 0	0

Rating of Value If score is: ___**2 = H** ___**1 = M** __X__**0 = L** *Record the rating on the first page*

Wetland name or number WT502

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All wetlands should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Vernal pools Is the wetland **less than 4000 ft^2**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input. — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *If you find perennial, obligate, wetland plants, the wetland is probably NOT a vernal pool*. — The soil in the wetland is shallow [< 1 ft (30 cm)deep] and is underlain by an impermeable layer such as basalt or clay. — Surface water is present for less than 120 days during the wet season. Yes **–** Go to **SC 1.1** No = **Not a vernal pool** SC 1.1. Is the vernal pool relatively undisturbed in February and March? Yes **–** Go to **SC 1.2** No = **Not a vernal pool with special characteristics**	
SC 1.2. Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 mi (other wetlands, rivers, lakes etc.)? Yes = **Category II** No = **Category III**	**Cat. II** **Cat. III**
SC 2.0. Alkali wetlands Does the wetland meet **one** of the following criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 and 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meet two of the following three sub-criteria? — Salt encrustations around more than 75% of the edge of the wetland — More than ¾ of the plant cover consists of species listed on Table 4 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. Yes = **Category I** No= **Not an alkali wetland**	**Cat. I**
SC 3.0. Wetlands of High Conservation Value (WHCV) SC 3.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to **SC 3.2** No – Go to **SC 3.3** SC 3.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = **Category I** No = **Not a WHCV** SC 3.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 3.4** No = **Not a WHCV** SC 3.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and it is listed on their website? Yes = **Category I** No =**Not a WHCV**	**Cat. I**

Wetland name or number WT502

SC 4.0 Bogs and Calcareous Fens Does the wetland (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens? *Use the key below to identify if the wetland is a bog or calcareous fen.* ***If you answer yes you will still need to rate the wetland based on its functions.*** SC 4.1. Does an area within the wetland have organic soil horizons (i.e., layers of organic soil), either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? *See Appendix C for a field key to identify organic soils*. Yes – Go to **SC 4.3** No – Go to **SC 4.2** SC 4.2. Does an area within the wetland have organic soils, either peats or mucks, that are less than 16 in deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 4.3** No = **Is not a bog for rating** SC 4.3. Does an area within the wetland have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes = **Category I bog** No – Go to **SC 4.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog. SC 4.4. Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No – Go to **SC 4.5** SC 4.5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes = **Is a Calcareous Fen for purpose of rating** No – Go to **SC 4.6** SC 4.6. Do the species listed in Table 6 comprise at least 10% of the total plant cover in an area of peats and mucks, AND one of the two following conditions is met: — Marl deposits [calcium carbonate ($CaCO_3$) precipitate] occur on the soil surface or plant stems — The pH of free water is ≥ 6.8 AND electrical conductivity is ≥ 200 uS/cm at multiple locations within the wetland Yes = **Is a Category I calcareous fen** No = **Is not a calcareous fen**	**Cat. I** **Cat. I**

SC 5.0. Forested Wetlands Does the wetland have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified that a forested class is present in question H 1.1*) — The wetland is within the 100 year floodplain of a river or stream — Aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species — There is at least ¼ ac of trees (even in wetlands smaller than 2.5 ac) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* Yes – Go to **SC 5.1** No = **Not a forested wetland with special characteristics**	
SC 5.1. Does the wetland have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*)? Yes = **Category I** No – Go to **SC 5.2** SC 5.2. Does the wetland have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species? Yes = **Category I** No – Go to **SC 5.3** SC 5.3. Does the wetland have at least ¼ acre with a forest canopy where more than 50% of the tree species (by cover) are fast growing species (*see Table 7*)? Yes = **Category II** No – Go to **SC 5.4** SC 5.4. Is the forested component of the wetland within the 100 year floodplain of a river or stream? Yes = **Category II** No = **Not a forested wetland with special characteristics**	**Cat. I** **Cat. I** **Cat. II** **Cat. II**
Category of wetland based on Special Characteristics *Choose the highest rating if wetland falls into several categories* If you answered No for all types, enter "Not Applicable" on Summary Form	N/A

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland: ***NOTE:*** *This question is independent of the land use between the wetland and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Old-growth/Mature forests:** Old-growth east of Cascade crest – Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.

— **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

— **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

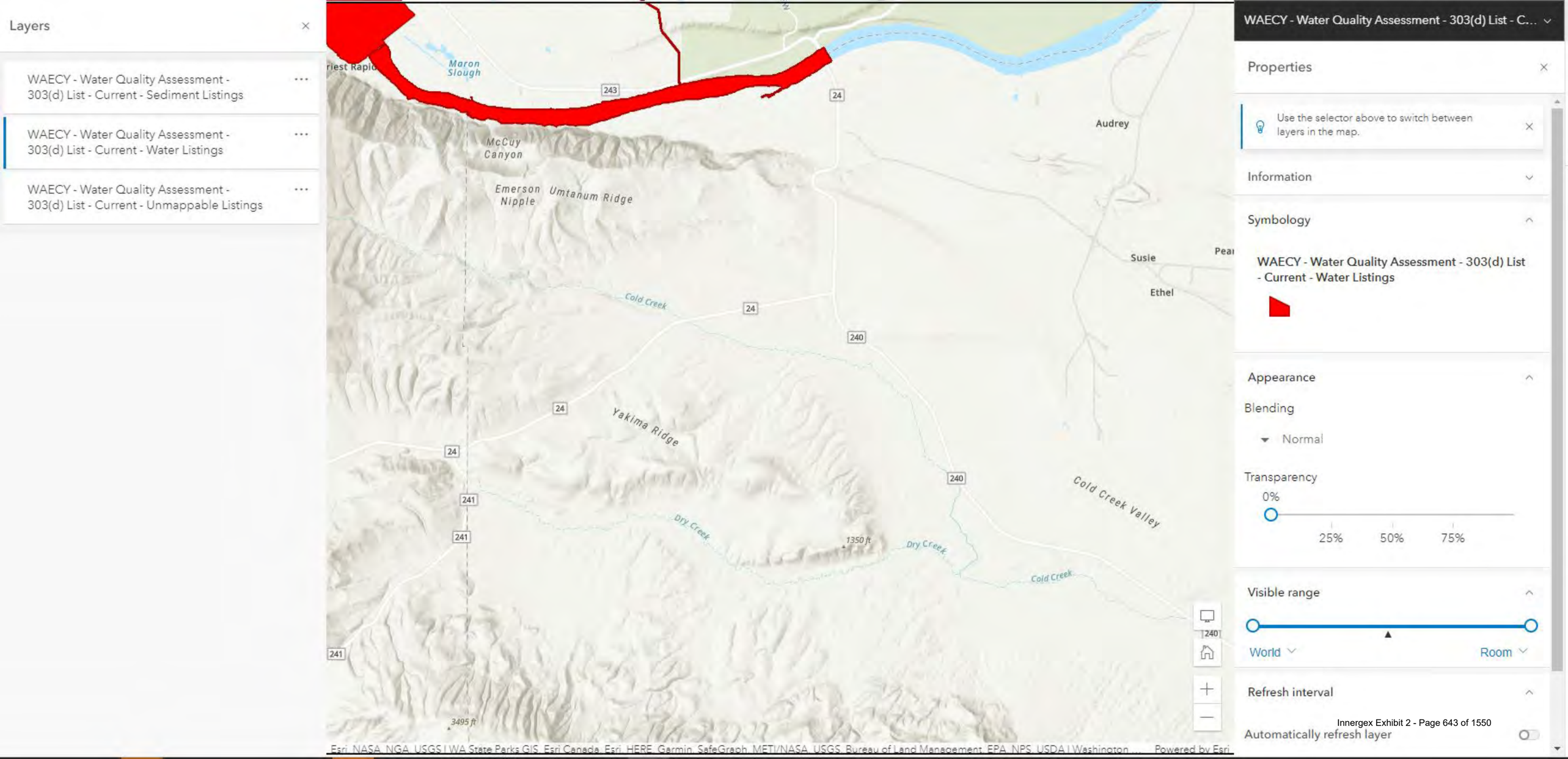
— **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 12 in (30 cm)in eastern Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

— **Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).

— **Eastside Steppe:** Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum* spp.).

— **Juniper Savannah:** All juniper woodlands.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.


Layers
WAECY - Water Quality Assessment - 303(d) List - Current - Sediment Listings
WAECY - Water Quality Assessment - 303(d) List - Current - Water Listings
WAECY - Water Quality Assessment - 303(d) List - Current - Unmappable Listings
Maron Slough
243
24
Audrey
McCuy Canyon
Emerson Nipple
Umtanum Ridge
Susie
Ethel
Cold Creek
24
240
24
Yakima Ridge
24
240
Cold Creek Valley
241
241
Dry Creek
1350 ft
Dry Creek
Cold Creek
241
3495 ft
Esri, NASA, NGA, USGS | WA State Parks GIS, Esri Canada, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA | Washington ...
Powered by Esri
WAECY - Water Quality Assessment - 303(d) List - C...
Properties
Use the selector above to switch between layers in the map.
Information
Symbology
WAECY - Water Quality Assessment - 303(d) List - Current - Water Listings
Appearance
Blending
Normal
Transparency
0%
25%
50%
75%
Visible range
World
Room
Refresh interval
Automatically refresh layer

DEPARTMENT OF ECOLOGY State of Washington

Benton County

Water quality improvement projects

Select the waterbody or pollutant name to find more information about the specific project.

Waterbody Name(s)	Pollutant(s)	Status	Project Lead(s)
Yakima River	Toxics	Under development	Jane Creech 509-454-7860 Mark Peterschmidt 509-454-7843
Yakima River, Lower	Turbidity	EPA approved	Jane Creech 509-454-7860

To request ADA accommodation, call Ecology at 360-407-7668, 711 (relay service), or 877-833-6341 (TTY). More about our accessibility services.

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Streamflow Duration Field Assessment Form

Project # / Name Wautoma Solar	Assessor Jessica Taylor and Katie Pyne
Address Sunnyside, WA	Date 10/5/2021
Waterway Name ST-710	Coordinates at downstream end (ddd.mm.ss) Lat. 46°29'41.87"N N
Reach Boundaries Study area width.	Long. 119°51'23.74"W W
Precipitation w/in 48 hours (cm) 0.0	Channel Width (m) 1-foot

☐ Disturbed Site / Difficult Situation (Describe in "Notes")

Observed Hydrology

% of reach w/observed surface flow 0

% of reach w/any flow (surface or hyporheic) 0

# of pools observed 0

Observations

Observed Wetland Plants NONE (and indicator status):

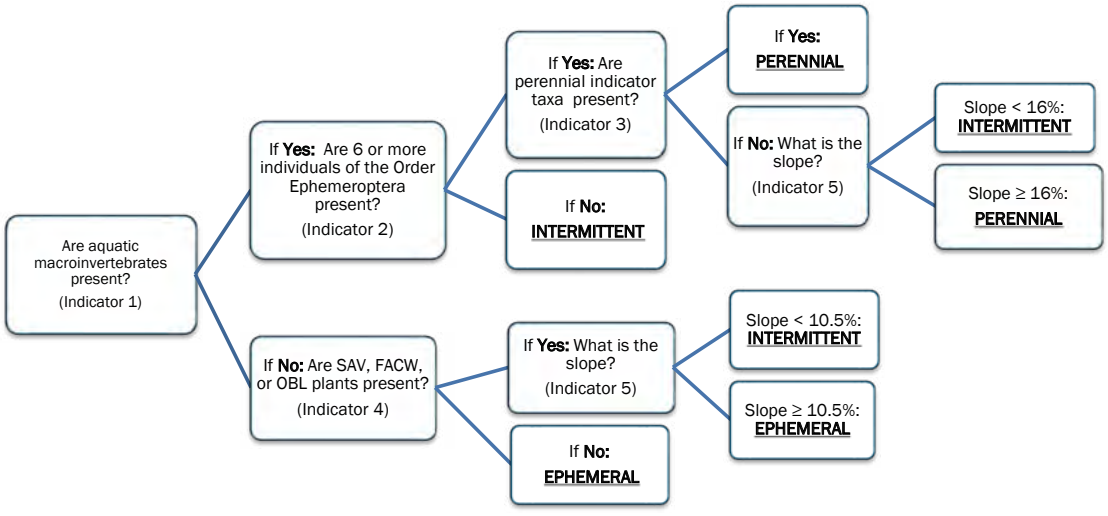
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
NONE			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☐ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☐ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☐ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☐ No
5. What is the slope? (In percent, measured for the valley, not the stream)	2 %	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Photo #710

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Wautoma Solar	Assessor Jessica Taylor and Katie Pyne
Address Sunnyside, WA	Date 3/15/2021
Waterway Name ST-200	Coordinates at downstream end (ddd.mm.ss) Lat. 46°31'9.57"N N
Reach Boundaries Study area width.	Long. 119°49'40.87"W W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 1-foot

☐ Disturbed Site / Difficult Situation (Describe in "Notes")

Observed Hydrology

% of reach w/observed surface flow 0

% of reach w/any flow (surface or hyporheic) 0

# of pools observed 0

Observations

Observed Wetland Plants NONE (and indicator status):

Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
NONE			

Indicators

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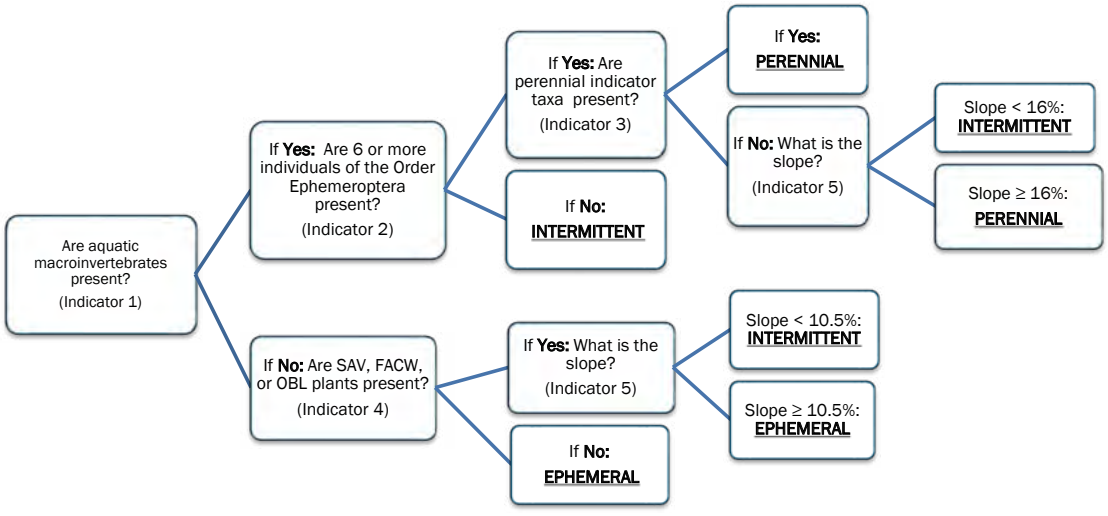
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☐ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☐ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☐ No
5. What is the slope? (In percent, measured for the valley, not the stream)	5 %	

Conclusions



Single Indicators:
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☐ Amphibians

Finding:
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☐ Intermittent
☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Photo # 200

Predominant vegetation is tumblemustard

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Wautoma Solar	Assessor Jessica Taylor and Katie Pyne
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Waterway Name ST-200	Coordinates at downstream end (ddd.mm.ss) Lat. 46°31'9.57"N N
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☐ Disturbed Site / Difficult Situation (Describe in "Notes")

Observed Hydrology

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Taxon	Indicator Status	Ephemer-optera?	# of Individuals
NONE			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☐ No
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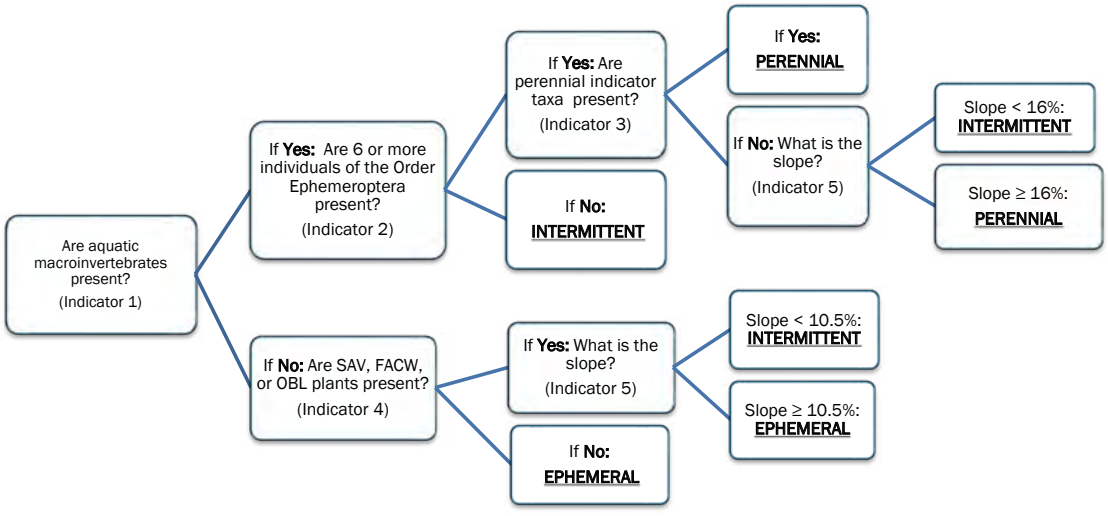
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☐ No
5. What is the slope? (In percent, measured for the valley, not the stream)	5 %	

Conclusions



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☐ Intermittent
☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

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☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Photo # 200

Predominant vegetation is tumblemustard

Ancillary Information:

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☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

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☐ Disturbed Site / Difficult Situation (Describe in "Notes")

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% of reach w/any flow (surface or hyporheic) 0

# of pools observed 0

Observations

Observed Wetland Plants NONE (and indicator status):

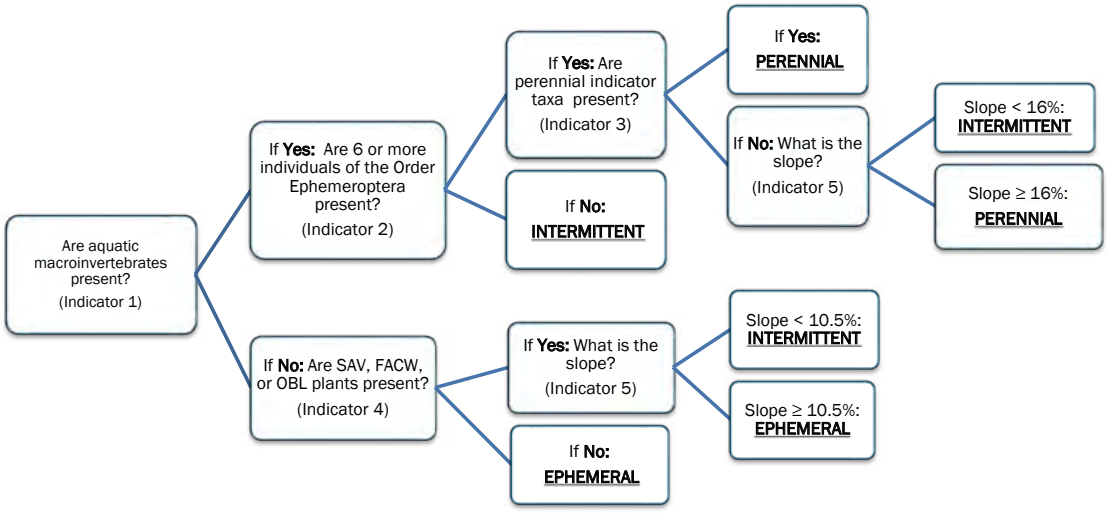
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
NONE			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☐ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☐ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☐ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☐ No
5. What is the slope? (In percent, measured for the valley, not the stream)	5 %	

Conclusions



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☐ Intermittent
☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

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☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Photo # 200

Predominant vegetation is tumblemustard

Ancillary Information:

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Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

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☐ Disturbed Site / Difficult Situation (Describe in "Notes")

Observed Hydrology

% of reach w/observed surface flow 0

% of reach w/any flow (surface or hyporheic) 0

# of pools observed 0

Observations

Observed Wetland Plants NONE (and indicator status):

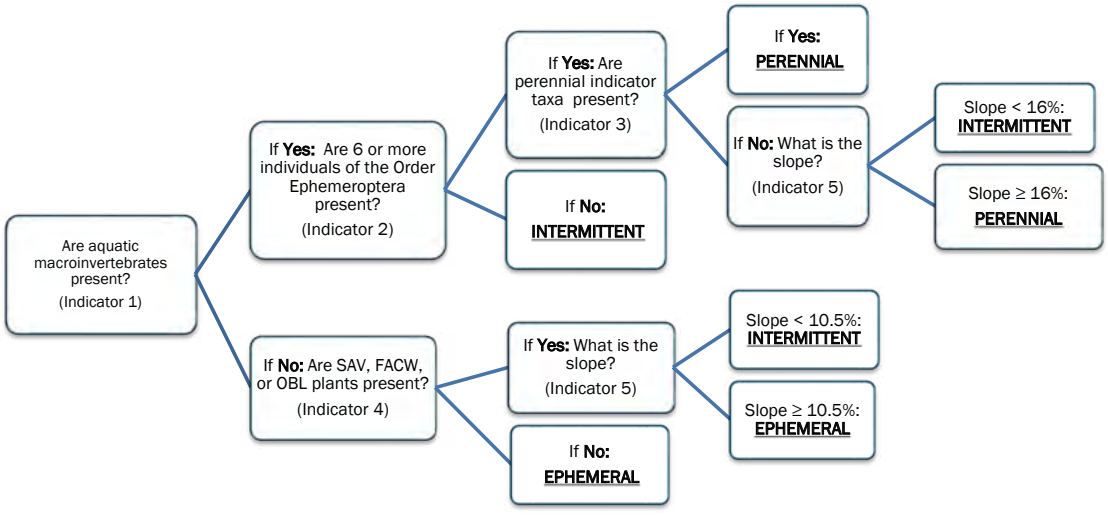
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
NONE			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☐ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☐ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☐ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☐ No
5. What is the slope? (In percent, measured for the valley, not the stream)	5 %	

Conclusions



Single Indicators:
☐ Fish
☐ Amphibians

Finding:
☒ Ephemeral
☐ Intermittent
☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Photo # 200

Predominant vegetation is tumblemustard

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

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% of reach w/any flow (surface or hyporheic) 0

# of pools observed 0

Observations

Observed Wetland Plants NONE (and indicator status):

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Taxon	Indicator Status	Ephemer-optera?	# of Individuals
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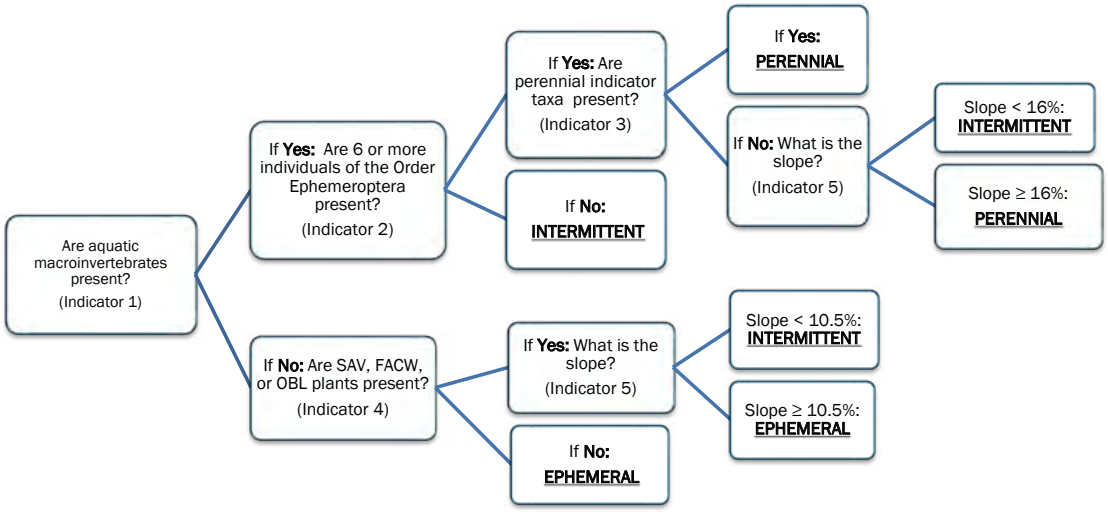
Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☐ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☐ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☐ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☐ No
5. What is the slope? (In percent, measured for the valley, not the stream)	5 %	

Conclusions



Single Indicators:
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☐ Amphibians

Finding:
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Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

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Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Photo # 200

Predominant vegetation is tumblemustard

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

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Observed Amphibians, Snake, and Fish:

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Reach Boundaries Study area width.	Long. 119°49'40.87"W W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 1-foot

☐ Disturbed Site / Difficult Situation (Describe in "Notes")

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% of reach w/any flow (surface or hyporheic) 0

# of pools observed 0

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Observed Wetland Plants NONE (and indicator status):

Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
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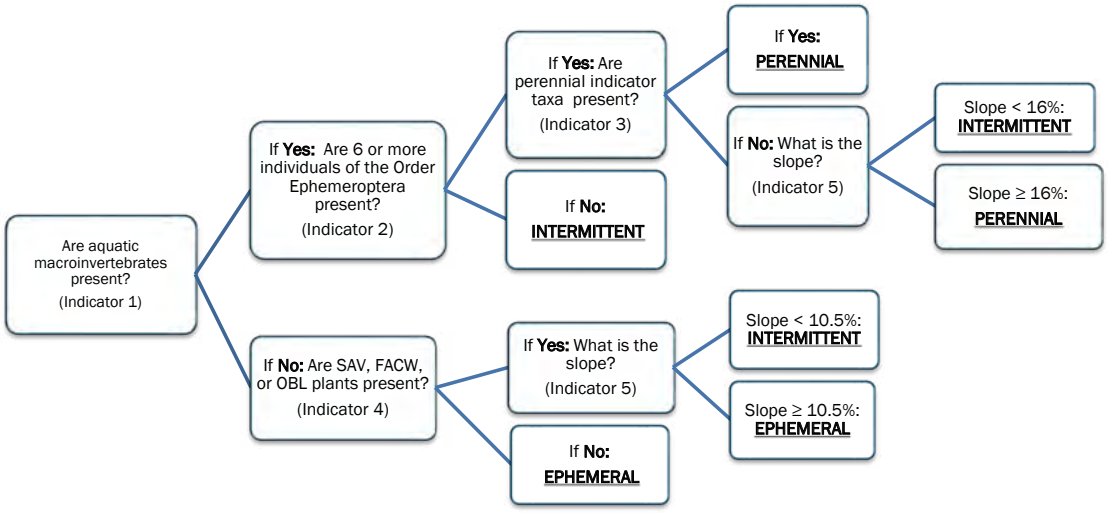

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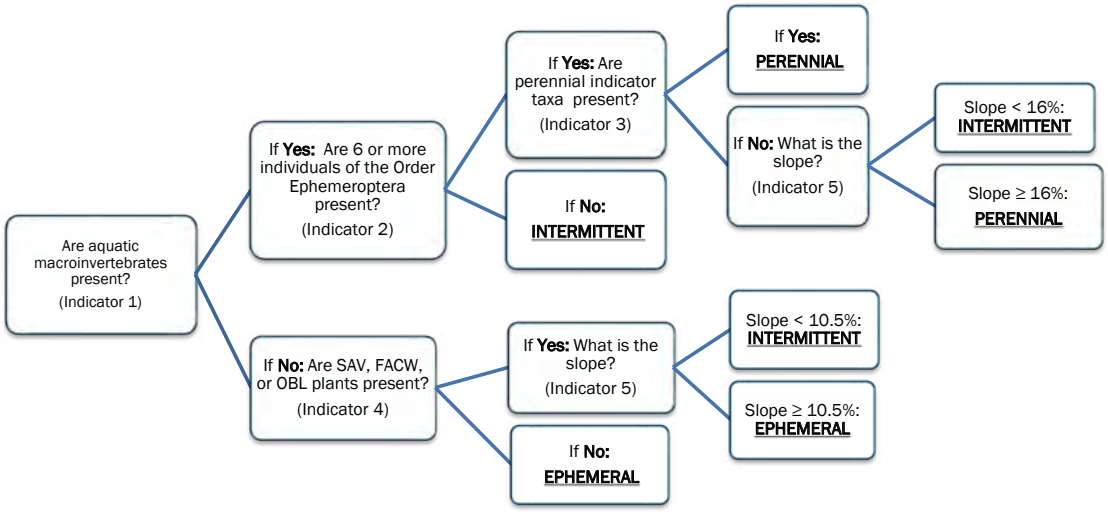

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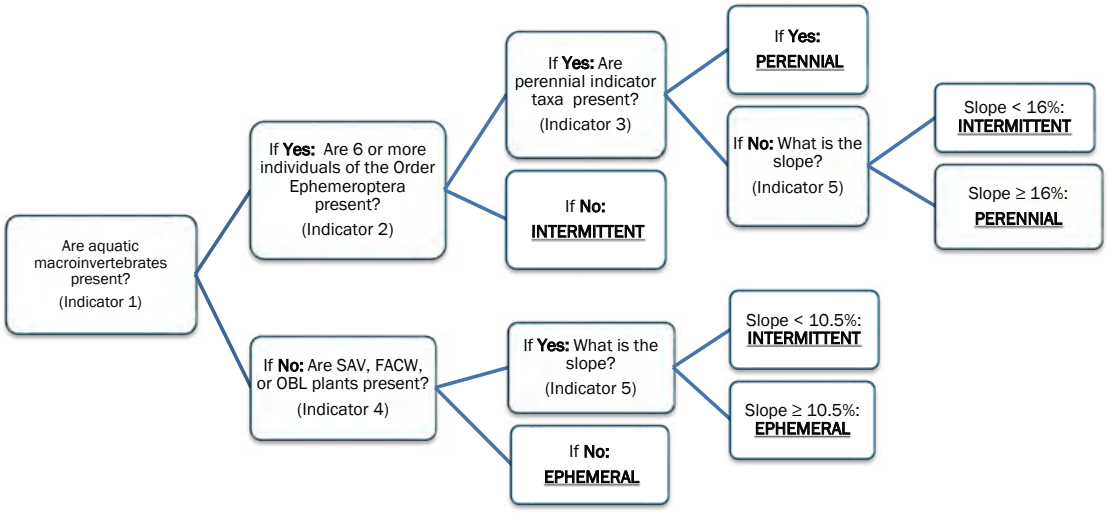

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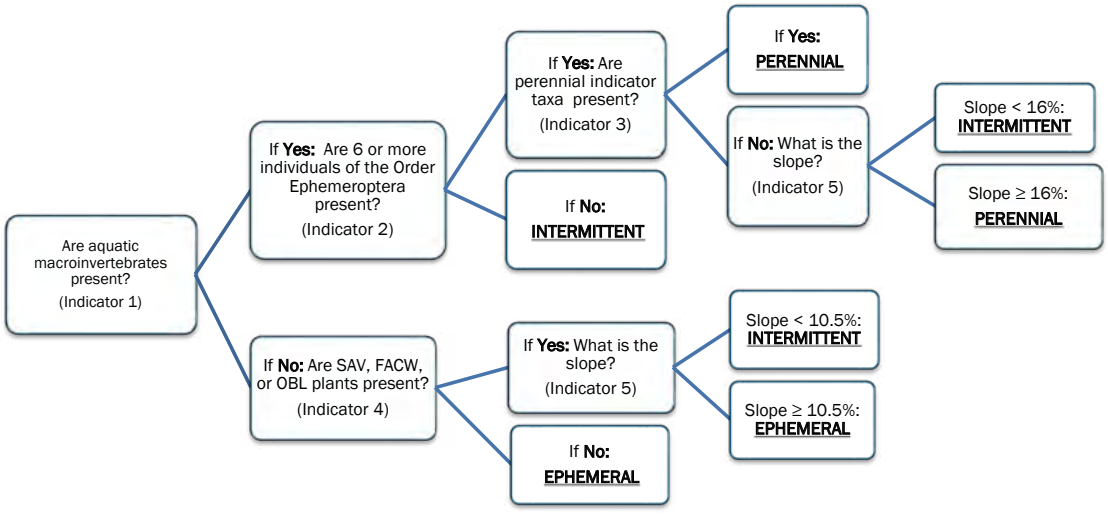

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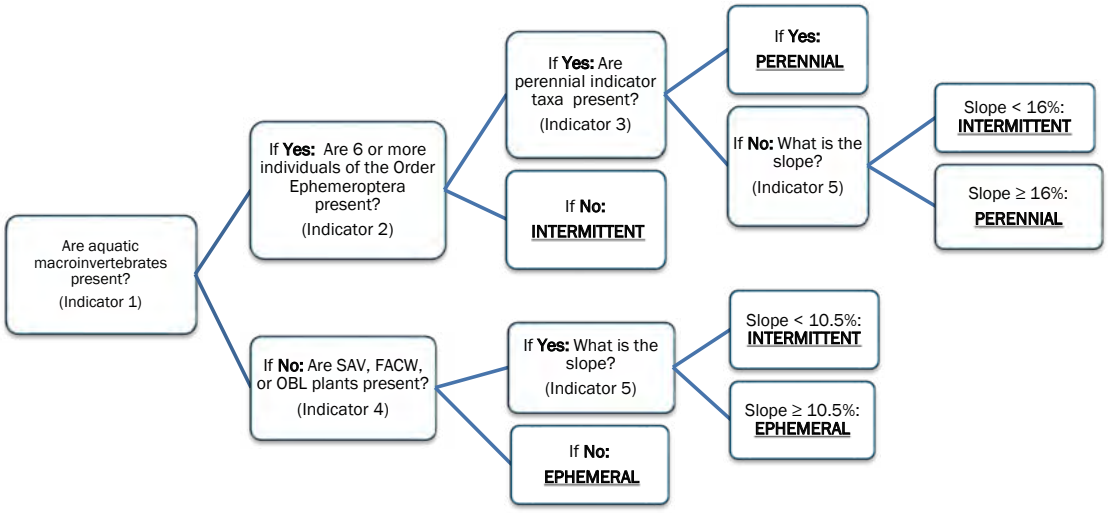

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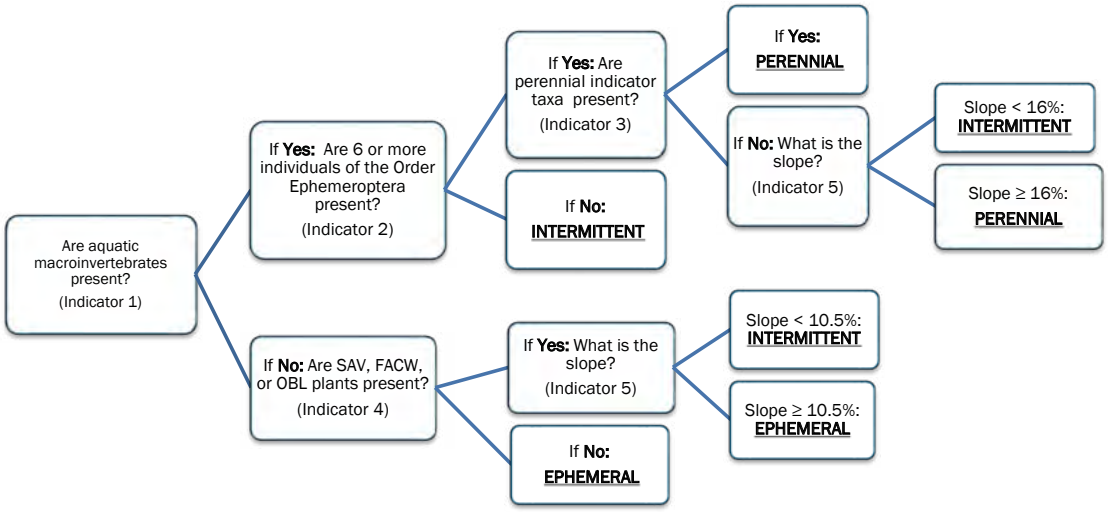

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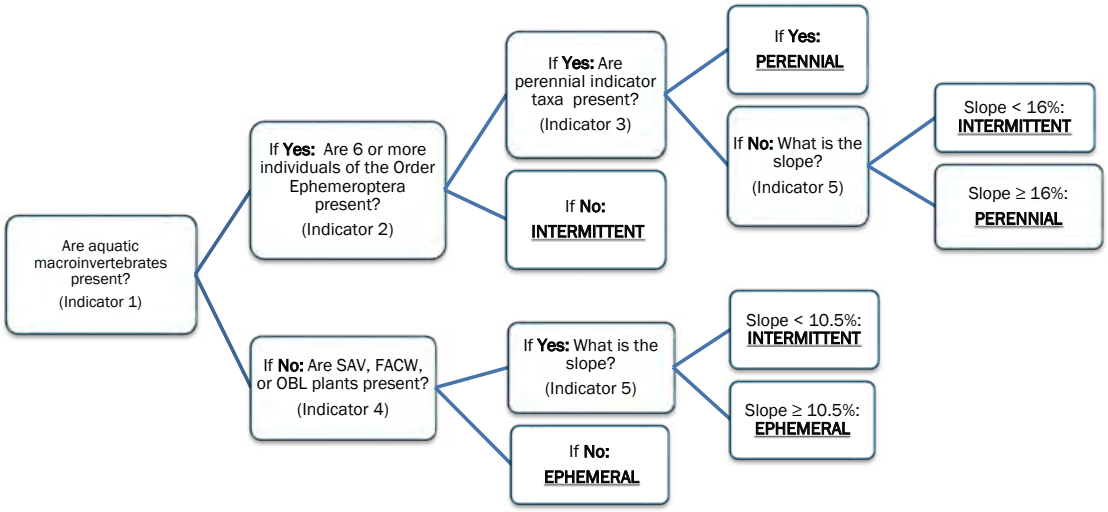

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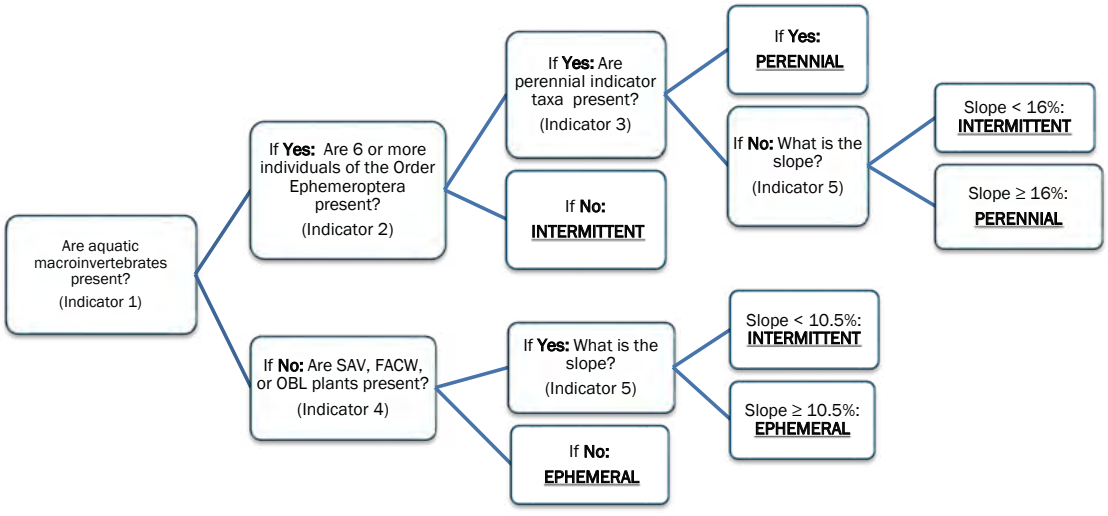

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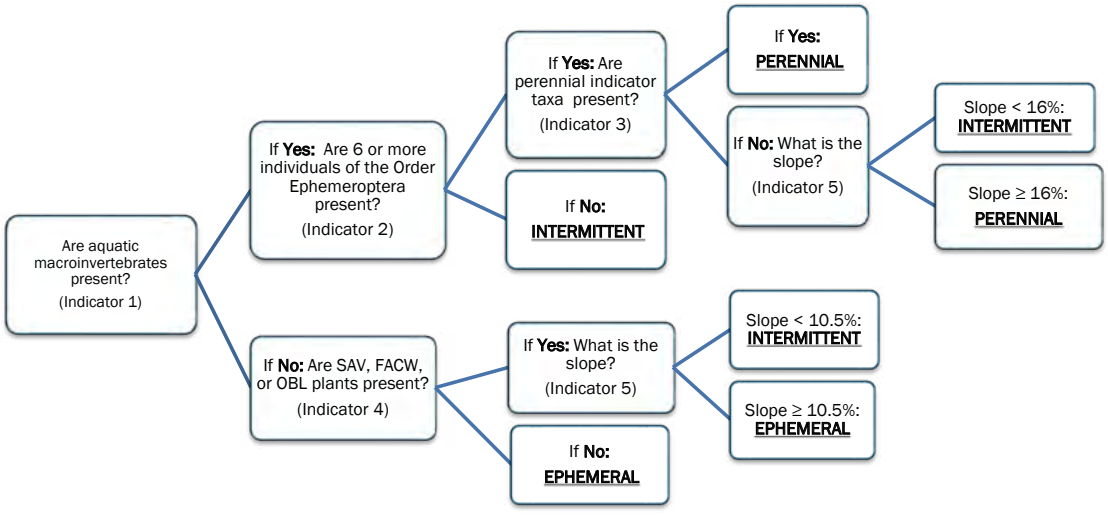

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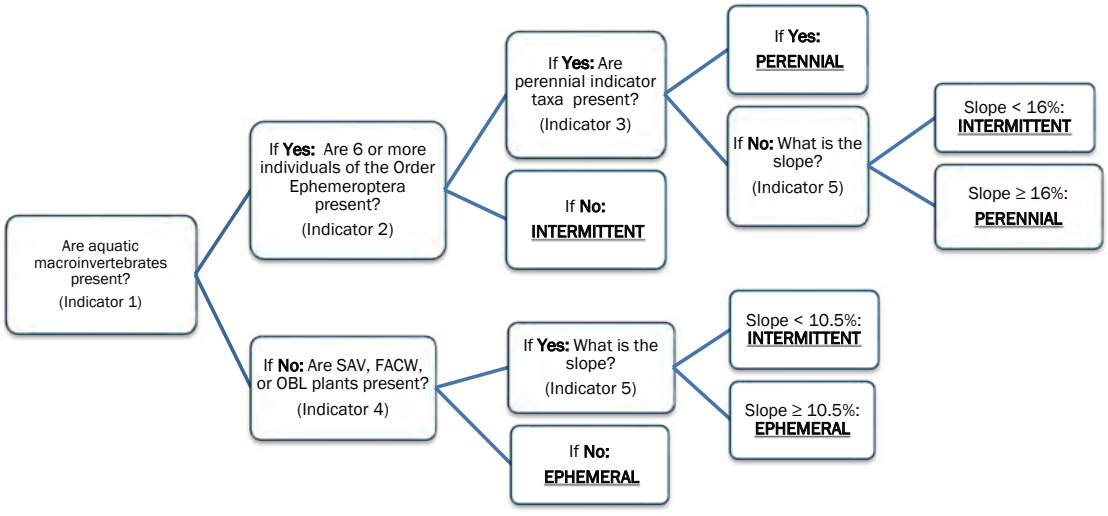

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Reach Boundaries Study area width.	Long. 119°49'40.87"W W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 1-foot

☐ Disturbed Site / Difficult Situation (Describe in "Notes")

Observed Hydrology

% of reach w/observed surface flow 0

% of reach w/any flow (surface or hyporheic) 0

# of pools observed 0

Observations

Observed Wetland Plants NONE (and indicator status):

Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
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Indicators

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2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☐ No
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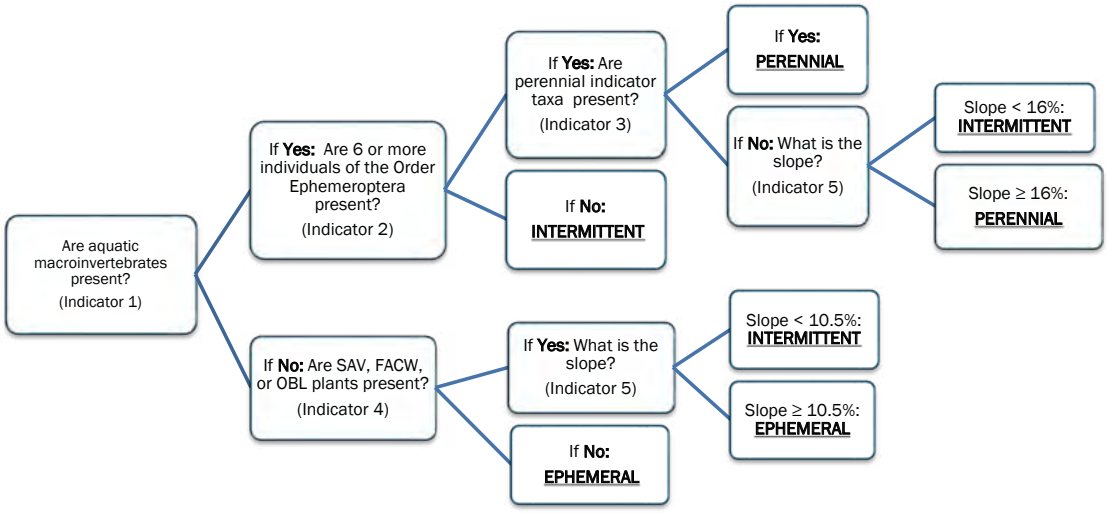

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☐ Fish
☐ Amphibians

Finding:
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Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

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☐ Below Average

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Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Photo # 200

Predominant vegetation is tumblemustard

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

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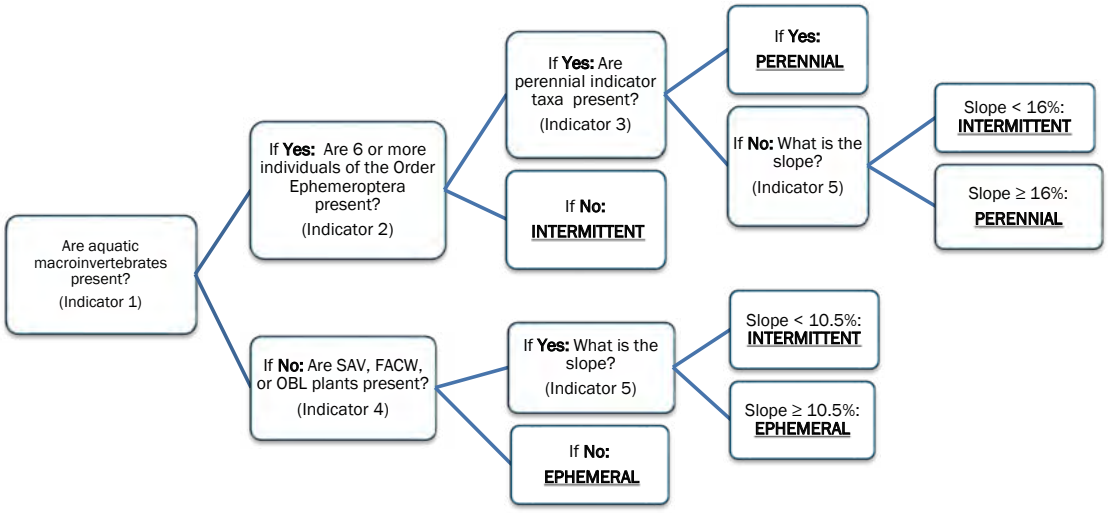

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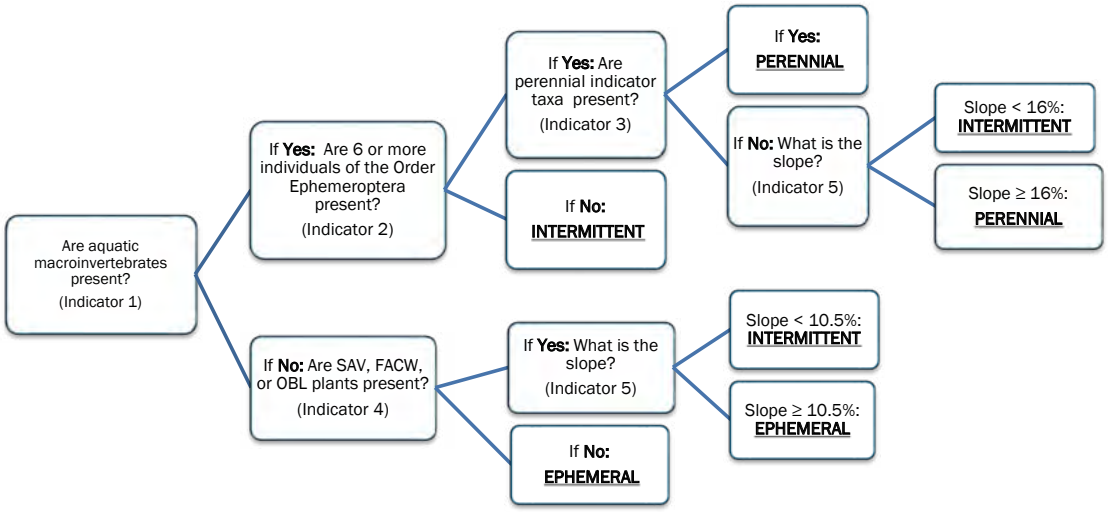

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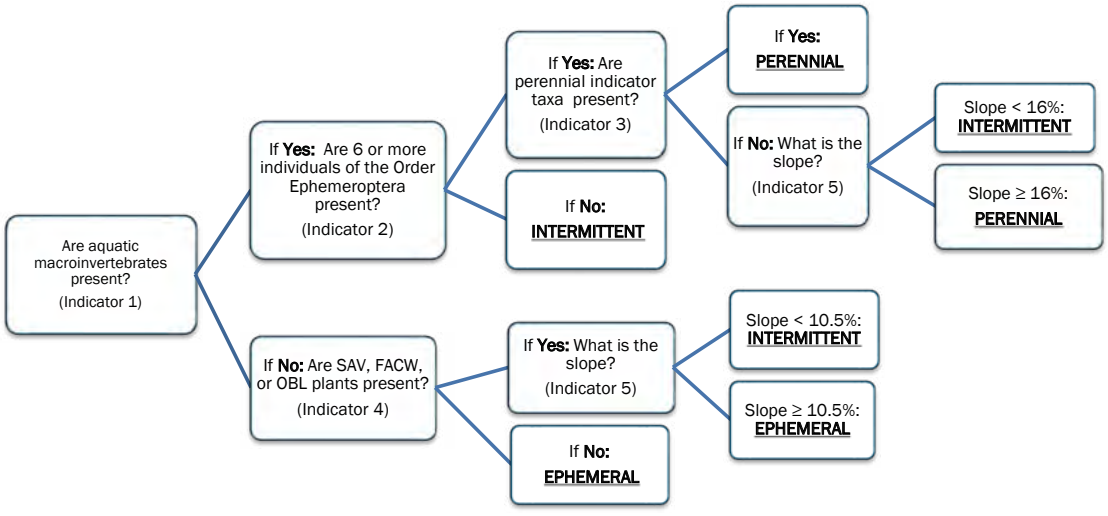

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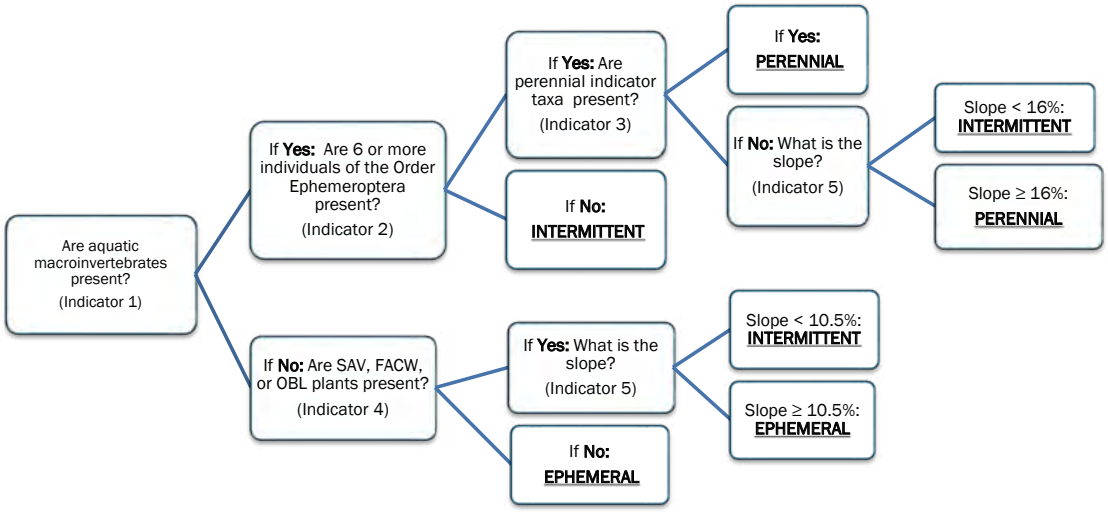

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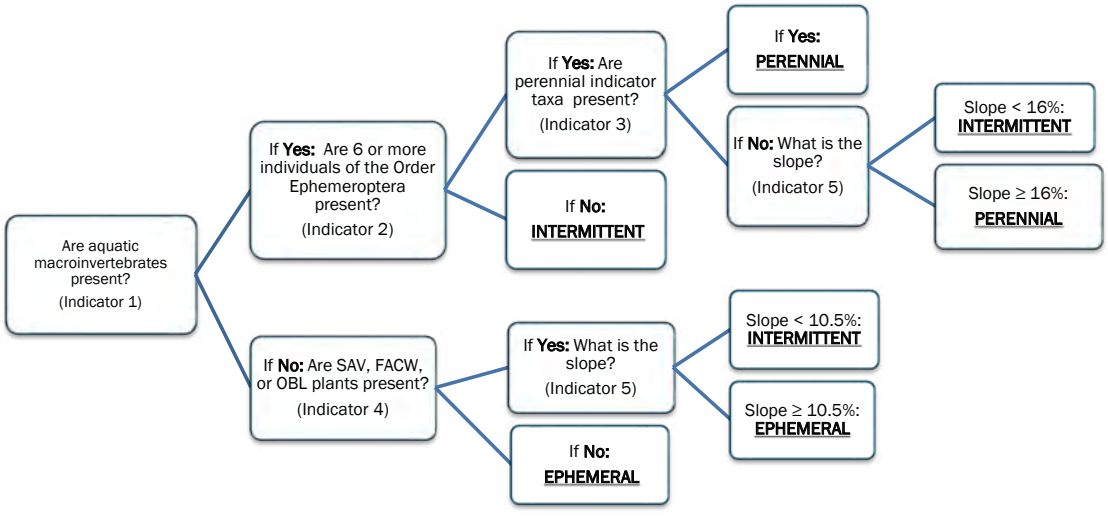

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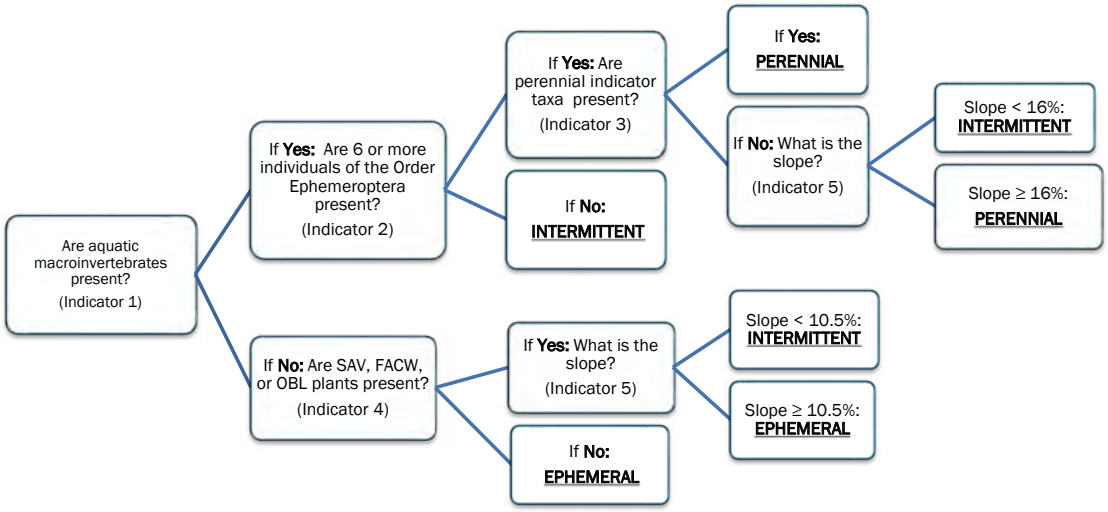

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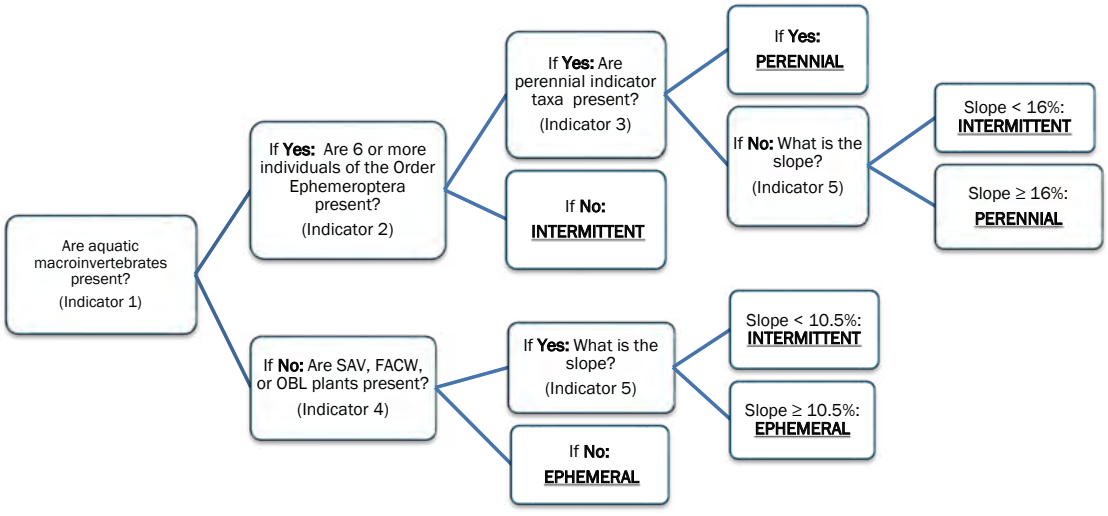

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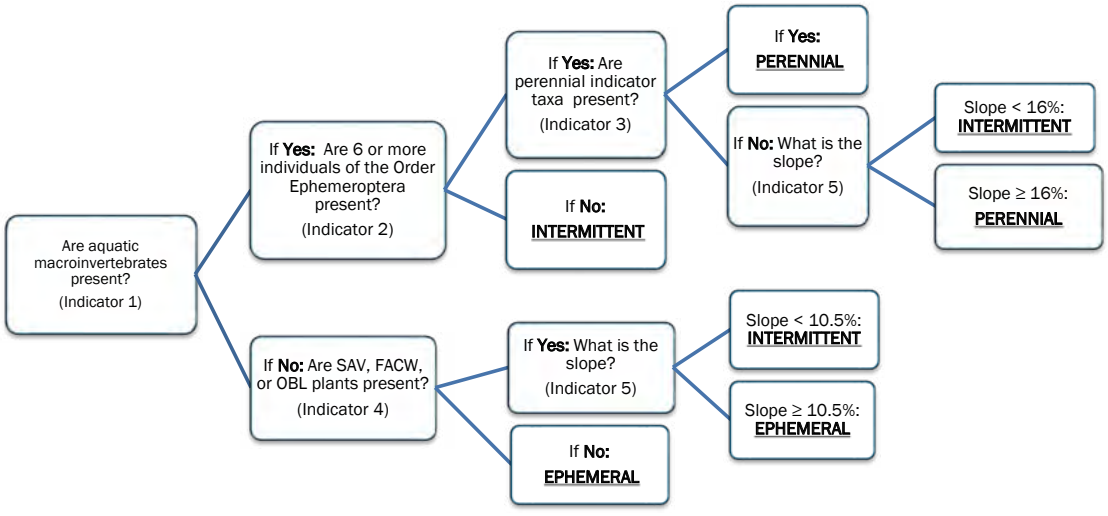

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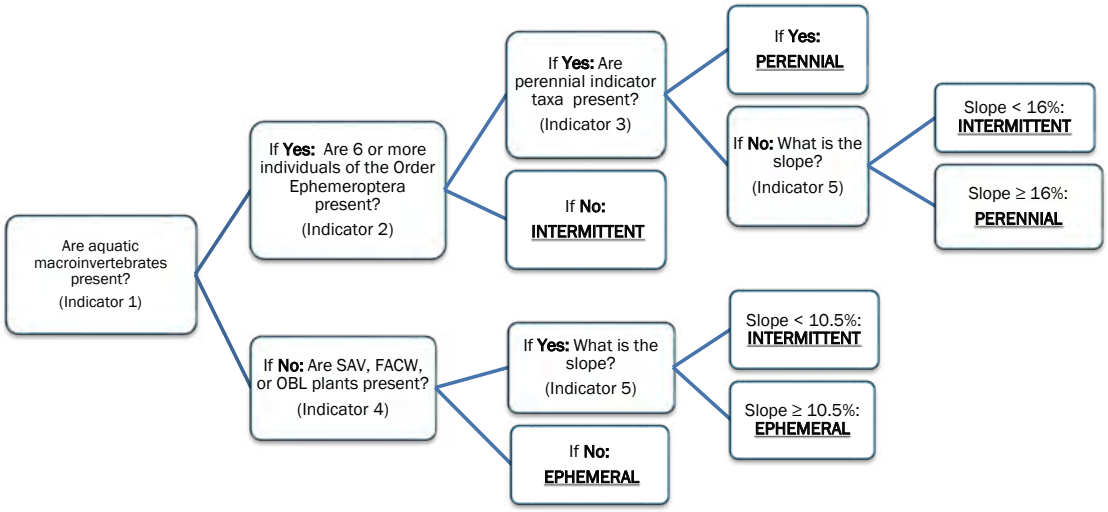

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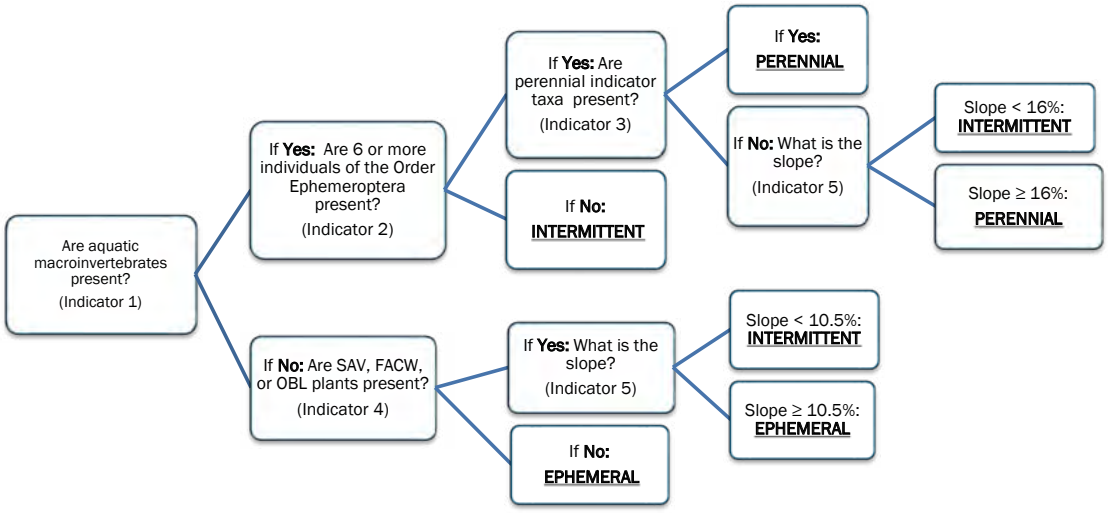

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☐ Amphibians

Finding:
☒ Ephemeral
☐ Intermittent
☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Photo # 200

Predominant vegetation is tumblemustard

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Wautoma Solar	Assessor Jessica Taylor and Katie Pyne
Address Sunnyside, WA	Date 3/15/2021
Waterway Name ST-200	Coordinates at downstream end (ddd.mm.ss) Lat. 46°31'9.57"N N
Reach Boundaries Study area width.	Long. 119°49'40.87"W W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 1-foot

☐ Disturbed Site / Difficult Situation (Describe in "Notes")

Observed Hydrology

% of reach w/observed surface flow 0

% of reach w/any flow (surface or hyporheic) 0

# of pools observed 0

Observations

Observed Wetland Plants NONE (and indicator status):

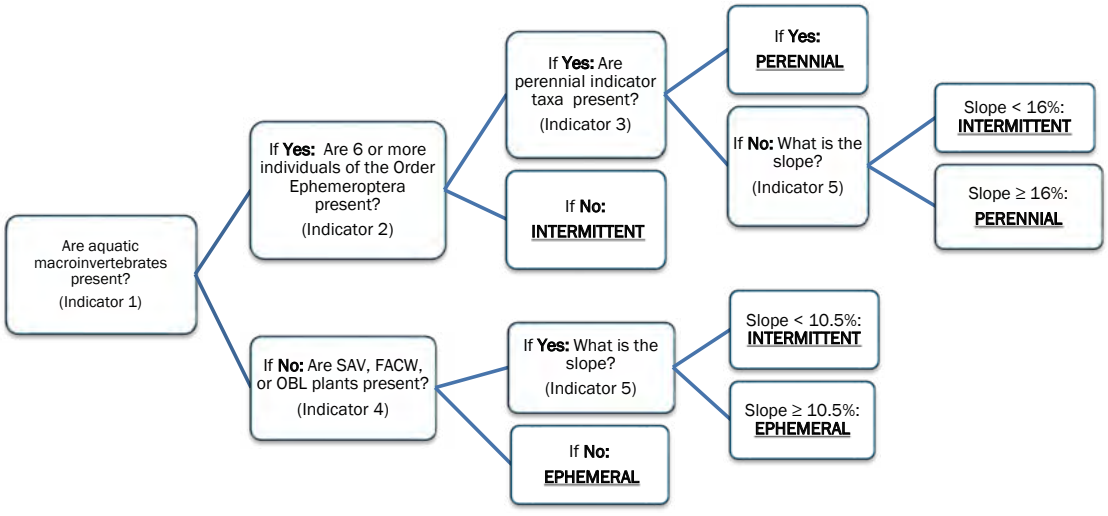
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
NONE			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☐ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☐ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☐ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☐ No
5. What is the slope? (In percent, measured for the valley, not the stream)	5 %	

Conclusions



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☐ Amphibians

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Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

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☐ Above Average

☐ Natural or Anthropogenic Disturbance

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Observed Hydrology

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% of reach w/any flow (surface or hyporheic) 0

# of pools observed 0

Observations

Observed Wetland Plants NONE (and indicator status):

Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
NONE			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☐ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☐ No
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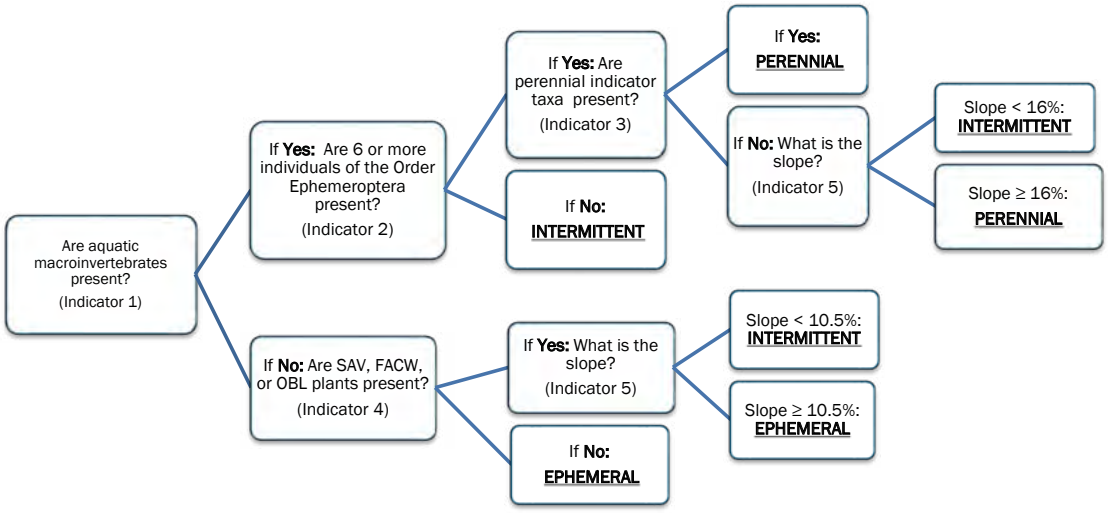
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☐ No
5. What is the slope? (In percent, measured for the valley, not the stream)	5 %	

Conclusions



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Finding:
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Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

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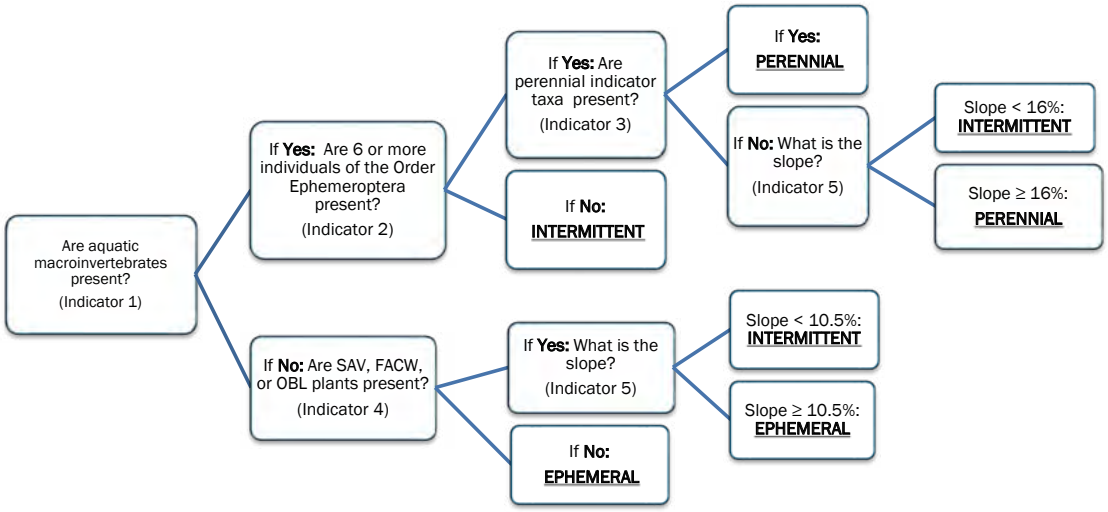

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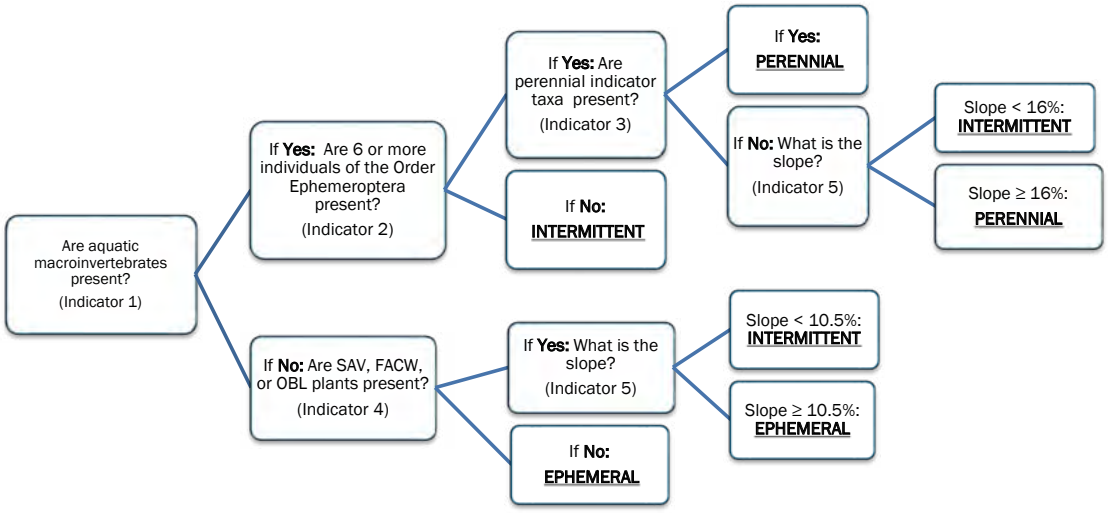

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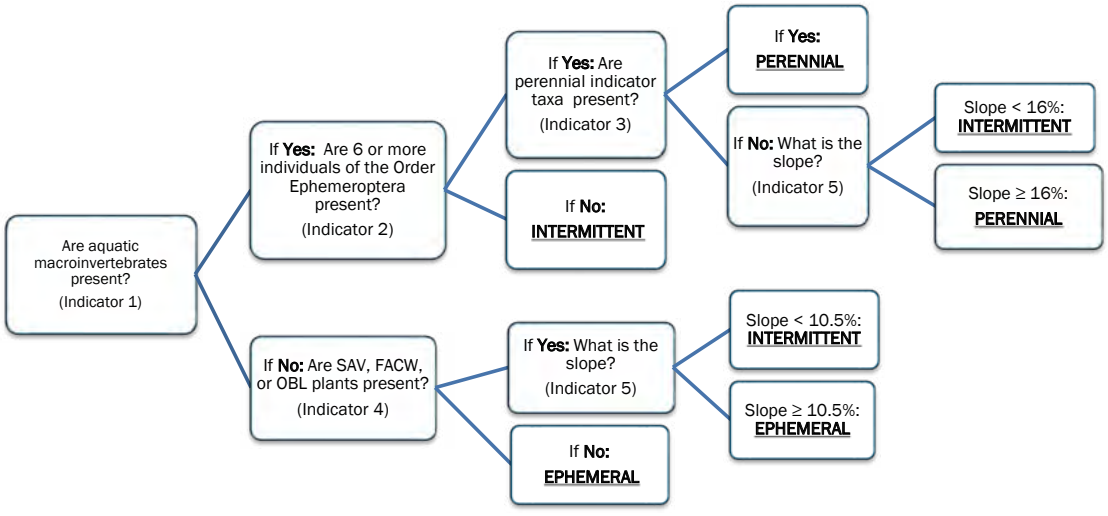

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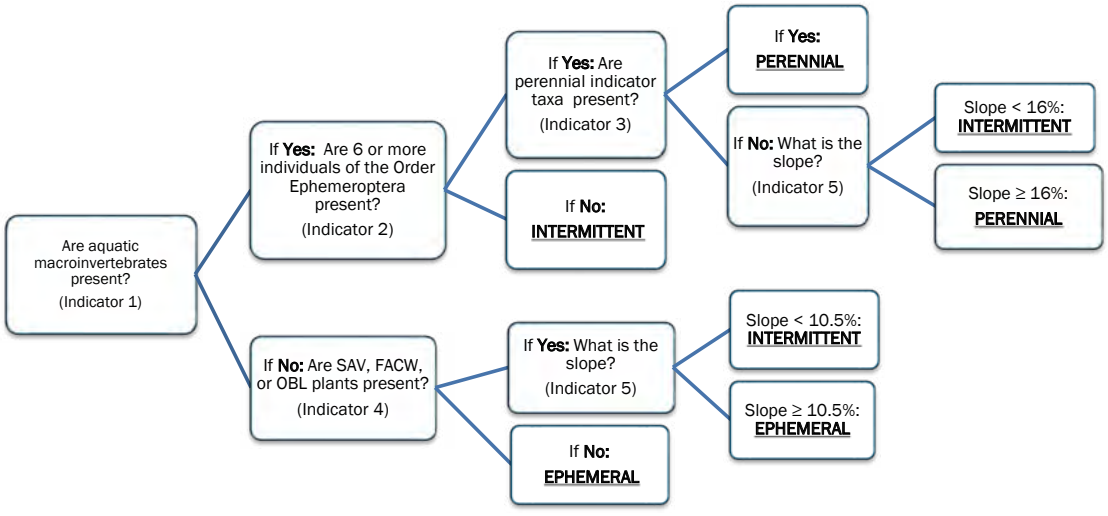

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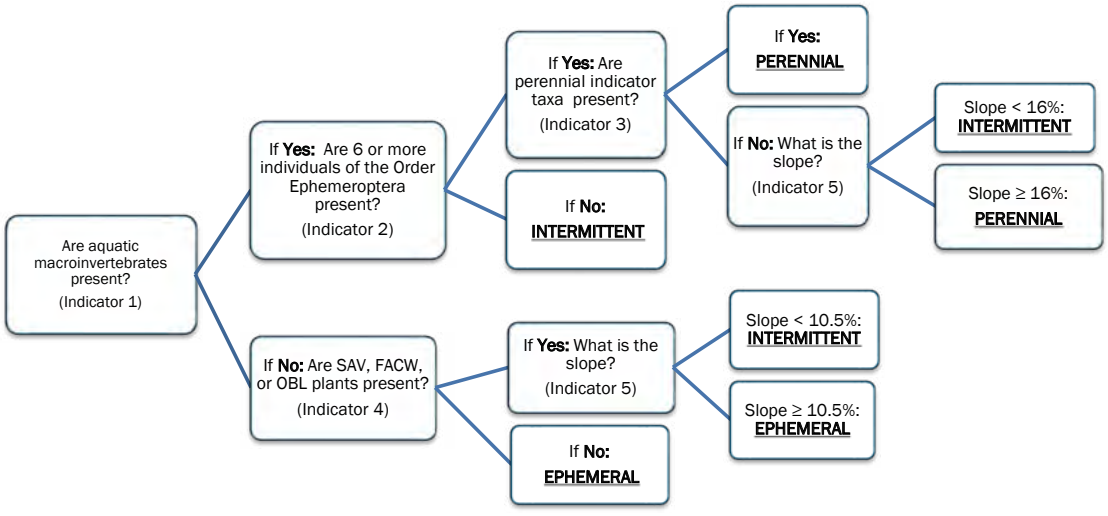

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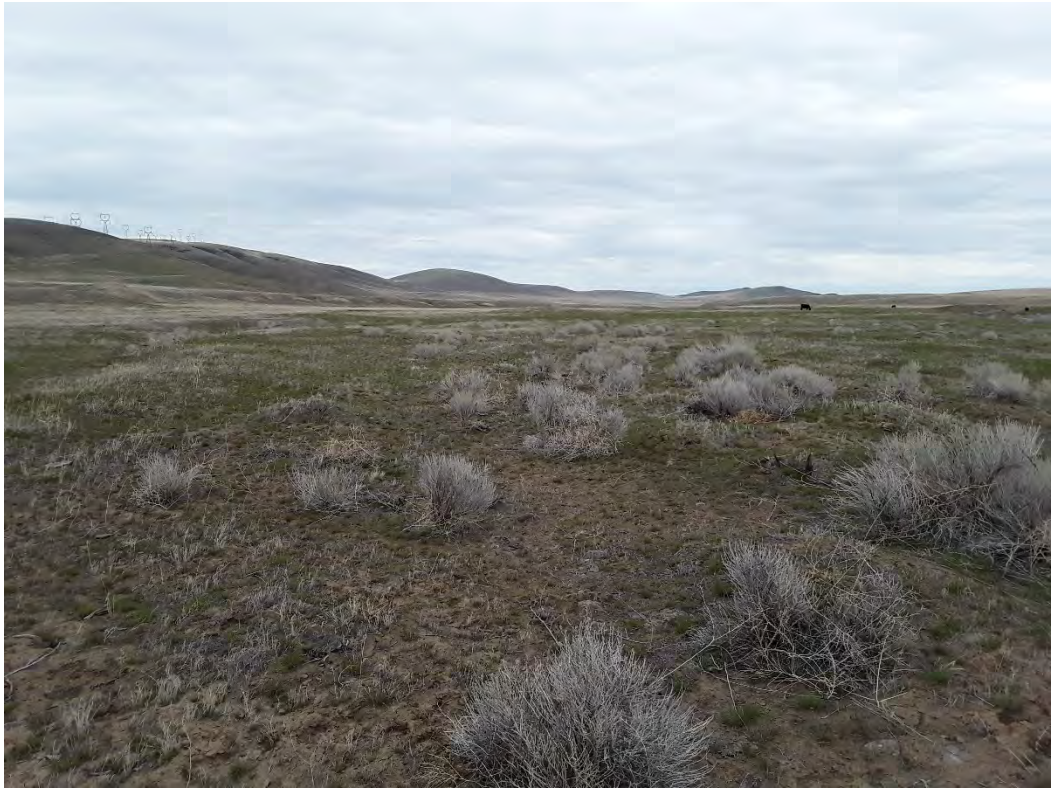
Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Appendix B:

Wetlands Photolog

Photopoint 100. No bed or banks on NHD line. XBB100. Facing north.

Photopoint 101. No bed or banks on NHD line. XBB101. Facing north.



Photopoint 104. No bed or banks on NHD line. XBB104. Facing east.

Photopoint 105. No bed or banks on NHD line. XBB105. Facing south.

Photopoint 106. No bed or banks on NHD line. XBB106. Facing north.

Photopoint 107. No bed or banks on NHD line. XBB107. Facing northwest.

Photopoint 108. No bed or banks on NHD line. XBB108. Facing west.

Photopoint 109. No bed or banks on NHD line. XBB109. Facing west.

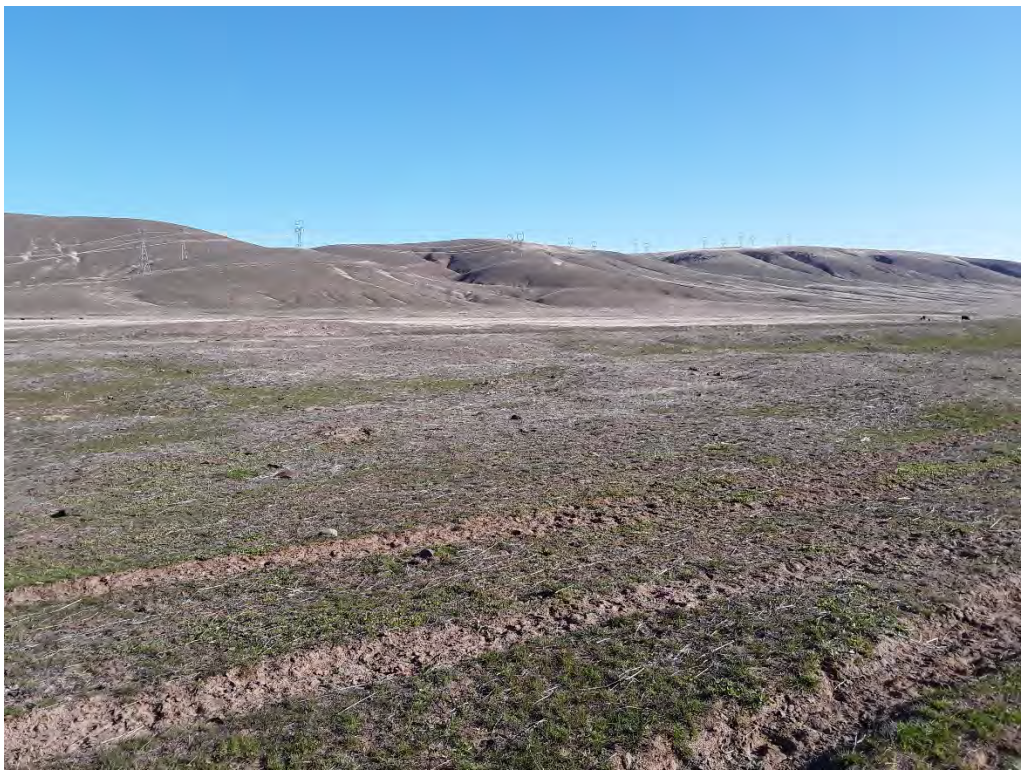
Photopoint 110. No bed or banks on NHD line. XBB110. Facing east.

Photopoint 111. No bed or banks on NHD line. XBB111. Facing west.

Photopoint 112. No bed or banks on NHD line. XBB112. Facing southeast.

Photopoint 113. No bed or banks on NHD line. XBB113. Facing southwest.

Photopoint 114. No bed or banks on NHD line. XBB114. Facing northeast.



Photopoint 115. No bed or banks on NHD line. XBB115. Facing northeast.

Photopoint 116. No bed or banks on NHD line. XBB116. Facing north.

Photopoint 117. No bed or banks on NHD line. XBB117. Facing north.

Photopoint 118a. Watering troughs show up green on orthoimagery. XBB118a. Facing north.

Photopoint 118b. No bed or banks on NHD line. XBB118b. Facing west.

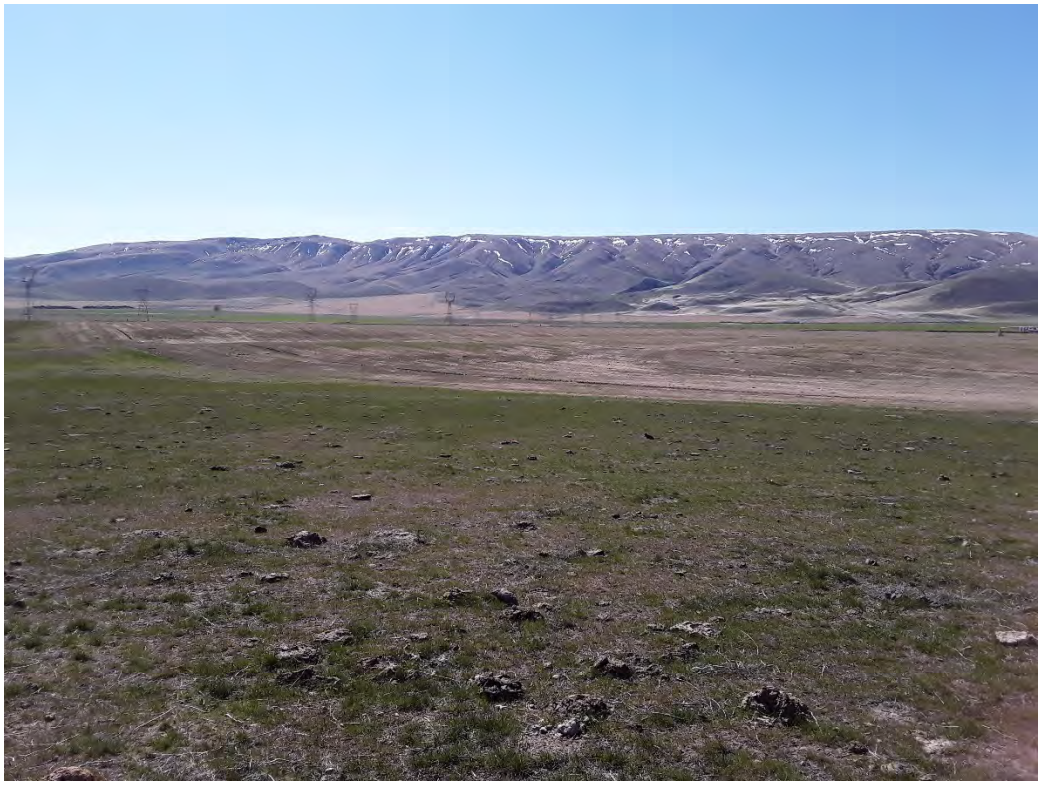
Photopoint 119. No bed or banks on NHD line. XBB119. Facing southwest.

Photopoint 120. No bed or banks on NHD line. XBB120. Facing south.

Photopoint 121. No bed or banks on NHD line. XBB121. Facing southwest.

Photopoint 122a. No bed or banks on NHD line. XBB122a. Facing southwest.

Photopoint 122b. No bed or banks on NHD line. XBB122b. Facing northwest.



Photopoint 124. No bed or banks on NHD line. XBB124. Facing south.

Photopoint 125. End of ST-211. XBB125. Facing southwest.

Photopoint 127. Cow wallow/erosional feature on NHD line, no bed or banks on either side of erosional feature. XBB127. Facing west.

Photopoint 128a. No bed or banks on NHD line. XBB128a. Facing west.

Photopoint 128b. No bed or banks on NHD line. XBB128b. Facing southwest.

Photopoint 129. No bed or banks on NHD line. XBB129. Facing east.

Photopoint 130. No bed or banks on NHD line. XBB130. Facing southeast.

Photopoint 131. No bed or banks on NHD line. XBB131. Facing northeast.

Photopoint 132. No bed or banks on NHD line. XBB132. Facing north.

Photopoint 133. No bed or banks on NHD line. XBB133. Facing north.

Photopoint 134. No bed or banks on NHD line. XBB134. Facing north.

Photopoint 135. No bed or banks on NHD line. XBB135. Facing north.

Photopoint 136. No bed or banks on NHD line. XBB136. Facing north.

Photopoint 137. No bed or banks on NHD line. XBB137. Facing north.

Photopoint 138a. No bed or banks on NHD line. XBB138a. Facing north.

Photopoint 138b. No bed or banks on NHD line. XBB138b. Facing south.

Photopoint 139. No bed or banks on NHD line. XBB139. Facing north.

Photopoint 140. No bed or banks on NHD line. XBB140. Facing north.

Photopoint 141. No bed or banks on NHD line. XBB141. Facing north.

Photopoint 142. No bed or banks on NHD line. XBB142. Facing north.

Photopoint 143. No bed or banks on NHD line. XBB143. Facing northeast.

Photopoint 144. No bed or banks on NHD line. XBB144. Facing northeast.

Photopoint 145. No bed or banks on NHD line. XBB145. Facing northeast.

Photopoint 146. No bed or banks on NHD line. XBB146. Facing northeast.

Photopoint 147. No bed or banks on NHD line. XBB147. Facing southwest.

Photopoint 148. No bed or banks on NHD line. XBB148. Facing east.

Photopoint 149. No bed or banks on NHD line. XBB149. Facing east.

Photopoint 150. No bed or banks on NHD line. XBB150. Facing east.

Photopoint 151. No bed or banks on NHD line. XBB151. Facing north.

Photopoint 152. No bed or banks on NHD line. XBB152. Facing northeast.

Photopoint 153. No bed or banks on NHD line. XBB153. Facing northeast.

Photopoint 154a. No bed or banks on NHD line. XBB154a. Facing north.

Photopoint 154b. No bed or banks on NHD line. End of ST-215. XBB154b. Facing north.

Photopoint 155. No bed or banks on NHD line. XBB155. Facing southwest.

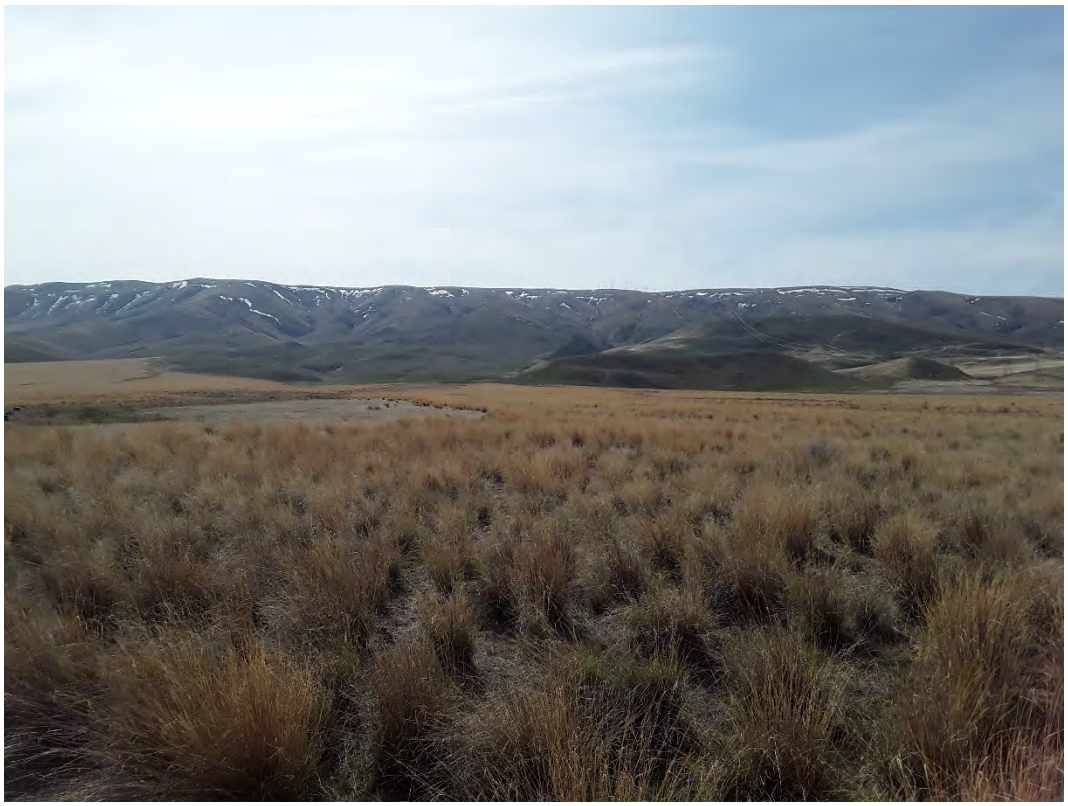
Photopoint 156. No bed or banks on NHD line. XBB156. Facing south.

Photopoint 157. No bed or banks on NHD line. XBB157. Facing south.

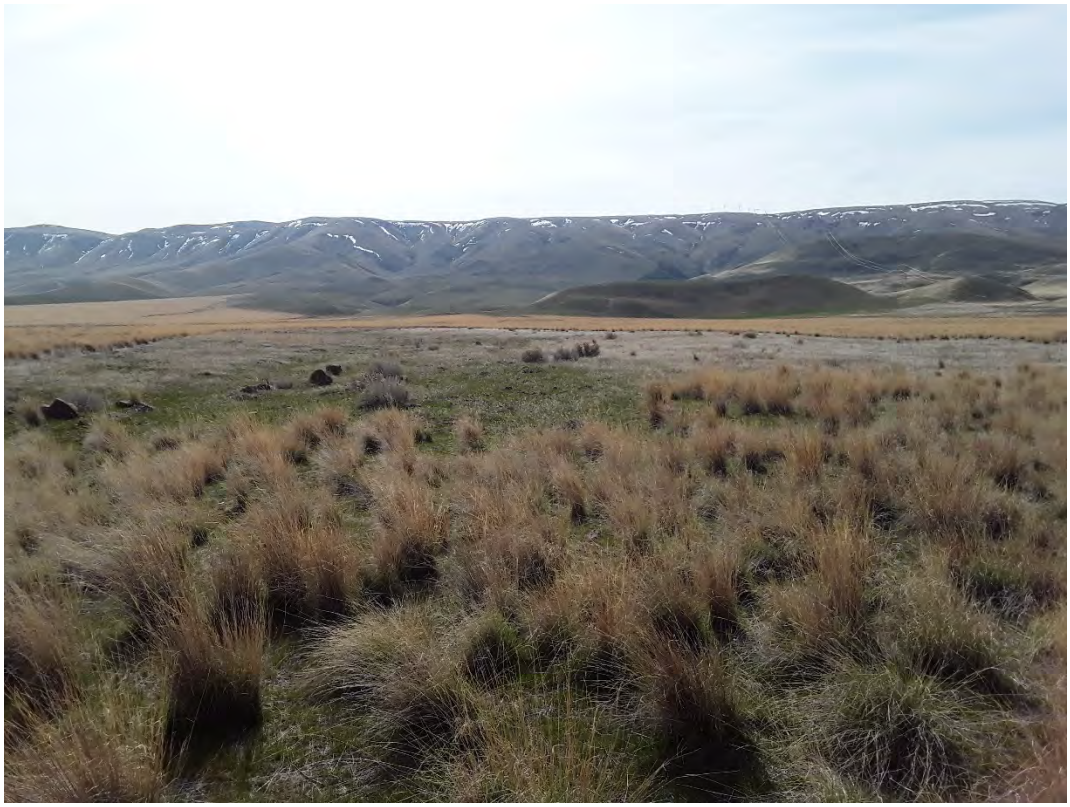
Photopoint 158. No bed or banks on NHD line. XBB158. Facing south.

Photopoint 159. No bed or banks on NHD line. XBB159. Facing south.

Photopoint 160. No bed or banks on NHD line. XBB160. Facing south.



Photopoint 161. No bed or banks on NHD line. XBB161. Facing south.



Photopoint 162. No bed or banks on NHD line. XBB162. Facing south.

Photopoint 163. No bed or banks on NHD line. XBB163. Facing north.

Photopoint 164a. No bed or banks on NHD line. XBB164a. Facing southwest.

Photopoint 164b. No bed or banks on NHD line. XBB164b. Facing southwest.

Photopoint 165. No bed or banks on NHD line. XBB165. Facing south.

Photopoint 166. No bed or banks on NHD line. XBB166. Facing south.

Photopoint 167. No bed or banks on NHD line. XBB167. Facing south.

Photopoint 168. No bed or banks on NHD line. XBB168. Facing southwest.

Photopoint 169. No bed or banks on NHD line. XBB169. Facing southwest.

Photopoint 170. No bed or banks on NHD line. XBB170. Facing northwest.

Photopoint 171. No bed or banks on NHD line. XBB171. Facing north.

Photopoint 172. No bed or banks on NHD line. XBB172. Facing northwest.

Photopoint 173. No bed or banks on NHD line. XBB173. Facing northwest.

Photopoint 174. No bed or banks on NHD line. XBB174. Facing north.

Photopoint 175. No bed or banks on NHD line. XBB175. Facing southeast.

Photopoint 176. No bed or banks on NHD line. XBB176. Facing north.

Photopoint 177. No bed or banks on NHD line. XBB177. Facing northeast.

Photopoint 178. Dark spot on orthoimagery is glacial erratic surrounded by weeds. XBB178. Facing west.

Photopoint 179. No bed or banks on NHD line. XBB179. Facing east.

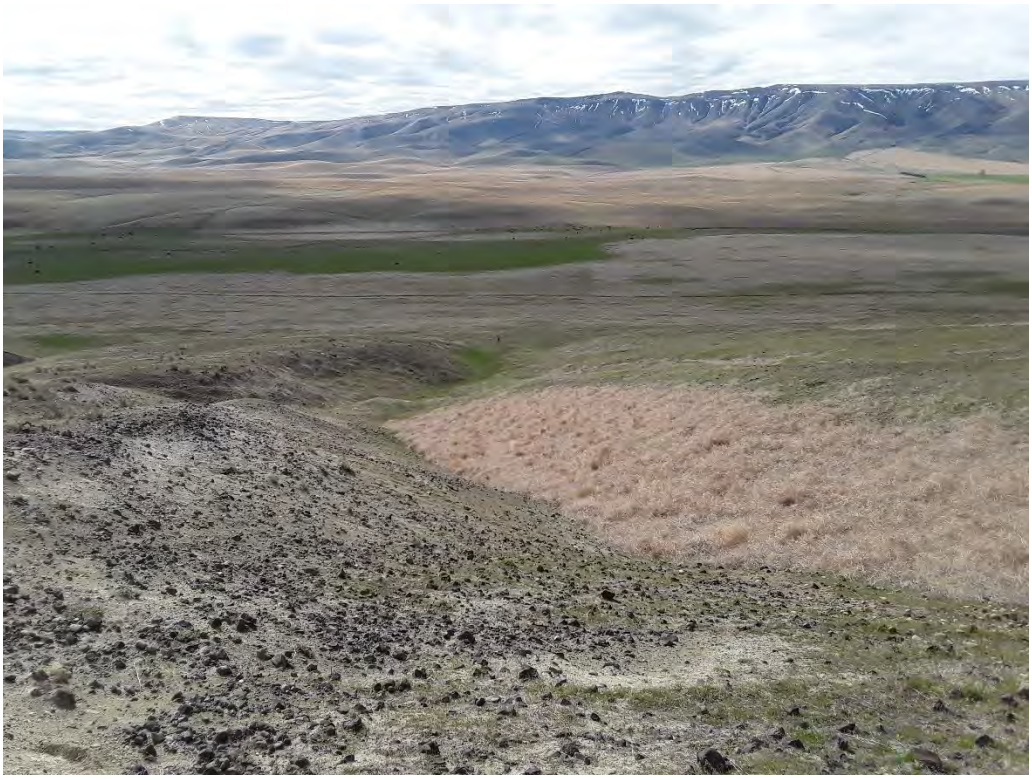
Photopoint 200. Ephemeral drainage. ST200. Facing southwest.

Photopoint 201. Ephemeral drainage. ST201. Facing north.

Photopoint 202. Ephemeral drainage. ST202. Facing south.

Photopoint 203. Ephemeral drainage. ST203. Facing southeast.

Photopoint 204. Ephemeral drainage. ST204. Facing southwest.



Photopoint 205. Ephemeral drainage. ST205. Facing south.

Photopoint 206. Ephemeral drainage. ST206. Facing southwest.

Photopoint 207. Ephemeral drainage. ST207. Facing west.

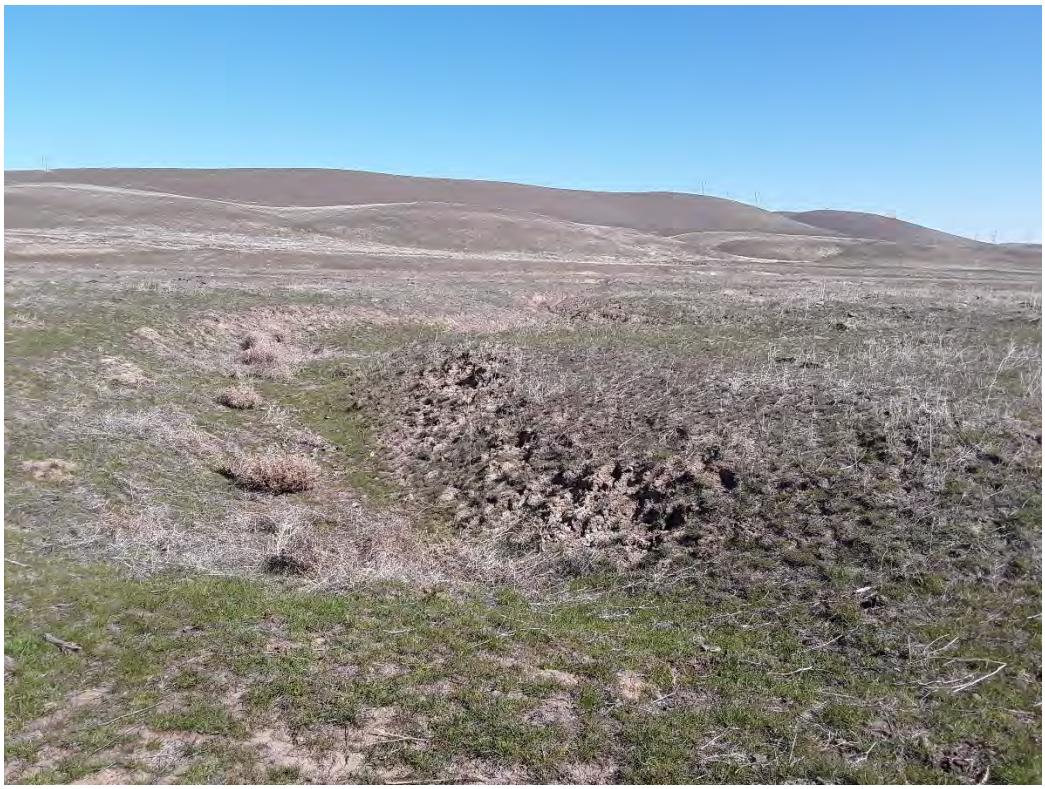
Photopoint 208. Ephemeral drainage. ST208. Facing southeast.

Photopoint 209. Ephemeral drainage. ST209. Facing southwest.

Photopoint 210. Ephemeral drainage. ST210. Facing north.

Photopoint 211. Ephemeral drainage. ST211. Facing northeast.

Photopoint 212. Ephemeral drainage. ST212. Facing south.



Photopoint 213. Ephemeral drainage. ST213. Facing northeast.

Photopoint 215. Ephemeral drainage. ST215. Facing south.

Photopoint 216. Ephemeral drainage. ST216. Facing northeast.

Photopoint 217. Ephemeral drainage. ST217. Facing northwest.

Photopoint 218. Ephemeral drainage. ST218. Facing southeast.

Photopoint 220. Ephemeral drainage. ST220. Facing south.

Photopoint 221. Ephemeral drainage. ST221. Facing east.

Photopoint 222. Ephemeral drainage. ST222. Facing northeast.

Photopoint 400. Livestock pond, with piped water. PD400. Facing southwest.

Photopoint 402. Livestock pond, with piped water. PD402. Facing south.

Photopoint 403a. Livestock pond, with piped water. PD403a. Facing west.

Photopoint 403b. Livestock pond, with piped water. PD403b. Facing northeast.

Photopoint 500. Irrigation induced wetland. WT500. Facing south.

Photopoint 501. Irrigation induced wetland. WT501. Facing southwest.

Photopoint 502. Sample site. SS502. Facing south.

Photopoint 2041. Ephemeral drainage. ST204. Facing northeast.

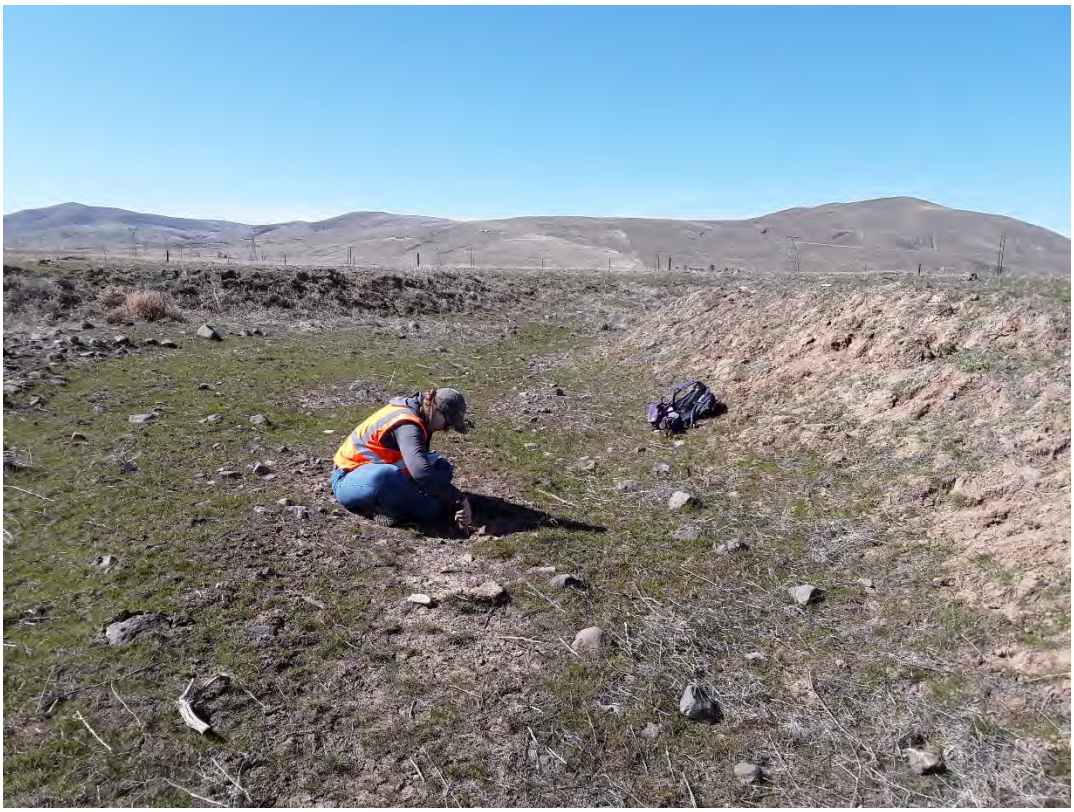
Photopoint 2071a. Ephemeral drainage. ST207. Facing southwest.

Photopoint 2071b. Ephemeral drainage. ST207. Facing southwest.

Photopoint 2072. Ephemeral drainage. ST207. Facing southwest.

Photopoint 2073. Ephemeral drainage. ST207. Facing northeast.

Photopoint 2081. Ephemeral drainage. ST208. Facing southeast.



Photopoint 2141. Ephemeral drainage. ST214. Facing southeast.

Photopoint 2142. Ephemeral drainage. ST214. Facing southeast.

Photopoint 2151. Ephemeral drainage. ST215. Facing north.

Photopoint 2191. Ephemeral drainage. ST219. Facing northeast.

Photopoint 2192. Ephemeral drainage. ST219. Facing south.

Photopoint 2211. Ephemeral drainage. ST221. Facing northeast.

Photopoint 2212. Ephemeral drainage. ST221. Facing northeast.

Photopoint 2213. Ephemeral drainage. ST221. Facing north.

Photopoint 2221. Ephemeral drainage. ST222. Facing north.

Photopoint 4001. Pipe into livestock pond. PD400. Facing southwest.

Photopoint 4002. Sample site. SS4002. Facing north.

Photopoint 4011. Pipe into livestock pond. PD401. Facing west.

Photopoint 4012. Livestock pond. PD401. Facing northeast.

Photopoint 4014. Livestock pond. PD401. Facing northeast.

Photopoint 4021. Livestock pond. PD402. Facing southwest.

Photopoint 4022. Livestock pond. PD402. Facing southeast.

Photopoint 4031. Livestock pond. PD403. Facing north.

Photopoint 4032. Livestock pond. PD403. Facing north.

Photopoint 5001. Upland sample site. WT500. Facing south.

Photopoint 5002. Sample site. WT500. Facing north.

Photopoint 5003. Upland sample site. WT500. Facing northeast.

Photopoint 5004. WT500. Facing west.

Photopoint 5005. WT500. Facing west.

Photopoint 5011. Upland sample site. WT501. Facing north.

Photopoint 5012. Sample site. WT501. Facing south.

Photopoint 501. WT501. Wetland created by a leak in irrigation pipe. Facing west.

Photopoint 502. WT502. Wetland created by a leak in irrigation pipe. Facing north.

Photopoint 600. No bed or banks on NHD line. Facing north.

Photopoint 601. No bed or banks on NHD line. Facing north.

Photopoint 602. No bed or banks on NHD line. Facing north.

Photopoint 603. No bed or banks on NHD line. Facing southwest.

Photopoint 604. No bed or banks on NHD line. Facing south.

Photopoint 605. No bed or banks on NHD line. ST705 does not continue southwest of here. Facing southwest.

Photopoint 606. No bed or banks on NHD line, swale feature full of cow bones. Facing south.

Photopoint 607. No bed or banks on NHD line. Facing south.

Photopoint 608. No bed or banks on NHD line. Facing west.

Photopoint 609. No bed or banks on NHD line. Facing northwest.

Photopoint 610. No bed or banks on NHD line. ST706 does not continue uphill from here. Facing southwest.

Photopoint 612. No bed or banks on NHD line. Facing northwest.

Photopoint 613. No bed or banks on NHD line. Facing west.

Photopoint 614. No bed or banks on NHD line. Facing southeast.

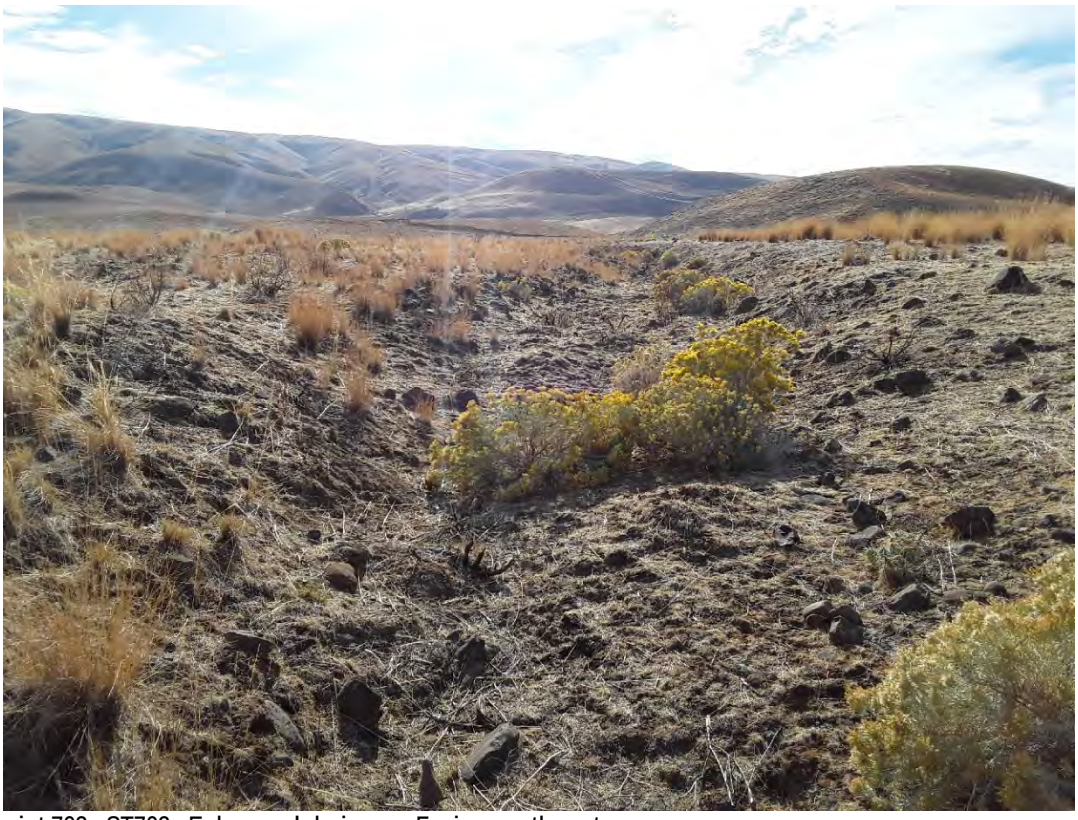
Photopoint 615. No bed or banks on NHD line. Facing southeast.

Photopoint 616. No bed or banks on NHD line. Facing southeast.

Photopoint 617. No bed or banks on NHD line. Facing west.

Photopoint 700. ST700. Ephemeral drainage. Facing north.

Photopoint 701. ST701. Ephemeral drainage. Facing northwest.



Photopoint 703. ST703. Ephemeral drainage. Facing southwest.

Photopoint 704. ST704. Ephemeral drainage. Facing northwest.

Photopoint 705. ST705. Ephemeral drainage. Facing west.

Photopoint 706. ST706. Ephemeral drainage. Facing southwest.

Photopoint 707. ST707. Ephemeral drainage. Facing southwest.

Photopoint 708. ST708. Ephemeral drainage. Facing north.

Photopoint 709. ST709. Ephemeral drainage. Facing east.

Photopoint 710. ST710. Ephemeral drainage. Facing southwest.

Photopoint 2071. ST207. Ephemeral drainage, downstream conditions. Facing east.

Photopoint 50021. WT500. Updated photo of WT500, water flowing from pipes. Facing north.

ATTACHMENT J: PRELIMINARY STORMWATER MANAGEMENT REPORT

PRELIMINARY STORMWATER MANAGEMENT REPORT

Wautoma Solar Project

Benton County, Washington

JANUARY 2022

PREPARED FOR:

INNERGEX

PREPARED BY:

Westwood

Preliminary Stormwater Management Report

Wautoma Solar Project

Benton County, Washington

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Project Number: R0033629.00
Date: January 14, 2022

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Appendix B: Curve Number Table
Appendix C: Existing HydroCAD Results
Appendix D: Proposed HydroCAD Results
Appendix E: Crossing Sizing Calculations
Appendix F: Geotechnical Report

Introduction

The purpose of this report is to summarize the proposed stormwater management for the Wautoma Solar Project ("the project"). This report was prepared to meet local and state requirements and is intended for submittal to these agencies for permitting review and approval.

The project site is proposed on approximately 2,980 acres and is located approximately 25 miles northwest of the city of West Richland in Benton County, Washington. The site's current use is primarily grassland with some agricultural row crops.

The proposed use of the site will be a solar facility consisting of roughly 2,470 acres of solar modules and 97 acres of the new impervious surface including gravel access roads, inverters, substation, and other associated solar infrastructure. The proposed site under the solar modules will be converted to grassland conditions within the fenced boundary around the proposed impervious surfaces. Due to the area between and beneath the panels being vegetated, panels are not considered an impervious surface.

Minimal grading will be proposed on site and existing drainage patterns will be maintained. Stormwater management practices including detention basins are proposed on site to meet the requirements of the state. Other stormwater measures are proposed to route water through the site including culverts and low water crossings.

Data Sources

TABLE 1: DATA SOURCES

Task	Format	Source	Use
Elevation	1-meter DEM	The National Map	Model Elevations
Elevation	DWG	Westwood Professional Services	Onsite Proposed Model Elevations
Crop Data	Shapefile	USDA 2013 Crop Data Layer	Landcover
Soils	Shapefile	USGS SSURGO Dataset	Curve Numbers
Precipitation	PDF File	NOAA Atlas 2	Design Storms
Site Boundary	Shapefile	Innergex	Define Model Extents
2014 Aerial Photography	ArcGIS Map Service	USDA FSA	Reference

Site Conditions

Site Location

The project area is located approximately 25 miles northwest of the city of West Richland in Benton County, Washington.

Historical Use

A review of aerial photographs shows that part of the site is currently used and has historically been used for agricultural row crops and grassland.

Topography Description

The existing topographic information used in this analysis was obtained from the USGS National Elevation Set 1m data obtained from The National Map. The site is generally flat with slopes around 1%-7%.

Drainage Patterns

Onsite runoff is split into 38 drainage areas based on discharge locations and existing low areas. An existing creek called Dry Creek flows through the north side of the site from west to east. Drainage areas are shown in Exhibits 5 and 6.

Discharge Locations

The site has seven ultimate discharge locations to the existing Dry Creek that runs through the site. Discharge locations are shown in Exhibits 5 and 6.

Soils

Soils data was downloaded from SSURGO and can be found in Exhibit 3. In addition to the SSURGO soils information, a geotechnical report was completed by RRC on November 24, 2021 (Appendix F). Both soils documents were reviewed and incorporated into the analysis.

The site consists primarily of Hydrologic Soil Group (HSG) B soils with some locations with HSG A and C. Type A soils have low runoff potential and high infiltration rates. Type B soils have moderate runoff potential and infiltration rates. Type C soils have moderate runoff potential and low infiltration rates.

Stormwater Management Requirements

Stormwater management for the project falls under the jurisdiction of the State of Washington and Benton County. Washington requirements are taken from the Stormwater Management Manual for Eastern Washington (SWMMEW) and conversations with the state, 2019SWMMEW - FrontCover (wa.gov). The following requirements need to be met for the project:

Water Quantity/Runoff Analysis

Stormwater quantity control must be provided so that proposed conditions peak runoff rates and volumes must be equal to or less than existing conditions. The 2-year, 10-year, 25-year, and 100-year 24-hour stormwater events must meet these requirements.

Water Quality

The aim of Core Element #5 of the SWMMEW is to treat at minimum 90% of runoff from pollution-generating impervious surfaces (PGIS). A surface is considered a PGIS if it is being

regularly used by vehicles. Since the access roads on the project site are primarily for operations and maintenance, it is assumed that this project is exempt from the Core Element #5 requirements. Water quality will be addressed using the Full Dispersion BMP (SWMMEW, Table 6.10).

Drainage Improvements

Proposed culverts and low water crossings will be sized for the 10-year 24-hour stormwater event per client.

Methodology

Existing and proposed conditions are modeled in HydroCAD software. HydroCAD is a widely accepted hydrologic and hydraulic modeling package based on TR-20 unit hydrograph equations. It models stormwater runoff discharge rates and velocities from ponds, culverts, outlet control structures, and stream reaches.

Hydrology

The state of Washington has a table in the SWMMEW with Curve Number values assigned to various land use areas (Chapter 4.6.3, Table 4.14). Curve numbers were assigned by reviewing the soil and landcover for each drainage area (Appendix B).

Time of concentrations were calculated for each drainage area in HydroCAD using the lag method. The lag method uses the hydraulic length (distance traveled by a drop of water from the most distant part of the subcatchment to the outlet point) and the average land slope (average slope of entire watershed). The overall curve number for the site along with the lag information is used to get the time of concentration for the site.

SCS Type II precipitation and distribution data for the 2-year, 10-year, 25 year, and 100-year 24-hour storm events were used as input for the analysis (Appendix A).

Hydraulics

Culvert sizing was completed using HydroCAD and contributing watershed properties to find runoff rates to the anticipated culvert locations. A table derived from CulvertMaster was then used to size the culverts assuming 1' allowable headwater and manning's number of 0.025 for corrugated metal culverts (Appendix E). CulvertMaster uses the methodologies outlined in Hydraulic Design Series Number 5 from the U.S. Federal Highway Administration to calculate capacities and end conditions.

Existing Conditions

The existing site consists of grassland and row crop. Cover for the analysis was determined using the USDA 2013 Crop Data Layer and aerial photos. Curve numbers were assigned from the SWMMEW (Chapter 4.6.3, Table 4.14) based on the landcover and soil types, see Table 2 for summary.

TABLE 2: EXISTING CONDITIONS COVER

Cover	CN	Area [ac]
Grassland, Fair (HSG A)	49	182.77
Grassland, Fair (HSG B)	69	1,987.68
Grassland, Fair (HSG C)	79	37.48
Straight Row Crop (HSG A)	64	16.30
Straight Row Crop (HSG B)	75	753.94
Total		2,978.17

Proposed Conditions

The use of the site will be a solar plant. The site will consist of approximately 2,470 acres of solar modules mounted above grade on a racking system and 97 acres of gravel access roads, electrical equipment, and a substation. The solar modules will be located above grade with grassland below the proposed array. See Table 3 below for landcover summary.

The proposed substation and O&M building will be a raised pad and runoff from this area will sheet flow to a proposed detention basin to the east.

Minimal grading is proposed to meet the tolerances of the proposed solar array. Drainage patterns will remain the same with the addition of detention basins that outlet similar to existing conditions. Culverts and low water crossings are proposed to route water through the site.

Minimal grading is proposed onsite and overall drainage patterns will remain the same as existing. Offsite drainage areas were not included in the analysis.

TABLE 3: PROPOSED CONDITIONS COVER

Cover	CN	Area [ac]
Roads/Inverters/Substation	98	96.98
Grassland, Fair (HSG A)	49	195.18
Grassland, Fair (HSG B)	69	2,649.44
Grassland, Fair (HSG C)	79	36.57
Total		2,978.17

Proposed Stormwater Management

A solar project differs greatly from other commercial or residential developments. When constructed, a solar project will include solar panels, at-grade gravel access roads, and other electrical equipment. The panels will be mounted above the ground with a low maintenance perennial grass growing below. Due to the area between and beneath the panels being vegetated, panels are not considered an impervious surface. While solar projects may require grading, the existing terrain is smoothed to accommodate array installation, rather than significant changes to grades or slopes, and the grading is designed to maintain existing drainage patterns. Access roads are installed at grade and allow for runoff to sheet flow through the proposed grassland cover which reduces runoff.

Water quality is improved over pre-development conditions due to the land cover's conversion from a higher runoff rate row-crop field to a lower runoff rate grassland.

Detention basins are proposed to provide rate control for the proposed site. The basins will have an outlet culvert at the bottom of the basin to allow water to slowly release to meet requirements. The proposed basins will not have any permanent standing water.

In addition to typical stormwater management BMPs, the recommended approach for solar projects should include the following: limit the number of impervious surfaces to reduce runoff, minimize the amount of grading to promote sheet flow, and the planting of grass on the majority of the site to provide runoff reduction.

Water Quantity/Runoff Analysis

Stormwater quantity calculations for the site were prepared using HydroCAD. The proposed site does not meet the rate control requirements of the state of Washington. Basins will be sized in each reach to reduce runoff rates to meet these requirements as the design progresses. Tables 4 and 5 show a summary of the runoff rates and volumes for each event at the site discharge locations.

TABLE 4: RUNOFF RATE SUMMARY

Location	2-year Runoff (cfs)		10-year Runoff (cfs)		25-yr Runoff (cfs)		100-year Runoff (cfs)	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1	0.04	0.06	1.40	1.80	2.87	3.53	7.35	8.55
2	1.73	8.59	39.99	26.20	69.57	48.71	150.95	114.95
3	0.08	0.15	2.45	3.72	4.44	6.27	9.95	13.02
4	0.15	0.24	5.08	6.86	10.49	13.27	27.29	32.27
5	0.01	0.01	0.35	0.70	0.87	1.46	2.60	3.65
6	0.04	0.07	1.96	2.73	4.39	5.66	12.14	14.48
7	0.04	0.06	1.85	2.30	4.09	4.85	11.48	12.89

TABLE 5: RUNOFF VOLUME SUMMARY

Location	2-year Runoff (ac-ft)		10-year Runoff (ac-ft)		25-yr Runoff (ac-ft)		100-year Runoff (ac-ft)	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1	0.016	0.032	0.686	0.783	1.095	1.228	2.217	2.431
2	1.382	0.957	20.941	17.197	31.965	27.046	59.420	52.155
3	0.057	0.129	1.091	1.396	1.686	2.070	3.171	3.712
4	0.062	0.146	2.619	3.120	4.165	4.809	8.082	9.011
5	0.003	0.010	0.115	0.153	0.183	0.232	0.355	0.425
6	0.018	0.040	0.753	0.887	1.198	1.371	2.325	2.575
7	0.017	0.030	0.728	0.808	1.158	1.261	2.248	2.397

Water Quality

Grassland is proposed below the solar array which will allow for treatment using the Full Dispersion BMP. Based on Table 6.10 in the SWMMEW, a minimum of 20% grass cover is required on site. 99.97% grass cover is proposed on this project site.

TABLE 6: FULL DISPERSION BMP

Criteria	Allowed	Proposed
% Impervious	Max 10%	3.3%
Ratio of Impervious to Native Veg	< 15%	3.3%
Flow Path from Impervious	> 100 ft	Provided by sheet flow to channels
Cover of Flow Path	Native Veg: grass & row crop	Grass

Stormwater Management Practices

Basin Calculations

Detention basins are provided at critical locations in the site to capture runoff to slow release rates for the site. Eight permanent detention basins will be provided at each discharge location that has an increase in runoff due to the proposed development and in critical discharge locations.

Crossing Sizing

Crossings are proposed at new access roads to maintain existing drainage patterns through the proposed site. Internal crossings were sized for either culverts or low water crossings, see Appendix E.

Culverts are sized for the 10-year 24-hour rain event with a 1-foot allowable head. Appendix E summarizes the proposed culverts and low water crossings on site, see civil plans for culvert locations.

Low water crossings are sized to withstand the shear stress caused by flow during the 10-year 24-hour rainfall event. FLO2D models were created and analyzed to determine the shear stresses and lengths. The combination of crossing depths and the slope of the flow path at each crossing location were multiplied by the density of water to determine the expected shear stress. See civil plan set for crossing locations.

Conclusion

The proposed site was designed to meet the requirements of the State of Washington for stormwater management. The proposed site consists of proposed basins and crossings in order to maintain existing drainage patterns and reduce runoff rates. Minimal grading on site and proposed crossings maintain existing drainage areas throughout the site. The proposed vegetative cover below the array and detention basin at the substation and 7 reaches reduce runoff rates for the final conditions.

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Exhibits

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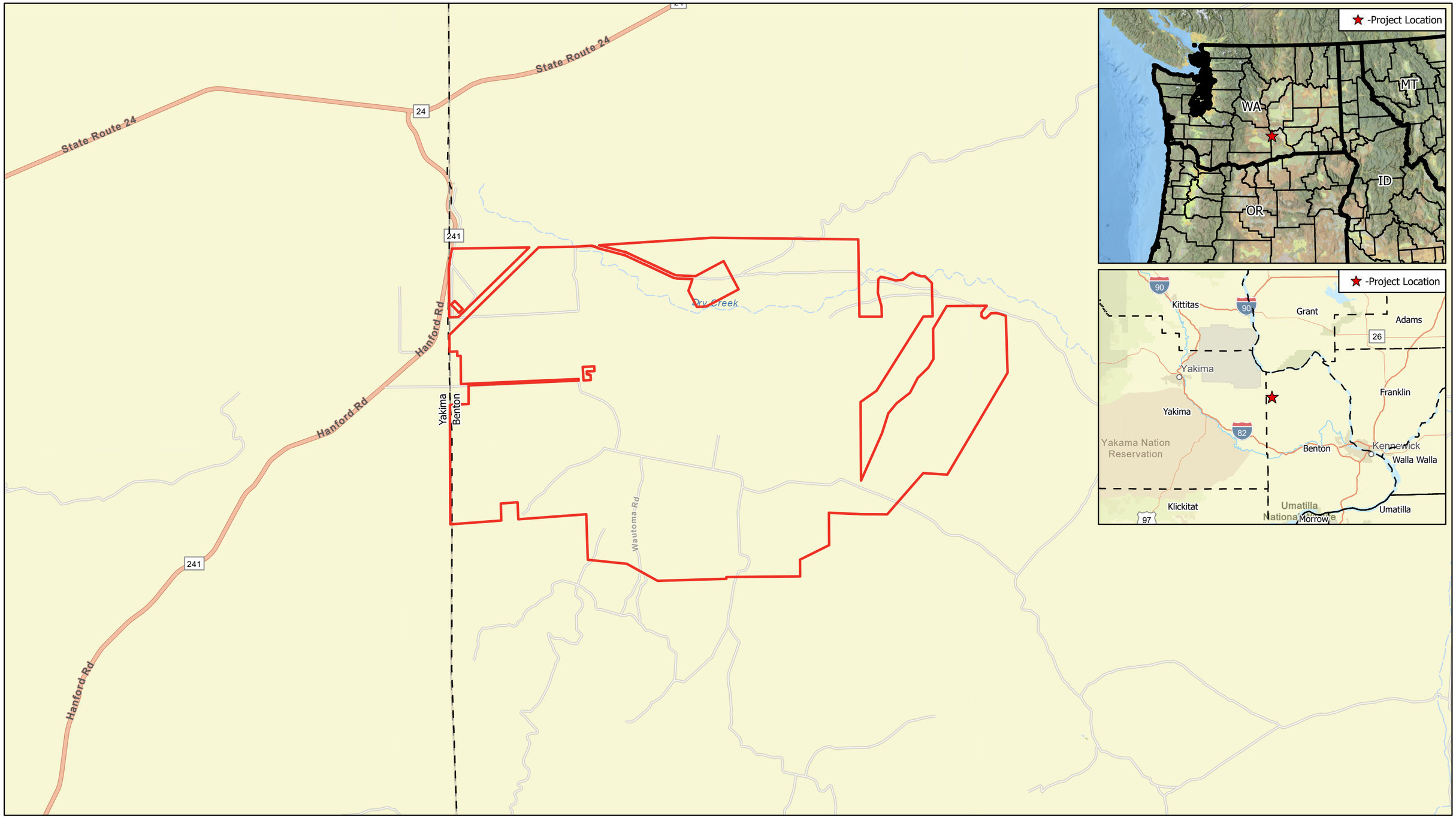

Data Source(s): Westwood (2022); Esri WMS Basemap Imagery (Accessed 2022); USGS (2022); FEMA (2022); USDA (2022)

Legend

- Project Boundary
- County Boundary

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N

0 Feet 3,500

Wautoma SWMP Exhibits

Benton County, Washington

Exhibit 1: Location Map

January 12, 2022

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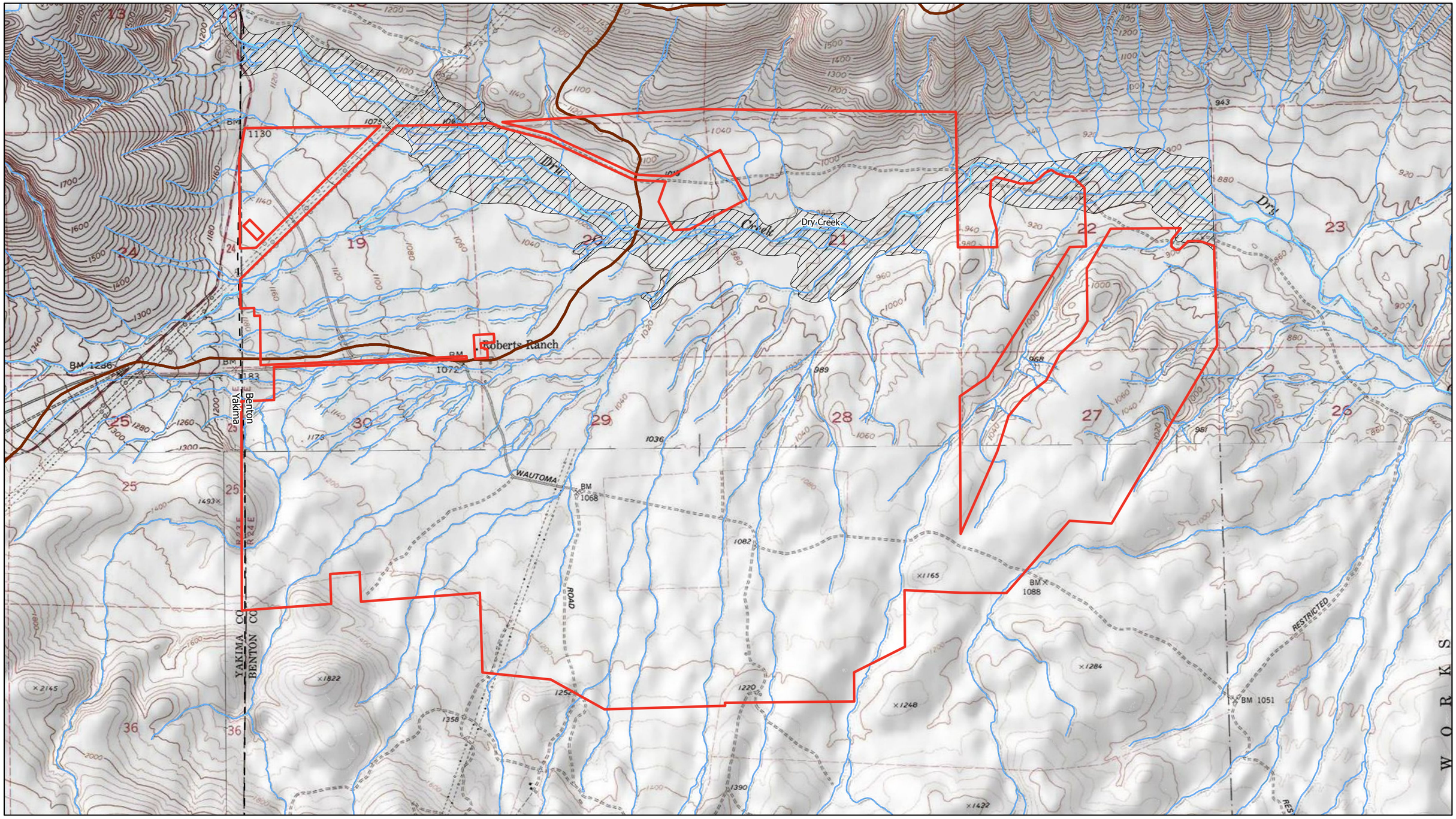

Data Source(s): Westwood (2022); Esri WMS Basemap Imagery (Accessed 2022); USGS (2022); FEMA (2022); USDA (2022)

Legend

- Project Boundary
- County Boundary
- HUC 12 Boundary
- FEMA Zone A*
- NWI Wetlands
- NHD Flowline

N

0 Feet 2,000

*FEMA Data not available for the southern portion of the site

Wautoma SWMP Exhibits

Benton County, Washington

Exhibit 2: Base Map

January 12, 2022

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Base Map - Base Map | 1/12/2022 8:04 AM | SStiles

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Data Source(s): Westwood (2022); Esri WMS Basemap Imagery (Accessed 2022); USGS (2022); FEMA (2022); USDA (2022)

Legend

- Project Boundary
- County Boundary

Hydrologic Soil Group

- A
- B
- C
- D

N

0 Feet 2,000

Wautoma SWMP Exhibits

Benton County, Washington

Exhibit 3: Soils Map

January 12, 2022

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Soils Map - Soils Map | 1/12/2022 8:07 AM | SStarks

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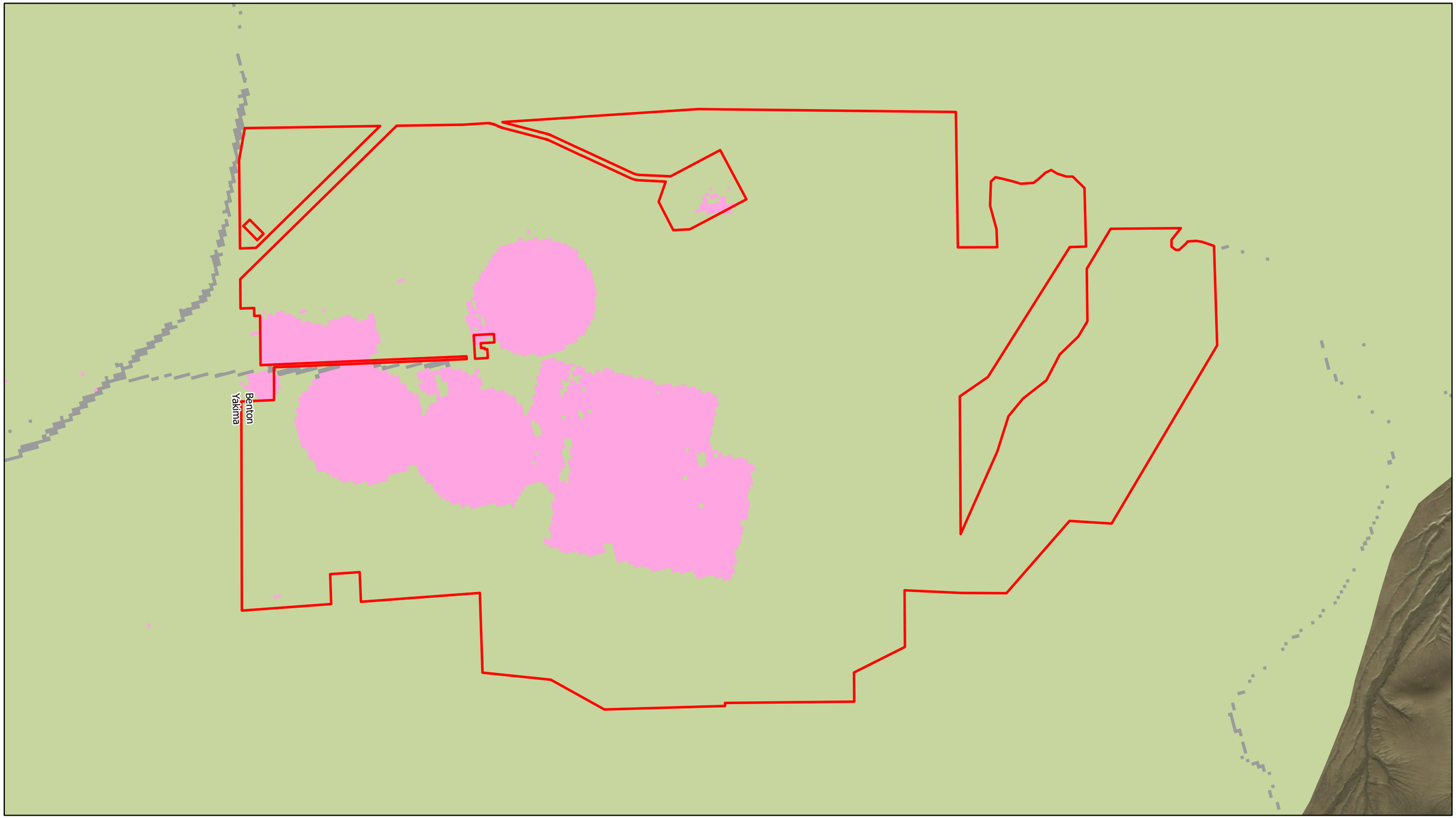

Data Source(s): Westwood (2022); Esri WMS Basemap Imagery (Accessed 2022); USGS (2022); FEMA (2022); USDA (2022)

Legend

Project Boundary

County Boundary

Layer

Landcover

Row Crops

Grassland/Pasture

Developed

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N

0 Feet 2,000

Wautoma SWMP Exhibits

Benton County, Washington

Exhibit 4: Landcover Map

January 13, 2022

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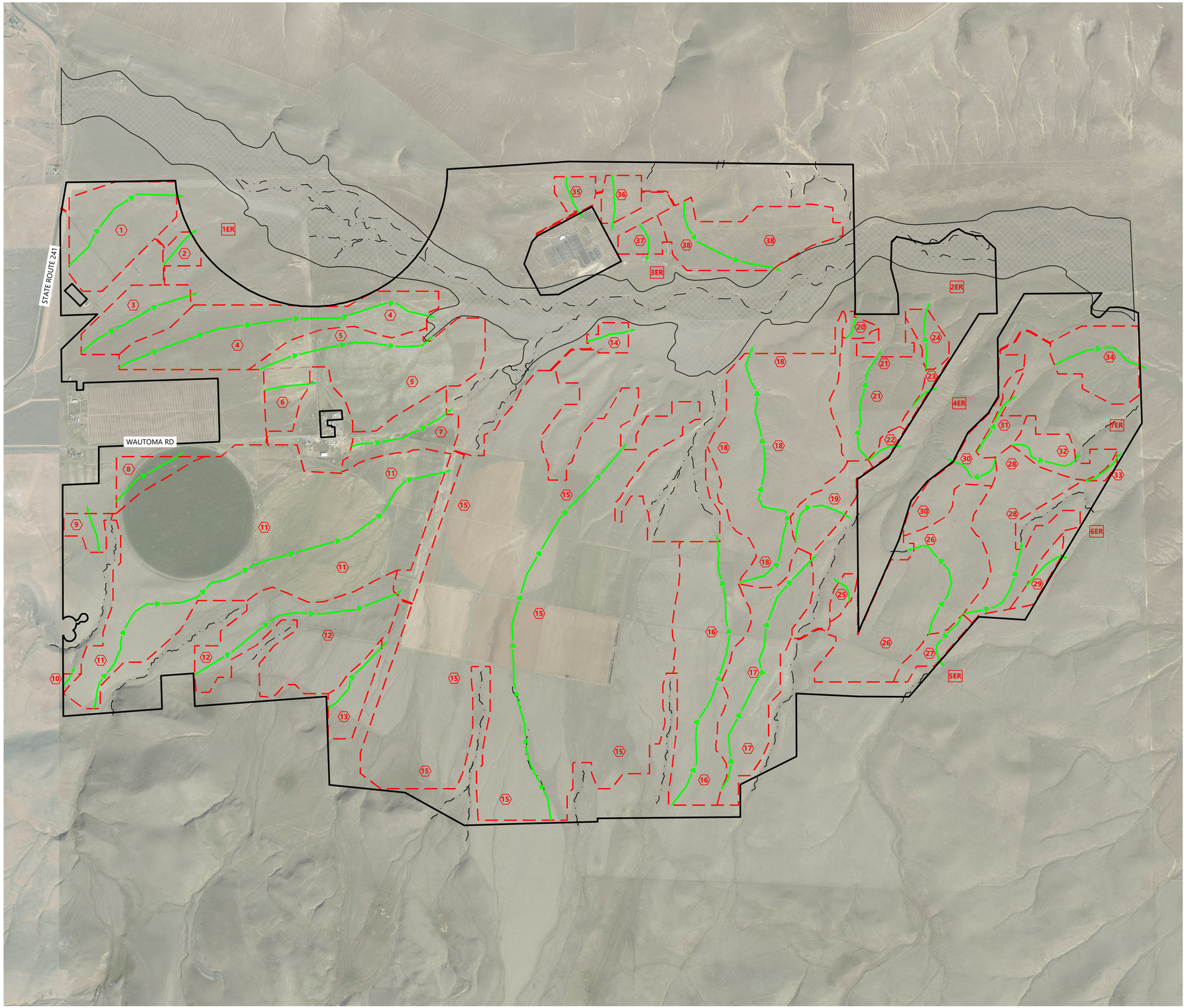

LEGEND:

- PROJECT BOUNDARY
- EX. STREAM CHANNEL
- FEMA FLOOD HAZARD ZONE
- EX. ONSITE DRAINAGE AREA BOUNDARY
- EX. TIME OF CONCENTRATION LINE
- DISCHARGE LOCATION
- 1 — DRAINAGE AREA LABEL
- 1ER — DISCHARGE REACH LABEL

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REVISIONS:

#	DATE	COMMENT	BY	CHK	APR

0' 1000' 2000' 3000'

Wautoma Solar Project

Benton County, Washington

Overall Existing Drainage Map

DATE: 1/14/2022
REV:
SHEET: 5

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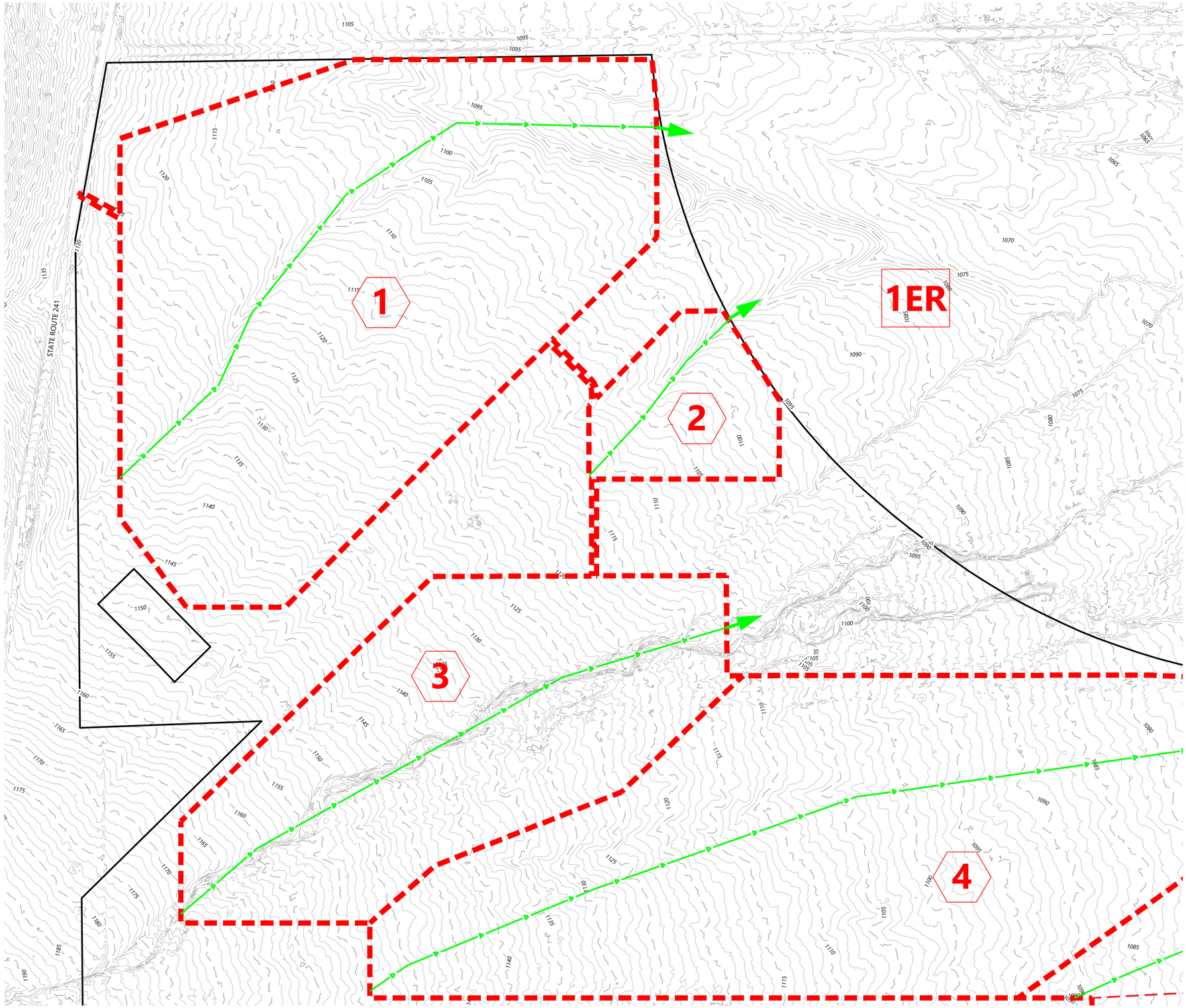

LEGEND:

- PROJECT BOUNDARY
- EX. INDEX CONTOUR
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- EX. STREAM CHANNEL
- FEMA FLOOD HAZARD ZONE
- EX. ONSITE DRAINAGE AREA BOUNDARY
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Wautoma Solar Project

Benton County, Washington

Existing Drainage Map

DATE: 1/14/2022
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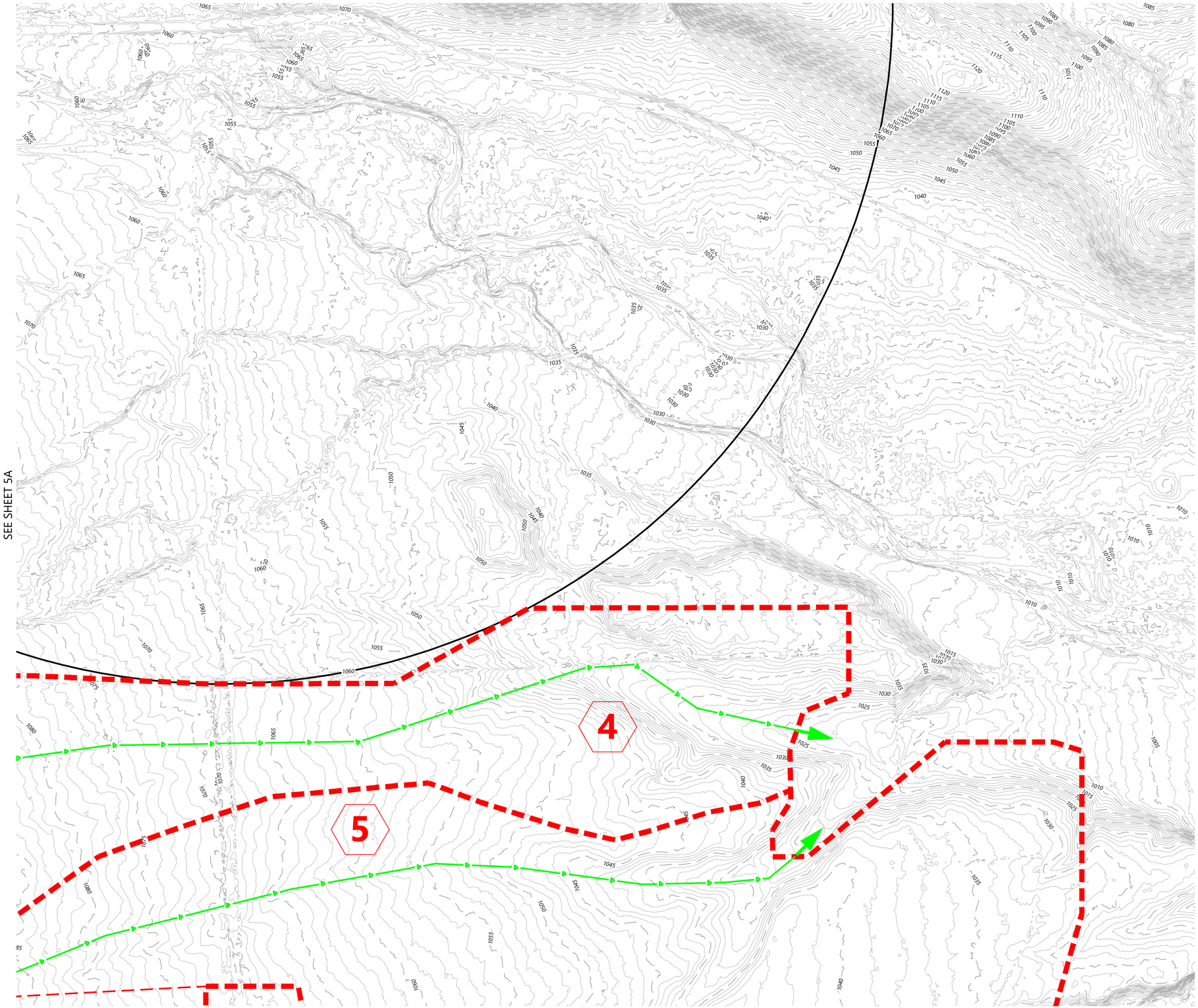

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Wautoma Solar Project

Benton County, Washington

Existing Drainage Map

DATE: 1/14/2022
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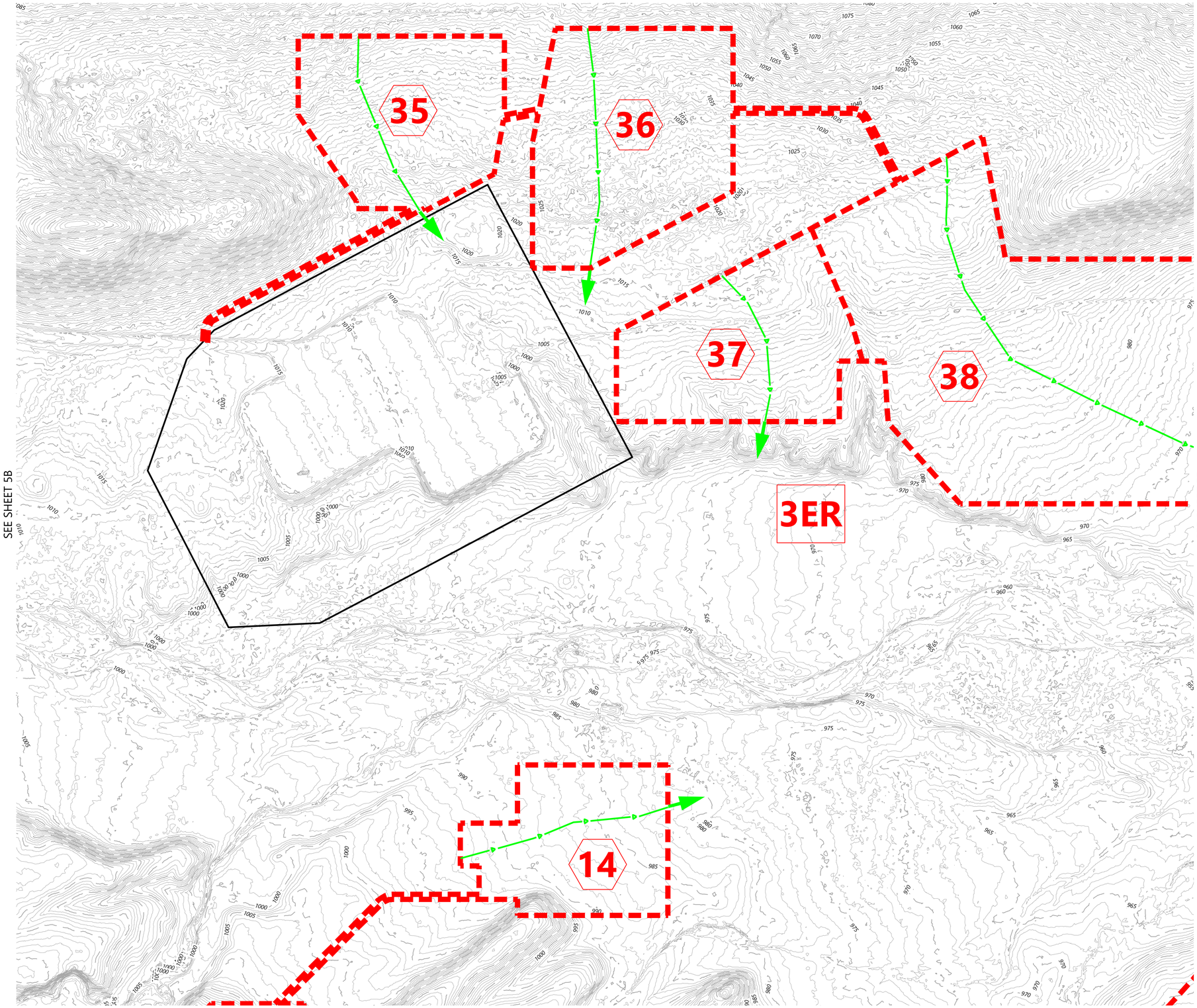

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- EX. ONSITE DRAINAGE AREA BOUNDARY
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Wautoma Solar Project

Benton County, Washington

Existing Drainage Map

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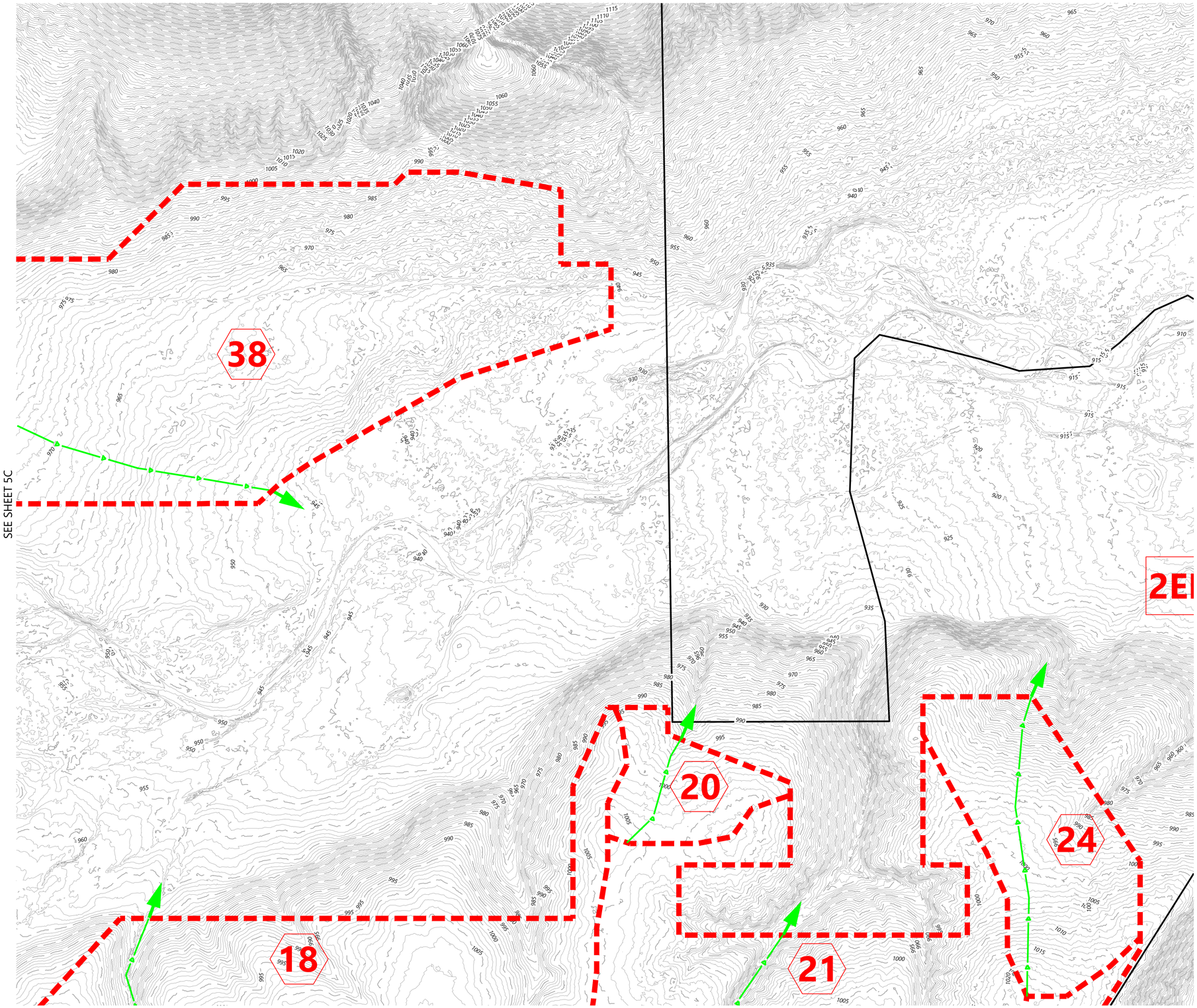

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Wautoma Solar Project

Benton County, Washington

Existing Drainage Map

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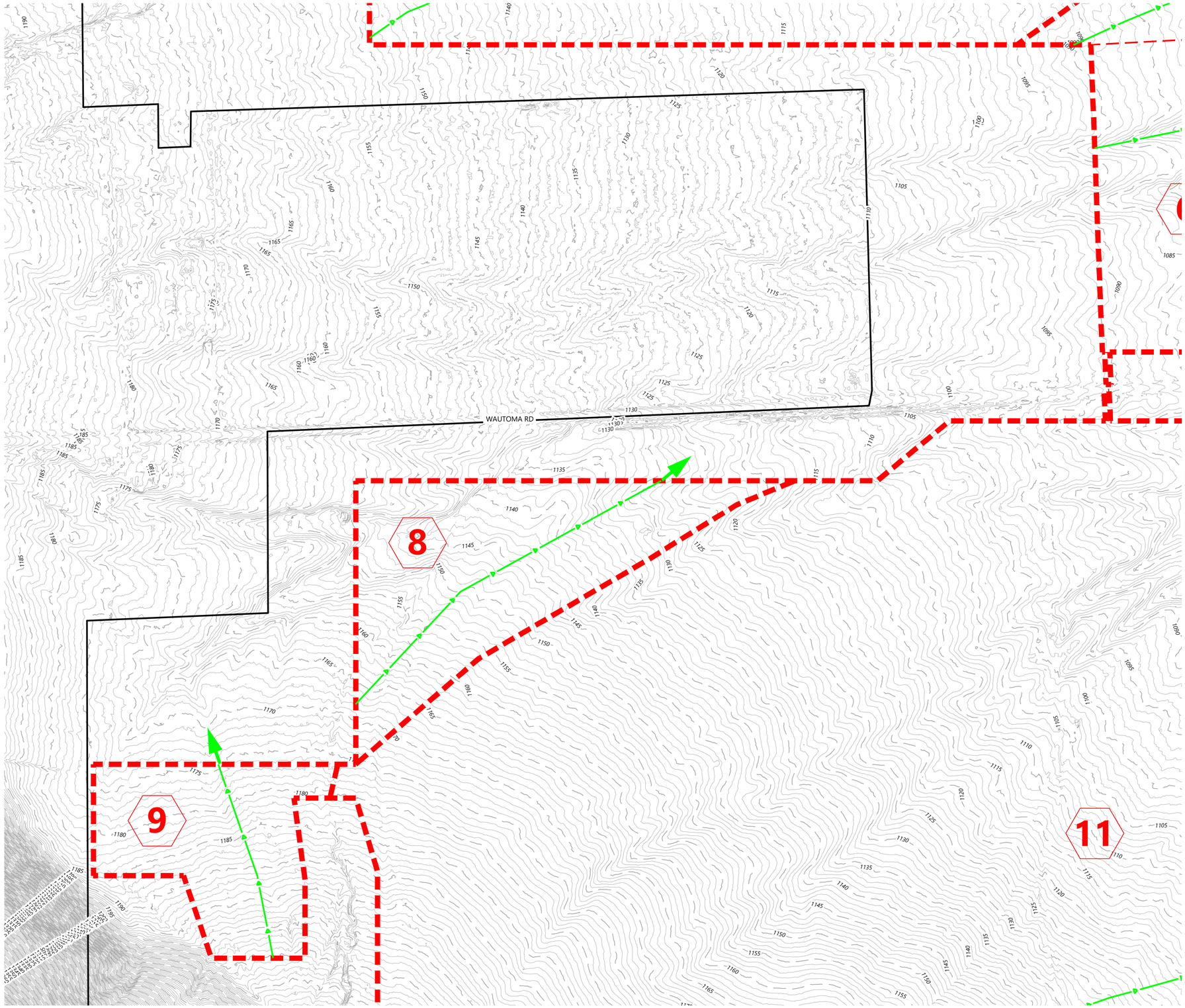

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Wautoma Solar Project

Benton County, Washington

Existing Drainage Map

DATE: 1/14/2022
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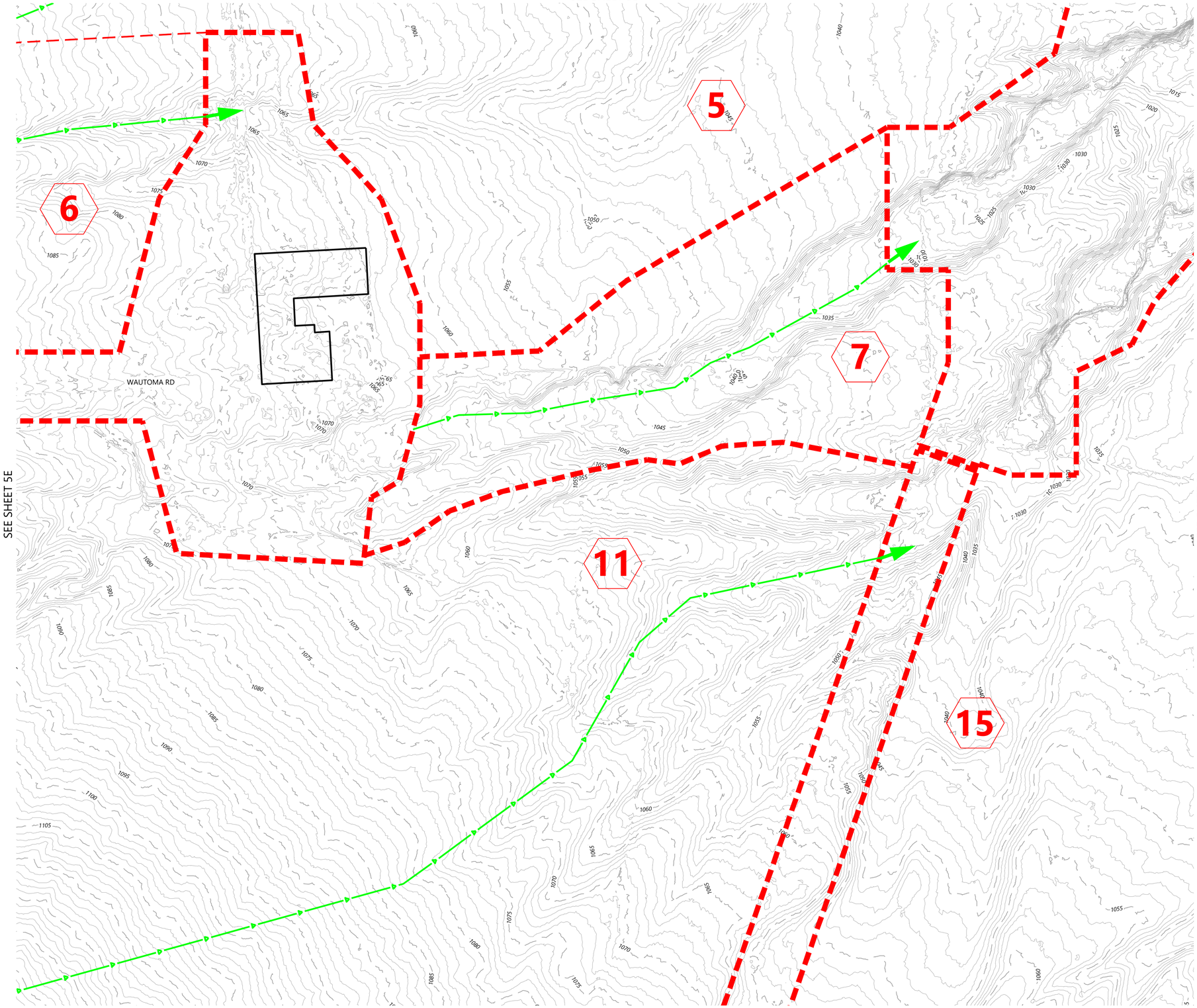

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Wautoma Solar Project

Benton County, Washington

Existing Drainage Map

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Wautoma Solar Project

Benton County, Washington

Existing Drainage Map

DATE: 1/14/2022
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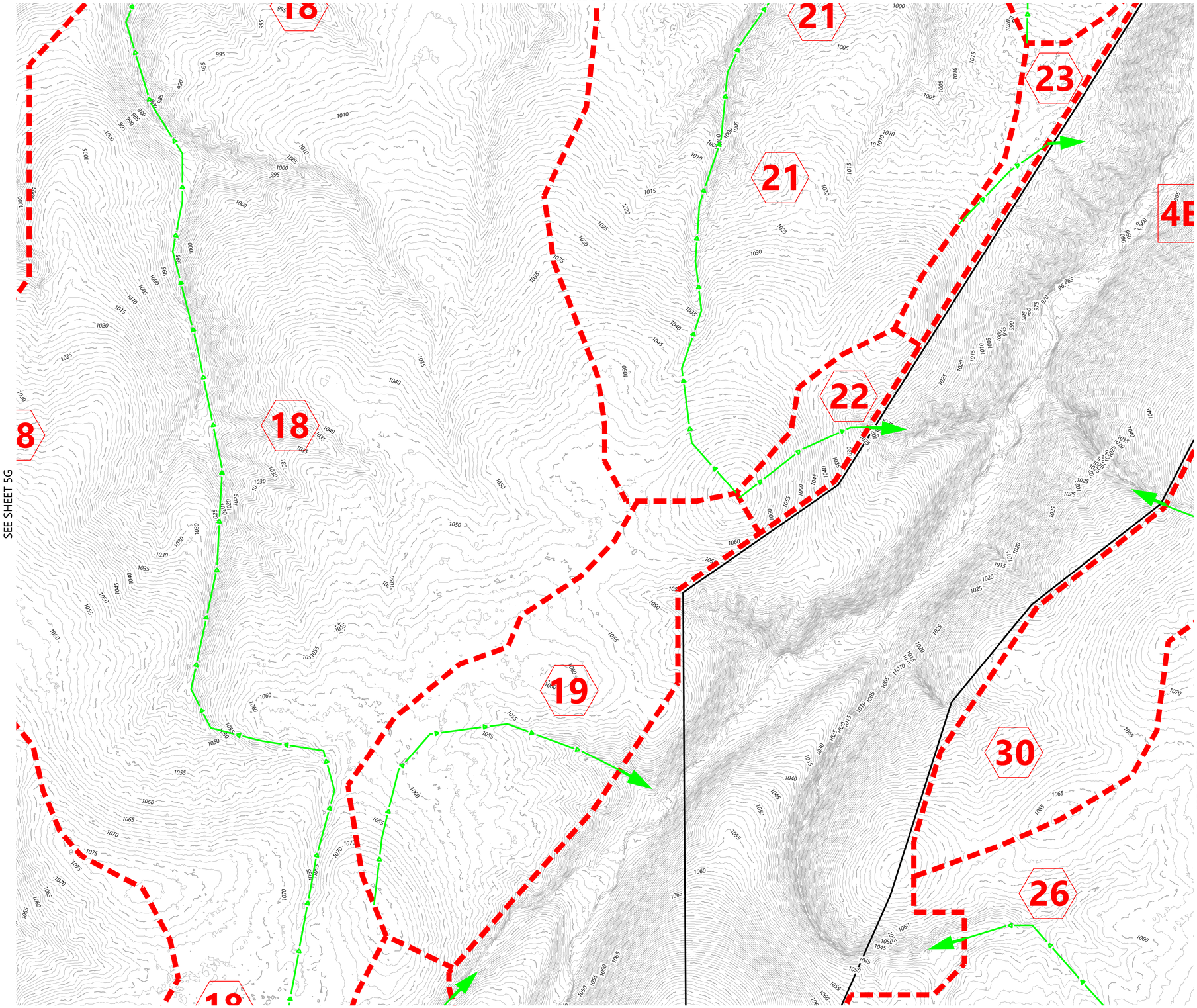

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Wautoma Solar Project

Benton County, Washington

Existing Drainage Map

DATE: 1/14/2022
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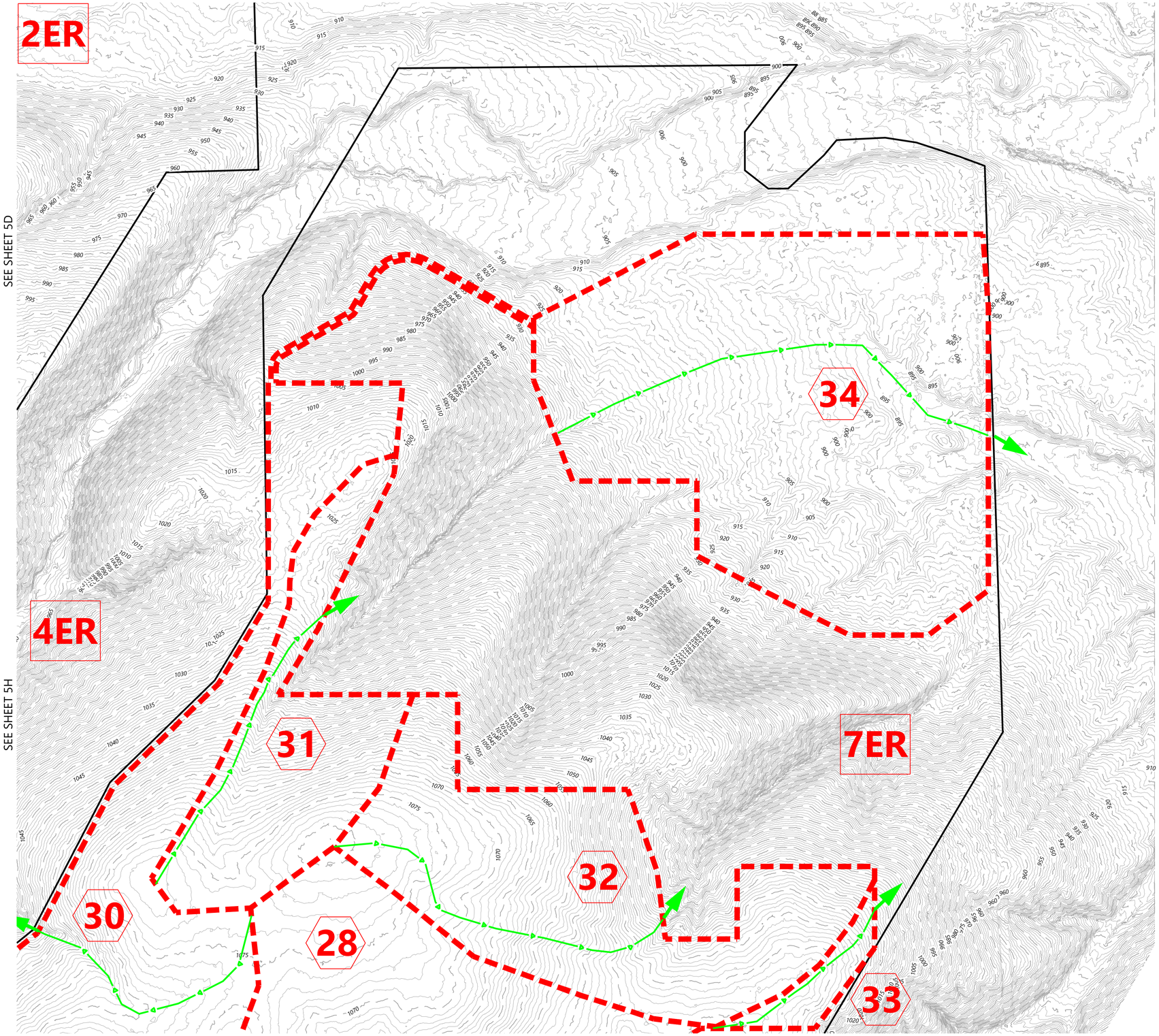

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Wautoma Solar Project

Benton County, Washington

Existing Drainage Map

DATE: 1/14/2022
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LEGEND:

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- FEMA FLOOD HAZARD ZONE
- EX. ONSITE DRAINAGE AREA BOUNDARY
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Wautoma Solar Project

Benton County, Washington

Existing Drainage Map

DATE: 1/14/2022

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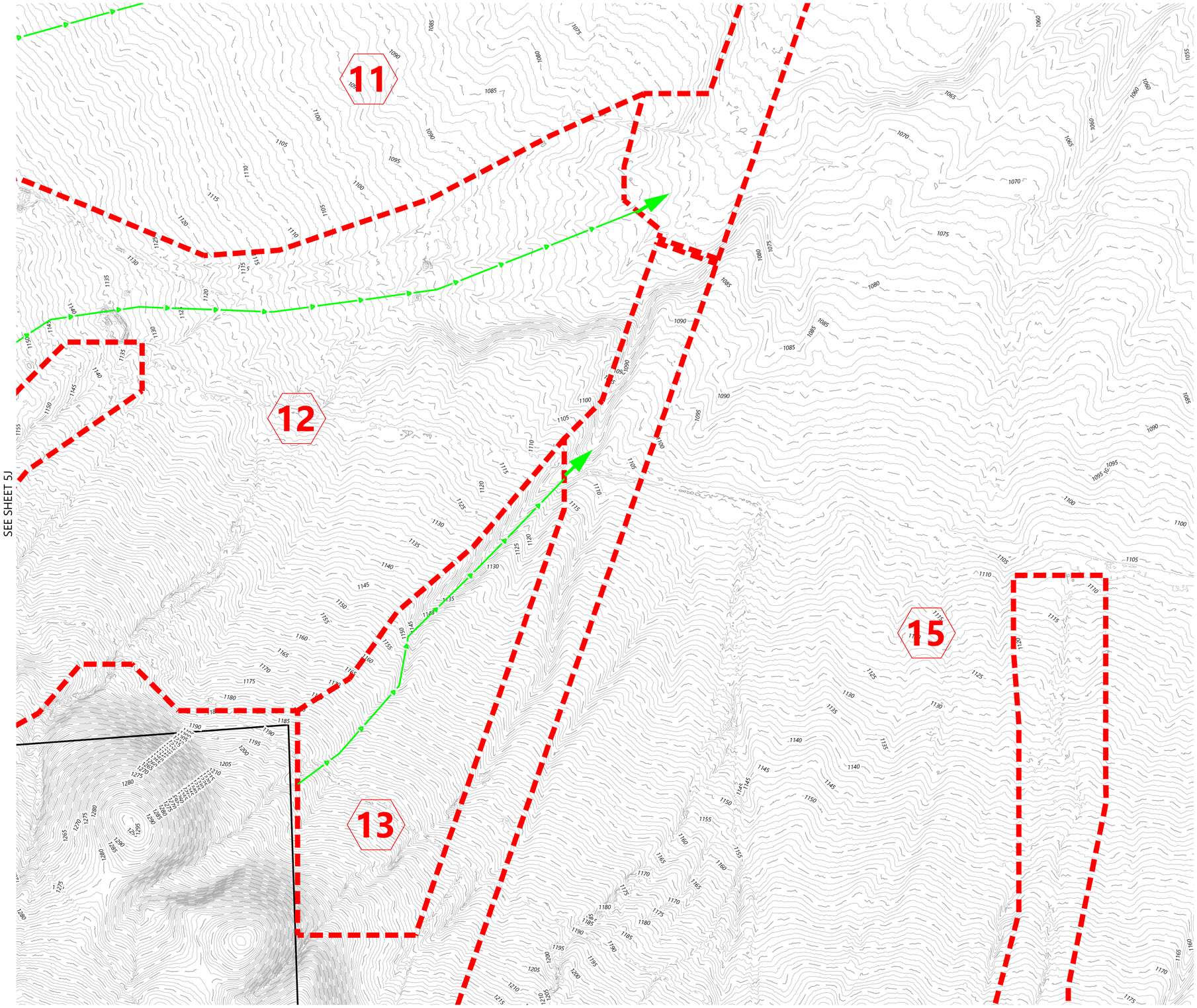

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- FEMA FLOOD HAZARD ZONE
- EX. ONSITE DRAINAGE AREA BOUNDARY
- EX. TIME OF CONCENTRATION LINE
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Wautoma Solar Project

Benton County, Washington

Existing Drainage Map

DATE: 1/14/2022
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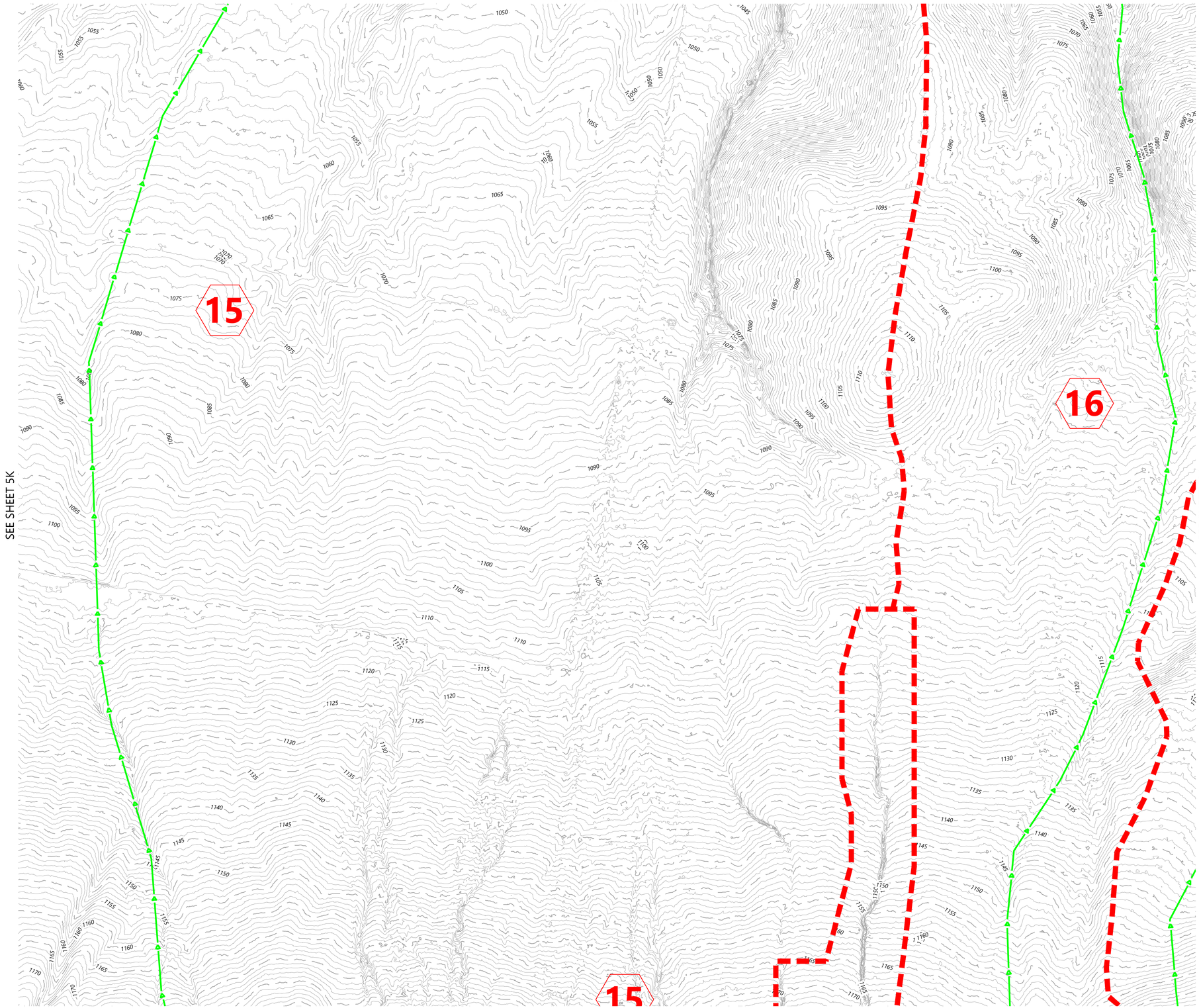

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Wautoma Solar Project

Benton County, Washington

Existing Drainage Map

DATE: 1/14/2022
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LEGEND:

- PROJECT BOUNDARY
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Wautoma Solar Project

Benton County, Washington

Existing Drainage Map

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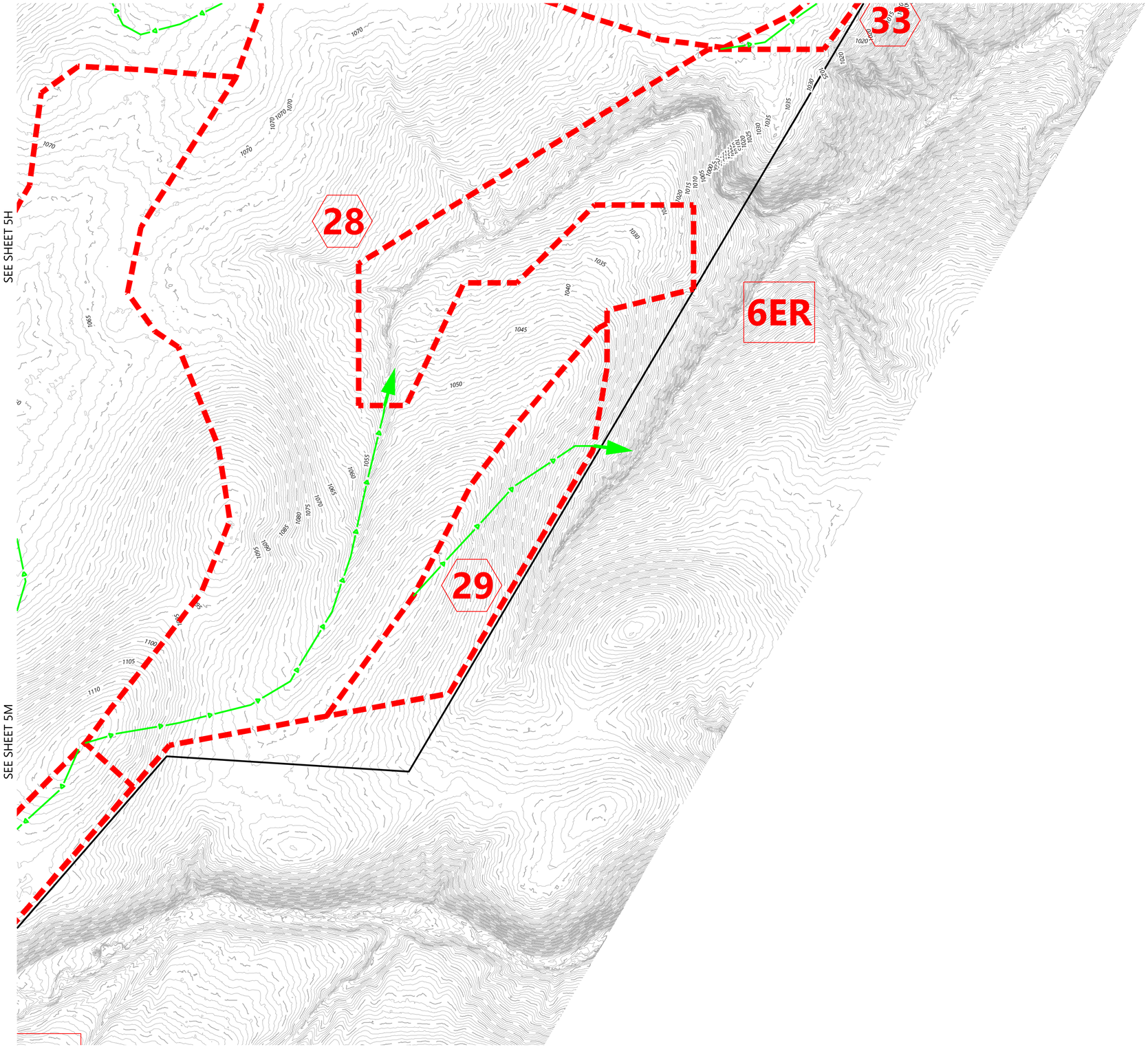

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Wautoma Solar Project

Benton County, Washington

Existing Drainage Map

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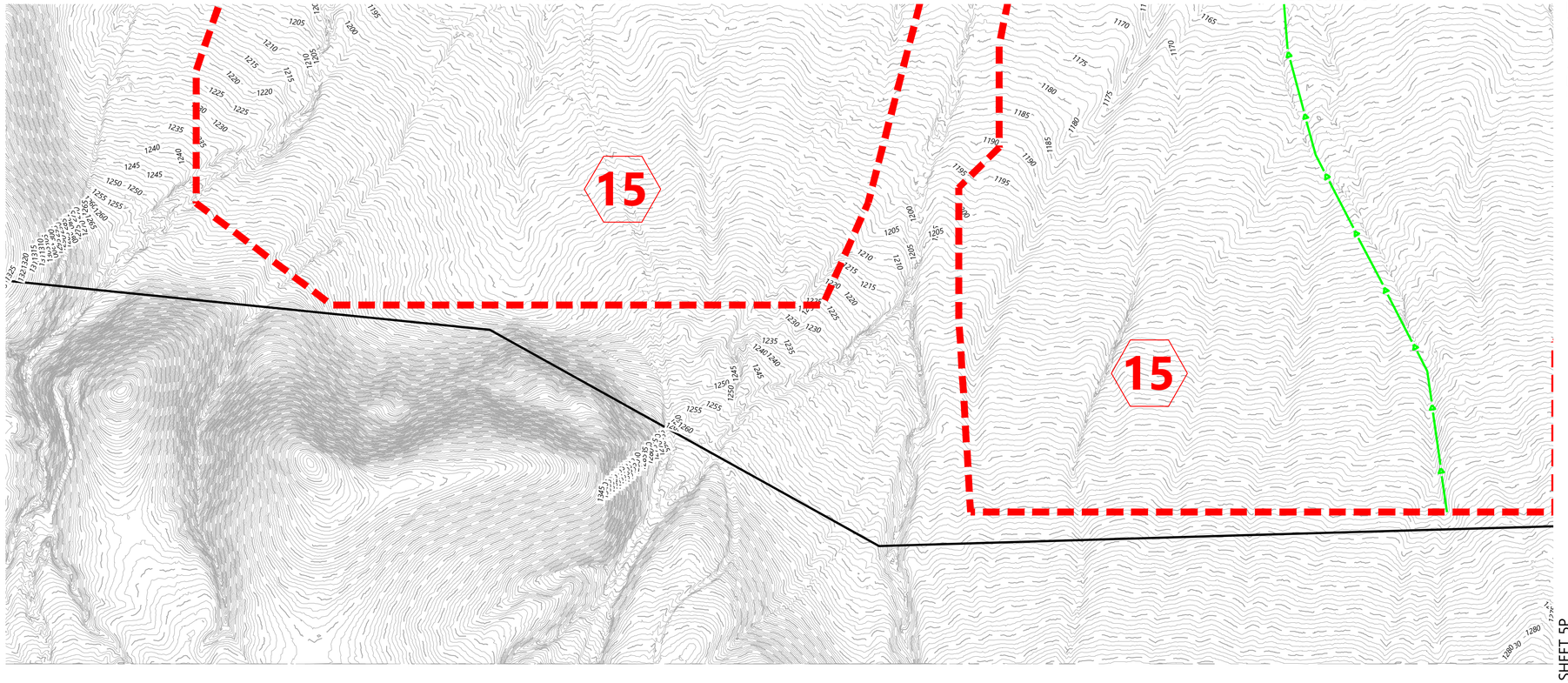

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Wautoma Solar Project

Benton County, Washington

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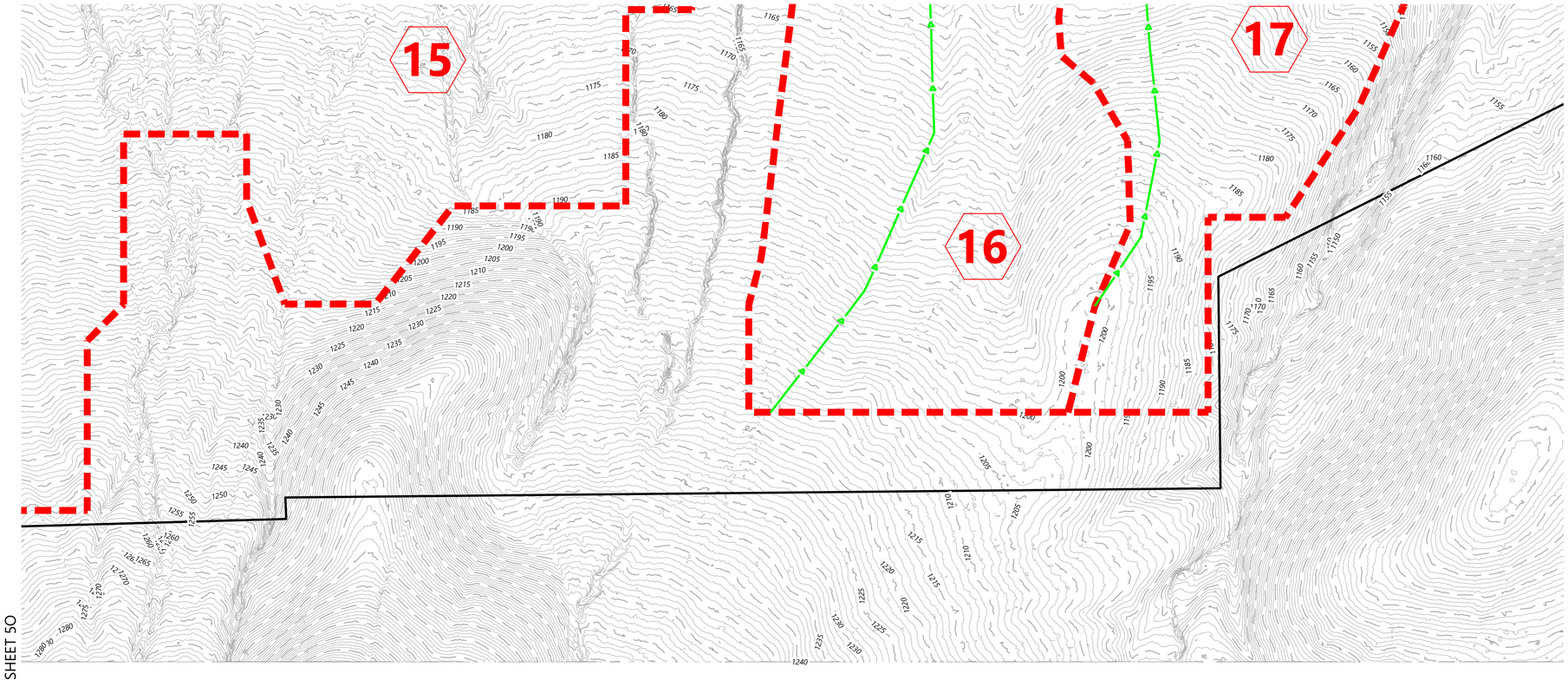

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0' 200' 400' 600'

Wautoma Solar Project

Benton County, Washington

Existing Drainage Map

DATE: 1/14/2022

REV:

SHEET: 5P

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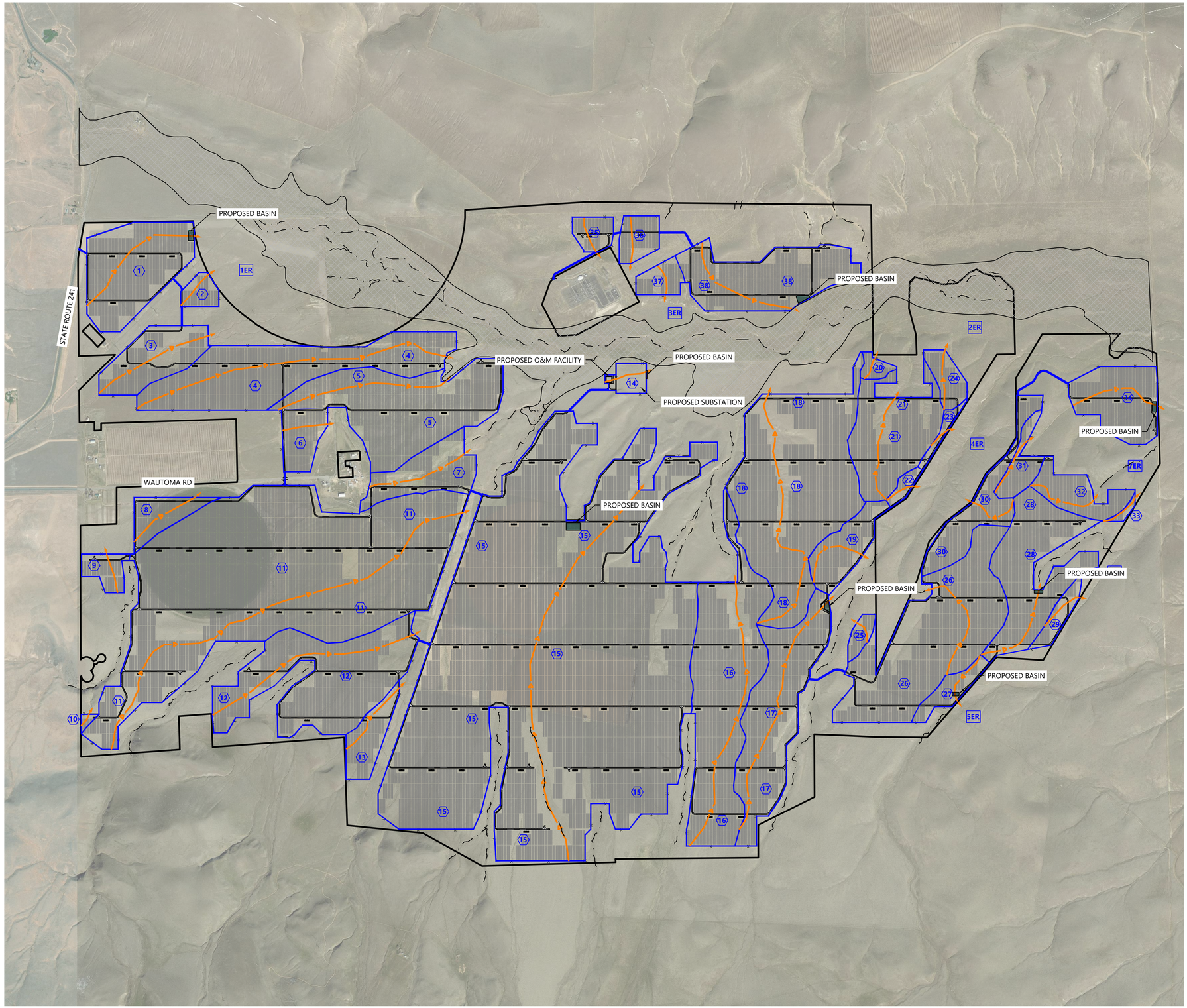

LEGEND:

- PROJECT BOUNDARY
- EX. STREAM CHANNEL
- FEMA FLOOD HAZARD ZONE
- PROPOSED SOLAR ARRAY
- PROPOSED ACCESS ROAD
- PROPOSED SECURITY FENCE
- PROPOSED ELECTRICAL EQUIPMENT
- PROPOSED ONSITE DRAINAGE AREA BOUNDARY
- PROPOSED TIME OF CONCENTRATION LINE
- DISCHARGE LOCATION
- 1 — DRAINAGE AREA LABEL
- 1ER — DISCHARGE REACH LABEL

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0' 1000' 2000' 3000'

Wautoma Solar Project

Benton County, Washington

Overall Proposed Drainage Map

DATE: 1/14/2022

REV:

SHEET: 6

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PROPOSED BASIN

STATE ROUTE 241

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SEE SHEET 6B

SEE SHEET 6E

LEGEND:

- PROJECT BOUNDARY
- EX. INDEX CONTOUR
- EX. INTERVAL CONTOUR
- EX. STREAM CHANNEL
- FEMA FLOOD HAZARD ZONE
- PROPOSED INDEX CONTOUR
- PROPOSED INTERVAL CONTOUR
- PROPOSED SOLAR ARRAY
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0' 200' 400' 600'

Wautoma Solar Project

Benton County, Washington

Proposed Drainage Map

DATE: 1/14/2022

REV:

SHEET: 6A

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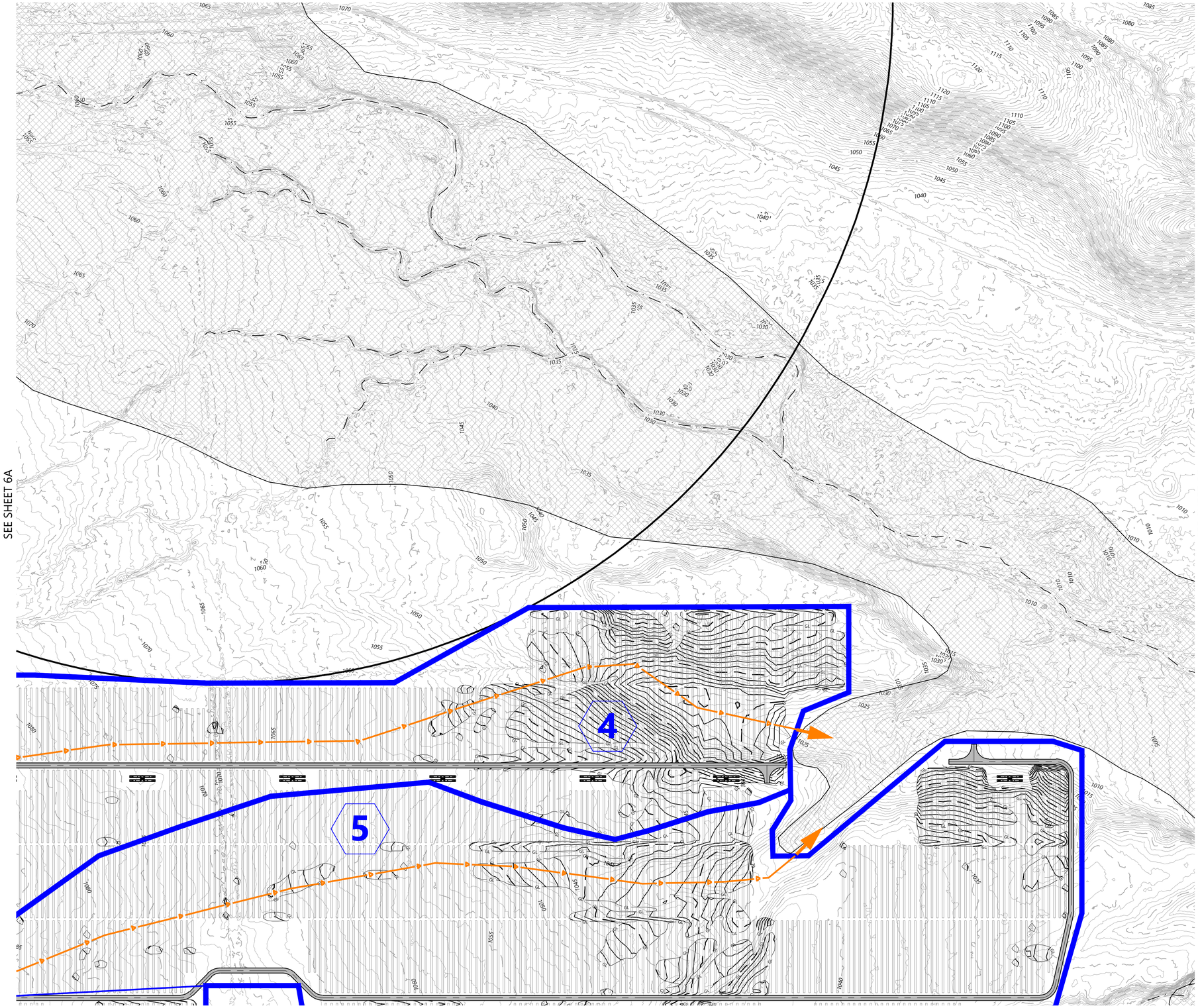

LEGEND:

- PROJECT BOUNDARY
- EX. INDEX CONTOUR
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- EX. STREAM CHANNEL
- FEMA FLOOD HAZARD ZONE
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0' 200' 400' 600'

Wautoma Solar Project

Benton County, Washington

Proposed Drainage Map

DATE: 1/14/2022
REV:
SHEET: 6B

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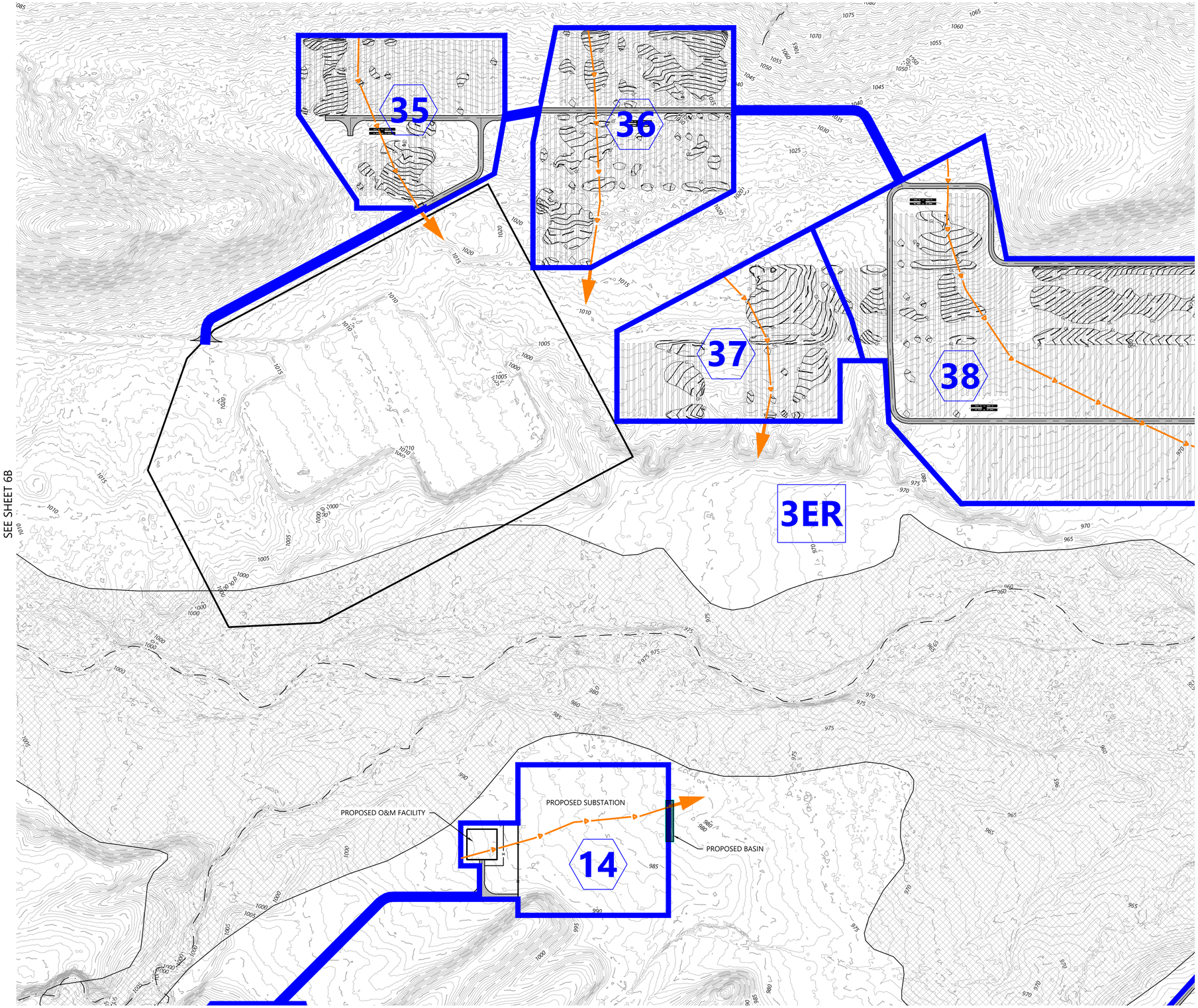

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Wautoma Solar Project

Benton County, Washington

Proposed Drainage Map

DATE: 1/14/2022
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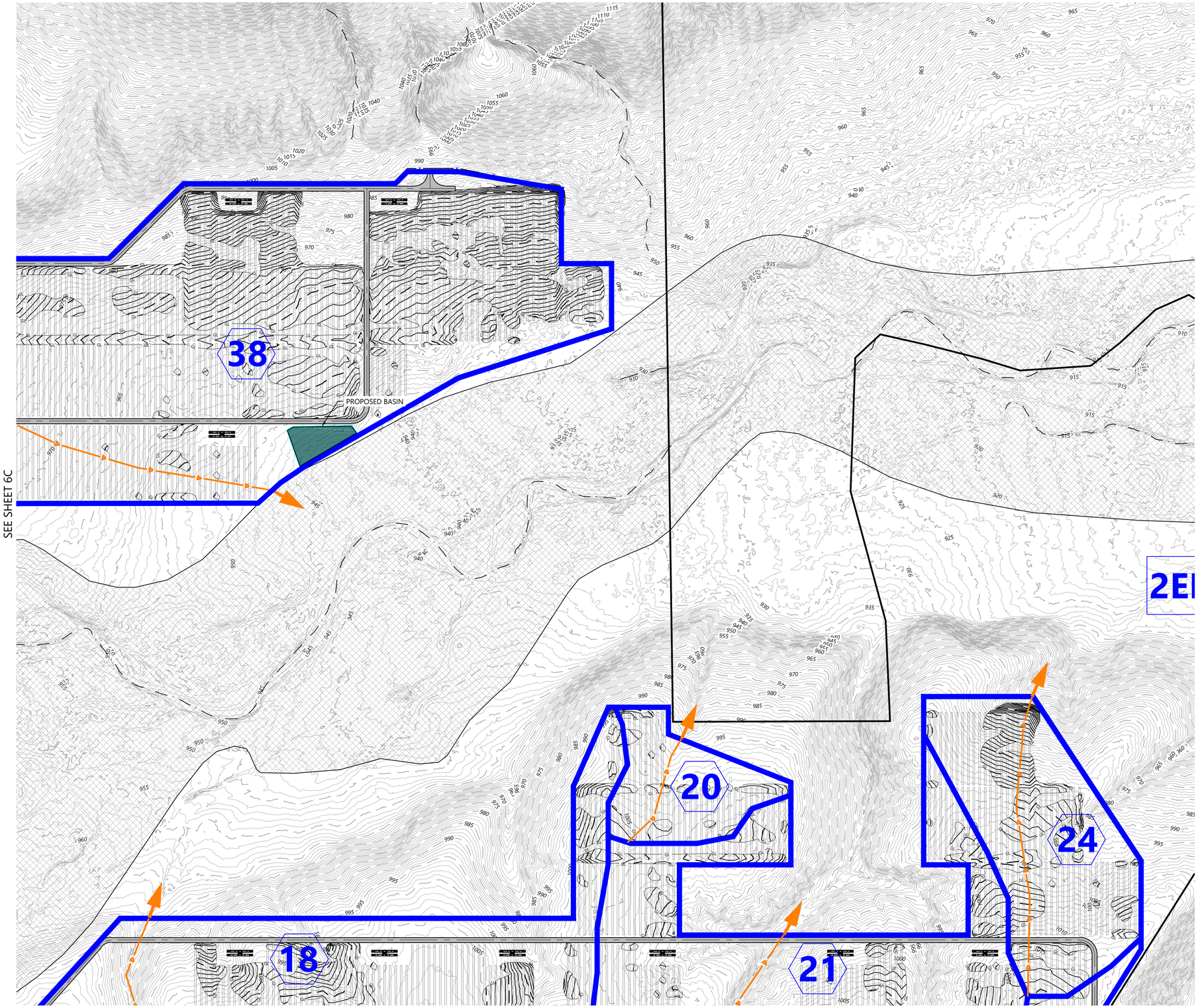

LEGEND:

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- EX. STREAM CHANNEL
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Wautoma Solar Project

Benton County, Washington

Proposed Drainage Map

DATE: 1/14/2022
REV:
SHEET: 6D

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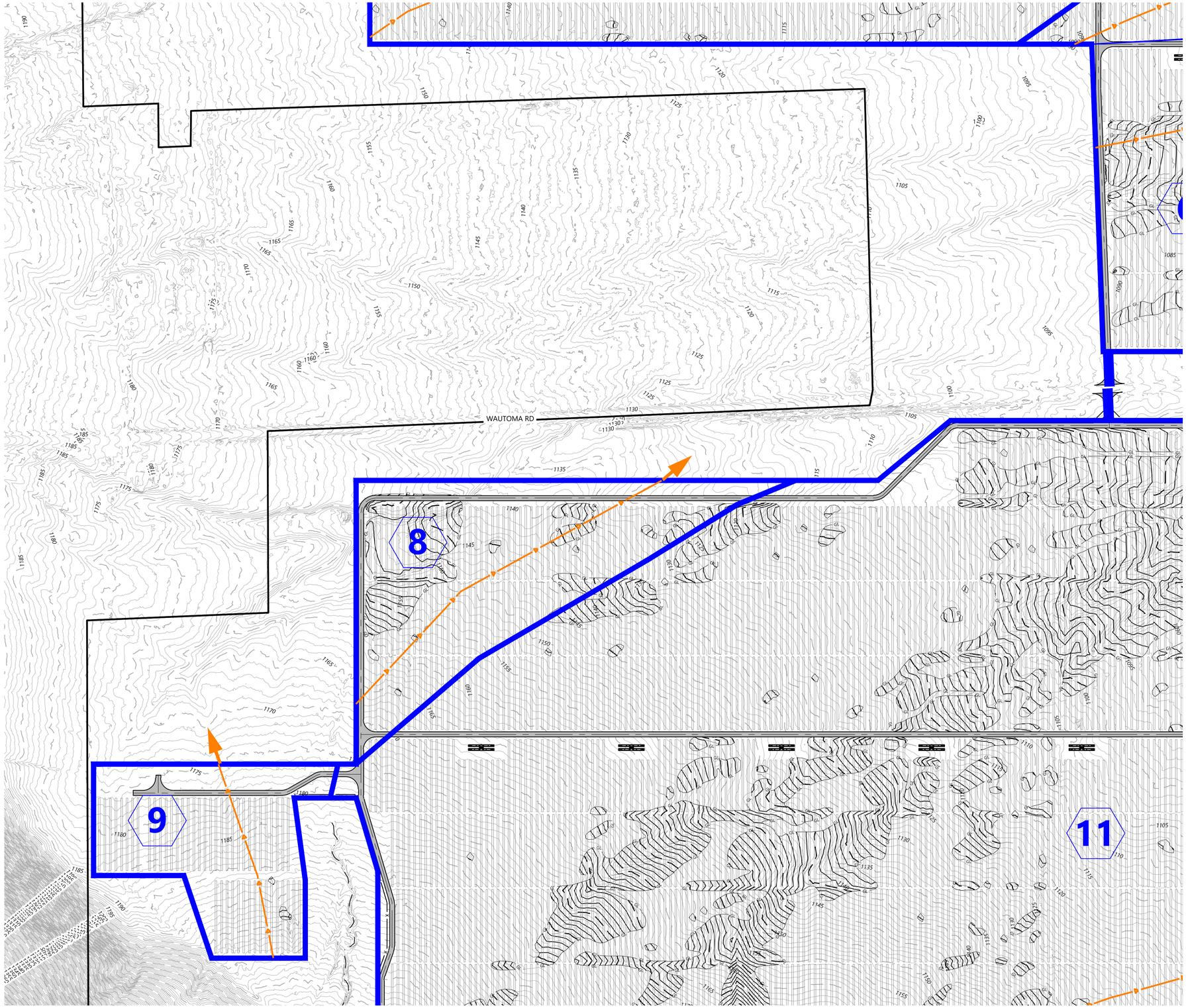

LEGEND:

- PROJECT BOUNDARY
- EX. INDEX CONTOUR (900)
- EX. INTERVAL CONTOUR
- EX. STREAM CHANNEL
- FEMA FLOOD HAZARD ZONE
- PROPOSED INDEX CONTOUR (900)
- PROPOSED INTERVAL CONTOUR
- PROPOSED SOLAR ARRAY
- PROPOSED ACCESS ROAD
- PROPOSED SECURITY FENCE (x)
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Wautoma Solar Project

Benton County, Washington

Proposed Drainage Map

DATE: 1/14/2022

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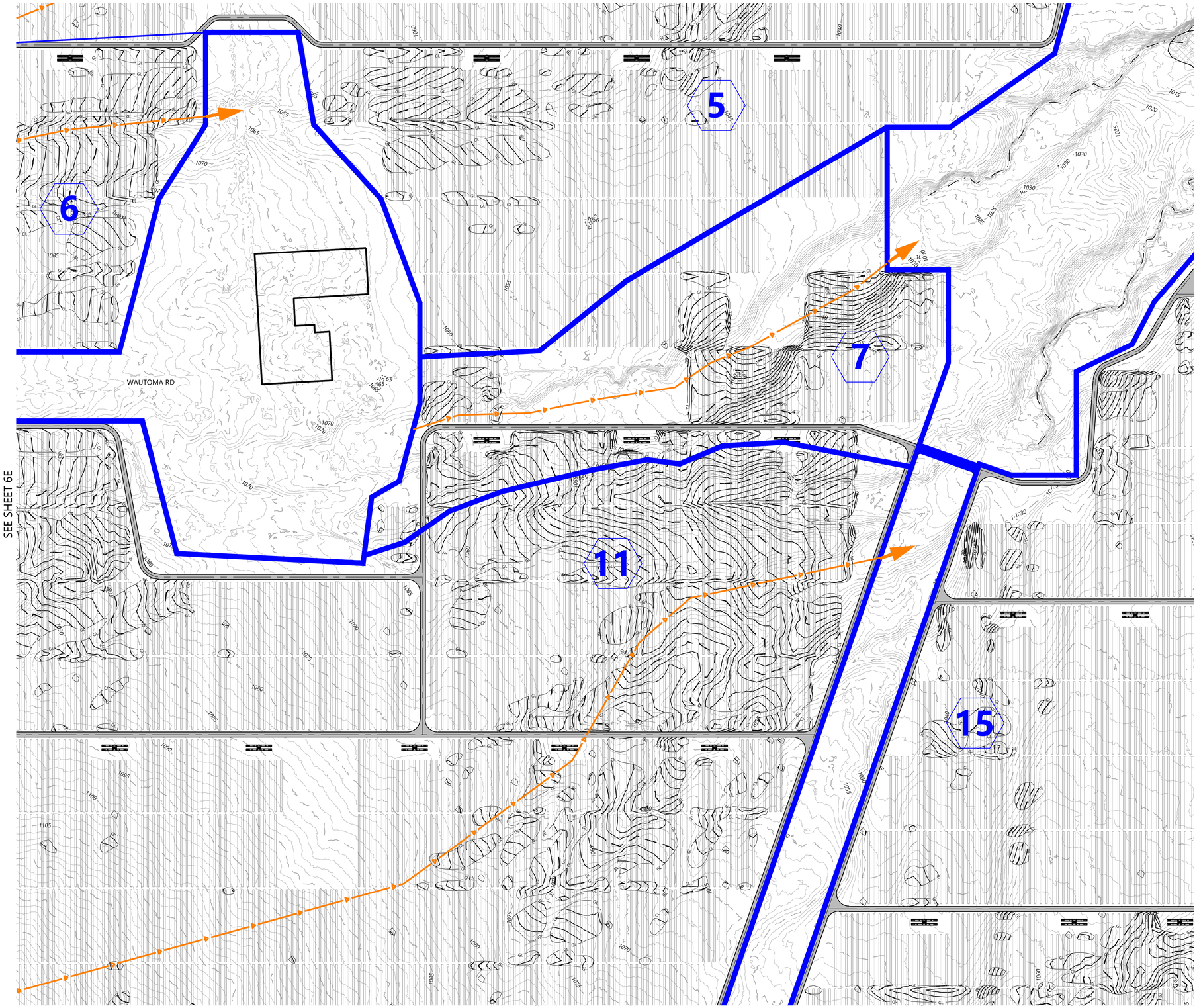

SEE SHEET 6E

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LEGEND:

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Wautoma Solar Project

Benton County, Washington

Proposed Drainage Map

DATE: 1/14/2022
REV:
SHEET: 6F

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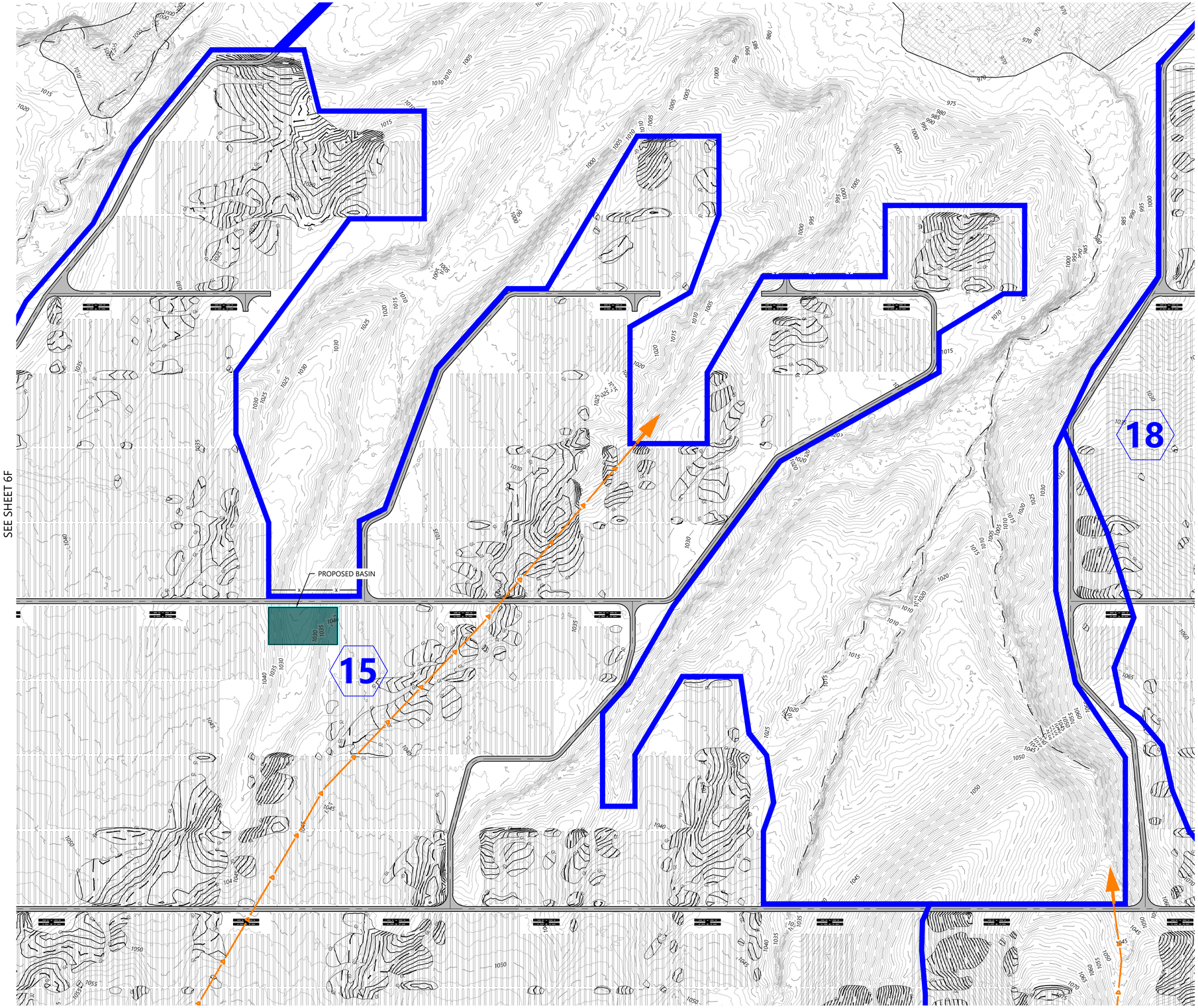

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LEGEND:

- PROJECT BOUNDARY
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Wautoma Solar Project

Benton County, Washington

Proposed Drainage Map

DATE: 1/14/2022
REV:
SHEET: 6G

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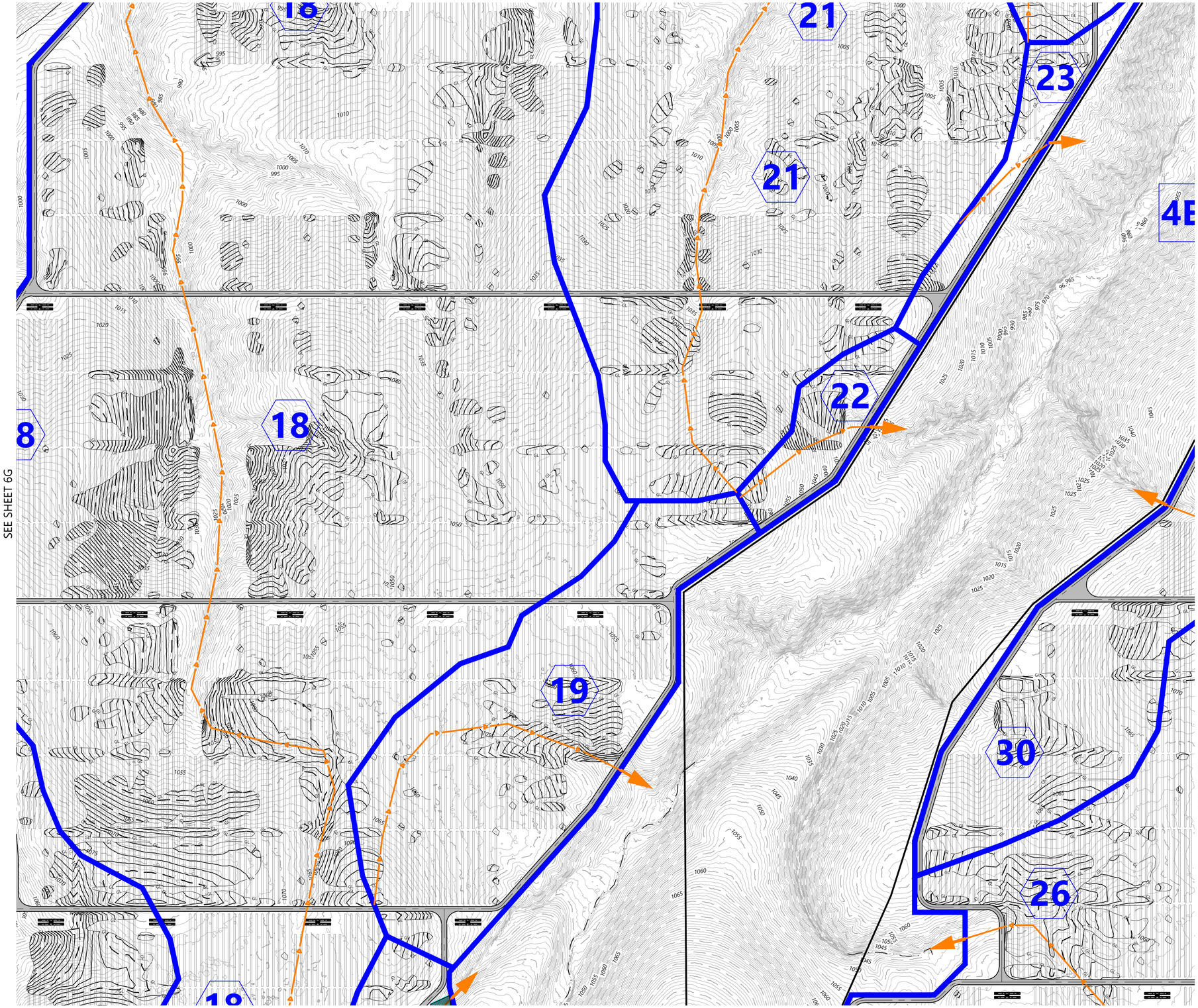

LEGEND:

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REVISIONS:

#	DATE	COMMENT	BY	CHK	APR

0' 200' 400' 600'

Wautoma Solar Project

Benton County, Washington

Proposed Drainage Map

DATE: 1/14/2022
REV:
SHEET: 6H

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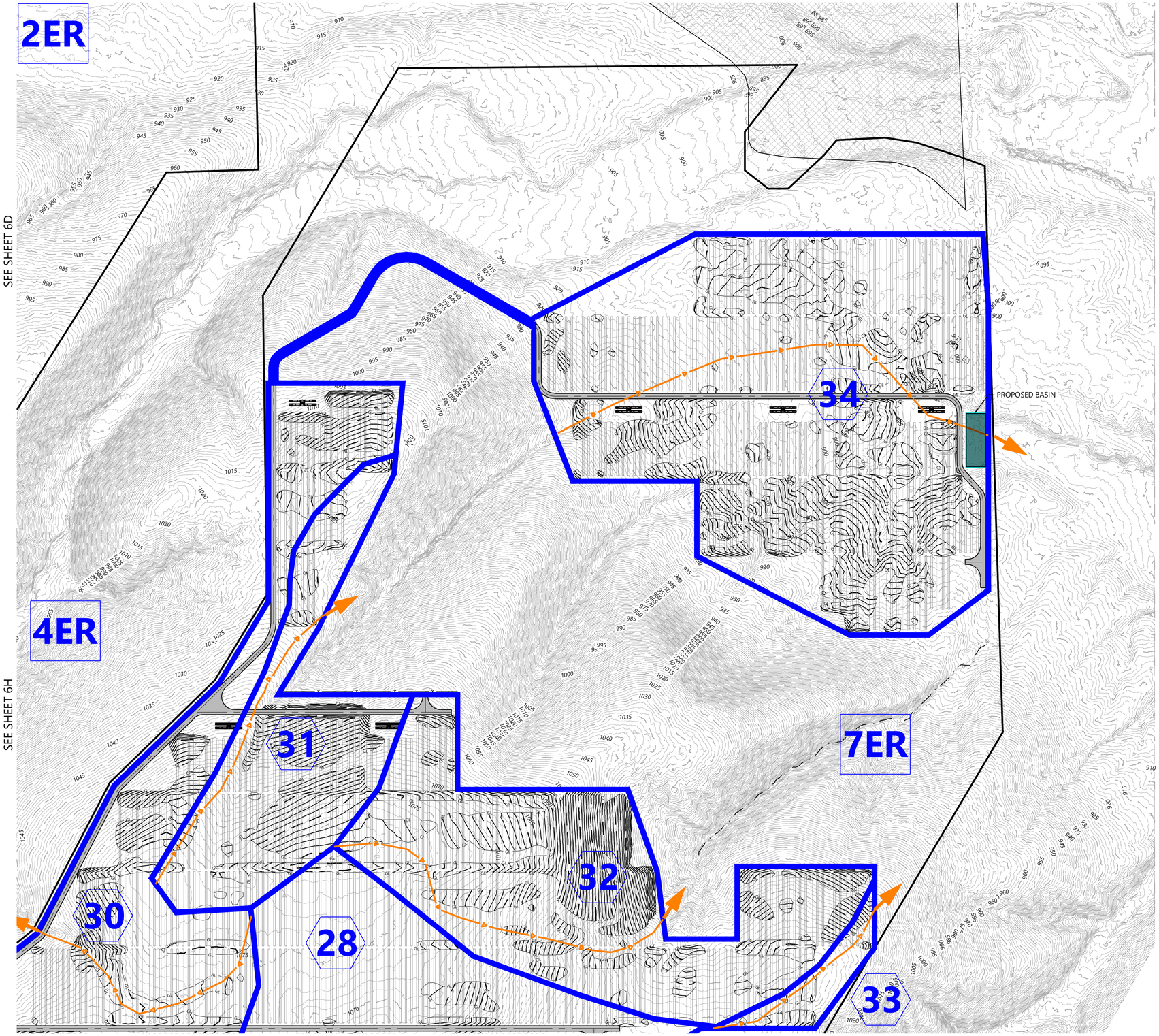

LEGEND:

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Wautoma Solar Project

Benton County, Washington

Proposed Drainage Map

DATE: 1/14/2022
REV:
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LEGEND:

- PROJECT BOUNDARY
- EX. INDEX CONTOUR
- EX. INTERVAL CONTOUR
- EX. STREAM CHANNEL
- FEMA FLOOD HAZARD ZONE
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REVISIONS:

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Wautoma Solar Project

Benton County, Washington

Proposed Drainage Map

DATE: 1/14/2022
REV:
SHEET: 6J

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SEE SHEET 6F

SEE SHEET 6J

SEE SHEET 6L

SEE SHEET 6O

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LEGEND:

- PROJECT BOUNDARY
- EX. INDEX CONTOUR
- EX. INTERVAL CONTOUR
- EX. STREAM CHANNEL
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Wautoma Solar Project

Benton County, Washington

Proposed Drainage Map

DATE: 1/14/2022
REV:
SHEET: 6K

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LEGEND:

- PROJECT BOUNDARY
- EX. INDEX CONTOUR (900)
- EX. INTERVAL CONTOUR
- EX. STREAM CHANNEL
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Wautoma Solar Project

Benton County, Washington

Proposed Drainage Map

DATE: 1/14/2022

REV:

SHEET: 6L

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PROPOSED BASIN

PROPOSED BASIN

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LEGEND:

- PROJECT BOUNDARY
- EX. INDEX CONTOUR
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Wautoma Solar Project

Benton County, Washington

Proposed Drainage Map

DATE: 1/14/2022

REV:

SHEET: 6M

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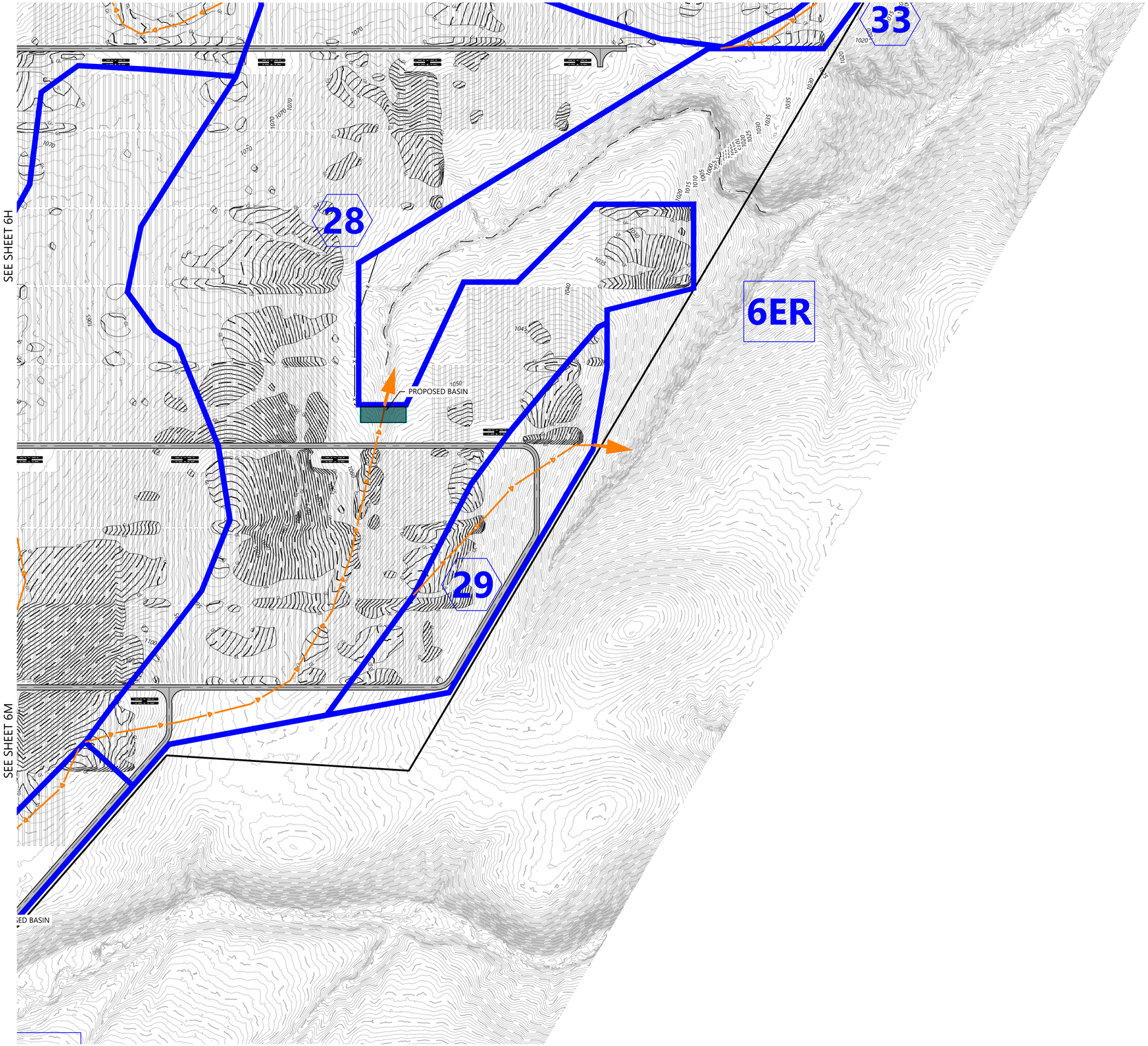

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Benton County, Washington

Proposed Drainage Map

DATE: 1/14/2022

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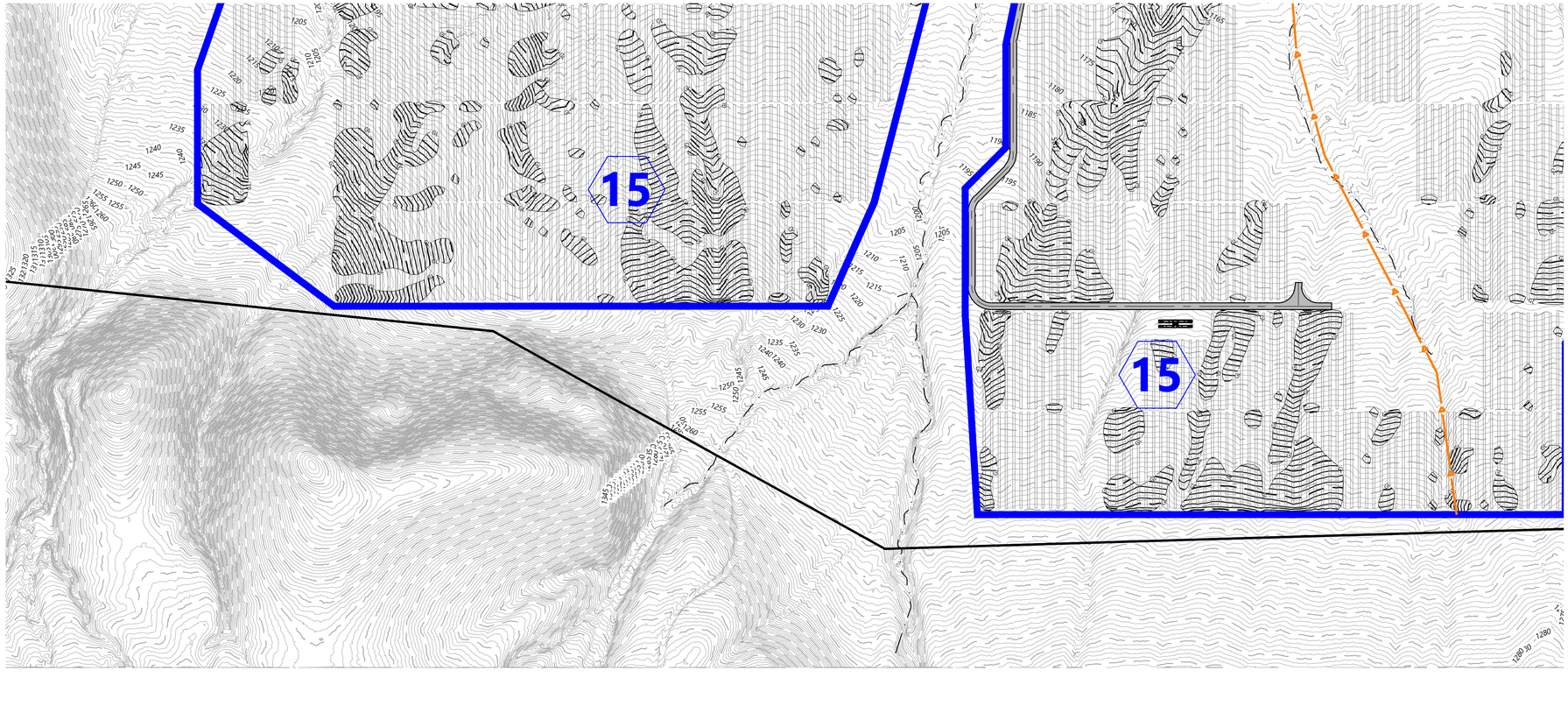
SEE SHEET 6K

SEE SHEET 6L



SEE SHEET 6P

LEGEND:

- PROJECT BOUNDARY
- EX. INDEX CONTOUR (900)
- EX. INTERVAL CONTOUR
- EX. STREAM CHANNEL
- FEMA FLOOD HAZARD ZONE
- PROPOSED INDEX CONTOUR (900)
- PROPOSED INTERVAL CONTOUR
- PROPOSED SOLAR ARRAY
- PROPOSED ACCESS ROAD
- PROPOSED SECURITY FENCE (x)
- PROPOSED ELECTRICAL EQUIPMENT
- PROPOSED ONSITE DRAINAGE AREA BOUNDARY
- PROPOSED TIME OF CONCENTRATION LINE
- DISCHARGE LOCATION
- 1 DRAINAGE AREA LABEL

Westwood

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Toll Free (888) 937-5150

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Minnetonka, MN 55343
westwoodps.com

Westwood Professional Services, Inc.

PREPARED FOR:

INNERGEX

1225 Saint-Charles Street West, 10th Floor,
Longueuil, Quebec J4K 0B9 Canada

REVISIONS:

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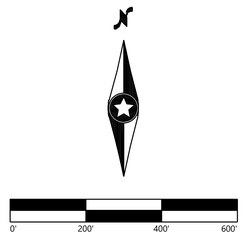

Wautoma Solar Project

Benton County, Washington

Proposed Drainage Map

DATE: 1/14/2022

REV:

SHEET: 6O

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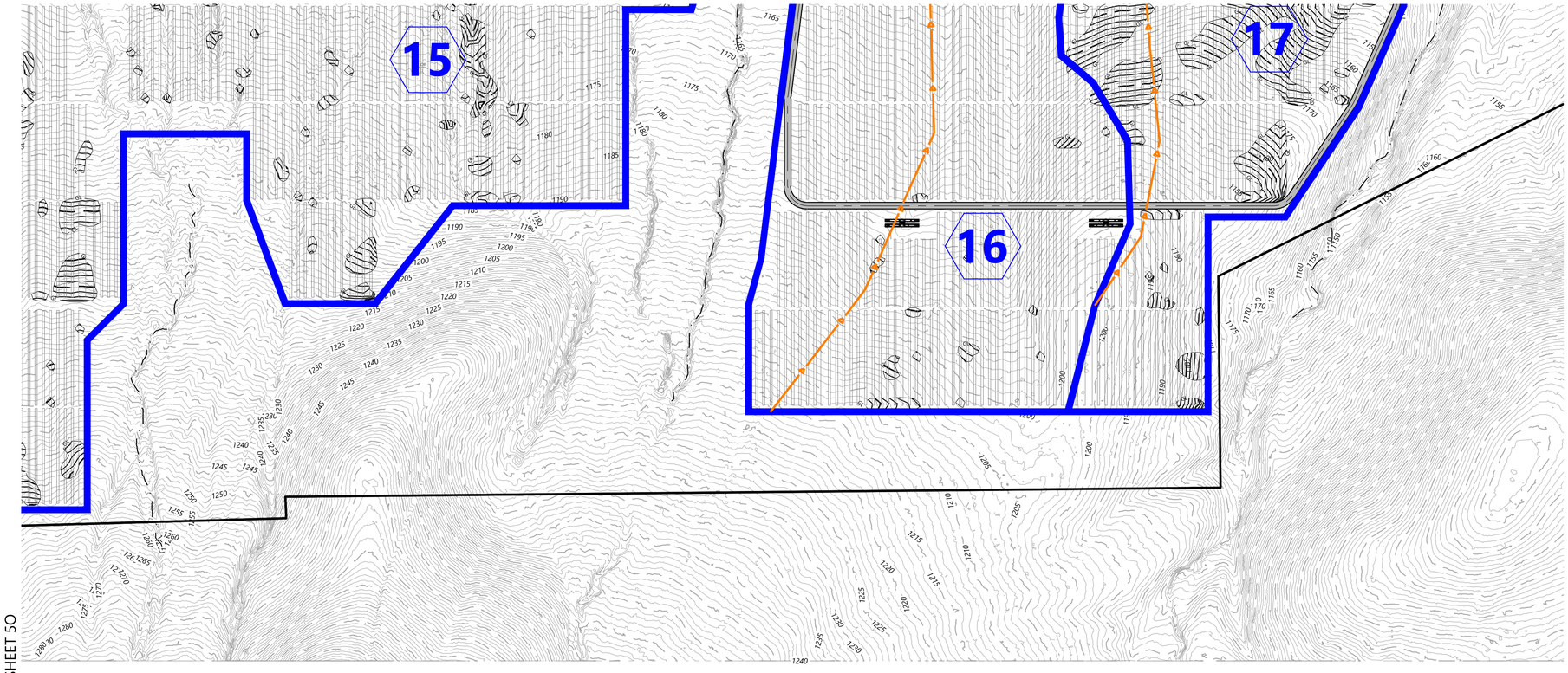
SEE SHEET 5M



SEE SHEET 5O

LEGEND:

- PROJECT BOUNDARY
- EX. INDEX CONTOUR
- EX. INTERVAL CONTOUR
- EX. STREAM CHANNEL
- FEMA FLOOD HAZARD ZONE
- PROPOSED INDEX CONTOUR
- PROPOSED INTERVAL CONTOUR
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Longueuil, Quebec J4K 0B9 Canada

REVISIONS:

#	DATE	COMMENT	BY	CHK	APR
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Wautoma Solar Project

Benton County, Washington

Proposed Drainage Map

DATE: 1/14/2022

REV:

SHEET: 6P

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Appendix A

SWMMEW Rainfall Maps

Source: NOAA Atlas 2, Volume IX, 1973
Precipitation in inches

County(2003, 1:24,000)
City(2003, 1:24,000)
Township/Range
Isopluvial(1973, 1:2,000,000)
NOAA/NWS Station(1931-1998)

Source: Miller et. al., 1973

DEPARTMENT OF ECOLOGY
State of Washington

2-Year, 24-Hour Isopluvial Map

Revised March 2005

Please see *http://www.ecy.wa.gov/copyright.html* for copyright notice including permissions, limitation of liability, and disclaimer.

Source: NOAA Atlas 2, Volume IX, 1973
Precipitation in inches

County(2003, 1:24,000)
City(2003, 1:24,000)
Township/Range
Isopluvial(1973, 1:2,000,000)
NOAA/NWS Station(1931-1998)

Source: Miller et. al., 1973

DEPARTMENT OF
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10-Year, 24-Hour Isopluvial Map

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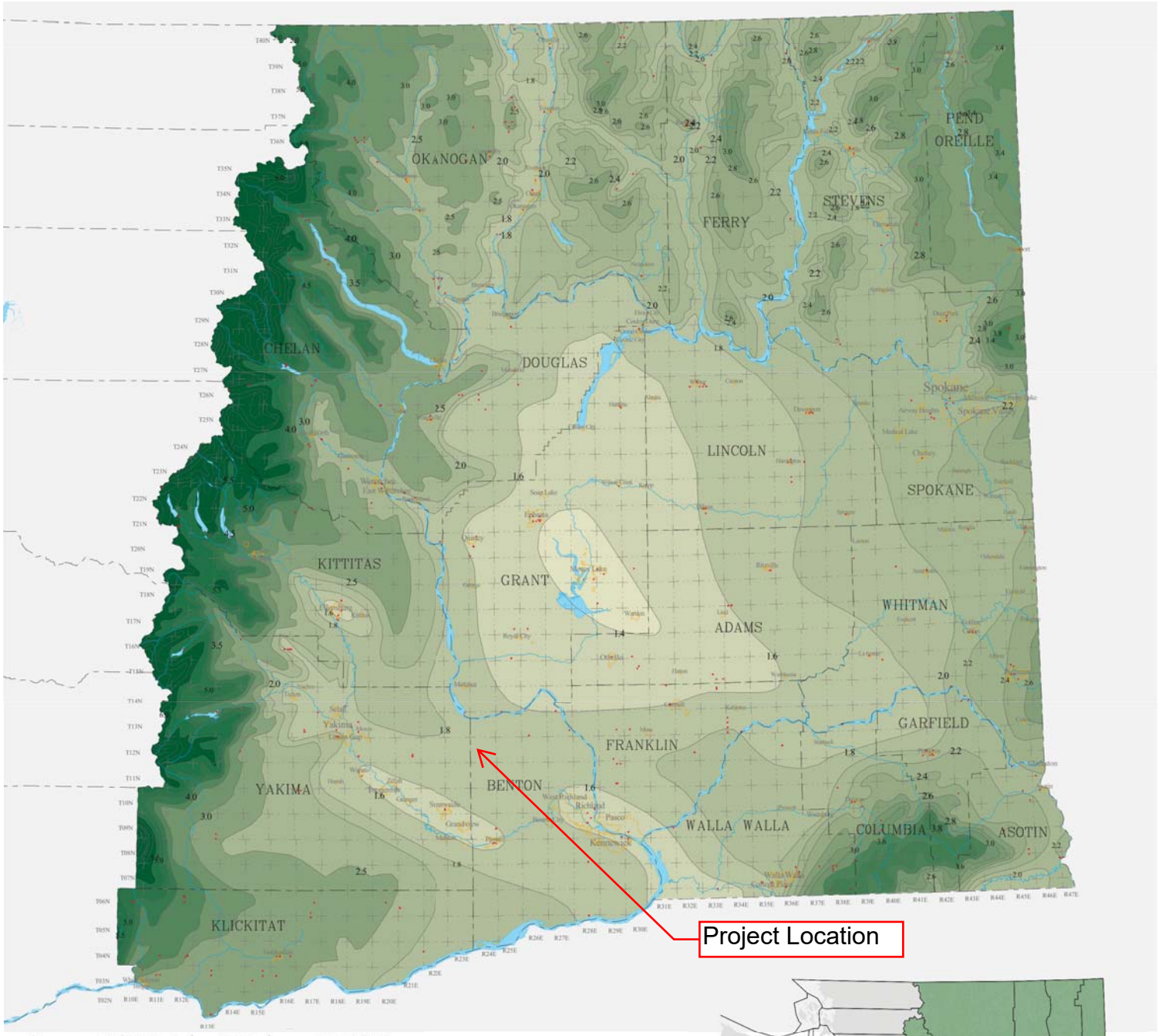

Source: NOAA Atlas 2, Volume IX, 1973
Precipitation in inches

County(2003, 1:24,000)
City(2003, 1:24,000)
Township/Range
Isopluvial(1973, 1:2,000,000)
NOAA/NWS Station(1931-1998)

Source: Miller et. al., 1973

DEPARTMENT OF ECOLOGY
State of Washington

25-Year, 24-Hour Isopluvial Map

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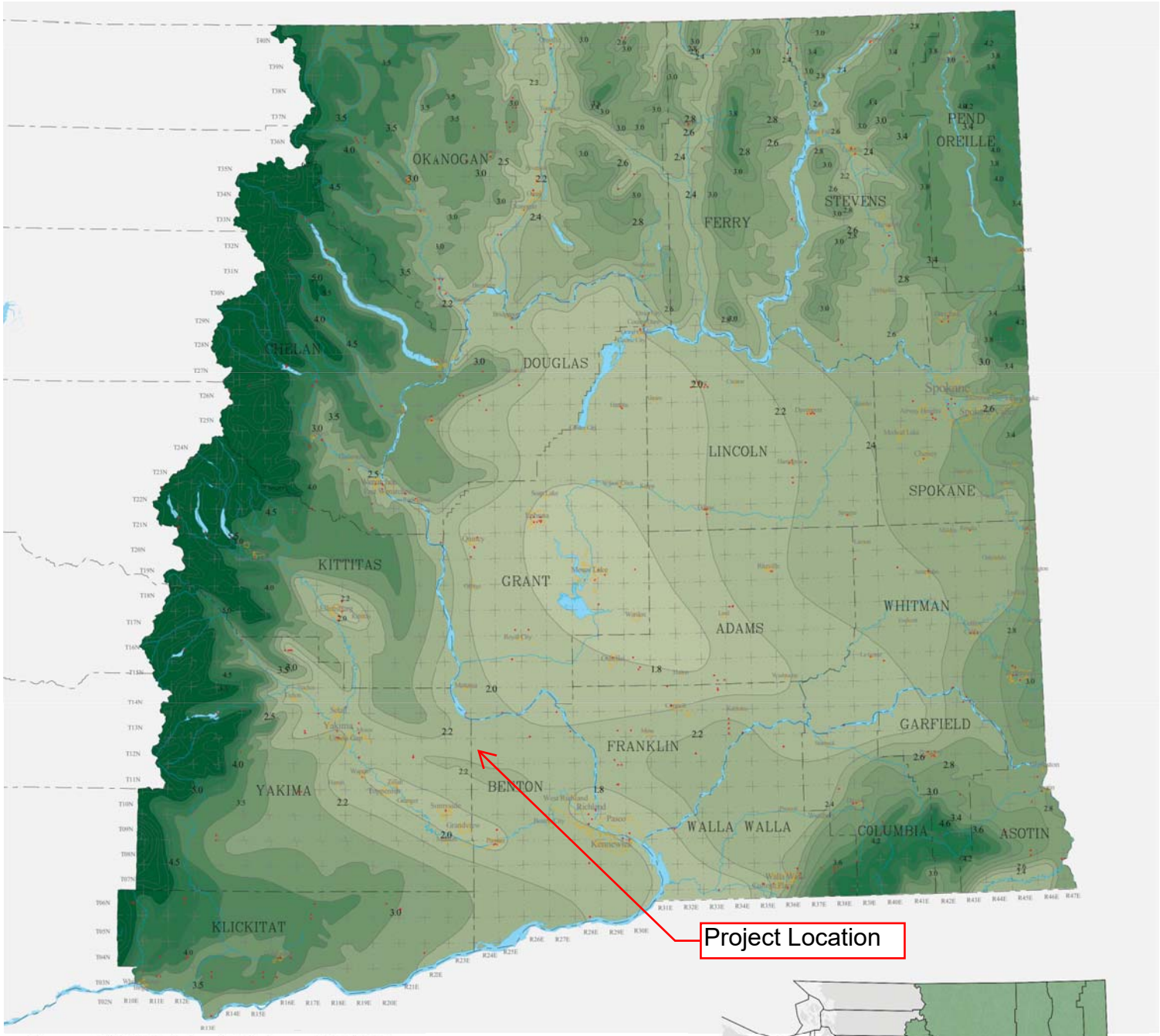

Source: NOAA Atlas 2, Volume IX, 1973
Precipitation in inches

County(2003, 1:24,000)
City(2003, 1:24,000)
Township/Range
Isopluvial(1973, 1:2,000,000)
NOAA/NWS Station(1931-1998)

Source: Miller et. al., 1973

DEPARTMENT OF ECOLOGY
State of Washington

100-Year, 24-Hour Isopluvial Map

Revised March 2005

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Appendix B

Curve Number Table

Cover type and hydrologic condition	CNs for hydrologic soil group			
	A	B	C	D
Open space (lawns, parks, golf courses, cemeteries, landscaping, etc.)[a]				
Poor condition (grass cover <50% of the area)	68	79	86	89
Fair condition (grass cover on 50% to 75% of the area)	49	69	79	84
Good condition (grass cover on >75% of the area)	39	61	74	80
Impervious areas				
Open water bodies: lakes, wetlands, ponds etc.	100	100	100	100
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)	98	98	98	98
Permeable pavers and permeable interlocking concrete (assumed as 85% impervious and 15% lawn)				
Fair lawn condition (weighted average CNs)	95	96	97	97
Gravel (including right-of-way)	76	85	89	91
Dirt (including right-of-way)	72	82	87	89

[a]Composite CNs may be computed for other combinations of open space cover type.

[b]Actual CN is < 30; use CN = 30 for runoff computations.

[c]The indicated CNs were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CNs for woods and pasture.

[d]CNs have not been developed for hydrologic soil group A.

Cover type and hydrologic condition	CNs for hydrologic soil group			
	A	B	C	D
Pasture, grassland, or range-continuous forage for grazing				
Poor condition (ground cover <50% or heavily grazed with no mulch)	68	79	86	89
Fair condition (ground cover 50% to 75% and not heavily grazed)	49	69	79	84
Good condition (ground cover >75% and lightly or only occasionally grazed)	39	61	74	80
Cultivated agricultural lands				
Row Crops (good) e.g., corn, sugar beets, soy beans	64	75	82	85
Small Grain (good) e.g., wheat, barley, flax	60	72	80	84
Meadow				
Continuous grass, protected from grazing and generally mowed for hay	30	58	71	78
Brush (brush-weed-grass mixture with brush the major element)				
Poor (<50% ground cover)	48	67	77	83
Fair (50% to 75% ground cover)				

[a]Composite CNs may be computed for other combinations of open space cover type.

[b]Actual CN is < 30; use CN = 30 for runoff computations.

[c]The indicated CNs were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CNs for woods and pasture.

[d]CNs have not been developed for hydrologic soil group A.

Cover type and hydrologic condition	CNs for hydrologic soil group			
	A	B	C	D
	35	56	70	77
Good (>75% ground cover)	30[b]	48	65	73
Woods-grass combination (orchard or tree farm)[c]				
Poor	57	73	82	86
Fair	43	65	76	82
Good	32	58	72	79
Woods				
Poor (Forest litter, small trees, and brush destroyed by heavy grazing or regular burning)	45	66	77	83
Fair (Woods are grazed but not burned, and some forest litter covers the soil)	36	60	73	79
Good (Woods are protected from grazing, and litter and brush adequately cover the soil)	30	55	70	77
Herbaceous (mixture of grass, weeds, and low-growing brush, with brush the minor element)				

[a]Composite CNs may be computed for other combinations of open space cover type.

[b]Actual CN is < 30; use CN = 30 for runoff computations.

[c]The indicated CNs were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CNs for woods and pasture.

[d]CNs have not been developed for hydrologic soil group A.

Cover type and hydrologic condition	CNs for hydrologic soil group			
	A	B	C	D
Poor (<30% ground cover)	n/a[d]	80	87	93
Fair (30% to 70% ground cover)		71	81	89
Good (>70% ground cover)		62	74	85
Sagebrush with grass understory				
Poor (<30% ground cover)	n/a[d]	67	80	85
Fair (30% to 70% ground cover)		51	63	70
Good (>70% ground cover)		35	47	55

[a]Composite CNs may be computed for other combinations of open space cover type.

[b]Actual CN is < 30; use CN = 30 for runoff computations.

[c]The indicated CNs were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CNs for woods and pasture.

[d]CNs have not been developed for hydrologic soil group A.

For more information: For a more detailed and complete description of land use curve numbers (CNs), see *Urban Hydrology for Small Watersheds* (USDA, 1986).

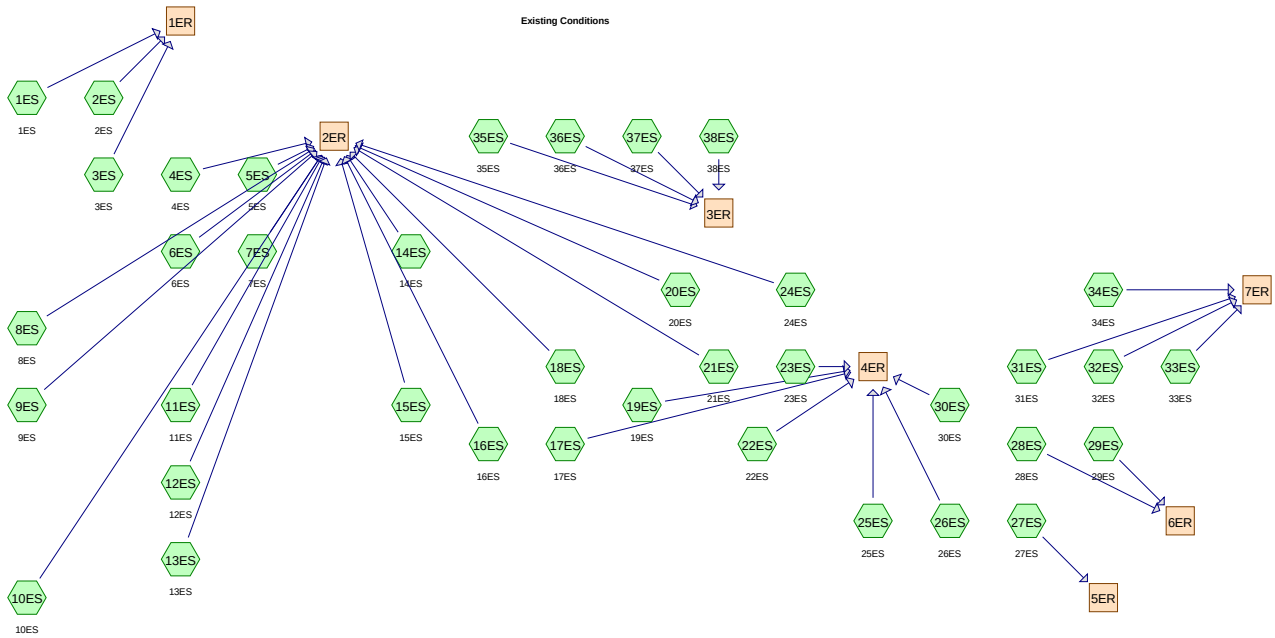
Antecedent Moisture Condition

The moisture condition in a soil at the onset of a storm event, referred to as the antecedent moisture condition (AMC), has a significant effect on both the volume and rate of runoff. Recognizing that fact, the SCS developed three antecedent soil moisture conditions (I, II, and III), which are described as follows:

- **AMC I:** Soils are dry but not to wilting point.
- **AMC II:** Average conditions.

Appendix C

Existing HydroCAD Results



Subcat Reach Pond Link

Routing Diagram for Wautoma Pre Post
Prepared by j, Printed 1/14/2022
HydroCAD® 10.10-3a s/n 03363 © 2020 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
182.770	49	Grassland, HSG A (3ES, 4ES, 5ES, 11ES, 12ES, 15ES, 16ES, 36ES, 38ES)
1,987.680	69	Grassland, HSG B (1ES, 2ES, 3ES, 4ES, 5ES, 6ES, 7ES, 8ES, 9ES, 10ES, 11ES, 12ES, 13ES, 14ES, 15ES, 16ES, 17ES, 18ES, 19ES, 20ES, 21ES, 22ES, 23ES, 24ES, 25ES, 26ES, 27ES, 28ES, 29ES, 30ES, 31ES, 32ES, 33ES, 34ES, 35ES, 36ES, 37ES, 38ES)
37.480	79	Grassland, HSG C (11ES, 15ES, 16ES, 17ES, 18ES, 38ES)
16.300	64	Straight Row Crop, HSG A (4ES, 5ES, 11ES)
753.940	75	Straight Row Crop, HSG B (4ES, 5ES, 7ES, 8ES, 11ES, 15ES)
2,978.170	**69**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
199.070	HSG A	3ES, 4ES, 5ES, 11ES, 12ES, 15ES, 16ES, 36ES, 38ES
2,741.620	HSG B	1ES, 2ES, 3ES, 4ES, 5ES, 6ES, 7ES, 8ES, 9ES, 10ES, 11ES, 12ES, 13ES, 14ES, 15ES, 16ES, 17ES, 18ES, 19ES, 20ES, 21ES, 22ES, 23ES, 24ES, 25ES, 26ES, 27ES, 28ES, 29ES, 30ES, 31ES, 32ES, 33ES, 34ES, 35ES, 36ES, 37ES, 38ES
37.480	HSG C	11ES, 15ES, 16ES, 17ES, 18ES, 38ES
0.000	HSG D	
0.000	Other	
2,978.170		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
182.770	1,987.680	37.480	0.000	0.000	2,207.930	Grassland	1ES, 2ES, 3ES, 4ES, 5ES, 6ES, 7ES, 8ES, 9ES, 10ES, 11ES, 12ES, 13ES, 14ES, 15ES, 16ES, 17ES, 18ES, 19ES, 20ES, 21ES, 22ES, 23ES, 24ES, 25ES, 26ES, 27ES, 28ES, 29ES, 30ES, 31ES, 32ES, 33ES, 34ES, 35ES, 36ES, 37ES, 38ES
16.300	753.940	0.000	0.000	0.000	770.240	Straight Row Crop	4ES, 5ES, 7ES, 8ES, 11ES, 15ES
199.070	**2,741.620**	**37.480**	**0.000**	**0.000**	**2,978.170**	**TOTAL AREA**	

Summary for Subcatchment 1ES: 1ES

Runoff = 0.04 cfs @ 24.21 hrs, Volume= 0.014 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	77.590	69	Grassland, HSG B
	77.590		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
70.1	2,780	0.0198	0.66		**Lag/CN Method,**

Summary for Subcatchment 2ES: 2ES

Runoff = 0.00 cfs @ 24.03 hrs, Volume= 0.002 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	9.310	69	Grassland, HSG B
	9.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	835	0.0240	0.57		**Lag/CN Method,**

Summary for Subcatchment 3ES: 3ES

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	32.920	49	Grassland, HSG A
*	10.900	69	Grassland, HSG B
	43.820	54	Weighted Average
	43.820		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
88.1	2,481	0.0226	0.47		**Lag/CN Method,**

Summary for Subcatchment 4ES: 4ES

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	65.500	49	Grassland, HSG A
*	36.400	69	Grassland, HSG B
*	3.060	64	Straight Row Crop, HSG A
*	14.870	75	Straight Row Crop, HSG B
	119.830	59	Weighted Average
	119.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
176.9	6,434	0.0200	0.61		**Lag/CN Method,**

Summary for Subcatchment 5ES: 5ES

Runoff = 0.11 cfs @ 24.14 hrs, Volume= 0.079 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	6.390	49	Grassland, HSG A
*	28.940	69	Grassland, HSG B
*	9.740	64	Straight Row Crop, HSG A
*	76.010	75	Straight Row Crop, HSG B
	121.080	71	Weighted Average
	121.080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.1	3,458	0.0171	0.68		**Lag/CN Method,**

Summary for Subcatchment 6ES: 6ES

Runoff = 0.01 cfs @ 24.05 hrs, Volume= 0.004 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	21.520	69	Grassland, HSG B
	21.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.2	917	0.0207	0.54		**Lag/CN Method,**

Summary for Subcatchment 7ES: 7ES

Runoff = 0.05 cfs @ 18.58 hrs, Volume= 0.040 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	21.440	69	Grassland, HSG B
*	18.850	75	Straight Row Crop, HSG B
	40.290	72	Weighted Average
	40.290		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
60.8	2,047	0.0137	0.56		**Lag/CN Method,**

Summary for Subcatchment 8ES: 8ES

Runoff = 0.04 cfs @ 15.63 hrs, Volume= 0.029 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	7.250	69	Grassland, HSG B
*	12.960	75	Straight Row Crop, HSG B
	20.210	73	Weighted Average
	20.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.3	1,527	0.0255	0.74		**Lag/CN Method,**

Summary for Subcatchment 9ES: 9ES

Runoff = 0.01 cfs @ 24.02 hrs, Volume= 0.002 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	12.030	69	Grassland, HSG B
	12.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.4	805	0.0398	0.73		**Lag/CN Method,**

Summary for Subcatchment 10ES: 10ES

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	1.490	69	Grassland, HSG B
	1.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	284	0.0423	0.61		**Lag/CN Method,**

Summary for Subcatchment 11ES: 11ES

Runoff = 0.72 cfs @ 18.16 hrs, Volume= 0.609 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	7.640	49	Grassland, HSG A
*	122.360	69	Grassland, HSG B
*	3.910	79	Grassland, HSG C
*	3.500	64	Straight Row Crop, HSG A
*	289.800	75	Straight Row Crop, HSG B
	427.210	73	Weighted Average
	427.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
115.9	9,180	0.0394	1.32		**Lag/CN Method,**

Summary for Subcatchment 12ES: 12ES

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	23.420	49	Grassland, HSG A
*	102.580	69	Grassland, HSG B
	126.000	65	Weighted Average
	126.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
81.5	4,460	0.0386	0.91		**Lag/CN Method,**

Summary for Subcatchment 13ES: 13ES

Runoff = 0.01 cfs @ 24.04 hrs, Volume= 0.004 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	22.630	69	Grassland, HSG B
	22.630		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.4	1,653	0.0563	1.00		**Lag/CN Method,**

Summary for Subcatchment 14ES: 14ES

Runoff = 0.00 cfs @ 24.05 hrs, Volume= 0.002 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	10.070	69	Grassland, HSG B
	10.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.1	858	0.0128	0.42		**Lag/CN Method,**

Summary for Subcatchment 15ES: 15ES

Runoff = 0.75 cfs @ 24.30 hrs, Volume= 0.549 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	35.160	49	Grassland, HSG A
*	458.060	69	Grassland, HSG B
*	4.290	79	Grassland, HSG C
*	341.450	75	Straight Row Crop, HSG B
	838.960	71	Weighted Average
	838.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
132.6	8,209	0.0281	1.03		**Lag/CN Method,**

Summary for Subcatchment 16ES: 16ES

Runoff = 0.03 cfs @ 24.48 hrs, Volume= 0.009 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	6.860	49	Grassland, HSG A
*	135.530	69	Grassland, HSG B
*	5.670	79	Grassland, HSG C
	148.060	68	Weighted Average
	148.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
99.4	5,558	0.0315	0.93		**Lag/CN Method,**

Summary for Subcatchment 17ES: 17ES

Runoff = 0.04 cfs @ 24.29 hrs, Volume= 0.018 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	97.680	69	Grassland, HSG B
*	0.900	79	Grassland, HSG C
	98.580	69	Weighted Average
	98.580		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
94.5	5,098	0.0288	0.90		**Lag/CN Method,**

Summary for Subcatchment 18ES: 18ES

Runoff = 0.08 cfs @ 24.39 hrs, Volume= 0.036 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	193.480	69	Grassland, HSG B
*	0.620	79	Grassland, HSG C
	194.100	69	Weighted Average
	194.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
110.2	5,588	0.0245	0.84		**Lag/CN Method,**

Summary for Subcatchment 19ES: 19ES

Runoff = 0.01 cfs @ 24.08 hrs, Volume= 0.006 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	30.380	69	Grassland, HSG B
	30.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.7	1,535	0.0280	0.70		**Lag/CN Method,**

Summary for Subcatchment 20ES: 20ES

Runoff = 0.00 cfs @ 23.99 hrs, Volume= 0.001 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	5.540	69	Grassland, HSG B
	5.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	477	0.0294	0.57		**Lag/CN Method,**

Summary for Subcatchment 21ES: 21ES

Runoff = 0.03 cfs @ 24.09 hrs, Volume= 0.013 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

Area (ac)	CN	Description
* 70.900	69	Grassland, HSG B
70.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.3	2,203	0.0413	0.91		**Lag/CN Method,**

Summary for Subcatchment 22ES: 22ES

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.001 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

Area (ac)	CN	Description
* 5.220	69	Grassland, HSG B
5.220		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	603	0.0763	0.96		**Lag/CN Method,**

Summary for Subcatchment 23ES: 23ES

Runoff = 0.00 cfs @ 24.02 hrs, Volume= 0.001 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

Area (ac)	CN	Description
* 5.330	69	Grassland, HSG B
5.330		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.7	473	0.0148	0.40		**Lag/CN Method,**

Summary for Subcatchment 24ES: 24ES

Runoff = 0.01 cfs @ 24.03 hrs, Volume= 0.003 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	14.000	69	Grassland, HSG B
	14.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	1,204	0.0532	0.92		**Lag/CN Method,**

Summary for Subcatchment 25ES: 25ES

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.001 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	6.880	69	Grassland, HSG B
	6.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	488	0.0656	0.85		**Lag/CN Method,**

Summary for Subcatchment 26ES: 26ES

Runoff = 0.07 cfs @ 24.13 hrs, Volume= 0.027 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	143.910	69	Grassland, HSG B
	143.910		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.6	2,319	0.0263	0.73		**Lag/CN Method,**

Summary for Subcatchment 27ES: 27ES

Runoff = 0.01 cfs @ 24.03 hrs, Volume= 0.003 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	14.570	69	Grassland, HSG B
	14.570		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.7	1,092	0.0357	0.74		**Lag/CN Method,**

Summary for Subcatchment 28ES: 28ES

Runoff = 0.04 cfs @ 24.08 hrs, Volume= 0.016 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	84.620	69	Grassland, HSG B
	84.620		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.4	1,958	0.0378	0.85		**Lag/CN Method,**

Summary for Subcatchment 29ES: 29ES

Runoff = 0.01 cfs @ 24.00 hrs, Volume= 0.002 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	10.820	69	Grassland, HSG B
	10.820		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	923	0.0607	0.93		**Lag/CN Method,**

Summary for Subcatchment 30ES: 30ES

Runoff = 0.02 cfs @ 24.05 hrs, Volume= 0.008 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	41.470	69	Grassland, HSG B
	41.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.2	1,164	0.0249	0.62		**Lag/CN Method,**

Summary for Subcatchment 31ES: 31ES

Runoff = 0.01 cfs @ 24.03 hrs, Volume= 0.003 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	15.190	69	Grassland, HSG B
	15.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.2	1,250	0.0464	0.86		**Lag/CN Method,**

Summary for Subcatchment 32ES: 32ES

Runoff = 0.01 cfs @ 24.05 hrs, Volume= 0.005 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	26.370	69	Grassland, HSG B
	26.370		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.4	1,498	0.0393	0.82		**Lag/CN Method,**

Summary for Subcatchment 33ES: 33ES

Runoff = 0.00 cfs @ 24.03 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	2.140	69	Grassland, HSG B
	2.140		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	813	0.0271	0.60		**Lag/CN Method,**

Summary for Subcatchment 34ES: 34ES

Runoff = 0.02 cfs @ 24.09 hrs, Volume= 0.009 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	48.580	69	Grassland, HSG B
	48.580		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
44.2	1,866	0.0263	0.70		**Lag/CN Method,**

Summary for Subcatchment 35ES: 35ES

Runoff = 0.01 cfs @ 23.99 hrs, Volume= 0.002 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	11.770	69	Grassland, HSG B
	11.770		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	754	0.0531	0.83		**Lag/CN Method,**

Summary for Subcatchment 36ES: 36ES

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	3.410	49	Grassland, HSG A
*	11.860	69	Grassland, HSG B
	15.270	65	Weighted Average
	15.270		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	962	0.0437	0.71		**Lag/CN Method,**

Summary for Subcatchment 37ES: 37ES

Runoff = 0.01 cfs @ 23.99 hrs, Volume= 0.002 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	12.020	69	Grassland, HSG B
	12.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	643	0.0373	0.68		**Lag/CN Method,**

Summary for Subcatchment 38ES: 38ES

Runoff = 0.07 cfs @ 24.13 hrs, Volume= 0.053 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	1.470	49	Grassland, HSG A
*	56.850	69	Grassland, HSG B
*	22.090	79	Grassland, HSG C
	80.410	71	Weighted Average
	80.410		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
80.1	3,791	0.0224	0.79		**Lag/CN Method,**

Summary for Reach 1ER:

Inflow Area = 130.720 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2yr event
Inflow = 0.04 cfs @ 24.10 hrs, Volume= 0.016 af
Outflow = 0.04 cfs @ 24.10 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 2ER:

Inflow Area = 2,193.920 ac, 0.00% Impervious, Inflow Depth = 0.01" for 2yr event
Inflow = 1.73 cfs @ 24.09 hrs, Volume= 1.382 af
Outflow = 1.73 cfs @ 24.09 hrs, Volume= 1.382 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 3ER:

Inflow Area = 119.470 ac, 0.00% Impervious, Inflow Depth = 0.01" for 2yr event
Inflow = 0.08 cfs @ 24.02 hrs, Volume= 0.057 af
Outflow = 0.08 cfs @ 24.02 hrs, Volume= 0.057 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 4ER:

Inflow Area = 331.770 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2yr event
Inflow = 0.15 cfs @ 24.04 hrs, Volume= 0.062 af
Outflow = 0.15 cfs @ 24.04 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 5ER:

Inflow Area = 14.570 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2yr event
Inflow = 0.01 cfs @ 24.03 hrs, Volume= 0.003 af
Outflow = 0.01 cfs @ 24.03 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 6ER:

Inflow Area = 95.440 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2yr event
Inflow = 0.04 cfs @ 24.04 hrs, Volume= 0.018 af
Outflow = 0.04 cfs @ 24.04 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 7ER:

Inflow Area = 92.280 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2yr event
Inflow = 0.04 cfs @ 24.05 hrs, Volume= 0.017 af
Outflow = 0.04 cfs @ 24.05 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1ES: 1ES

Runoff = 1.26 cfs @ 13.22 hrs, Volume= 0.612 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	77.590	69	Grassland, HSG B
	77.590		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
70.1	2,780	0.0198	0.66		**Lag/CN Method,**

Summary for Subcatchment 2ES: 2ES

Runoff = 0.22 cfs @ 12.37 hrs, Volume= 0.073 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	9.310	69	Grassland, HSG B
	9.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	835	0.0240	0.57		**Lag/CN Method,**

Summary for Subcatchment 3ES: 3ES

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	32.920	49	Grassland, HSG A
*	10.900	69	Grassland, HSG B
	43.820	54	Weighted Average
	43.820		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
88.1	2,481	0.0226	0.47		**Lag/CN Method,**

Summary for Subcatchment 4ES: 4ES

Runoff = 0.11 cfs @ 24.60 hrs, Volume= 0.062 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	65.500	49	Grassland, HSG A
*	36.400	69	Grassland, HSG B
*	3.060	64	Straight Row Crop, HSG A
*	14.870	75	Straight Row Crop, HSG B
	119.830	59	Weighted Average
	119.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
176.9	6,434	0.0200	0.61		**Lag/CN Method,**

Summary for Subcatchment 5ES: 5ES

Runoff = 3.01 cfs @ 13.36 hrs, Volume= 1.271 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	6.390	49	Grassland, HSG A
*	28.940	69	Grassland, HSG B
*	9.740	64	Straight Row Crop, HSG A
*	76.010	75	Straight Row Crop, HSG B
	121.080	71	Weighted Average
	121.080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.1	3,458	0.0171	0.68		**Lag/CN Method,**

Summary for Subcatchment 6ES: 6ES

Runoff = 0.50 cfs @ 12.45 hrs, Volume= 0.170 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	21.520	69	Grassland, HSG B
	21.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.2	917	0.0207	0.54		**Lag/CN Method,**

Summary for Subcatchment 7ES: 7ES

Runoff = 1.50 cfs @ 12.91 hrs, Volume= 0.482 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	21.440	69	Grassland, HSG B
*	18.850	75	Straight Row Crop, HSG B
	40.290	72	Weighted Average
	40.290		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
60.8	2,047	0.0137	0.56		**Lag/CN Method,**

Summary for Subcatchment 8ES: 8ES

Runoff = 1.30 cfs @ 12.43 hrs, Volume= 0.273 af, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	7.250	69	Grassland, HSG B
*	12.960	75	Straight Row Crop, HSG B
	20.210	73	Weighted Average
	20.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.3	1,527	0.0255	0.74		**Lag/CN Method,**

Summary for Subcatchment 9ES: 9ES

Runoff = 0.33 cfs @ 12.25 hrs, Volume= 0.095 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	12.030	69	Grassland, HSG B
	12.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.4	805	0.0398	0.73		**Lag/CN Method,**

Summary for Subcatchment 10ES: 10ES

Runoff = 0.06 cfs @ 12.06 hrs, Volume= 0.012 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	1.490	69	Grassland, HSG B
	1.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	284	0.0423	0.61		**Lag/CN Method,**

Summary for Subcatchment 11ES: 11ES

Runoff = 13.47 cfs @ 13.80 hrs, Volume= 5.779 af, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	7.640	49	Grassland, HSG A
*	122.360	69	Grassland, HSG B
*	3.910	79	Grassland, HSG C
*	3.500	64	Straight Row Crop, HSG A
*	289.800	75	Straight Row Crop, HSG B
	427.210	73	Weighted Average
	427.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
115.9	9,180	0.0394	1.32		**Lag/CN Method,**

Summary for Subcatchment 12ES: 12ES

Runoff = 0.64 cfs @ 14.61 hrs, Volume= 0.486 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	23.420	49	Grassland, HSG A
*	102.580	69	Grassland, HSG B
	126.000	65	Weighted Average
	126.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
81.5	4,460	0.0386	0.91		**Lag/CN Method,**

Summary for Subcatchment 13ES: 13ES

Runoff = 0.52 cfs @ 12.44 hrs, Volume= 0.179 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	22.630	69	Grassland, HSG B
	22.630		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.4	1,653	0.0563	1.00		**Lag/CN Method,**

Summary for Subcatchment 14ES: 14ES

Runoff = 0.22 cfs @ 12.56 hrs, Volume= 0.079 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	10.070	69	Grassland, HSG B
	10.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.1	858	0.0128	0.42		**Lag/CN Method,**

Summary for Subcatchment 15ES: 15ES

Runoff = 16.60 cfs @ 14.17 hrs, Volume= 8.808 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	35.160	49	Grassland, HSG A
*	458.060	69	Grassland, HSG B
*	4.290	79	Grassland, HSG C
*	341.450	75	Straight Row Crop, HSG B
	838.960	71	Weighted Average
	838.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
132.6	8,209	0.0281	1.03		**Lag/CN Method,**

Summary for Subcatchment 16ES: 16ES

Runoff = 1.67 cfs @ 13.94 hrs, Volume= 0.998 af, Depth= 0.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	6.860	49	Grassland, HSG A
*	135.530	69	Grassland, HSG B
*	5.670	79	Grassland, HSG C
	148.060	68	Weighted Average
	148.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
99.4	5,558	0.0315	0.93		**Lag/CN Method,**

Summary for Subcatchment 17ES: 17ES

Runoff = 1.44 cfs @ 13.73 hrs, Volume= 0.778 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	97.680	69	Grassland, HSG B
*	0.900	79	Grassland, HSG C
	98.580	69	Weighted Average
	98.580		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
94.5	5,098	0.0288	0.90		**Lag/CN Method,**

Summary for Subcatchment 18ES: 18ES

Runoff = 2.65 cfs @ 14.03 hrs, Volume= 1.532 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	193.480	69	Grassland, HSG B
*	0.620	79	Grassland, HSG C
	194.100	69	Weighted Average
	194.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
110.2	5,588	0.0245	0.84		**Lag/CN Method,**

Summary for Subcatchment 19ES: 19ES

Runoff = 0.64 cfs @ 12.61 hrs, Volume= 0.240 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	30.380	69	Grassland, HSG B
	30.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.7	1,535	0.0280	0.70		**Lag/CN Method,**

Summary for Subcatchment 20ES: 20ES

Runoff = 0.17 cfs @ 12.17 hrs, Volume= 0.044 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	5.540	69	Grassland, HSG B
	5.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	477	0.0294	0.57		**Lag/CN Method,**

Summary for Subcatchment 21ES: 21ES

Runoff = 1.45 cfs @ 12.67 hrs, Volume= 0.560 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	70.900	69	Grassland, HSG B
	70.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.3	2,203	0.0413	0.91		**Lag/CN Method,**

Summary for Subcatchment 22ES: 22ES

Runoff = 0.19 cfs @ 12.11 hrs, Volume= 0.041 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	5.220	69	Grassland, HSG B
	5.220		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	603	0.0763	0.96		**Lag/CN Method,**

Summary for Subcatchment 23ES: 23ES

Runoff = 0.14 cfs @ 12.27 hrs, Volume= 0.042 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	5.330	69	Grassland, HSG B
	5.330		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.7	473	0.0148	0.40		**Lag/CN Method,**

Summary for Subcatchment 24ES: 24ES

Runoff = 0.35 cfs @ 12.32 hrs, Volume= 0.111 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	14.000	69	Grassland, HSG B
	14.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	1,204	0.0532	0.92		**Lag/CN Method,**

Summary for Subcatchment 25ES: 25ES

Runoff = 0.26 cfs @ 12.09 hrs, Volume= 0.054 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	6.880	69	Grassland, HSG B
	6.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	488	0.0656	0.85		**Lag/CN Method,**

Summary for Subcatchment 26ES: 26ES

Runoff = 2.67 cfs @ 12.91 hrs, Volume= 1.136 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	143.910	69	Grassland, HSG B
	143.910		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.6	2,319	0.0263	0.73		**Lag/CN Method,**

Summary for Subcatchment 27ES: 27ES

Runoff = 0.35 cfs @ 12.37 hrs, Volume= 0.115 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	14.570	69	Grassland, HSG B
	14.570		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.7	1,092	0.0357	0.74		**Lag/CN Method,**

Summary for Subcatchment 28ES: 28ES

Runoff = 1.75 cfs @ 12.65 hrs, Volume= 0.668 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	84.620	69	Grassland, HSG B
	84.620		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.4	1,958	0.0378	0.85		**Lag/CN Method,**

Summary for Subcatchment 29ES: 29ES

Runoff = 0.31 cfs @ 12.21 hrs, Volume= 0.085 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	10.820	69	Grassland, HSG B
	10.820		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	923	0.0607	0.93		**Lag/CN Method,**

Summary for Subcatchment 30ES: 30ES

Runoff = 0.92 cfs @ 12.51 hrs, Volume= 0.327 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	41.470	69	Grassland, HSG B
	41.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.2	1,164	0.0249	0.62		**Lag/CN Method,**

Summary for Subcatchment 31ES: 31ES

Runoff = 0.37 cfs @ 12.37 hrs, Volume= 0.120 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	15.190	69	Grassland, HSG B
	15.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.2	1,250	0.0464	0.86		**Lag/CN Method,**

Summary for Subcatchment 32ES: 32ES

Runoff = 0.59 cfs @ 12.50 hrs, Volume= 0.208 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	26.370	69	Grassland, HSG B
	26.370		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.4	1,498	0.0393	0.82		**Lag/CN Method,**

Summary for Subcatchment 33ES: 33ES

Runoff = 0.05 cfs @ 12.33 hrs, Volume= 0.017 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	2.140	69	Grassland, HSG B
	2.140		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	813	0.0271	0.60		**Lag/CN Method,**

Summary for Subcatchment 34ES: 34ES

Runoff = 0.95 cfs @ 12.74 hrs, Volume= 0.383 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	48.580	69	Grassland, HSG B
	48.580		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
44.2	1,866	0.0263	0.70		**Lag/CN Method,**

Summary for Subcatchment 35ES: 35ES

Runoff = 0.35 cfs @ 12.18 hrs, Volume= 0.093 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	11.770	69	Grassland, HSG B
	11.770		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	754	0.0531	0.83		**Lag/CN Method,**

Summary for Subcatchment 36ES: 36ES

Runoff = 0.09 cfs @ 13.42 hrs, Volume= 0.059 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	3.410	49	Grassland, HSG A
*	11.860	69	Grassland, HSG B
	15.270	65	Weighted Average
	15.270		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	962	0.0437	0.71		**Lag/CN Method,**

Summary for Subcatchment 37ES: 37ES

Runoff = 0.35 cfs @ 12.20 hrs, Volume= 0.095 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	12.020	69	Grassland, HSG B
	12.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	643	0.0373	0.68		**Lag/CN Method,**

Summary for Subcatchment 38ES: 38ES

Runoff = 2.05 cfs @ 13.27 hrs, Volume= 0.844 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	1.470	49	Grassland, HSG A
*	56.850	69	Grassland, HSG B
*	22.090	79	Grassland, HSG C
	80.410	71	Weighted Average
	80.410		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
80.1	3,791	0.0224	0.79		**Lag/CN Method,**

Summary for Reach 1ER:

Inflow Area = 130.720 ac, 0.00% Impervious, Inflow Depth = 0.06" for 10yr event
Inflow = 1.40 cfs @ 13.19 hrs, Volume= 0.686 af
Outflow = 1.40 cfs @ 13.19 hrs, Volume= 0.686 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 2ER:

Inflow Area = 2,193.920 ac, 0.00% Impervious, Inflow Depth = 0.11" for 10yr event
Inflow = 39.99 cfs @ 13.93 hrs, Volume= 20.941 af
Outflow = 39.99 cfs @ 13.93 hrs, Volume= 20.941 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 3ER:

Inflow Area = 119.470 ac, 0.00% Impervious, Inflow Depth = 0.11" for 10yr event
Inflow = 2.45 cfs @ 13.25 hrs, Volume= 1.091 af
Outflow = 2.45 cfs @ 13.25 hrs, Volume= 1.091 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 4ER:

Inflow Area = 331.770 ac, 0.00% Impervious, Inflow Depth = 0.09" for 10yr event
Inflow = 5.08 cfs @ 12.97 hrs, Volume= 2.619 af
Outflow = 5.08 cfs @ 12.97 hrs, Volume= 2.619 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 5ER:

Inflow Area = 14.570 ac, 0.00% Impervious, Inflow Depth = 0.09" for 10yr event
Inflow = 0.35 cfs @ 12.37 hrs, Volume= 0.115 af
Outflow = 0.35 cfs @ 12.37 hrs, Volume= 0.115 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 6ER:

Inflow Area = 95.440 ac, 0.00% Impervious, Inflow Depth = 0.09" for 10yr event
Inflow = 1.96 cfs @ 12.63 hrs, Volume= 0.753 af
Outflow = 1.96 cfs @ 12.63 hrs, Volume= 0.753 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 7ER:

Inflow Area = 92.280 ac, 0.00% Impervious, Inflow Depth = 0.09" for 10yr event
Inflow = 1.85 cfs @ 12.66 hrs, Volume= 0.728 af
Outflow = 1.85 cfs @ 12.66 hrs, Volume= 0.728 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1ES: 1ES

Runoff = 2.63 cfs @ 13.08 hrs, Volume= 0.974 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	77.590	69	Grassland, HSG B
	77.590		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
70.1	2,780	0.0198	0.66		**Lag/CN Method,**

Summary for Subcatchment 2ES: 2ES

Runoff = 0.56 cfs @ 12.29 hrs, Volume= 0.117 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	9.310	69	Grassland, HSG B
	9.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	835	0.0240	0.57		**Lag/CN Method,**

Summary for Subcatchment 3ES: 3ES

Runoff = 0.02 cfs @ 24.41 hrs, Volume= 0.004 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	32.920	49	Grassland, HSG A
*	10.900	69	Grassland, HSG B
	43.820	54	Weighted Average
	43.820		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
88.1	2,481	0.0226	0.47		**Lag/CN Method,**

Summary for Subcatchment 4ES: 4ES

Runoff = 0.28 cfs @ 20.25 hrs, Volume= 0.228 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	65.500	49	Grassland, HSG A
*	36.400	69	Grassland, HSG B
*	3.060	64	Straight Row Crop, HSG A
*	14.870	75	Straight Row Crop, HSG B
	119.830	59	Weighted Average
	119.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
176.9	6,434	0.0200	0.61		**Lag/CN Method,**

Summary for Subcatchment 5ES: 5ES

Runoff = 5.42 cfs @ 13.25 hrs, Volume= 1.924 af, Depth= 0.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	6.390	49	Grassland, HSG A
*	28.940	69	Grassland, HSG B
*	9.740	64	Straight Row Crop, HSG A
*	76.010	75	Straight Row Crop, HSG B
	121.080	71	Weighted Average
	121.080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.1	3,458	0.0171	0.68		**Lag/CN Method,**

Summary for Subcatchment 6ES: 6ES

Runoff = 1.19 cfs @ 12.36 hrs, Volume= 0.270 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	21.520	69	Grassland, HSG B
	21.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.2	917	0.0207	0.54		**Lag/CN Method,**

Summary for Subcatchment 7ES: 7ES

Runoff = 2.66 cfs @ 12.83 hrs, Volume= 0.714 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	21.440	69	Grassland, HSG B
*	18.850	75	Straight Row Crop, HSG B
	40.290	72	Weighted Average
	40.290		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
60.8	2,047	0.0137	0.56		**Lag/CN Method,**

Summary for Subcatchment 8ES: 8ES

Runoff = 2.31 cfs @ 12.40 hrs, Volume= 0.398 af, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	7.250	69	Grassland, HSG B
*	12.960	75	Straight Row Crop, HSG B
	20.210	73	Weighted Average
	20.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.3	1,527	0.0255	0.74		**Lag/CN Method,**

Summary for Subcatchment 9ES: 9ES

Runoff = 0.87 cfs @ 12.20 hrs, Volume= 0.151 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	12.030	69	Grassland, HSG B
	12.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.4	805	0.0398	0.73		**Lag/CN Method,**

Summary for Subcatchment 10ES: 10ES

Runoff = 0.18 cfs @ 12.04 hrs, Volume= 0.019 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	1.490	69	Grassland, HSG B
	1.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	284	0.0423	0.61		**Lag/CN Method,**

Summary for Subcatchment 11ES: 11ES

Runoff = 21.99 cfs @ 13.69 hrs, Volume= 8.410 af, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	7.640	49	Grassland, HSG A
*	122.360	69	Grassland, HSG B
*	3.910	79	Grassland, HSG C
*	3.500	64	Straight Row Crop, HSG A
*	289.800	75	Straight Row Crop, HSG B
	427.210	73	Weighted Average
	427.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
115.9	9,180	0.0394	1.32		**Lag/CN Method,**

Summary for Subcatchment 12ES: 12ES

Runoff = 1.53 cfs @ 13.69 hrs, Volume= 0.899 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	23.420	49	Grassland, HSG A
*	102.580	69	Grassland, HSG B
	126.000	65	Weighted Average
	126.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
81.5	4,460	0.0386	0.91		**Lag/CN Method,**

Summary for Subcatchment 13ES: 13ES

Runoff = 1.28 cfs @ 12.35 hrs, Volume= 0.284 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	22.630	69	Grassland, HSG B
	22.630		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.4	1,653	0.0563	1.00		**Lag/CN Method,**

Summary for Subcatchment 14ES: 14ES

Runoff = 0.50 cfs @ 12.46 hrs, Volume= 0.126 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	10.070	69	Grassland, HSG B
	10.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.1	858	0.0128	0.42		**Lag/CN Method,**

Summary for Subcatchment 15ES: 15ES

Runoff = 29.01 cfs @ 14.02 hrs, Volume= 13.334 af, Depth= 0.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	35.160	49	Grassland, HSG A
*	458.060	69	Grassland, HSG B
*	4.290	79	Grassland, HSG C
*	341.450	75	Straight Row Crop, HSG B
	838.960	71	Weighted Average
	838.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
132.6	8,209	0.0281	1.03		**Lag/CN Method,**

Summary for Subcatchment 16ES: 16ES

Runoff = 3.42 cfs @ 13.64 hrs, Volume= 1.635 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	6.860	49	Grassland, HSG A
*	135.530	69	Grassland, HSG B
*	5.670	79	Grassland, HSG C
	148.060	68	Weighted Average
	148.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
99.4	5,558	0.0315	0.93		**Lag/CN Method,**

Summary for Subcatchment 17ES: 17ES

Runoff = 2.83 cfs @ 13.49 hrs, Volume= 1.238 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	97.680	69	Grassland, HSG B
*	0.900	79	Grassland, HSG C
	98.580	69	Weighted Average
	98.580		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
94.5	5,098	0.0288	0.90		**Lag/CN Method,**

Summary for Subcatchment 18ES: 18ES

Runoff = 5.14 cfs @ 13.76 hrs, Volume= 2.437 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	193.480	69	Grassland, HSG B
*	0.620	79	Grassland, HSG C
	194.100	69	Weighted Average
	194.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
110.2	5,588	0.0245	0.84		**Lag/CN Method,**

Summary for Subcatchment 19ES: 19ES

Runoff = 1.46 cfs @ 12.51 hrs, Volume= 0.381 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	30.380	69	Grassland, HSG B
	30.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.7	1,535	0.0280	0.70		**Lag/CN Method,**

Summary for Subcatchment 20ES: 20ES

Runoff = 0.47 cfs @ 12.13 hrs, Volume= 0.070 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	5.540	69	Grassland, HSG B
	5.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	477	0.0294	0.57		**Lag/CN Method,**

Summary for Subcatchment 21ES: 21ES

Runoff = 3.24 cfs @ 12.57 hrs, Volume= 0.890 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	70.900	69	Grassland, HSG B
	70.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.3	2,203	0.0413	0.91		**Lag/CN Method,**

Summary for Subcatchment 22ES: 22ES

Runoff = 0.53 cfs @ 12.08 hrs, Volume= 0.066 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	5.220	69	Grassland, HSG B
	5.220		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	603	0.0763	0.96		**Lag/CN Method,**

Summary for Subcatchment 23ES: 23ES

Runoff = 0.37 cfs @ 12.22 hrs, Volume= 0.067 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	5.330	69	Grassland, HSG B
	5.330		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.7	473	0.0148	0.40		**Lag/CN Method,**

Summary for Subcatchment 24ES: 24ES

Runoff = 0.90 cfs @ 12.25 hrs, Volume= 0.176 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	14.000	69	Grassland, HSG B
	14.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	1,204	0.0532	0.92		**Lag/CN Method,**

Summary for Subcatchment 25ES: 25ES

Runoff = 0.75 cfs @ 12.07 hrs, Volume= 0.086 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	6.880	69	Grassland, HSG B
	6.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	488	0.0656	0.85		**Lag/CN Method,**

Summary for Subcatchment 26ES: 26ES

Runoff = 5.71 cfs @ 12.78 hrs, Volume= 1.807 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	143.910	69	Grassland, HSG B
	143.910		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.6	2,319	0.0263	0.73		**Lag/CN Method,**

Summary for Subcatchment 27ES: 27ES

Runoff = 0.87 cfs @ 12.30 hrs, Volume= 0.183 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	14.570	69	Grassland, HSG B
	14.570		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.7	1,092	0.0357	0.74		**Lag/CN Method,**

Summary for Subcatchment 28ES: 28ES

Runoff = 3.98 cfs @ 12.54 hrs, Volume= 1.062 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	84.620	69	Grassland, HSG B
	84.620		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.4	1,958	0.0378	0.85		**Lag/CN Method,**

Summary for Subcatchment 29ES: 29ES

Runoff = 0.84 cfs @ 12.17 hrs, Volume= 0.136 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	10.820	69	Grassland, HSG B
	10.820		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	923	0.0607	0.93		**Lag/CN Method,**

Summary for Subcatchment 30ES: 30ES

Runoff = 2.18 cfs @ 12.41 hrs, Volume= 0.521 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	41.470	69	Grassland, HSG B
	41.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.2	1,164	0.0249	0.62		**Lag/CN Method,**

Summary for Subcatchment 31ES: 31ES

Runoff = 0.92 cfs @ 12.29 hrs, Volume= 0.191 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	15.190	69	Grassland, HSG B
	15.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.2	1,250	0.0464	0.86		**Lag/CN Method,**

Summary for Subcatchment 32ES: 32ES

Runoff = 1.41 cfs @ 12.40 hrs, Volume= 0.331 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	26.370	69	Grassland, HSG B
	26.370		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.4	1,498	0.0393	0.82		**Lag/CN Method,**

Summary for Subcatchment 33ES: 33ES

Runoff = 0.14 cfs @ 12.26 hrs, Volume= 0.027 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	2.140	69	Grassland, HSG B
	2.140		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	813	0.0271	0.60		**Lag/CN Method,**

Summary for Subcatchment 34ES: 34ES

Runoff = 2.12 cfs @ 12.64 hrs, Volume= 0.610 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	48.580	69	Grassland, HSG B
	48.580		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
44.2	1,866	0.0263	0.70		**Lag/CN Method,**

Summary for Subcatchment 35ES: 35ES

Runoff = 0.96 cfs @ 12.15 hrs, Volume= 0.148 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	11.770	69	Grassland, HSG B
	11.770		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	754	0.0531	0.83		**Lag/CN Method,**

Summary for Subcatchment 36ES: 36ES

Runoff = 0.26 cfs @ 12.53 hrs, Volume= 0.109 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	3.410	49	Grassland, HSG A
*	11.860	69	Grassland, HSG B
	15.270	65	Weighted Average
	15.270		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	962	0.0437	0.71		**Lag/CN Method,**

Summary for Subcatchment 37ES: 37ES

Runoff = 0.96 cfs @ 12.16 hrs, Volume= 0.151 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	12.020	69	Grassland, HSG B
	12.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	643	0.0373	0.68		**Lag/CN Method,**

Summary for Subcatchment 38ES: 38ES

Runoff = 3.72 cfs @ 13.16 hrs, Volume= 1.278 af, Depth= 0.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	1.470	49	Grassland, HSG A
*	56.850	69	Grassland, HSG B
*	22.090	79	Grassland, HSG C
	80.410	71	Weighted Average
	80.410		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
80.1	3,791	0.0224	0.79		**Lag/CN Method,**

Summary for Reach 1ER:

Inflow Area = 130.720 ac, 0.00% Impervious, Inflow Depth = 0.10" for 25yr event
Inflow = 2.87 cfs @ 13.06 hrs, Volume= 1.095 af
Outflow = 2.87 cfs @ 13.06 hrs, Volume= 1.095 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 2ER:

Inflow Area = 2,193.920 ac, 0.00% Impervious, Inflow Depth = 0.17" for 25yr event
Inflow = 69.57 cfs @ 13.75 hrs, Volume= 31.965 af
Outflow = 69.57 cfs @ 13.75 hrs, Volume= 31.965 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 3ER:

Inflow Area = 119.470 ac, 0.00% Impervious, Inflow Depth = 0.17" for 25yr event
Inflow = 4.44 cfs @ 13.12 hrs, Volume= 1.686 af
Outflow = 4.44 cfs @ 13.12 hrs, Volume= 1.686 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 4ER:

Inflow Area = 331.770 ac, 0.00% Impervious, Inflow Depth = 0.15" for 25yr event
Inflow = 10.49 cfs @ 12.79 hrs, Volume= 4.165 af
Outflow = 10.49 cfs @ 12.79 hrs, Volume= 4.165 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 5ER:

Inflow Area = 14.570 ac, 0.00% Impervious, Inflow Depth = 0.15" for 25yr event
Inflow = 0.87 cfs @ 12.30 hrs, Volume= 0.183 af
Outflow = 0.87 cfs @ 12.30 hrs, Volume= 0.183 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 6ER:

Inflow Area = 95.440 ac, 0.00% Impervious, Inflow Depth = 0.15" for 25yr event
Inflow = 4.39 cfs @ 12.52 hrs, Volume= 1.198 af
Outflow = 4.39 cfs @ 12.52 hrs, Volume= 1.198 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 7ER:

Inflow Area = 92.280 ac, 0.00% Impervious, Inflow Depth = 0.15" for 25yr event
Inflow = 4.09 cfs @ 12.49 hrs, Volume= 1.158 af
Outflow = 4.09 cfs @ 12.49 hrs, Volume= 1.158 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1ES: 1ES

Runoff = 6.84 cfs @ 12.95 hrs, Volume= 1.890 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	77.590	69	Grassland, HSG B
	77.590		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
70.1	2,780	0.0198	0.66		**Lag/CN Method,**

Summary for Subcatchment 2ES: 2ES

Runoff = 1.68 cfs @ 12.25 hrs, Volume= 0.227 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	9.310	69	Grassland, HSG B
	9.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	835	0.0240	0.57		**Lag/CN Method,**

Summary for Subcatchment 3ES: 3ES

Runoff = 0.12 cfs @ 18.89 hrs, Volume= 0.100 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	32.920	49	Grassland, HSG A
*	10.900	69	Grassland, HSG B
	43.820	54	Weighted Average
	43.820		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
88.1	2,481	0.0226	0.47		**Lag/CN Method,**

Summary for Subcatchment 4ES: 4ES

Runoff = 1.05 cfs @ 16.10 hrs, Volume= 0.845 af, Depth= 0.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	65.500	49	Grassland, HSG A
*	36.400	69	Grassland, HSG B
*	3.060	64	Straight Row Crop, HSG A
*	14.870	75	Straight Row Crop, HSG B
	119.830	59	Weighted Average
	119.830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
176.9	6,434	0.0200	0.61		**Lag/CN Method,**

Summary for Subcatchment 5ES: 5ES

Runoff = 12.24 cfs @ 13.15 hrs, Volume= 3.530 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	6.390	49	Grassland, HSG A
*	28.940	69	Grassland, HSG B
*	9.740	64	Straight Row Crop, HSG A
*	76.010	75	Straight Row Crop, HSG B
	121.080	71	Weighted Average
	121.080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.1	3,458	0.0171	0.68		**Lag/CN Method,**

Summary for Subcatchment 6ES: 6ES

Runoff = 3.50 cfs @ 12.30 hrs, Volume= 0.524 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	21.520	69	Grassland, HSG B
	21.520		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.2	917	0.0207	0.54		**Lag/CN Method,**

Summary for Subcatchment 7ES: 7ES

Runoff = 5.87 cfs @ 12.77 hrs, Volume= 1.279 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	21.440	69	Grassland, HSG B
*	18.850	75	Straight Row Crop, HSG B
	40.290	72	Weighted Average
	40.290		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
60.8	2,047	0.0137	0.56		**Lag/CN Method,**

Summary for Subcatchment 8ES: 8ES

Runoff = 4.99 cfs @ 12.36 hrs, Volume= 0.696 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	7.250	69	Grassland, HSG B
*	12.960	75	Straight Row Crop, HSG B
	20.210	73	Weighted Average
	20.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.3	1,527	0.0255	0.74		**Lag/CN Method,**

Summary for Subcatchment 9ES: 9ES

Runoff = 2.64 cfs @ 12.16 hrs, Volume= 0.293 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	12.030	69	Grassland, HSG B
	12.030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.4	805	0.0398	0.73		**Lag/CN Method,**

Summary for Subcatchment 10ES: 10ES

Runoff = 0.53 cfs @ 12.02 hrs, Volume= 0.036 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	1.490	69	Grassland, HSG B
	1.490		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	284	0.0423	0.61		**Lag/CN Method,**

Summary for Subcatchment 11ES: 11ES

Runoff = 44.40 cfs @ 13.56 hrs, Volume= 14.715 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	7.640	49	Grassland, HSG A
*	122.360	69	Grassland, HSG B
*	3.910	79	Grassland, HSG C
*	3.500	64	Straight Row Crop, HSG A
*	289.800	75	Straight Row Crop, HSG B
	427.210	73	Weighted Average
	427.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
115.9	9,180	0.0394	1.32		**Lag/CN Method,**

Summary for Subcatchment 12ES: 12ES

Runoff = 5.21 cfs @ 13.25 hrs, Volume= 2.035 af, Depth= 0.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	23.420	49	Grassland, HSG A
*	102.580	69	Grassland, HSG B
	126.000	65	Weighted Average
	126.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
81.5	4,460	0.0386	0.91		**Lag/CN Method,**

Summary for Subcatchment 13ES: 13ES

Runoff = 3.76 cfs @ 12.29 hrs, Volume= 0.551 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	22.630	69	Grassland, HSG B
	22.630		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.4	1,653	0.0563	1.00		**Lag/CN Method,**

Summary for Subcatchment 14ES: 14ES

Runoff = 1.44 cfs @ 12.40 hrs, Volume= 0.245 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	10.070	69	Grassland, HSG B
	10.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.1	858	0.0128	0.42		**Lag/CN Method,**

Summary for Subcatchment 15ES: 15ES

Runoff = 63.04 cfs @ 13.87 hrs, Volume= 24.461 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	35.160	49	Grassland, HSG A
*	458.060	69	Grassland, HSG B
*	4.290	79	Grassland, HSG C
*	341.450	75	Straight Row Crop, HSG B
	838.960	71	Weighted Average
	838.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
132.6	8,209	0.0281	1.03		**Lag/CN Method,**

Summary for Subcatchment 16ES: 16ES

Runoff = 8.94 cfs @ 13.43 hrs, Volume= 3.278 af, Depth= 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	6.860	49	Grassland, HSG A
*	135.530	69	Grassland, HSG B
*	5.670	79	Grassland, HSG C
	148.060	68	Weighted Average
	148.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
99.4	5,558	0.0315	0.93		**Lag/CN Method,**

Summary for Subcatchment 17ES: 17ES

Runoff = 7.07 cfs @ 13.34 hrs, Volume= 2.401 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	97.680	69	Grassland, HSG B
*	0.900	79	Grassland, HSG C
	98.580	69	Weighted Average
	98.580		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
94.5	5,098	0.0288	0.90		**Lag/CN Method,**

Summary for Subcatchment 18ES: 18ES

Runoff = 12.62 cfs @ 13.59 hrs, Volume= 4.728 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	193.480	69	Grassland, HSG B
*	0.620	79	Grassland, HSG C
	194.100	69	Weighted Average
	194.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
110.2	5,588	0.0245	0.84		**Lag/CN Method,**

Summary for Subcatchment 19ES: 19ES

Runoff = 4.13 cfs @ 12.44 hrs, Volume= 0.740 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	30.380	69	Grassland, HSG B
	30.380		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.7	1,535	0.0280	0.70		**Lag/CN Method,**

Summary for Subcatchment 20ES: 20ES

Runoff = 1.45 cfs @ 12.10 hrs, Volume= 0.135 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	5.540	69	Grassland, HSG B
	5.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	477	0.0294	0.57		**Lag/CN Method,**

Summary for Subcatchment 21ES: 21ES

Runoff = 9.04 cfs @ 12.49 hrs, Volume= 1.727 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	70.900	69	Grassland, HSG B
	70.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.3	2,203	0.0413	0.91		**Lag/CN Method,**

Summary for Subcatchment 22ES: 22ES

Runoff = 1.63 cfs @ 12.06 hrs, Volume= 0.127 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	5.220	69	Grassland, HSG B
	5.220		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	603	0.0763	0.96		**Lag/CN Method,**

Summary for Subcatchment 23ES: 23ES

Runoff = 1.11 cfs @ 12.18 hrs, Volume= 0.130 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	5.330	69	Grassland, HSG B
	5.330		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.7	473	0.0148	0.40		**Lag/CN Method,**

Summary for Subcatchment 24ES: 24ES

Runoff = 2.72 cfs @ 12.21 hrs, Volume= 0.341 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	14.000	69	Grassland, HSG B
	14.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	1,204	0.0532	0.92		**Lag/CN Method,**

Summary for Subcatchment 25ES: 25ES

Runoff = 2.23 cfs @ 12.05 hrs, Volume= 0.168 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	6.880	69	Grassland, HSG B
	6.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	488	0.0656	0.85		**Lag/CN Method,**

Summary for Subcatchment 26ES: 26ES

Runoff = 15.35 cfs @ 12.69 hrs, Volume= 3.506 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	143.910	69	Grassland, HSG B
	143.910		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.6	2,319	0.0263	0.73		**Lag/CN Method,**

Summary for Subcatchment 27ES: 27ES

Runoff = 2.60 cfs @ 12.25 hrs, Volume= 0.355 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	14.570	69	Grassland, HSG B
	14.570		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.7	1,092	0.0357	0.74		**Lag/CN Method,**

Summary for Subcatchment 28ES: 28ES

Runoff = 11.14 cfs @ 12.46 hrs, Volume= 2.061 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	84.620	69	Grassland, HSG B
	84.620		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.4	1,958	0.0378	0.85		**Lag/CN Method,**

Summary for Subcatchment 29ES: 29ES

Runoff = 2.53 cfs @ 12.14 hrs, Volume= 0.264 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	10.820	69	Grassland, HSG B
	10.820		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	923	0.0607	0.93		**Lag/CN Method,**

Summary for Subcatchment 30ES: 30ES

Runoff = 6.29 cfs @ 12.35 hrs, Volume= 1.010 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	41.470	69	Grassland, HSG B
	41.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.2	1,164	0.0249	0.62		**Lag/CN Method,**

Summary for Subcatchment 31ES: 31ES

Runoff = 2.75 cfs @ 12.24 hrs, Volume= 0.370 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	15.190	69	Grassland, HSG B
	15.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.2	1,250	0.0464	0.86		**Lag/CN Method,**

Summary for Subcatchment 32ES: 32ES

Runoff = 4.07 cfs @ 12.34 hrs, Volume= 0.642 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	26.370	69	Grassland, HSG B
	26.370		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.4	1,498	0.0393	0.82		**Lag/CN Method,**

Summary for Subcatchment 33ES: 33ES

Runoff = 0.41 cfs @ 12.22 hrs, Volume= 0.052 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	2.140	69	Grassland, HSG B
	2.140		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	813	0.0271	0.60		**Lag/CN Method,**

Summary for Subcatchment 34ES: 34ES

Runoff = 5.83 cfs @ 12.55 hrs, Volume= 1.183 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	48.580	69	Grassland, HSG B
	48.580		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
44.2	1,866	0.0263	0.70		**Lag/CN Method,**

Summary for Subcatchment 35ES: 35ES

Runoff = 2.95 cfs @ 12.12 hrs, Volume= 0.287 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	11.770	69	Grassland, HSG B
	11.770		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	754	0.0531	0.83		**Lag/CN Method,**

Summary for Subcatchment 36ES: 36ES

Runoff = 1.33 cfs @ 12.26 hrs, Volume= 0.247 af, Depth= 0.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	3.410	49	Grassland, HSG A
*	11.860	69	Grassland, HSG B
	15.270	65	Weighted Average
	15.270		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	962	0.0437	0.71		**Lag/CN Method,**

Summary for Subcatchment 37ES: 37ES

Runoff = 2.92 cfs @ 12.12 hrs, Volume= 0.293 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	12.020	69	Grassland, HSG B
	12.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	643	0.0373	0.68		**Lag/CN Method,**

Summary for Subcatchment 38ES: 38ES

Runoff = 8.46 cfs @ 13.08 hrs, Volume= 2.344 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	1.470	49	Grassland, HSG A
*	56.850	69	Grassland, HSG B
*	22.090	79	Grassland, HSG C
	80.410	71	Weighted Average
	80.410		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
80.1	3,791	0.0224	0.79		**Lag/CN Method,**

Summary for Reach 1ER:

Inflow Area = 130.720 ac, 0.00% Impervious, Inflow Depth = 0.20" for 100yr event
Inflow = 7.35 cfs @ 12.92 hrs, Volume= 2.217 af
Outflow = 7.35 cfs @ 12.92 hrs, Volume= 2.217 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 2ER:

Inflow Area = 2,193.920 ac, 0.00% Impervious, Inflow Depth = 0.33" for 100yr event
Inflow = 150.95 cfs @ 13.62 hrs, Volume= 59.420 af
Outflow = 150.95 cfs @ 13.62 hrs, Volume= 59.420 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 3ER:

Inflow Area = 119.470 ac, 0.00% Impervious, Inflow Depth = 0.32" for 100yr event
Inflow = 9.95 cfs @ 13.03 hrs, Volume= 3.171 af
Outflow = 9.95 cfs @ 13.03 hrs, Volume= 3.171 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 4ER:

Inflow Area = 331.770 ac, 0.00% Impervious, Inflow Depth = 0.29" for 100yr event
Inflow = 27.29 cfs @ 12.64 hrs, Volume= 8.082 af
Outflow = 27.29 cfs @ 12.64 hrs, Volume= 8.082 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 5ER:

Inflow Area = 14.570 ac, 0.00% Impervious, Inflow Depth = 0.29" for 100yr event
Inflow = 2.60 cfs @ 12.25 hrs, Volume= 0.355 af
Outflow = 2.60 cfs @ 12.25 hrs, Volume= 0.355 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 6ER:

Inflow Area = 95.440 ac, 0.00% Impervious, Inflow Depth = 0.29" for 100yr event
Inflow = 12.14 cfs @ 12.44 hrs, Volume= 2.325 af
Outflow = 12.14 cfs @ 12.44 hrs, Volume= 2.325 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

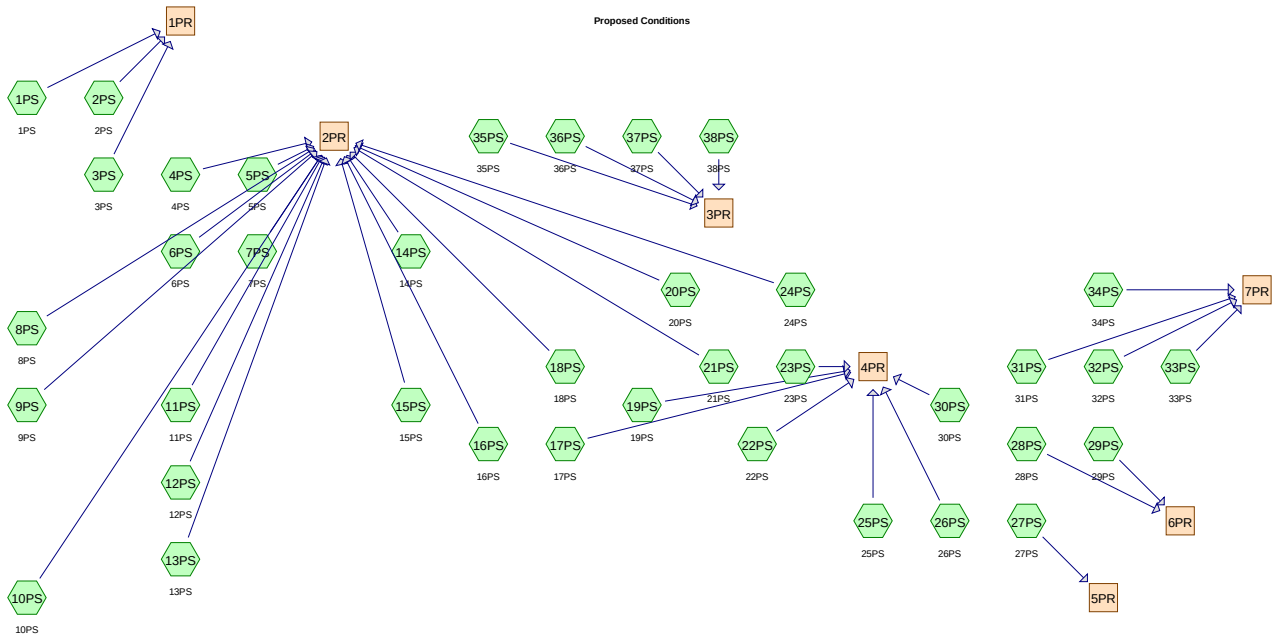
Summary for Reach 7ER:

Inflow Area = 92.280 ac, 0.00% Impervious, Inflow Depth = 0.29" for 100yr event
Inflow = 11.48 cfs @ 12.39 hrs, Volume= 2.248 af
Outflow = 11.48 cfs @ 12.39 hrs, Volume= 2.248 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Appendix D

Proposed HydroCAD Results



Subcat Reach Pond Link

Routing Diagram for Wautoma Pre Post
Prepared by j, Printed 1/13/2022
HydroCAD® 10.10-3a s/n 03363 © 2020 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
195.180	49	Grassland, HSG A (3PS, 4PS, 5PS, 11PS, 12PS, 15PS, 16PS, 36PS, 38PS)
2,649.440	69	Grassland, HSG B (1PS, 2PS, 3PS, 4PS, 5PS, 6PS, 7PS, 8PS, 9PS, 10PS, 11PS, 12PS, 13PS, 14PS, 15PS, 16PS, 17PS, 18PS, 19PS, 20PS, 21PS, 22PS, 23PS, 24PS, 25PS, 26PS, 27PS, 28PS, 29PS, 30PS, 31PS, 32PS, 33PS, 34PS, 35PS, 36PS, 37PS, 38PS)
36.570	79	Grassland, HSG C (11PS, 15PS, 16PS, 17PS, 18PS, 38PS)
96.980	98	Impervious (1PS, 2PS, 3PS, 4PS, 5PS, 6PS, 7PS, 8PS, 9PS, 10PS, 11PS, 12PS, 13PS, 14PS, 15PS, 16PS, 17PS, 18PS, 19PS, 21PS, 22PS, 23PS, 24PS, 26PS, 27PS, 28PS, 29PS, 30PS, 31PS, 32PS, 34PS, 35PS, 36PS, 38PS)
2,978.170	**69**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
195.180	HSG A	3PS, 4PS, 5PS, 11PS, 12PS, 15PS, 16PS, 36PS, 38PS
2,649.440	HSG B	1PS, 2PS, 3PS, 4PS, 5PS, 6PS, 7PS, 8PS, 9PS, 10PS, 11PS, 12PS, 13PS, 14PS, 15PS, 16PS, 17PS, 18PS, 19PS, 20PS, 21PS, 22PS, 23PS, 24PS, 25PS, 26PS, 27PS, 28PS, 29PS, 30PS, 31PS, 32PS, 33PS, 34PS, 35PS, 36PS, 37PS, 38PS
36.570	HSG C	11PS, 15PS, 16PS, 17PS, 18PS, 38PS
0.000	HSG D	
96.980	Other	1PS, 2PS, 3PS, 4PS, 5PS, 6PS, 7PS, 8PS, 9PS, 10PS, 11PS, 12PS, 13PS, 14PS, 15PS, 16PS, 17PS, 18PS, 19PS, 21PS, 22PS, 23PS, 24PS, 26PS, 27PS, 28PS, 29PS, 30PS, 31PS, 32PS, 34PS, 35PS, 36PS, 38PS
2,978.170		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
195.180	2,649.440	36.570	0.000	0.000	2,881.190	Grassland	1PS, 2PS, 3PS, 4PS, 5PS, 6PS, 7PS, 8PS, 9PS, 10PS, 11PS, 12PS, 13PS, 14PS, 15PS, 16PS, 17PS, 18PS, 19PS, 20PS, 21PS, 22PS, 23PS, 24PS, 25PS, 26PS, 27PS, 28PS, 29PS, 30PS, 31PS, 32PS, 33PS, 34PS, 35PS, 36PS, 37PS, 38PS
0.000	0.000	0.000	0.000	96.980	96.980	Impervious	1PS, 2PS, 3PS, 4PS, 5PS, 6PS, 7PS, 8PS, 9PS, 10PS, 11PS, 12PS, 13PS, 14PS, 15PS, 16PS, 17PS, 18PS, 19PS, 21PS, 22PS, 23PS, 24PS, 26PS, 27PS, 28PS, 29PS, 30PS, 31PS, 32PS, 34PS, 35PS, 36PS, 38PS
195.180	**2,649.440**	**36.570**	**0.000**	**96.980**	**2,978.170**	**TOTAL AREA**	

Summary for Subcatchment 1PS: 1PS

Runoff = 0.05 cfs @ 24.18 hrs, Volume= 0.030 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	74.900	69	Grassland, HSG B
*	2.690	98	Impervious
	77.590	70	Weighted Average
	74.900		96.53% Pervious Area
	2.690		3.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
68.3	2,780	0.0198	0.68		**Lag/CN Method,**

Summary for Subcatchment 2PS: 2PS

Runoff = 0.00 cfs @ 24.03 hrs, Volume= 0.002 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	9.300	69	Grassland, HSG B
*	0.010	98	Impervious
	9.310	69	Weighted Average
	9.300		99.89% Pervious Area
	0.010		0.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	835	0.0240	0.57		**Lag/CN Method,**

Summary for Subcatchment 3PS: 3PS

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	32.290	49	Grassland, HSG A
*	10.130	69	Grassland, HSG B
*	1.400	98	Impervious
	43.820	55	Weighted Average
	42.420		96.81% Pervious Area
	1.400		3.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.9	2,481	0.0226	0.48		**Lag/CN Method,**

Summary for Subcatchment 4PS: 4PS

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	67.350	49	Grassland, HSG A
*	49.690	69	Grassland, HSG B
*	2.790	98	Impervious
	119.830	58	Weighted Average
	117.040		97.67% Pervious Area
	2.790		2.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
181.4	6,434	0.0200	0.59		**Lag/CN Method,**

Summary for Subcatchment 5PS: 5PS

Runoff = 0.00 cfs @ 24.77 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	15.960	49	Grassland, HSG A
*	102.670	69	Grassland, HSG B
*	2.450	98	Impervious
	121.080	67	Weighted Average
	118.630		97.98% Pervious Area
	2.450		2.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
94.8	3,458	0.0171	0.61		**Lag/CN Method,**

Summary for Subcatchment 6PS: 6PS

Runoff = 0.01 cfs @ 24.03 hrs, Volume= 0.008 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	20.460	69	Grassland, HSG B
*	1.060	98	Impervious
	21.520	70	Weighted Average
	20.460		95.07% Pervious Area
	1.060		4.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.5	917	0.0207	0.56		**Lag/CN Method,**

Summary for Subcatchment 7PS: 7PS

Runoff = 0.03 cfs @ 24.15 hrs, Volume= 0.015 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	38.980	69	Grassland, HSG B
*	1.310	98	Impervious
	40.290	70	Weighted Average
	38.980		96.75% Pervious Area
	1.310		3.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
64.3	2,047	0.0137	0.53		**Lag/CN Method,**

Summary for Subcatchment 8PS: 8PS

Runoff = 0.02 cfs @ 24.01 hrs, Volume= 0.013 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	18.940	69	Grassland, HSG B
*	1.270	98	Impervious
	20.210	71	Weighted Average
	18.940		93.72% Pervious Area
	1.270		6.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.3	1,527	0.0255	0.70		**Lag/CN Method,**

Summary for Subcatchment 9PS: 9PS

Runoff = 0.02 cfs @ 17.94 hrs, Volume= 0.012 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	10.760	69	Grassland, HSG B
*	1.270	98	Impervious
	12.030	72	Weighted Average
	10.760		89.44% Pervious Area
	1.270		10.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	805	0.0398	0.79		**Lag/CN Method,**

Summary for Subcatchment 10PS: 10PS

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.001 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	1.450	69	Grassland, HSG B
*	0.040	98	Impervious
	1.490	70	Weighted Average
	1.450		97.32% Pervious Area
	0.040		2.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	284	0.0423	0.63		**Lag/CN Method,**

Summary for Subcatchment 11PS: 11PS

Runoff = 0.18 cfs @ 24.54 hrs, Volume= 0.080 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	10.790	49	Grassland, HSG A
*	400.770	69	Grassland, HSG B
*	3.910	79	Grassland, HSG C
*	11.740	98	Impervious
	427.210	69	Weighted Average
	415.470		97.25% Pervious Area
	11.740		2.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
129.3	9,180	0.0394	1.18		**Lag/CN Method,**

Summary for Subcatchment 12PS: 12PS

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	22.540	49	Grassland, HSG A
*	99.480	69	Grassland, HSG B
*	3.980	98	Impervious
	126.000	66	Weighted Average
	122.020		96.84% Pervious Area
	3.980		3.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
79.4	4,460	0.0386	0.94		**Lag/CN Method,**

Summary for Subcatchment 13PS: 13PS

Runoff = 0.02 cfs @ 24.02 hrs, Volume= 0.009 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	22.040	69	Grassland, HSG B
*	0.590	98	Impervious
	22.630	70	Weighted Average
	22.040		97.39% Pervious Area
	0.590		2.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.7	1,653	0.0563	1.03		**Lag/CN Method,**

Summary for Subcatchment 14PS: 14PS

Runoff = 8.59 cfs @ 12.05 hrs, Volume= 0.529 af, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	0.860	69	Grassland, HSG B
*	9.210	98	Impervious
	10.070	96	Weighted Average
	0.860		8.54% Pervious Area
	9.210		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	858	0.0128	1.08		**Lag/CN Method,**

Summary for Subcatchment 15PS: 15PS

Runoff = 0.35 cfs @ 24.59 hrs, Volume= 0.157 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	34.910	49	Grassland, HSG A
*	778.320	69	Grassland, HSG B
*	4.290	79	Grassland, HSG C
*	21.440	98	Impervious
	838.960	69	Weighted Average
	817.520		97.44% Pervious Area
	21.440		2.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
140.0	8,209	0.0281	0.98		**Lag/CN Method,**

Summary for Subcatchment 16PS: 16PS

Runoff = 0.07 cfs @ 24.33 hrs, Volume= 0.028 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	6.640	49	Grassland, HSG A
*	131.510	69	Grassland, HSG B
*	5.670	79	Grassland, HSG C
*	4.240	98	Impervious
	148.060	69	Weighted Average
	143.820		97.14% Pervious Area
	4.240		2.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
96.8	5,558	0.0315	0.96		**Lag/CN Method,**

Summary for Subcatchment 17PS: 17PS

Runoff = 0.07 cfs @ 24.22 hrs, Volume= 0.038 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	93.520	69	Grassland, HSG B
*	0.900	79	Grassland, HSG C
*	4.160	98	Impervious
	98.580	70	Weighted Average
	94.420		95.78% Pervious Area
	4.160		4.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
92.0	5,098	0.0288	0.92		**Lag/CN Method,**

Summary for Subcatchment 18PS: 18PS

Runoff = 0.13 cfs @ 24.27 hrs, Volume= 0.075 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	189.100	69	Grassland, HSG B
*	0.620	79	Grassland, HSG C
*	4.380	98	Impervious
	194.100	70	Weighted Average
	189.720		97.74% Pervious Area
	4.380		2.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
107.3	5,588	0.0245	0.87		**Lag/CN Method,**

Summary for Subcatchment 19PS: 19PS

Runoff = 0.02 cfs @ 24.03 hrs, Volume= 0.012 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	28.880	69	Grassland, HSG B
*	1.500	98	Impervious
	30.380	70	Weighted Average
	28.880		95.06% Pervious Area
	1.500		4.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.7	1,535	0.0280	0.72		**Lag/CN Method,**

Summary for Subcatchment 20PS: 20PS

Runoff = 0.00 cfs @ 23.99 hrs, Volume= 0.001 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	5.540	69	Grassland, HSG B
	5.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	477	0.0294	0.57		**Lag/CN Method,**

Summary for Subcatchment 21PS: 21PS

Runoff = 0.05 cfs @ 24.05 hrs, Volume= 0.027 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	69.470	69	Grassland, HSG B
*	1.430	98	Impervious
	70.900	70	Weighted Average
	69.470		97.98% Pervious Area
	1.430		2.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.3	2,203	0.0413	0.94		**Lag/CN Method,**

Summary for Subcatchment 22PS: 22PS

Runoff = 0.01 cfs @ 17.76 hrs, Volume= 0.005 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	4.760	69	Grassland, HSG B
*	0.460	98	Impervious
	5.220	72	Weighted Average
	4.760		91.19% Pervious Area
	0.460		8.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	603	0.0763	1.04		**Lag/CN Method,**

Summary for Subcatchment 23PS: 23PS

Runoff = 0.01 cfs @ 15.39 hrs, Volume= 0.008 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	4.550	69	Grassland, HSG B
*	0.780	98	Impervious
	5.330	73	Weighted Average
	4.550		85.37% Pervious Area
	0.780		14.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.6	473	0.0148	0.45		**Lag/CN Method,**

Summary for Subcatchment 24PS: 24PS

Runoff = 0.01 cfs @ 24.03 hrs, Volume= 0.003 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	13.780	69	Grassland, HSG B
*	0.220	98	Impervious
	14.000	69	Weighted Average
	13.780		98.43% Pervious Area
	0.220		1.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	1,204	0.0532	0.92		**Lag/CN Method,**

Summary for Subcatchment 25PS: 25PS

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.001 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	6.880	69	Grassland, HSG B
	6.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	488	0.0656	0.85		**Lag/CN Method,**

Summary for Subcatchment 26PS: 26PS

Runoff = 0.10 cfs @ 24.10 hrs, Volume= 0.055 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	139.330	69	Grassland, HSG B
*	4.580	98	Impervious
	143.910	70	Weighted Average
	139.330		96.82% Pervious Area
	4.580		3.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.2	2,319	0.0263	0.75		**Lag/CN Method,**

Summary for Subcatchment 27PS: 27PS

Runoff = 0.01 cfs @ 23.99 hrs, Volume= 0.010 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	13.750	69	Grassland, HSG B
*	0.820	98	Impervious
	14.570	71	Weighted Average
	13.750		94.37% Pervious Area
	0.820		5.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	1,092	0.0357	0.78		**Lag/CN Method,**

Summary for Subcatchment 28PS: 28PS

Runoff = 0.06 cfs @ 24.04 hrs, Volume= 0.032 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	82.740	69	Grassland, HSG B
*	1.880	98	Impervious
	84.620	70	Weighted Average
	82.740		97.78% Pervious Area
	1.880		2.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.3	1,958	0.0378	0.87		**Lag/CN Method,**

Summary for Subcatchment 29PS: 29PS

Runoff = 0.01 cfs @ 24.00 hrs, Volume= 0.007 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	10.120	69	Grassland, HSG B
*	0.700	98	Impervious
	10.820	71	Weighted Average
	10.120		93.53% Pervious Area
	0.700		6.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	923	0.0607	0.98		**Lag/CN Method,**

Summary for Subcatchment 30PS: 30PS

Runoff = 0.04 cfs @ 24.05 hrs, Volume= 0.027 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	38.040	69	Grassland, HSG B
*	3.430	98	Impervious
	41.470	71	Weighted Average
	38.040		91.73% Pervious Area
	3.430		8.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.5	1,164	0.0249	0.66		**Lag/CN Method,**

Summary for Subcatchment 31PS: 31PS

Runoff = 0.01 cfs @ 24.00 hrs, Volume= 0.006 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	14.890	69	Grassland, HSG B
*	0.300	98	Impervious
	15.190	70	Weighted Average
	14.890		98.03% Pervious Area
	0.300		1.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.5	1,250	0.0464	0.89		**Lag/CN Method,**

Summary for Subcatchment 32PS: 32PS

Runoff = 0.01 cfs @ 24.05 hrs, Volume= 0.005 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	26.240	69	Grassland, HSG B
*	0.130	98	Impervious
	26.370	69	Weighted Average
	26.240		99.51% Pervious Area
	0.130		0.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.4	1,498	0.0393	0.82		**Lag/CN Method,**

Summary for Subcatchment 33PS: 33PS

Runoff = 0.00 cfs @ 24.03 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	2.140	69	Grassland, HSG B
	2.140		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	813	0.0271	0.60		**Lag/CN Method,**

Summary for Subcatchment 34PS: 34PS

Runoff = 0.03 cfs @ 24.06 hrs, Volume= 0.019 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	47.290	69	Grassland, HSG B
*	1.290	98	Impervious
	48.580	70	Weighted Average
	47.290		97.34% Pervious Area
	1.290		2.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.1	1,866	0.0263	0.72		**Lag/CN Method,**

Summary for Subcatchment 35PS: 35PS

Runoff = 0.01 cfs @ 17.84 hrs, Volume= 0.012 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	10.590	69	Grassland, HSG B
*	1.180	98	Impervious
	11.770	72	Weighted Average
	10.590		89.97% Pervious Area
	1.180		10.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	754	0.0531	0.90		**Lag/CN Method,**

Summary for Subcatchment 36PS: 36PS

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	3.230	49	Grassland, HSG A
*	11.490	69	Grassland, HSG B
*	0.550	98	Impervious
	15.270	66	Weighted Average
	14.720		96.40% Pervious Area
	0.550		3.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	962	0.0437	0.73		**Lag/CN Method,**

Summary for Subcatchment 37PS: 37PS

Runoff = 0.01 cfs @ 23.99 hrs, Volume= 0.002 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	12.020	69	Grassland, HSG B
	12.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	643	0.0373	0.68		**Lag/CN Method,**

Summary for Subcatchment 38PS: 38PS

Runoff = 0.14 cfs @ 16.26 hrs, Volume= 0.115 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 2yr Rainfall=1.00"

	Area (ac)	CN	Description
*	1.470	49	Grassland, HSG A
*	54.060	69	Grassland, HSG B
*	21.180	79	Grassland, HSG C
*	3.700	98	Impervious
	80.410	73	Weighted Average
	76.710		95.40% Pervious Area
	3.700		4.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
75.8	3,791	0.0224	0.83		**Lag/CN Method,**

Summary for Reach 1PR:

Inflow Area = 130.720 ac, 3.14% Impervious, Inflow Depth = 0.00" for 2yr event
Inflow = 0.06 cfs @ 24.08 hrs, Volume= 0.032 af
Outflow = 0.06 cfs @ 24.08 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 2PR:

Inflow Area = 2,193.920 ac, 3.07% Impervious, Inflow Depth = 0.01" for 2yr event
Inflow = 8.59 cfs @ 12.05 hrs, Volume= 0.957 af
Outflow = 8.59 cfs @ 12.05 hrs, Volume= 0.957 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 3PR:

Inflow Area = 119.470 ac, 4.55% Impervious, Inflow Depth = 0.01" for 2yr event
Inflow = 0.15 cfs @ 16.41 hrs, Volume= 0.129 af
Outflow = 0.15 cfs @ 16.41 hrs, Volume= 0.129 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 4PR:

Inflow Area = 331.770 ac, 4.49% Impervious, Inflow Depth = 0.01" for 2yr event
Inflow = 0.24 cfs @ 24.03 hrs, Volume= 0.146 af
Outflow = 0.24 cfs @ 24.03 hrs, Volume= 0.146 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 5PR:

Inflow Area = 14.570 ac, 5.63% Impervious, Inflow Depth = 0.01" for 2yr event
Inflow = 0.01 cfs @ 23.99 hrs, Volume= 0.010 af
Outflow = 0.01 cfs @ 23.99 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 6PR:

Inflow Area = 95.440 ac, 2.70% Impervious, Inflow Depth = 0.00" for 2yr event
Inflow = 0.07 cfs @ 24.01 hrs, Volume= 0.040 af
Outflow = 0.07 cfs @ 24.01 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 7PR:

Inflow Area = 92.280 ac, 1.86% Impervious, Inflow Depth = 0.00" for 2yr event
Inflow = 0.06 cfs @ 24.03 hrs, Volume= 0.030 af
Outflow = 0.06 cfs @ 24.03 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1PS: 1PS

Runoff = 1.67 cfs @ 13.11 hrs, Volume= 0.710 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	74.900	69	Grassland, HSG B
*	2.690	98	Impervious
	77.590	70	Weighted Average
	74.900		96.53% Pervious Area
	2.690		3.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
68.3	2,780	0.0198	0.68		**Lag/CN Method,**

Summary for Subcatchment 2PS: 2PS

Runoff = 0.22 cfs @ 12.37 hrs, Volume= 0.073 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	9.300	69	Grassland, HSG B
*	0.010	98	Impervious
	9.310	69	Weighted Average
	9.300		99.89% Pervious Area
	0.010		0.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	835	0.0240	0.57		**Lag/CN Method,**

Summary for Subcatchment 3PS: 3PS

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	32.290	49	Grassland, HSG A
*	10.130	69	Grassland, HSG B
*	1.400	98	Impervious
	43.820	55	Weighted Average
	42.420		96.81% Pervious Area
	1.400		3.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.9	2,481	0.0226	0.48		**Lag/CN Method,**

Summary for Subcatchment 4PS: 4PS

Runoff = 0.07 cfs @ 24.83 hrs, Volume= 0.031 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	67.350	49	Grassland, HSG A
*	49.690	69	Grassland, HSG B
*	2.790	98	Impervious
	119.830	58	Weighted Average
	117.040		97.67% Pervious Area
	2.790		2.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
181.4	6,434	0.0200	0.59		**Lag/CN Method,**

Summary for Subcatchment 5PS: 5PS

Runoff = 1.05 cfs @ 14.19 hrs, Volume= 0.689 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	15.960	49	Grassland, HSG A
*	102.670	69	Grassland, HSG B
*	2.450	98	Impervious
	121.080	67	Weighted Average
	118.630		97.98% Pervious Area
	2.450		2.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
94.8	3,458	0.0171	0.61		**Lag/CN Method,**

Summary for Subcatchment 6PS: 6PS

Runoff = 0.70 cfs @ 12.39 hrs, Volume= 0.197 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	20.460	69	Grassland, HSG B
*	1.060	98	Impervious
	21.520	70	Weighted Average
	20.460		95.07% Pervious Area
	1.060		4.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.5	917	0.0207	0.56		**Lag/CN Method,**

Summary for Subcatchment 7PS: 7PS

Runoff = 0.90 cfs @ 13.05 hrs, Volume= 0.368 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	38.980	69	Grassland, HSG B
*	1.310	98	Impervious
	40.290	70	Weighted Average
	38.980		96.75% Pervious Area
	1.310		3.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
64.3	2,047	0.0137	0.53		**Lag/CN Method,**

Summary for Subcatchment 8PS: 8PS

Runoff = 0.77 cfs @ 12.52 hrs, Volume= 0.212 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	18.940	69	Grassland, HSG B
*	1.270	98	Impervious
	20.210	71	Weighted Average
	18.940		93.72% Pervious Area
	1.270		6.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.3	1,527	0.0255	0.70		**Lag/CN Method,**

Summary for Subcatchment 9PS: 9PS

Runoff = 0.95 cfs @ 12.17 hrs, Volume= 0.144 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	10.760	69	Grassland, HSG B
*	1.270	98	Impervious
	12.030	72	Weighted Average
	10.760		89.44% Pervious Area
	1.270		10.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	805	0.0398	0.79		**Lag/CN Method,**

Summary for Subcatchment 10PS: 10PS

Runoff = 0.10 cfs @ 12.05 hrs, Volume= 0.014 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	1.450	69	Grassland, HSG B
*	0.040	98	Impervious
	1.490	70	Weighted Average
	1.450		97.32% Pervious Area
	0.040		2.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	284	0.0423	0.63		**Lag/CN Method,**

Summary for Subcatchment 11PS: 11PS

Runoff = 5.52 cfs @ 14.33 hrs, Volume= 3.372 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	10.790	49	Grassland, HSG A
*	400.770	69	Grassland, HSG B
*	3.910	79	Grassland, HSG C
*	11.740	98	Impervious
	427.210	69	Weighted Average
	415.470		97.25% Pervious Area
	11.740		2.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
129.3	9,180	0.0394	1.18		**Lag/CN Method,**

Summary for Subcatchment 12PS: 12PS

Runoff = 0.86 cfs @ 14.20 hrs, Volume= 0.596 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	22.540	49	Grassland, HSG A
*	99.480	69	Grassland, HSG B
*	3.980	98	Impervious
	126.000	66	Weighted Average
	122.020		96.84% Pervious Area
	3.980		3.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
79.4	4,460	0.0386	0.94		**Lag/CN Method,**

Summary for Subcatchment 13PS: 13PS

Runoff = 0.74 cfs @ 12.37 hrs, Volume= 0.207 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	22.040	69	Grassland, HSG B
*	0.590	98	Impervious
	22.630	70	Weighted Average
	22.040		97.39% Pervious Area
	0.590		2.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.7	1,653	0.0563	1.03		**Lag/CN Method,**

Summary for Subcatchment 14PS: 14PS

Runoff = 15.80 cfs @ 12.05 hrs, Volume= 0.998 af, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	0.860	69	Grassland, HSG B
*	9.210	98	Impervious
	10.070	96	Weighted Average
	0.860		8.54% Pervious Area
	9.210		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	858	0.0128	1.08		**Lag/CN Method,**

Summary for Subcatchment 15PS: 15PS

Runoff = 10.60 cfs @ 14.49 hrs, Volume= 6.623 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	34.910	49	Grassland, HSG A
*	778.320	69	Grassland, HSG B
*	4.290	79	Grassland, HSG C
*	21.440	98	Impervious
	838.960	69	Weighted Average
	817.520		97.44% Pervious Area
	21.440		2.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
140.0	8,209	0.0281	0.98		**Lag/CN Method,**

Summary for Subcatchment 16PS: 16PS

Runoff = 2.15 cfs @ 13.71 hrs, Volume= 1.169 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	6.640	49	Grassland, HSG A
*	131.510	69	Grassland, HSG B
*	5.670	79	Grassland, HSG C
*	4.240	98	Impervious
	148.060	69	Weighted Average
	143.820		97.14% Pervious Area
	4.240		2.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
96.8	5,558	0.0315	0.96		**Lag/CN Method,**

Summary for Subcatchment 17PS: 17PS

Runoff = 1.88 cfs @ 13.57 hrs, Volume= 0.902 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	93.520	69	Grassland, HSG B
*	0.900	79	Grassland, HSG C
*	4.160	98	Impervious
	98.580	70	Weighted Average
	94.420		95.78% Pervious Area
	4.160		4.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
92.0	5,098	0.0288	0.92		**Lag/CN Method,**

Summary for Subcatchment 18PS: 18PS

Runoff = 3.46 cfs @ 13.85 hrs, Volume= 1.775 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	189.100	69	Grassland, HSG B
*	0.620	79	Grassland, HSG C
*	4.380	98	Impervious
	194.100	70	Weighted Average
	189.720		97.74% Pervious Area
	4.380		2.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
107.3	5,588	0.0245	0.87		**Lag/CN Method,**

Summary for Subcatchment 19PS: 19PS

Runoff = 0.88 cfs @ 12.54 hrs, Volume= 0.278 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	28.880	69	Grassland, HSG B
*	1.500	98	Impervious
	30.380	70	Weighted Average
	28.880		95.06% Pervious Area
	1.500		4.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.7	1,535	0.0280	0.72		**Lag/CN Method,**

Summary for Subcatchment 20PS: 20PS

Runoff = 0.17 cfs @ 12.17 hrs, Volume= 0.044 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	5.540	69	Grassland, HSG B
	5.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	477	0.0294	0.57		**Lag/CN Method,**

Summary for Subcatchment 21PS: 21PS

Runoff = 1.97 cfs @ 12.60 hrs, Volume= 0.648 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	69.470	69	Grassland, HSG B
*	1.430	98	Impervious
	70.900	70	Weighted Average
	69.470		97.98% Pervious Area
	1.430		2.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.3	2,203	0.0413	0.94		**Lag/CN Method,**

Summary for Subcatchment 22PS: 22PS

Runoff = 0.59 cfs @ 12.06 hrs, Volume= 0.062 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	4.760	69	Grassland, HSG B
*	0.460	98	Impervious
	5.220	72	Weighted Average
	4.760		91.19% Pervious Area
	0.460		8.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	603	0.0763	1.04		**Lag/CN Method,**

Summary for Subcatchment 23PS: 23PS

Runoff = 0.53 cfs @ 12.17 hrs, Volume= 0.072 af, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	4.550	69	Grassland, HSG B
*	0.780	98	Impervious
	5.330	73	Weighted Average
	4.550		85.37% Pervious Area
	0.780		14.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.6	473	0.0148	0.45		**Lag/CN Method,**

Summary for Subcatchment 24PS: 24PS

Runoff = 0.35 cfs @ 12.32 hrs, Volume= 0.111 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	13.780	69	Grassland, HSG B
*	0.220	98	Impervious
	14.000	69	Weighted Average
	13.780		98.43% Pervious Area
	0.220		1.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	1,204	0.0532	0.92		**Lag/CN Method,**

Summary for Subcatchment 25PS: 25PS

Runoff = 0.26 cfs @ 12.09 hrs, Volume= 0.054 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	6.880	69	Grassland, HSG B
	6.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	488	0.0656	0.85		**Lag/CN Method,**

Summary for Subcatchment 26PS: 26PS

Runoff = 3.54 cfs @ 12.81 hrs, Volume= 1.316 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	139.330	69	Grassland, HSG B
*	4.580	98	Impervious
	143.910	70	Weighted Average
	139.330		96.82% Pervious Area
	4.580		3.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.2	2,319	0.0263	0.75		**Lag/CN Method,**

Summary for Subcatchment 27PS: 27PS

Runoff = 0.70 cfs @ 12.29 hrs, Volume= 0.153 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	13.750	69	Grassland, HSG B
*	0.820	98	Impervious
	14.570	71	Weighted Average
	13.750		94.37% Pervious Area
	0.820		5.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	1,092	0.0357	0.78		**Lag/CN Method,**

Summary for Subcatchment 28PS: 28PS

Runoff = 2.40 cfs @ 12.57 hrs, Volume= 0.774 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	82.740	69	Grassland, HSG B
*	1.880	98	Impervious
	84.620	70	Weighted Average
	82.740		97.78% Pervious Area
	1.880		2.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.3	1,958	0.0378	0.87		**Lag/CN Method,**

Summary for Subcatchment 29PS: 29PS

Runoff = 0.67 cfs @ 12.16 hrs, Volume= 0.114 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	10.120	69	Grassland, HSG B
*	0.700	98	Impervious
	10.820	71	Weighted Average
	10.120		93.53% Pervious Area
	0.700		6.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	923	0.0607	0.98		**Lag/CN Method,**

Summary for Subcatchment 30PS: 30PS

Runoff = 1.76 cfs @ 12.39 hrs, Volume= 0.435 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	38.040	69	Grassland, HSG B
*	3.430	98	Impervious
	41.470	71	Weighted Average
	38.040		91.73% Pervious Area
	3.430		8.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.5	1,164	0.0249	0.66		**Lag/CN Method,**

Summary for Subcatchment 31PS: 31PS

Runoff = 0.53 cfs @ 12.31 hrs, Volume= 0.139 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	14.890	69	Grassland, HSG B
*	0.300	98	Impervious
	15.190	70	Weighted Average
	14.890		98.03% Pervious Area
	0.300		1.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.5	1,250	0.0464	0.89		**Lag/CN Method,**

Summary for Subcatchment 32PS: 32PS

Runoff = 0.59 cfs @ 12.50 hrs, Volume= 0.208 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	26.240	69	Grassland, HSG B
*	0.130	98	Impervious
	26.370	69	Weighted Average
	26.240		99.51% Pervious Area
	0.130		0.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.4	1,498	0.0393	0.82		**Lag/CN Method,**

Summary for Subcatchment 33PS: 33PS

Runoff = 0.05 cfs @ 12.33 hrs, Volume= 0.017 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	2.140	69	Grassland, HSG B
	2.140		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	813	0.0271	0.60		**Lag/CN Method,**

Summary for Subcatchment 34PS: 34PS

Runoff = 1.30 cfs @ 12.67 hrs, Volume= 0.444 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	47.290	69	Grassland, HSG B
*	1.290	98	Impervious
	48.580	70	Weighted Average
	47.290		97.34% Pervious Area
	1.290		2.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.1	1,866	0.0263	0.72		**Lag/CN Method,**

Summary for Subcatchment 35PS: 35PS

Runoff = 1.06 cfs @ 12.12 hrs, Volume= 0.141 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	10.590	69	Grassland, HSG B
*	1.180	98	Impervious
	11.770	72	Weighted Average
	10.590		89.97% Pervious Area
	1.180		10.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	754	0.0531	0.90		**Lag/CN Method,**

Summary for Subcatchment 36PS: 36PS

Runoff = 0.12 cfs @ 12.71 hrs, Volume= 0.072 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	3.230	49	Grassland, HSG A
*	11.490	69	Grassland, HSG B
*	0.550	98	Impervious
	15.270	66	Weighted Average
	14.720		96.40% Pervious Area
	0.550		3.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	962	0.0437	0.73		**Lag/CN Method,**

Summary for Subcatchment 37PS: 37PS

Runoff = 0.35 cfs @ 12.20 hrs, Volume= 0.095 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	12.020	69	Grassland, HSG B
	12.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	643	0.0373	0.68		**Lag/CN Method,**

Summary for Subcatchment 38PS: 38PS

Runoff = 3.17 cfs @ 13.11 hrs, Volume= 1.088 af, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.60"

	Area (ac)	CN	Description
*	1.470	49	Grassland, HSG A
*	54.060	69	Grassland, HSG B
*	21.180	79	Grassland, HSG C
*	3.700	98	Impervious
	80.410	73	Weighted Average
	76.710		95.40% Pervious Area
	3.700		4.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
75.8	3,791	0.0224	0.83		**Lag/CN Method,**

Summary for Reach 1PR:

Inflow Area = 130.720 ac, 3.14% Impervious, Inflow Depth = 0.07" for 10yr event
Inflow = 1.81 cfs @ 13.10 hrs, Volume= 0.783 af
Outflow = 1.81 cfs @ 13.10 hrs, Volume= 0.783 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 2PR:

Inflow Area = 2,193.920 ac, 3.07% Impervious, Inflow Depth = 0.09" for 10yr event
Inflow = 26.20 cfs @ 14.26 hrs, Volume= 17.197 af
Outflow = 26.20 cfs @ 14.26 hrs, Volume= 17.197 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 3PR:

Inflow Area = 119.470 ac, 4.55% Impervious, Inflow Depth = 0.14" for 10yr event
Inflow = 3.72 cfs @ 13.07 hrs, Volume= 1.396 af
Outflow = 3.72 cfs @ 13.07 hrs, Volume= 1.396 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 4PR:

Inflow Area = 331.770 ac, 4.49% Impervious, Inflow Depth = 0.11" for 10yr event
Inflow = 6.86 cfs @ 12.82 hrs, Volume= 3.120 af
Outflow = 6.86 cfs @ 12.82 hrs, Volume= 3.120 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 5PR:

Inflow Area = 14.570 ac, 5.63% Impervious, Inflow Depth = 0.13" for 10yr event
Inflow = 0.70 cfs @ 12.29 hrs, Volume= 0.153 af
Outflow = 0.70 cfs @ 12.29 hrs, Volume= 0.153 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 6PR:

Inflow Area = 95.440 ac, 2.70% Impervious, Inflow Depth = 0.11" for 10yr event
Inflow = 2.73 cfs @ 12.55 hrs, Volume= 0.887 af
Outflow = 2.73 cfs @ 12.55 hrs, Volume= 0.887 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 7PR:

Inflow Area = 92.280 ac, 1.86% Impervious, Inflow Depth = 0.11" for 10yr event
Inflow = 2.30 cfs @ 12.60 hrs, Volume= 0.808 af
Outflow = 2.30 cfs @ 12.60 hrs, Volume= 0.808 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1PS: 1PS

Runoff = 3.28 cfs @ 13.01 hrs, Volume= 1.099 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	74.900	69	Grassland, HSG B
*	2.690	98	Impervious
	77.590	70	Weighted Average
	74.900		96.53% Pervious Area
	2.690		3.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
68.3	2,780	0.0198	0.68		**Lag/CN Method,**

Summary for Subcatchment 2PS: 2PS

Runoff = 0.56 cfs @ 12.29 hrs, Volume= 0.117 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	9.300	69	Grassland, HSG B
*	0.010	98	Impervious
	9.310	69	Weighted Average
	9.300		99.89% Pervious Area
	0.010		0.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	835	0.0240	0.57		**Lag/CN Method,**

Summary for Subcatchment 3PS: 3PS

Runoff = 0.03 cfs @ 24.31 hrs, Volume= 0.012 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	32.290	49	Grassland, HSG A
*	10.130	69	Grassland, HSG B
*	1.400	98	Impervious
	43.820	55	Weighted Average
	42.420		96.81% Pervious Area
	1.400		3.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.9	2,481	0.0226	0.48		**Lag/CN Method,**

Summary for Subcatchment 4PS: 4PS

Runoff = 0.21 cfs @ 24.39 hrs, Volume= 0.163 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	67.350	49	Grassland, HSG A
*	49.690	69	Grassland, HSG B
*	2.790	98	Impervious
	119.830	58	Weighted Average
	117.040		97.67% Pervious Area
	2.790		2.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
181.4	6,434	0.0200	0.59		**Lag/CN Method,**

Summary for Subcatchment 5PS: 5PS

Runoff = 2.27 cfs @ 13.61 hrs, Volume= 1.167 af, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	15.960	49	Grassland, HSG A
*	102.670	69	Grassland, HSG B
*	2.450	98	Impervious
	121.080	67	Weighted Average
	118.630		97.98% Pervious Area
	2.450		2.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
94.8	3,458	0.0171	0.61		**Lag/CN Method,**

Summary for Subcatchment 6PS: 6PS

Runoff = 1.55 cfs @ 12.33 hrs, Volume= 0.305 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	20.460	69	Grassland, HSG B
*	1.060	98	Impervious
	21.520	70	Weighted Average
	20.460		95.07% Pervious Area
	1.060		4.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.5	917	0.0207	0.56		**Lag/CN Method,**

Summary for Subcatchment 7PS: 7PS

Runoff = 1.78 cfs @ 12.95 hrs, Volume= 0.571 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	38.980	69	Grassland, HSG B
*	1.310	98	Impervious
	40.290	70	Weighted Average
	38.980		96.75% Pervious Area
	1.310		3.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
64.3	2,047	0.0137	0.53		**Lag/CN Method,**

Summary for Subcatchment 8PS: 8PS

Runoff = 1.52 cfs @ 12.46 hrs, Volume= 0.321 af, Depth= 0.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	18.940	69	Grassland, HSG B
*	1.270	98	Impervious
	20.210	71	Weighted Average
	18.940		93.72% Pervious Area
	1.270		6.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.3	1,527	0.0255	0.70		**Lag/CN Method,**

Summary for Subcatchment 9PS: 9PS

Runoff = 1.85 cfs @ 12.15 hrs, Volume= 0.213 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	10.760	69	Grassland, HSG B
*	1.270	98	Impervious
	12.030	72	Weighted Average
	10.760		89.44% Pervious Area
	1.270		10.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	805	0.0398	0.79		**Lag/CN Method,**

Summary for Subcatchment 10PS: 10PS

Runoff = 0.23 cfs @ 12.03 hrs, Volume= 0.021 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	1.450	69	Grassland, HSG B
*	0.040	98	Impervious
	1.490	70	Weighted Average
	1.450		97.32% Pervious Area
	0.040		2.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	284	0.0423	0.63		**Lag/CN Method,**

Summary for Subcatchment 11PS: 11PS

Runoff = 10.54 cfs @ 14.10 hrs, Volume= 5.363 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	10.790	49	Grassland, HSG A
*	400.770	69	Grassland, HSG B
*	3.910	79	Grassland, HSG C
*	11.740	98	Impervious
	427.210	69	Weighted Average
	415.470		97.25% Pervious Area
	11.740		2.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
129.3	9,180	0.0394	1.18		**Lag/CN Method,**

Summary for Subcatchment 12PS: 12PS

Runoff = 1.98 cfs @ 13.49 hrs, Volume= 1.051 af, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	22.540	49	Grassland, HSG A
*	99.480	69	Grassland, HSG B
*	3.980	98	Impervious
	126.000	66	Weighted Average
	122.020		96.84% Pervious Area
	3.980		3.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
79.4	4,460	0.0386	0.94		**Lag/CN Method,**

Summary for Subcatchment 13PS: 13PS

Runoff = 1.66 cfs @ 12.32 hrs, Volume= 0.321 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	22.040	69	Grassland, HSG B
*	0.590	98	Impervious
	22.630	70	Weighted Average
	22.040		97.39% Pervious Area
	0.590		2.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.7	1,653	0.0563	1.03		**Lag/CN Method,**

Summary for Subcatchment 14PS: 14PS

Runoff = 18.20 cfs @ 12.05 hrs, Volume= 1.159 af, Depth= 1.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	0.860	69	Grassland, HSG B
*	9.210	98	Impervious
	10.070	96	Weighted Average
	0.860		8.54% Pervious Area
	9.210		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	858	0.0128	1.08		**Lag/CN Method,**

Summary for Subcatchment 15PS: 15PS

Runoff = 20.07 cfs @ 14.30 hrs, Volume= 10.532 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	34.910	49	Grassland, HSG A
*	778.320	69	Grassland, HSG B
*	4.290	79	Grassland, HSG C
*	21.440	98	Impervious
	838.960	69	Weighted Average
	817.520		97.44% Pervious Area
	21.440		2.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
140.0	8,209	0.0281	0.98		**Lag/CN Method,**

Summary for Subcatchment 16PS: 16PS

Runoff = 4.27 cfs @ 13.55 hrs, Volume= 1.859 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	6.640	49	Grassland, HSG A
*	131.510	69	Grassland, HSG B
*	5.670	79	Grassland, HSG C
*	4.240	98	Impervious
	148.060	69	Weighted Average
	143.820		97.14% Pervious Area
	4.240		2.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
96.8	5,558	0.0315	0.96		**Lag/CN Method,**

Summary for Subcatchment 17PS: 17PS

Runoff = 3.57 cfs @ 13.41 hrs, Volume= 1.397 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	93.520	69	Grassland, HSG B
*	0.900	79	Grassland, HSG C
*	4.160	98	Impervious
	98.580	70	Weighted Average
	94.420		95.78% Pervious Area
	4.160		4.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
92.0	5,098	0.0288	0.92		**Lag/CN Method,**

Summary for Subcatchment 18PS: 18PS

Runoff = 6.36 cfs @ 13.69 hrs, Volume= 2.750 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	189.100	69	Grassland, HSG B
*	0.620	79	Grassland, HSG C
*	4.380	98	Impervious
	194.100	70	Weighted Average
	189.720		97.74% Pervious Area
	4.380		2.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
107.3	5,588	0.0245	0.87		**Lag/CN Method,**

Summary for Subcatchment 19PS: 19PS

Runoff = 1.87 cfs @ 12.47 hrs, Volume= 0.430 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	28.880	69	Grassland, HSG B
*	1.500	98	Impervious
	30.380	70	Weighted Average
	28.880		95.06% Pervious Area
	1.500		4.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.7	1,535	0.0280	0.72		**Lag/CN Method,**

Summary for Subcatchment 20PS: 20PS

Runoff = 0.47 cfs @ 12.13 hrs, Volume= 0.070 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	5.540	69	Grassland, HSG B
	5.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	477	0.0294	0.57		**Lag/CN Method,**

Summary for Subcatchment 21PS: 21PS

Runoff = 4.13 cfs @ 12.53 hrs, Volume= 1.005 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	69.470	69	Grassland, HSG B
*	1.430	98	Impervious
	70.900	70	Weighted Average
	69.470		97.98% Pervious Area
	1.430		2.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.3	2,203	0.0413	0.94		**Lag/CN Method,**

Summary for Subcatchment 22PS: 22PS

Runoff = 1.13 cfs @ 12.05 hrs, Volume= 0.093 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	4.760	69	Grassland, HSG B
*	0.460	98	Impervious
	5.220	72	Weighted Average
	4.760		91.19% Pervious Area
	0.460		8.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	603	0.0763	1.04		**Lag/CN Method,**

Summary for Subcatchment 23PS: 23PS

Runoff = 0.96 cfs @ 12.15 hrs, Volume= 0.105 af, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	4.550	69	Grassland, HSG B
*	0.780	98	Impervious
	5.330	73	Weighted Average
	4.550		85.37% Pervious Area
	0.780		14.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.6	473	0.0148	0.45		**Lag/CN Method,**

Summary for Subcatchment 24PS: 24PS

Runoff = 0.90 cfs @ 12.25 hrs, Volume= 0.176 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	13.780	69	Grassland, HSG B
*	0.220	98	Impervious
	14.000	69	Weighted Average
	13.780		98.43% Pervious Area
	0.220		1.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	1,204	0.0532	0.92		**Lag/CN Method,**

Summary for Subcatchment 25PS: 25PS

Runoff = 0.75 cfs @ 12.07 hrs, Volume= 0.086 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	6.880	69	Grassland, HSG B
	6.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	488	0.0656	0.85		**Lag/CN Method,**

Summary for Subcatchment 26PS: 26PS

Runoff = 7.18 cfs @ 12.73 hrs, Volume= 2.039 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	139.330	69	Grassland, HSG B
*	4.580	98	Impervious
	143.910	70	Weighted Average
	139.330		96.82% Pervious Area
	4.580		3.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.2	2,319	0.0263	0.75		**Lag/CN Method,**

Summary for Subcatchment 27PS: 27PS

Runoff = 1.46 cfs @ 12.25 hrs, Volume= 0.232 af, Depth= 0.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	13.750	69	Grassland, HSG B
*	0.820	98	Impervious
	14.570	71	Weighted Average
	13.750		94.37% Pervious Area
	0.820		5.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	1,092	0.0357	0.78		**Lag/CN Method,**

Summary for Subcatchment 28PS: 28PS

Runoff = 5.09 cfs @ 12.50 hrs, Volume= 1.199 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	82.740	69	Grassland, HSG B
*	1.880	98	Impervious
	84.620	70	Weighted Average
	82.740		97.78% Pervious Area
	1.880		2.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.3	1,958	0.0378	0.87		**Lag/CN Method,**

Summary for Subcatchment 29PS: 29PS

Runoff = 1.42 cfs @ 12.14 hrs, Volume= 0.172 af, Depth= 0.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	10.120	69	Grassland, HSG B
*	0.700	98	Impervious
	10.820	71	Weighted Average
	10.120		93.53% Pervious Area
	0.700		6.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	923	0.0607	0.98		**Lag/CN Method,**

Summary for Subcatchment 30PS: 30PS

Runoff = 3.57 cfs @ 12.35 hrs, Volume= 0.659 af, Depth= 0.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	38.040	69	Grassland, HSG B
*	3.430	98	Impervious
	41.470	71	Weighted Average
	38.040		91.73% Pervious Area
	3.430		8.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.5	1,164	0.0249	0.66		**Lag/CN Method,**

Summary for Subcatchment 31PS: 31PS

Runoff = 1.21 cfs @ 12.26 hrs, Volume= 0.215 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	14.890	69	Grassland, HSG B
*	0.300	98	Impervious
	15.190	70	Weighted Average
	14.890		98.03% Pervious Area
	0.300		1.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.5	1,250	0.0464	0.89		**Lag/CN Method,**

Summary for Subcatchment 32PS: 32PS

Runoff = 1.41 cfs @ 12.40 hrs, Volume= 0.331 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	26.240	69	Grassland, HSG B
*	0.130	98	Impervious
	26.370	69	Weighted Average
	26.240		99.51% Pervious Area
	0.130		0.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.4	1,498	0.0393	0.82		**Lag/CN Method,**

Summary for Subcatchment 33PS: 33PS

Runoff = 0.14 cfs @ 12.26 hrs, Volume= 0.027 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	2.140	69	Grassland, HSG B
	2.140		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	813	0.0271	0.60		**Lag/CN Method,**

Summary for Subcatchment 34PS: 34PS

Runoff = 2.69 cfs @ 12.60 hrs, Volume= 0.688 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	47.290	69	Grassland, HSG B
*	1.290	98	Impervious
	48.580	70	Weighted Average
	47.290		97.34% Pervious Area
	1.290		2.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.1	1,866	0.0263	0.72		**Lag/CN Method,**

Summary for Subcatchment 35PS: 35PS

Runoff = 2.07 cfs @ 12.11 hrs, Volume= 0.209 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	10.590	69	Grassland, HSG B
*	1.180	98	Impervious
	11.770	72	Weighted Average
	10.590		89.97% Pervious Area
	1.180		10.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	754	0.0531	0.90		**Lag/CN Method,**

Summary for Subcatchment 36PS: 36PS

Runoff = 0.37 cfs @ 12.35 hrs, Volume= 0.127 af, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	3.230	49	Grassland, HSG A
*	11.490	69	Grassland, HSG B
*	0.550	98	Impervious
	15.270	66	Weighted Average
	14.720		96.40% Pervious Area
	0.550		3.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	962	0.0437	0.73		**Lag/CN Method,**

Summary for Subcatchment 37PS: 37PS

Runoff = 0.96 cfs @ 12.16 hrs, Volume= 0.151 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	12.020	69	Grassland, HSG B
	12.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	643	0.0373	0.68		**Lag/CN Method,**

Summary for Subcatchment 38PS: 38PS

Runoff = 5.38 cfs @ 13.05 hrs, Volume= 1.583 af, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 25yr Rainfall=1.80"

	Area (ac)	CN	Description
*	1.470	49	Grassland, HSG A
*	54.060	69	Grassland, HSG B
*	21.180	79	Grassland, HSG C
*	3.700	98	Impervious
	80.410	73	Weighted Average
	76.710		95.40% Pervious Area
	3.700		4.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
75.8	3,791	0.0224	0.83		**Lag/CN Method,**

Summary for Reach 1PR:

Inflow Area = 130.720 ac, 3.14% Impervious, Inflow Depth = 0.11" for 25yr event
Inflow = 3.53 cfs @ 13.00 hrs, Volume= 1.228 af
Outflow = 3.53 cfs @ 13.00 hrs, Volume= 1.228 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 2PR:

Inflow Area = 2,193.920 ac, 3.07% Impervious, Inflow Depth = 0.15" for 25yr event
Inflow = 48.71 cfs @ 13.96 hrs, Volume= 27.046 af
Outflow = 48.71 cfs @ 13.96 hrs, Volume= 27.046 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 3PR:

Inflow Area = 119.470 ac, 4.55% Impervious, Inflow Depth = 0.21" for 25yr event
Inflow = 6.27 cfs @ 13.02 hrs, Volume= 2.070 af
Outflow = 6.27 cfs @ 13.02 hrs, Volume= 2.070 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 4PR:

Inflow Area = 331.770 ac, 4.49% Impervious, Inflow Depth = 0.17" for 25yr event
Inflow = 13.27 cfs @ 12.71 hrs, Volume= 4.809 af
Outflow = 13.27 cfs @ 12.71 hrs, Volume= 4.809 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 5PR:

Inflow Area = 14.570 ac, 5.63% Impervious, Inflow Depth = 0.19" for 25yr event
Inflow = 1.46 cfs @ 12.25 hrs, Volume= 0.232 af
Outflow = 1.46 cfs @ 12.25 hrs, Volume= 0.232 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 6PR:

Inflow Area = 95.440 ac, 2.70% Impervious, Inflow Depth = 0.17" for 25yr event
Inflow = 5.66 cfs @ 12.48 hrs, Volume= 1.371 af
Outflow = 5.66 cfs @ 12.48 hrs, Volume= 1.371 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 7PR:

Inflow Area = 92.280 ac, 1.86% Impervious, Inflow Depth = 0.16" for 25yr event
Inflow = 4.85 cfs @ 12.48 hrs, Volume= 1.261 af
Outflow = 4.85 cfs @ 12.48 hrs, Volume= 1.261 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1PS: 1PS

Runoff = 8.01 cfs @ 12.89 hrs, Volume= 2.072 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	74.900	69	Grassland, HSG B
*	2.690	98	Impervious
	77.590	70	Weighted Average
	74.900		96.53% Pervious Area
	2.690		3.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
68.3	2,780	0.0198	0.68		**Lag/CN Method,**

Summary for Subcatchment 2PS: 2PS

Runoff = 1.68 cfs @ 12.25 hrs, Volume= 0.227 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	9.300	69	Grassland, HSG B
*	0.010	98	Impervious
	9.310	69	Weighted Average
	9.300		99.89% Pervious Area
	0.010		0.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	835	0.0240	0.57		**Lag/CN Method,**

Summary for Subcatchment 3PS: 3PS

Runoff = 0.16 cfs @ 16.69 hrs, Volume= 0.133 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	32.290	49	Grassland, HSG A
*	10.130	69	Grassland, HSG B
*	1.400	98	Impervious
	43.820	55	Weighted Average
	42.420		96.81% Pervious Area
	1.400		3.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.9	2,481	0.0226	0.48		**Lag/CN Method,**

Summary for Subcatchment 4PS: 4PS

Runoff = 0.84 cfs @ 16.74 hrs, Volume= 0.706 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	67.350	49	Grassland, HSG A
*	49.690	69	Grassland, HSG B
*	2.790	98	Impervious
	119.830	58	Weighted Average
	117.040		97.67% Pervious Area
	2.790		2.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
181.4	6,434	0.0200	0.59		**Lag/CN Method,**

Summary for Subcatchment 5PS: 5PS

Runoff = 6.49 cfs @ 13.40 hrs, Volume= 2.425 af, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	15.960	49	Grassland, HSG A
*	102.670	69	Grassland, HSG B
*	2.450	98	Impervious
	121.080	67	Weighted Average
	118.630		97.98% Pervious Area
	2.450		2.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
94.8	3,458	0.0171	0.61		**Lag/CN Method,**

Summary for Subcatchment 6PS: 6PS

Runoff = 4.16 cfs @ 12.28 hrs, Volume= 0.575 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	20.460	69	Grassland, HSG B
*	1.060	98	Impervious
	21.520	70	Weighted Average
	20.460		95.07% Pervious Area
	1.060		4.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.5	917	0.0207	0.56		**Lag/CN Method,**

Summary for Subcatchment 7PS: 7PS

Runoff = 4.35 cfs @ 12.83 hrs, Volume= 1.076 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	38.980	69	Grassland, HSG B
*	1.310	98	Impervious
	40.290	70	Weighted Average
	38.980		96.75% Pervious Area
	1.310		3.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
64.3	2,047	0.0137	0.53		**Lag/CN Method,**

Summary for Subcatchment 8PS: 8PS

Runoff = 3.71 cfs @ 12.41 hrs, Volume= 0.589 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	18.940	69	Grassland, HSG B
*	1.270	98	Impervious
	20.210	71	Weighted Average
	18.940		93.72% Pervious Area
	1.270		6.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.3	1,527	0.0255	0.70		**Lag/CN Method,**

Summary for Subcatchment 9PS: 9PS

Runoff = 4.27 cfs @ 12.13 hrs, Volume= 0.382 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	10.760	69	Grassland, HSG B
*	1.270	98	Impervious
	12.030	72	Weighted Average
	10.760		89.44% Pervious Area
	1.270		10.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	805	0.0398	0.79		**Lag/CN Method,**

Summary for Subcatchment 10PS: 10PS

Runoff = 0.62 cfs @ 12.01 hrs, Volume= 0.040 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	1.450	69	Grassland, HSG B
*	0.040	98	Impervious
	1.490	70	Weighted Average
	1.450		97.32% Pervious Area
	0.040		2.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	284	0.0423	0.63		**Lag/CN Method,**

Summary for Subcatchment 11PS: 11PS

Runoff = 25.35 cfs @ 13.92 hrs, Volume= 10.407 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	10.790	49	Grassland, HSG A
*	400.770	69	Grassland, HSG B
*	3.910	79	Grassland, HSG C
*	11.740	98	Impervious
	427.210	69	Weighted Average
	415.470		97.25% Pervious Area
	11.740		2.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
129.3	9,180	0.0394	1.18		**Lag/CN Method,**

Summary for Subcatchment 12PS: 12PS

Runoff = 6.37 cfs @ 13.17 hrs, Volume= 2.273 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	22.540	49	Grassland, HSG A
*	99.480	69	Grassland, HSG B
*	3.980	98	Impervious
	126.000	66	Weighted Average
	122.020		96.84% Pervious Area
	3.980		3.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
79.4	4,460	0.0386	0.94		**Lag/CN Method,**

Summary for Subcatchment 13PS: 13PS

Runoff = 4.48 cfs @ 12.27 hrs, Volume= 0.604 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	22.040	69	Grassland, HSG B
*	0.590	98	Impervious
	22.630	70	Weighted Average
	22.040		97.39% Pervious Area
	0.590		2.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.7	1,653	0.0563	1.03		**Lag/CN Method,**

Summary for Subcatchment 14PS: 14PS

Runoff = 22.98 cfs @ 12.04 hrs, Volume= 1.484 af, Depth= 1.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	0.860	69	Grassland, HSG B
*	9.210	98	Impervious
	10.070	96	Weighted Average
	0.860		8.54% Pervious Area
	9.210		91.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	858	0.0128	1.08		**Lag/CN Method,**

Summary for Subcatchment 15PS: 15PS

Runoff = 47.69 cfs @ 14.13 hrs, Volume= 20.437 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	34.910	49	Grassland, HSG A
*	778.320	69	Grassland, HSG B
*	4.290	79	Grassland, HSG C
*	21.440	98	Impervious
	838.960	69	Weighted Average
	817.520		97.44% Pervious Area
	21.440		2.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
140.0	8,209	0.0281	0.98		**Lag/CN Method,**

Summary for Subcatchment 16PS: 16PS

Runoff = 10.62 cfs @ 13.37 hrs, Volume= 3.607 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	6.640	49	Grassland, HSG A
*	131.510	69	Grassland, HSG B
*	5.670	79	Grassland, HSG C
*	4.240	98	Impervious
	148.060	69	Weighted Average
	143.820		97.14% Pervious Area
	4.240		2.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
96.8	5,558	0.0315	0.96		**Lag/CN Method,**

Summary for Subcatchment 17PS: 17PS

Runoff = 8.37 cfs @ 13.28 hrs, Volume= 2.632 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	93.520	69	Grassland, HSG B
*	0.900	79	Grassland, HSG C
*	4.160	98	Impervious
	98.580	70	Weighted Average
	94.420		95.78% Pervious Area
	4.160		4.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
92.0	5,098	0.0288	0.92		**Lag/CN Method,**

Summary for Subcatchment 18PS: 18PS

Runoff = 14.68 cfs @ 13.50 hrs, Volume= 5.182 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	189.100	69	Grassland, HSG B
*	0.620	79	Grassland, HSG C
*	4.380	98	Impervious
	194.100	70	Weighted Average
	189.720		97.74% Pervious Area
	4.380		2.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
107.3	5,588	0.0245	0.87		**Lag/CN Method,**

Summary for Subcatchment 19PS: 19PS

Runoff = 4.90 cfs @ 12.41 hrs, Volume= 0.811 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	28.880	69	Grassland, HSG B
*	1.500	98	Impervious
	30.380	70	Weighted Average
	28.880		95.06% Pervious Area
	1.500		4.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.7	1,535	0.0280	0.72		**Lag/CN Method,**

Summary for Subcatchment 20PS: 20PS

Runoff = 1.45 cfs @ 12.10 hrs, Volume= 0.135 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	5.540	69	Grassland, HSG B
	5.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	477	0.0294	0.57		**Lag/CN Method,**

Summary for Subcatchment 21PS: 21PS

Runoff = 10.71 cfs @ 12.46 hrs, Volume= 1.893 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	69.470	69	Grassland, HSG B
*	1.430	98	Impervious
	70.900	70	Weighted Average
	69.470		97.98% Pervious Area
	1.430		2.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.3	2,203	0.0413	0.94		**Lag/CN Method,**

Summary for Subcatchment 22PS: 22PS

Runoff = 2.53 cfs @ 12.04 hrs, Volume= 0.166 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	4.760	69	Grassland, HSG B
*	0.460	98	Impervious
	5.220	72	Weighted Average
	4.760		91.19% Pervious Area
	0.460		8.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	603	0.0763	1.04		**Lag/CN Method,**

Summary for Subcatchment 23PS: 23PS

Runoff = 2.09 cfs @ 12.13 hrs, Volume= 0.184 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	4.550	69	Grassland, HSG B
*	0.780	98	Impervious
	5.330	73	Weighted Average
	4.550		85.37% Pervious Area
	0.780		14.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.6	473	0.0148	0.45		**Lag/CN Method,**

Summary for Subcatchment 24PS: 24PS

Runoff = 2.72 cfs @ 12.21 hrs, Volume= 0.341 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	13.780	69	Grassland, HSG B
*	0.220	98	Impervious
	14.000	69	Weighted Average
	13.780		98.43% Pervious Area
	0.220		1.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	1,204	0.0532	0.92		**Lag/CN Method,**

Summary for Subcatchment 25PS: 25PS

Runoff = 2.23 cfs @ 12.05 hrs, Volume= 0.168 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	6.880	69	Grassland, HSG B
	6.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	488	0.0656	0.85		**Lag/CN Method,**

Summary for Subcatchment 26PS: 26PS

Runoff = 18.04 cfs @ 12.64 hrs, Volume= 3.842 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	139.330	69	Grassland, HSG B
*	4.580	98	Impervious
	143.910	70	Weighted Average
	139.330		96.82% Pervious Area
	4.580		3.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.2	2,319	0.0263	0.75		**Lag/CN Method,**

Summary for Subcatchment 27PS: 27PS

Runoff = 3.65 cfs @ 12.22 hrs, Volume= 0.425 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	13.750	69	Grassland, HSG B
*	0.820	98	Impervious
	14.570	71	Weighted Average
	13.750		94.37% Pervious Area
	0.820		5.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	1,092	0.0357	0.78		**Lag/CN Method,**

Summary for Subcatchment 28PS: 28PS

Runoff = 13.21 cfs @ 12.43 hrs, Volume= 2.259 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	82.740	69	Grassland, HSG B
*	1.880	98	Impervious
	84.620	70	Weighted Average
	82.740		97.78% Pervious Area
	1.880		2.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.3	1,958	0.0378	0.87		**Lag/CN Method,**

Summary for Subcatchment 29PS: 29PS

Runoff = 3.56 cfs @ 12.11 hrs, Volume= 0.315 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	10.120	69	Grassland, HSG B
*	0.700	98	Impervious
	10.820	71	Weighted Average
	10.120		93.53% Pervious Area
	0.700		6.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	923	0.0607	0.98		**Lag/CN Method,**

Summary for Subcatchment 30PS: 30PS

Runoff = 8.83 cfs @ 12.31 hrs, Volume= 1.209 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	38.040	69	Grassland, HSG B
*	3.430	98	Impervious
	41.470	71	Weighted Average
	38.040		91.73% Pervious Area
	3.430		8.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.5	1,164	0.0249	0.66		**Lag/CN Method,**

Summary for Subcatchment 31PS: 31PS

Runoff = 3.28 cfs @ 12.23 hrs, Volume= 0.406 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	14.890	69	Grassland, HSG B
*	0.300	98	Impervious
	15.190	70	Weighted Average
	14.890		98.03% Pervious Area
	0.300		1.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.5	1,250	0.0464	0.89		**Lag/CN Method,**

Summary for Subcatchment 32PS: 32PS

Runoff = 4.07 cfs @ 12.34 hrs, Volume= 0.642 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	26.240	69	Grassland, HSG B
*	0.130	98	Impervious
	26.370	69	Weighted Average
	26.240		99.51% Pervious Area
	0.130		0.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.4	1,498	0.0393	0.82		**Lag/CN Method,**

Summary for Subcatchment 33PS: 33PS

Runoff = 0.41 cfs @ 12.22 hrs, Volume= 0.052 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	2.140	69	Grassland, HSG B
	2.140		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	813	0.0271	0.60		**Lag/CN Method,**

Summary for Subcatchment 34PS: 34PS

Runoff = 6.89 cfs @ 12.52 hrs, Volume= 1.297 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	47.290	69	Grassland, HSG B
*	1.290	98	Impervious
	48.580	70	Weighted Average
	47.290		97.34% Pervious Area
	1.290		2.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.1	1,866	0.0263	0.72		**Lag/CN Method,**

Summary for Subcatchment 35PS: 35PS

Runoff = 4.73 cfs @ 12.09 hrs, Volume= 0.374 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	10.590	69	Grassland, HSG B
*	1.180	98	Impervious
	11.770	72	Weighted Average
	10.590		89.97% Pervious Area
	1.180		10.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	754	0.0531	0.90		**Lag/CN Method,**

Summary for Subcatchment 36PS: 36PS

Runoff = 1.69 cfs @ 12.24 hrs, Volume= 0.275 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	3.230	49	Grassland, HSG A
*	11.490	69	Grassland, HSG B
*	0.550	98	Impervious
	15.270	66	Weighted Average
	14.720		96.40% Pervious Area
	0.550		3.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.9	962	0.0437	0.73		**Lag/CN Method,**

Summary for Subcatchment 37PS: 37PS

Runoff = 2.92 cfs @ 12.12 hrs, Volume= 0.293 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	12.020	69	Grassland, HSG B
	12.020		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	643	0.0373	0.68		**Lag/CN Method,**

Summary for Subcatchment 38PS: 38PS

Runoff = 11.19 cfs @ 12.95 hrs, Volume= 2.770 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs
Type II 24-hr 100yr Rainfall=2.20"

	Area (ac)	CN	Description
*	1.470	49	Grassland, HSG A
*	54.060	69	Grassland, HSG B
*	21.180	79	Grassland, HSG C
*	3.700	98	Impervious
	80.410	73	Weighted Average
	76.710		95.40% Pervious Area
	3.700		4.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
75.8	3,791	0.0224	0.83		**Lag/CN Method,**

Summary for Reach 1PR:

Inflow Area = 130.720 ac, 3.14% Impervious, Inflow Depth = 0.22" for 100yr event
Inflow = 8.55 cfs @ 12.87 hrs, Volume= 2.431 af
Outflow = 8.55 cfs @ 12.87 hrs, Volume= 2.431 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 2PR:

Inflow Area = 2,193.920 ac, 3.07% Impervious, Inflow Depth = 0.29" for 100yr event
Inflow = 114.95 cfs @ 13.71 hrs, Volume= 52.155 af
Outflow = 114.95 cfs @ 13.71 hrs, Volume= 52.155 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 3PR:

Inflow Area = 119.470 ac, 4.55% Impervious, Inflow Depth = 0.37" for 100yr event
Inflow = 13.02 cfs @ 12.92 hrs, Volume= 3.712 af
Outflow = 13.02 cfs @ 12.92 hrs, Volume= 3.712 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 4PR:

Inflow Area = 331.770 ac, 4.49% Impervious, Inflow Depth = 0.33" for 100yr event
Inflow = 32.27 cfs @ 12.57 hrs, Volume= 9.011 af
Outflow = 32.27 cfs @ 12.57 hrs, Volume= 9.011 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 5PR:

Inflow Area = 14.570 ac, 5.63% Impervious, Inflow Depth = 0.35" for 100yr event
Inflow = 3.65 cfs @ 12.22 hrs, Volume= 0.425 af
Outflow = 3.65 cfs @ 12.22 hrs, Volume= 0.425 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Summary for Reach 6PR:

Inflow Area = 95.440 ac, 2.70% Impervious, Inflow Depth = 0.32" for 100yr event
Inflow = 14.48 cfs @ 12.41 hrs, Volume= 2.575 af
Outflow = 14.48 cfs @ 12.41 hrs, Volume= 2.575 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

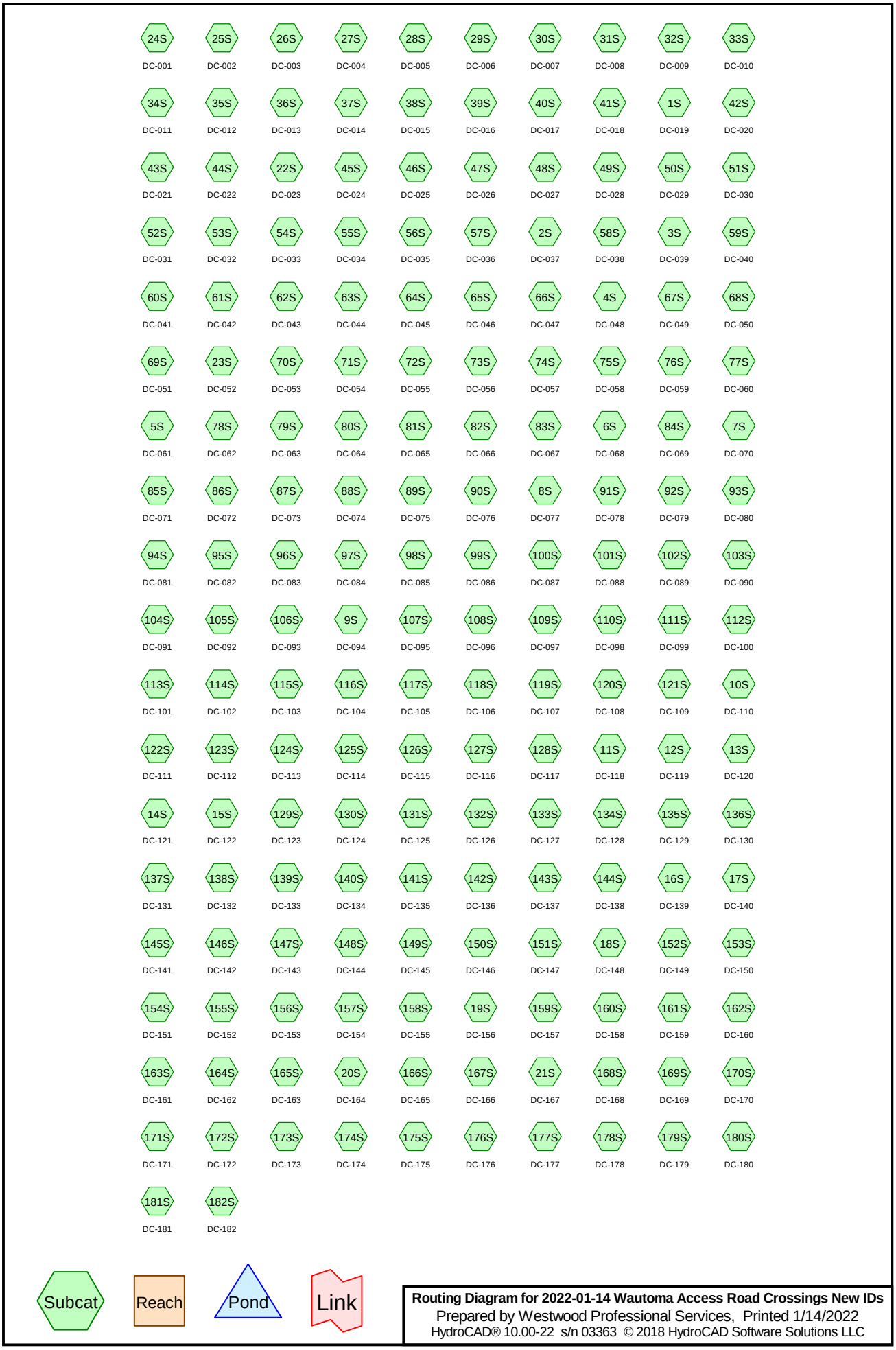
Summary for Reach 7PR:

Inflow Area = 92.280 ac, 1.86% Impervious, Inflow Depth = 0.31" for 100yr event
Inflow = 12.89 cfs @ 12.38 hrs, Volume= 2.397 af
Outflow = 12.89 cfs @ 12.38 hrs, Volume= 2.397 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-240.00 hrs, dt= 0.05 hrs

Appendix E

Crossing Sizing Calculations



Routing Diagram for 2022-01-14 Wautoma Access Road Crossings New IDs

Prepared by Westwood Professional Services, Printed 1/14/2022

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
47,653.868	79	(1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 20S, 21S, 22S, 23S, 24S, 25S, 26S, 27S, 28S, 29S, 30S, 31S, 32S, 33S, 34S, 35S, 36S, 37S, 38S, 39S, 40S, 41S, 42S, 43S, 44S, 45S, 46S, 47S, 48S, 49S, 50S, 51S, 52S, 53S, 54S, 55S, 56S, 57S, 58S, 59S, 60S, 61S, 62S, 63S, 64S, 65S, 66S, 67S, 68S, 69S, 70S, 71S, 72S, 73S, 74S, 75S, 76S, 77S, 78S, 79S, 80S, 81S, 82S, 83S, 84S, 85S, 86S, 87S, 88S, 89S, 90S, 91S, 92S, 93S, 94S, 95S, 96S, 97S, 98S, 99S, 100S, 101S, 102S, 103S, 104S, 105S, 106S, 107S, 108S, 109S, 110S, 111S, 112S, 113S, 114S, 115S, 116S, 117S, 118S, 119S, 120S, 121S, 122S, 123S, 124S, 125S, 126S, 127S, 128S, 129S, 130S, 131S, 132S, 133S, 134S, 135S, 136S, 137S, 138S, 139S, 140S, 141S, 142S, 143S, 144S, 145S, 146S, 147S, 148S, 149S, 150S, 151S, 152S, 153S, 154S, 155S, 156S, 157S, 158S, 159S, 160S, 161S, 162S, 163S, 164S, 165S, 166S, 167S, 168S, 169S, 170S, 171S, 172S, 173S, 174S, 175S, 176S, 177S, 178S, 179S, 180S, 181S, 182S)
47,653.868	**79**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
47,653.868	Other	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 20S, 21S, 22S, 23S, 24S, 25S, 26S, 27S, 28S, 29S, 30S, 31S, 32S, 33S, 34S, 35S, 36S, 37S, 38S, 39S, 40S, 41S, 42S, 43S, 44S, 45S, 46S, 47S, 48S, 49S, 50S, 51S, 52S, 53S, 54S, 55S, 56S, 57S, 58S, 59S, 60S, 61S, 62S, 63S, 64S, 65S, 66S, 67S, 68S, 69S, 70S, 71S, 72S, 73S, 74S, 75S, 76S, 77S, 78S, 79S, 80S, 81S, 82S, 83S, 84S, 85S, 86S, 87S, 88S, 89S, 90S, 91S, 92S, 93S, 94S, 95S, 96S, 97S, 98S, 99S, 100S, 101S, 102S, 103S, 104S, 105S, 106S, 107S, 108S, 109S, 110S, 111S, 112S, 113S, 114S, 115S, 116S, 117S, 118S, 119S, 120S, 121S, 122S, 123S, 124S, 125S, 126S, 127S, 128S, 129S, 130S, 131S, 132S, 133S, 134S, 135S, 136S, 137S, 138S, 139S, 140S, 141S, 142S, 143S, 144S, 145S, 146S, 147S, 148S, 149S, 150S, 151S, 152S, 153S, 154S, 155S, 156S, 157S, 158S, 159S, 160S, 161S, 162S, 163S, 164S, 165S, 166S, 167S, 168S, 169S, 170S, 171S, 172S, 173S, 174S, 175S, 176S, 177S, 178S, 179S, 180S, 181S, 182S
47,653.868		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	47,653.868	47,653.868		1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 20S, 21S, 22S, 23S, 24S, 25S, 26S, 27S, 28S, 29S, 30S, 31S, 32S, 33S, 34S, 35S, 36S, 37S, 38S, 39S, 40S, 41S, 42S, 43S, 44S, 45S, 46S, 47S, 48S, 49S, 50S, 51S, 52S, 53S, 54S, 55S, 56S, 57S, 58S, 59S, 60S, 61S, 62S, 63S, 64S, 65S, 66S, 67S, 68S, 69S, 70S, 71S, 72S, 73S, 74S, 75S, 76S, 77S, 78S, 79S, 80S, 81S, 82S, 83S, 84S, 85S, 86S, 87S, 88S, 89S, 90S, 91S, 92S, 93S, 94S, 95S, 96S, 97S, 98S, 99S, 100S, 101S, 102S, 103S, 104S, 105S, 106S, 107S, 108S, 109S, 110S, 111S, 112S, 113S, 114S, 115S, 116S, 117S, 118S, 119S, 120S, 121S, 122S, 123S, 124S, 125S, 126S, 127S, 128S, 129S, 130S, 131S, 132S, 133S, 134S, 135S, 136S, 137S, 138S, 139S, 140S, 141S, 142S, 143S, 144S, 145S, 146S, 147S, 148S, 149S, 150S, 151S, 152S, 153S, 154S, 155S, 156S, 157S, 158S, 159S, 160S, 161S, 162S, 163S, 164S, 165S, 166S, 167S, 168S, 169S, 170S, 171S, 172S, 173S, 174S, 175S, 176S, 177S, 178S, 179S,

Ground Covers (all nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	**0.000**	**0.000**	**0.000**	**47,653.868**	**47,653.868**	**TOTAL AREA**	

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DC-019 Runoff Area=5.688 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,685' Slope=0.0318 '/' Tc=27.9 min CN=79 Runoff=0.97 cfs 0.123 af

Subcatchment 2S: DC-037 Runoff Area=0.836 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=382' Slope=0.0461 '/' Tc=7.1 min CN=79 Runoff=0.31 cfs 0.018 af

Subcatchment 3S: DC-039 Runoff Area=3.199 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=894' Slope=0.0683 '/' Tc=11.5 min CN=79 Runoff=0.97 cfs 0.069 af

Subcatchment 4S: DC-048 Runoff Area=1.415 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=686' Slope=0.0516 '/' Tc=10.7 min CN=79 Runoff=0.45 cfs 0.030 af

Subcatchment 5S: DC-061 Runoff Area=5.538 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,260' Slope=0.0710 '/' Tc=14.8 min CN=79 Runoff=1.46 cfs 0.119 af

Subcatchment 6S: DC-068 Runoff Area=1.247 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=389' Slope=0.0427 '/' Tc=7.5 min CN=79 Runoff=0.46 cfs 0.027 af

Subcatchment 7S: DC-070 Runoff Area=5.481 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=983' Slope=0.0356 '/' Tc=17.1 min CN=79 Runoff=1.31 cfs 0.118 af

Subcatchment 8S: DC-077 Runoff Area=74.600 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=4,600' Slope=0.0320 '/' Tc=62.1 min CN=79 Runoff=7.26 cfs 1.607 af

Subcatchment 9S: DC-094 Runoff Area=3.142 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=924' Slope=0.0199 '/' Tc=21.8 min CN=79 Runoff=0.64 cfs 0.068 af

Subcatchment 10S: DC-110 Runoff Area=6.973 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,217' Slope=0.0439 '/' Tc=18.3 min CN=79 Runoff=1.60 cfs 0.150 af

Subcatchment 11S: DC-118 Runoff Area=15.965 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,249' Slope=0.1048 '/' Tc=12.1 min CN=79 Runoff=4.72 cfs 0.344 af

Subcatchment 12S: DC-119 Runoff Area=613.160 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=14,097' Slope=0.1690 '/' Tc=66.2 min CN=79 Runoff=56.69 cfs 13.212 af

Subcatchment 13S: DC-120 Runoff Area=4.540 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,236' Slope=0.0662 '/' Tc=15.1 min CN=79 Runoff=1.18 cfs 0.098 af

Subcatchment 14S: DC-121 Runoff Area=57.442 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=3,938' Slope=0.0751 '/' Tc=35.8 min CN=79 Runoff=8.23 cfs 1.238 af

Subcatchment 15S: DC-122 Runoff Area=7.086 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,493' Slope=0.0601 '/' Tc=18.4 min CN=79 Runoff=1.62 cfs 0.153 af

Subcatchment 16S: DC-139 Runoff Area=4.100 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=300' Slope=0.0525 '/' Tc=5.5 min CN=79 Runoff=1.64 cfs 0.088 af

Subcatchment 17S: DC-140 Runoff Area=4.700 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=500' Slope=0.0309 '/' Tc=10.7 min CN=79 Runoff=1.48 cfs 0.101 af

Subcatchment 18S: DC-148 Runoff Area=4.390 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=840' Slope=0.0439 '/' Tc=13.6 min CN=79 Runoff=1.21 cfs 0.095 af

Subcatchment 19S: DC-156 Runoff Area=5.040 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=930' Slope=0.0360 '/' Tc=16.3 min CN=79 Runoff=1.25 cfs 0.109 af

Subcatchment 20S: DC-164 Runoff Area=5.400 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=663' Slope=0.0331 '/' Tc=13.0 min CN=79 Runoff=1.52 cfs 0.116 af

Subcatchment 21S: DC-167 Runoff Area=32.460 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,565' Slope=0.0595 '/' Tc=28.5 min CN=79 Runoff=5.47 cfs 0.699 af

Subcatchment 22S: DC-023 Runoff Area=854.320 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=19,272' Slope=0.1103 '/' Tc=105.2 min CN=79 Runoff=56.77 cfs 18.408 af

Subcatchment 23S: DC-052 Runoff Area=20.180 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=3,284' Slope=0.1091 '/' Tc=25.7 min CN=79 Runoff=3.67 cfs 0.435 af

Subcatchment 24S: DC-001 Runoff Area=169.392 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=6,051' Slope=0.1068 '/' Tc=42.3 min CN=79 Runoff=21.53 cfs 3.650 af

Subcatchment 25S: DC-002 Runoff Area=17.035 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,621' Slope=0.0257 '/' Tc=44.2 min CN=79 Runoff=2.10 cfs 0.367 af

Subcatchment 26S: DC-003 Runoff Area=13.594 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,107' Slope=0.0267 '/' Tc=36.4 min CN=79 Runoff=1.93 cfs 0.293 af

Subcatchment 27S: DC-004 Runoff Area=157.886 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=4,994' Slope=0.1237 '/' Tc=33.7 min CN=79 Runoff=23.62 cfs 3.402 af

Subcatchment 28S: DC-005 Runoff Area=45.452 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=5,471' Slope=0.0564 '/' Tc=53.7 min CN=79 Runoff=4.87 cfs 0.979 af

Subcatchment 29S: DC-006 Runoff Area=17.419 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=3,023' Slope=0.0262 '/' Tc=49.1 min CN=79 Runoff=2.00 cfs 0.375 af

Subcatchment 30S: DC-007 Runoff Area=5,998.508 ac 0.00% Impervious Runoff Depth>0.26"
Flow Length=30,518' Slope=0.0657 '/' Tc=197.0 min CN=79 Runoff=262.89 cfs 129.040 af

Subcatchment 31S: DC-008 Runoff Area=45.077 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=4,039' Slope=0.0261 '/' Tc=62.0 min CN=79 Runoff=4.39 cfs 0.971 af

Subcatchment 32S: DC-009 Runoff Area=13.788 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,546' Slope=0.0210 '/' Tc=47.8 min CN=79 Runoff=1.61 cfs 0.297 af

Subcatchment 33S: DC-010 Runoff Area=8.613 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,877' Slope=0.0227 '/' Tc=36.0 min CN=79 Runoff=1.23 cfs 0.186 af

Subcatchment 34S: DC-011 Runoff Area=53.973 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=5,420' Slope=0.0256 '/' Tc=79.2 min CN=79 Runoff=4.38 cfs 1.163 af

Subcatchment 35S: DC-012 Runoff Area=6.208 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,255' Slope=0.0213 '/' Tc=26.9 min CN=79 Runoff=1.09 cfs 0.134 af

Subcatchment 36S: DC-013 Runoff Area=17.264 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,785' Slope=0.0231 '/' Tc=48.9 min CN=79 Runoff=1.98 cfs 0.372 af

Subcatchment 37S: DC-014 Runoff Area=6,051.355 ac 0.00% Impervious Runoff Depth>0.26"
Tc=197.0 min CN=79 Runoff=265.21 cfs 130.177 af

Subcatchment 38S: DC-015 Runoff Area=1,458.524 ac 0.00% Impervious Runoff Depth>0.26"
Flow Length=23,602' Slope=0.0946 '/' Tc=133.6 min CN=79 Runoff=82.90 cfs 31.425 af

Subcatchment 39S: DC-016 Runoff Area=170.448 ac 0.00% Impervious Runoff Depth>0.26"
Flow Length=8,650' Slope=0.0233 '/' Tc=120.6 min CN=79 Runoff=10.40 cfs 3.673 af

Subcatchment 40S: DC-017 Runoff Area=19.905 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,490' Slope=0.0308 '/' Tc=38.7 min CN=79 Runoff=2.70 cfs 0.429 af

Subcatchment 41S: DC-018 Runoff Area=17.007 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,088' Slope=0.0332 '/' Tc=32.4 min CN=79 Runoff=2.62 cfs 0.366 af

Subcatchment 42S: DC-020 Runoff Area=1,380.393 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=20,434' Slope=0.1071 '/' Tc=111.9 min CN=79 Runoff=87.60 cfs 29.744 af

Subcatchment 43S: DC-021 Runoff Area=423.737 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=9,746' Slope=0.0674 '/' Tc=78.0 min CN=79 Runoff=34.78 cfs 9.130 af

Subcatchment 44S: DC-022 Runoff Area=102.944 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=3,228' Slope=0.1057 '/' Tc=25.7 min CN=79 Runoff=18.72 cfs 2.218 af

Subcatchment 45S: DC-024 Runoff Area=23.124 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=3,373' Slope=0.0492 '/' Tc=39.1 min CN=79 Runoff=3.11 cfs 0.498 af

Subcatchment 46S: DC-025 Runoff Area=35.047 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,628' Slope=0.0566 '/' Tc=29.8 min CN=79 Runoff=5.73 cfs 0.755 af

Subcatchment 47S: DC-026 Runoff Area=11.184 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,711' Slope=0.0468 '/' Tc=23.3 min CN=79 Runoff=2.18 cfs 0.241 af

Subcatchment 48S: DC-027 Runoff Area=1,463.992 ac 0.00% Impervious Runoff Depth>0.26"
Flow Length=23,918' Slope=0.0950 '/' Tc=134.8 min CN=79 Runoff=81.23 cfs 31.543 af

Subcatchment 49S: DC-028 Runoff Area=115.063 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=4,965' Slope=0.0421 '/' Tc=57.6 min CN=79 Runoff=11.77 cfs 2.479 af

Subcatchment 50S: DC-029 Runoff Area=16.582 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,807' Slope=0.0362 '/' Tc=39.3 min CN=79 Runoff=2.23 cfs 0.357 af

Subcatchment 51S: DC-030 Runoff Area=245.259 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=6,221' Slope=0.0357 '/' Tc=74.9 min CN=79 Runoff=20.79 cfs 5.285 af

Subcatchment 52S: DC-031 Runoff Area=247.975 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=6,923' Slope=0.0343 '/' Tc=83.2 min CN=79 Runoff=19.63 cfs 5.343 af

Subcatchment 53S: DC-032 Runoff Area=30.852 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=3,066' Slope=0.0296 '/' Tc=46.7 min CN=79 Runoff=3.65 cfs 0.665 af

Subcatchment 54S: DC-033 Runoff Area=18.826 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,559' Slope=0.0336 '/' Tc=37.9 min CN=79 Runoff=2.59 cfs 0.406 af

Subcatchment 55S: DC-034 Runoff Area=1,104.036 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=19,853' Slope=0.1235 '/' Tc=101.8 min CN=79 Runoff=75.11 cfs 23.789 af

Subcatchment 56S: DC-035 Runoff Area=34.989 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=3,827' Slope=0.0298 '/' Tc=55.6 min CN=79 Runoff=3.68 cfs 0.754 af

Subcatchment 57S: DC-036 Runoff Area=15.693 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,995' Slope=0.0221 '/' Tc=53.0 min CN=79 Runoff=1.71 cfs 0.338 af

Subcatchment 58S: DC-038 Runoff Area=8.108 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,083' Slope=0.0663 '/' Tc=13.6 min CN=79 Runoff=2.23 cfs 0.175 af

Subcatchment 59S: DC-040 Runoff Area=53.413 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=5,676' Slope=0.0571 '/' Tc=55.0 min CN=79 Runoff=5.66 cfs 1.151 af

Subcatchment 60S: DC-041 Runoff Area=1,087.470 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=17,794' Slope=0.1369 '/' Tc=88.6 min CN=79 Runoff=82.08 cfs 23.432 af

Subcatchment 61S: DC-042 Runoff Area=10.930 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,044' Slope=0.0343 '/' Tc=31.4 min CN=79 Runoff=1.72 cfs 0.236 af

Subcatchment 62S: DC-043 Runoff Area=230.429 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=7,854' Slope=0.0849 '/' Tc=58.5 min CN=79 Runoff=23.29 cfs 4.965 af

Subcatchment 63S: DC-044 Runoff Area=558.434 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=17,213' Slope=0.1404 '/' Tc=85.2 min CN=79 Runoff=43.08 cfs 12.033 af

Subcatchment 64S: DC-045 Runoff Area=47.182 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=5,263' Slope=0.0679 '/' Tc=47.5 min CN=79 Runoff=5.52 cfs 1.017 af

Subcatchment 65S: DC-046 Runoff Area=6.859 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,410' Slope=0.0472 '/' Tc=19.9 min CN=79 Runoff=1.49 cfs 0.148 af

Subcatchment 66S: DC-047 Runoff Area=18.105 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,936' Slope=0.0730 '/' Tc=20.6 min CN=79 Runoff=3.85 cfs 0.390 af

Subcatchment 67S: DC-049 Runoff Area=502.771 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=15,576' Slope=0.1523 '/' Tc=75.5 min CN=79 Runoff=42.40 cfs 10.833 af

Subcatchment 68S: DC-050 Runoff Area=2.919 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,004' Slope=0.0502 '/' Tc=14.7 min CN=79 Runoff=0.77 cfs 0.063 af

Subcatchment 69S: DC-051 Runoff Area=180.764 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=5,741' Slope=0.1042 '/' Tc=41.1 min CN=79 Runoff=23.51 cfs 3.895 af

Subcatchment 70S: DC-053 Runoff Area=95.826 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=4,794' Slope=0.1181 '/' Tc=33.4 min CN=79 Runoff=14.45 cfs 2.065 af

Subcatchment 71S: DC-054 Runoff Area=94.979 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=4,462' Slope=0.1223 '/' Tc=31.0 min CN=79 Runoff=15.12 cfs 2.047 af

Subcatchment 72S: DC-055 Runoff Area=493.799 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=14,520' Slope=0.1574 '/' Tc=70.2 min CN=79 Runoff=44.07 cfs 10.640 af

Subcatchment 73S: DC-056 Runoff Area=8.663 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=847' Slope=0.1647 '/' Tc=7.1 min CN=79 Runoff=3.24 cfs 0.187 af

Subcatchment 74S: DC-057 Runoff Area=24.346 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=3,386' Slope=0.0816 '/' Tc=30.4 min CN=79 Runoff=3.92 cfs 0.525 af

Subcatchment 75S: DC-058 Runoff Area=35.709 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=4,213' Slope=0.0750 '/' Tc=37.8 min CN=79 Runoff=4.93 cfs 0.769 af

Subcatchment 76S: DC-059 Runoff Area=7.006 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,908' Slope=0.0815 '/' Tc=19.2 min CN=79 Runoff=1.56 cfs 0.151 af

Subcatchment 77S: DC-060 Runoff Area=18.609 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,913' Slope=0.1306 '/' Tc=21.3 min CN=79 Runoff=3.85 cfs 0.401 af

Subcatchment 78S: DC-062 Runoff Area=8.952 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,603' Slope=0.0918 '/' Tc=15.8 min CN=79 Runoff=2.26 cfs 0.193 af

Subcatchment 79S: DC-063 Runoff Area=17.326 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,473' Slope=0.0206 '/' Tc=47.1 min CN=79 Runoff=2.04 cfs 0.373 af

Subcatchment 80S: DC-064 Runoff Area=1,166.263 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=21,173' Slope=0.1169 '/' Tc=110.2 min CN=79 Runoff=75.05 cfs 25.130 af

Subcatchment 81S: DC-065 Runoff Area=61.327 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=5,179' Slope=0.0244 '/' Tc=78.2 min CN=79 Runoff=5.05 cfs 1.321 af

Subcatchment 82S: DC-066 Runoff Area=1,232.711 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=21,490' Slope=0.1125 '/' Tc=113.7 min CN=79 Runoff=78.40 cfs 26.561 af

Subcatchment 83S: DC-067 Runoff Area=1,703.519 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=20,645' Slope=0.1209 '/' Tc=106.2 min CN=79 Runoff=113.45 cfs 36.706 af

Subcatchment 84S: DC-069 Runoff Area=22.274 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,323' Slope=0.0102 '/' Tc=63.7 min CN=79 Runoff=2.13 cfs 0.480 af

Subcatchment 85S: DC-071 Runoff Area=19.249 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,918' Slope=0.0206 '/' Tc=53.8 min CN=79 Runoff=2.06 cfs 0.415 af

Subcatchment 86S: DC-072 Runoff Area=1,697.803 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=19,589' Slope=0.1279 '/' Tc=99.0 min CN=79 Runoff=118.82 cfs 36.583 af

Subcatchment 87S: DC-073 Runoff Area=12.229 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,653' Slope=0.0105 '/' Tc=47.8 min CN=79 Runoff=1.43 cfs 0.264 af

Subcatchment 88S: DC-074 Runoff Area=660.808 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=13,200' Slope=0.0721 '/' Tc=96.2 min CN=79 Runoff=46.67 cfs 14.239 af

Subcatchment 89S: DC-075 Runoff Area=22.833 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,411' Slope=0.0165 '/' Tc=51.6 min CN=79 Runoff=2.52 cfs 0.492 af

Subcatchment 90S: DC-076 Runoff Area=77.359 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=4,499' Slope=0.0313 '/' Tc=61.7 min CN=79 Runoff=7.51 cfs 1.667 af

Subcatchment 91S: DC-078 Runoff Area=555.494 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=11,986' Slope=0.0727 '/' Tc=88.7 min CN=79 Runoff=42.00 cfs 11.969 af

Subcatchment 92S: DC-079 Runoff Area=89.963 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=5,462' Slope=0.0364 '/' Tc=66.8 min CN=79 Runoff=8.33 cfs 1.938 af

Subcatchment 93S: DC-080 Runoff Area=12.855 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,579' Slope=0.0190 '/' Tc=34.3 min CN=79 Runoff=1.90 cfs 0.277 af

Subcatchment 94S: DC-081 Runoff Area=1,640.698 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=18,216' Slope=0.1353 '/' Tc=90.8 min CN=79 Runoff=121.49 cfs 35.352 af

Subcatchment 95S: DC-082 Runoff Area=855.402 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=18,216' Slope=0.1353 '/' Tc=90.8 min CN=79 Runoff=63.34 cfs 18.431 af

Subcatchment 96S: DC-083 Runoff Area=781.350 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=16,949' Slope=0.1471 '/' Tc=82.2 min CN=79 Runoff=62.39 cfs 16.836 af

Subcatchment 97S: DC-084 Runoff Area=53.304 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=3,981' Slope=0.0432 '/' Tc=47.6 min CN=79 Runoff=6.25 cfs 1.149 af

Subcatchment 98S: DC-085 Runoff Area=534.894 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=10,095' Slope=0.0799 '/' Tc=73.7 min CN=79 Runoff=45.71 cfs 11.525 af

Subcatchment 99S: DC-086 Runoff Area=44.849 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,972' Slope=0.0364 '/' Tc=41.1 min CN=79 Runoff=5.83 cfs 0.966 af

Subcatchment 100S: DC-087 Runoff Area=7.416 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,460' Slope=0.0284 '/' Tc=26.3 min CN=79 Runoff=1.33 cfs 0.160 af

Subcatchment 101S: DC-088 Runoff Area=918.253 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=18,850' Slope=0.1379 '/' Tc=92.5 min CN=79 Runoff=66.87 cfs 19.786 af

Subcatchment 102S: DC-089 Runoff Area=9.633 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,752' Slope=0.0305 '/' Tc=29.4 min CN=79 Runoff=1.59 cfs 0.208 af

Subcatchment 103S: DC-090 Runoff Area=721.074 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=5,921' Slope=0.0514 '/' Tc=60.0 min CN=79 Runoff=71.94 cfs 15.537 af

Subcatchment 104S: DC-091 Runoff Area=37.195 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=3,169' Slope=0.0290 '/' Tc=48.4 min CN=79 Runoff=4.30 cfs 0.801 af

Subcatchment 105S: DC-092 Runoff Area=71.389 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=5,460' Slope=0.0347 '/' Tc=68.4 min CN=79 Runoff=6.50 cfs 1.538 af

Subcatchment 106S: DC-093 Runoff Area=48.147 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=3,799' Slope=0.0263 '/' Tc=58.8 min CN=79 Runoff=4.87 cfs 1.037 af

Subcatchment 107S: DC-095 Runoff Area=65.492 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=4,676' Slope=0.0256 '/' Tc=70.4 min CN=79 Runoff=5.83 cfs 1.411 af

Subcatchment 108S: DC-096 Runoff Area=14.377 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,224' Slope=0.0183 '/' Tc=28.5 min CN=79 Runoff=2.42 cfs 0.310 af

Subcatchment 109S: DC-097 Runoff Area=136.256 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=6,709' Slope=0.0333 '/' Tc=82.3 min CN=79 Runoff=10.86 cfs 2.936 af

Subcatchment 110S: DC-098 Runoff Area=746.263 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=7,100' Slope=0.0468 '/' Tc=72.7 min CN=79 Runoff=64.37 cfs 16.080 af

Subcatchment 111S: DC-099 Runoff Area=946.614 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=18,322' Slope=0.1317 '/' Tc=92.5 min CN=79 Runoff=68.94 cfs 20.397 af

Subcatchment 112S: DC-100 Runoff Area=8.248 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,224' Slope=0.0254 '/' Tc=24.2 min CN=79 Runoff=1.57 cfs 0.178 af

Subcatchment 113S: DC-101 Runoff Area=32.592 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=4,751' Slope=0.0706 '/' Tc=42.9 min CN=79 Runoff=4.10 cfs 0.702 af

Subcatchment 114S: DC-102 Runoff Area=34.729 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,809' Slope=0.0763 '/' Tc=27.1 min CN=79 Runoff=6.09 cfs 0.748 af

Subcatchment 115S: DC-103 Runoff Area=683.207 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=15,787' Slope=0.1531 '/' Tc=76.2 min CN=79 Runoff=57.53 cfs 14.721 af

Subcatchment 116S: DC-104 Runoff Area=9.286 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,739' Slope=0.0435 '/' Tc=24.5 min CN=79 Runoff=1.74 cfs 0.200 af

Subcatchment 117S: DC-105 Runoff Area=12.627 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,673' Slope=0.0502 '/' Tc=32.1 min CN=79 Runoff=1.96 cfs 0.272 af

Subcatchment 118S: DC-106 Runoff Area=9.797 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,103' Slope=0.0448 '/' Tc=28.1 min CN=79 Runoff=1.67 cfs 0.211 af

Subcatchment 119S: DC-107 Runoff Area=353.838 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=8,406' Slope=0.0835 '/' Tc=62.3 min CN=79 Runoff=34.24 cfs 7.624 af

Subcatchment 120S: DC-108 Runoff Area=160.975 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=6,286' Slope=0.0645 '/' Tc=56.2 min CN=79 Runoff=16.80 cfs 3.469 af

Subcatchment 121S: DC-109 Runoff Area=10.569 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,700' Slope=0.0415 '/' Tc=24.6 min CN=79 Runoff=1.98 cfs 0.228 af

Subcatchment 122S: DC-111 Runoff Area=831.504 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=17,582' Slope=0.1430 '/' Tc=85.9 min CN=79 Runoff=64.40 cfs 17.917 af

Subcatchment 123S: DC-112 Runoff Area=53.268 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=5,612' Slope=0.0683 '/' Tc=49.8 min CN=79 Runoff=6.03 cfs 1.148 af

Subcatchment 124S: DC-113 Runoff Area=43.226 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=4,215' Slope=0.0569 '/' Tc=43.4 min CN=79 Runoff=5.41 cfs 0.931 af

Subcatchment 125S: DC-114 Runoff Area=614.240 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=14,995' Slope=0.1426 '/' Tc=75.7 min CN=79 Runoff=51.45 cfs 13.235 af

Subcatchment 126S: DC-115 Runoff Area=14.484 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,658' Slope=0.0326 '/' Tc=27.2 min CN=79 Runoff=2.53 cfs 0.312 af

Subcatchment 127S: DC-116 Runoff Area=54.889 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=4,172' Slope=0.0368 '/' Tc=53.6 min CN=79 Runoff=5.90 cfs 1.183 af

Subcatchment 128S: DC-117 Runoff Area=14.912 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,411' Slope=0.0276 '/' Tc=39.9 min CN=79 Runoff=1.98 cfs 0.321 af

Subcatchment 129S: DC-123 Runoff Area=20.889 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=3,728' Slope=0.0693 '/' Tc=35.7 min CN=79 Runoff=3.00 cfs 0.450 af

Subcatchment 130S: DC-124 Runoff Area=5.923 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,544' Slope=0.0559 '/' Tc=19.6 min CN=79 Runoff=1.30 cfs 0.128 af

Subcatchment 131S: DC-125 Runoff Area=4.467 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,240' Slope=0.0538 '/' Tc=16.8 min CN=79 Runoff=1.09 cfs 0.096 af

Subcatchment 132S: DC-126 Runoff Area=805.099 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=16,315' Slope=0.1511 '/' Tc=78.7 min CN=79 Runoff=66.18 cfs 17.348 af

Subcatchment 133S: DC-127 Runoff Area=33.287 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=4,326' Slope=0.0767 '/' Tc=38.2 min CN=79 Runoff=4.56 cfs 0.717 af

Subcatchment 134S: DC-128 Runoff Area=39.536 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=3,274' Slope=0.0687 '/' Tc=32.3 min CN=79 Runoff=6.09 cfs 0.852 af

Subcatchment 135S: DC-129 Runoff Area=598.033 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=13,992' Slope=0.1501 '/' Tc=69.8 min CN=79 Runoff=53.09 cfs 12.886 af

Subcatchment 136S: DC-130 Runoff Area=616.781 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=16,262' Slope=0.1440 '/' Tc=80.4 min CN=79 Runoff=49.59 cfs 13.290 af

Subcatchment 137S: DC-131 Runoff Area=11.114 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,599' Slope=0.0338 '/' Tc=26.0 min CN=79 Runoff=2.00 cfs 0.239 af

Subcatchment 138S: DC-132 Runoff Area=7.960 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,335' Slope=0.0376 '/' Tc=21.3 min CN=79 Runoff=1.65 cfs 0.172 af

Subcatchment 139S: DC-133 Runoff Area=24.045 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,904' Slope=0.0423 '/' Tc=37.4 min CN=79 Runoff=3.34 cfs 0.518 af

Subcatchment 140S: DC-134 Runoff Area=17.695 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,001' Slope=0.0419 '/' Tc=27.9 min CN=79 Runoff=3.03 cfs 0.381 af

Subcatchment 141S: DC-135 Runoff Area=7.318 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,113' Slope=0.0452 '/' Tc=16.8 min CN=79 Runoff=1.78 cfs 0.158 af

Subcatchment 142S: DC-136 Runoff Area=16.780 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,042' Slope=0.0438 '/' Tc=27.7 min CN=79 Runoff=2.89 cfs 0.362 af

Subcatchment 143S: DC-137 Runoff Area=43.605 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,794' Slope=0.0214 '/' Tc=51.0 min CN=79 Runoff=4.86 cfs 0.940 af

Subcatchment 144S: DC-138 Runoff Area=15.322 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,055' Slope=0.0260 '/' Tc=21.2 min CN=79 Runoff=3.18 cfs 0.330 af

Subcatchment 145S: DC-141 Runoff Area=10.178 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=830' Slope=0.0283 '/' Tc=16.8 min CN=79 Runoff=2.48 cfs 0.219 af

Subcatchment 146S: DC-142 Runoff Area=7.038 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=830' Slope=0.0299 '/' Tc=16.3 min CN=79 Runoff=1.75 cfs 0.152 af

Subcatchment 147S: DC-143 Runoff Area=15.206 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,323' Slope=0.0239 '/' Tc=26.5 min CN=79 Runoff=2.70 cfs 0.328 af

Subcatchment 148S: DC-144 Runoff Area=89.452 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=4,086' Slope=0.0236 '/' Tc=65.8 min CN=79 Runoff=8.35 cfs 1.927 af

Subcatchment 149S: DC-145 Runoff Area=5.849 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=931' Slope=0.0410 '/' Tc=15.3 min CN=79 Runoff=1.51 cfs 0.126 af

Subcatchment 150S: DC-146 Runoff Area=6.866 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,038' Slope=0.0432 '/' Tc=16.2 min CN=79 Runoff=1.71 cfs 0.148 af

Subcatchment 151S: DC-147 Runoff Area=135.560 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=5,250' Slope=0.0247 '/' Tc=78.6 min CN=79 Runoff=11.17 cfs 2.921 af

Subcatchment 152S: DC-149 Runoff Area=6.883 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=825' Slope=0.0349 '/' Tc=15.0 min CN=79 Runoff=1.80 cfs 0.148 af

Subcatchment 153S: DC-150 Runoff Area=23.577 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,059' Slope=0.0327 '/' Tc=32.3 min CN=79 Runoff=3.63 cfs 0.508 af

Subcatchment 154S: DC-151 Runoff Area=33.109 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,117' Slope=0.0390 '/' Tc=30.2 min CN=79 Runoff=5.36 cfs 0.713 af

Subcatchment 155S: DC-152 Runoff Area=22.595 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,140' Slope=0.0368 '/' Tc=31.4 min CN=79 Runoff=3.56 cfs 0.487 af

Subcatchment 156S: DC-153 Runoff Area=438.370 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=9,154' Slope=0.0732 '/' Tc=71.2 min CN=79 Runoff=38.80 cfs 9.446 af

Subcatchment 157S: DC-154 Runoff Area=24.103 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,663' Slope=0.0458 '/' Tc=23.0 min CN=79 Runoff=4.74 cfs 0.519 af

Subcatchment 158S: DC-155 Runoff Area=5.587 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,025' Slope=0.0518 '/' Tc=14.7 min CN=79 Runoff=1.48 cfs 0.120 af

Subcatchment 159S: DC-157 Runoff Area=11.368 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=705' Slope=0.0255 '/' Tc=15.5 min CN=79 Runoff=2.91 cfs 0.245 af

Subcatchment 160S: DC-158 Runoff Area=68.589 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=3,078' Slope=0.0355 '/' Tc=42.8 min CN=79 Runoff=8.67 cfs 1.478 af

Subcatchment 161S: DC-159 Runoff Area=85.369 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=4,037' Slope=0.0337 '/' Tc=54.5 min CN=79 Runoff=9.11 cfs 1.839 af

Subcatchment 162S: DC-160 Runoff Area=30.248 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,809' Slope=0.0189 '/' Tc=38.3 min CN=79 Runoff=4.13 cfs 0.652 af

Subcatchment 163S: DC-161 Runoff Area=68.284 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,106' Slope=0.0211 '/' Tc=40.9 min CN=79 Runoff=8.89 cfs 1.471 af

Subcatchment 164S: DC-162 Runoff Area=21.607 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,673' Slope=0.0429 '/' Tc=23.9 min CN=79 Runoff=4.14 cfs 0.466 af

Subcatchment 165S: DC-163 Runoff Area=4.800 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=663' Slope=0.0331 '/' Tc=13.0 min CN=79 Runoff=1.35 cfs 0.103 af

Subcatchment 166S: DC-165 Runoff Area=10.219 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=918' Slope=0.0289 '/' Tc=18.0 min CN=79 Runoff=2.37 cfs 0.220 af

Subcatchment 167S: DC-166 Runoff Area=7.275 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=797' Slope=0.0419 '/' Tc=13.4 min CN=79 Runoff=2.02 cfs 0.157 af

Subcatchment 168S: DC-168 Runoff Area=56.360 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=4,302' Slope=0.0435 '/' Tc=50.5 min CN=79 Runoff=6.33 cfs 1.214 af

Subcatchment 169S: DC-169 Runoff Area=57.225 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=4,405' Slope=0.0423 '/' Tc=52.2 min CN=79 Runoff=6.26 cfs 1.233 af

Subcatchment 170S: DC-170 Runoff Area=52.129 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,641' Slope=0.0685 '/' Tc=27.2 min CN=79 Runoff=9.10 cfs 1.123 af

Subcatchment 171S: DC-171 Runoff Area=216.901 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=5,679' Slope=0.0822 '/' Tc=45.9 min CN=79 Runoff=26.00 cfs 4.674 af

Subcatchment 172S: DC-172 Runoff Area=21.100 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=3,201' Slope=0.1676 '/' Tc=20.3 min CN=79 Runoff=4.53 cfs 0.455 af

Subcatchment 173S: DC-173 Runoff Area=12.829 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,260' Slope=0.0705 '/' Tc=14.9 min CN=79 Runoff=3.36 cfs 0.276 af

Subcatchment 174S: DC-174 Runoff Area=23.056 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,960' Slope=0.0308 '/' Tc=44.5 min CN=79 Runoff=2.84 cfs 0.497 af

Subcatchment 175S: DC-175 Runoff Area=96.046 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=6,621' Slope=0.0761 '/' Tc=53.9 min CN=79 Runoff=10.33 cfs 2.070 af

Subcatchment 176S: DC-176 Runoff Area=20.660 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=3,928' Slope=0.0815 '/' Tc=34.3 min CN=79 Runoff=3.05 cfs 0.445 af

Subcatchment 177S: DC-177 Runoff Area=14.485 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=3,057' Slope=0.0783 '/' Tc=28.6 min CN=79 Runoff=2.44 cfs 0.312 af

Subcatchment 178S: DC-178 Runoff Area=932.300 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=18,691' Slope=0.1171 '/' Tc=99.7 min CN=79 Runoff=64.09 cfs 20.088 af

Subcatchment 179S: DC-179 Runoff Area=5.501 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=995' Slope=0.0409 '/' Tc=16.1 min CN=79 Runoff=1.38 cfs 0.119 af

Subcatchment 180S: DC-180 Runoff Area=11.880 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,260' Slope=0.0249 '/' Tc=39.9 min CN=79 Runoff=1.58 cfs 0.256 af

Subcatchment 181S: DC-181 Runoff Area=8.875 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=2,388' Slope=0.0835 '/' Tc=22.8 min CN=79 Runoff=1.75 cfs 0.191 af

Subcatchment 182S: DC-182 Runoff Area=14.206 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=1,848' Slope=0.0636 '/' Tc=21.2 min CN=79 Runoff=2.95 cfs 0.306 af

Total Runoff Area = 47,653.868 ac Runoff Volume = 1,026.378 af Average Runoff Depth = 0.26"
100.00% Pervious = 47,653.868 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: DC-019

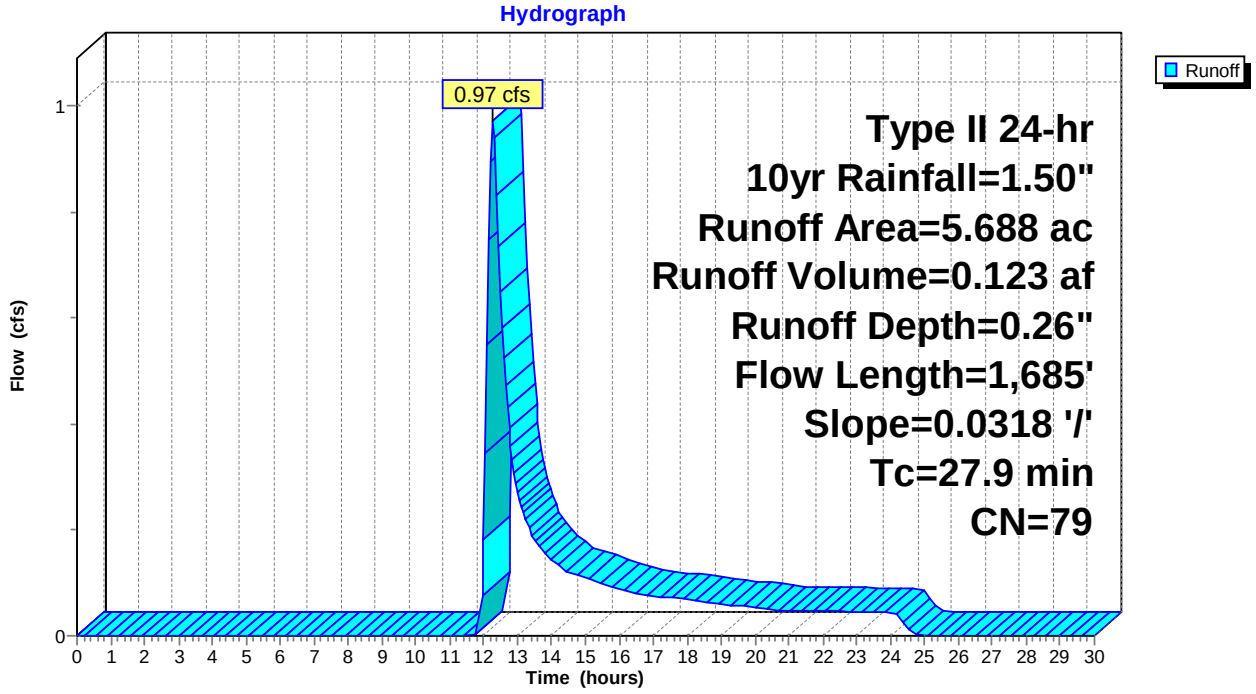
Runoff = 0.97 cfs @ 12.28 hrs, Volume= 0.123 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	5.688	79	
	5.688		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.9	1,685	0.0318	1.01		**Lag/CN Method,**

Subcatchment 1S: DC-019



Summary for Subcatchment 2S: DC-037

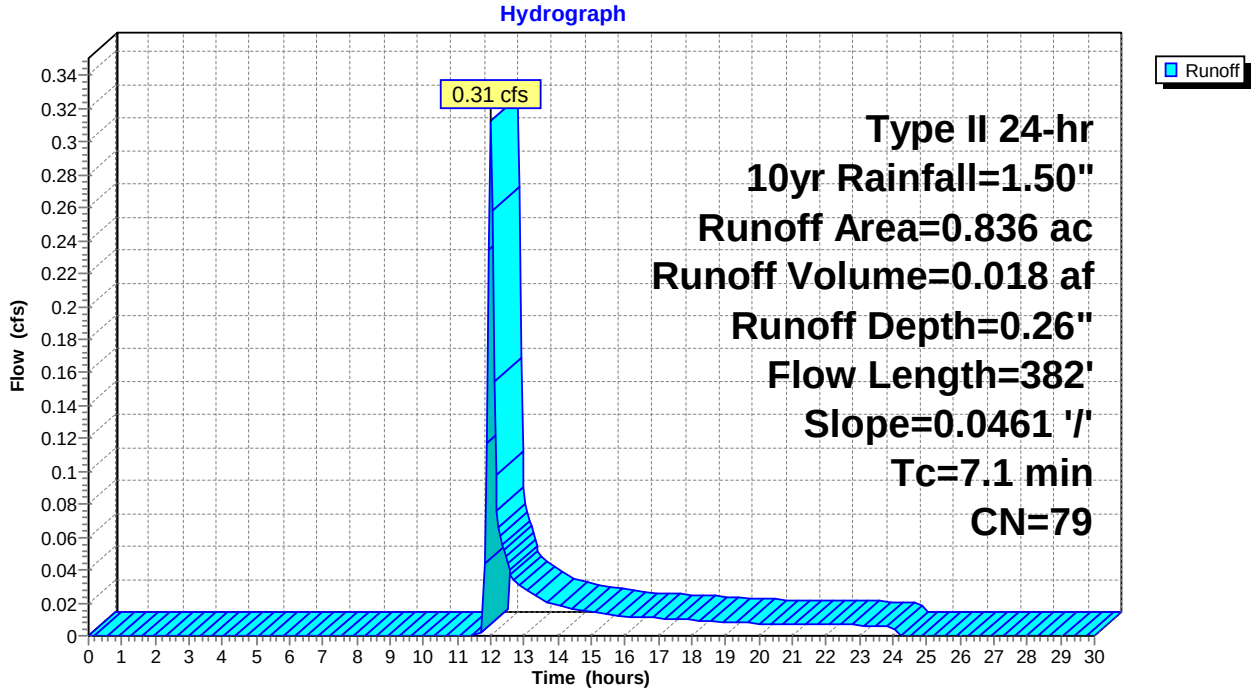
Runoff = 0.31 cfs @ 12.00 hrs, Volume= 0.018 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	0.836	79	
	0.836		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	382	0.0461	0.90		**Lag/CN Method,**

Subcatchment 2S: DC-037



Summary for Subcatchment 3S: DC-039

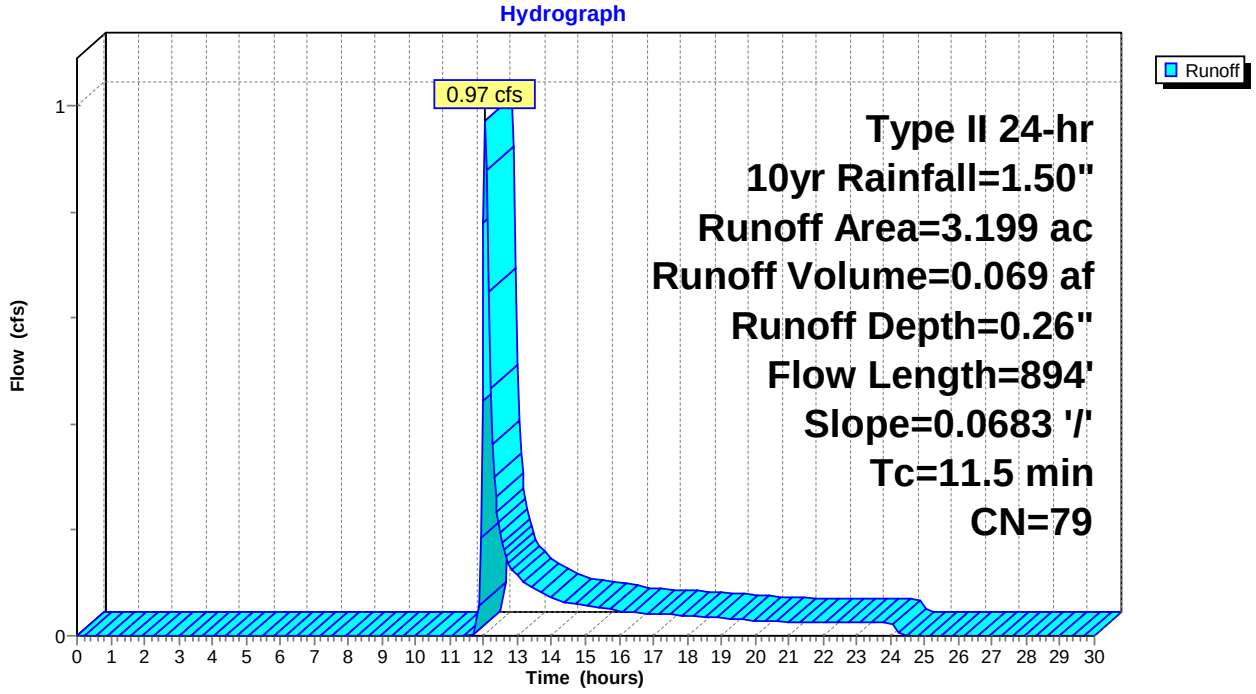
Runoff = 0.97 cfs @ 12.06 hrs, Volume= 0.069 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	3.199	79	
	3.199		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	894	0.0683	1.30		**Lag/CN Method,**

Subcatchment 3S: DC-039



Summary for Subcatchment 4S: DC-048

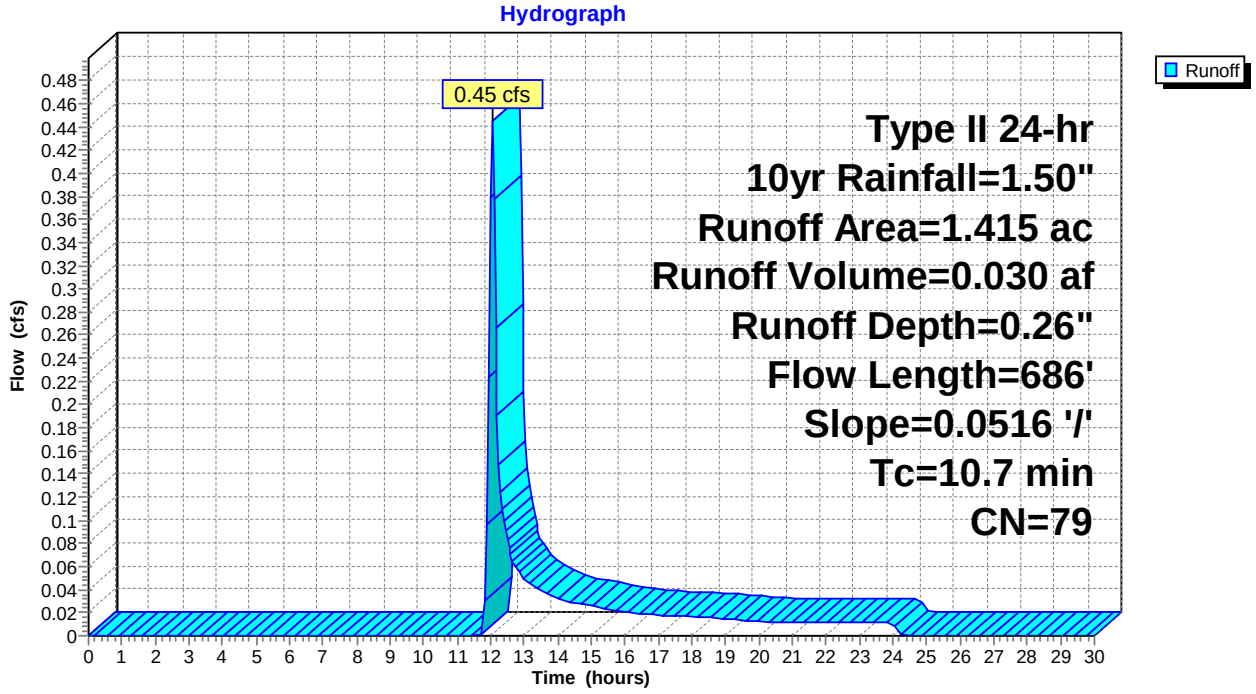
Runoff = 0.45 cfs @ 12.05 hrs, Volume= 0.030 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	1.415	79	
	1.415		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	686	0.0516	1.07		**Lag/CN Method,**

Subcatchment 4S: DC-048



Summary for Subcatchment 5S: DC-061

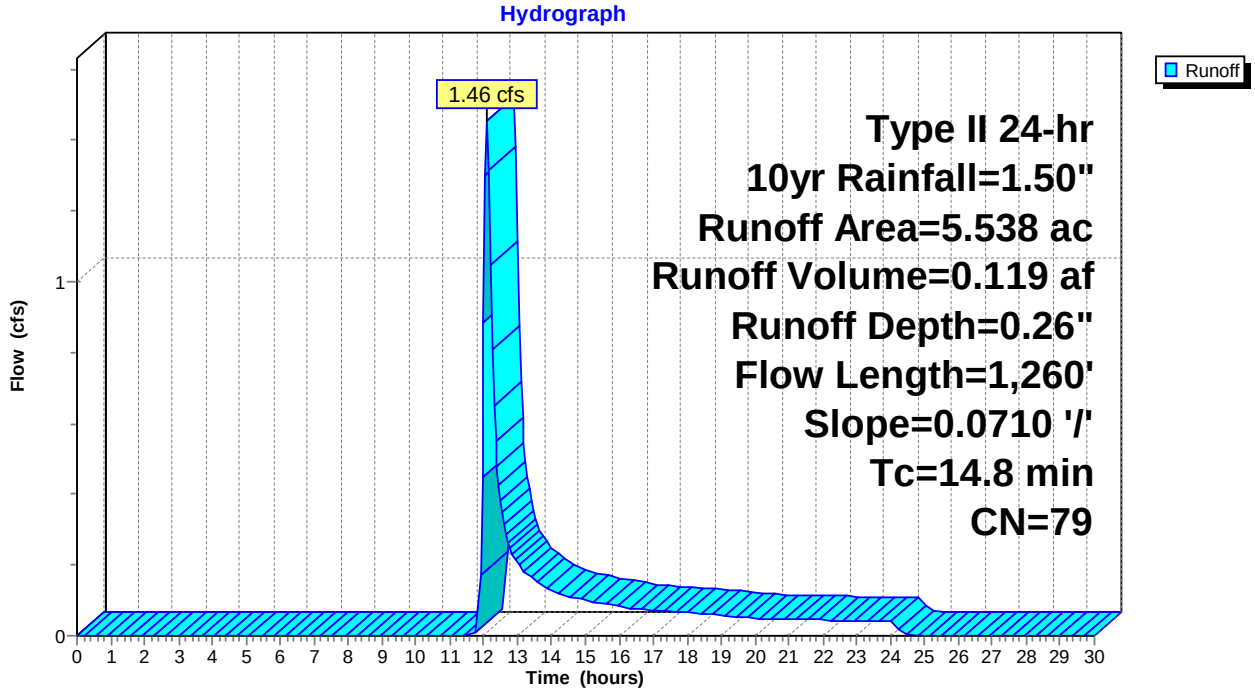
Runoff = 1.46 cfs @ 12.10 hrs, Volume= 0.119 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	5.538	79	
	5.538		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.8	1,260	0.0710	1.42		**Lag/CN Method,**

Subcatchment 5S: DC-061



Summary for Subcatchment 6S: DC-068

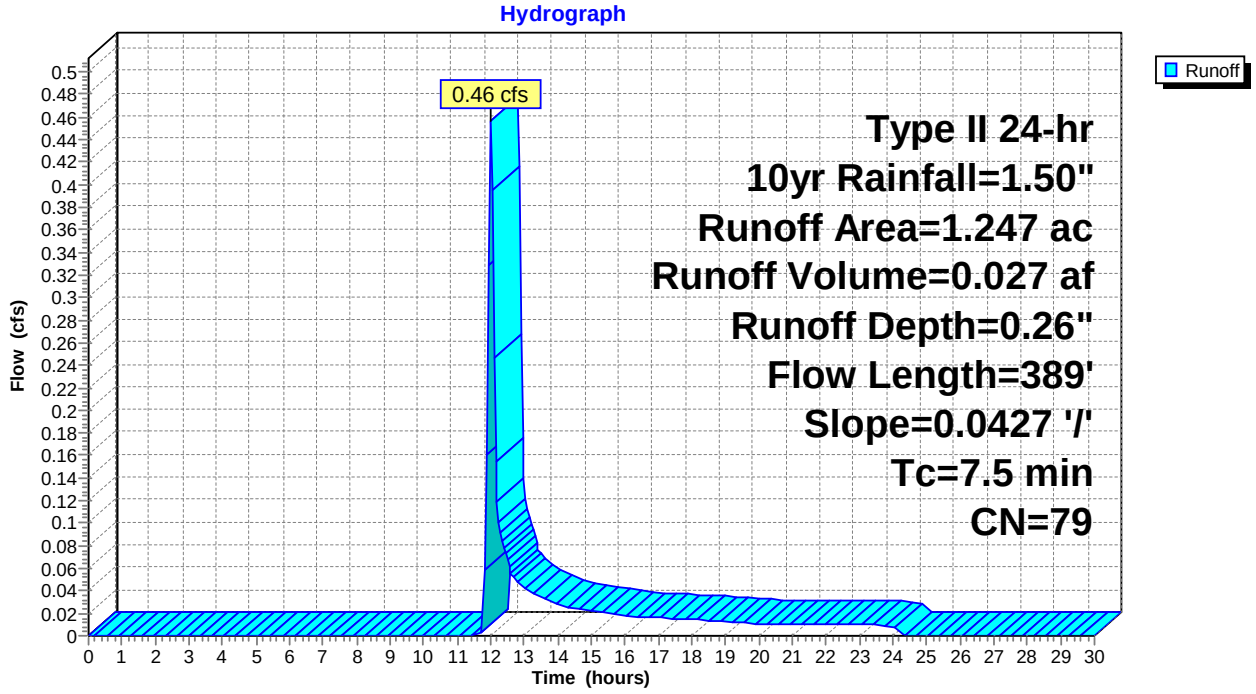
Runoff = 0.46 cfs @ 12.01 hrs, Volume= 0.027 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	1.247	79	
	1.247		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	389	0.0427	0.87		**Lag/CN Method,**

Subcatchment 6S: DC-068



Summary for Subcatchment 7S: DC-070

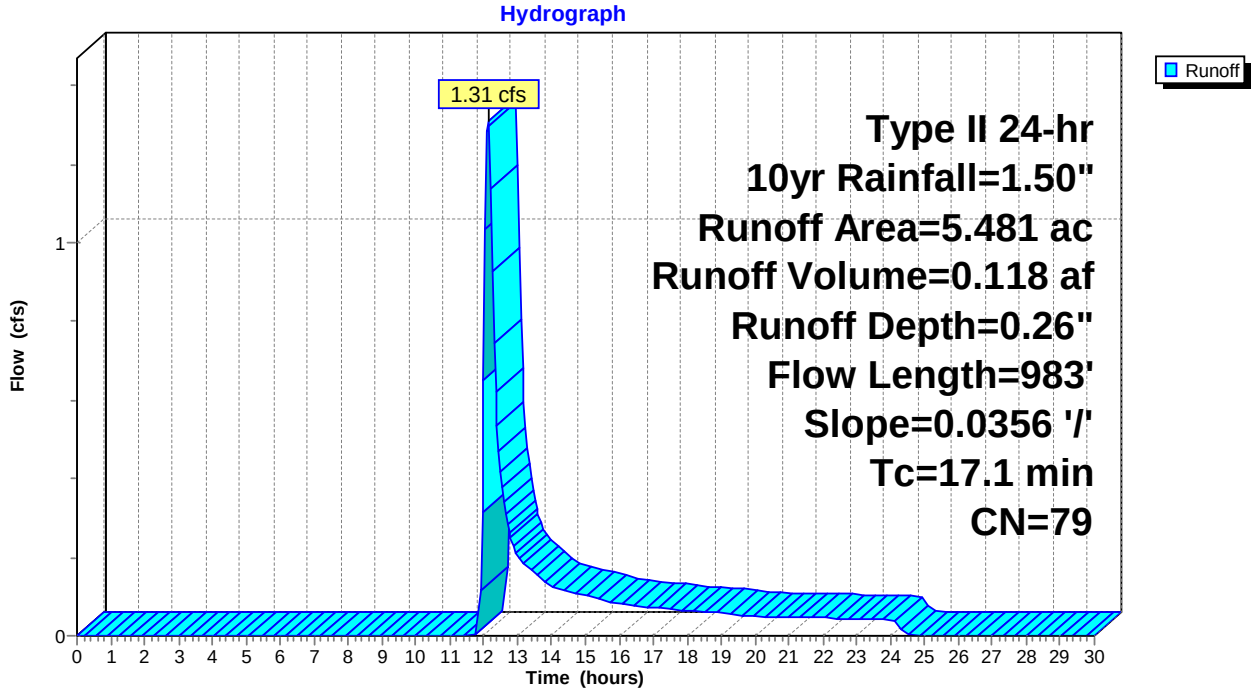
Runoff = 1.31 cfs @ 12.13 hrs, Volume= 0.118 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	5.481	79	
	5.481		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.1	983	0.0356	0.96		**Lag/CN Method,**

Subcatchment 7S: DC-070



Summary for Subcatchment 8S: DC-077

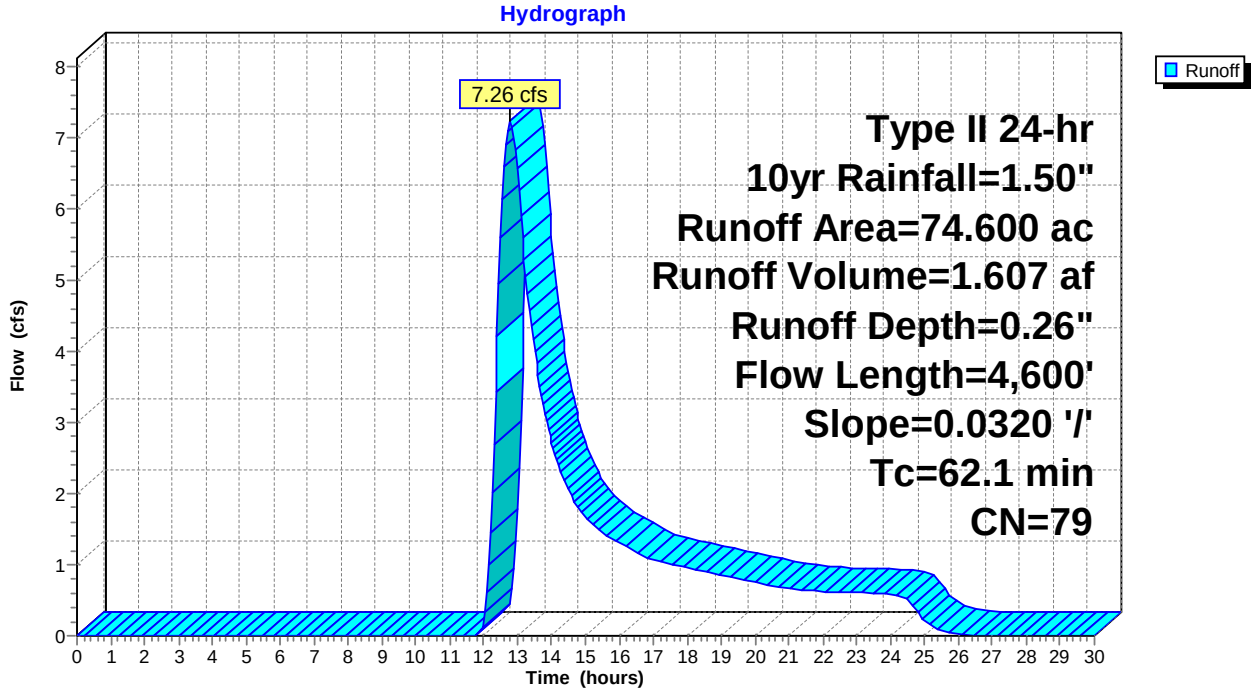
Runoff = 7.26 cfs @ 12.78 hrs, Volume= 1.607 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	74.600	79	
	74.600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
62.1	4,600	0.0320	1.23		**Lag/CN Method,**

Subcatchment 8S: DC-077



Summary for Subcatchment 9S: DC-094

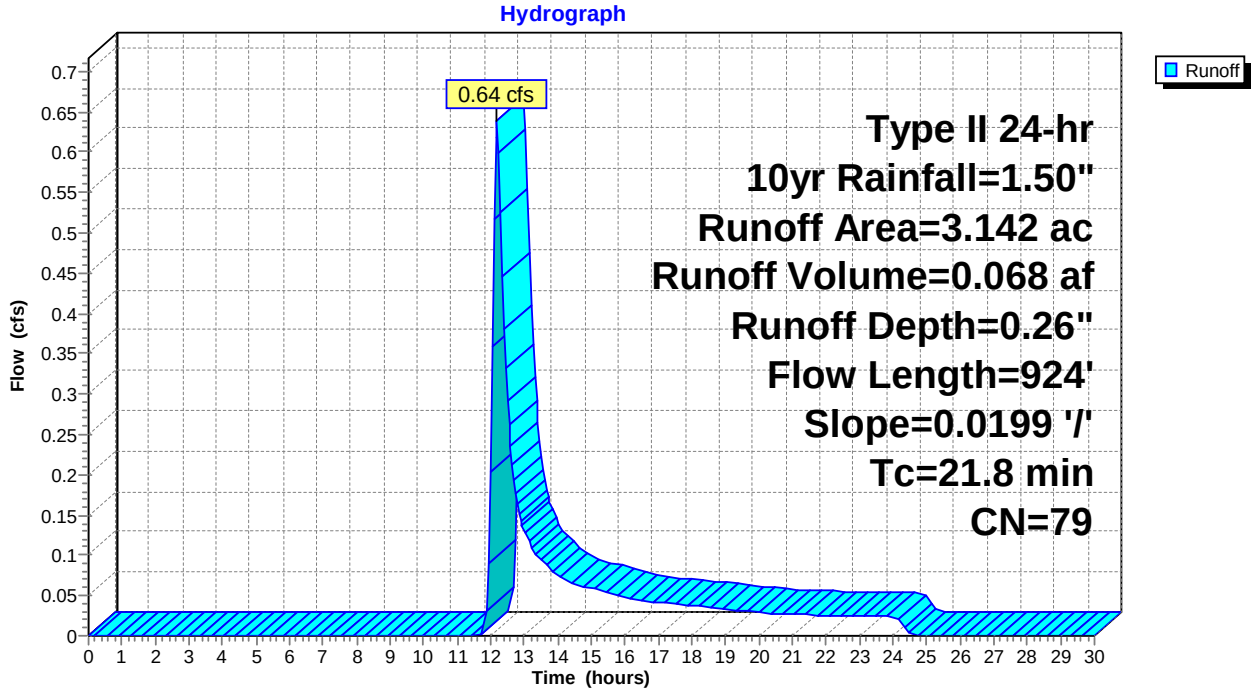
Runoff = 0.64 cfs @ 12.19 hrs, Volume= 0.068 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	3.142	79	
	3.142		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.8	924	0.0199	0.71		**Lag/CN Method,**

Subcatchment 9S: DC-094



Summary for Subcatchment 10S: DC-110

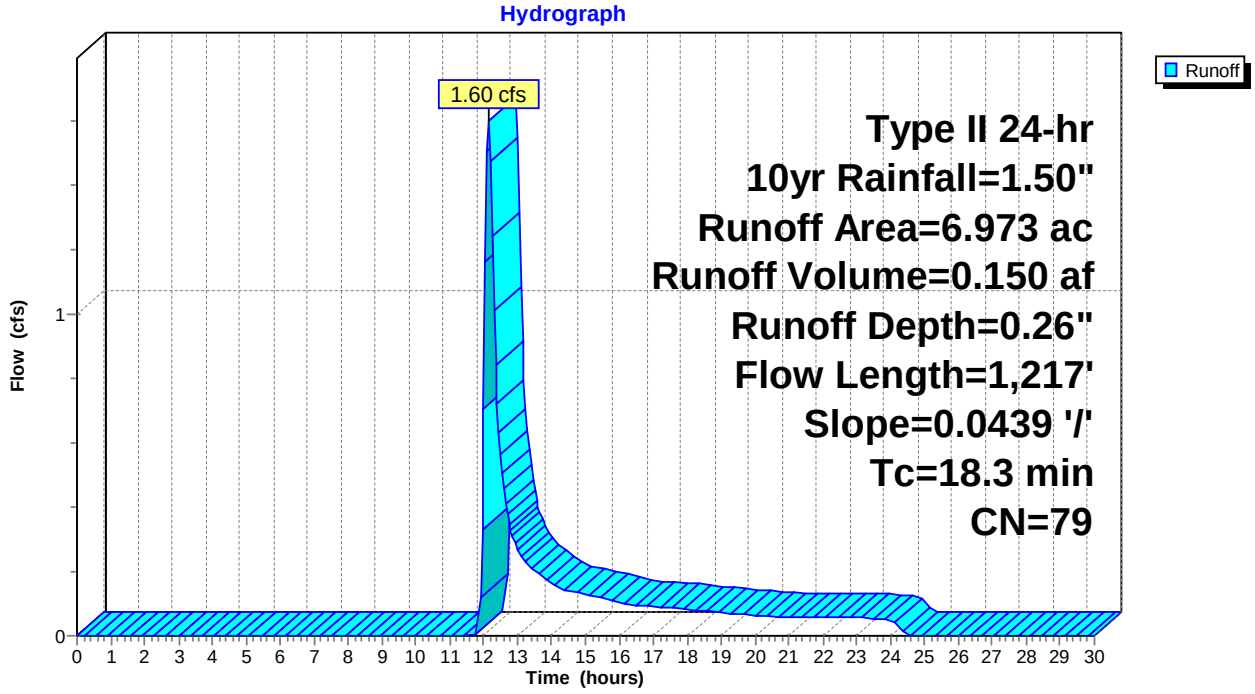
Runoff = 1.60 cfs @ 12.15 hrs, Volume= 0.150 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	6.973	79	
	6.973		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.3	1,217	0.0439	1.11		**Lag/CN Method,**

Subcatchment 10S: DC-110



Summary for Subcatchment 11S: DC-118

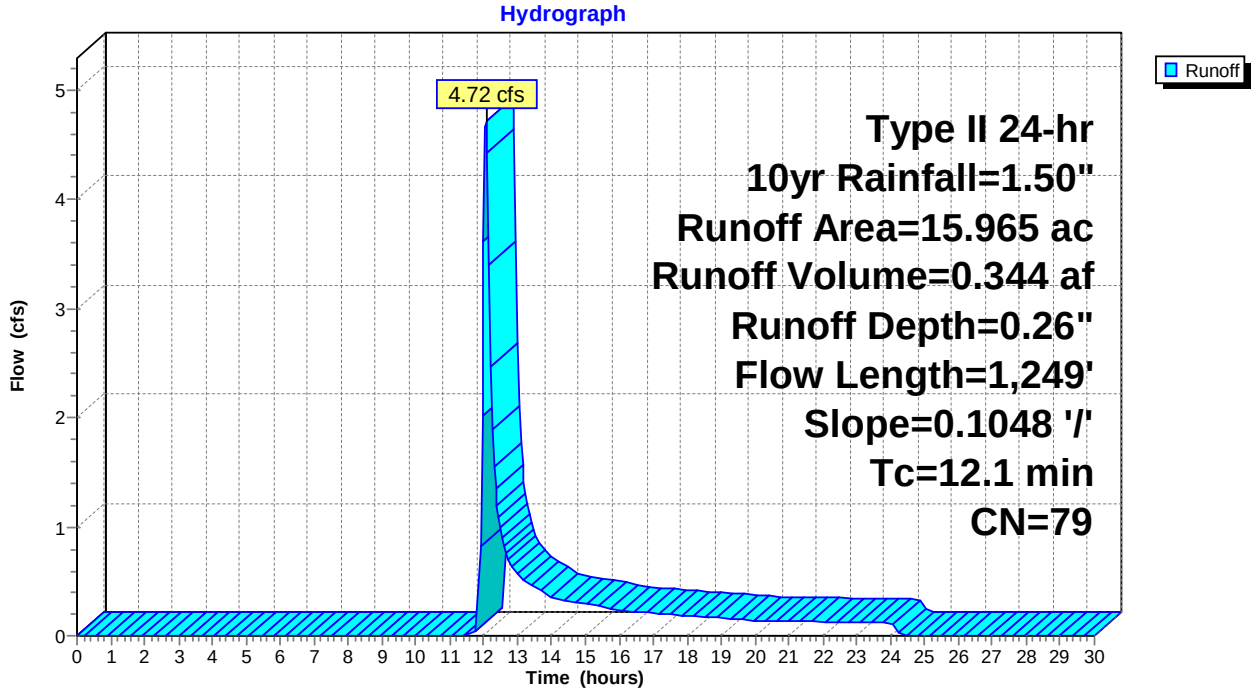
Runoff = 4.72 cfs @ 12.07 hrs, Volume= 0.344 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	15.965	79	
	15.965		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	1,249	0.1048	1.72		**Lag/CN Method,**

Subcatchment 11S: DC-118



Summary for Subcatchment 12S: DC-119

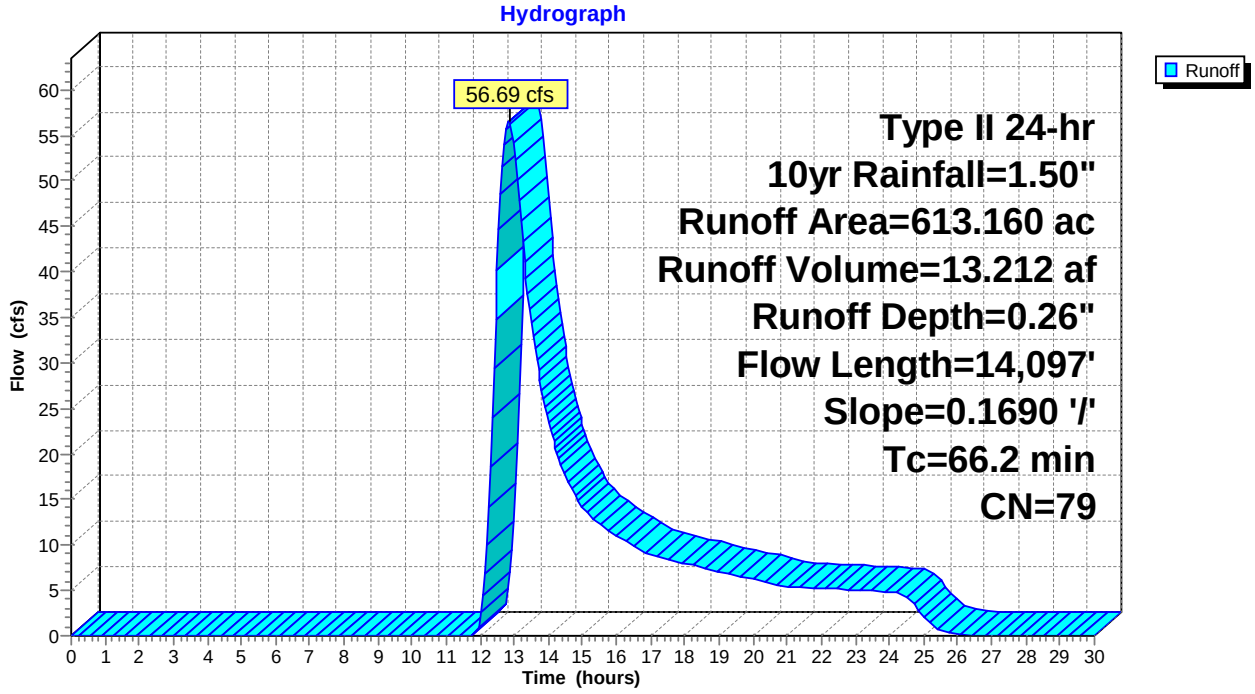
Runoff = 56.69 cfs @ 12.85 hrs, Volume= 13.212 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	613.160	79	
	613.160		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
66.2	14,097	0.1690	3.55		**Lag/CN Method,**

Subcatchment 12S: DC-119



Summary for Subcatchment 13S: DC-120

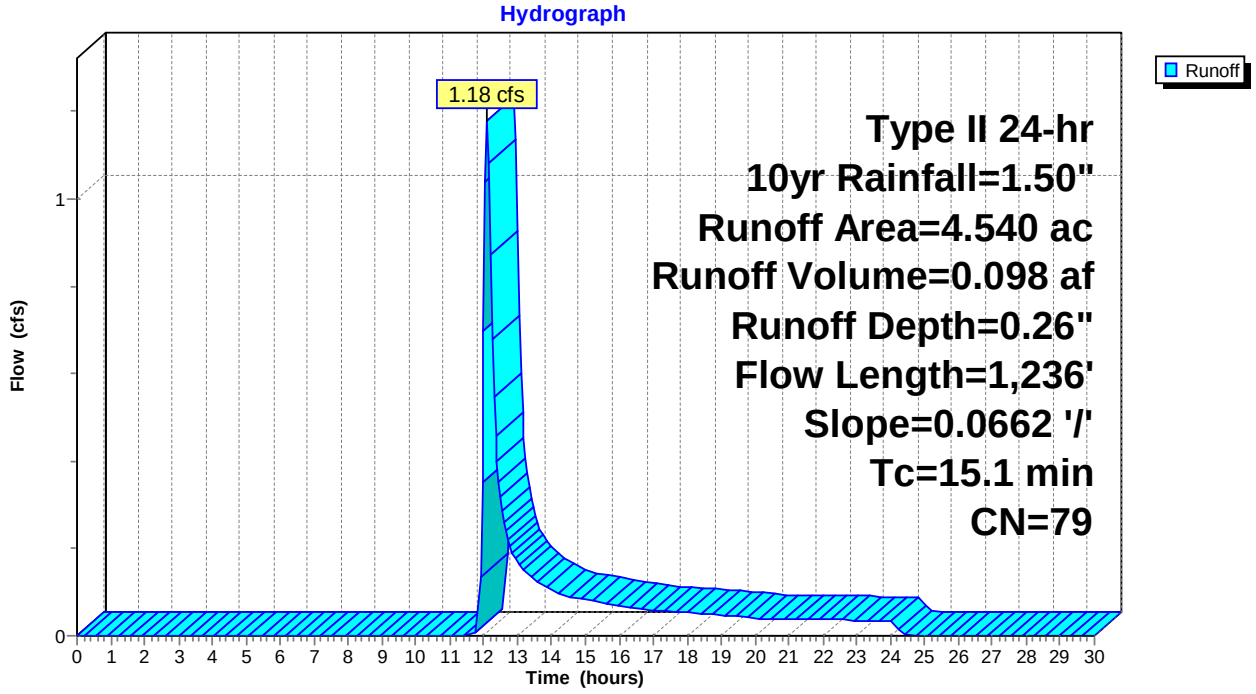
Runoff = 1.18 cfs @ 12.10 hrs, Volume= 0.098 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	4.540	79	
	4.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	1,236	0.0662	1.37		**Lag/CN Method,**

Subcatchment 13S: DC-120



Summary for Subcatchment 14S: DC-121

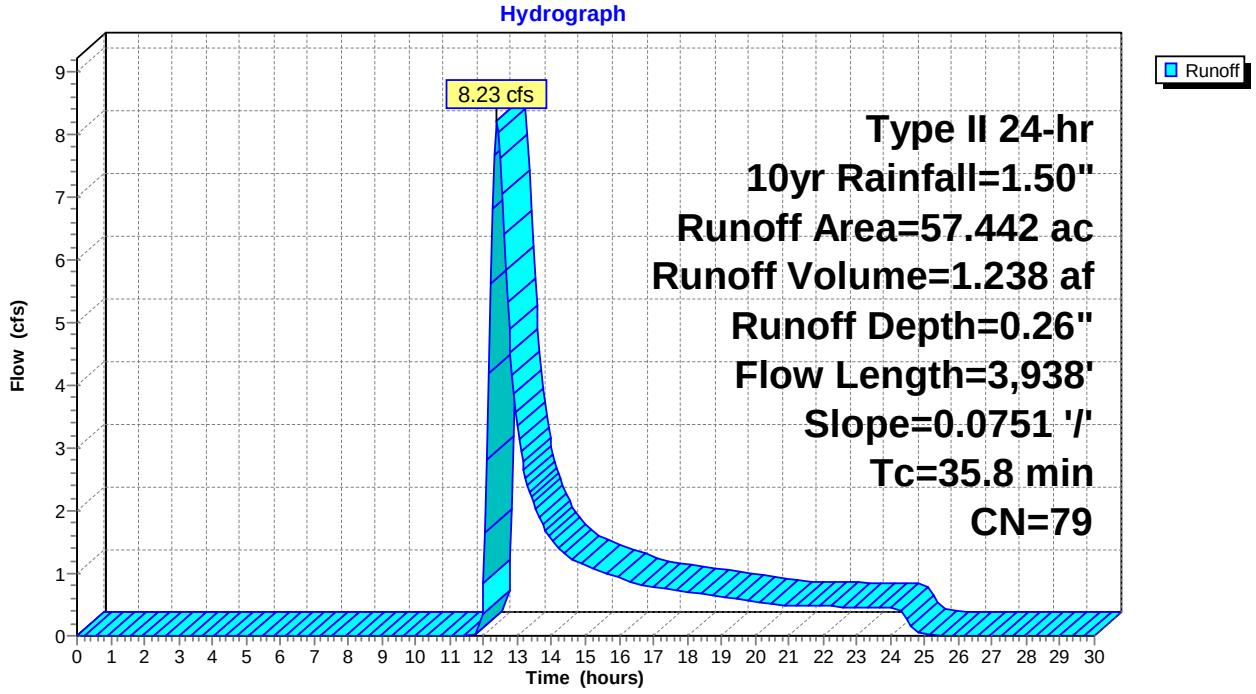
Runoff = 8.23 cfs @ 12.39 hrs, Volume= 1.238 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	57.442	79	
	57.442		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.8	3,938	0.0751	1.83		**Lag/CN Method,**

Subcatchment 14S: DC-121



Summary for Subcatchment 15S: DC-122

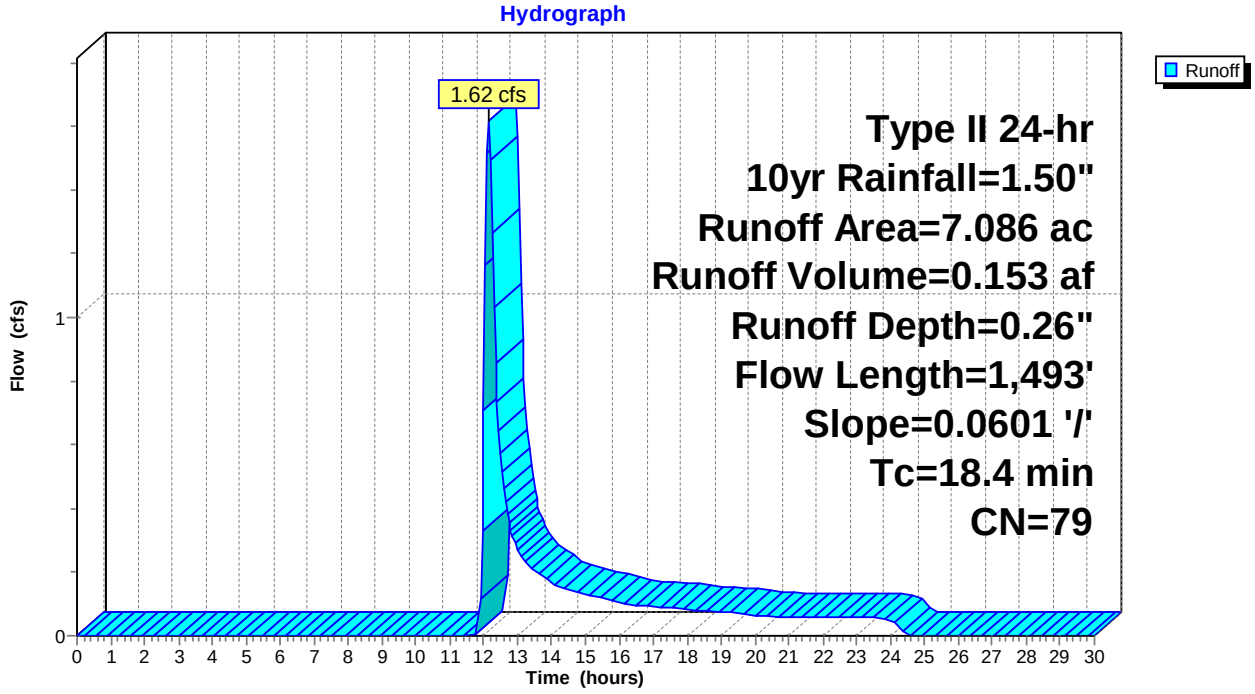
Runoff = 1.62 cfs @ 12.15 hrs, Volume= 0.153 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	7.086	79	
	7.086		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.4	1,493	0.0601	1.35		**Lag/CN Method,**

Subcatchment 15S: DC-122



Summary for Subcatchment 16S: DC-139

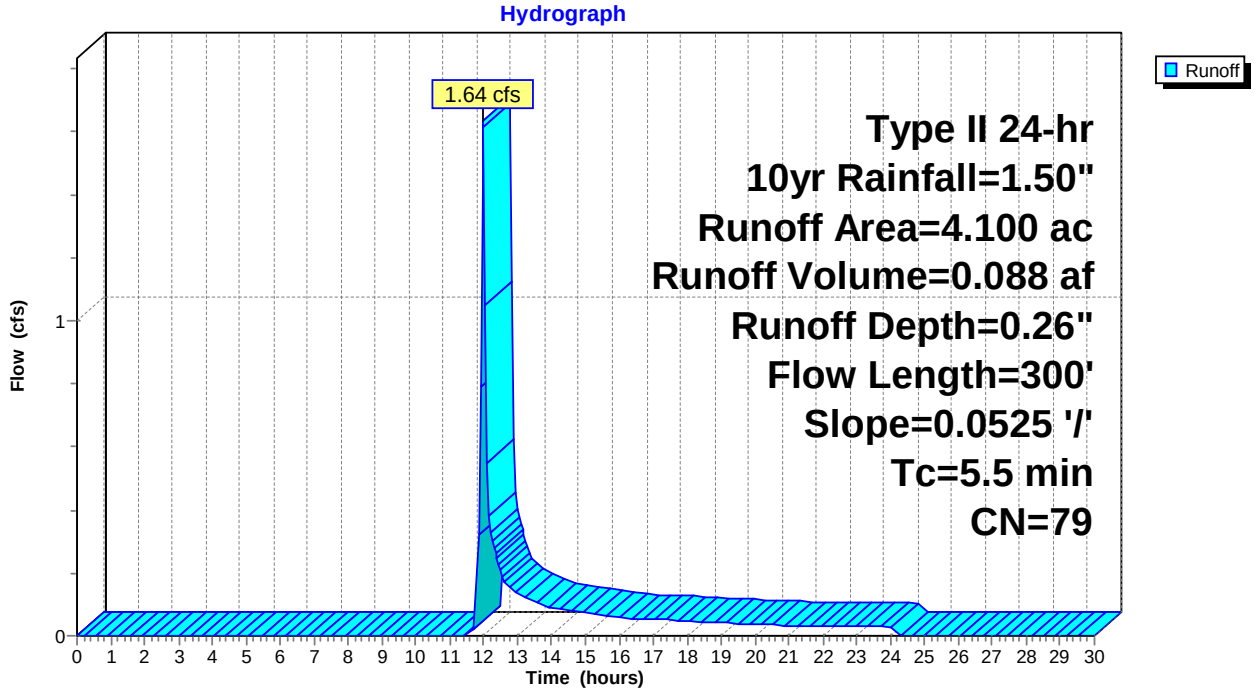
Runoff = 1.64 cfs @ 11.99 hrs, Volume= 0.088 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	4.100	79	
	4.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	300	0.0525	0.92		**Lag/CN Method,**

Subcatchment 16S: DC-139



Summary for Subcatchment 17S: DC-140

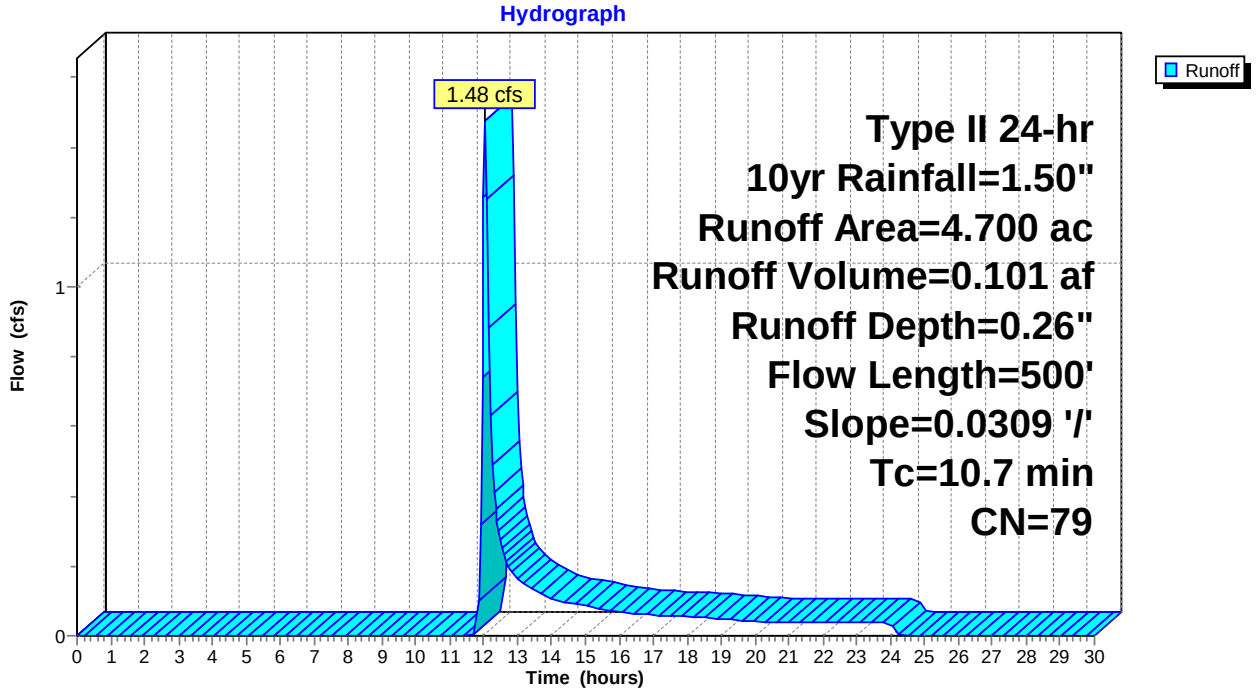
Runoff = 1.48 cfs @ 12.05 hrs, Volume= 0.101 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	4.700	79	
	4.700		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	500	0.0309	0.78		**Lag/CN Method,**

Subcatchment 17S: DC-140



Summary for Subcatchment 18S: DC-148

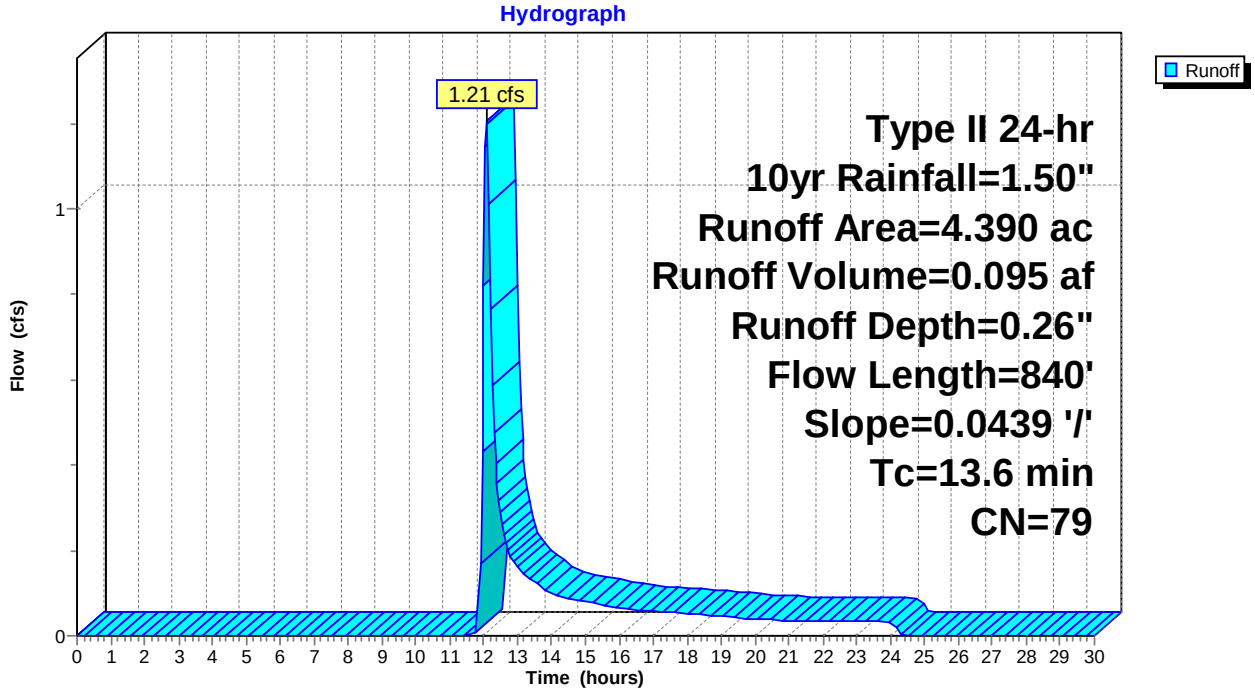
Runoff = 1.21 cfs @ 12.09 hrs, Volume= 0.095 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	4.390	79	
	4.390		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6	840	0.0439	1.03		**Lag/CN Method,**

Subcatchment 18S: DC-148



Summary for Subcatchment 19S: DC-156

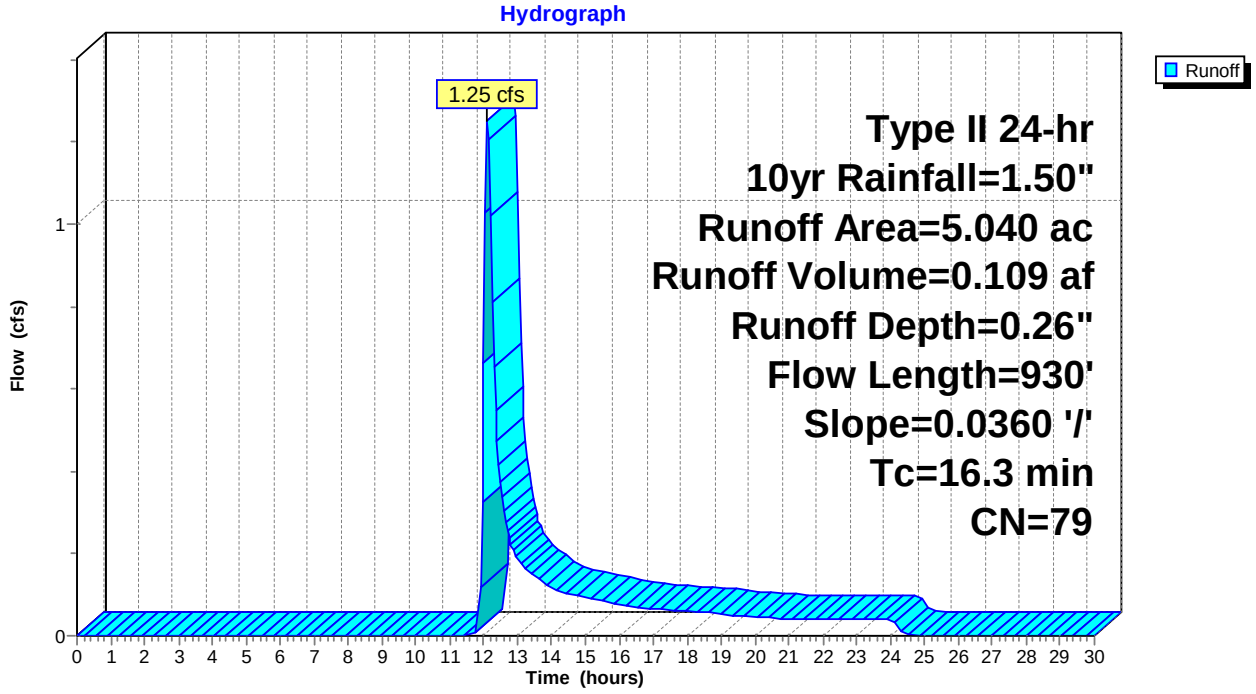
Runoff = 1.25 cfs @ 12.12 hrs, Volume= 0.109 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	5.040	79	
	5.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	930	0.0360	0.95		**Lag/CN Method,**

Subcatchment 19S: DC-156



Summary for Subcatchment 20S: DC-164

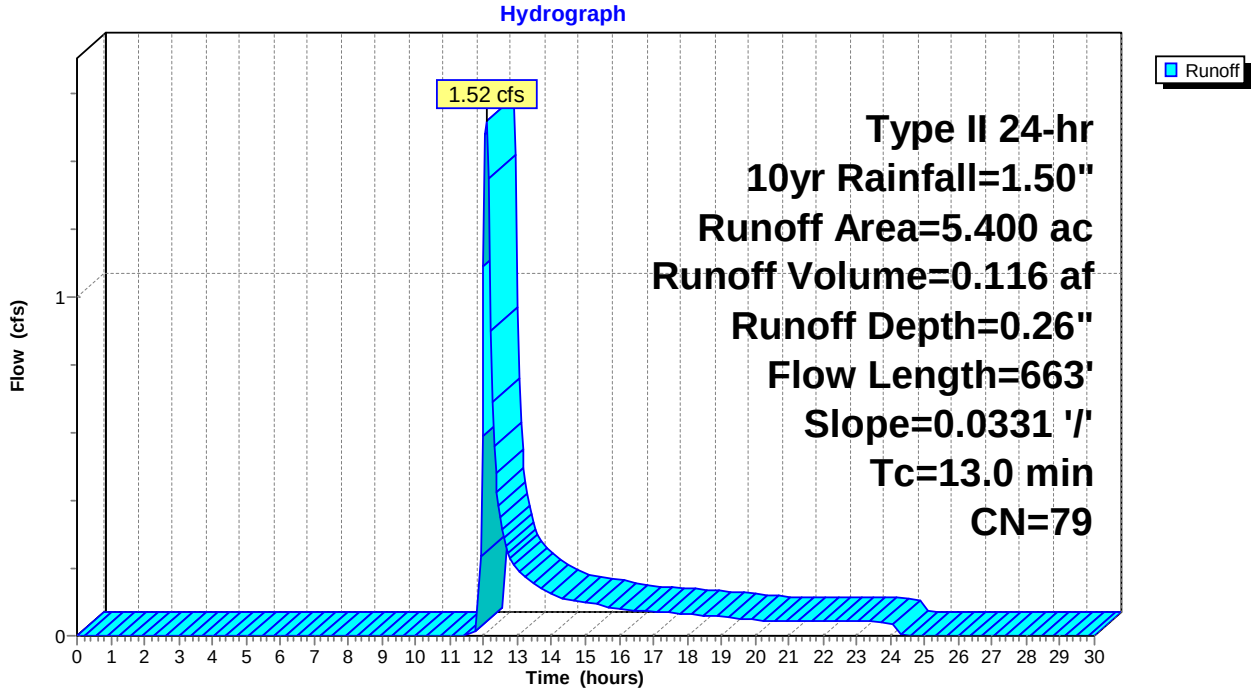
Runoff = 1.52 cfs @ 12.08 hrs, Volume= 0.116 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	5.400	79	
	5.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	663	0.0331	0.85		**Lag/CN Method,**

Subcatchment 20S: DC-164



Summary for Subcatchment 21S: DC-167

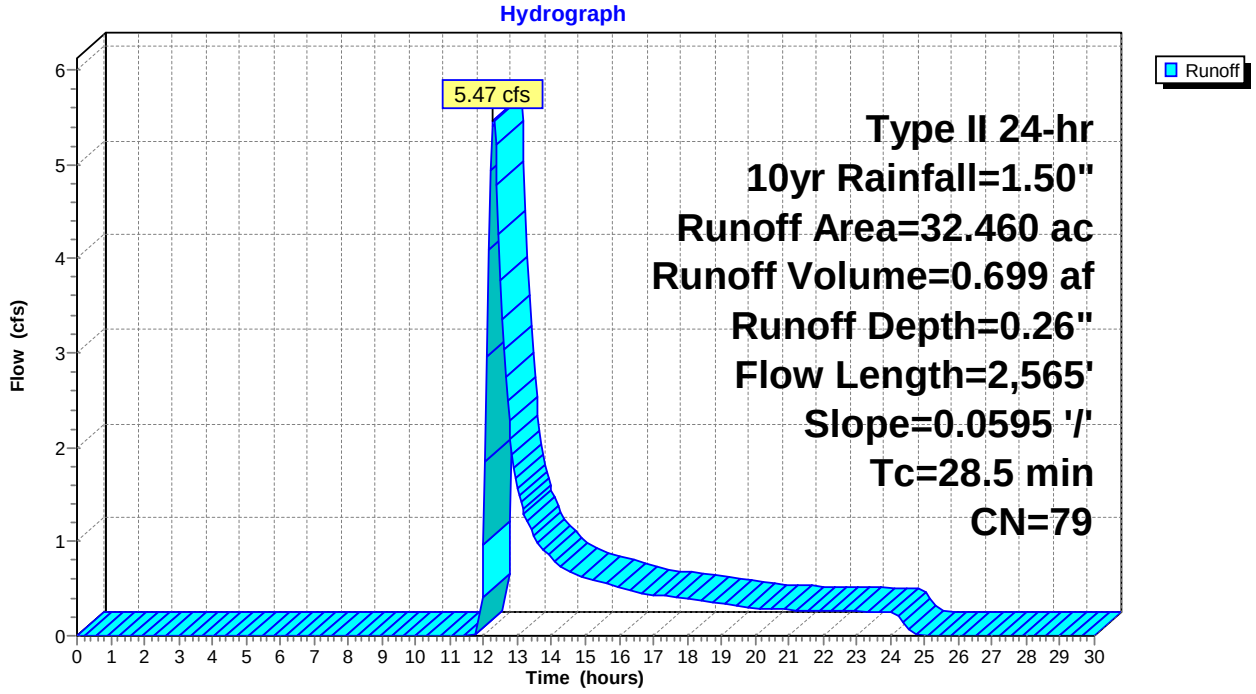
Runoff = 5.47 cfs @ 12.28 hrs, Volume= 0.699 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	32.460	79	
	32.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.5	2,565	0.0595	1.50		**Lag/CN Method,**

Subcatchment 21S: DC-167



Summary for Subcatchment 22S: DC-023

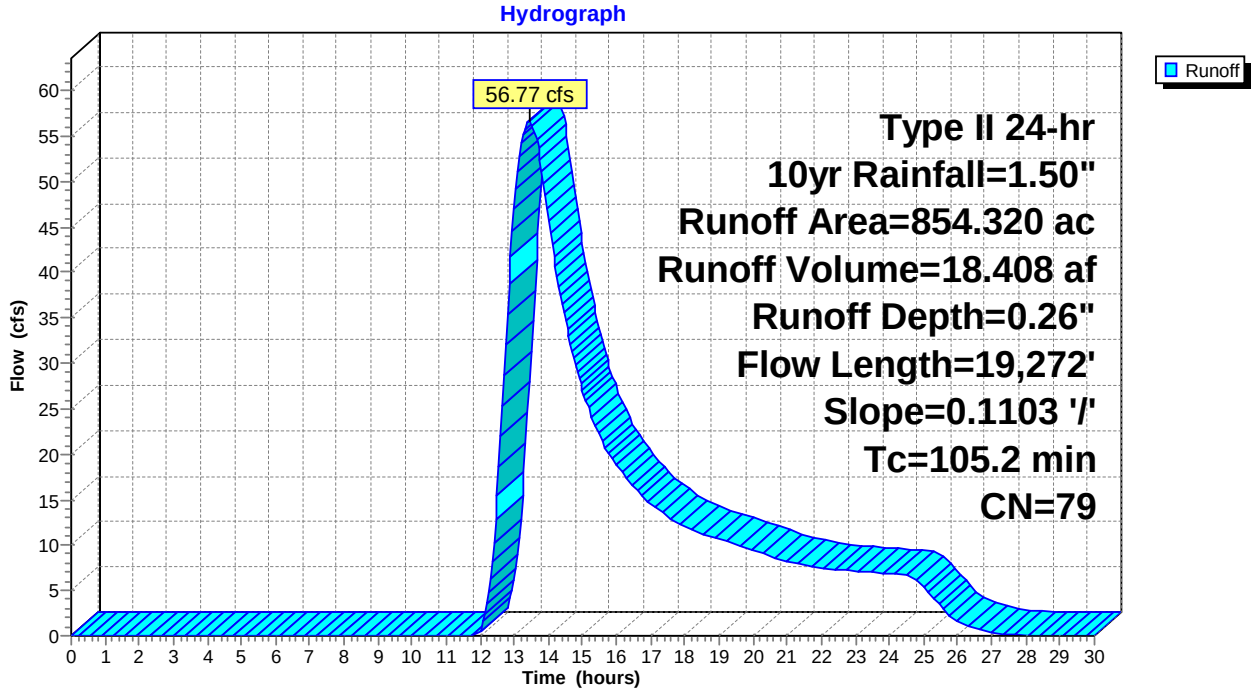
Runoff = 56.77 cfs @ 13.44 hrs, Volume= 18.408 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	854.320	79	
	854.320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
105.2	19,272	0.1103	3.05		**Lag/CN Method,**

Subcatchment 22S: DC-023



Summary for Subcatchment 23S: DC-052

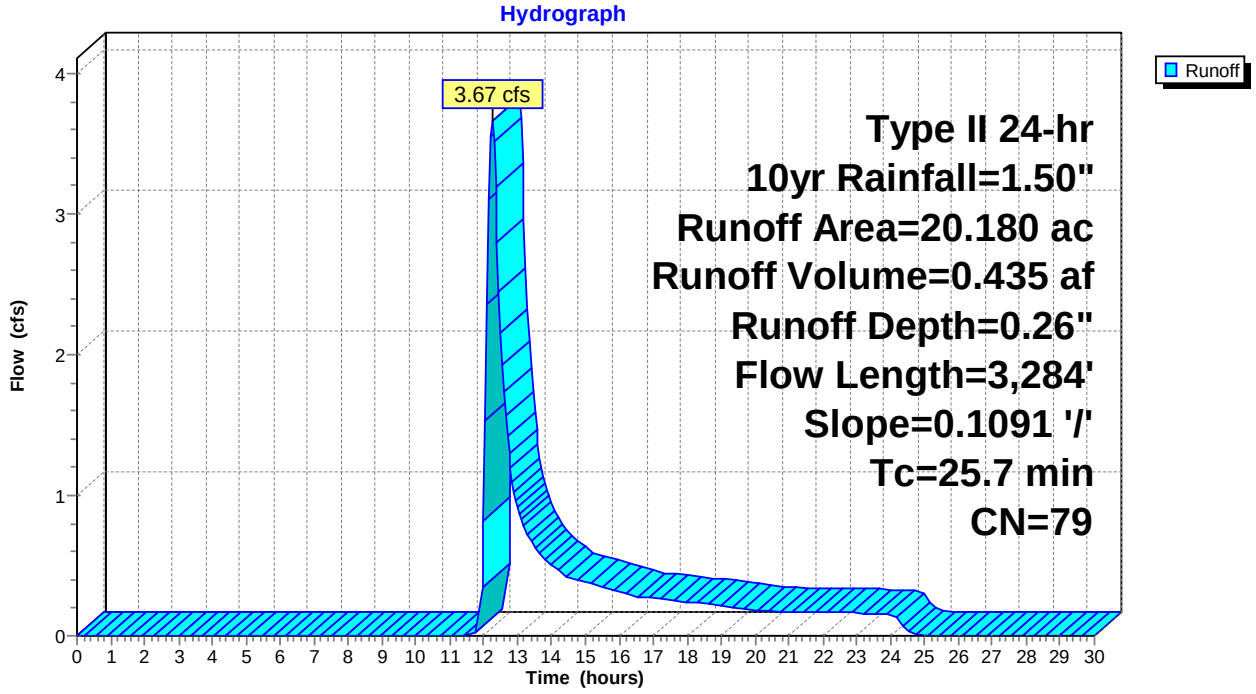
Runoff = 3.67 cfs @ 12.25 hrs, Volume= 0.435 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	20.180	79	
	20.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	3,284	0.1091	2.13		**Lag/CN Method,**

Subcatchment 23S: DC-052



Summary for Subcatchment 24S: DC-001

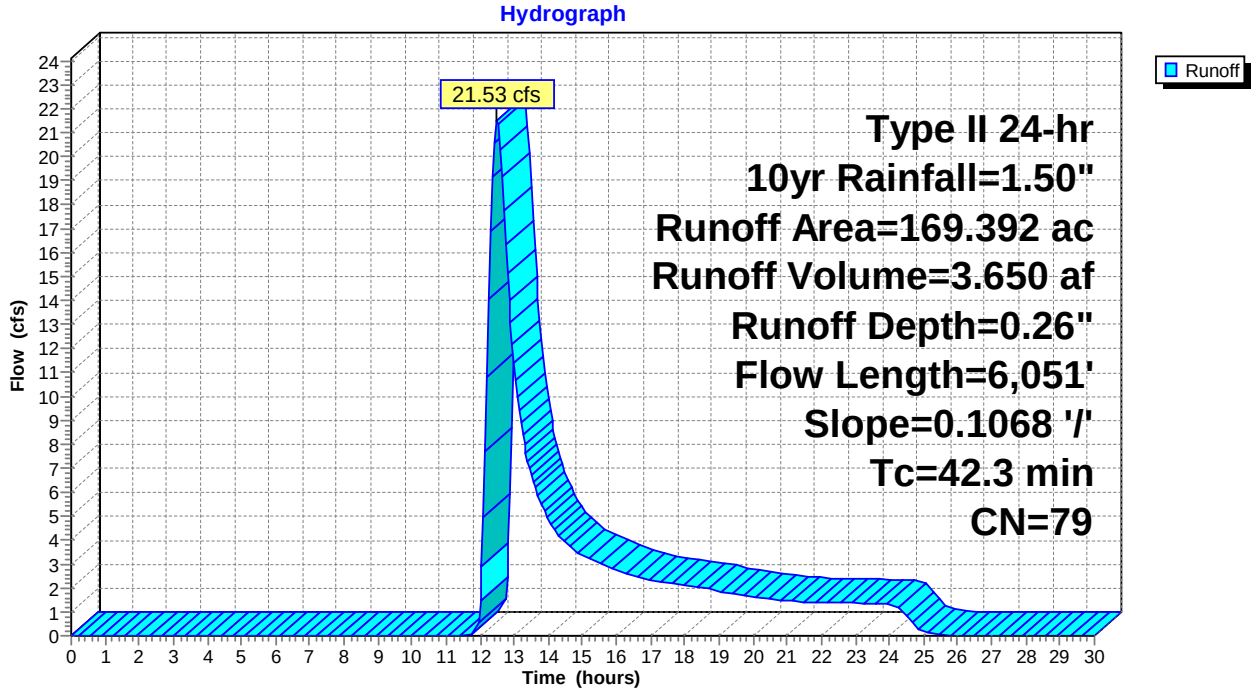
Runoff = 21.53 cfs @ 12.48 hrs, Volume= 3.650 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	169.392	79	
	169.392		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.3	6,051	0.1068	2.38		**Lag/CN Method,**

Subcatchment 24S: DC-001



Summary for Subcatchment 25S: DC-002

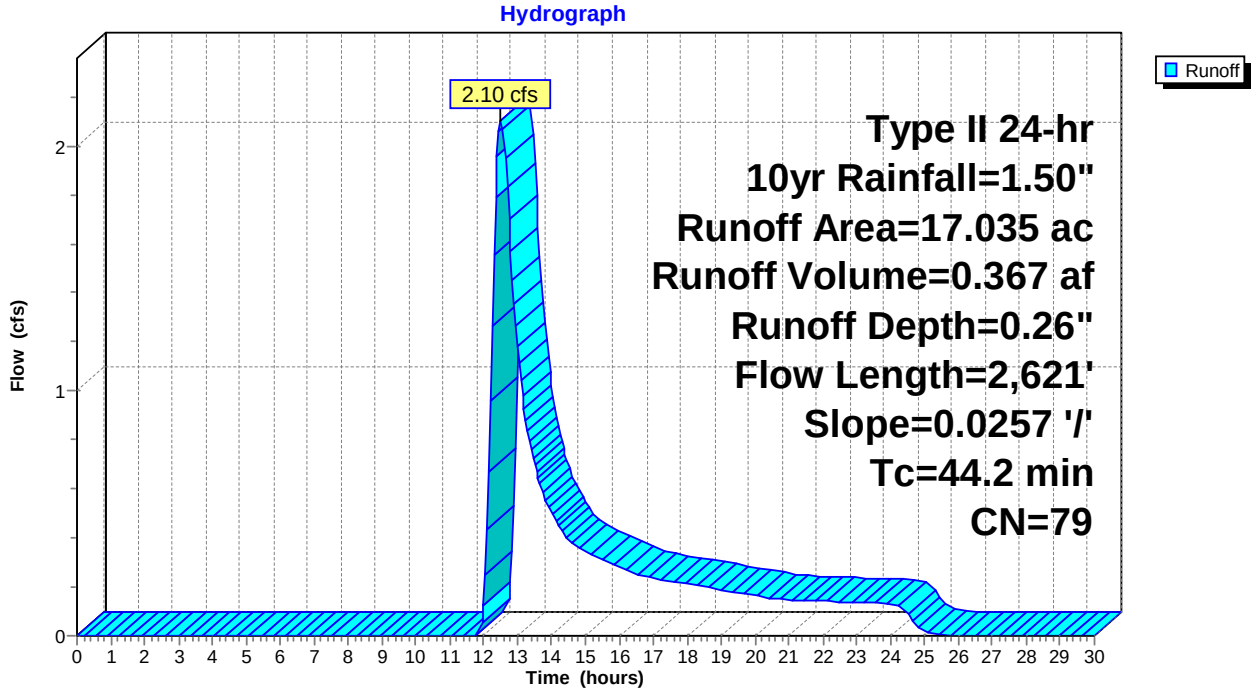
Runoff = 2.10 cfs @ 12.52 hrs, Volume= 0.367 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	17.035	79	
	17.035		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
44.2	2,621	0.0257	0.99		**Lag/CN Method,**

Subcatchment 25S: DC-002



Summary for Subcatchment 26S: DC-003

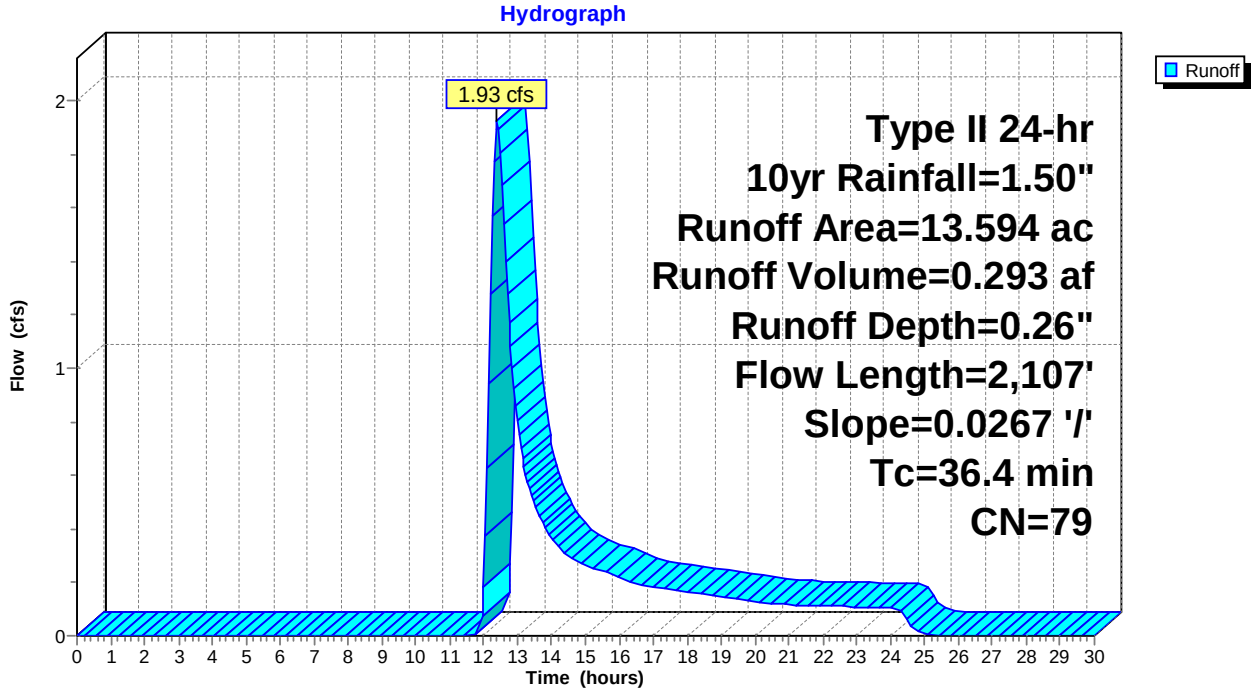
Runoff = 1.93 cfs @ 12.40 hrs, Volume= 0.293 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	13.594	79	
	13.594		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.4	2,107	0.0267	0.96		**Lag/CN Method,**

Subcatchment 26S: DC-003



Summary for Subcatchment 27S: DC-004

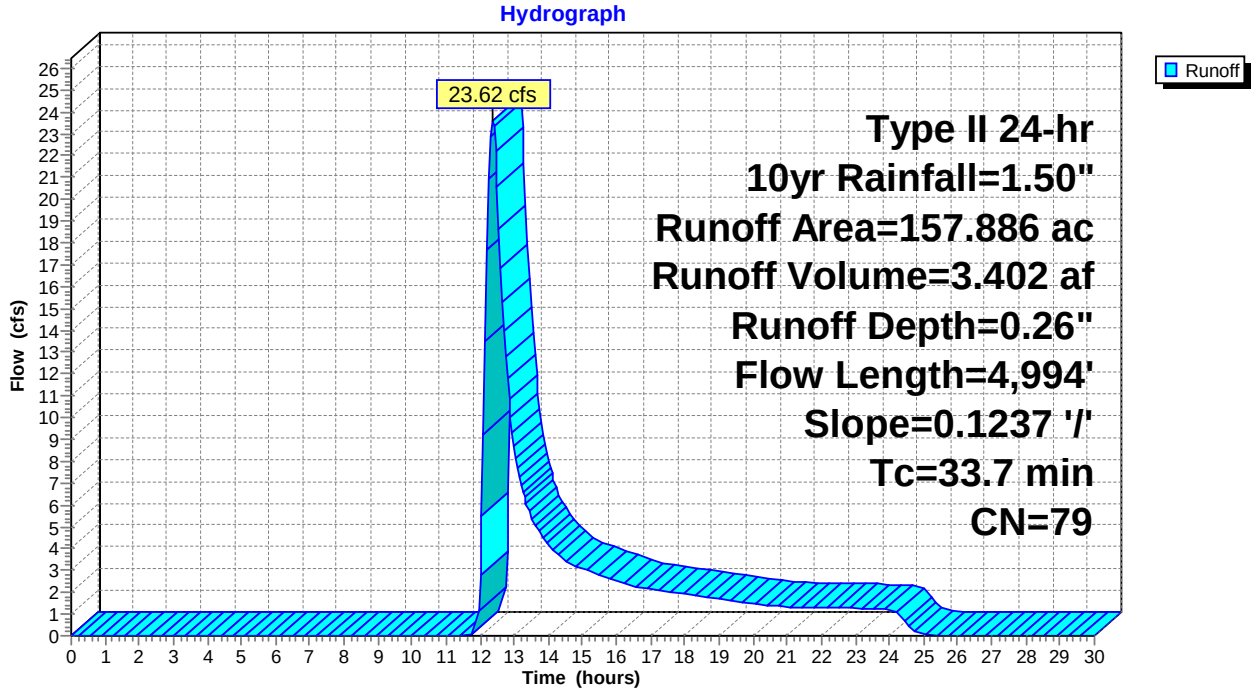
Runoff = 23.62 cfs @ 12.36 hrs, Volume= 3.402 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	157.886	79	
	157.886		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.7	4,994	0.1237	2.47		**Lag/CN Method,**

Subcatchment 27S: DC-004



Summary for Subcatchment 28S: DC-005

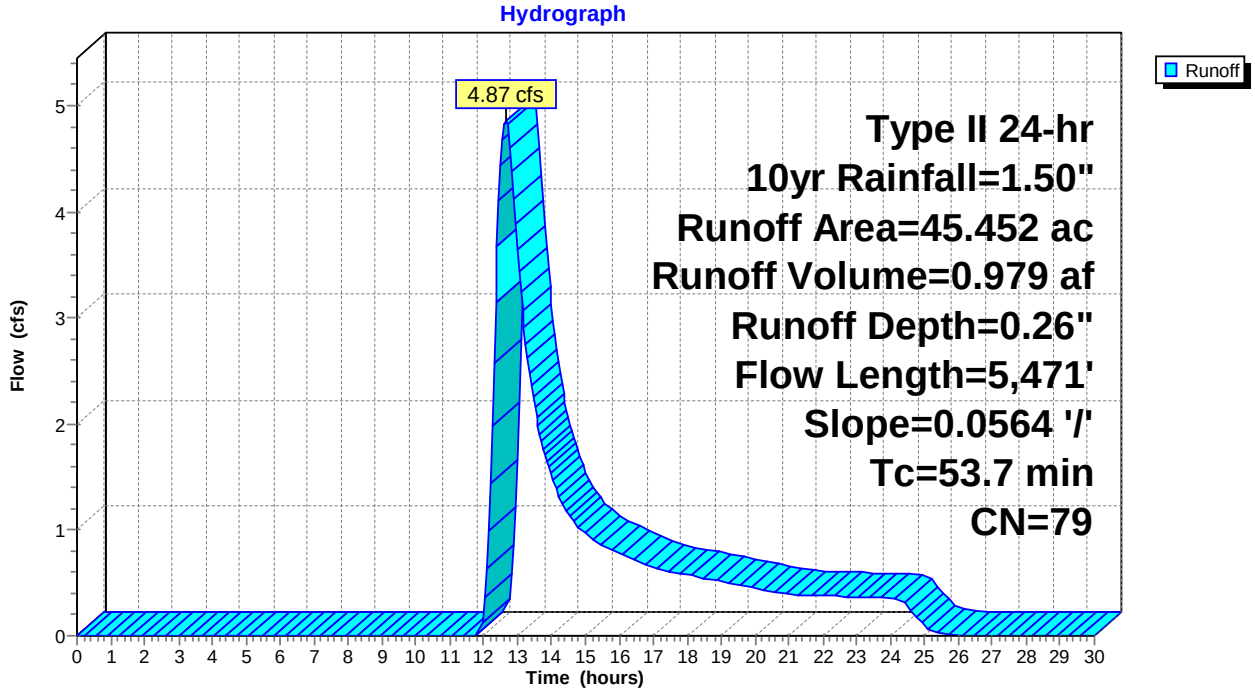
Runoff = 4.87 cfs @ 12.66 hrs, Volume= 0.979 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	45.452	79	
	45.452		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
53.7	5,471	0.0564	1.70		**Lag/CN Method,**

Subcatchment 28S: DC-005



Summary for Subcatchment 29S: DC-006

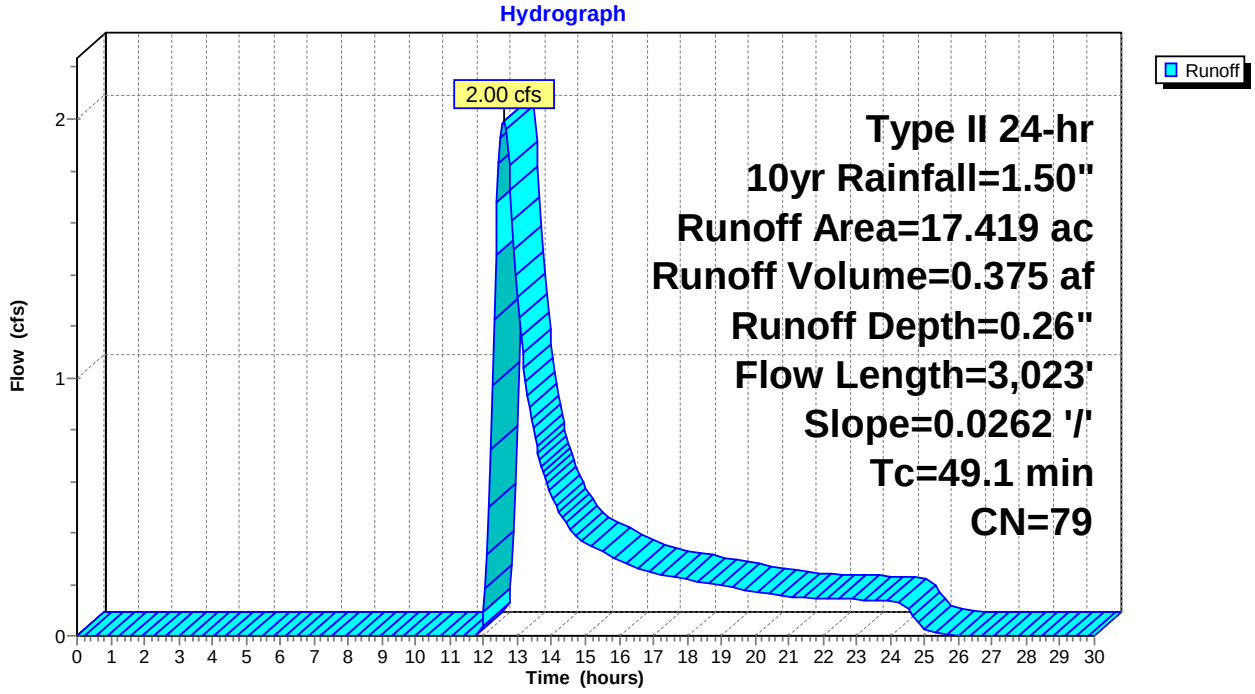
Runoff = 2.00 cfs @ 12.59 hrs, Volume= 0.375 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	17.419	79	
	17.419		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
49.1	3,023	0.0262	1.03		**Lag/CN Method,**

Subcatchment 29S: DC-006



Summary for Subcatchment 30S: DC-007

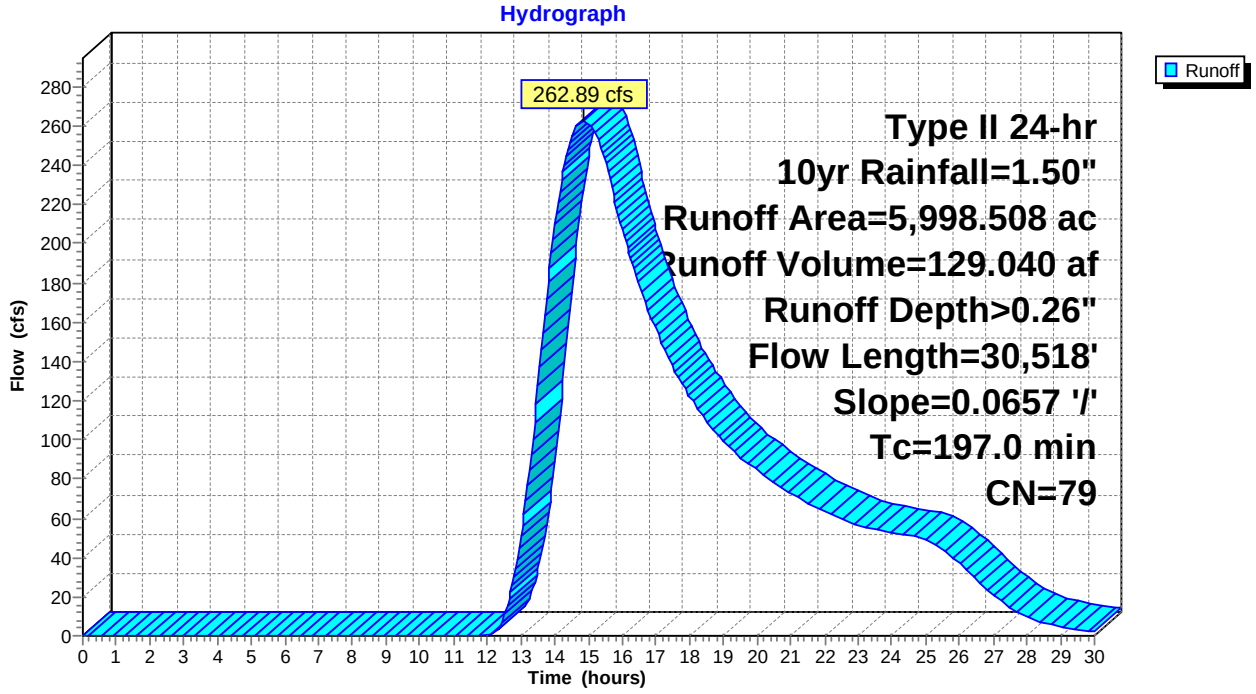
Runoff = 262.89 cfs @ 14.87 hrs, Volume= 129.040 af, Depth> 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	5,998.508	79	
	5,998.508		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
197.0	30,518	0.0657	2.58		**Lag/CN Method,**

Subcatchment 30S: DC-007



Summary for Subcatchment 31S: DC-008

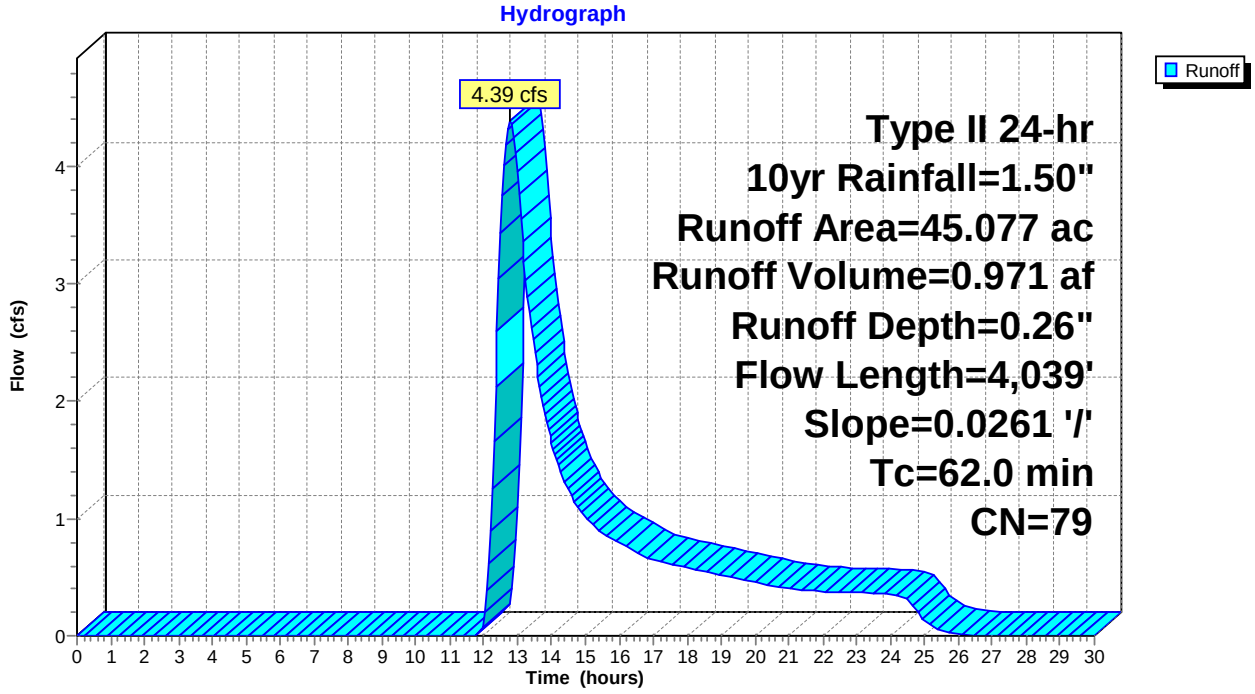
Runoff = 4.39 cfs @ 12.77 hrs, Volume= 0.971 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	45.077	79	
	45.077		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
62.0	4,039	0.0261	1.09		**Lag/CN Method,**

Subcatchment 31S: DC-008



Summary for Subcatchment 32S: DC-009

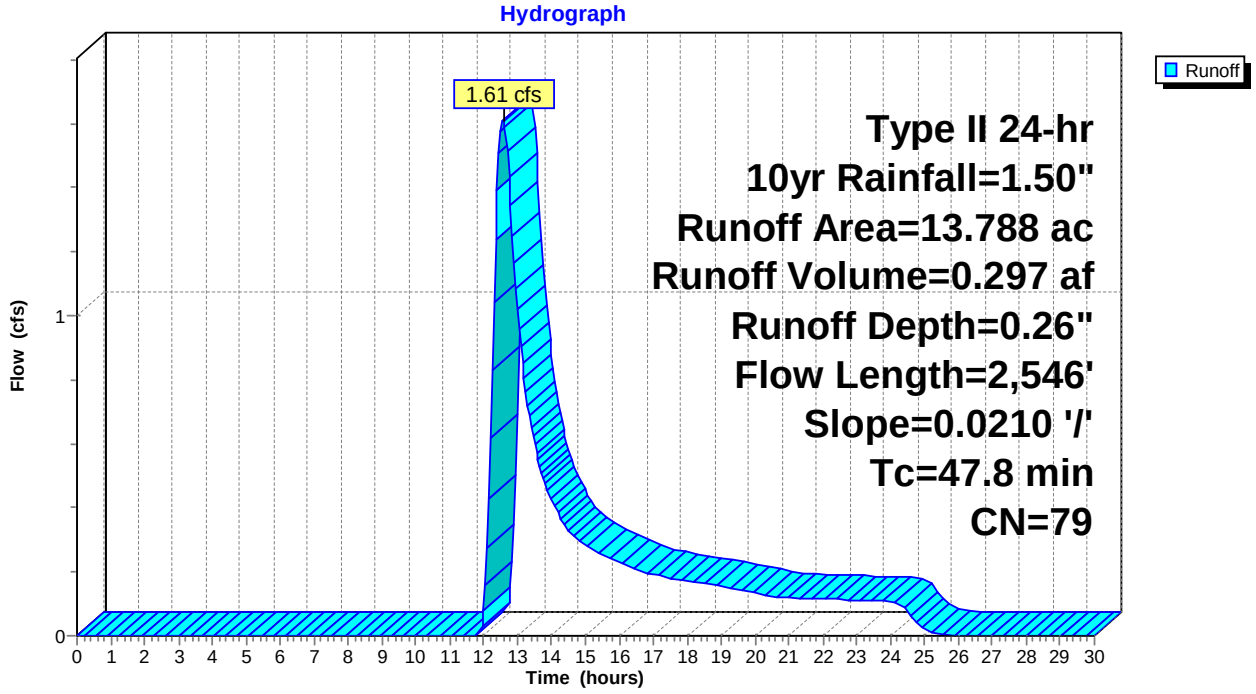
Runoff = 1.61 cfs @ 12.58 hrs, Volume= 0.297 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	13.788	79	
	13.788		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.8	2,546	0.0210	0.89		**Lag/CN Method,**

Subcatchment 32S: DC-009



Summary for Subcatchment 33S: DC-010

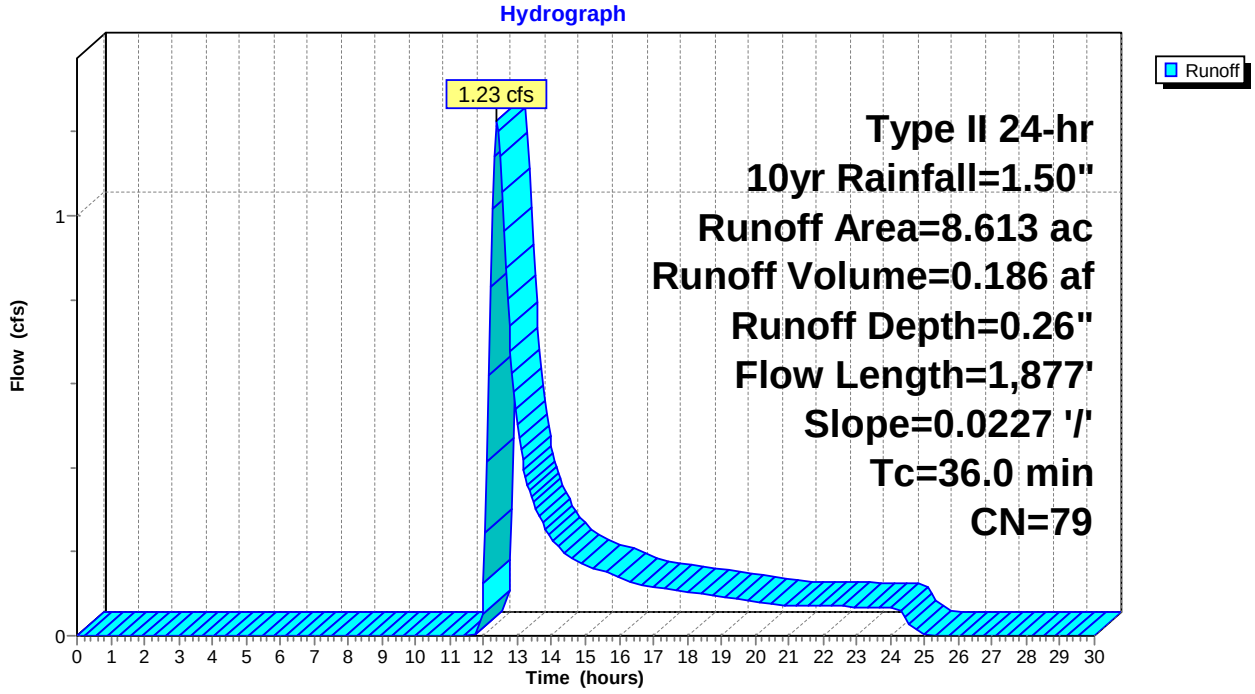
Runoff = 1.23 cfs @ 12.39 hrs, Volume= 0.186 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	8.613	79	
	8.613		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.0	1,877	0.0227	0.87		**Lag/CN Method,**

Subcatchment 33S: DC-010



Summary for Subcatchment 34S: DC-011

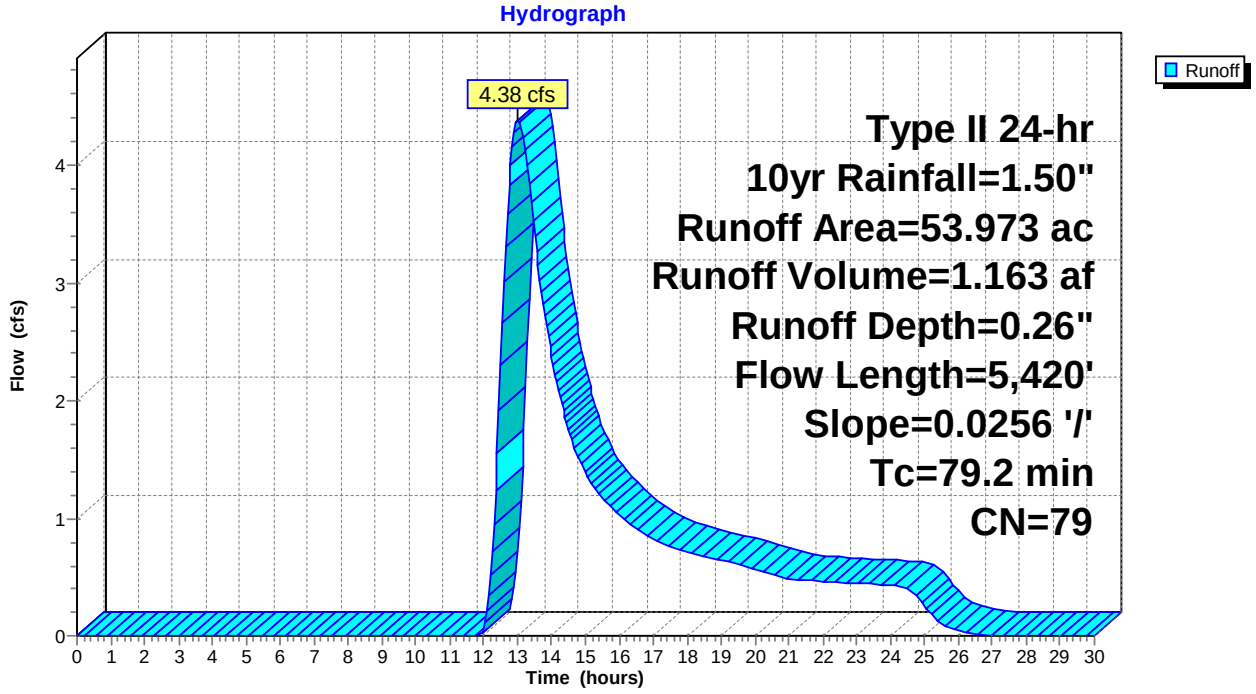
Runoff = 4.38 cfs @ 13.02 hrs, Volume= 1.163 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	53.973	79	
	53.973		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
79.2	5,420	0.0256	1.14		**Lag/CN Method,**

Subcatchment 34S: DC-011



Summary for Subcatchment 35S: DC-012

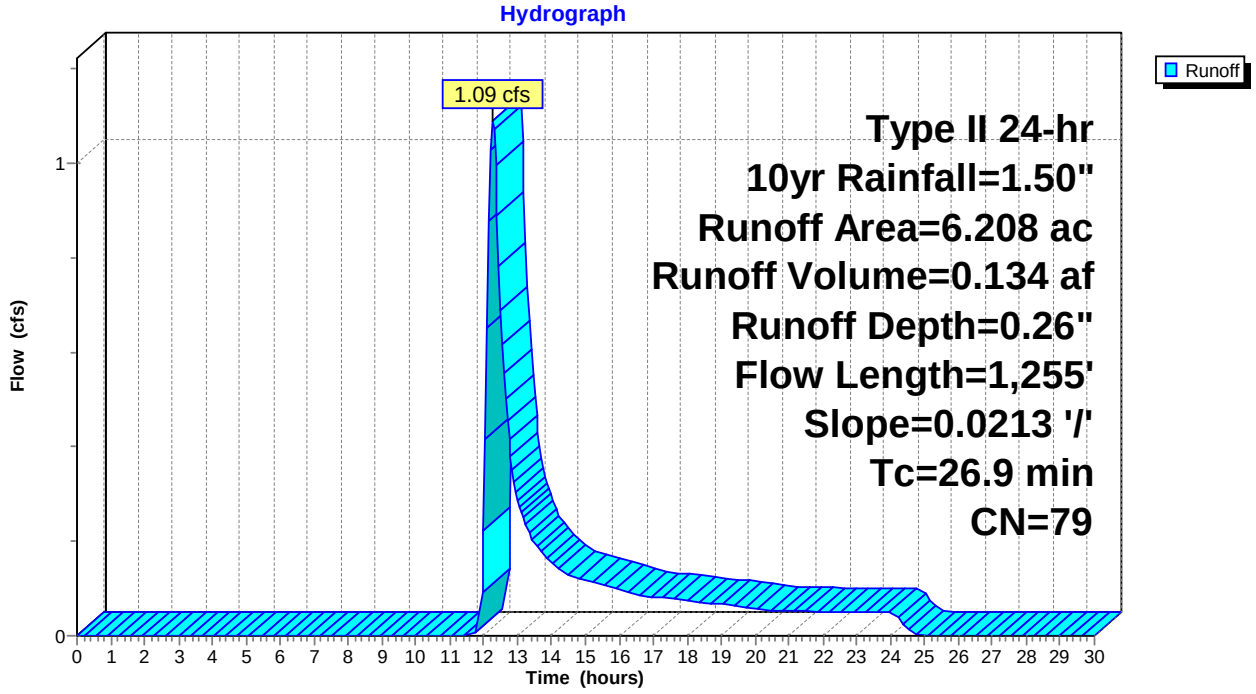
Runoff = 1.09 cfs @ 12.26 hrs, Volume= 0.134 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	6.208	79	
	6.208		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.9	1,255	0.0213	0.78		**Lag/CN Method,**

Subcatchment 35S: DC-012



Summary for Subcatchment 36S: DC-013

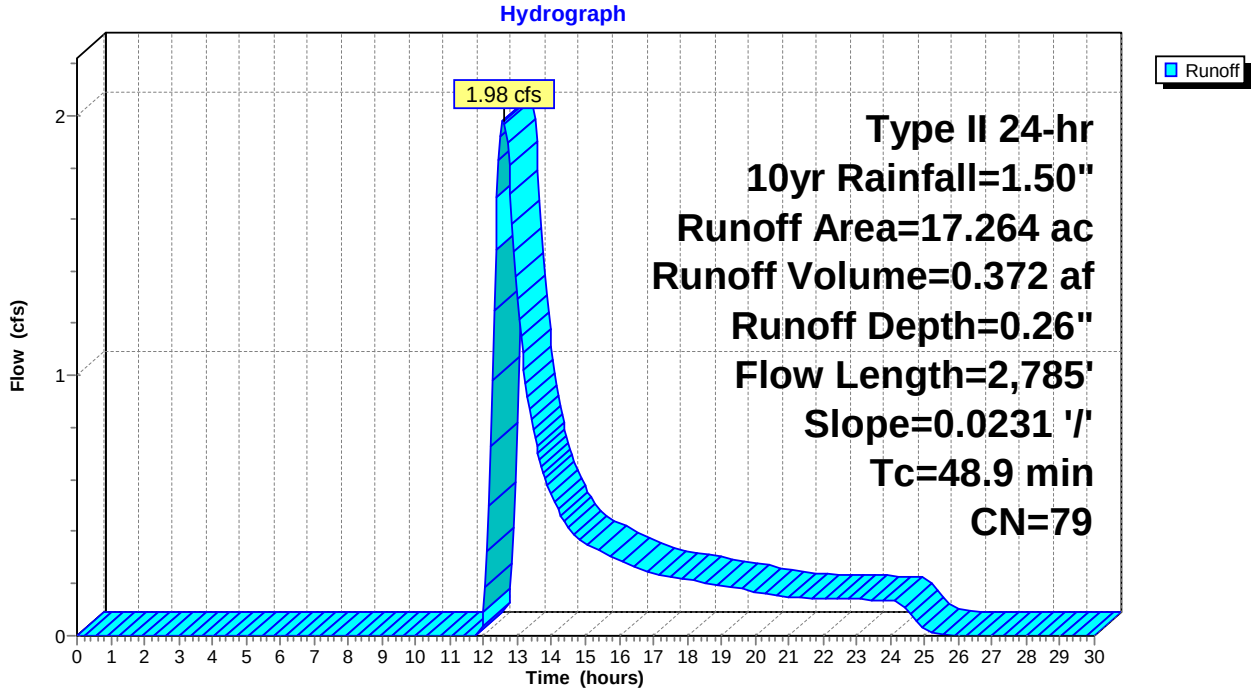
Runoff = 1.98 cfs @ 12.58 hrs, Volume= 0.372 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	17.264	79	
	17.264		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
48.9	2,785	0.0231	0.95		**Lag/CN Method,**

Subcatchment 36S: DC-013



Summary for Subcatchment 37S: DC-014

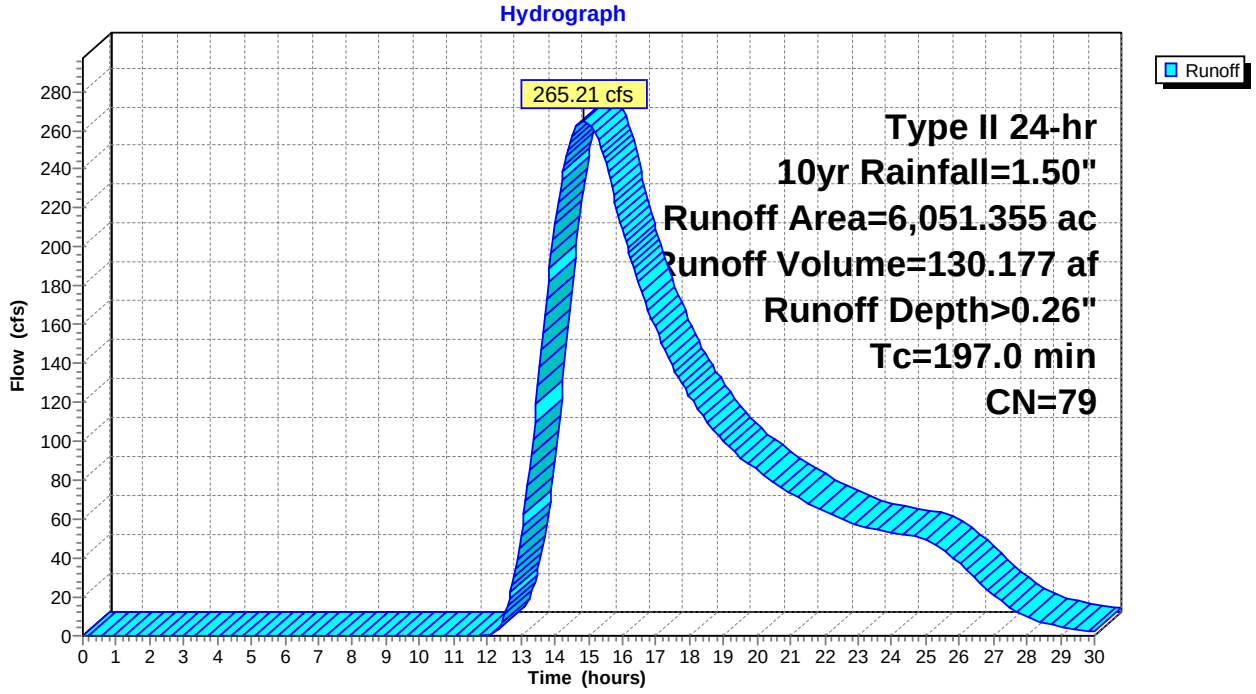
Runoff = 265.21 cfs @ 14.87 hrs, Volume= 130.177 af, Depth> 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	6,051.355	79	
	6,051.355		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
197.0					**Direct Entry,**

Subcatchment 37S: DC-014



Summary for Subcatchment 38S: DC-015

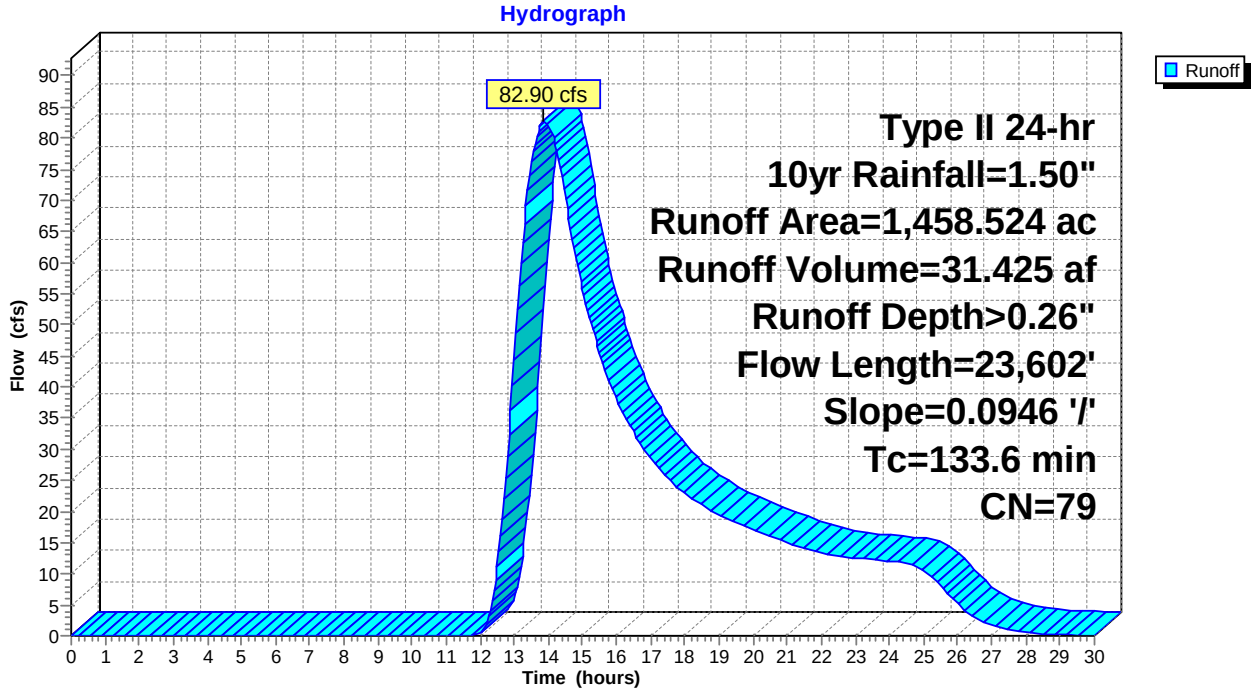
Runoff = 82.90 cfs @ 13.84 hrs, Volume= 31.425 af, Depth> 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	1,458.524	79	
	1,458.524		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
133.6	23,602	0.0946	2.94		**Lag/CN Method,**

Subcatchment 38S: DC-015



Summary for Subcatchment 39S: DC-016

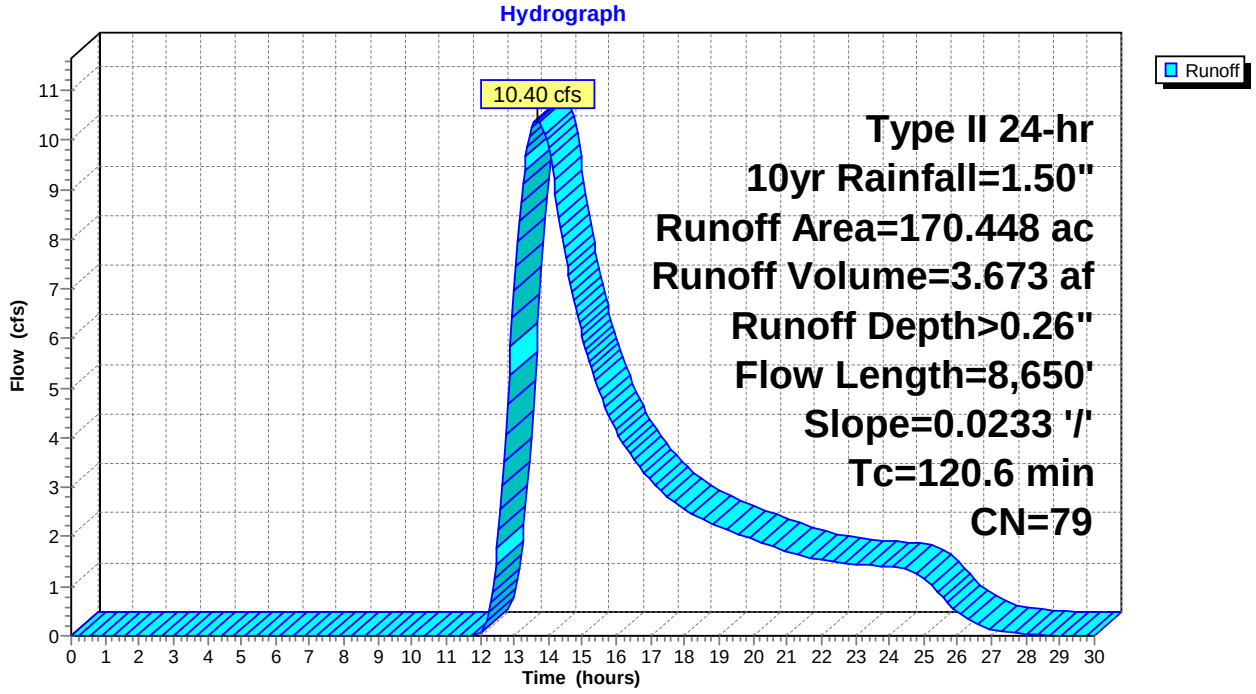
Runoff = 10.40 cfs @ 13.66 hrs, Volume= 3.673 af, Depth> 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	170.448	79	
	170.448		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
120.6	8,650	0.0233	1.20		**Lag/CN Method,**

Subcatchment 39S: DC-016



Summary for Subcatchment 40S: DC-017

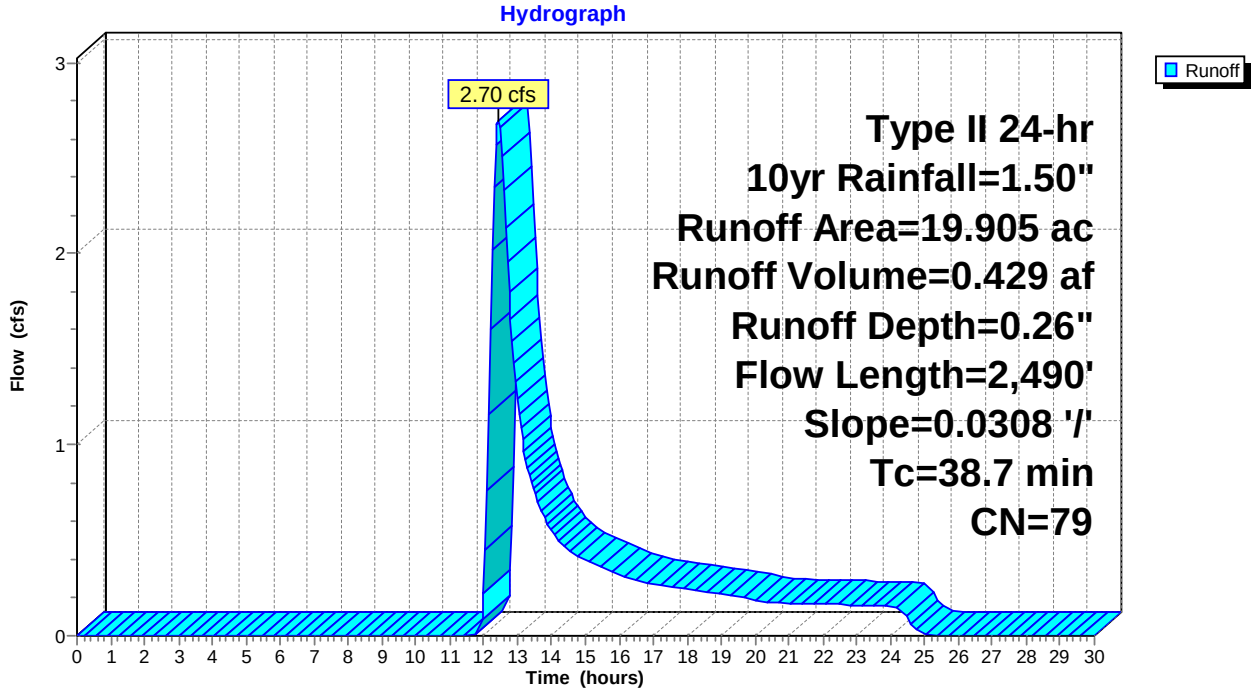
Runoff = 2.70 cfs @ 12.44 hrs, Volume= 0.429 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	19.905	79	
	19.905		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.7	2,490	0.0308	1.07		**Lag/CN Method,**

Subcatchment 40S: DC-017



Summary for Subcatchment 41S: DC-018

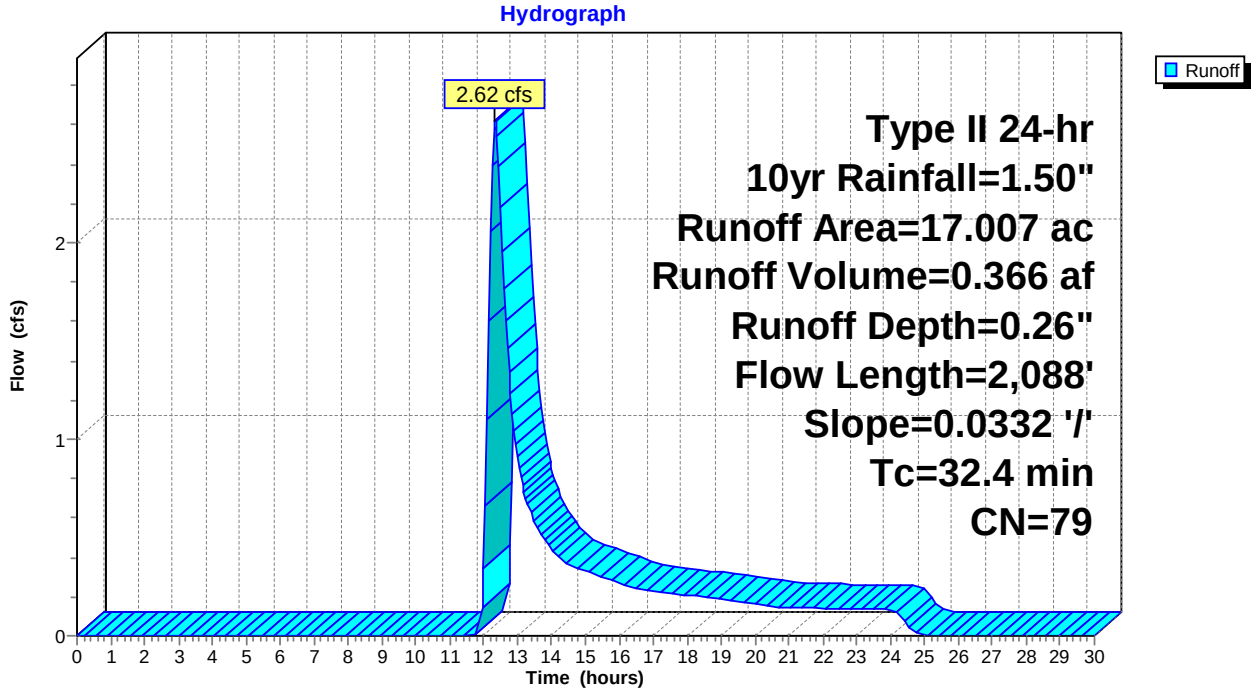
Runoff = 2.62 cfs @ 12.34 hrs, Volume= 0.366 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	17.007	79	
	17.007		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.4	2,088	0.0332	1.07		**Lag/CN Method,**

Subcatchment 41S: DC-018



Summary for Subcatchment 42S: DC-020

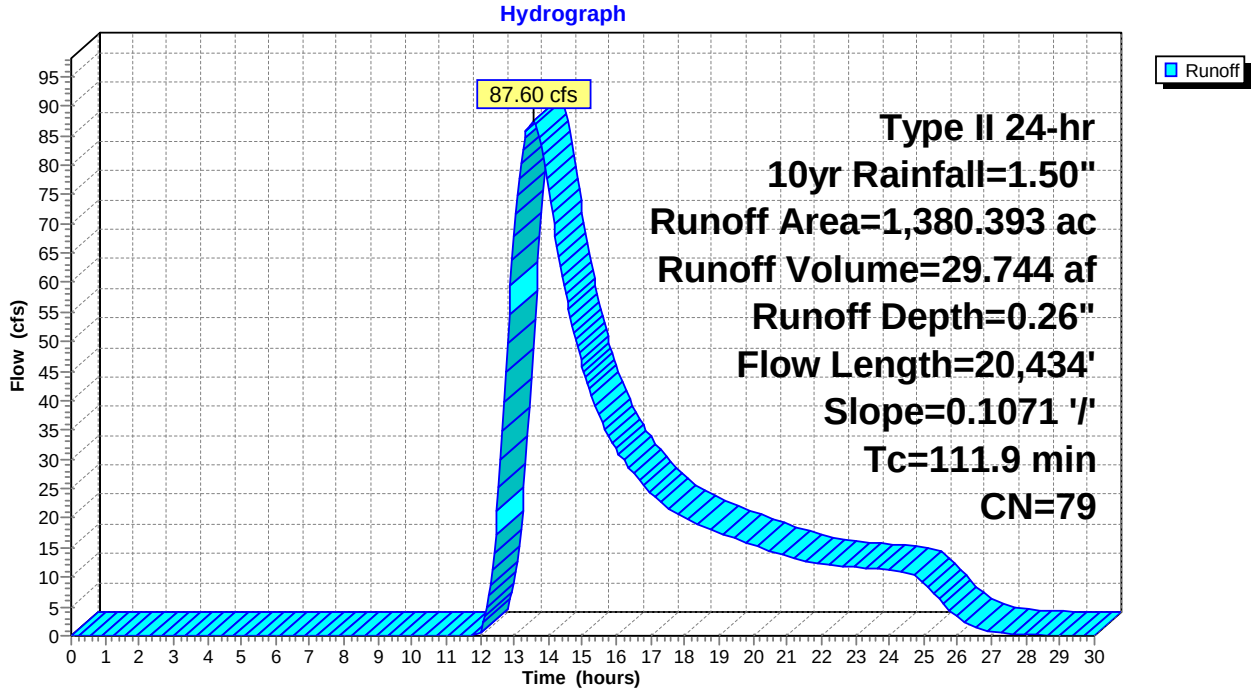
Runoff = 87.60 cfs @ 13.54 hrs, Volume= 29.744 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	1,380.393	79	
	1,380.393		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
111.9	20,434	0.1071	3.04		**Lag/CN Method,**

Subcatchment 42S: DC-020



Summary for Subcatchment 43S: DC-021

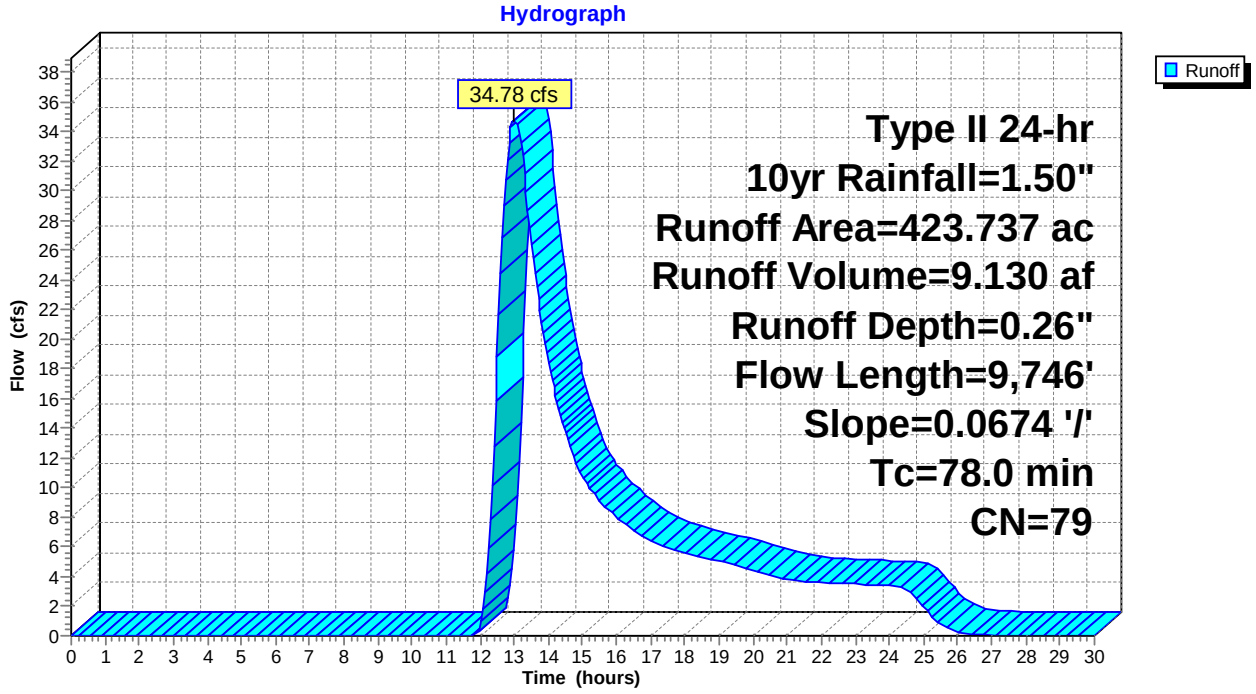
Runoff = 34.78 cfs @ 13.01 hrs, Volume= 9.130 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	423.737	79	
	423.737		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.0	9,746	0.0674	2.08		**Lag/CN Method,**

Subcatchment 43S: DC-021



Summary for Subcatchment 44S: DC-022

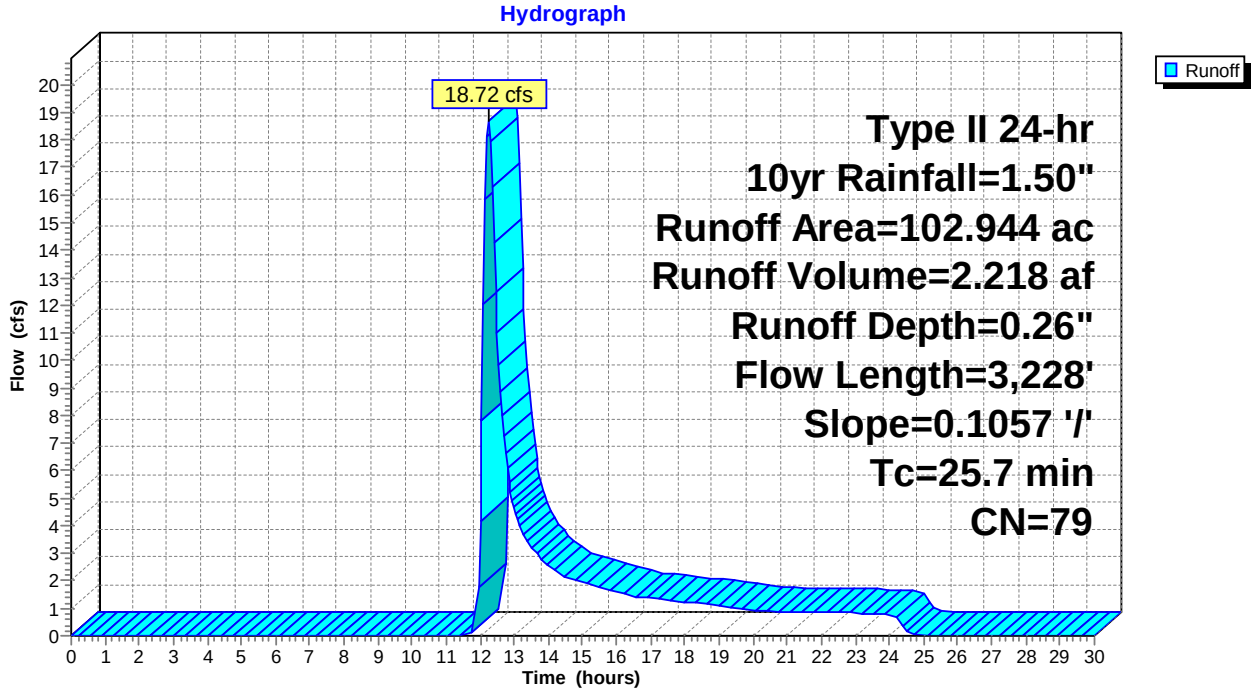
Runoff = 18.72 cfs @ 12.25 hrs, Volume= 2.218 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	102.944	79	
	102.944		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.7	3,228	0.1057	2.09		**Lag/CN Method,**

Subcatchment 44S: DC-022



Summary for Subcatchment 45S: DC-024

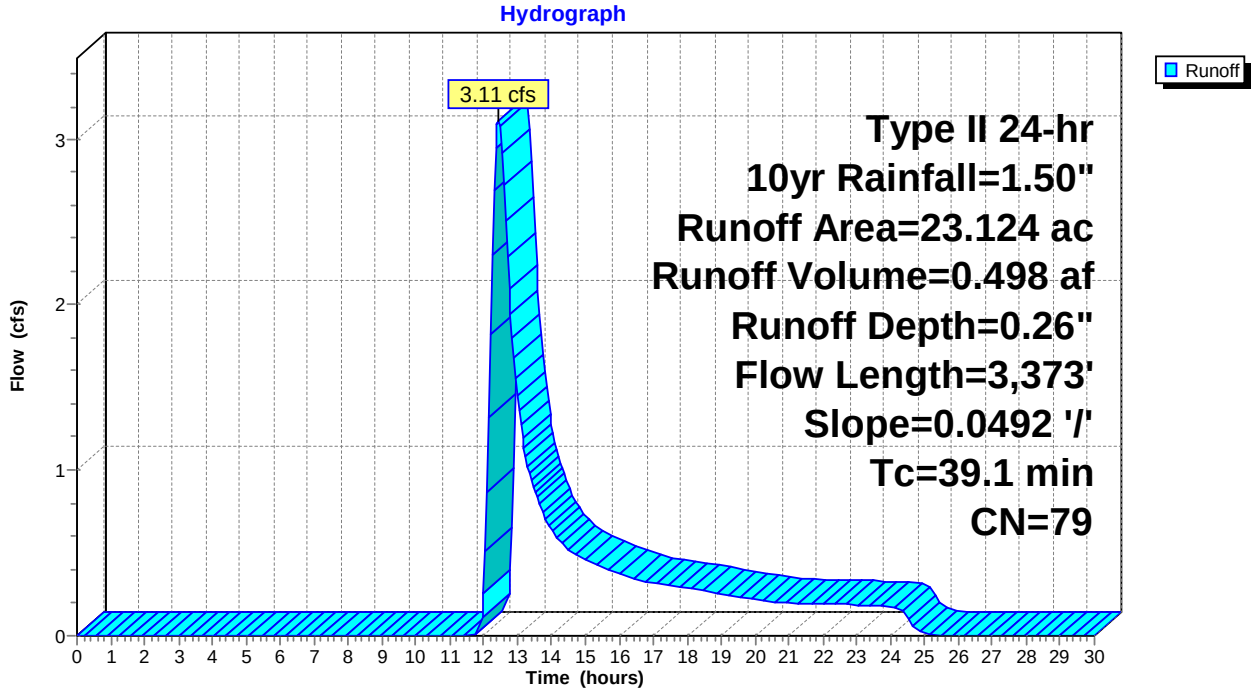
Runoff = 3.11 cfs @ 12.44 hrs, Volume= 0.498 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	23.124	79	
	23.124		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.1	3,373	0.0492	1.44		**Lag/CN Method,**

Subcatchment 45S: DC-024



Summary for Subcatchment 46S: DC-025

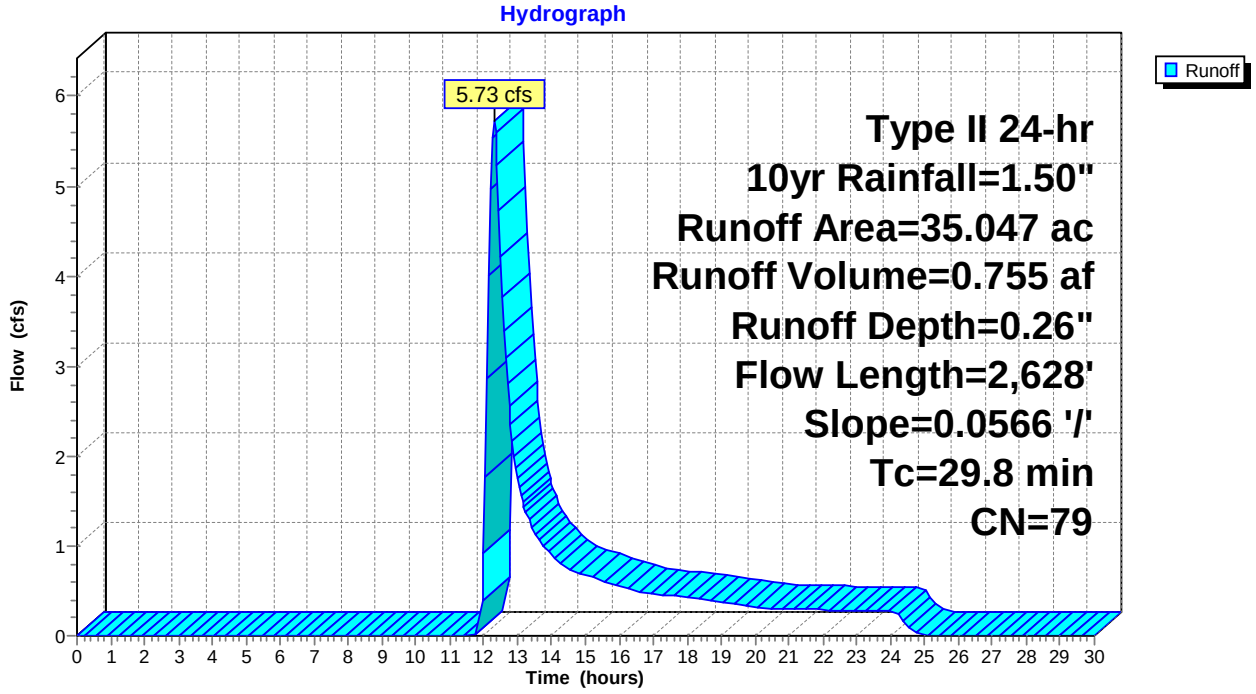
Runoff = 5.73 cfs @ 12.30 hrs, Volume= 0.755 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	35.047	79	
	35.047		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.8	2,628	0.0566	1.47		**Lag/CN Method,**

Subcatchment 46S: DC-025



Summary for Subcatchment 47S: DC-026

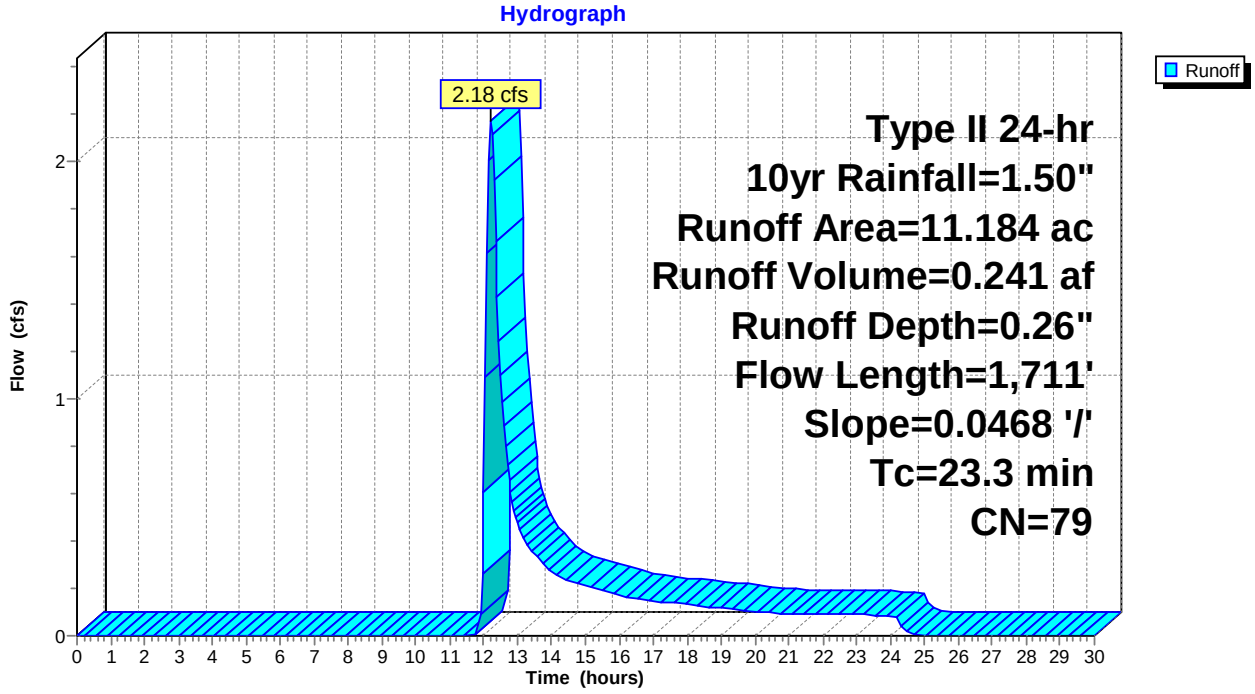
Runoff = 2.18 cfs @ 12.21 hrs, Volume= 0.241 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	11.184	79	
	11.184		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.3	1,711	0.0468	1.22		**Lag/CN Method,**

Subcatchment 47S: DC-026



Summary for Subcatchment 48S: DC-027

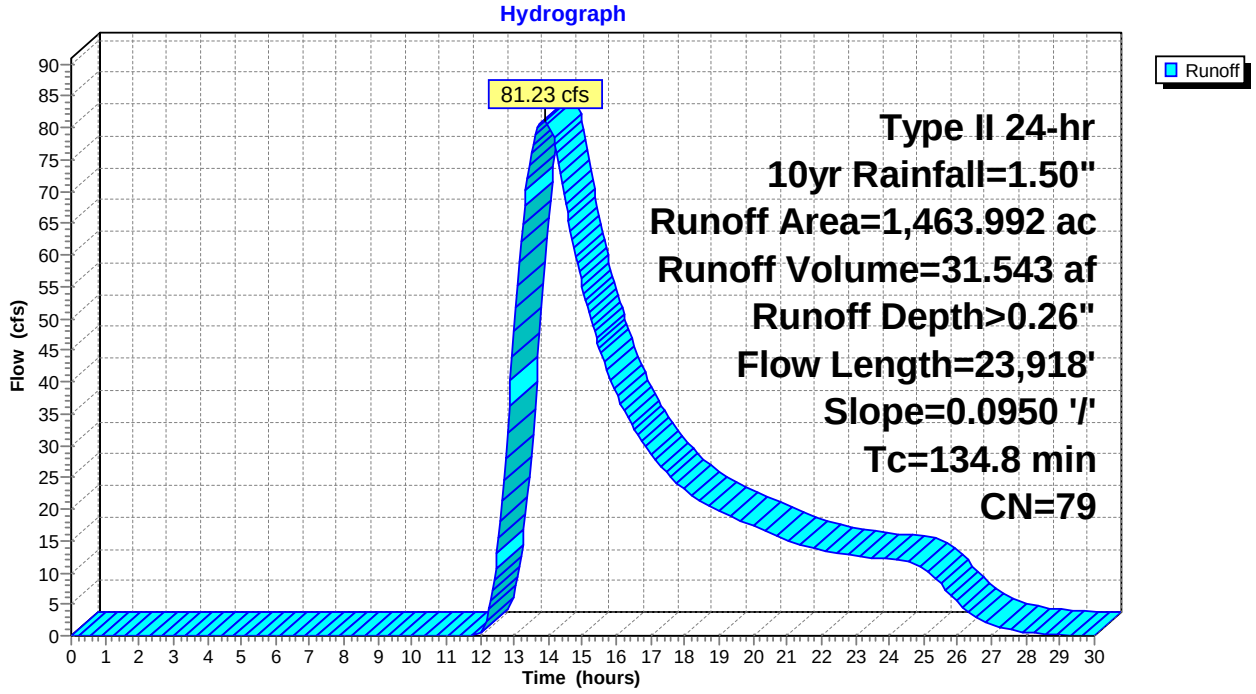
Runoff = 81.23 cfs @ 13.89 hrs, Volume= 31.543 af, Depth> 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	1,463.992	79	
	1,463.992		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
134.8	23,918	0.0950	2.96		**Lag/CN Method,**

Subcatchment 48S: DC-027



Summary for Subcatchment 49S: DC-028

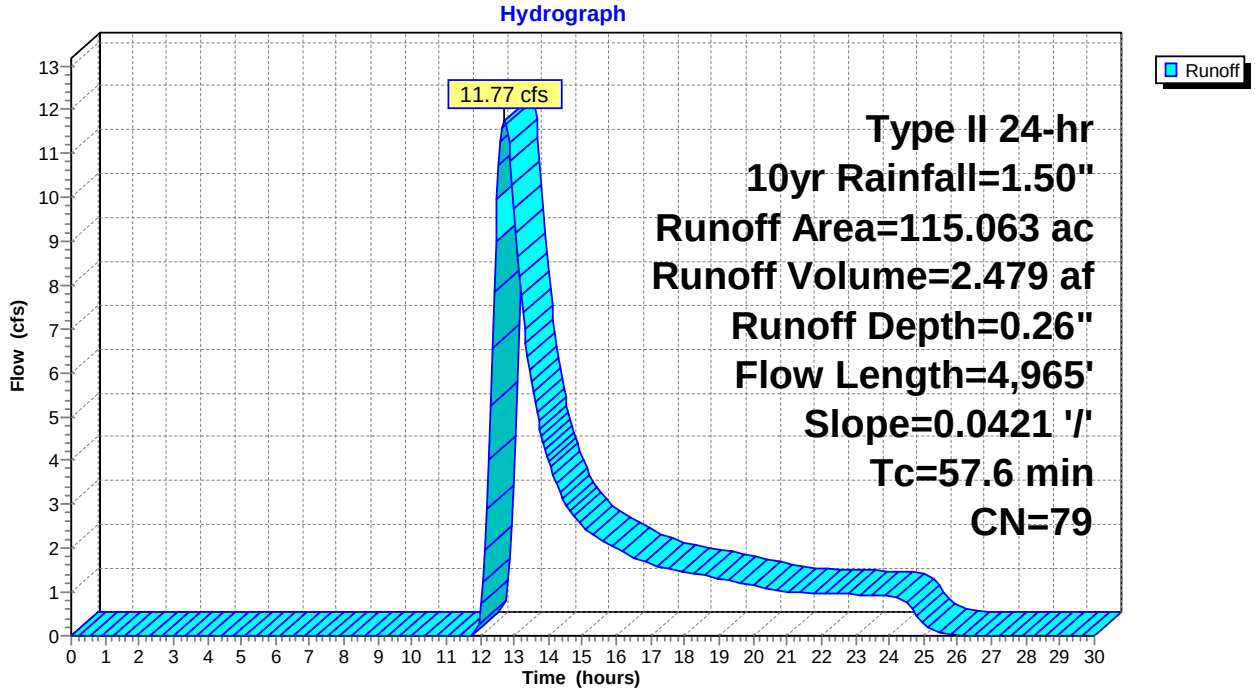
Runoff = 11.77 cfs @ 12.73 hrs, Volume= 2.479 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	115.063	79	
	115.063		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
57.6	4,965	0.0421	1.44		**Lag/CN Method,**

Subcatchment 49S: DC-028



Summary for Subcatchment 50S: DC-029

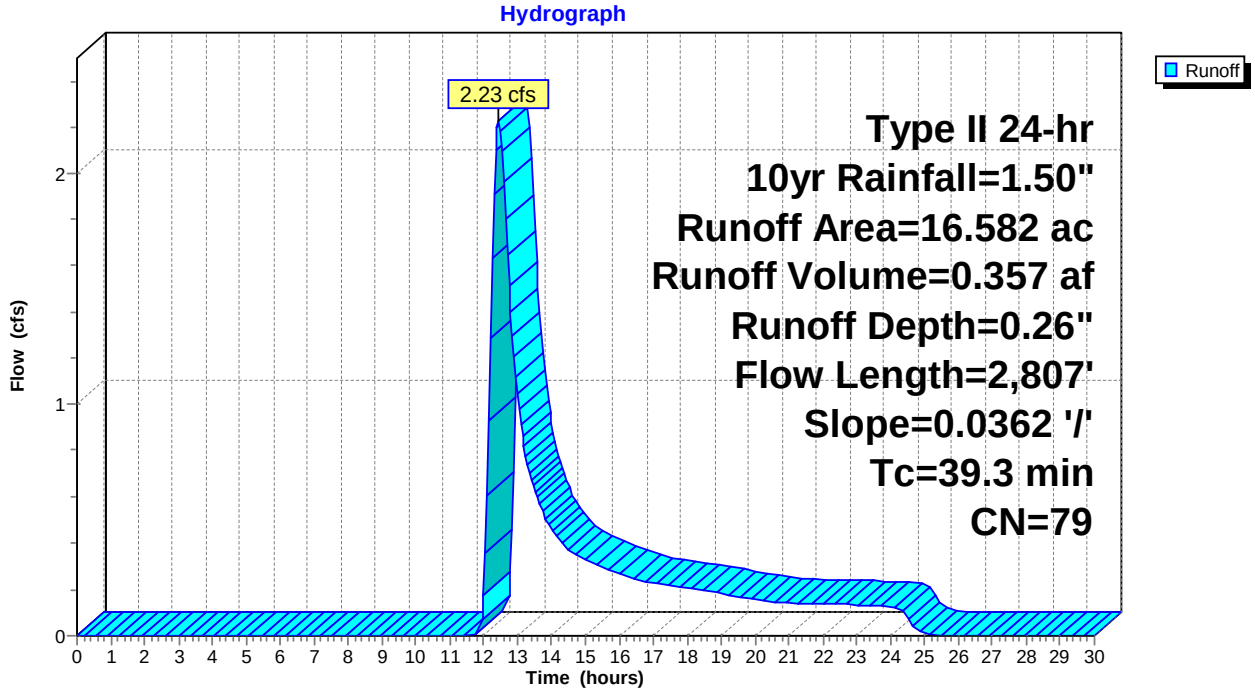
Runoff = 2.23 cfs @ 12.45 hrs, Volume= 0.357 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	16.582	79	
	16.582		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.3	2,807	0.0362	1.19		**Lag/CN Method,**

Subcatchment 50S: DC-029



Summary for Subcatchment 51S: DC-030

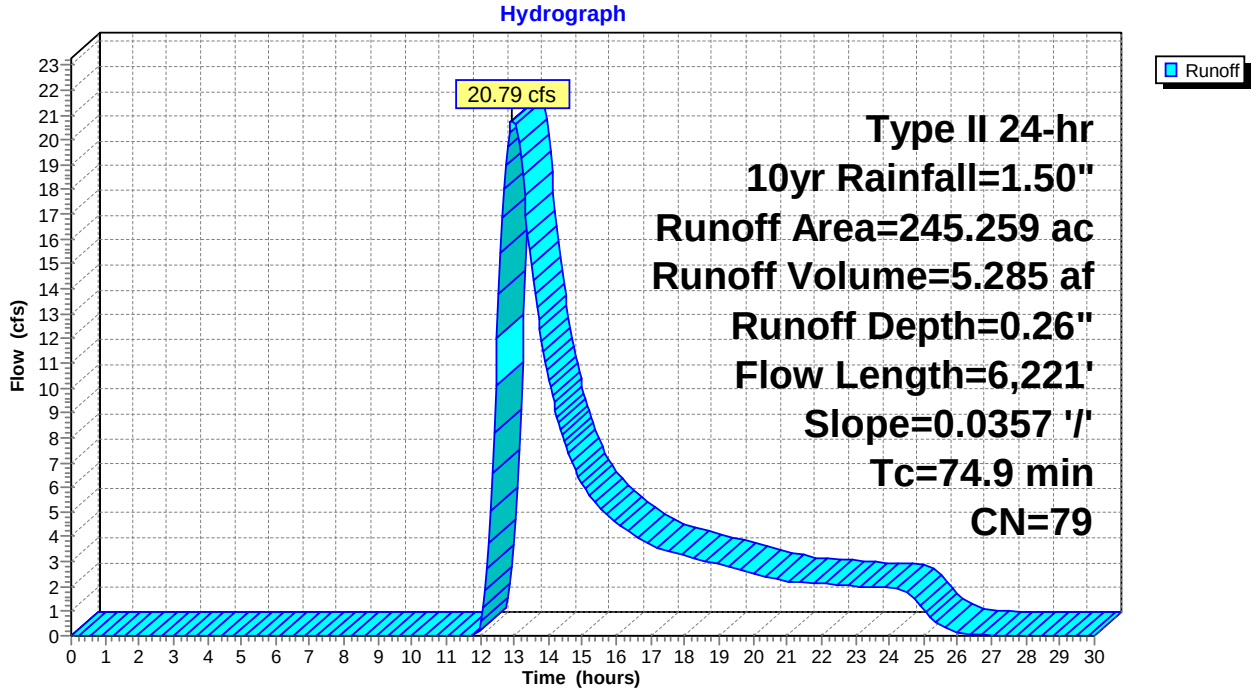
Runoff = 20.79 cfs @ 12.96 hrs, Volume= 5.285 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	245.259	79	
	245.259		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
74.9	6,221	0.0357	1.38		**Lag/CN Method,**

Subcatchment 51S: DC-030



Summary for Subcatchment 52S: DC-031

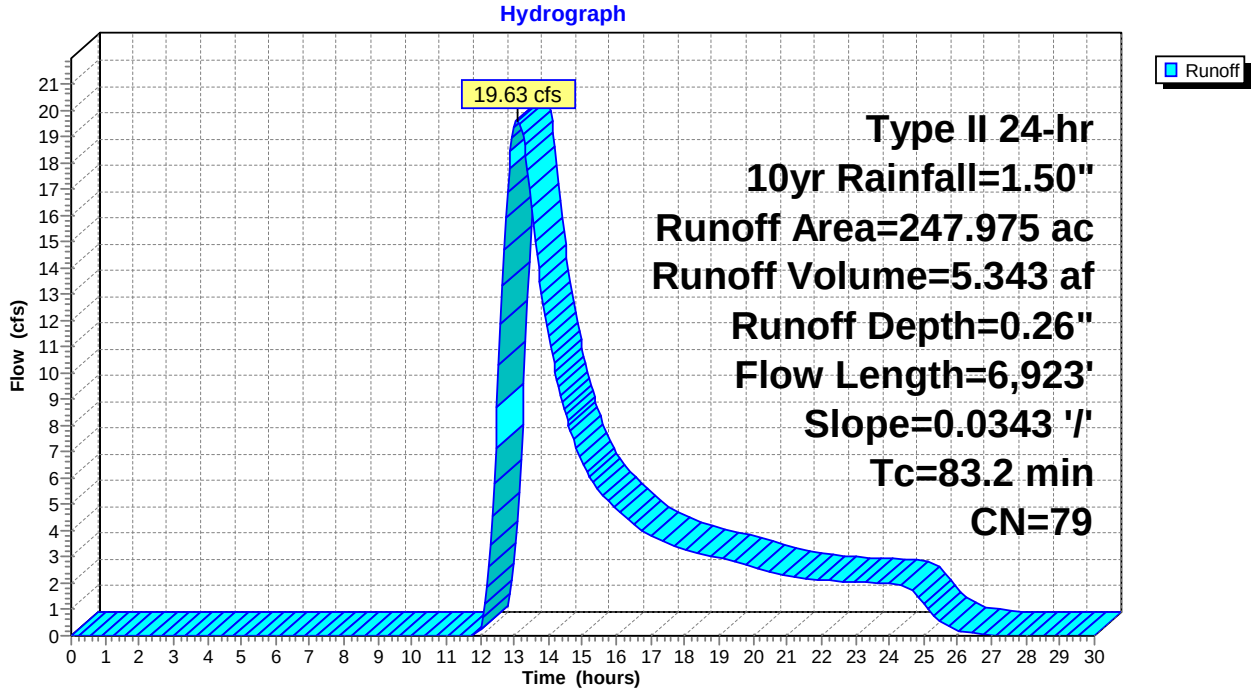
Runoff = 19.63 cfs @ 13.07 hrs, Volume= 5.343 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	247.975	79	
	247.975		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
83.2	6,923	0.0343	1.39		**Lag/CN Method,**

Subcatchment 52S: DC-031



Summary for Subcatchment 53S: DC-032

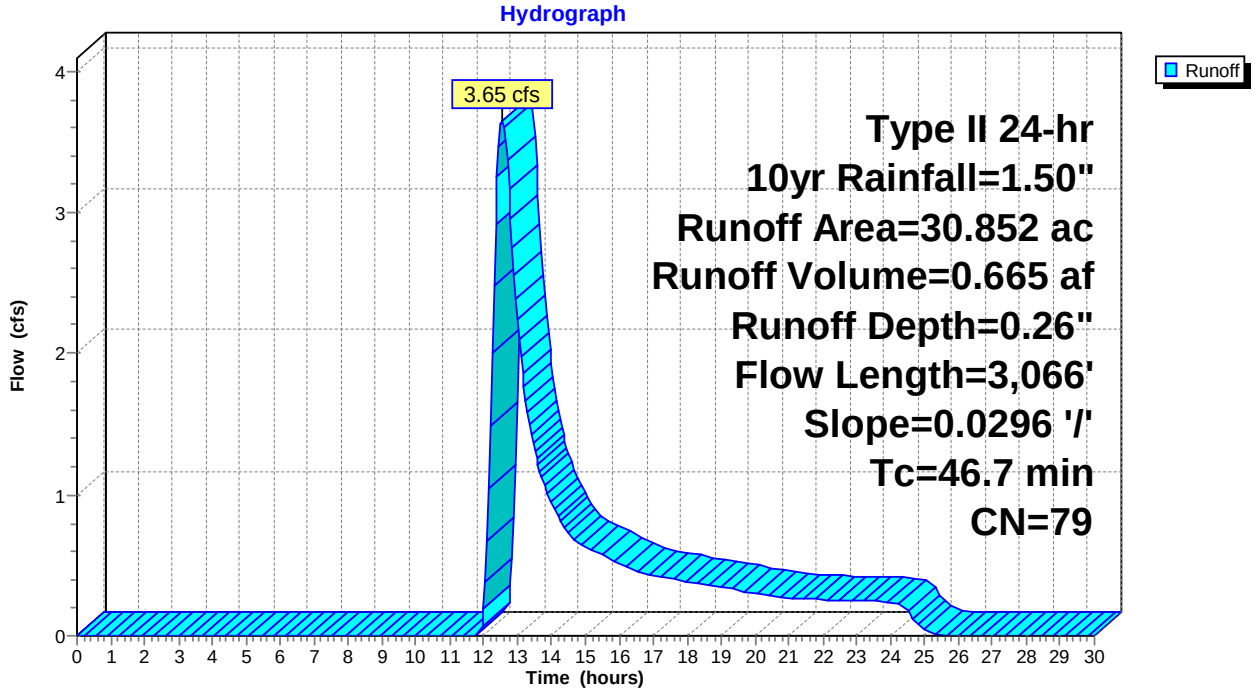
Runoff = 3.65 cfs @ 12.55 hrs, Volume= 0.665 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	30.852	79	
	30.852		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.7	3,066	0.0296	1.09		**Lag/CN Method,**

Subcatchment 53S: DC-032



Summary for Subcatchment 54S: DC-033

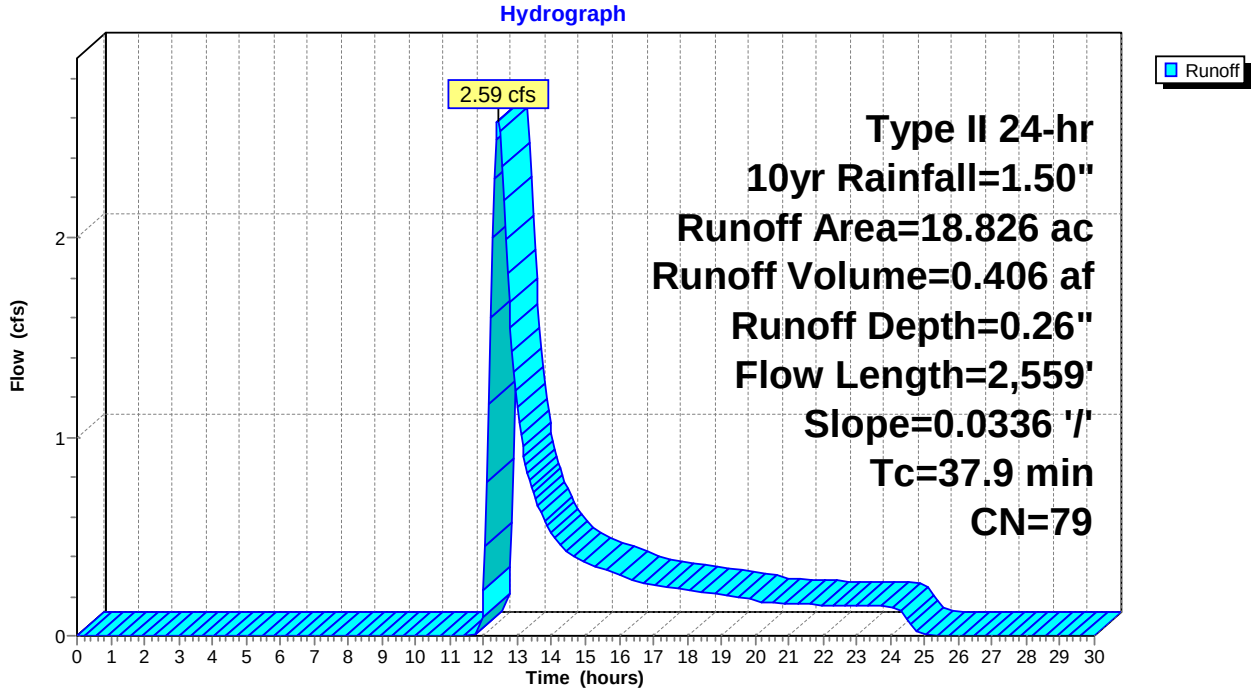
Runoff = 2.59 cfs @ 12.42 hrs, Volume= 0.406 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	18.826	79	
	18.826		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.9	2,559	0.0336	1.12		**Lag/CN Method,**

Subcatchment 54S: DC-033



Summary for Subcatchment 55S: DC-034

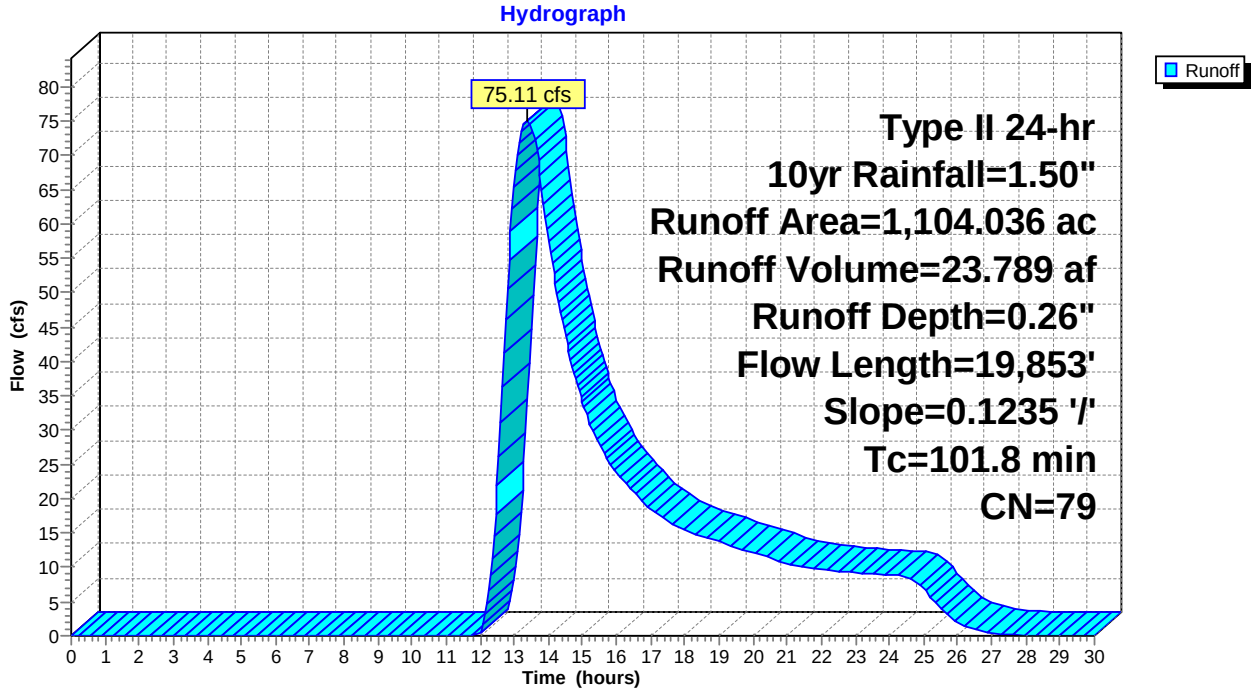
Runoff = 75.11 cfs @ 13.36 hrs, Volume= 23.789 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	1,104.036	79	
	1,104.036		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
101.8	19,853	0.1235	3.25		**Lag/CN Method,**

Subcatchment 55S: DC-034



Summary for Subcatchment 56S: DC-035

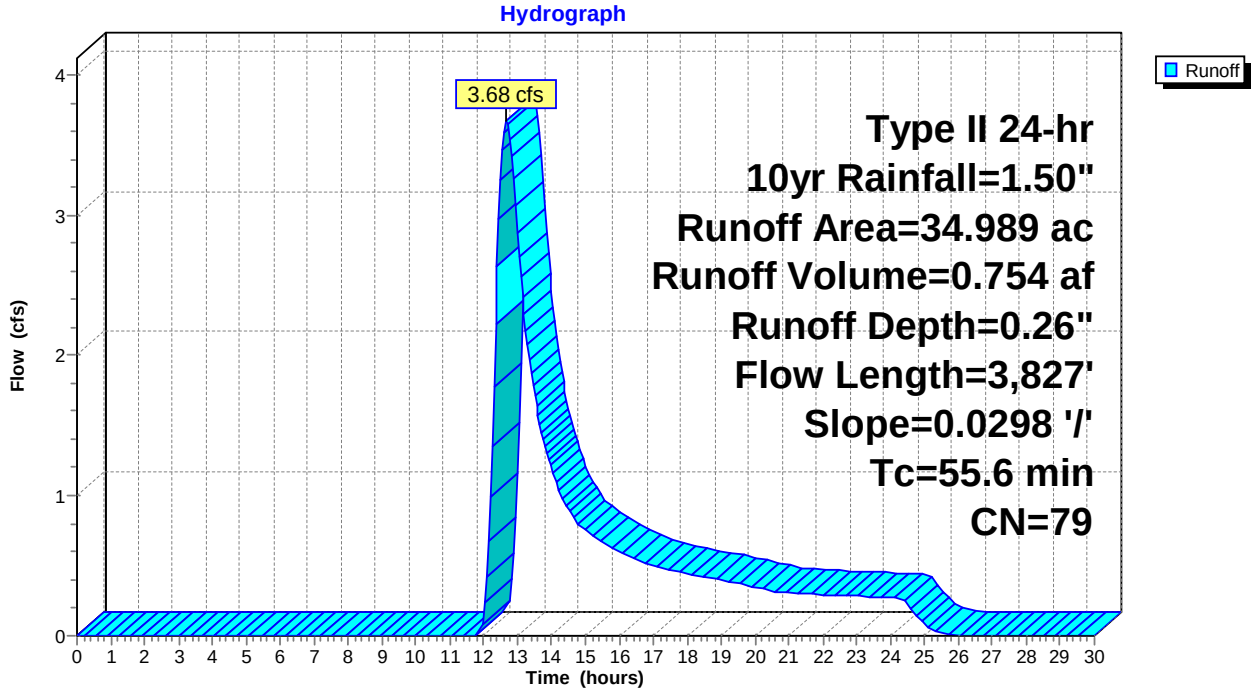
Runoff = 3.68 cfs @ 12.68 hrs, Volume= 0.754 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	34.989	79	
	34.989		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
55.6	3,827	0.0298	1.15		**Lag/CN Method,**

Subcatchment 56S: DC-035



Summary for Subcatchment 57S: DC-036

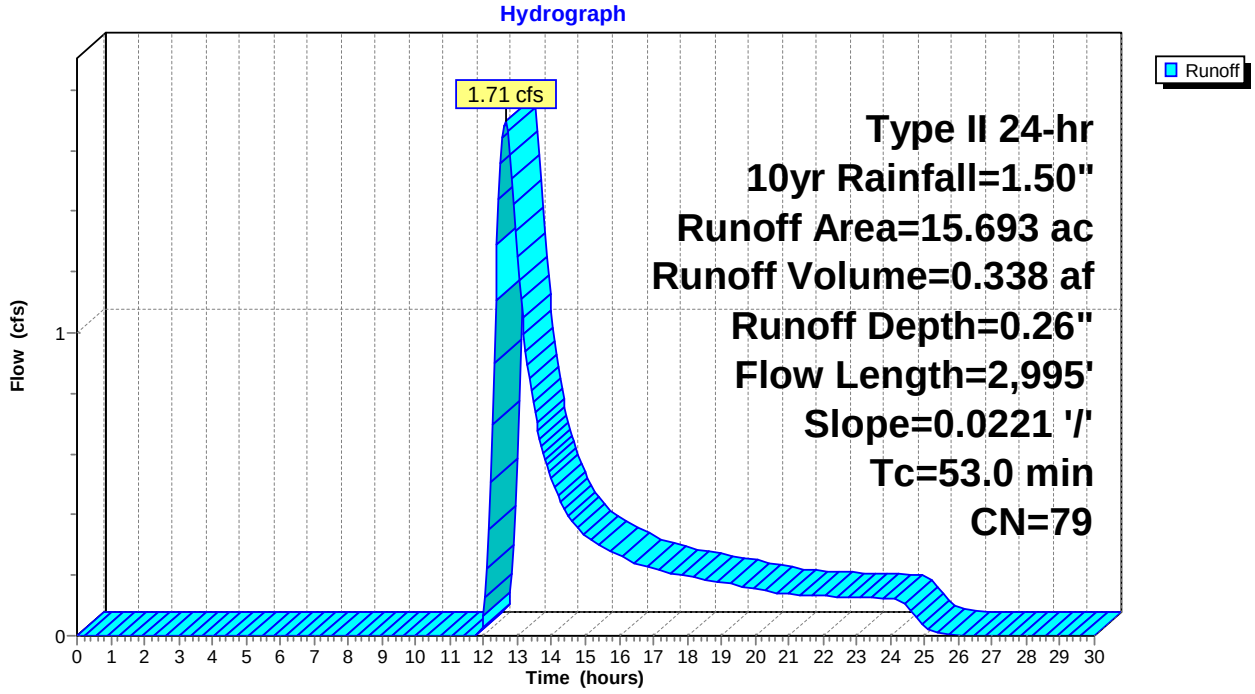
Runoff = 1.71 cfs @ 12.65 hrs, Volume= 0.338 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	15.693	79	
	15.693		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
53.0	2,995	0.0221	0.94		**Lag/CN Method,**

Subcatchment 57S: DC-036



Summary for Subcatchment 58S: DC-038

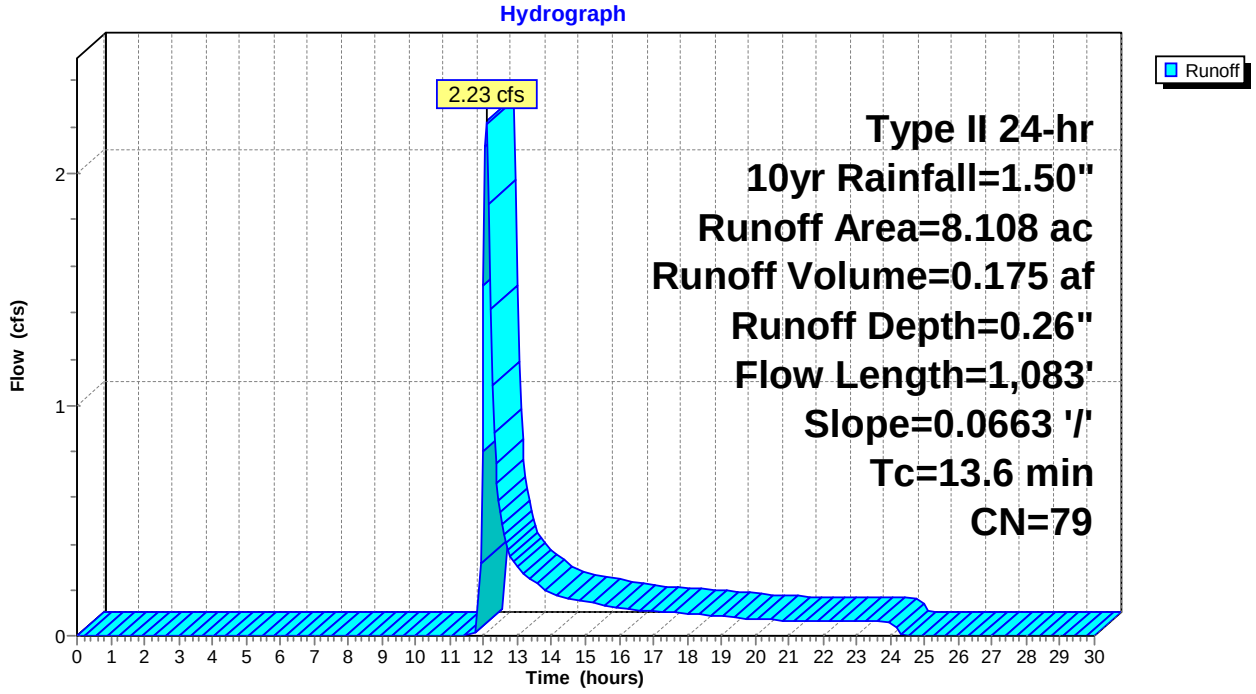
Runoff = 2.23 cfs @ 12.09 hrs, Volume= 0.175 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	8.108	79	
	8.108		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6	1,083	0.0663	1.33		**Lag/CN Method,**

Subcatchment 58S: DC-038



Summary for Subcatchment 59S: DC-040

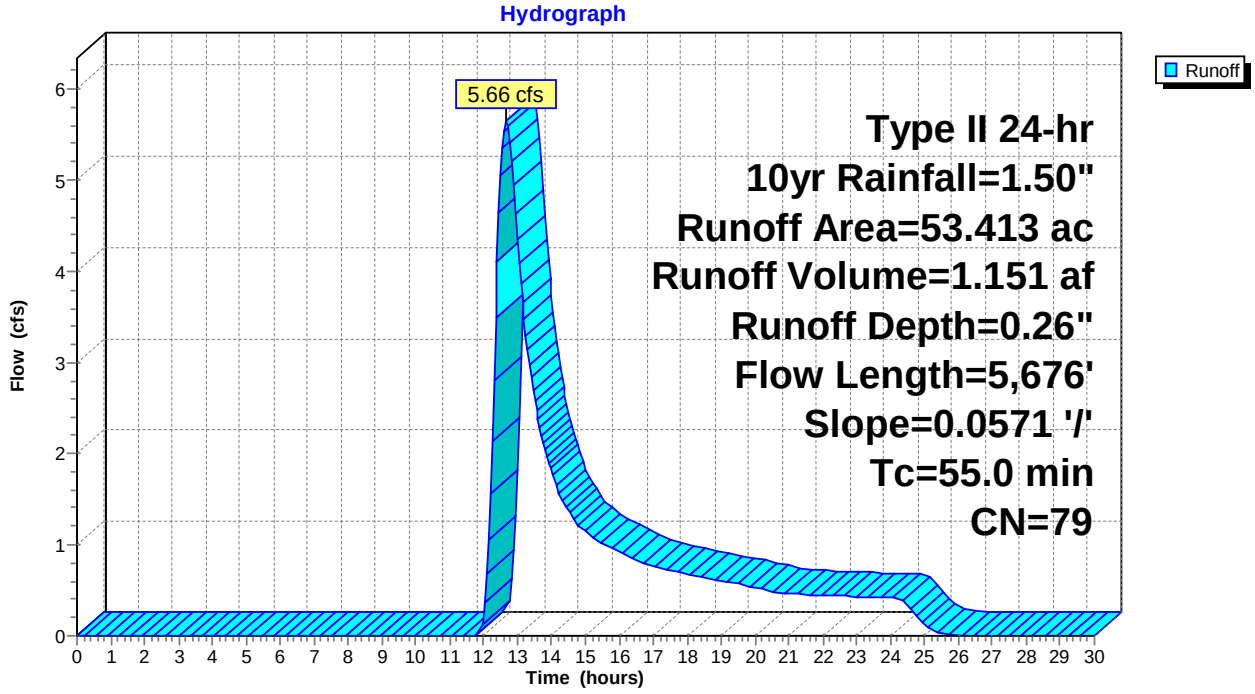
Runoff = 5.66 cfs @ 12.67 hrs, Volume= 1.151 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	53.413	79	
	53.413		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
55.0	5,676	0.0571	1.72		**Lag/CN Method,**

Subcatchment 59S: DC-040



Summary for Subcatchment 60S: DC-041

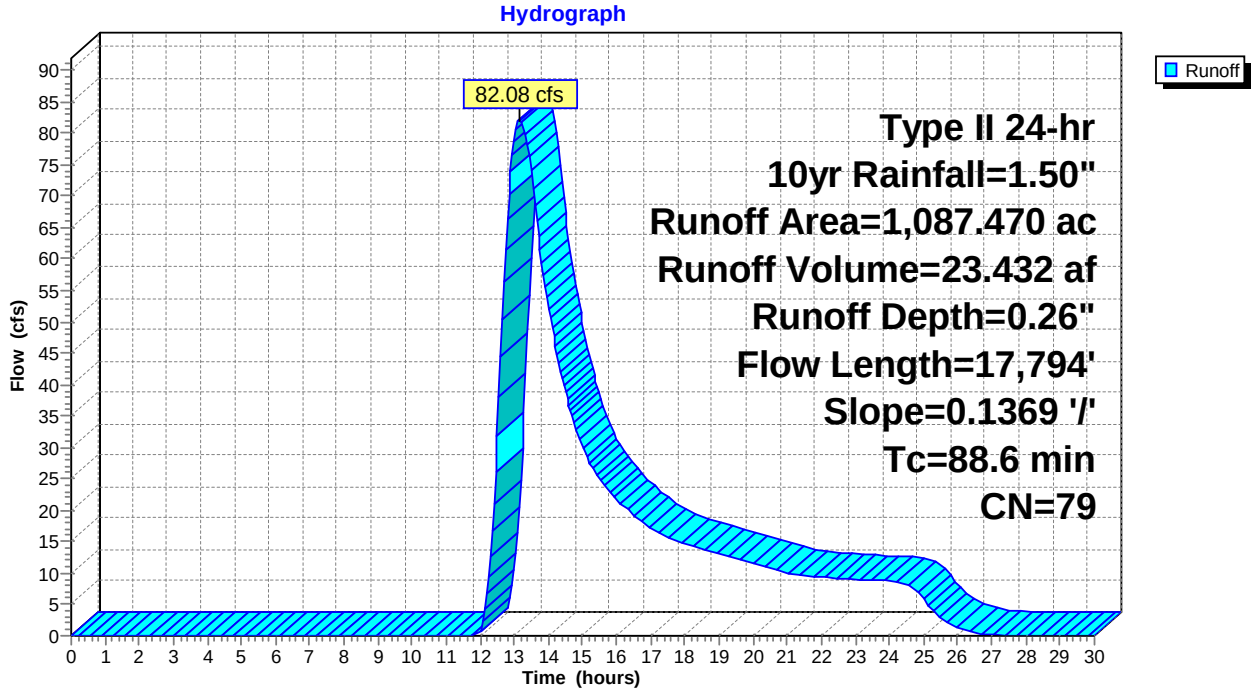
Runoff = 82.08 cfs @ 13.16 hrs, Volume= 23.432 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	1,087.470	79	
	1,087.470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
88.6	17,794	0.1369	3.35		**Lag/CN Method,**

Subcatchment 60S: DC-041



Summary for Subcatchment 61S: DC-042

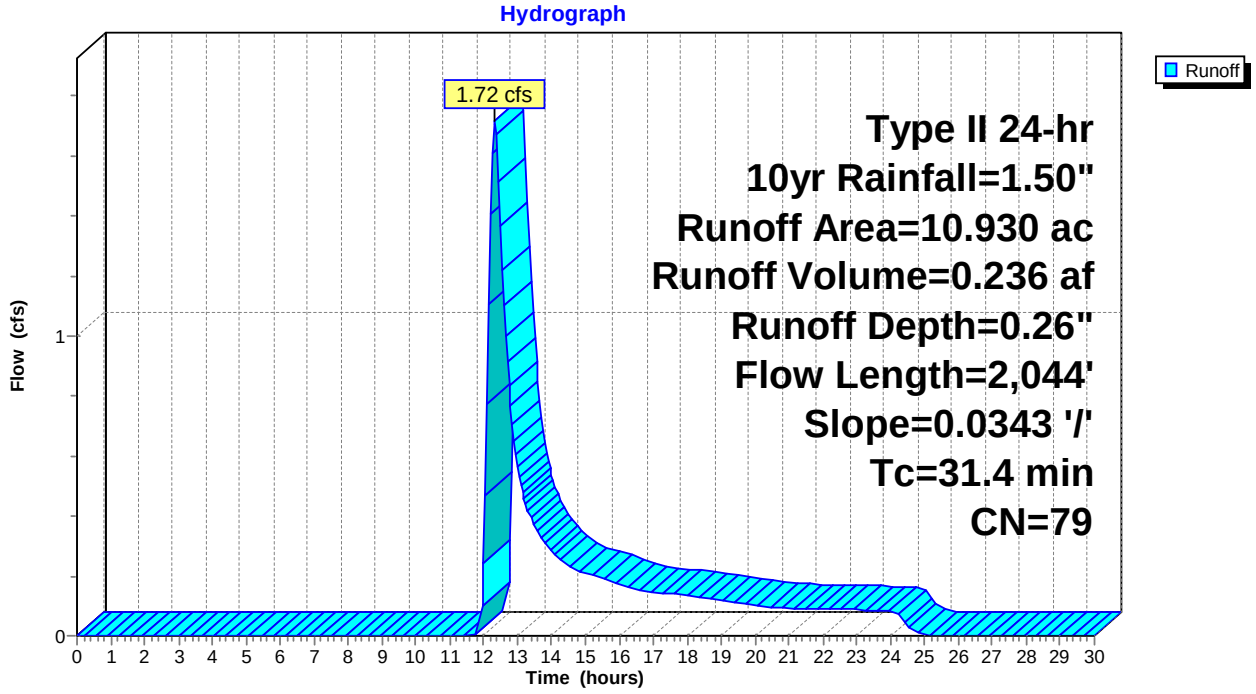
Runoff = 1.72 cfs @ 12.32 hrs, Volume= 0.236 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	10.930	79	
	10.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.4	2,044	0.0343	1.09		**Lag/CN Method,**

Subcatchment 61S: DC-042



Summary for Subcatchment 62S: DC-043

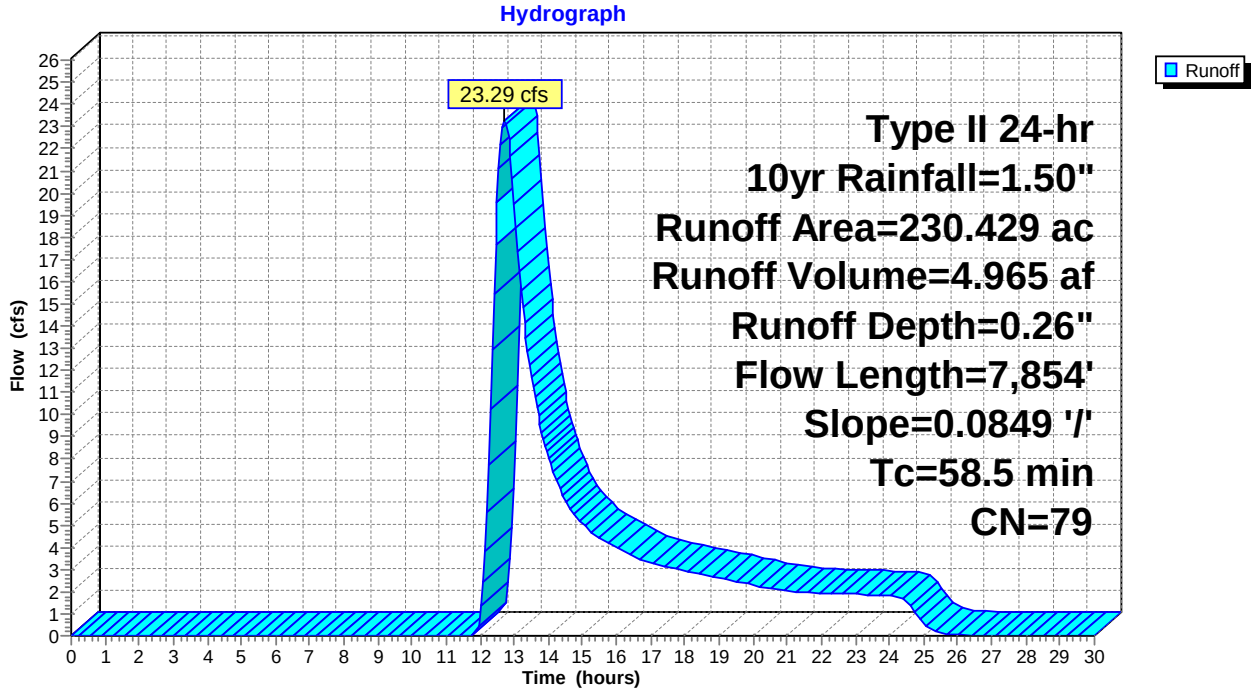
Runoff = 23.29 cfs @ 12.72 hrs, Volume= 4.965 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	230.429	79	
	230.429		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
58.5	7,854	0.0849	2.24		**Lag/CN Method,**

Subcatchment 62S: DC-043



Summary for Subcatchment 63S: DC-044

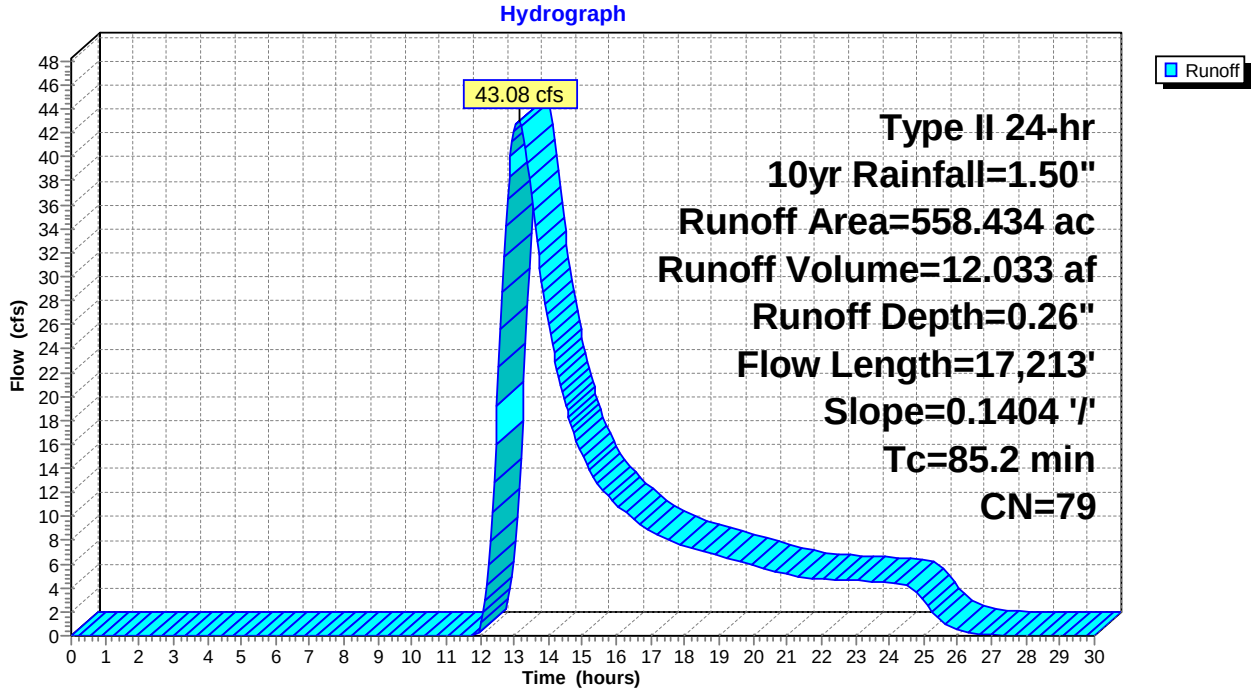
Runoff = 43.08 cfs @ 13.14 hrs, Volume= 12.033 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	558.434	79	
	558.434		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.2	17,213	0.1404	3.37		**Lag/CN Method,**

Subcatchment 63S: DC-044



Summary for Subcatchment 64S: DC-045

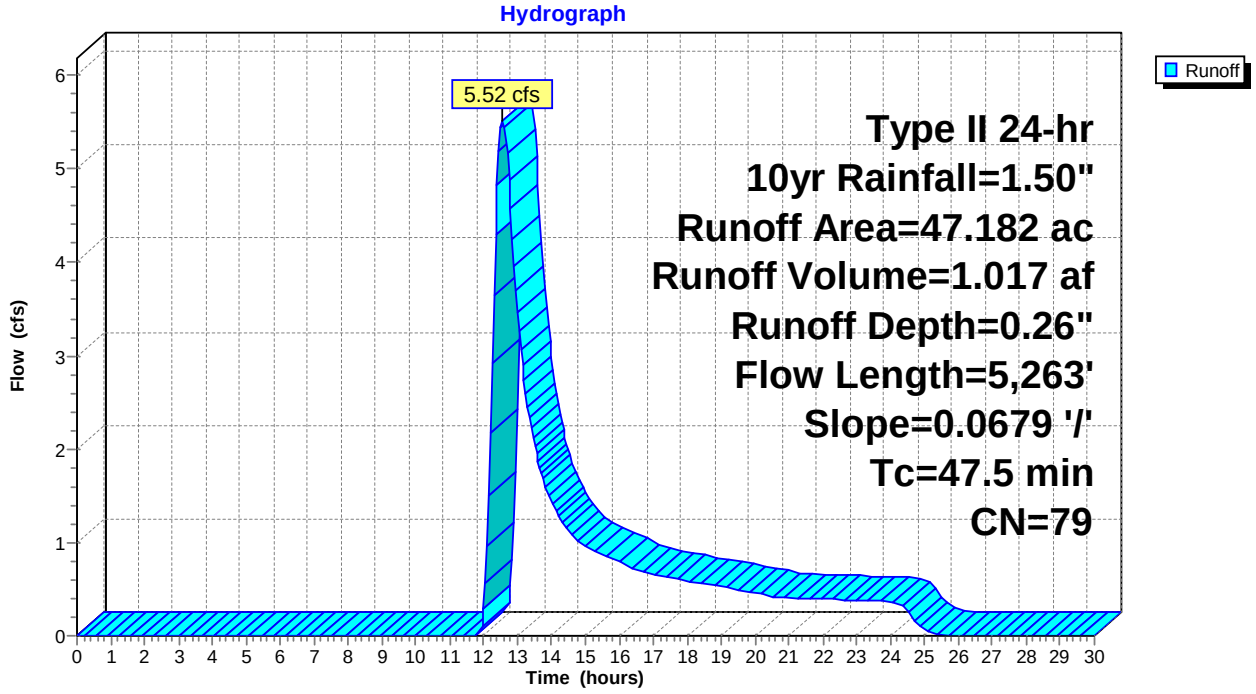
Runoff = 5.52 cfs @ 12.57 hrs, Volume= 1.017 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	47.182	79	
	47.182		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.5	5,263	0.0679	1.85		**Lag/CN Method,**

Subcatchment 64S: DC-045



Summary for Subcatchment 65S: DC-046

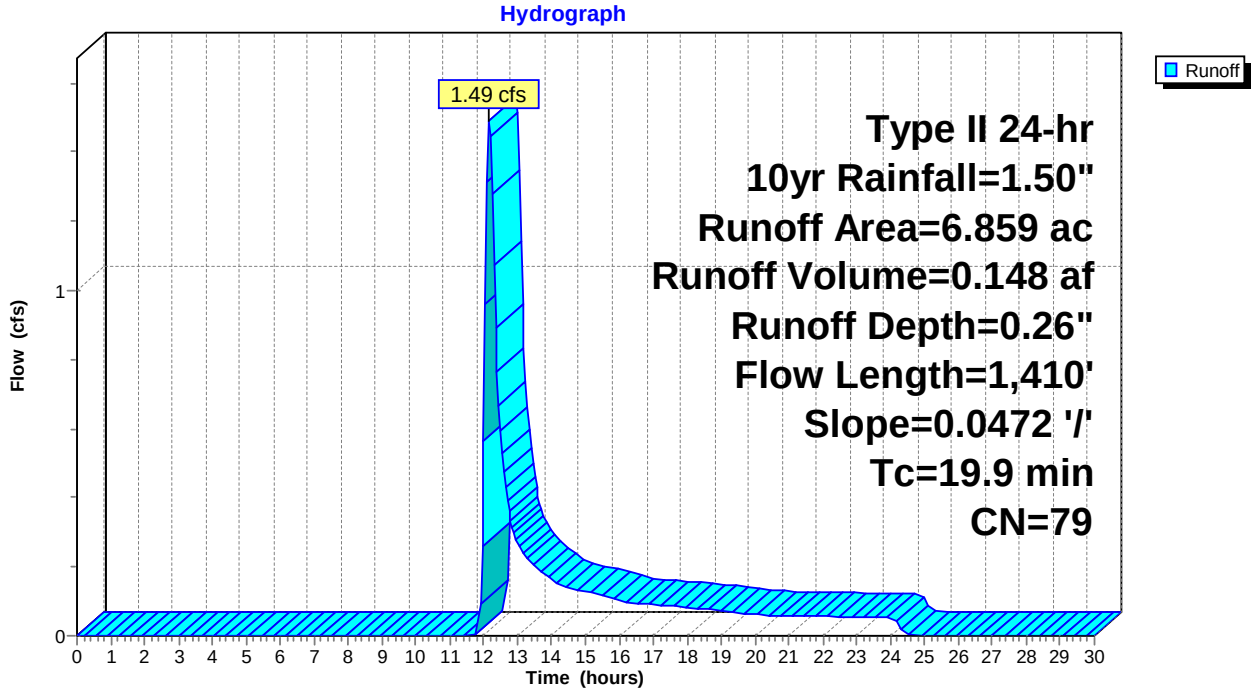
Runoff = 1.49 cfs @ 12.17 hrs, Volume= 0.148 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	6.859	79	
	6.859		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.9	1,410	0.0472	1.18		**Lag/CN Method,**

Subcatchment 65S: DC-046



Summary for Subcatchment 66S: DC-047

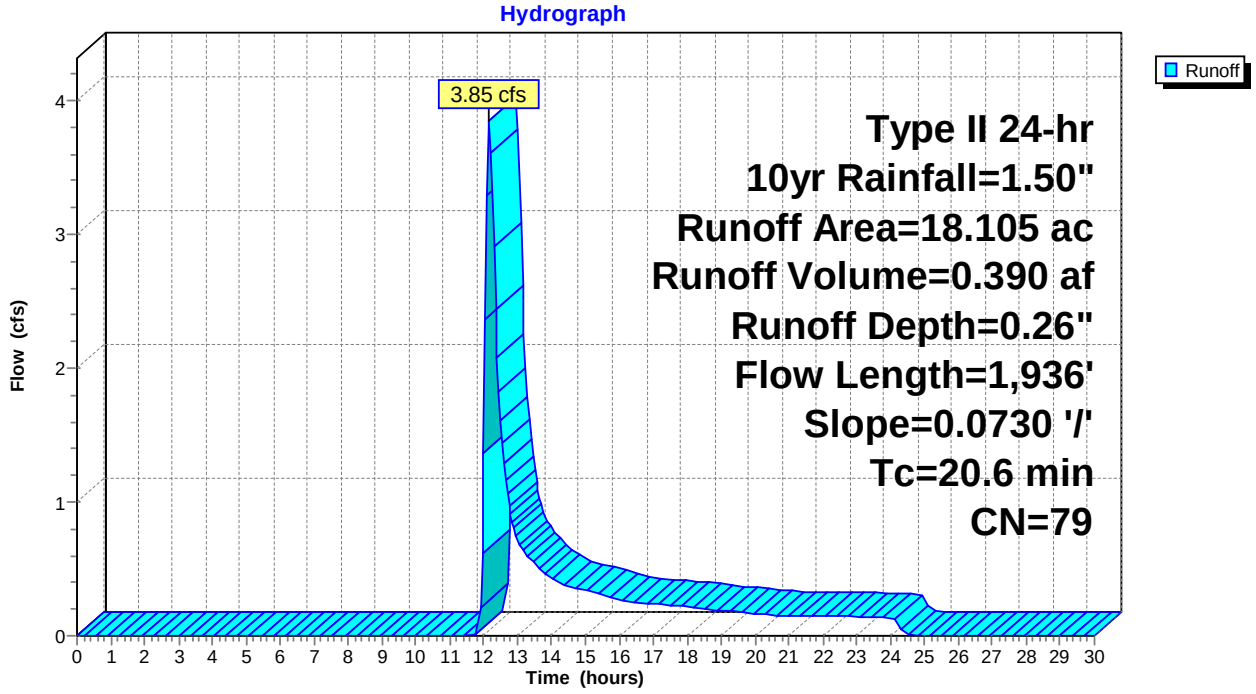
Runoff = 3.85 cfs @ 12.17 hrs, Volume= 0.390 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	18.105	79	
	18.105		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.6	1,936	0.0730	1.57		**Lag/CN Method,**

Subcatchment 66S: DC-047



Summary for Subcatchment 67S: DC-049

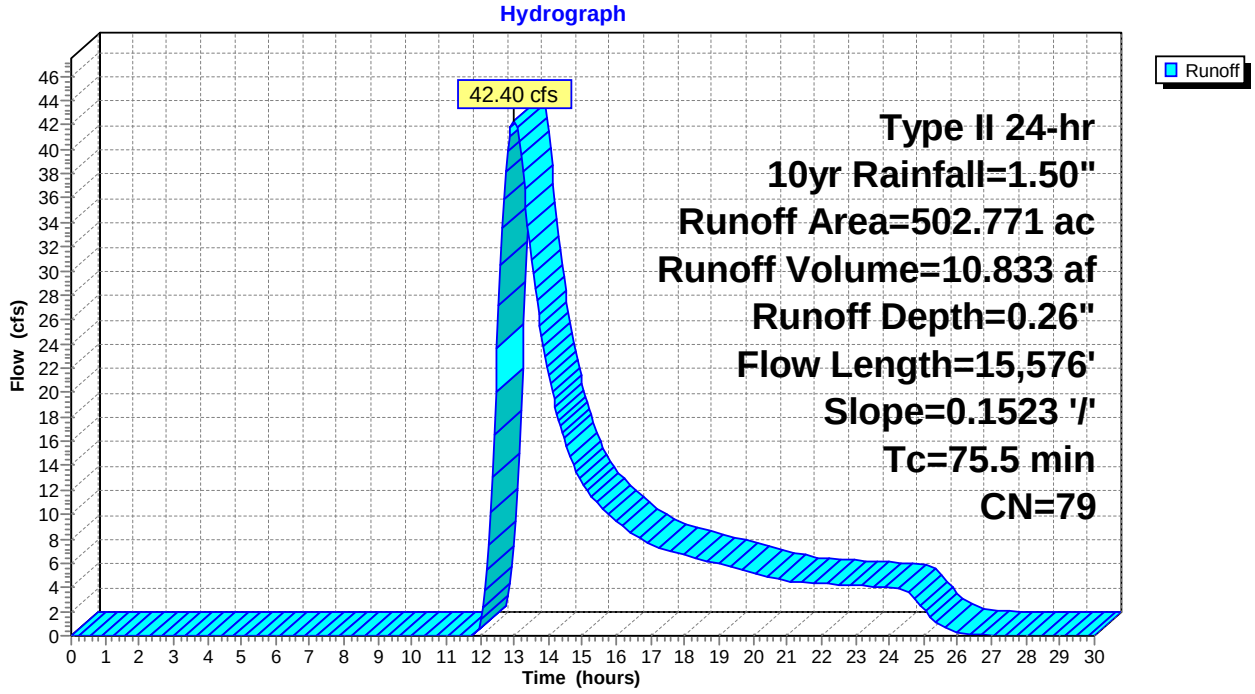
Runoff = 42.40 cfs @ 12.99 hrs, Volume= 10.833 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	502.771	79	
	502.771		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
75.5	15,576	0.1523	3.44		**Lag/CN Method,**

Subcatchment 67S: DC-049



Summary for Subcatchment 68S: DC-050

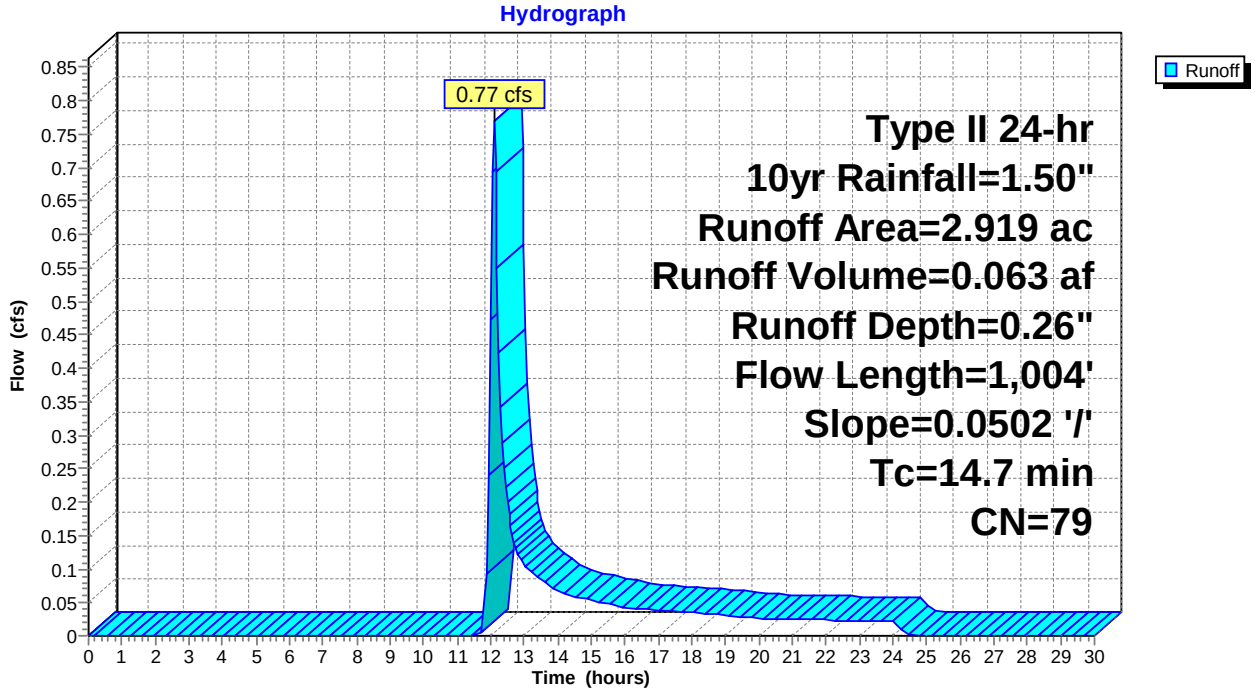
Runoff = 0.77 cfs @ 12.10 hrs, Volume= 0.063 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	2.919	79	
	2.919		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	1,004	0.0502	1.14		**Lag/CN Method,**

Subcatchment 68S: DC-050



Summary for Subcatchment 69S: DC-051

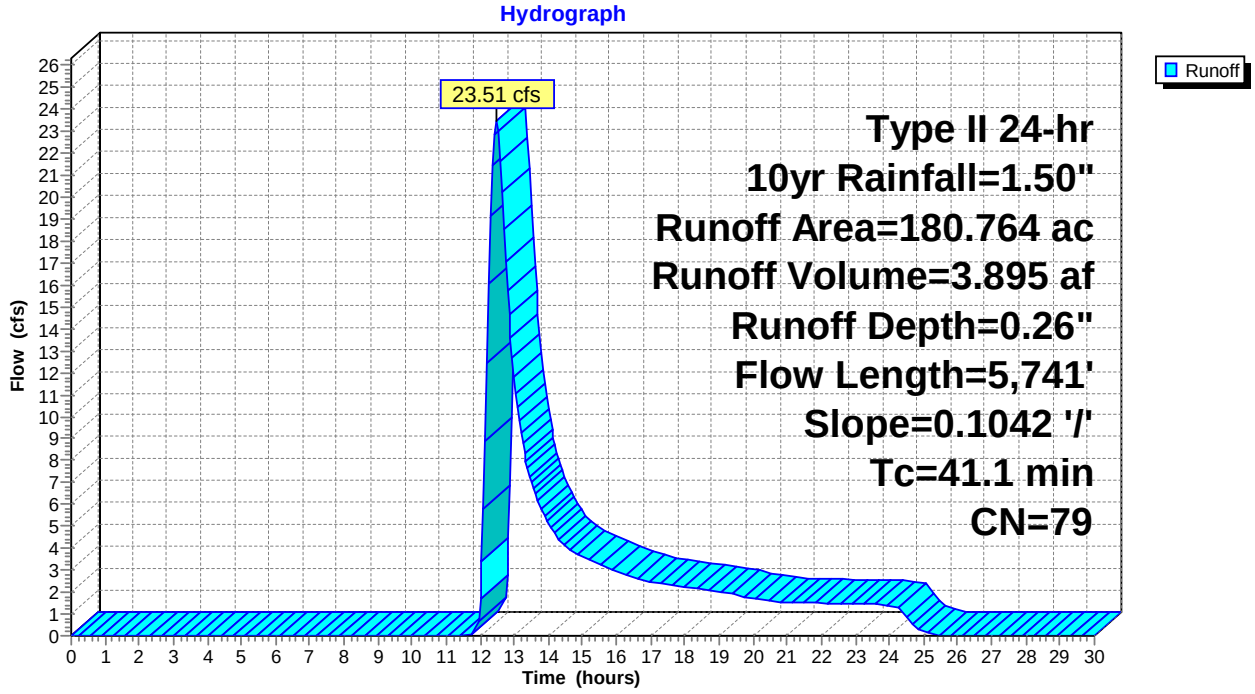
Runoff = 23.51 cfs @ 12.47 hrs, Volume= 3.895 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	180.764	79	
	180.764		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.1	5,741	0.1042	2.33		**Lag/CN Method,**

Subcatchment 69S: DC-051



Summary for Subcatchment 70S: DC-053

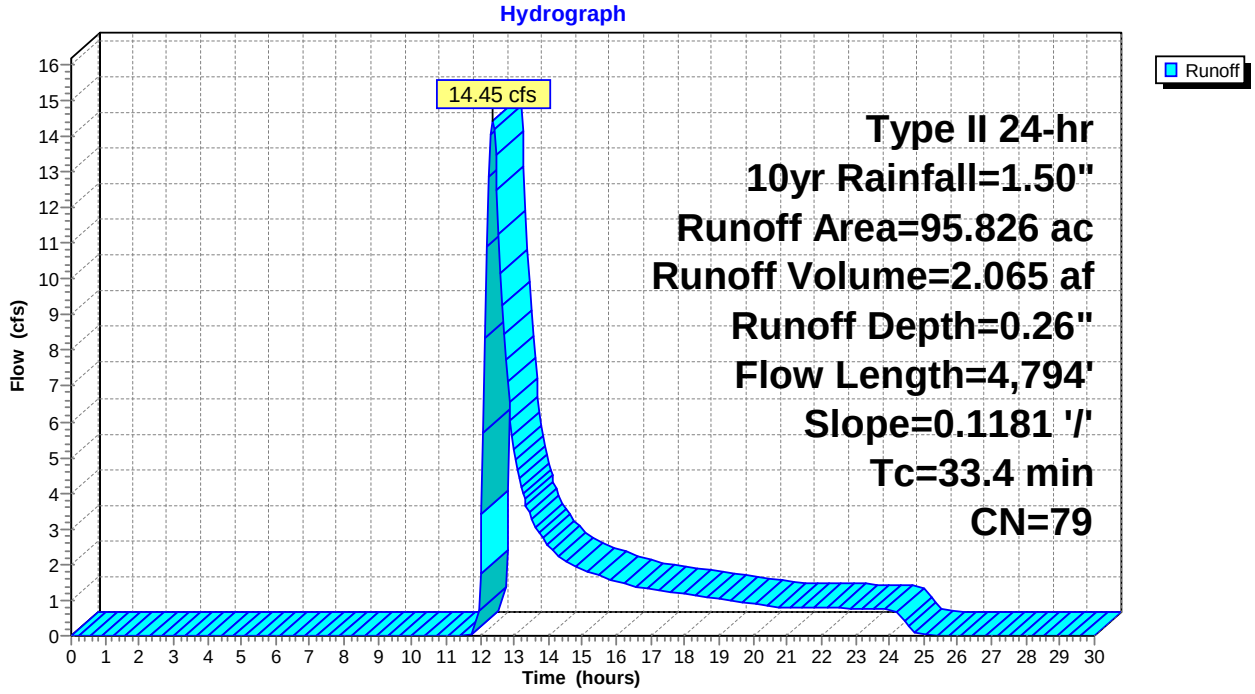
Runoff = 14.45 cfs @ 12.36 hrs, Volume= 2.065 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	95.826	79	
	95.826		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.4	4,794	0.1181	2.39		**Lag/CN Method,**

Subcatchment 70S: DC-053



Summary for Subcatchment 71S: DC-054

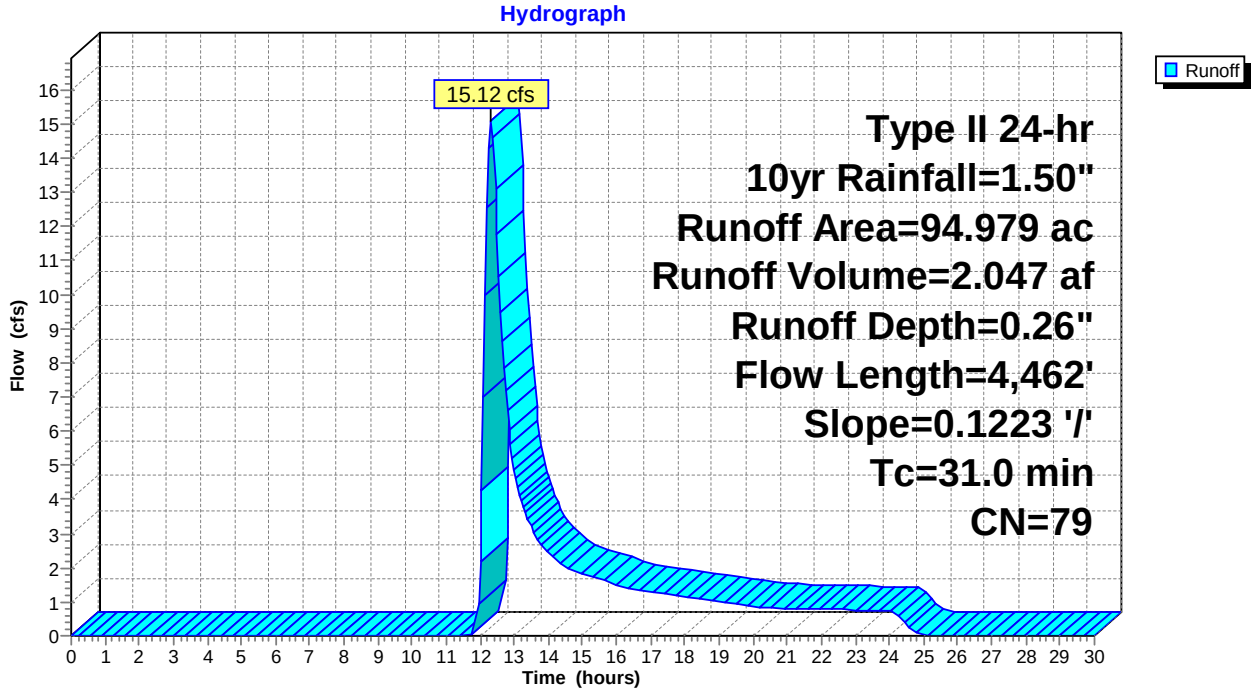
Runoff = 15.12 cfs @ 12.32 hrs, Volume= 2.047 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	94.979	79	
	94.979		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.0	4,462	0.1223	2.40		**Lag/CN Method,**

Subcatchment 71S: DC-054



Summary for Subcatchment 72S: DC-055

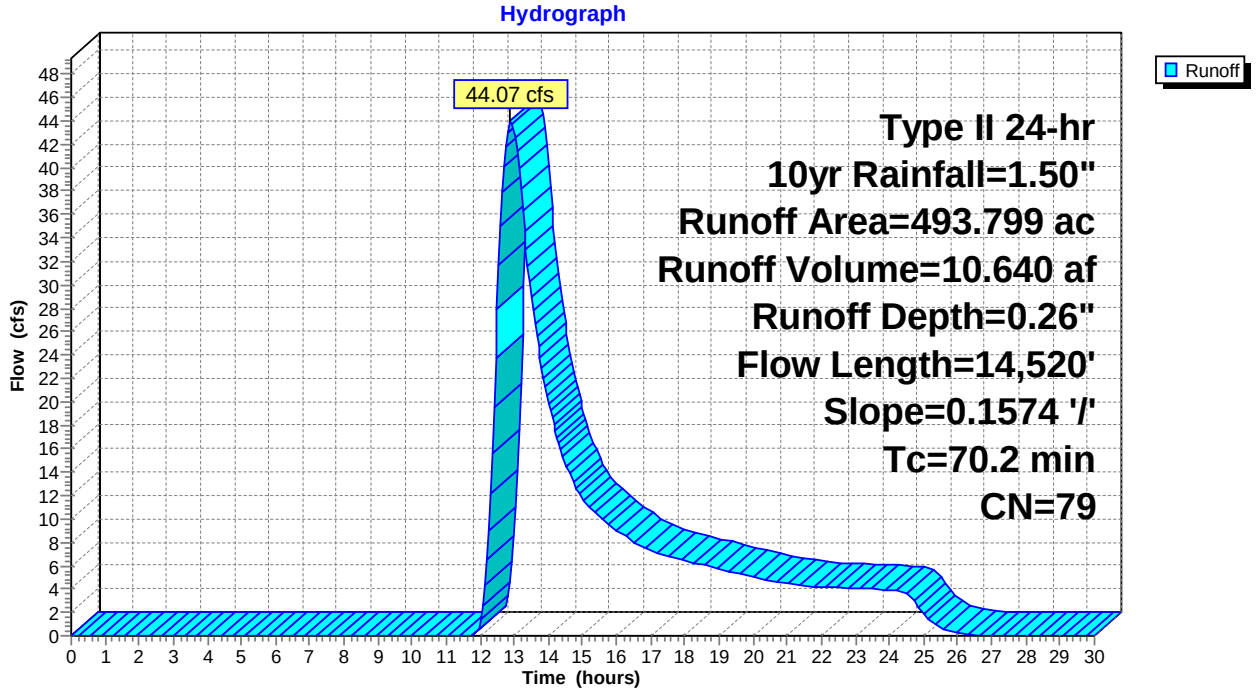
Runoff = 44.07 cfs @ 12.90 hrs, Volume= 10.640 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	493.799	79	
	493.799		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
70.2	14,520	0.1574	3.45		**Lag/CN Method,**

Subcatchment 72S: DC-055



Summary for Subcatchment 73S: DC-056

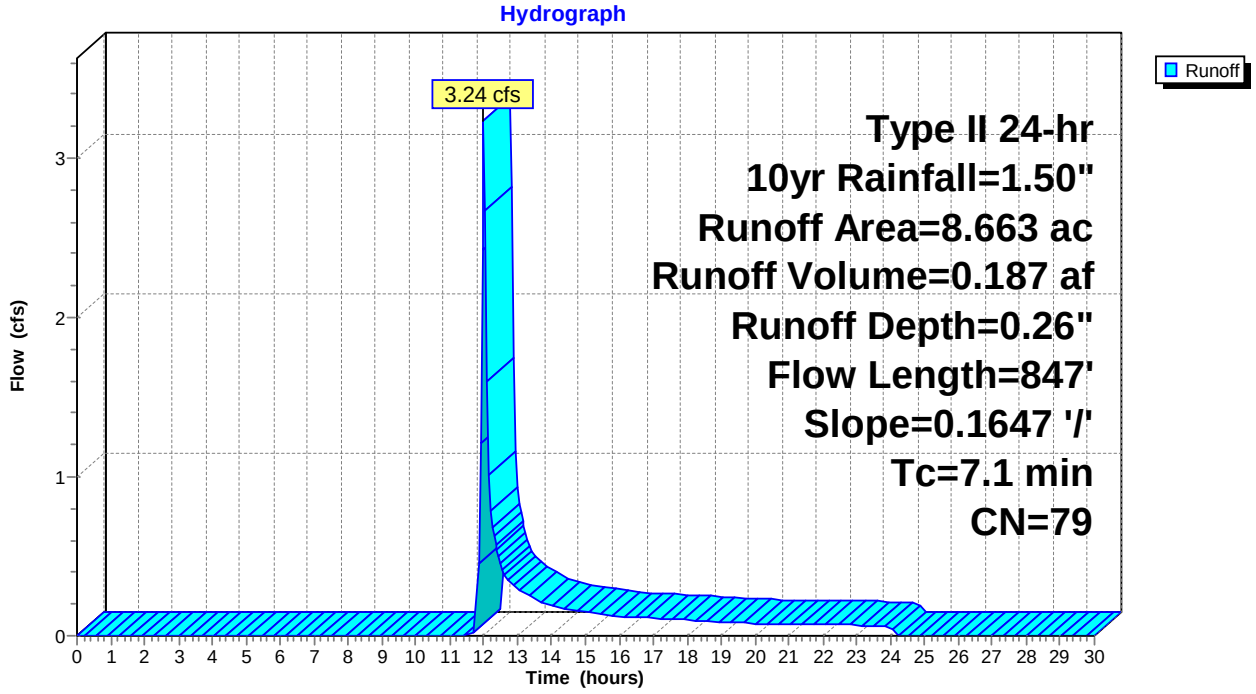
Runoff = 3.24 cfs @ 12.00 hrs, Volume= 0.187 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	8.663	79	
	8.663		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	847	0.1647	2.00		**Lag/CN Method,**

Subcatchment 73S: DC-056



Summary for Subcatchment 74S: DC-057

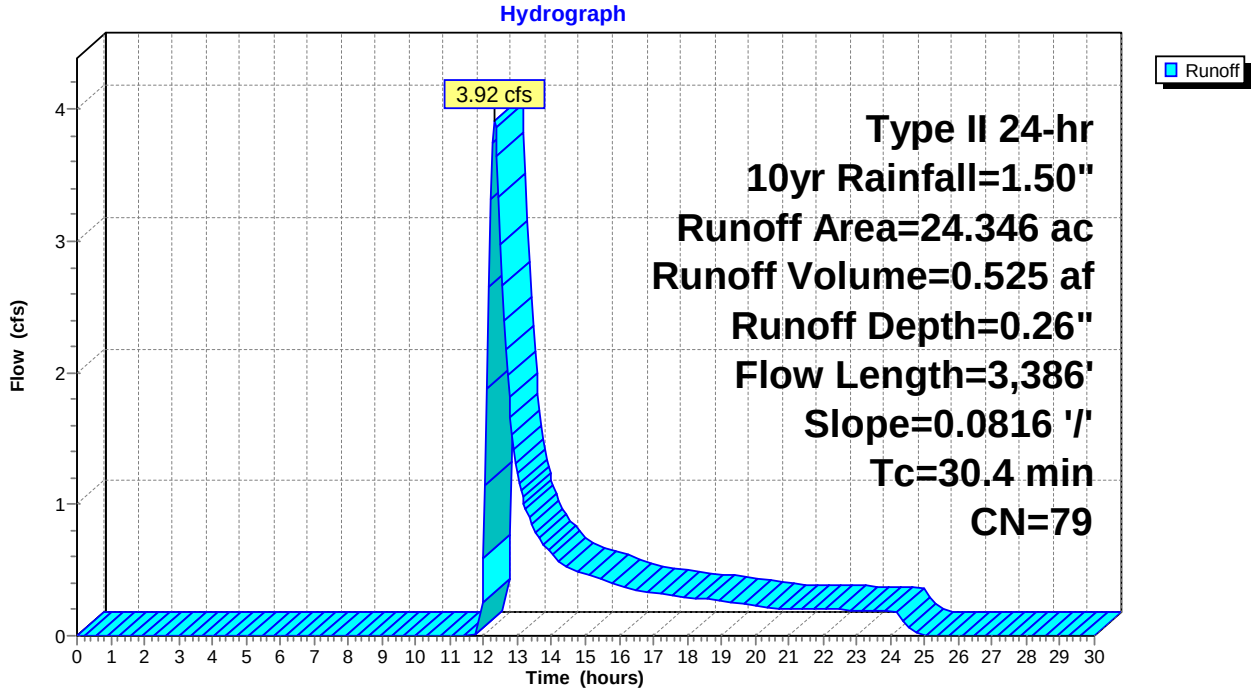
Runoff = 3.92 cfs @ 12.31 hrs, Volume= 0.525 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	24.346	79	
	24.346		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.4	3,386	0.0816	1.85		**Lag/CN Method,**

Subcatchment 74S: DC-057



Summary for Subcatchment 75S: DC-058

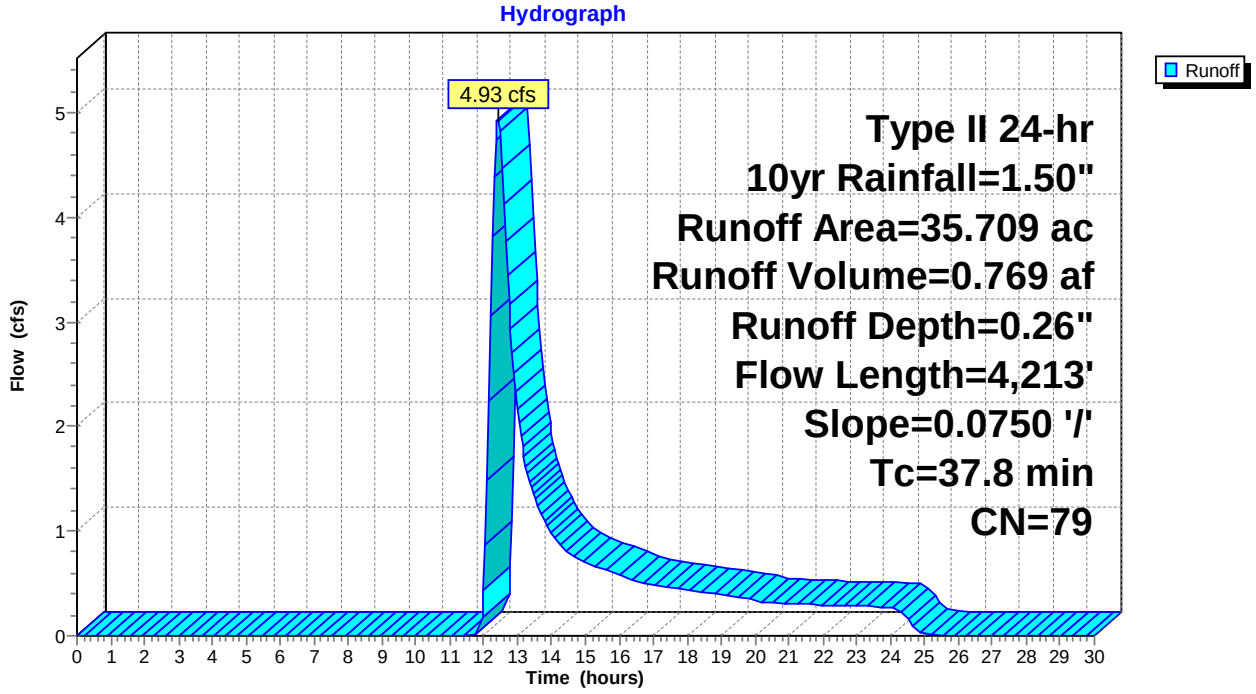
Runoff = 4.93 cfs @ 12.42 hrs, Volume= 0.769 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	35.709	79	
	35.709		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.8	4,213	0.0750	1.86		**Lag/CN Method,**

Subcatchment 75S: DC-058



Summary for Subcatchment 76S: DC-059

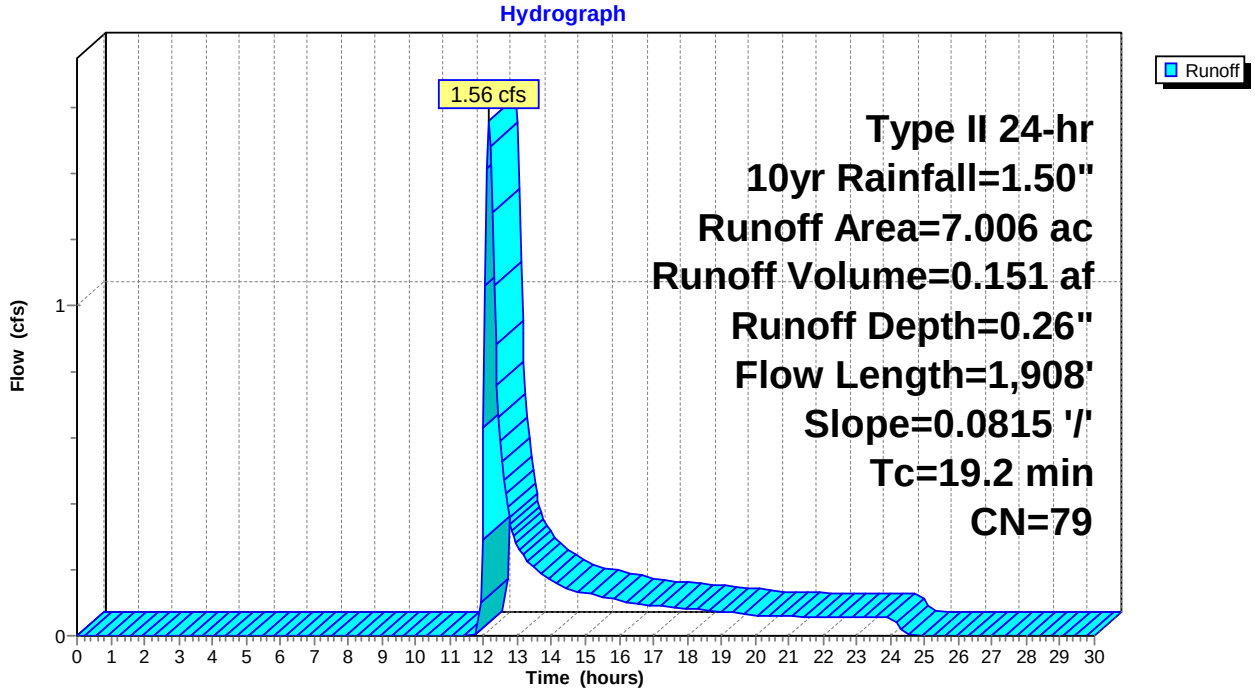
Runoff = 1.56 cfs @ 12.16 hrs, Volume= 0.151 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	7.006	79	
	7.006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	1,908	0.0815	1.65		**Lag/CN Method,**

Subcatchment 76S: DC-059



Summary for Subcatchment 77S: DC-060

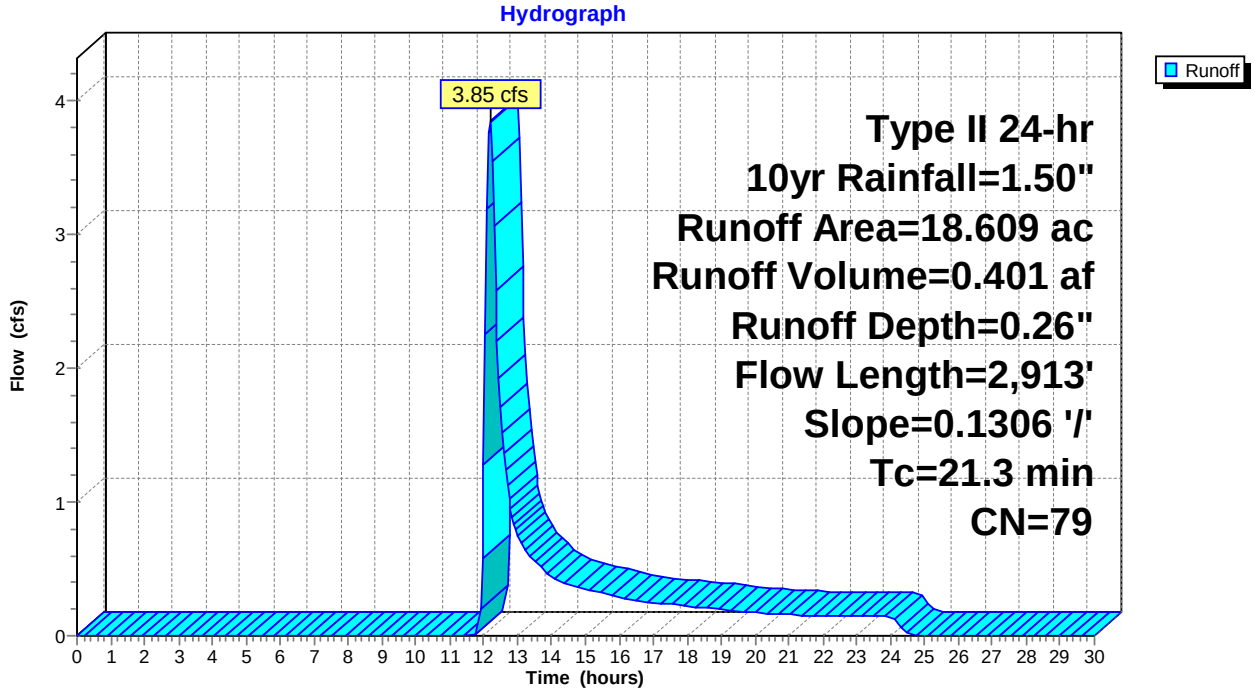
Runoff = 3.85 cfs @ 12.19 hrs, Volume= 0.401 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	18.609	79	
	18.609		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.3	2,913	0.1306	2.28		**Lag/CN Method,**

Subcatchment 77S: DC-060



Summary for Subcatchment 78S: DC-062

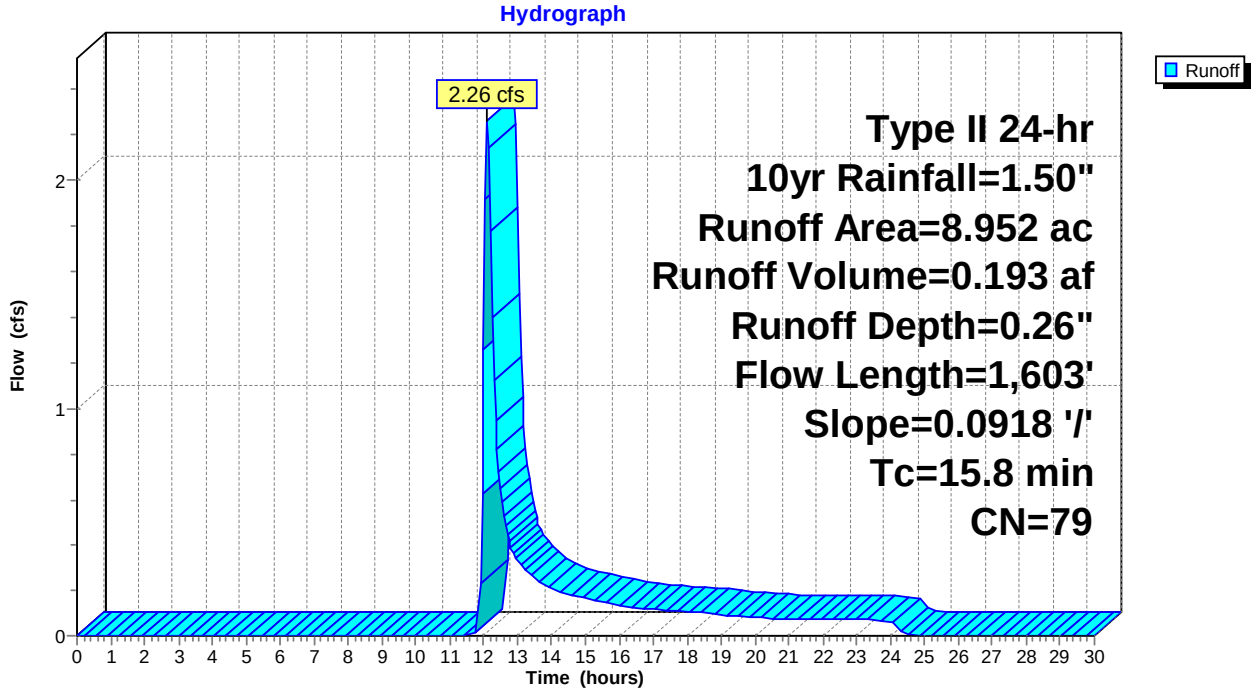
Runoff = 2.26 cfs @ 12.11 hrs, Volume= 0.193 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	8.952	79	
	8.952		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	1,603	0.0918	1.69		**Lag/CN Method,**

Subcatchment 78S: DC-062



Summary for Subcatchment 79S: DC-063

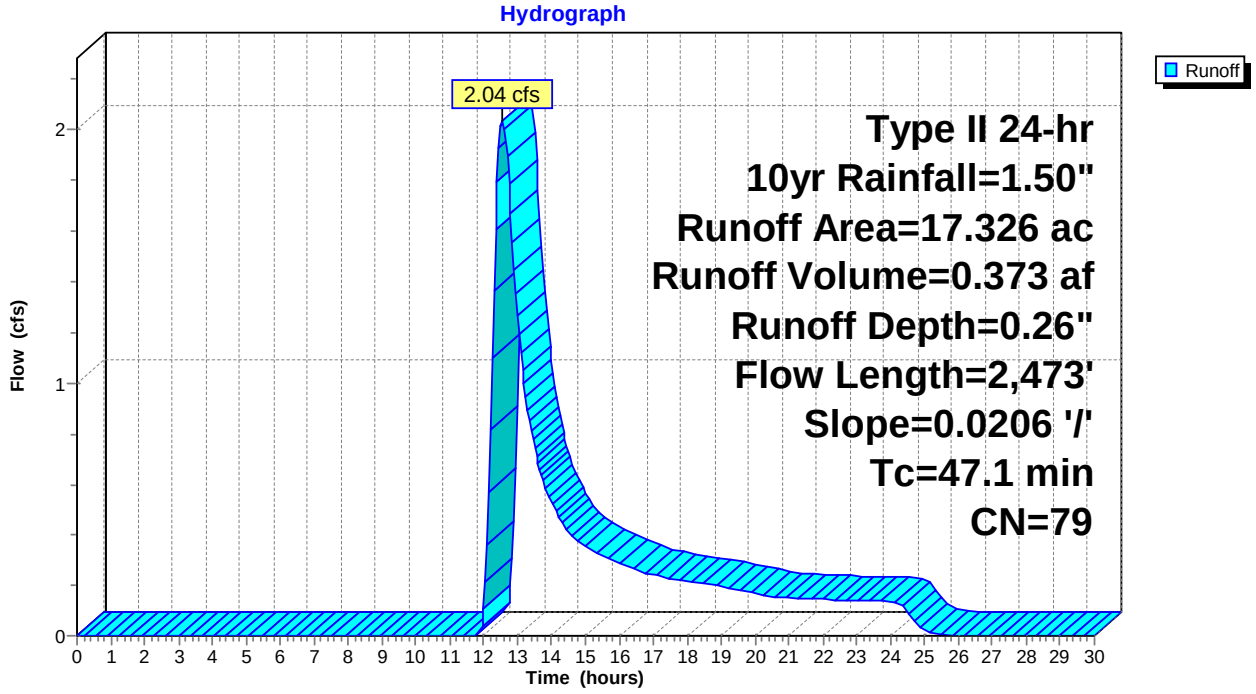
Runoff = 2.04 cfs @ 12.56 hrs, Volume= 0.373 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	17.326	79	
	17.326		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.1	2,473	0.0206	0.87		**Lag/CN Method,**

Subcatchment 79S: DC-063



Summary for Subcatchment 80S: DC-064

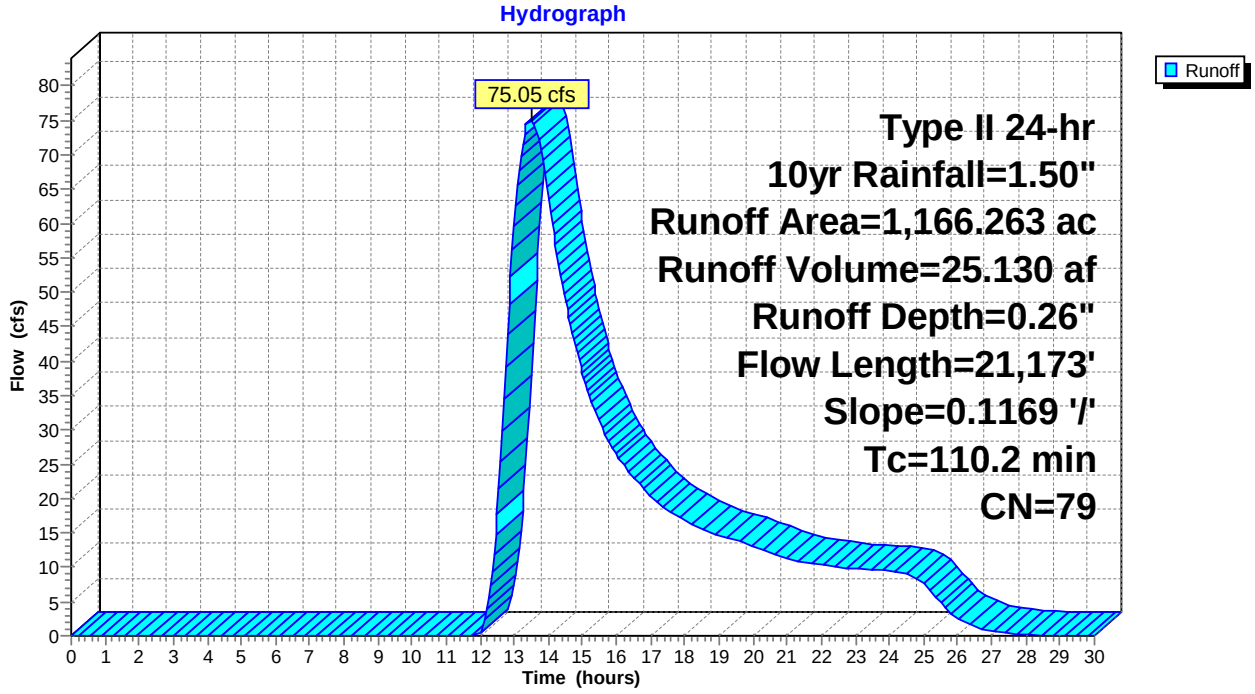
Runoff = 75.05 cfs @ 13.49 hrs, Volume= 25.130 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	1,166.263	79	
	1,166.263		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
110.2	21,173	0.1169	3.20		**Lag/CN Method,**

Subcatchment 80S: DC-064



Summary for Subcatchment 81S: DC-065

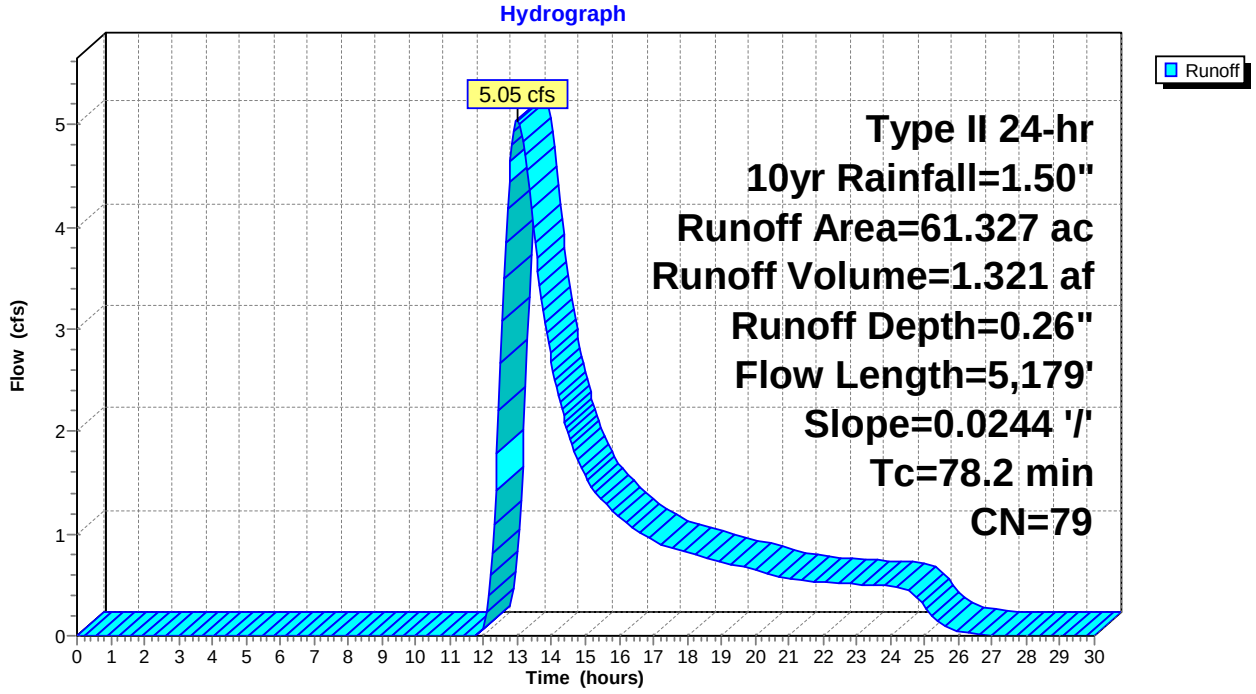
Runoff = 5.05 cfs @ 13.00 hrs, Volume= 1.321 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	61.327	79	
	61.327		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.2	5,179	0.0244	1.10		**Lag/CN Method,**

Subcatchment 81S: DC-065



Summary for Subcatchment 82S: DC-066

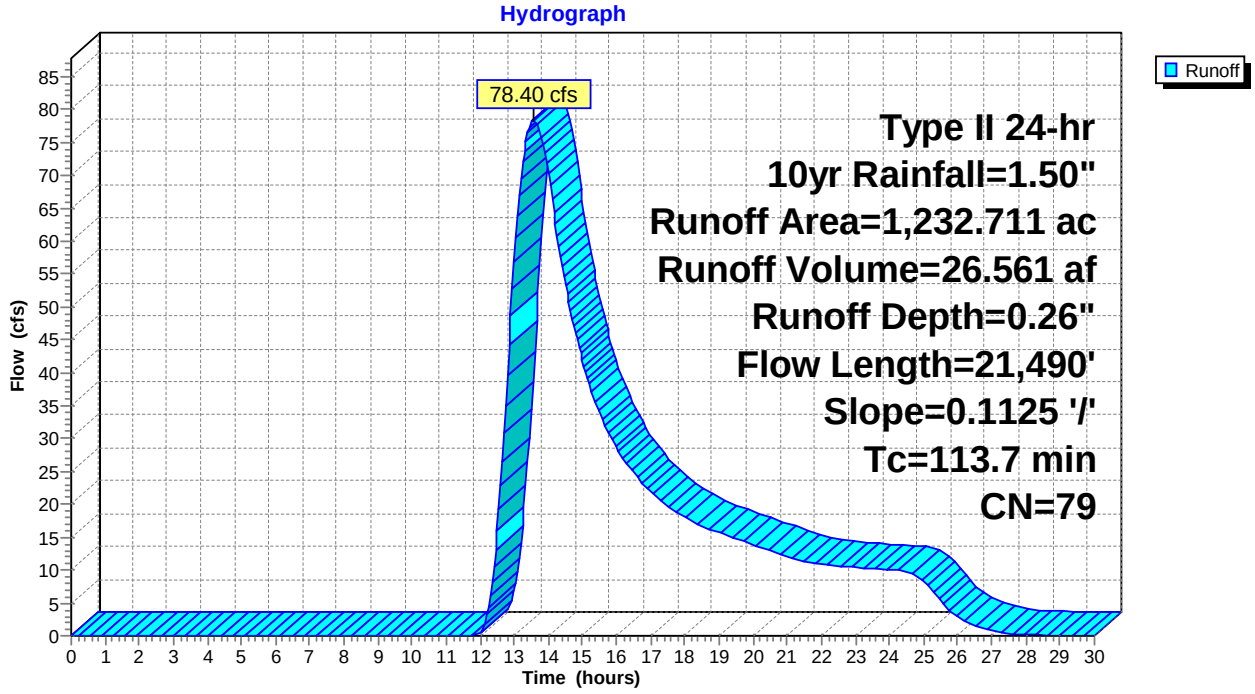
Runoff = 78.40 cfs @ 13.55 hrs, Volume= 26.561 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	1,232.711	79	
	1,232.711		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
113.7	21,490	0.1125	3.15		**Lag/CN Method,**

Subcatchment 82S: DC-066



Summary for Subcatchment 83S: DC-067

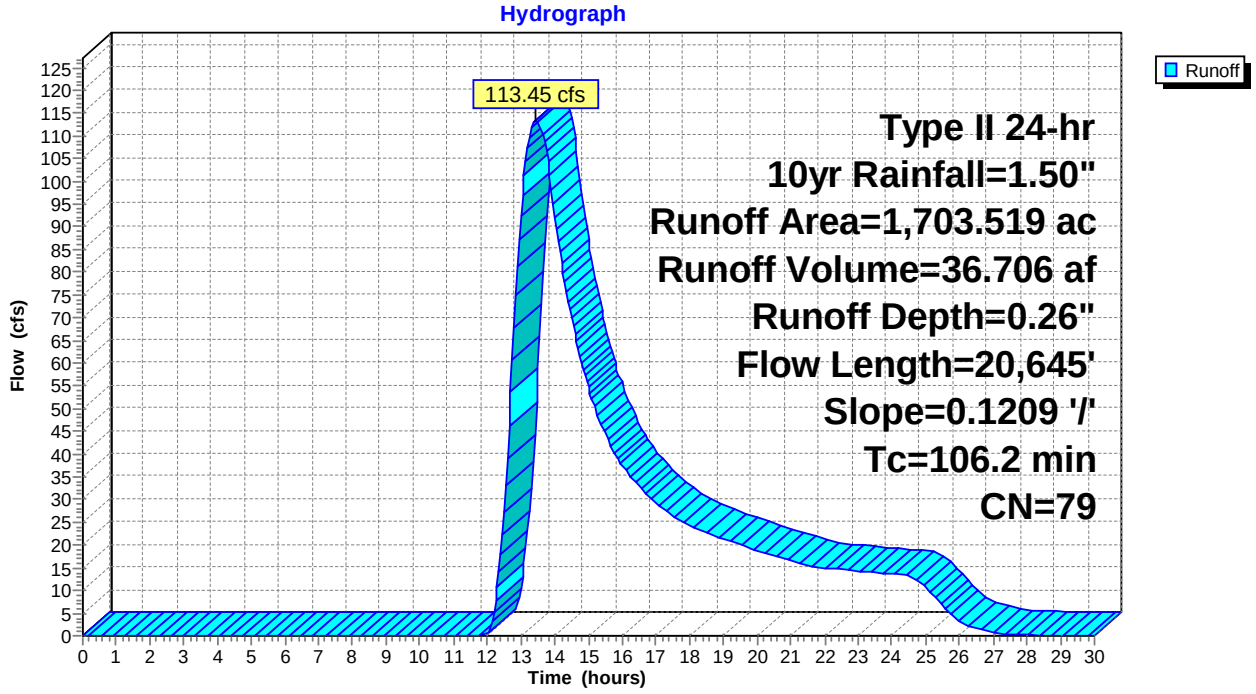
Runoff = 113.45 cfs @ 13.44 hrs, Volume= 36.706 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	1,703.519	79	
	1,703.519		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
106.2	20,645	0.1209	3.24		**Lag/CN Method,**

Subcatchment 83S: DC-067



Summary for Subcatchment 84S: DC-069

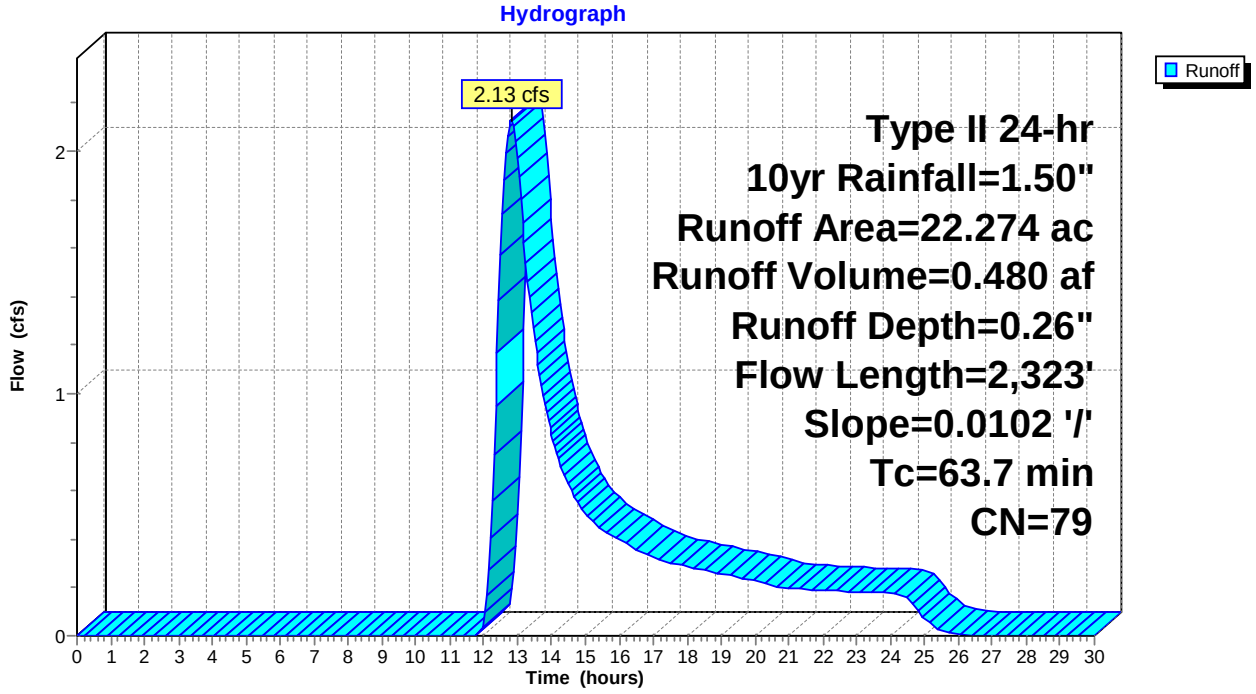
Runoff = 2.13 cfs @ 12.81 hrs, Volume= 0.480 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	22.274	79	
	22.274		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
63.7	2,323	0.0102	0.61		**Lag/CN Method,**

Subcatchment 84S: DC-069



Summary for Subcatchment 85S: DC-071

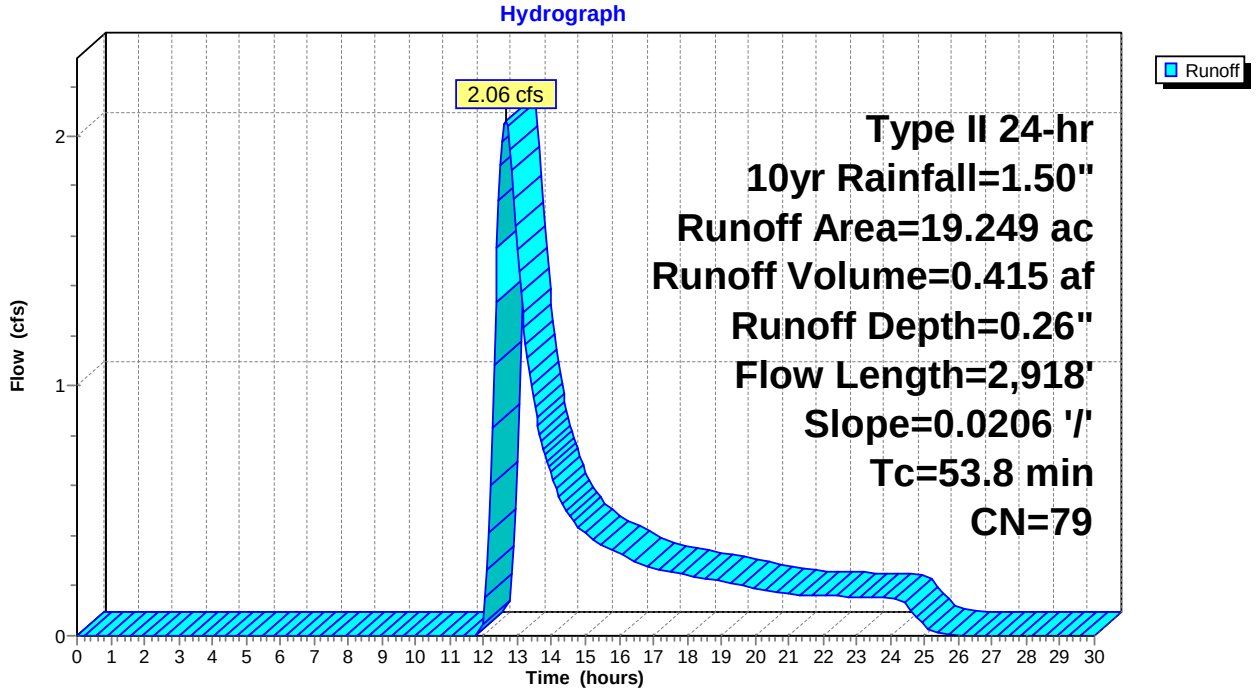
Runoff = 2.06 cfs @ 12.65 hrs, Volume= 0.415 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	19.249	79	
	19.249		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
53.8	2,918	0.0206	0.90		**Lag/CN Method,**

Subcatchment 85S: DC-071



Summary for Subcatchment 86S: DC-072

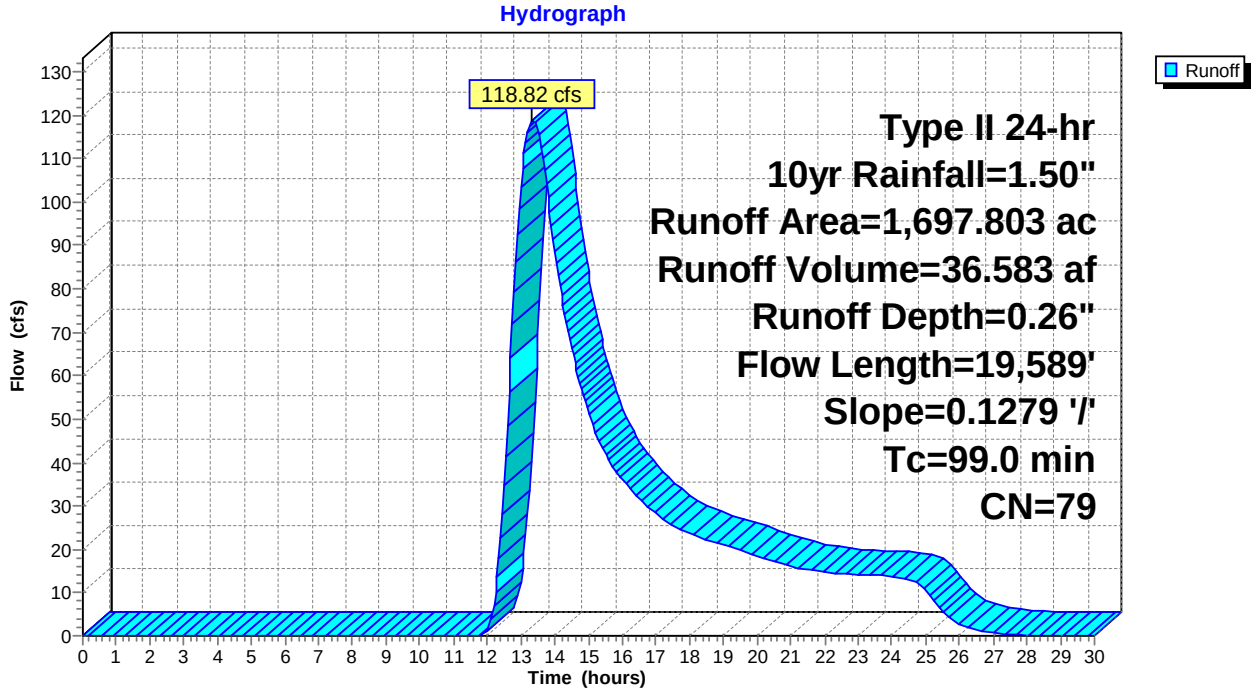
Runoff = 118.82 cfs @ 13.33 hrs, Volume= 36.583 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	1,697.803	79	
	1,697.803		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
99.0	19,589	0.1279	3.30		**Lag/CN Method,**

Subcatchment 86S: DC-072



Summary for Subcatchment 87S: DC-073

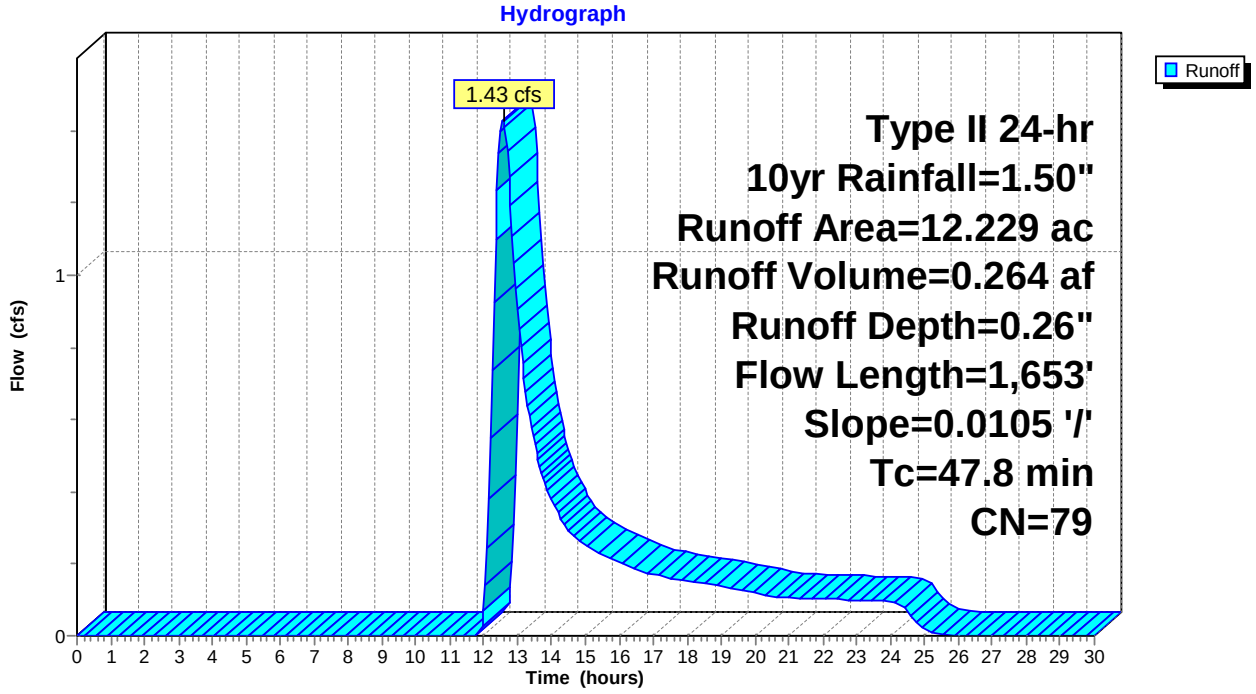
Runoff = 1.43 cfs @ 12.58 hrs, Volume= 0.264 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	12.229	79	
	12.229		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.8	1,653	0.0105	0.58		**Lag/CN Method,**

Subcatchment 87S: DC-073



Summary for Subcatchment 88S: DC-074

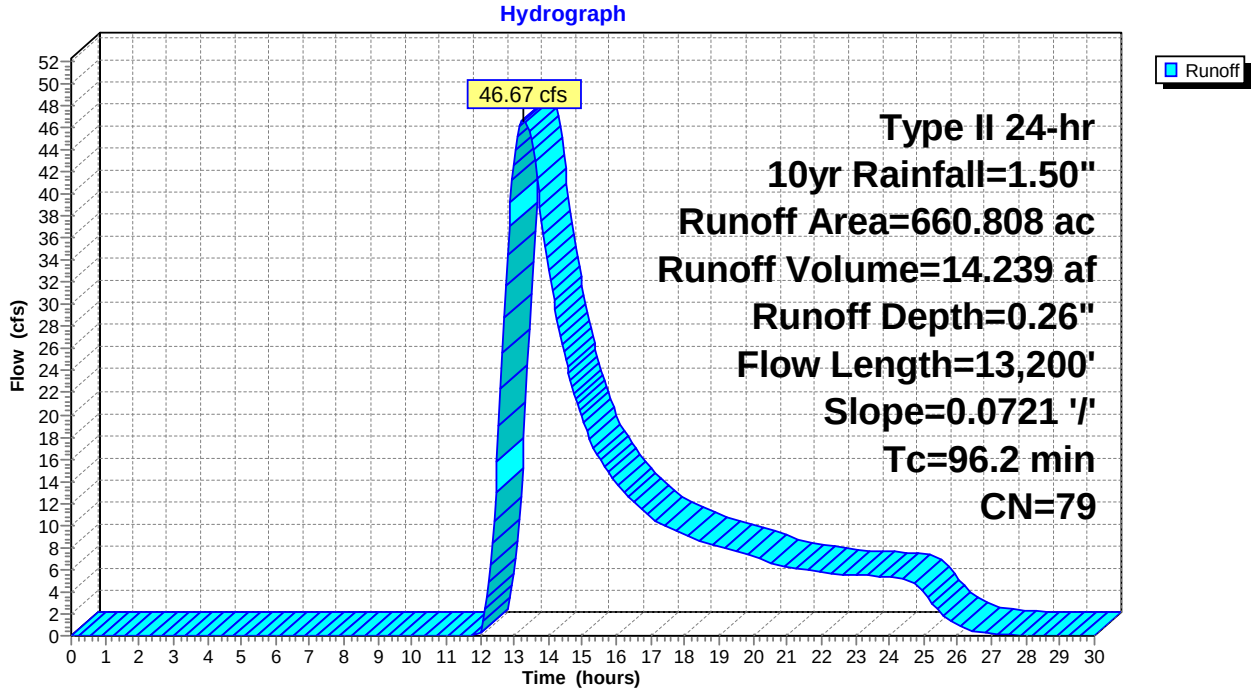
Runoff = 46.67 cfs @ 13.27 hrs, Volume= 14.239 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	660.808	79	
	660.808		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
96.2	13,200	0.0721	2.29		**Lag/CN Method,**

Subcatchment 88S: DC-074



Summary for Subcatchment 89S: DC-075

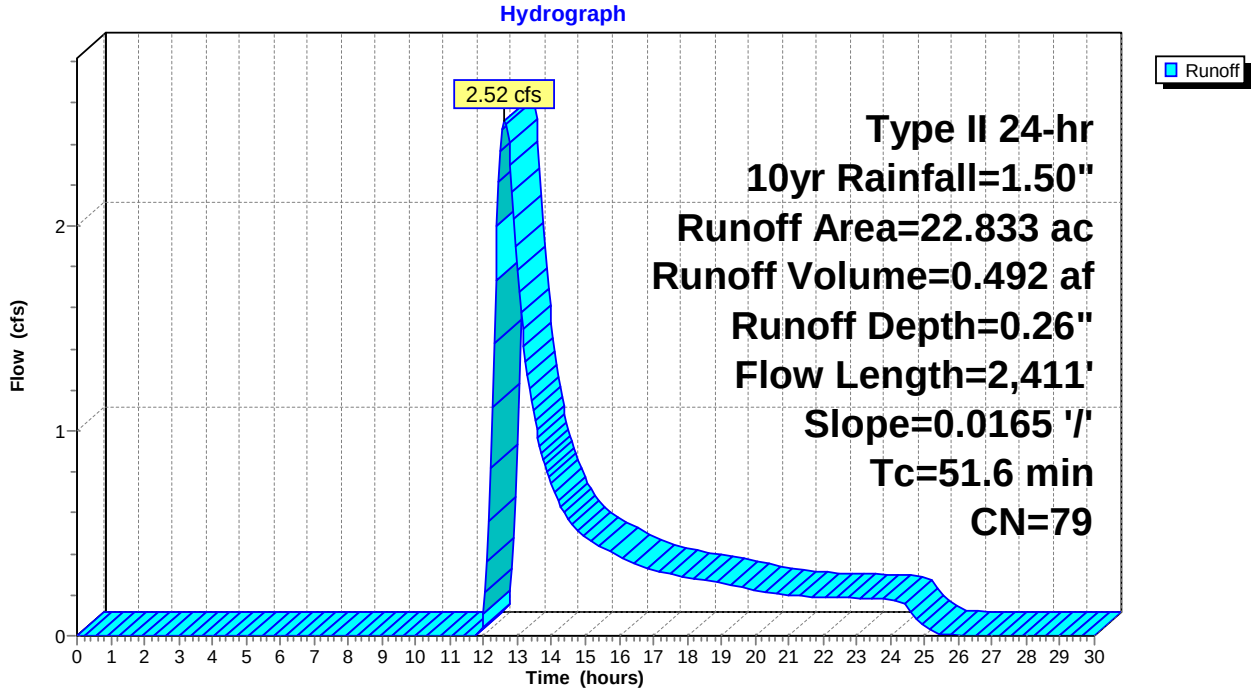
Runoff = 2.52 cfs @ 12.63 hrs, Volume= 0.492 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	22.833	79	
	22.833		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.6	2,411	0.0165	0.78		**Lag/CN Method,**

Subcatchment 89S: DC-075



Summary for Subcatchment 90S: DC-076

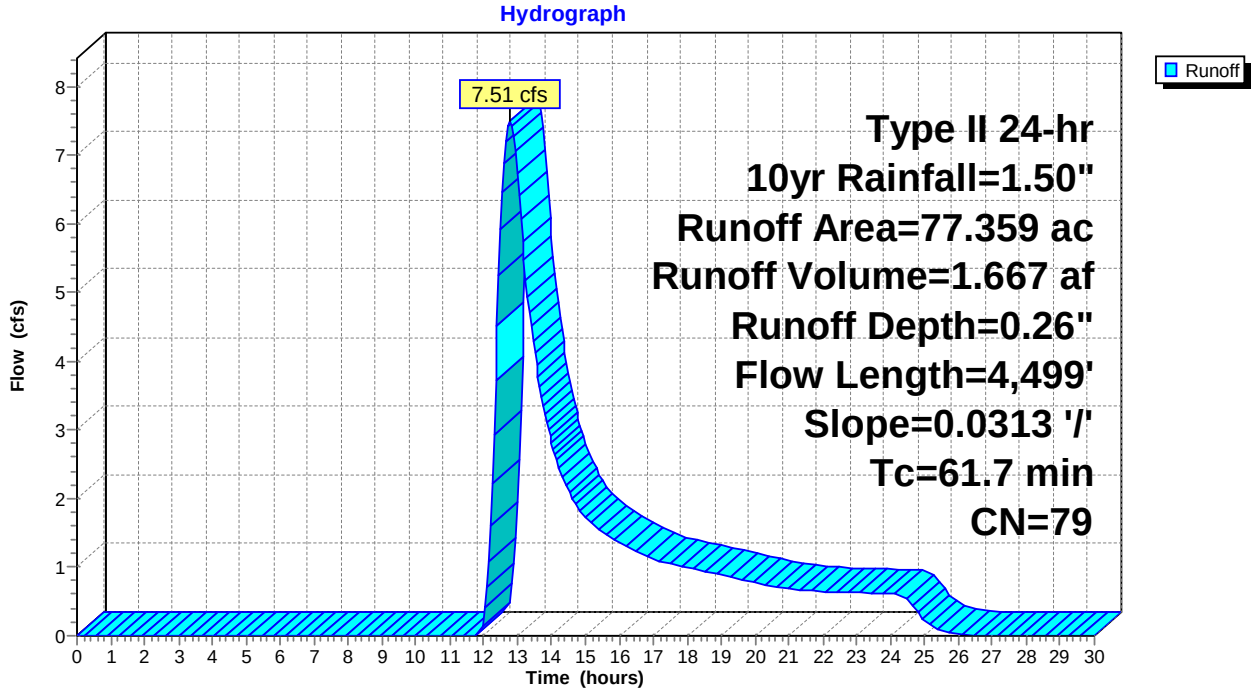
Runoff = 7.51 cfs @ 12.78 hrs, Volume= 1.667 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	77.359	79	
	77.359		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
61.7	4,499	0.0313	1.22		**Lag/CN Method,**

Subcatchment 90S: DC-076



Summary for Subcatchment 91S: DC-078

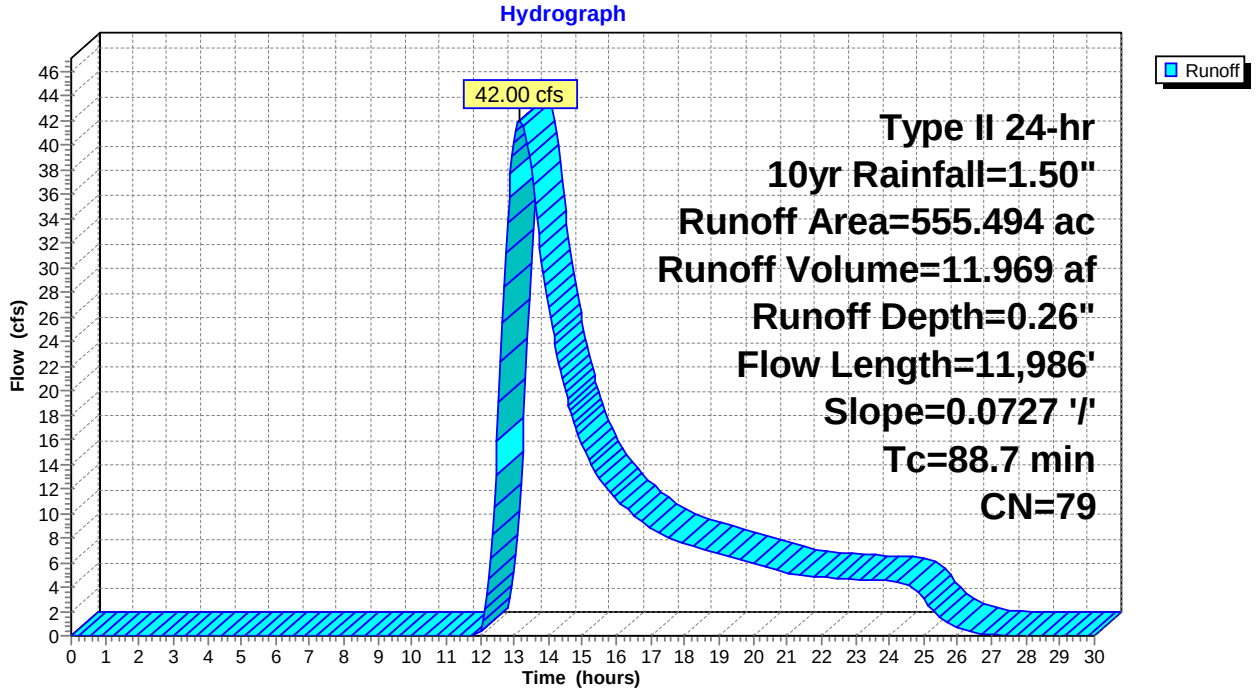
Runoff = 42.00 cfs @ 13.17 hrs, Volume= 11.969 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	555.494	79	
	555.494		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
88.7	11,986	0.0727	2.25		**Lag/CN Method,**

Subcatchment 91S: DC-078



Summary for Subcatchment 92S: DC-079

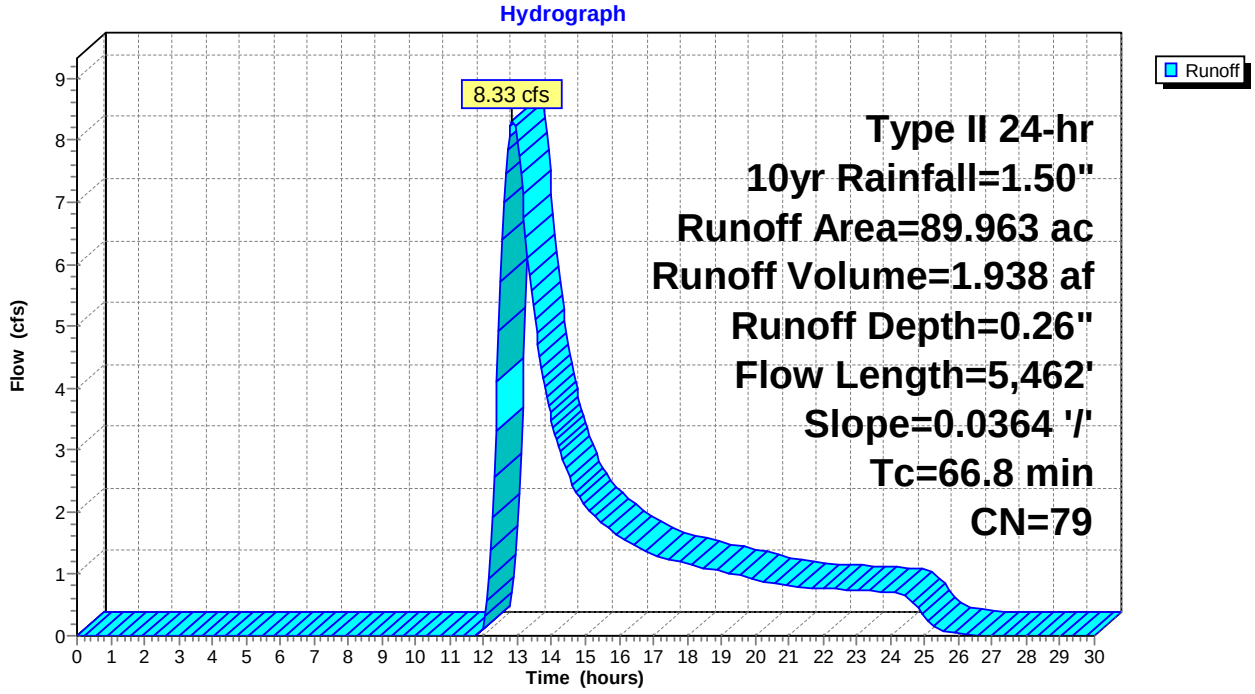
Runoff = 8.33 cfs @ 12.86 hrs, Volume= 1.938 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	89.963	79	
	89.963		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
66.8	5,462	0.0364	1.36		**Lag/CN Method,**

Subcatchment 92S: DC-079



Summary for Subcatchment 93S: DC-080

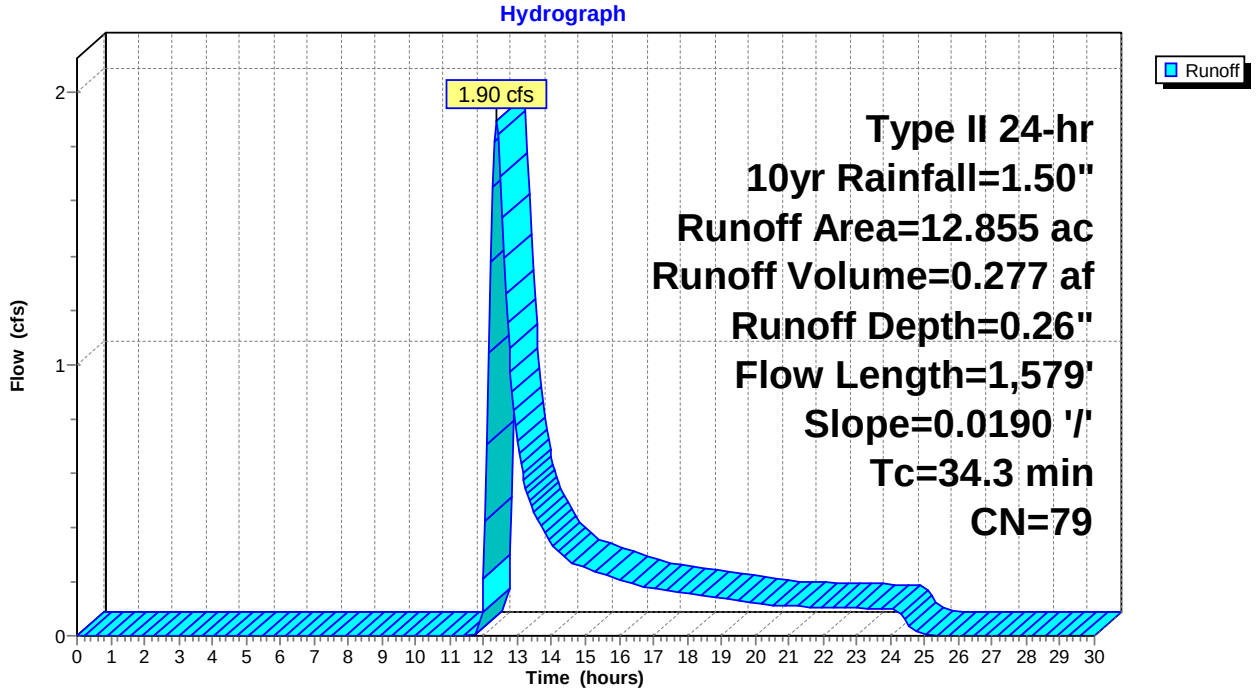
Runoff = 1.90 cfs @ 12.37 hrs, Volume= 0.277 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	12.855	79	
	12.855		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.3	1,579	0.0190	0.77		**Lag/CN Method,**

Subcatchment 93S: DC-080



Summary for Subcatchment 94S: DC-081

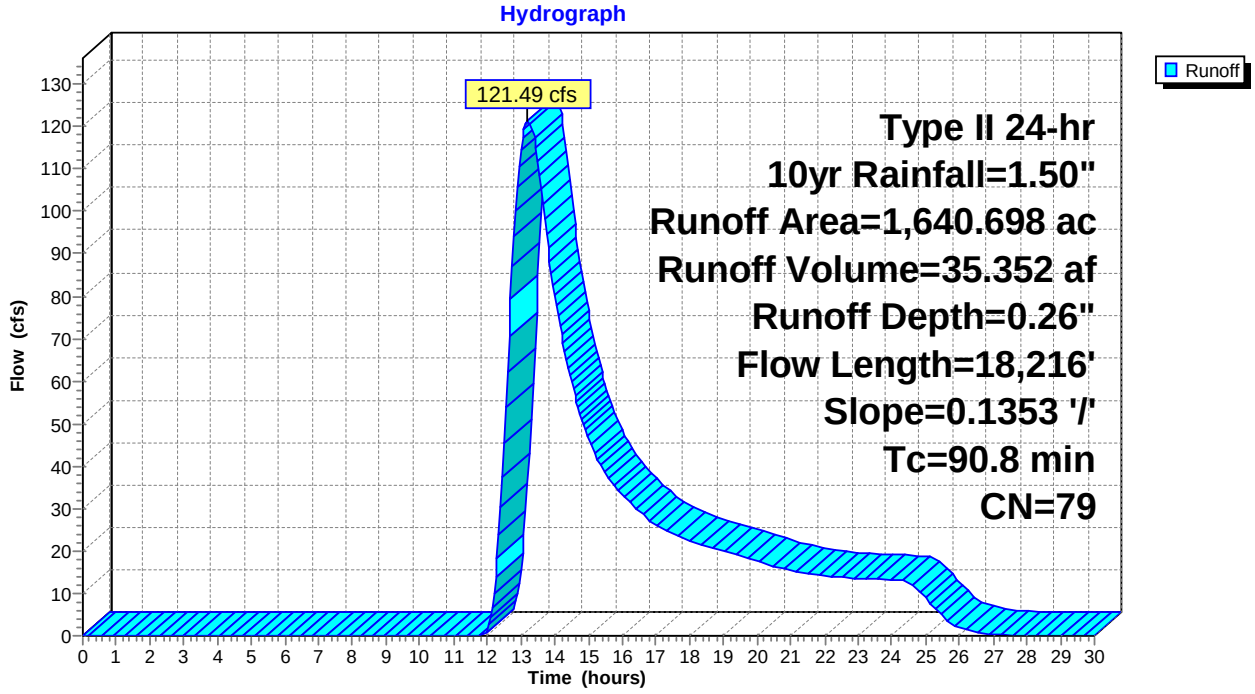
Runoff = 121.49 cfs @ 13.22 hrs, Volume= 35.352 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	1,640.698	79	
	1,640.698		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
90.8	18,216	0.1353	3.34		**Lag/CN Method,**

Subcatchment 94S: DC-081



Summary for Subcatchment 95S: DC-082

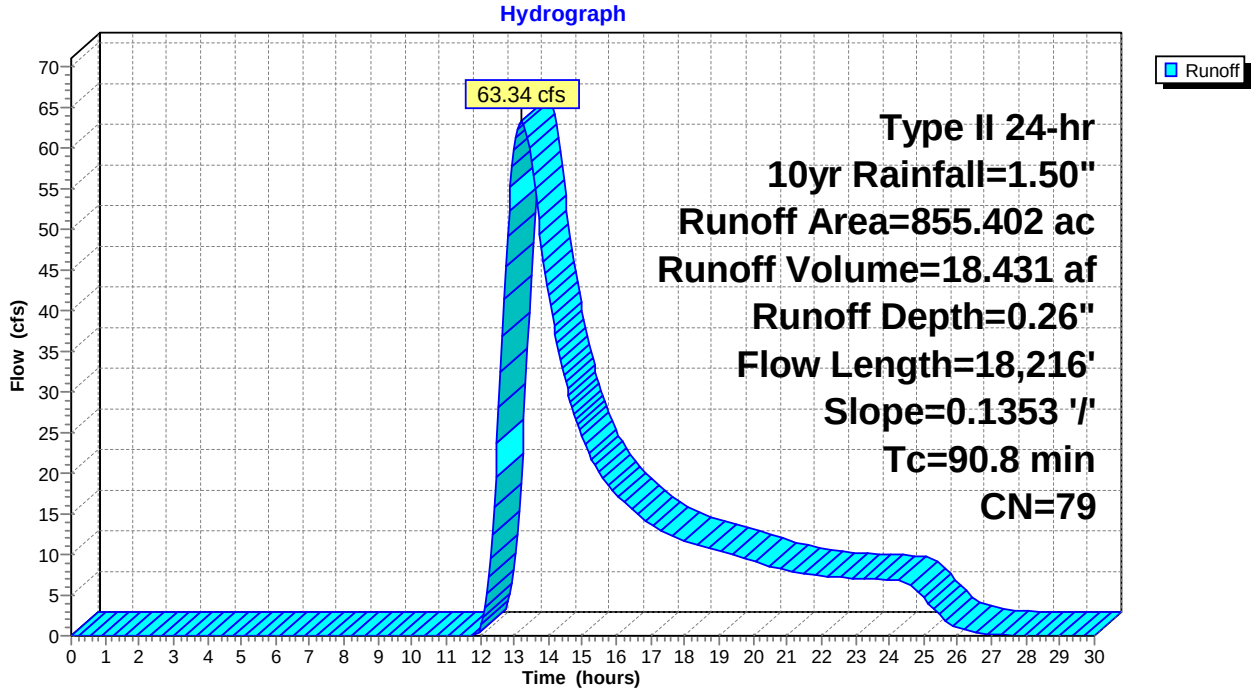
Runoff = 63.34 cfs @ 13.22 hrs, Volume= 18.431 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	855.402	79	
	855.402		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
90.8	18,216	0.1353	3.34		**Lag/CN Method,**

Subcatchment 95S: DC-082



Summary for Subcatchment 96S: DC-083

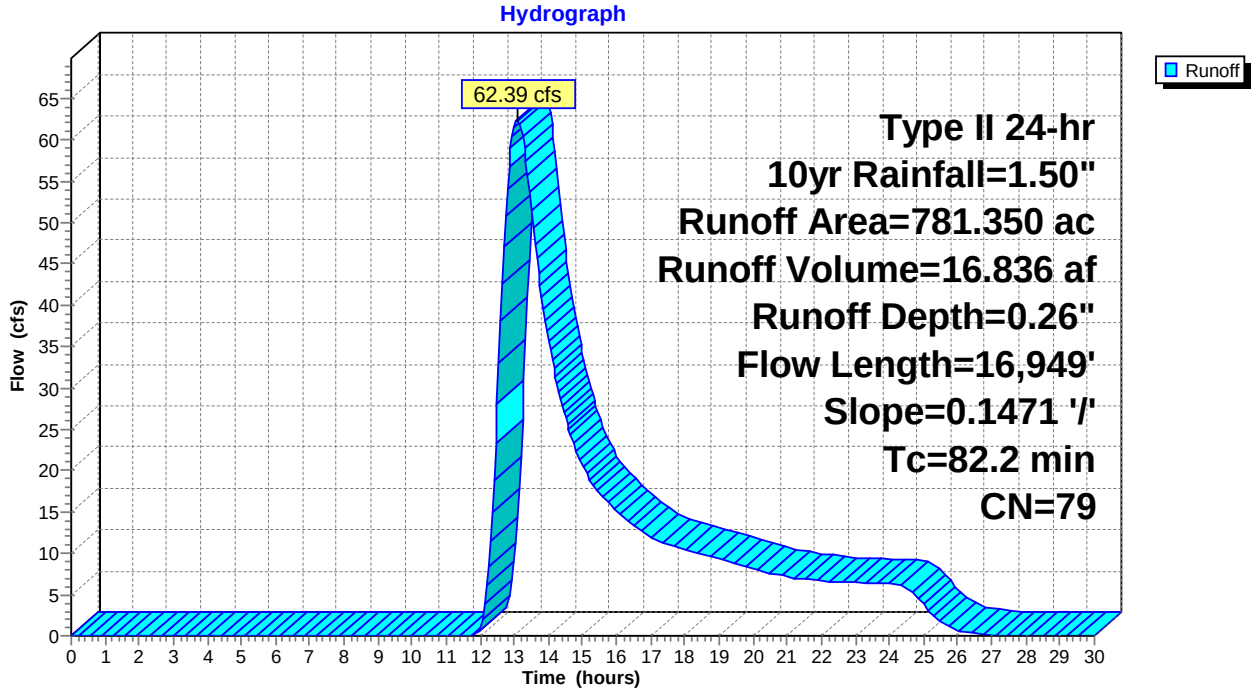
Runoff = 62.39 cfs @ 13.08 hrs, Volume= 16.836 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	781.350	79	
	781.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
82.2	16,949	0.1471	3.44		**Lag/CN Method,**

Subcatchment 96S: DC-083



Summary for Subcatchment 97S: DC-084

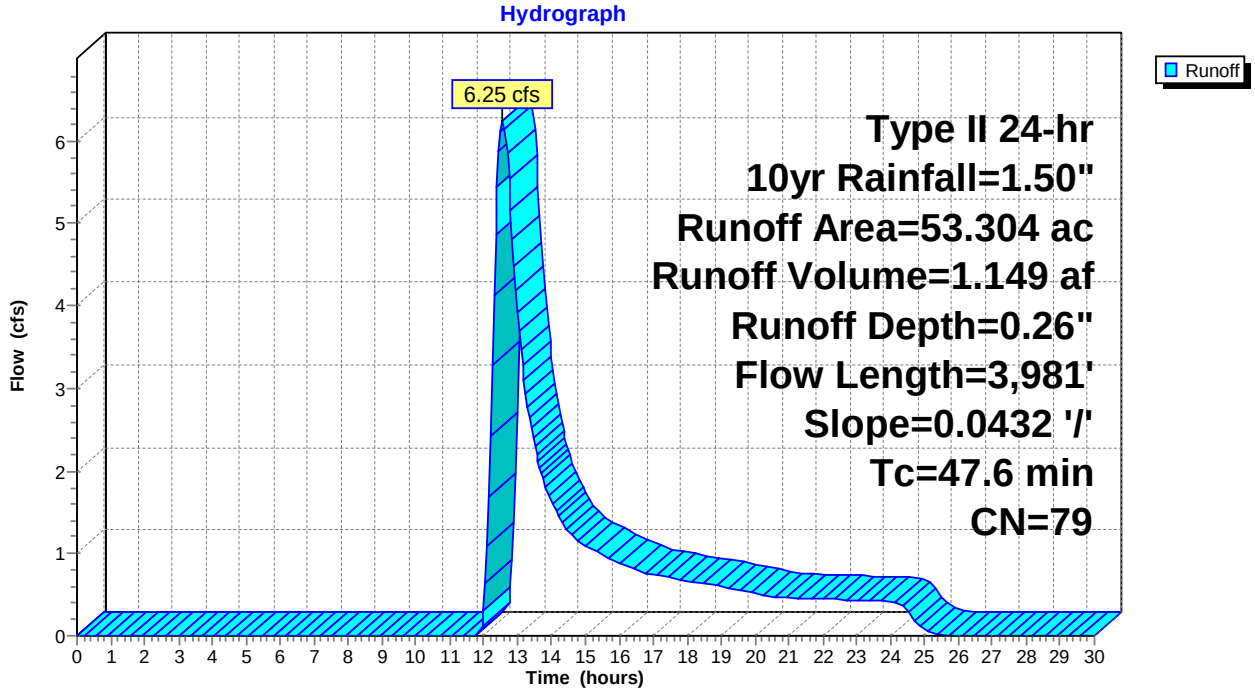
Runoff = 6.25 cfs @ 12.56 hrs, Volume= 1.149 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	53.304	79	
	53.304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
47.6	3,981	0.0432	1.39		**Lag/CN Method,**

Subcatchment 97S: DC-084



Summary for Subcatchment 98S: DC-085

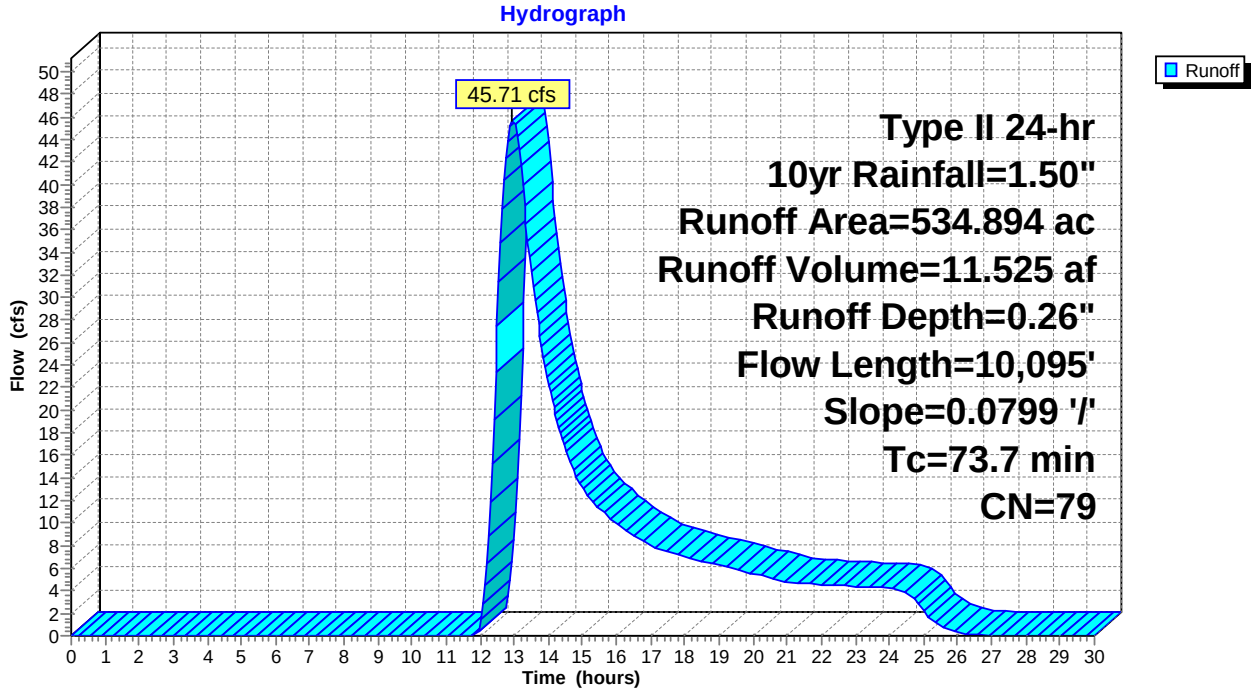
Runoff = 45.71 cfs @ 12.95 hrs, Volume= 11.525 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	534.894	79	
	534.894		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.7	10,095	0.0799	2.28		**Lag/CN Method,**

Subcatchment 98S: DC-085



Summary for Subcatchment 99S: DC-086

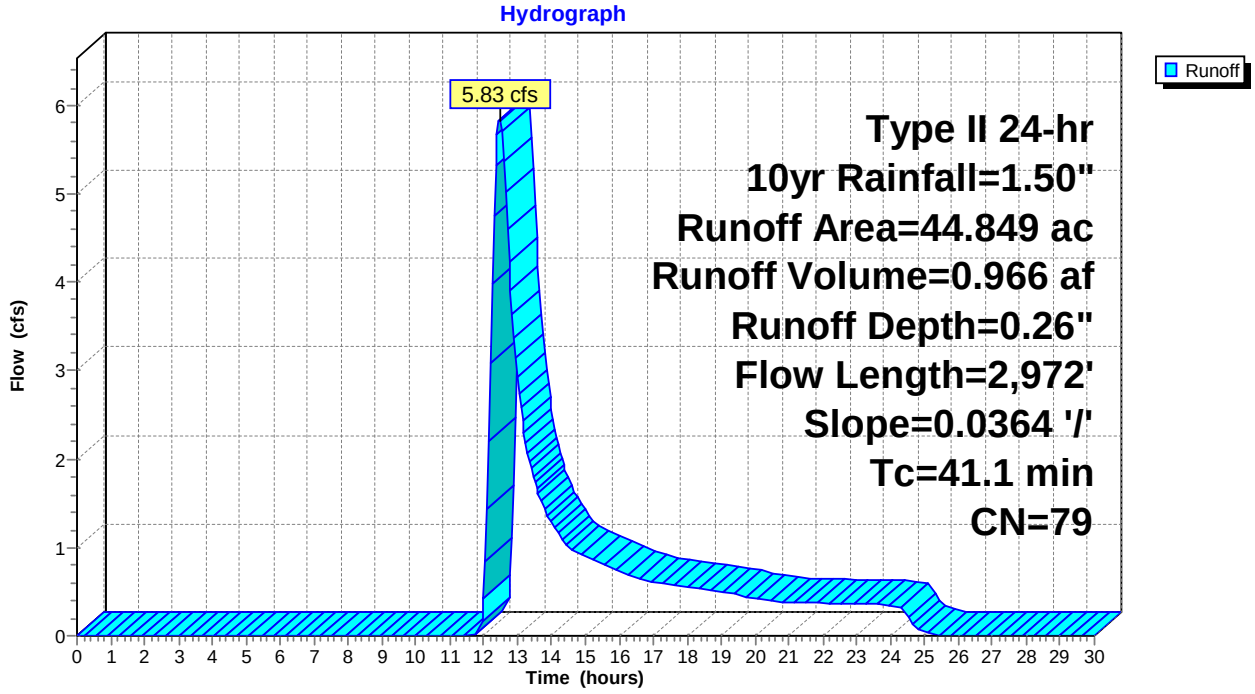
Runoff = 5.83 cfs @ 12.47 hrs, Volume= 0.966 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	44.849	79	
	44.849		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.1	2,972	0.0364	1.21		**Lag/CN Method,**

Subcatchment 99S: DC-086



Summary for Subcatchment 100S: DC-087

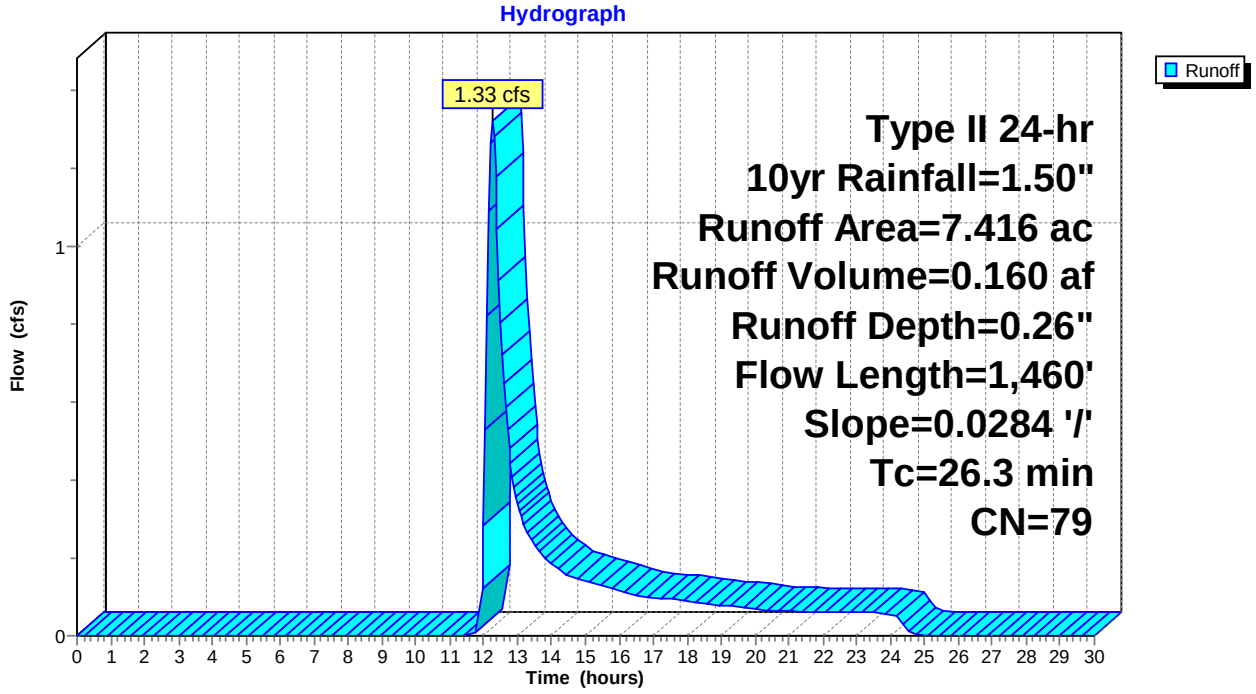
Runoff = 1.33 cfs @ 12.25 hrs, Volume= 0.160 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	7.416	79	
	7.416		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.3	1,460	0.0284	0.92		**Lag/CN Method,**

Subcatchment 100S: DC-087



Summary for Subcatchment 101S: DC-088

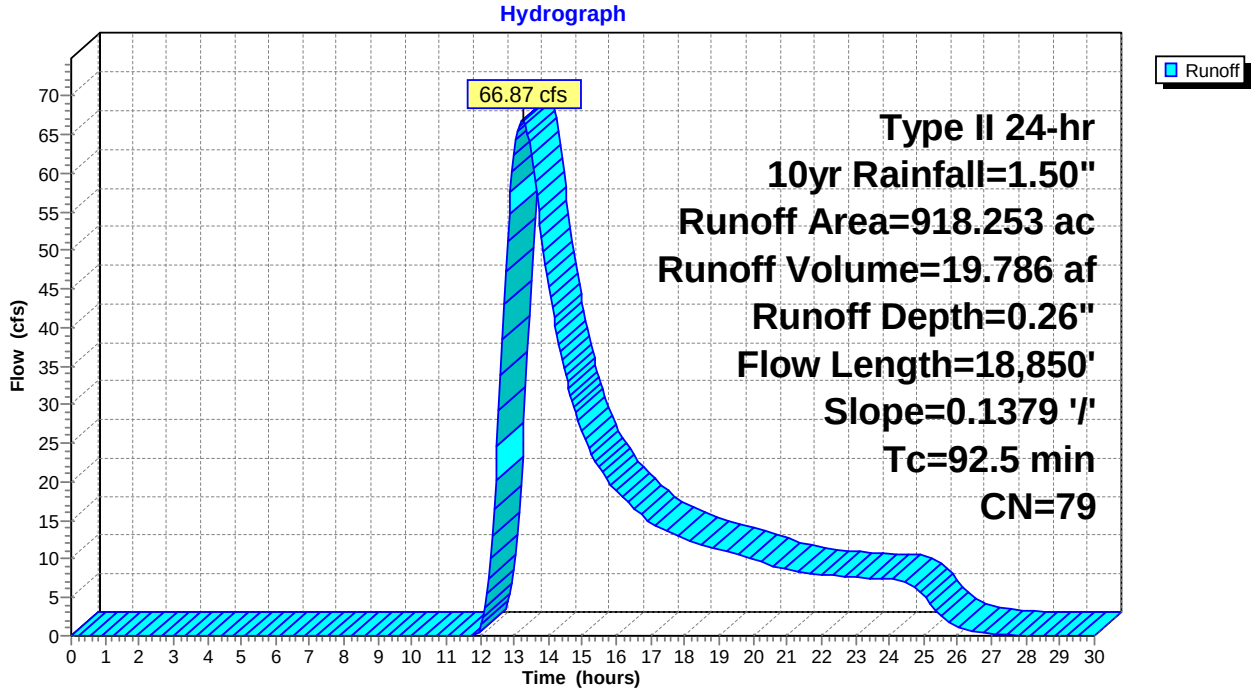
Runoff = 66.87 cfs @ 13.25 hrs, Volume= 19.786 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	918.253	79	
	918.253		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
92.5	18,850	0.1379	3.40		**Lag/CN Method,**

Subcatchment 101S: DC-088



Summary for Subcatchment 102S: DC-089

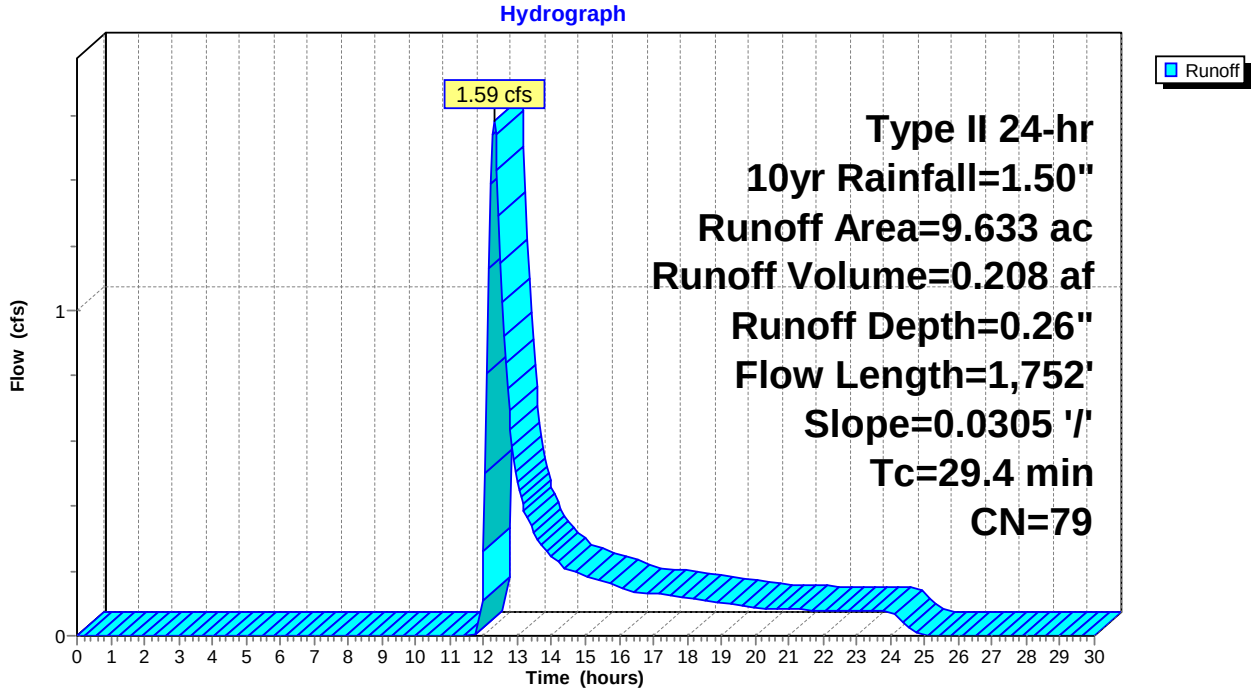
Runoff = 1.59 cfs @ 12.30 hrs, Volume= 0.208 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	9.633	79	
	9.633		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.4	1,752	0.0305	0.99		**Lag/CN Method,**

Subcatchment 102S: DC-089



Summary for Subcatchment 103S: DC-090

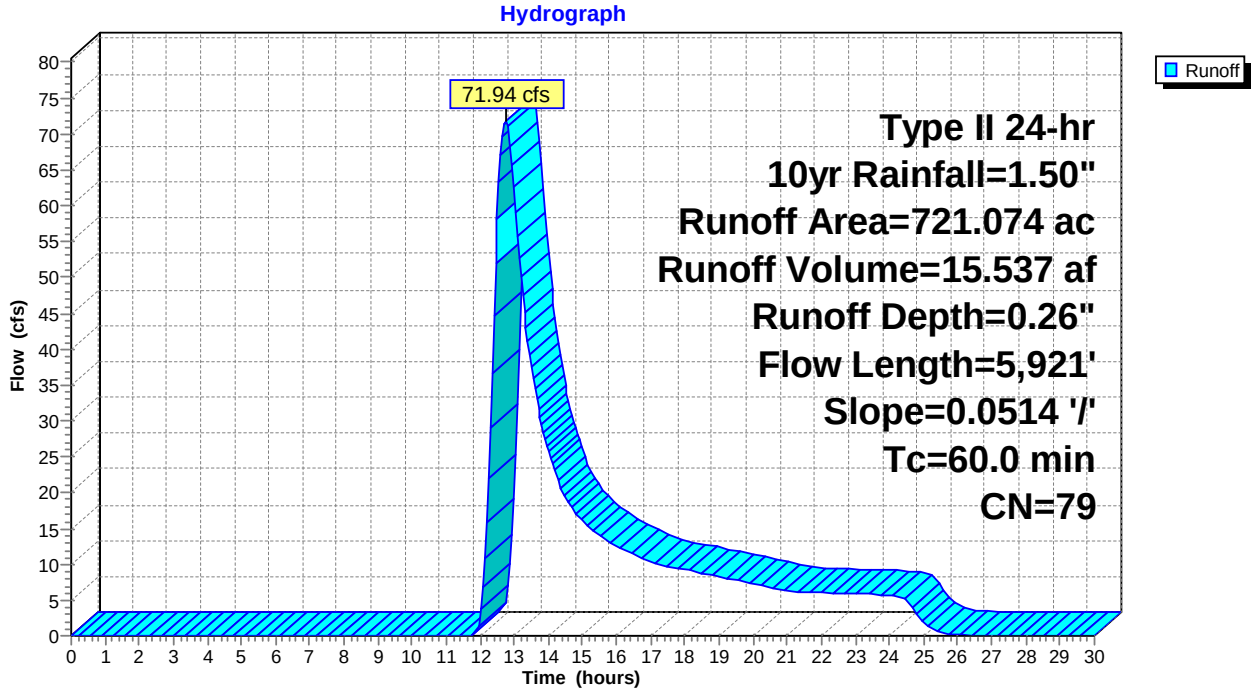
Runoff = 71.94 cfs @ 12.75 hrs, Volume= 15.537 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	721.074	79	
	721.074		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
60.0	5,921	0.0514	1.65		**Lag/CN Method,**

Subcatchment 103S: DC-090



Summary for Subcatchment 104S: DC-091

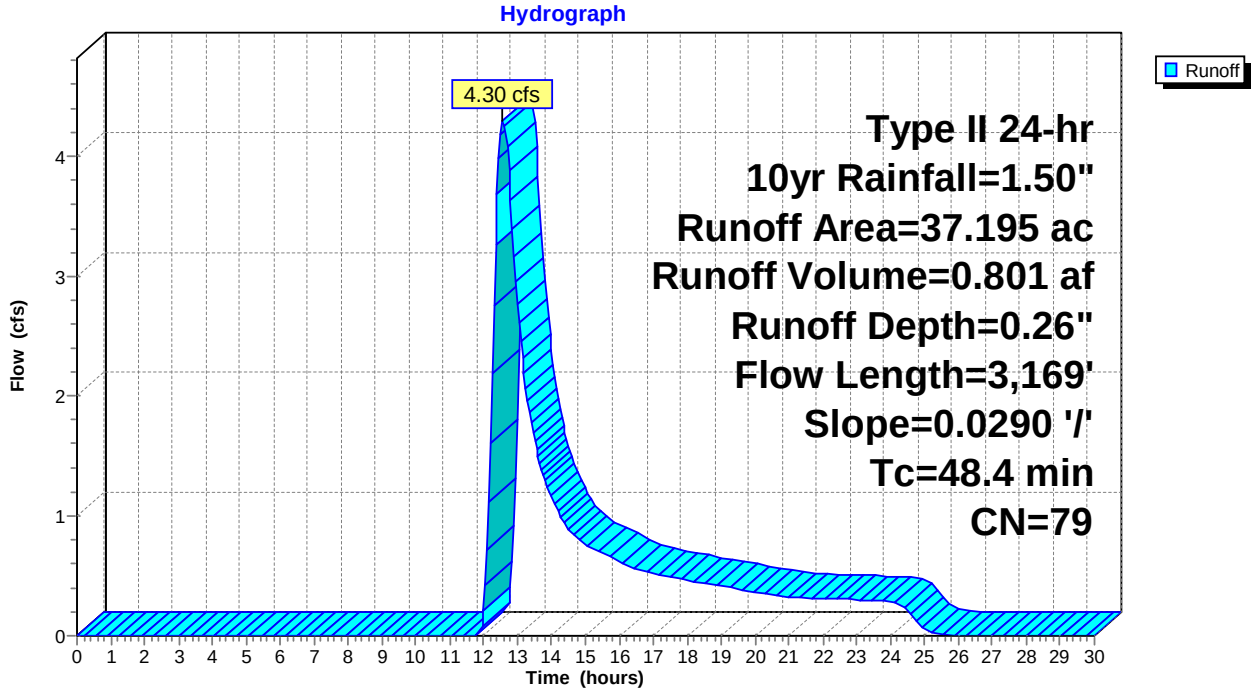
Runoff = 4.30 cfs @ 12.57 hrs, Volume= 0.801 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	37.195	79	
	37.195		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
48.4	3,169	0.0290	1.09		**Lag/CN Method,**

Subcatchment 104S: DC-091



Summary for Subcatchment 105S: DC-092

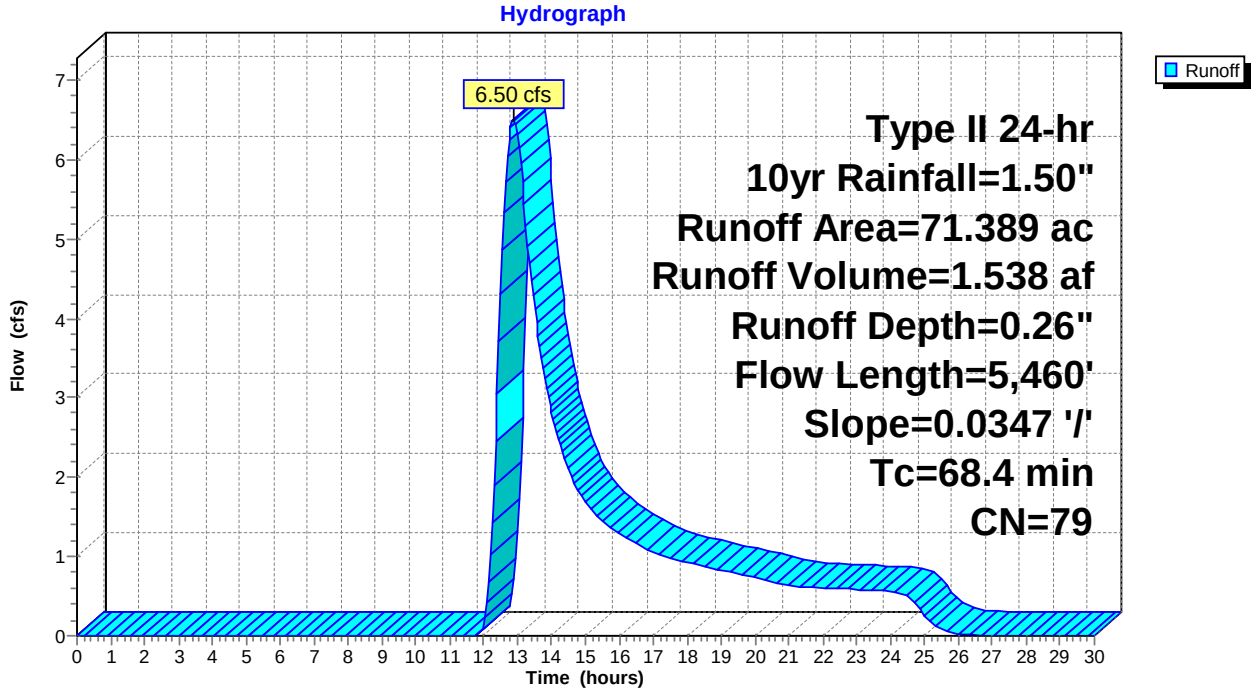
Runoff = 6.50 cfs @ 12.87 hrs, Volume= 1.538 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	71.389	79	
	71.389		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
68.4	5,460	0.0347	1.33		**Lag/CN Method,**

Subcatchment 105S: DC-092



Summary for Subcatchment 106S: DC-093

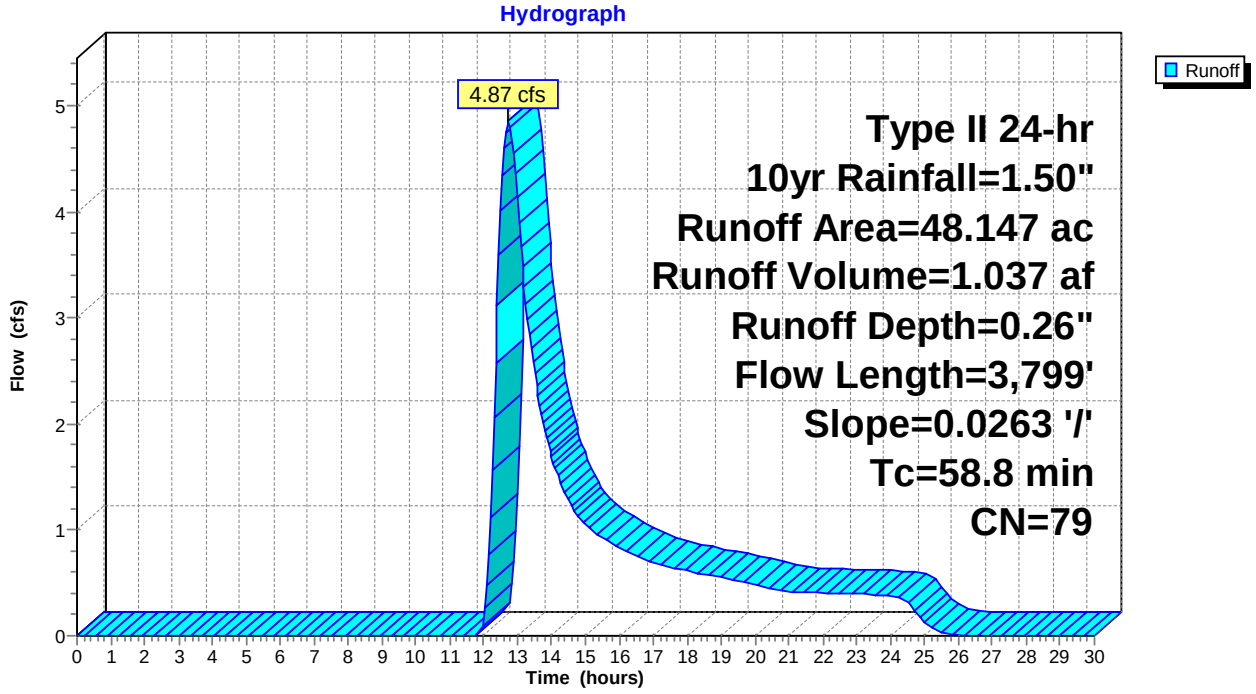
Runoff = 4.87 cfs @ 12.74 hrs, Volume= 1.037 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	48.147	79	
	48.147		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
58.8	3,799	0.0263	1.08		**Lag/CN Method,**

Subcatchment 106S: DC-093



Summary for Subcatchment 107S: DC-095

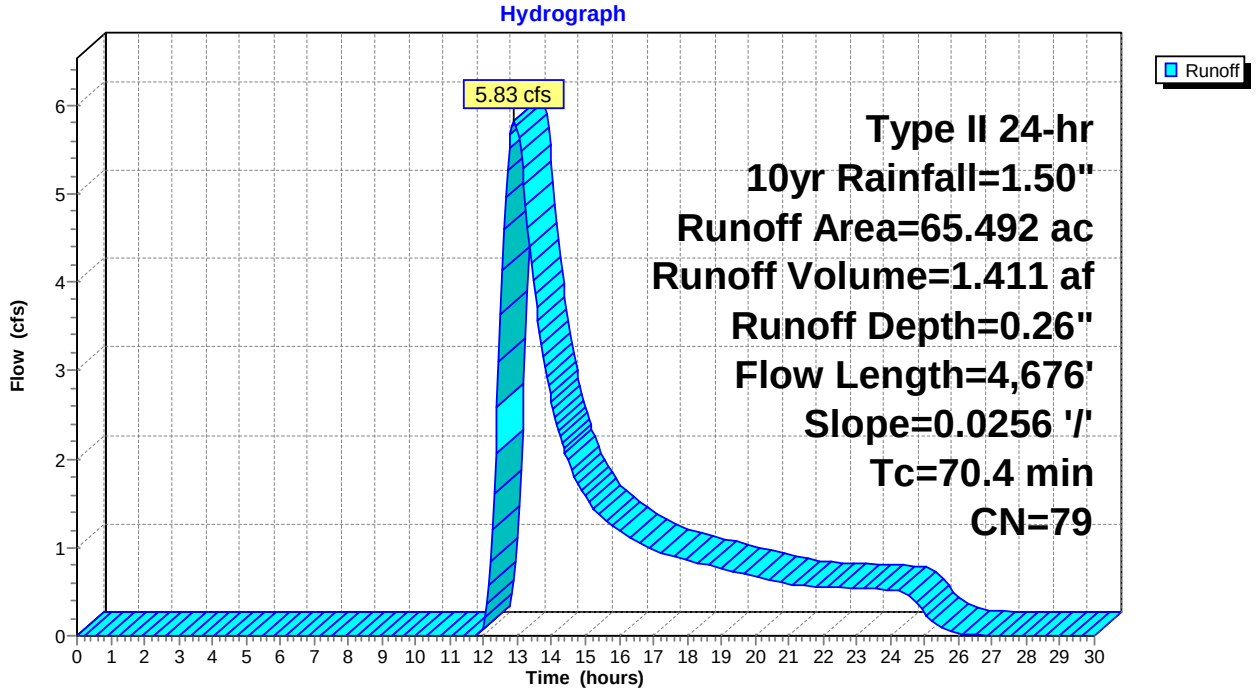
Runoff = 5.83 cfs @ 12.91 hrs, Volume= 1.411 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	65.492	79	
	65.492		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
70.4	4,676	0.0256	1.11		**Lag/CN Method,**

Subcatchment 107S: DC-095



Summary for Subcatchment 108S: DC-096

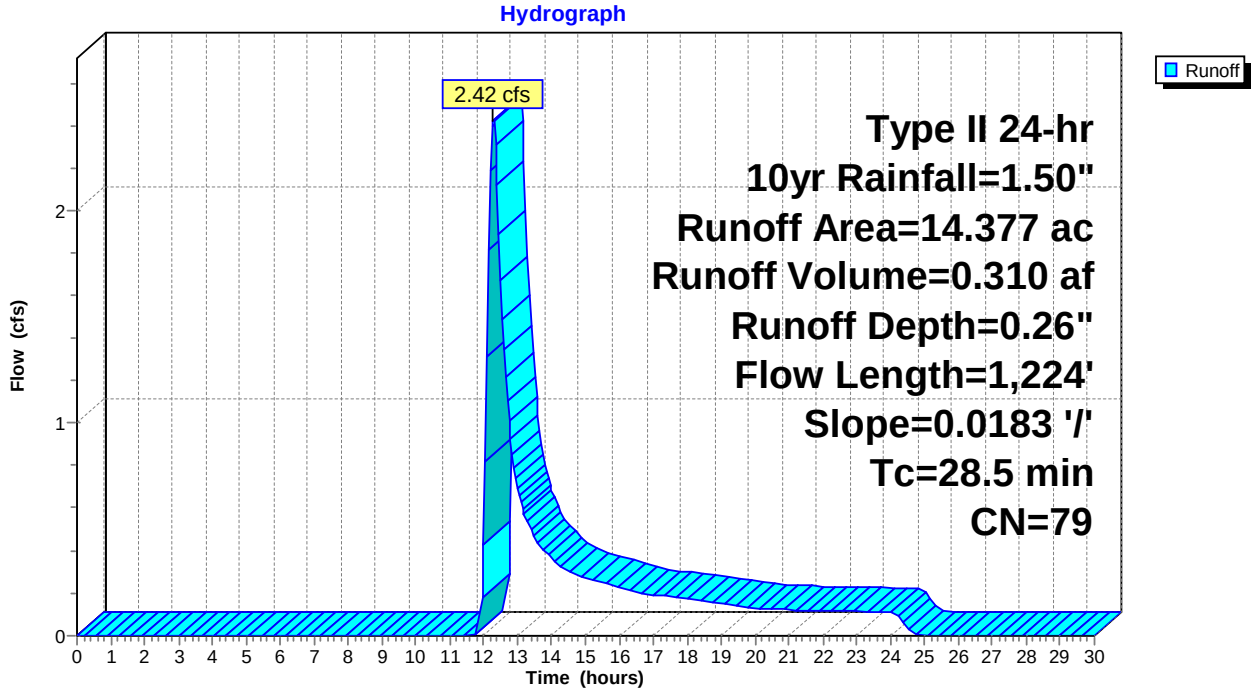
Runoff = 2.42 cfs @ 12.28 hrs, Volume= 0.310 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	14.377	79	
	14.377		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.5	1,224	0.0183	0.72		**Lag/CN Method,**

Subcatchment 108S: DC-096



Summary for Subcatchment 109S: DC-097

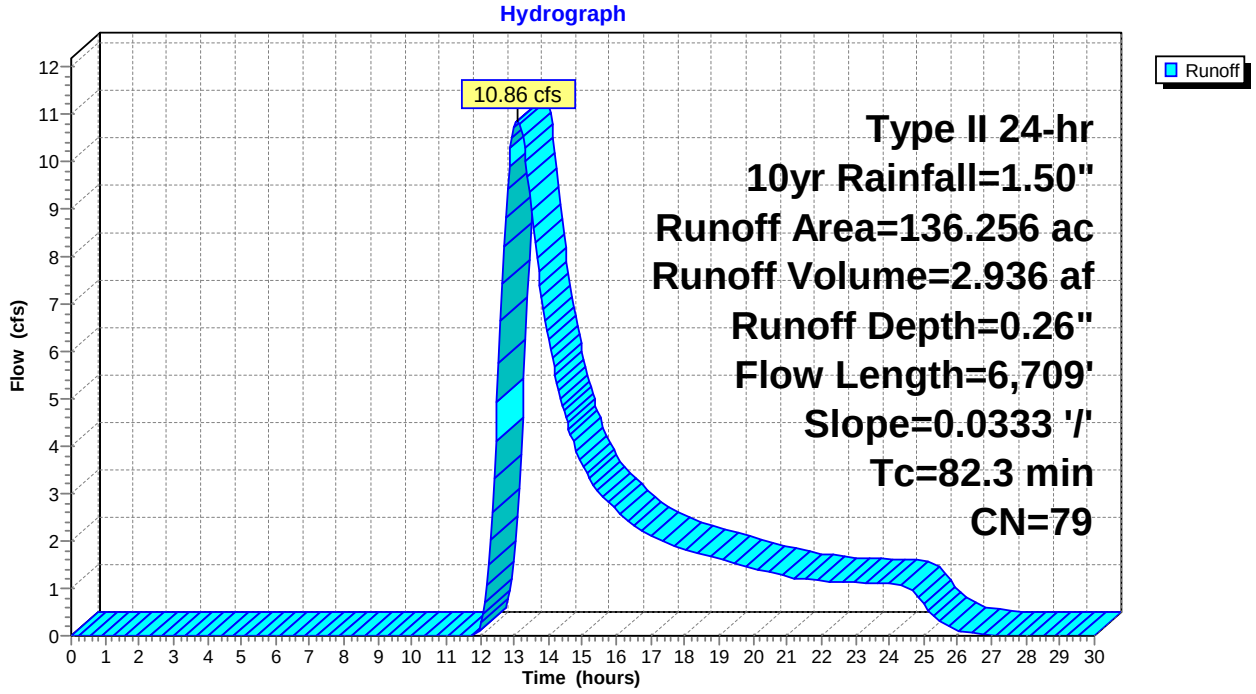
Runoff = 10.86 cfs @ 13.09 hrs, Volume= 2.936 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	136.256	79	
	136.256		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
82.3	6,709	0.0333	1.36		**Lag/CN Method,**

Subcatchment 109S: DC-097



Summary for Subcatchment 110S: DC-098

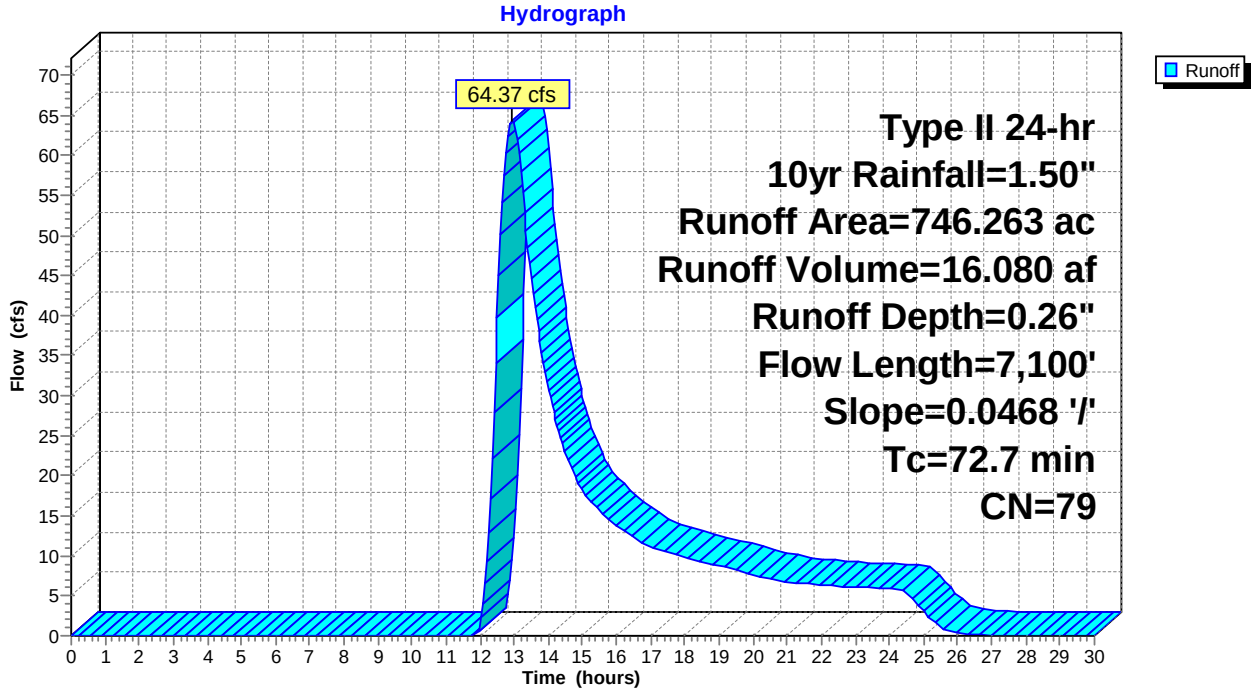
Runoff = 64.37 cfs @ 12.93 hrs, Volume= 16.080 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	746.263	79	
	746.263		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
72.7	7,100	0.0468	1.63		**Lag/CN Method,**

Subcatchment 110S: DC-098



Summary for Subcatchment 111S: DC-099

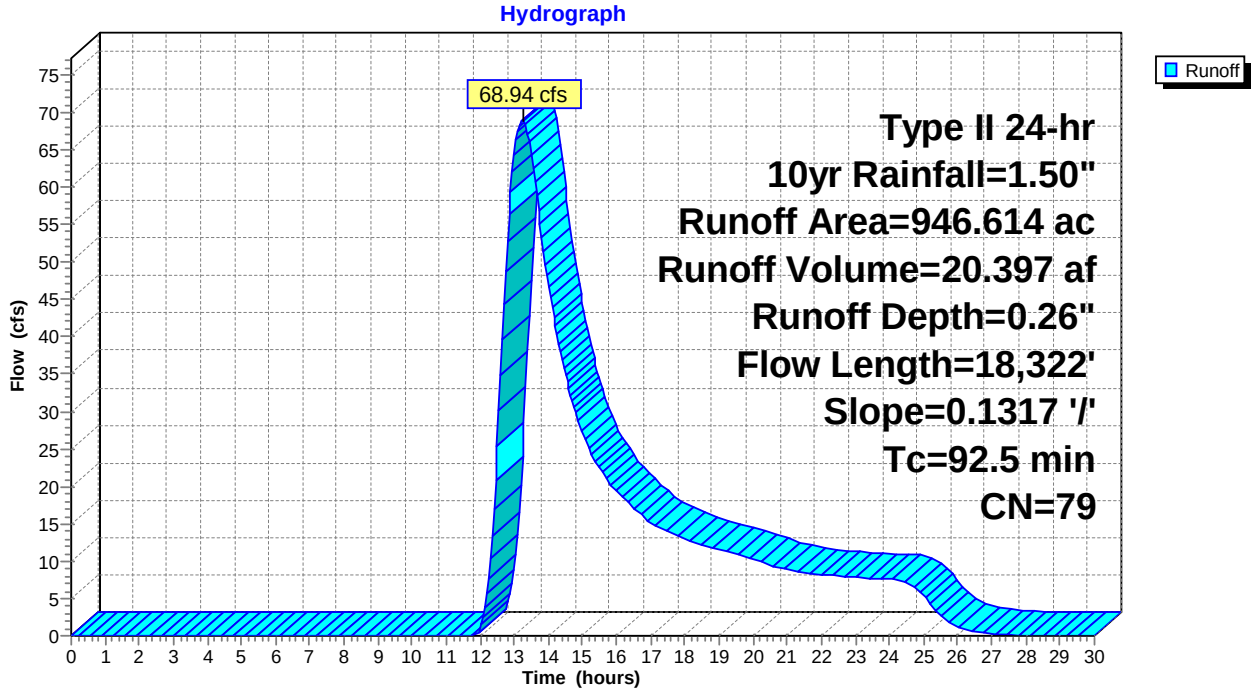
Runoff = 68.94 cfs @ 13.25 hrs, Volume= 20.397 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	946.614	79	
	946.614		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
92.5	18,322	0.1317	3.30		**Lag/CN Method,**

Subcatchment 111S: DC-099



Summary for Subcatchment 112S: DC-100

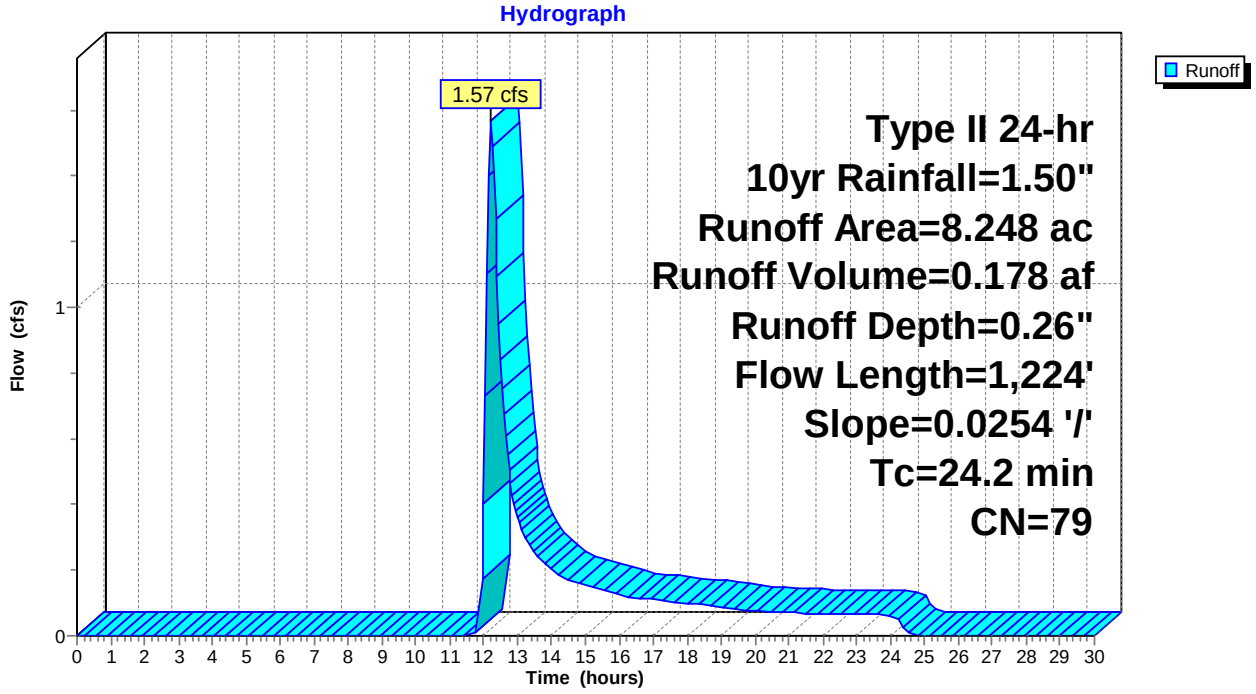
Runoff = 1.57 cfs @ 12.22 hrs, Volume= 0.178 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	8.248	79	
	8.248		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.2	1,224	0.0254	0.84		**Lag/CN Method,**

Subcatchment 112S: DC-100



Summary for Subcatchment 113S: DC-101

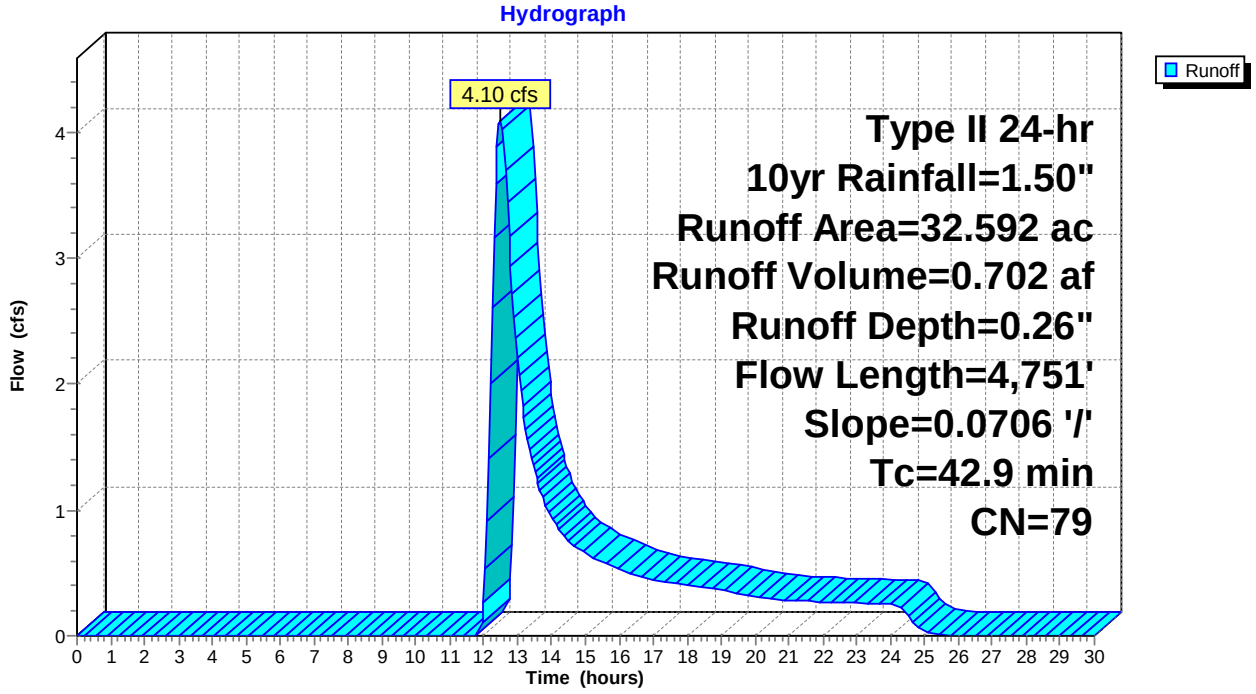
Runoff = 4.10 cfs @ 12.50 hrs, Volume= 0.702 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	32.592	79	
	32.592		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.9	4,751	0.0706	1.85		**Lag/CN Method,**

Subcatchment 113S: DC-101



Summary for Subcatchment 114S: DC-102

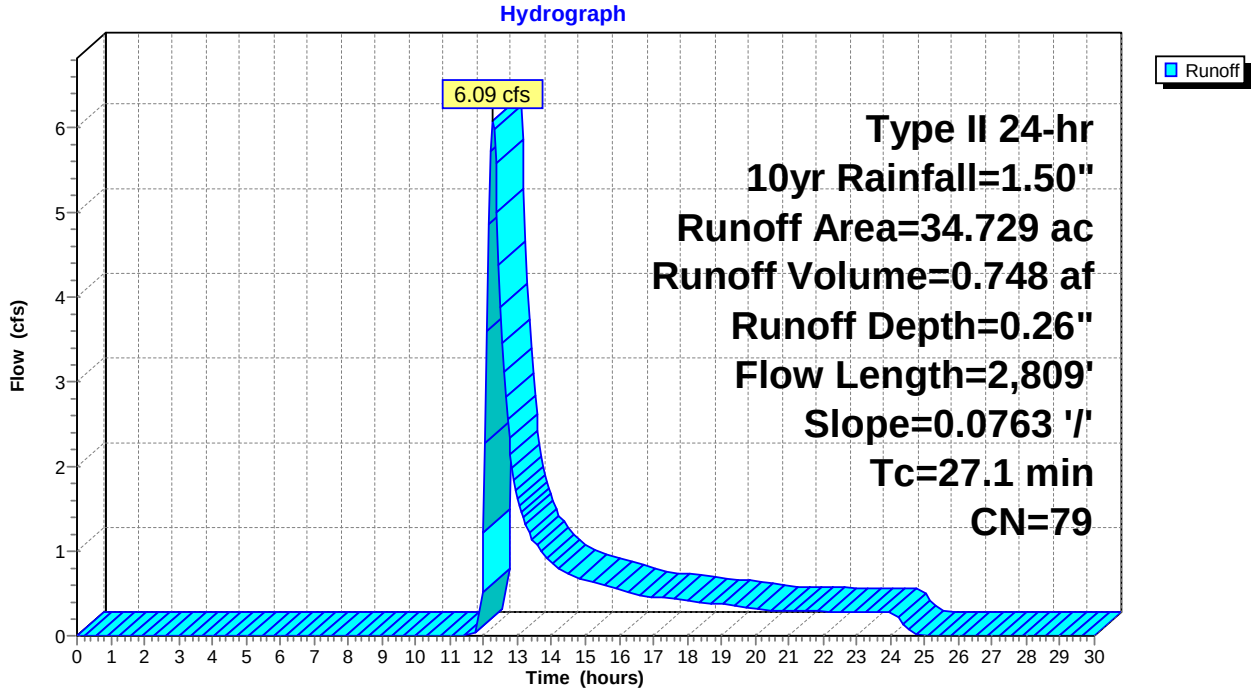
Runoff = 6.09 cfs @ 12.26 hrs, Volume= 0.748 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	34.729	79	
	34.729		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.1	2,809	0.0763	1.73		**Lag/CN Method,**

Subcatchment 114S: DC-102



Summary for Subcatchment 115S: DC-103

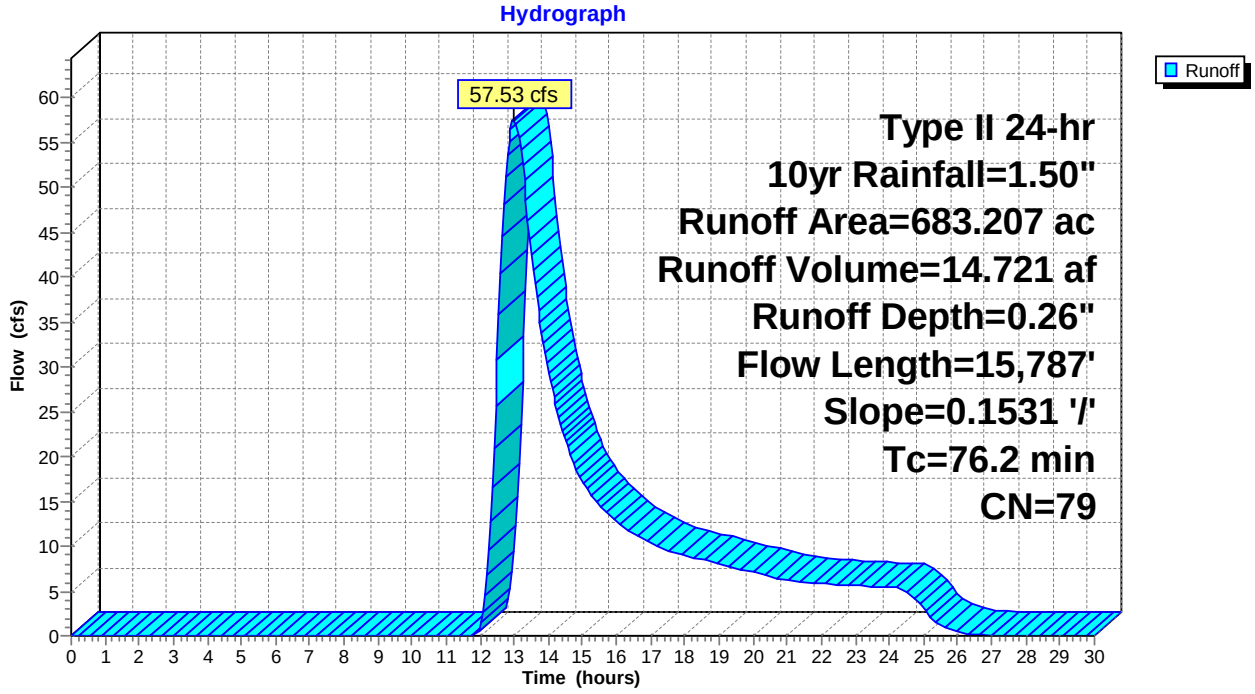
Runoff = 57.53 cfs @ 12.98 hrs, Volume= 14.721 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	683.207	79	
	683.207		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
76.2	15,787	0.1531	3.46		**Lag/CN Method,**

Subcatchment 115S: DC-103



Summary for Subcatchment 116S: DC-104

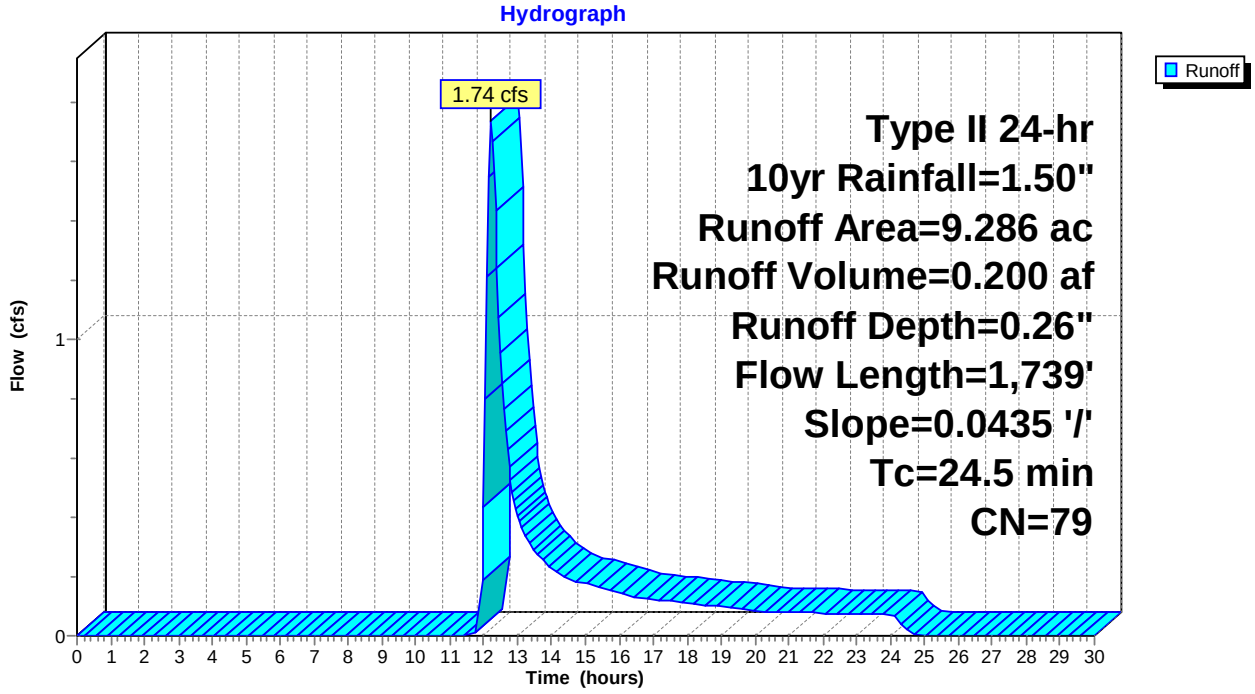
Runoff = 1.74 cfs @ 12.23 hrs, Volume= 0.200 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	9.286	79	
	9.286		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	1,739	0.0435	1.18		**Lag/CN Method,**

Subcatchment 116S: DC-104



Summary for Subcatchment 117S: DC-105

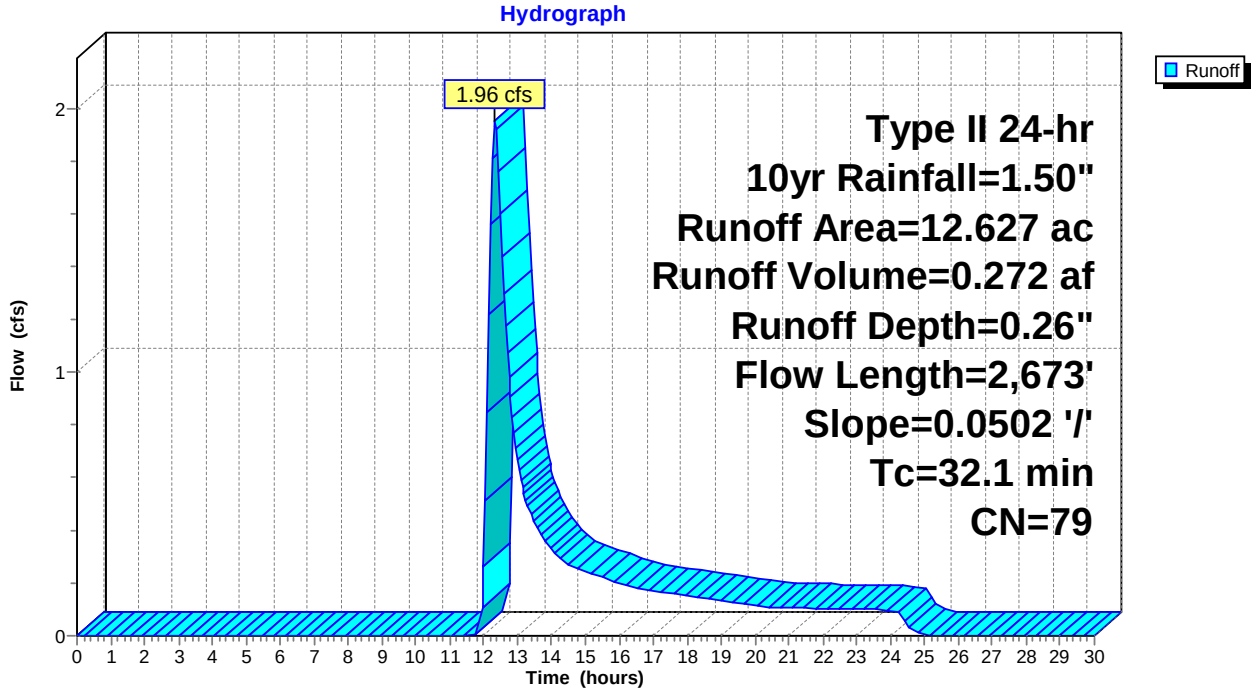
Runoff = 1.96 cfs @ 12.34 hrs, Volume= 0.272 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	12.627	79	
	12.627		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.1	2,673	0.0502	1.39		**Lag/CN Method,**

Subcatchment 117S: DC-105



Summary for Subcatchment 118S: DC-106

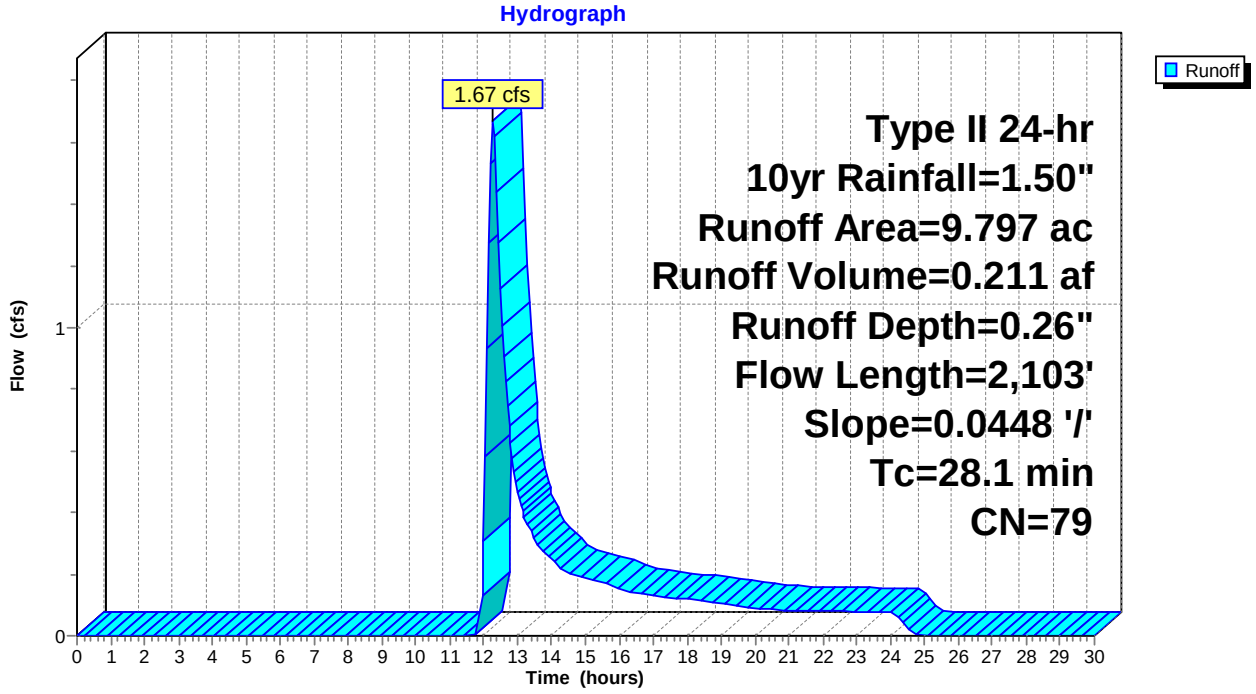
Runoff = 1.67 cfs @ 12.28 hrs, Volume= 0.211 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	9.797	79	
	9.797		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.1	2,103	0.0448	1.25		**Lag/CN Method,**

Subcatchment 118S: DC-106



Summary for Subcatchment 119S: DC-107

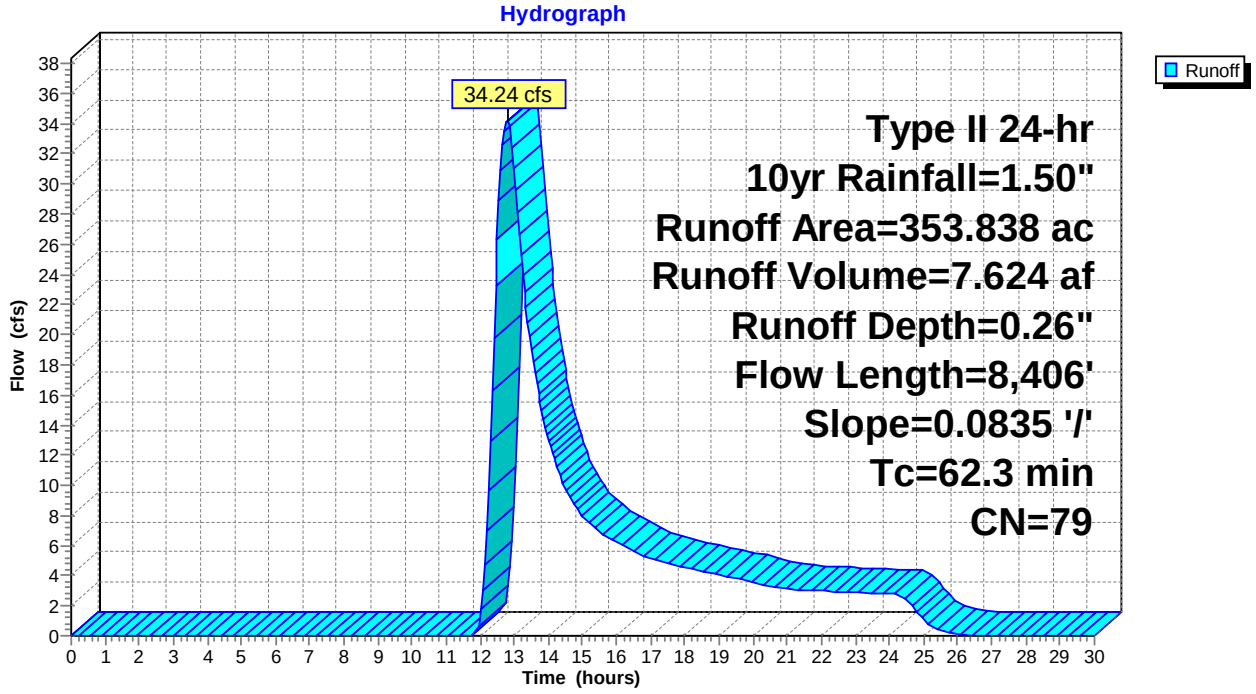
Runoff = 34.24 cfs @ 12.80 hrs, Volume= 7.624 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	353.838	79	
	353.838		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
62.3	8,406	0.0835	2.25		**Lag/CN Method,**

Subcatchment 119S: DC-107



Summary for Subcatchment 120S: DC-108

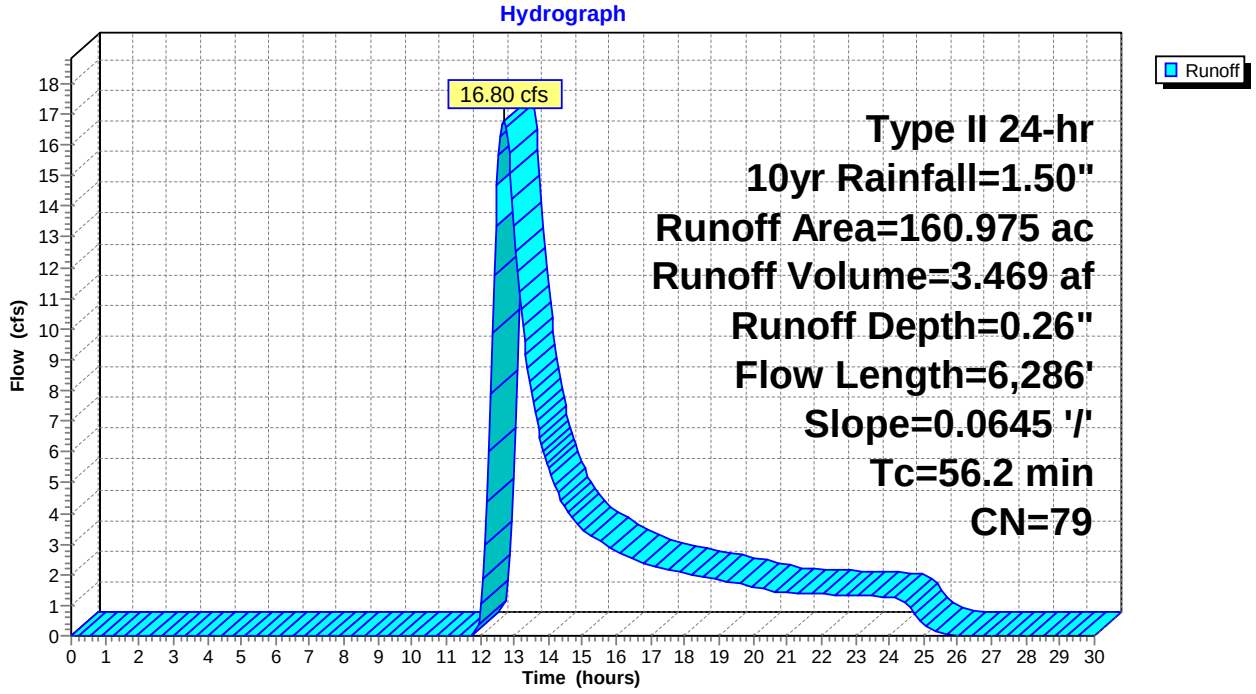
Runoff = 16.80 cfs @ 12.69 hrs, Volume= 3.469 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	160.975	79	
	160.975		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
56.2	6,286	0.0645	1.87		**Lag/CN Method,**

Subcatchment 120S: DC-108



Summary for Subcatchment 121S: DC-109

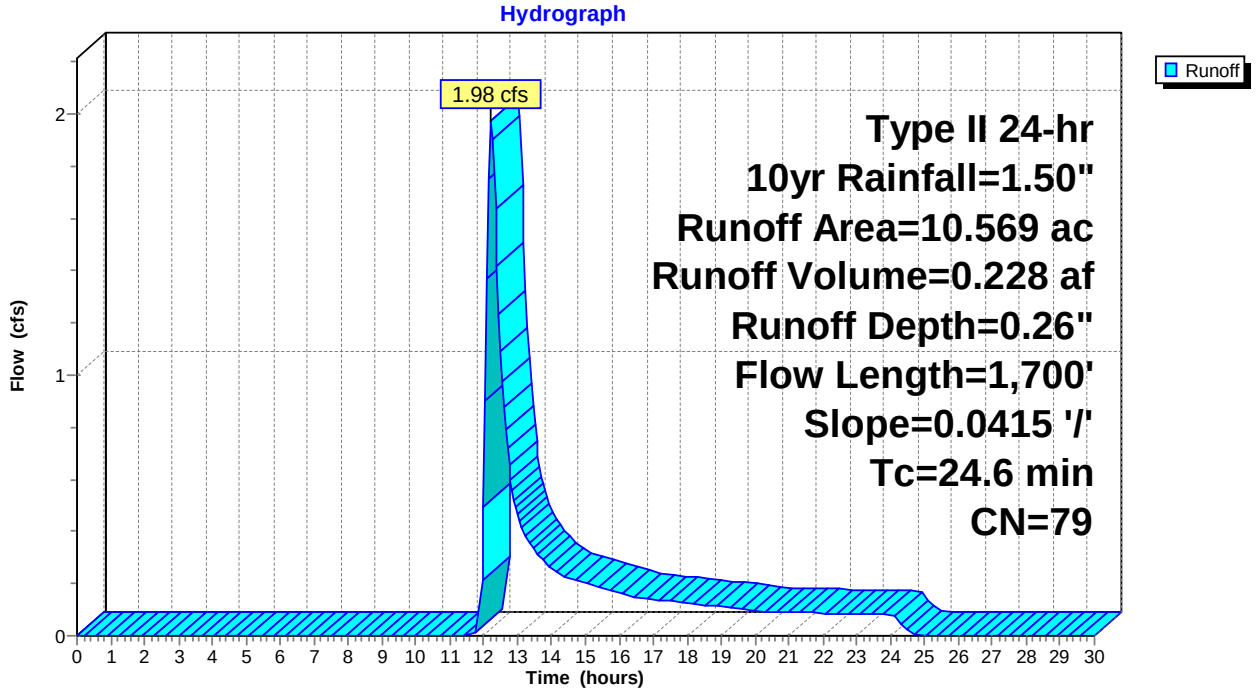
Runoff = 1.98 cfs @ 12.23 hrs, Volume= 0.228 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	10.569	79	
	10.569		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.6	1,700	0.0415	1.15		**Lag/CN Method,**

Subcatchment 121S: DC-109



Summary for Subcatchment 122S: DC-111

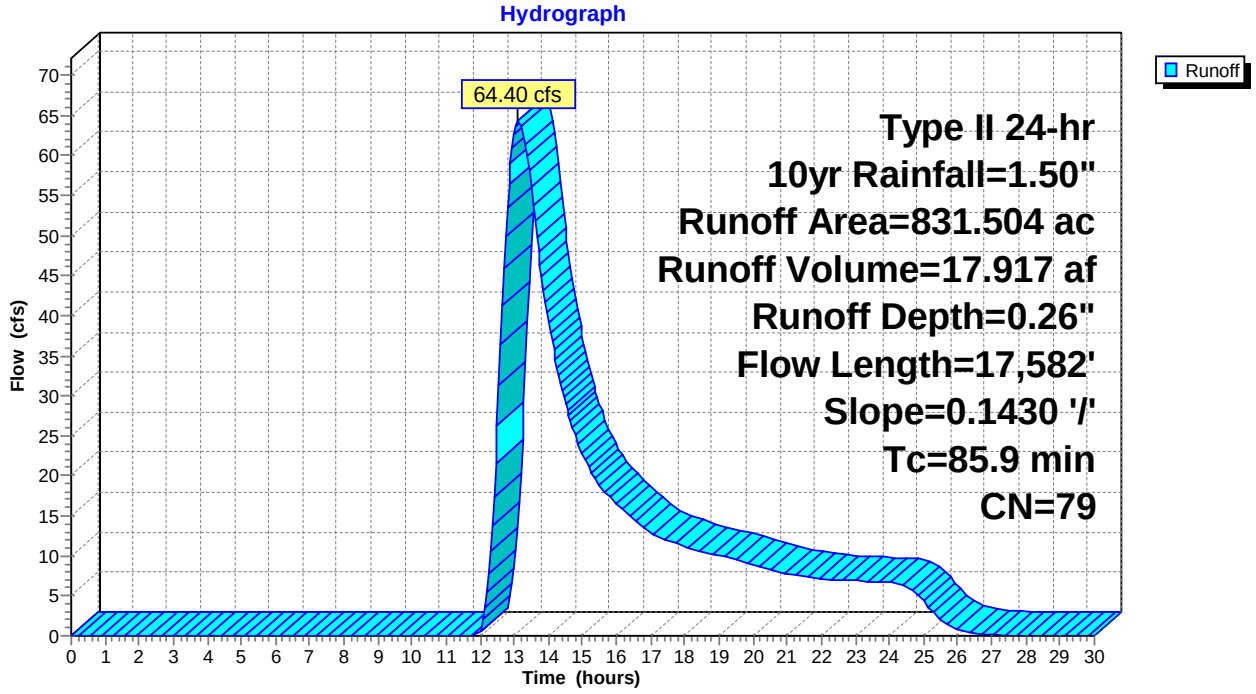
Runoff = 64.40 cfs @ 13.12 hrs, Volume= 17.917 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	831.504	79	
	831.504		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.9	17,582	0.1430	3.41		**Lag/CN Method,**

Subcatchment 122S: DC-111



Summary for Subcatchment 123S: DC-112

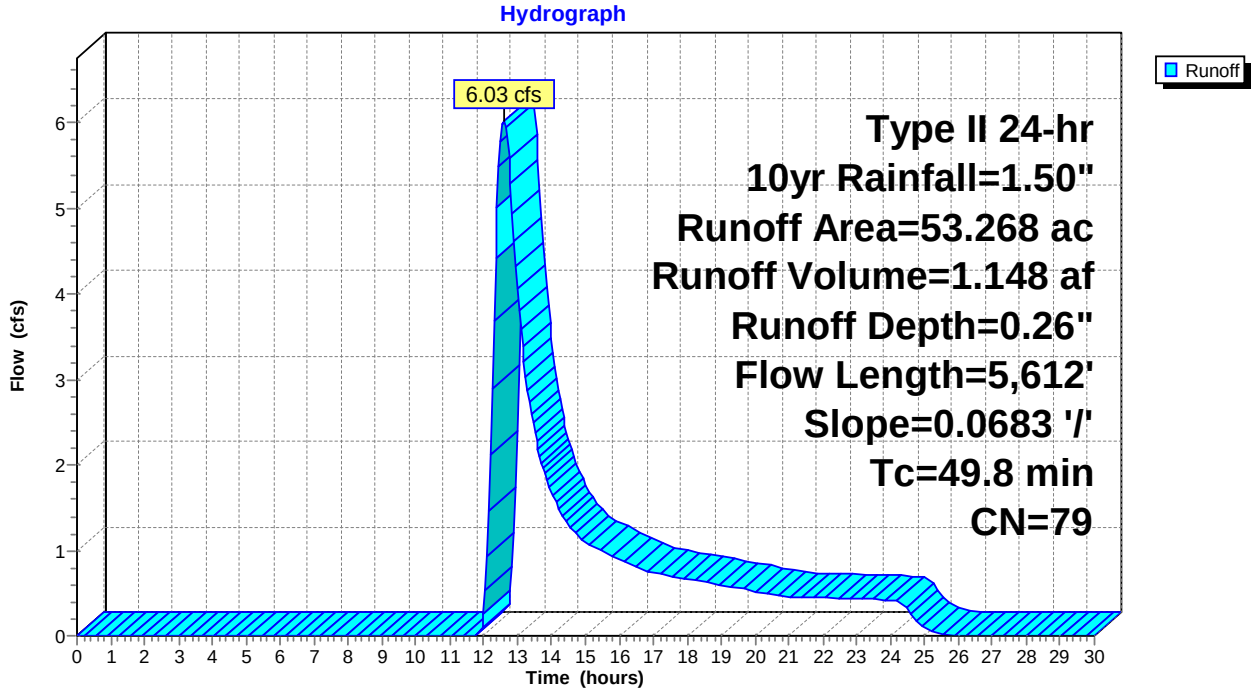
Runoff = 6.03 cfs @ 12.60 hrs, Volume= 1.148 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	53.268	79	
	53.268		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
49.8	5,612	0.0683	1.88		**Lag/CN Method,**

Subcatchment 123S: DC-112



Summary for Subcatchment 124S: DC-113

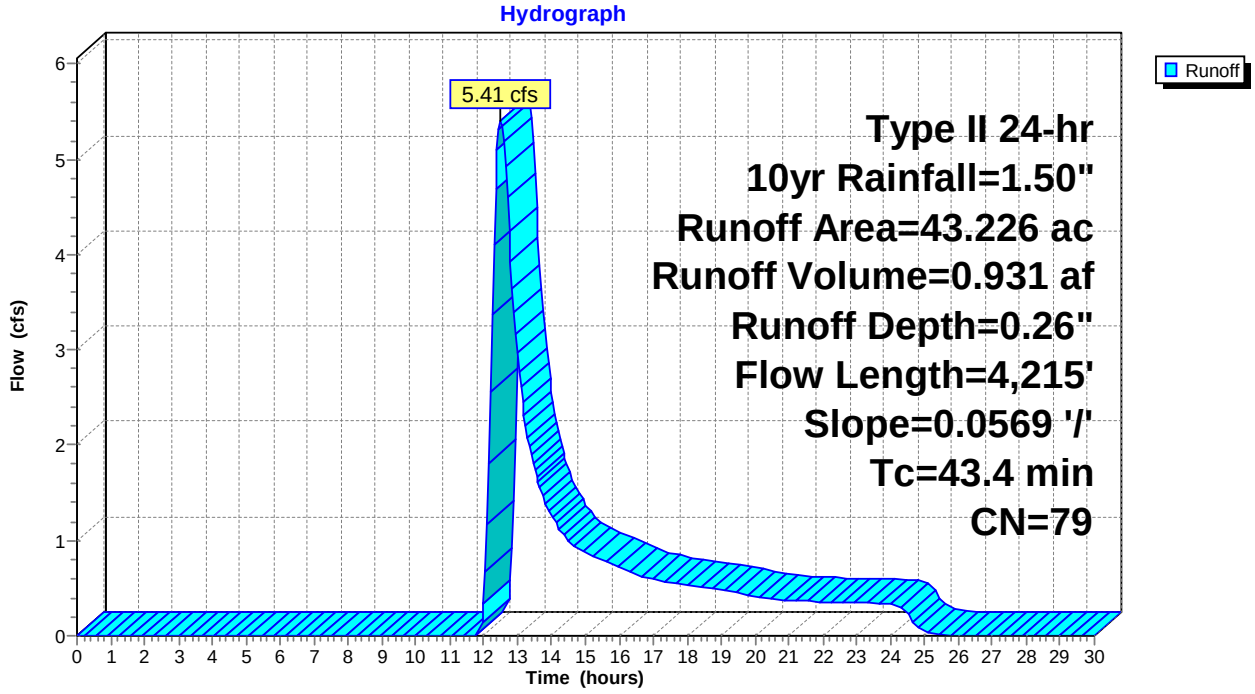
Runoff = 5.41 cfs @ 12.50 hrs, Volume= 0.931 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	43.226	79	
	43.226		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
43.4	4,215	0.0569	1.62		**Lag/CN Method,**

Subcatchment 124S: DC-113



Summary for Subcatchment 125S: DC-114

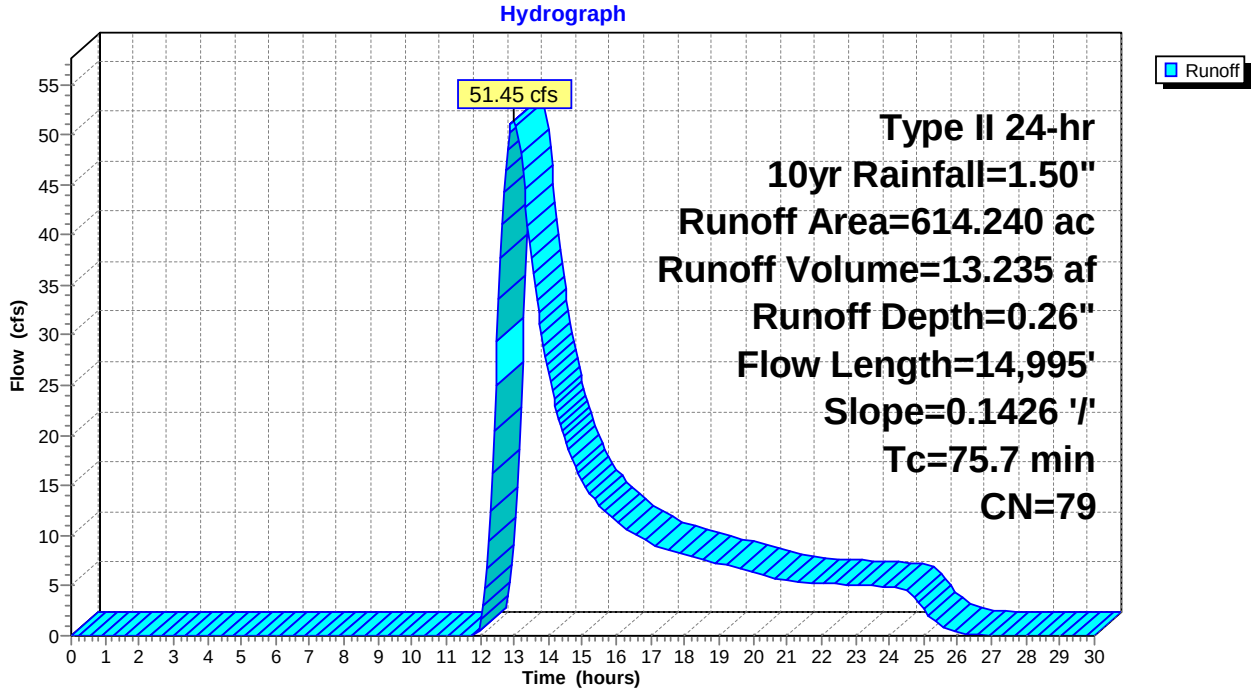
Runoff = 51.45 cfs @ 12.98 hrs, Volume= 13.235 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	614.240	79	
	614.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
75.7	14,995	0.1426	3.30		**Lag/CN Method,**

Subcatchment 125S: DC-114



Summary for Subcatchment 126S: DC-115

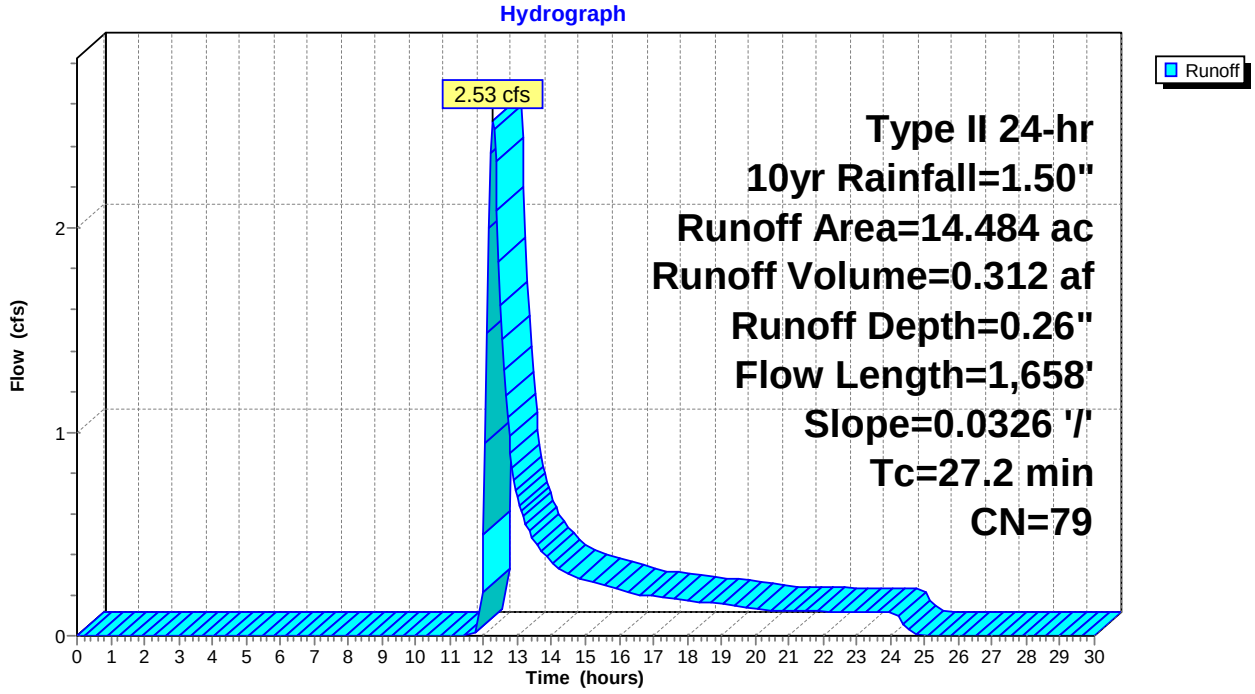
Runoff = 2.53 cfs @ 12.27 hrs, Volume= 0.312 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	14.484	79	
	14.484		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.2	1,658	0.0326	1.02		**Lag/CN Method,**

Subcatchment 126S: DC-115



Summary for Subcatchment 127S: DC-116

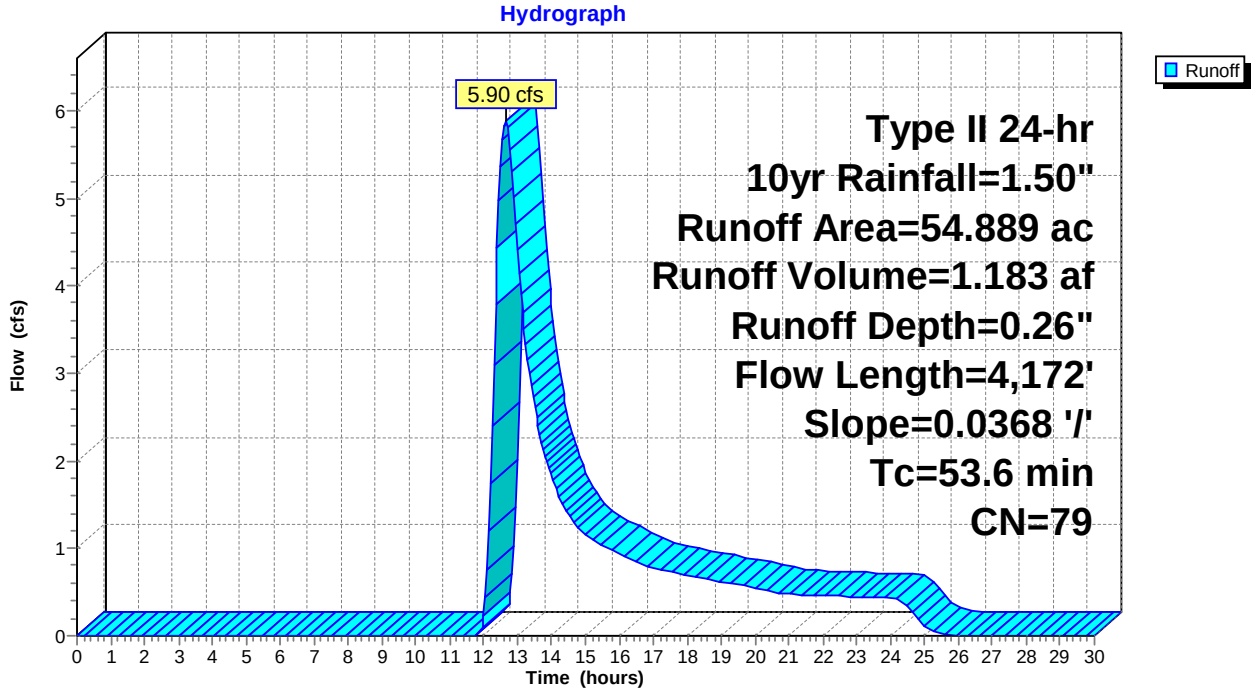
Runoff = 5.90 cfs @ 12.66 hrs, Volume= 1.183 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	54.889	79	
	54.889		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
53.6	4,172	0.0368	1.30		**Lag/CN Method,**

Subcatchment 127S: DC-116



Summary for Subcatchment 128S: DC-117

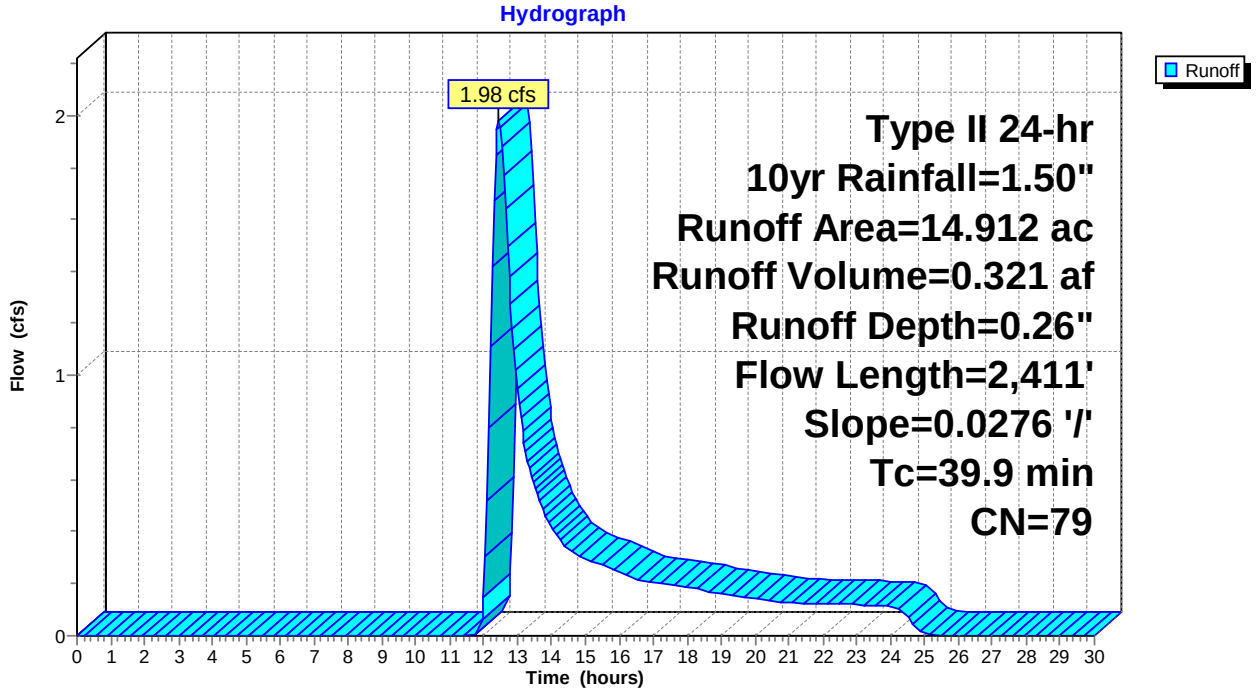
Runoff = 1.98 cfs @ 12.45 hrs, Volume= 0.321 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	14.912	79	
	14.912		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.9	2,411	0.0276	1.01		**Lag/CN Method,**

Subcatchment 128S: DC-117



Summary for Subcatchment 129S: DC-123

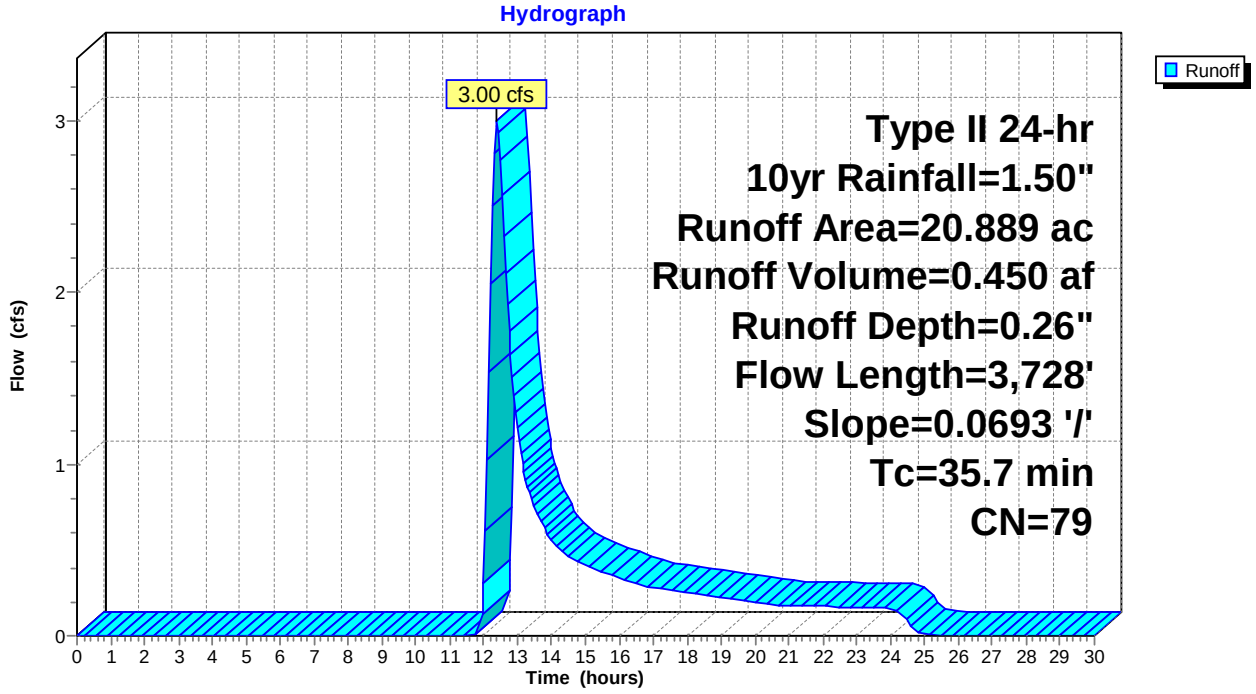
Runoff = 3.00 cfs @ 12.39 hrs, Volume= 0.450 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	20.889	79	
	20.889		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.7	3,728	0.0693	1.74		**Lag/CN Method,**

Subcatchment 129S: DC-123



Summary for Subcatchment 130S: DC-124

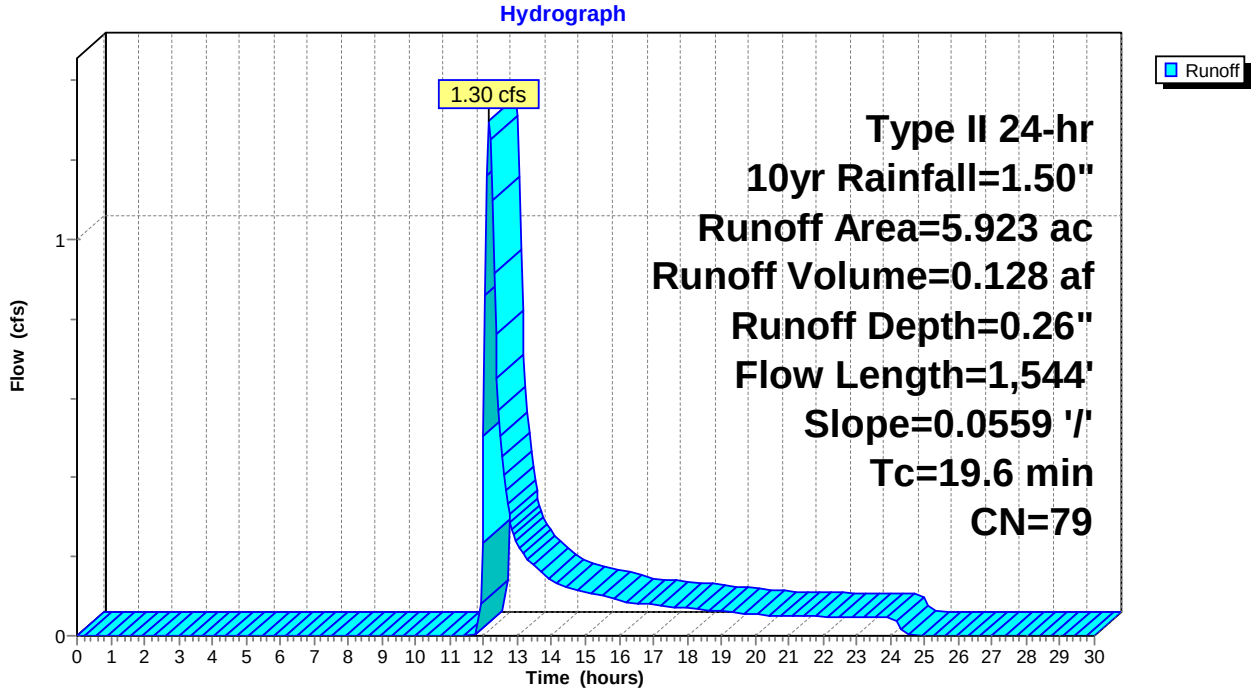
Runoff = 1.30 cfs @ 12.16 hrs, Volume= 0.128 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	5.923	79	
	5.923		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.6	1,544	0.0559	1.31		**Lag/CN Method,**

Subcatchment 130S: DC-124



Summary for Subcatchment 131S: DC-125

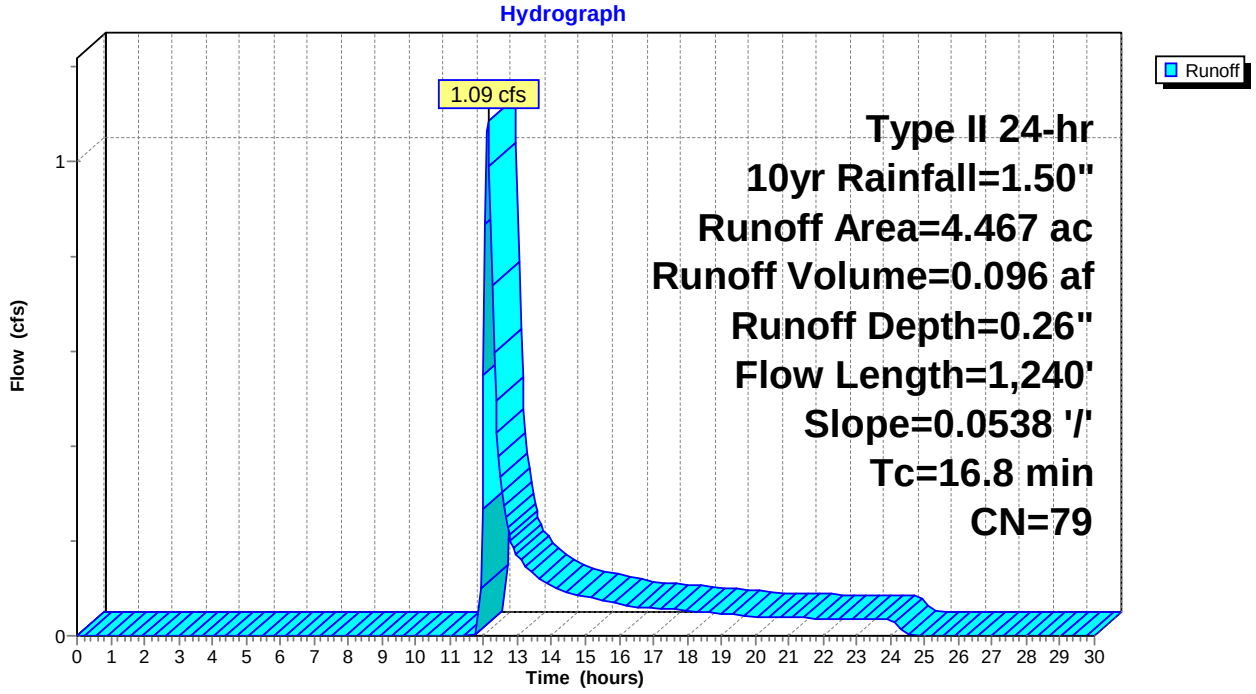
Runoff = 1.09 cfs @ 12.12 hrs, Volume= 0.096 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	4.467	79	
	4.467		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8	1,240	0.0538	1.23		**Lag/CN Method,**

Subcatchment 131S: DC-125



Summary for Subcatchment 132S: DC-126

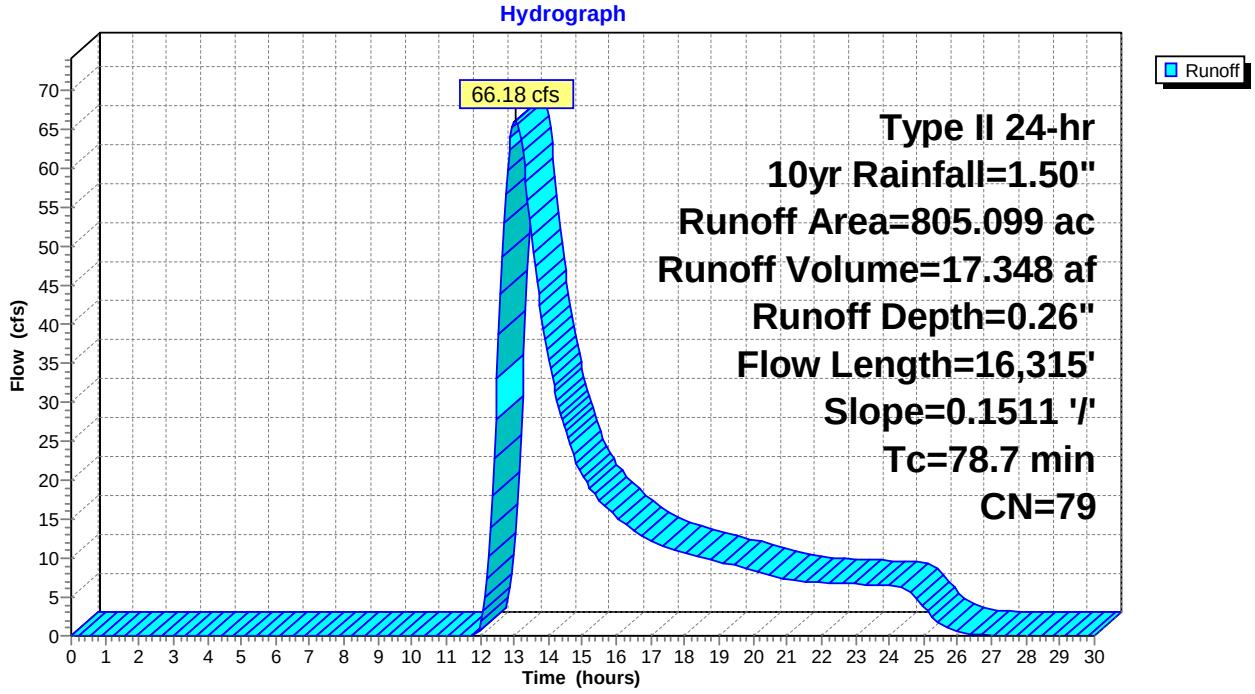
Runoff = 66.18 cfs @ 13.04 hrs, Volume= 17.348 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	805.099	79	
	805.099		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.7	16,315	0.1511	3.46		**Lag/CN Method,**

Subcatchment 132S: DC-126



Summary for Subcatchment 133S: DC-127

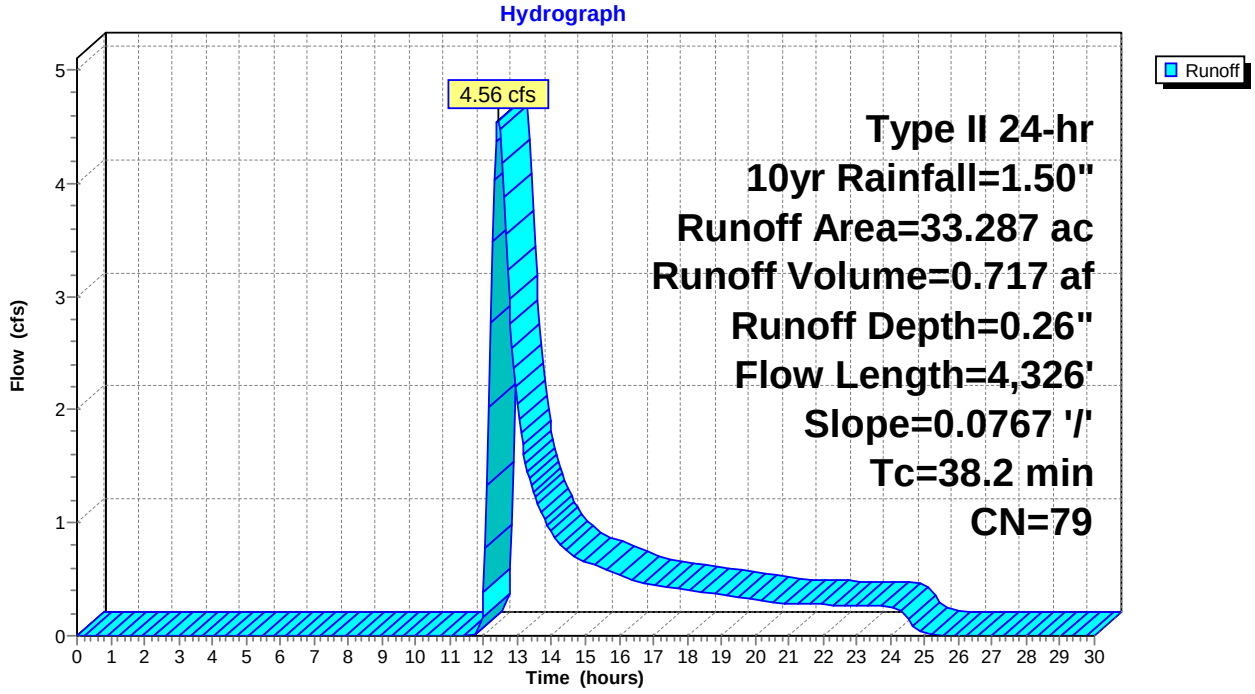
Runoff = 4.56 cfs @ 12.43 hrs, Volume= 0.717 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	33.287	79	
	33.287		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.2	4,326	0.0767	1.89		**Lag/CN Method,**

Subcatchment 133S: DC-127



Summary for Subcatchment 134S: DC-128

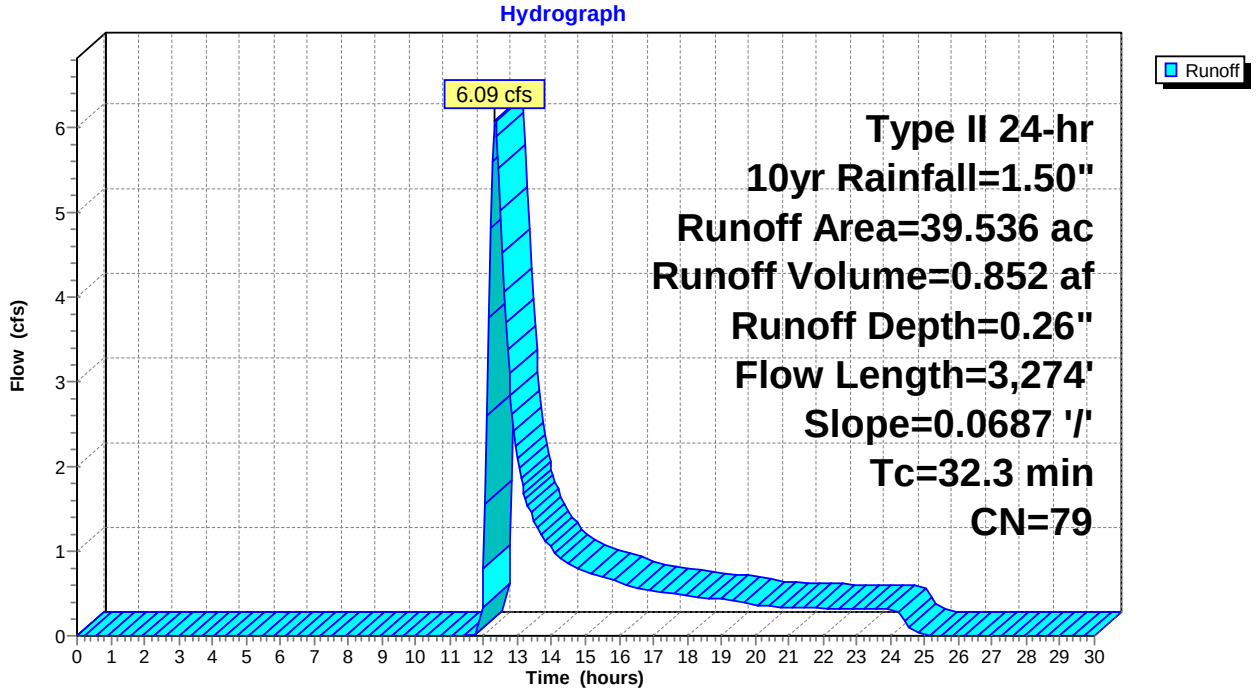
Runoff = 6.09 cfs @ 12.34 hrs, Volume= 0.852 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	39.536	79	
	39.536		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.3	3,274	0.0687	1.69		**Lag/CN Method,**

Subcatchment 134S: DC-128



Summary for Subcatchment 135S: DC-129

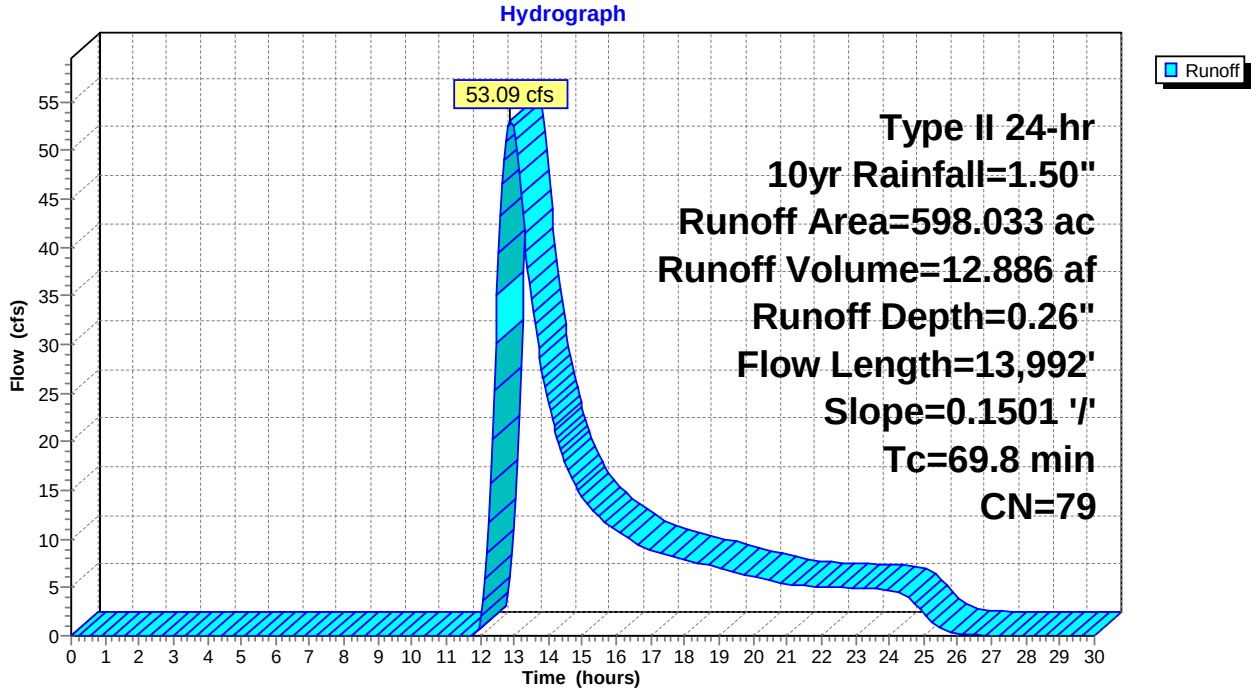
Runoff = 53.09 cfs @ 12.90 hrs, Volume= 12.886 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	598.033	79	
	598.033		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.8	13,992	0.1501	3.34		**Lag/CN Method,**

Subcatchment 135S: DC-129



Summary for Subcatchment 136S: DC-130

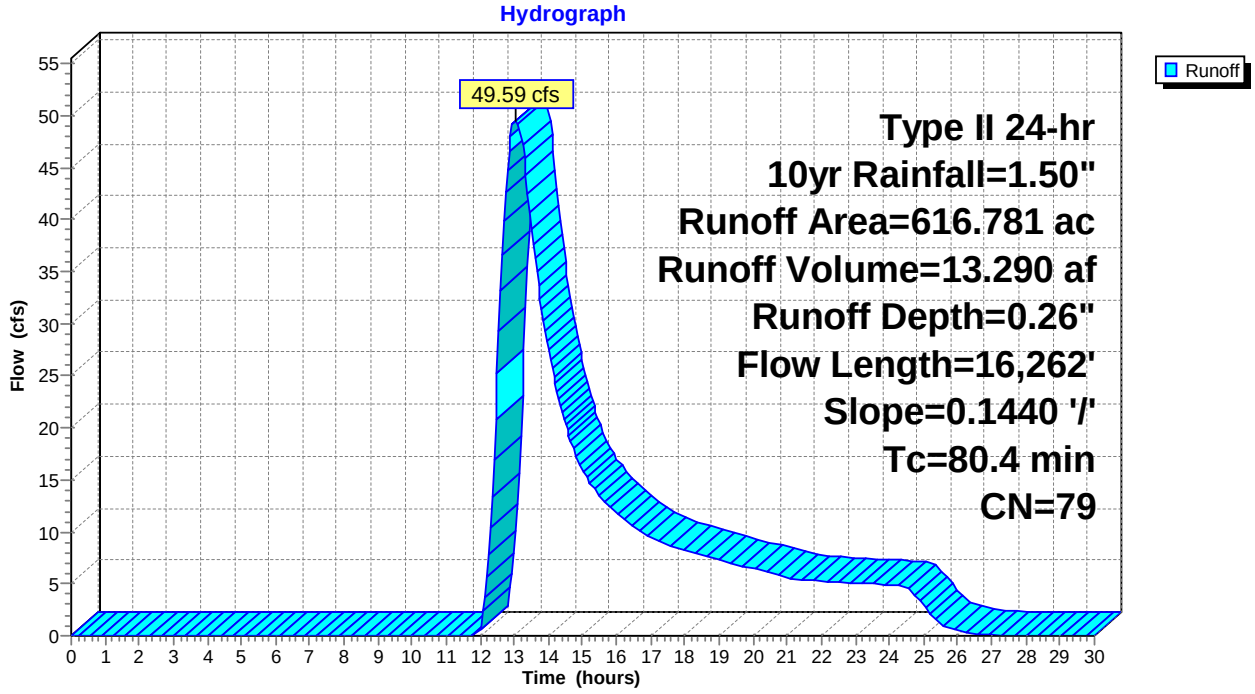
Runoff = 49.59 cfs @ 13.04 hrs, Volume= 13.290 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	616.781	79	
	616.781		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
80.4	16,262	0.1440	3.37		**Lag/CN Method,**

Subcatchment 136S: DC-130



Summary for Subcatchment 137S: DC-131

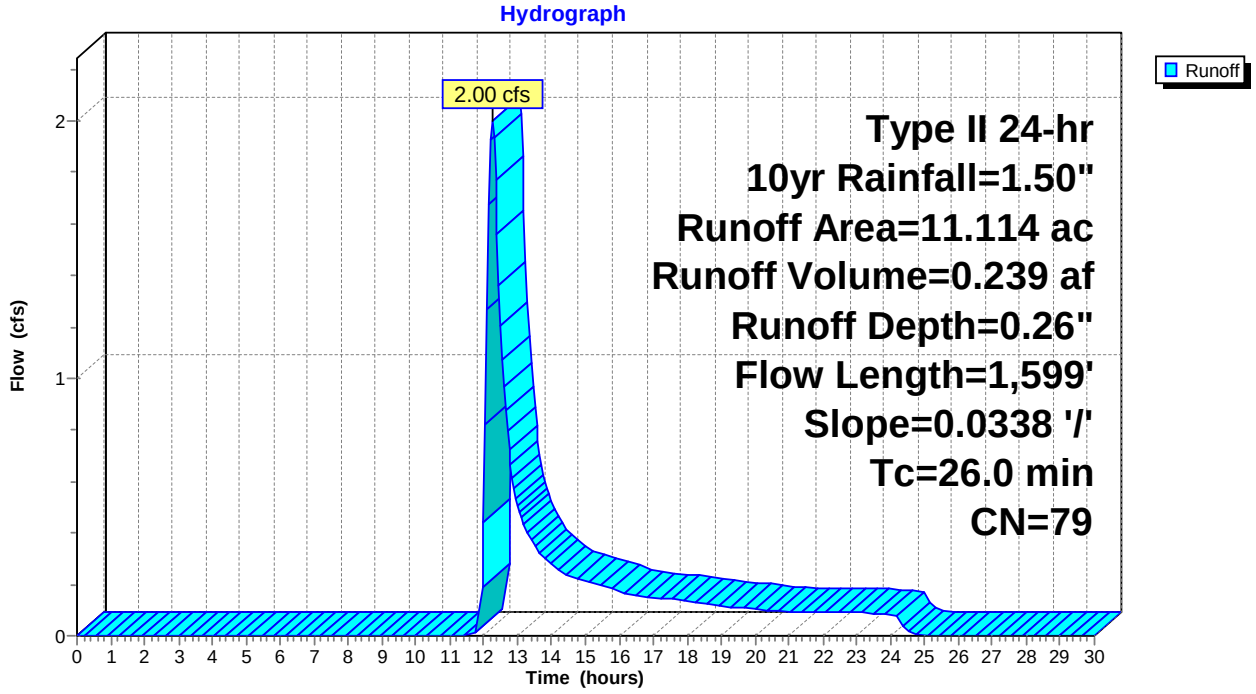
Runoff = 2.00 cfs @ 12.25 hrs, Volume= 0.239 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	11.114	79	
	11.114		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.0	1,599	0.0338	1.03		**Lag/CN Method,**

Subcatchment 137S: DC-131



Summary for Subcatchment 138S: DC-132

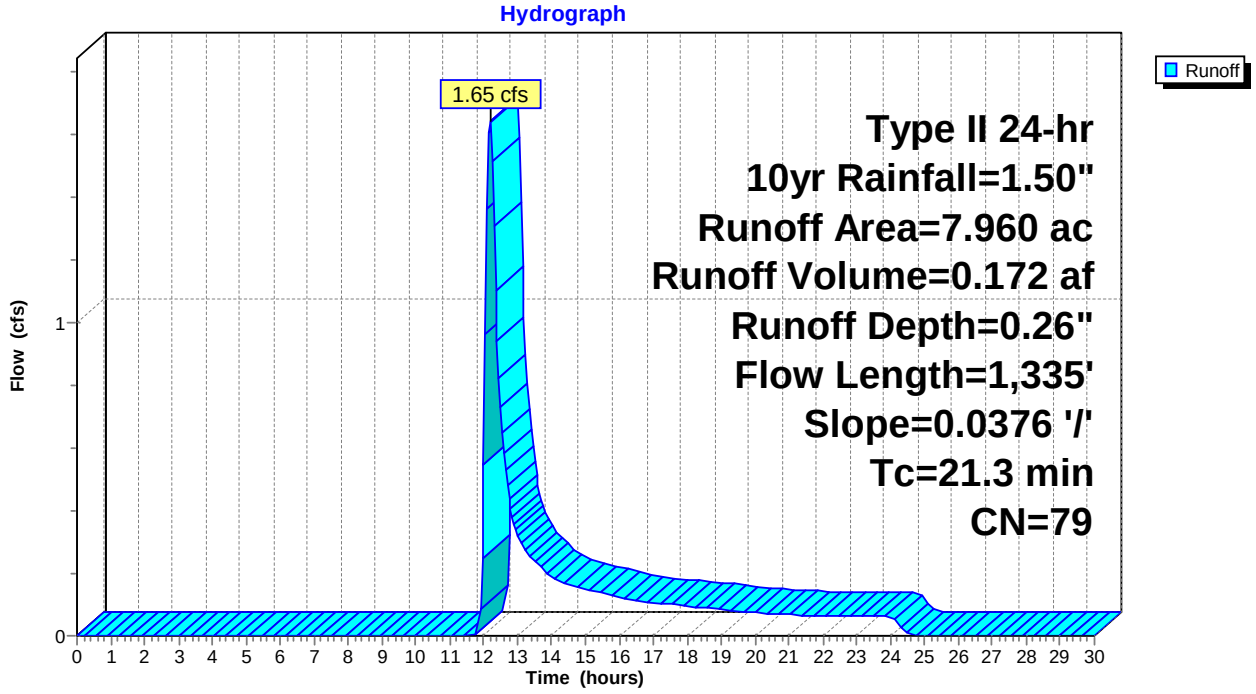
Runoff = 1.65 cfs @ 12.19 hrs, Volume= 0.172 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	7.960	79	
	7.960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.3	1,335	0.0376	1.04		**Lag/CN Method,**

Subcatchment 138S: DC-132



Summary for Subcatchment 139S: DC-133

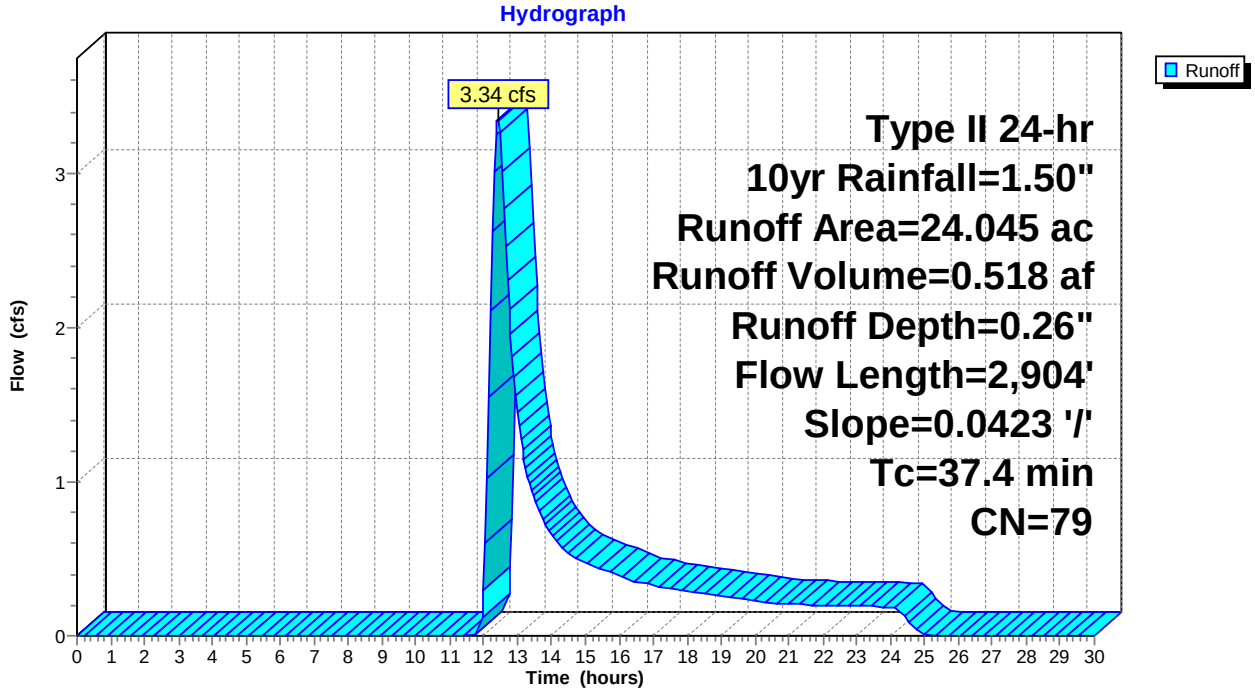
Runoff = 3.34 cfs @ 12.42 hrs, Volume= 0.518 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	24.045	79	
	24.045		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.4	2,904	0.0423	1.29		**Lag/CN Method,**

Subcatchment 139S: DC-133



Summary for Subcatchment 140S: DC-134

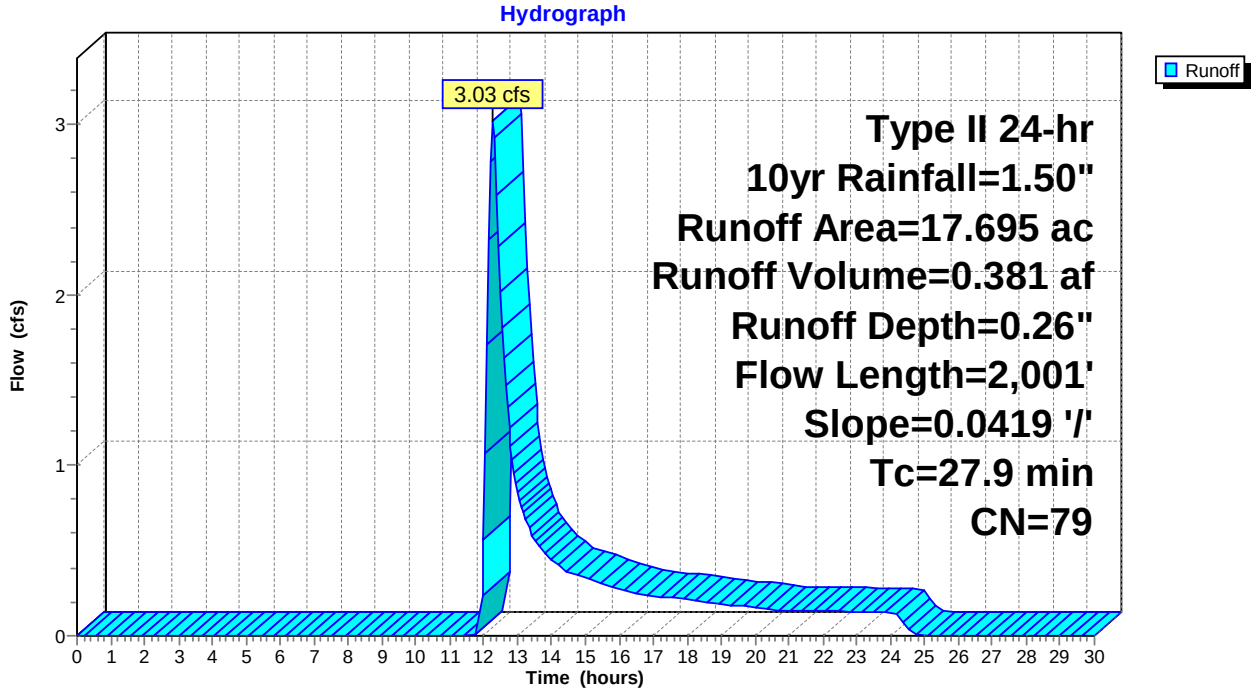
Runoff = 3.03 cfs @ 12.28 hrs, Volume= 0.381 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	17.695	79	
	17.695		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.9	2,001	0.0419	1.20		**Lag/CN Method,**

Subcatchment 140S: DC-134



Summary for Subcatchment 141S: DC-135

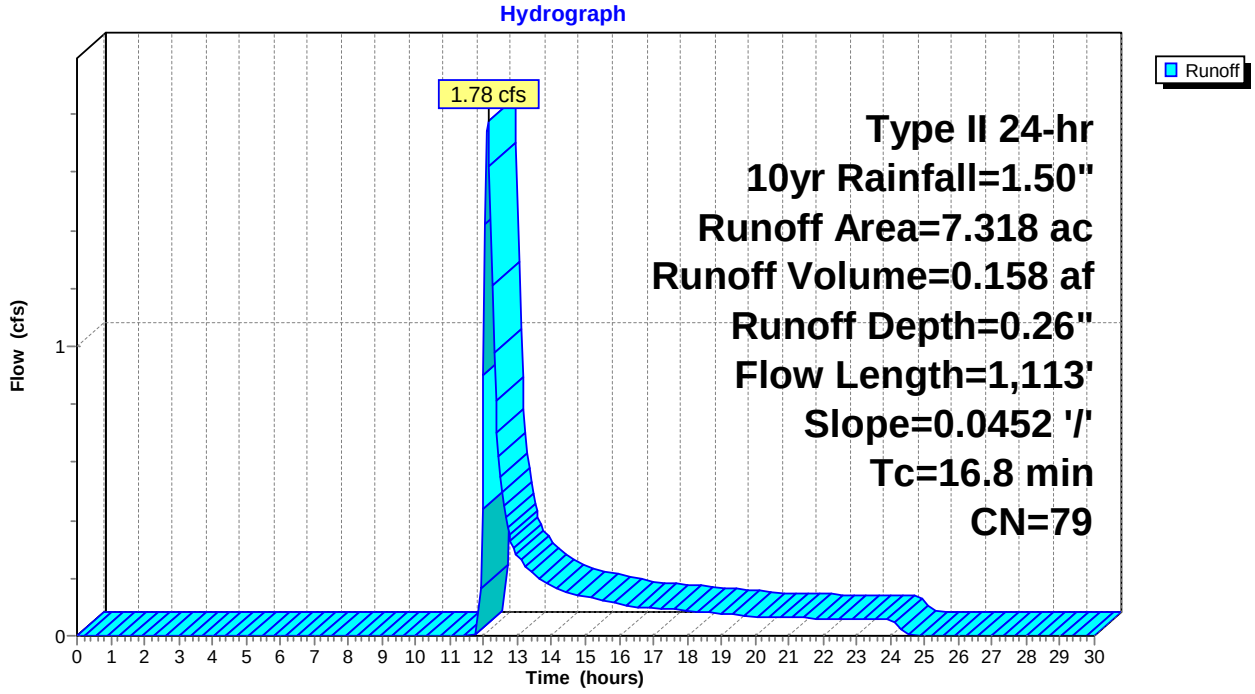
Runoff = 1.78 cfs @ 12.12 hrs, Volume= 0.158 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	7.318	79	
	7.318		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8	1,113	0.0452	1.10		**Lag/CN Method,**

Subcatchment 141S: DC-135



Summary for Subcatchment 142S: DC-136

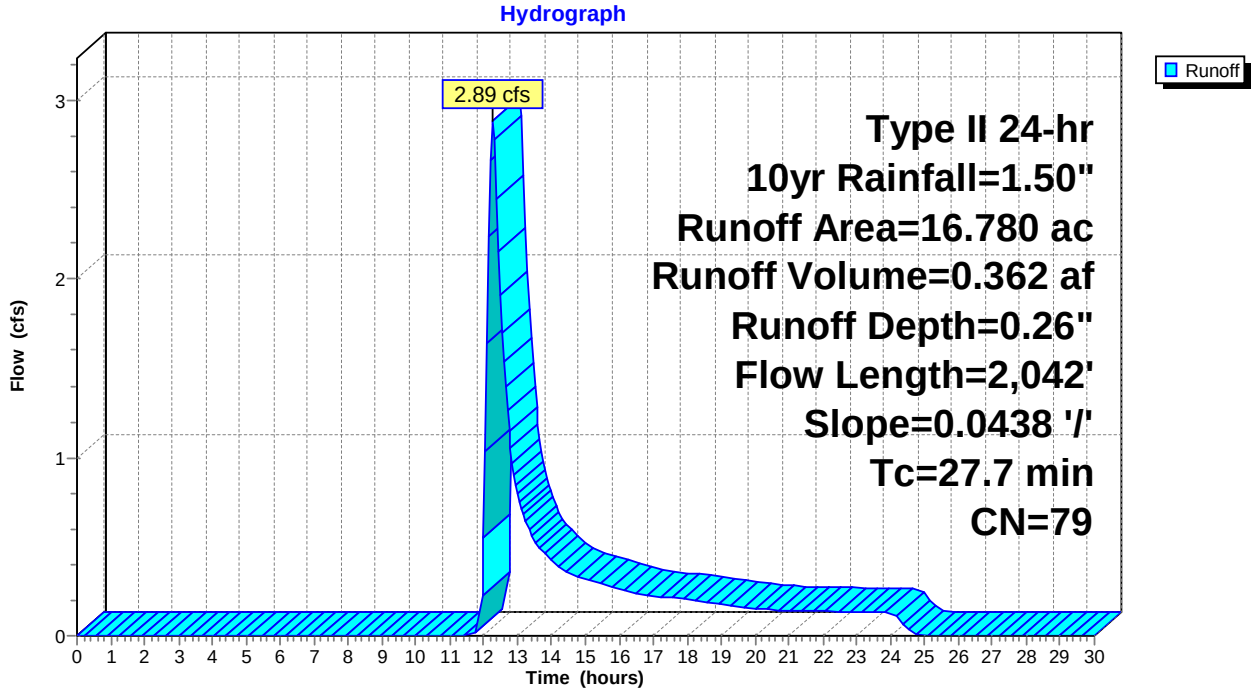
Runoff = 2.89 cfs @ 12.27 hrs, Volume= 0.362 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	16.780	79	
	16.780		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.7	2,042	0.0438	1.23		**Lag/CN Method,**

Subcatchment 142S: DC-136



Summary for Subcatchment 143S: DC-137

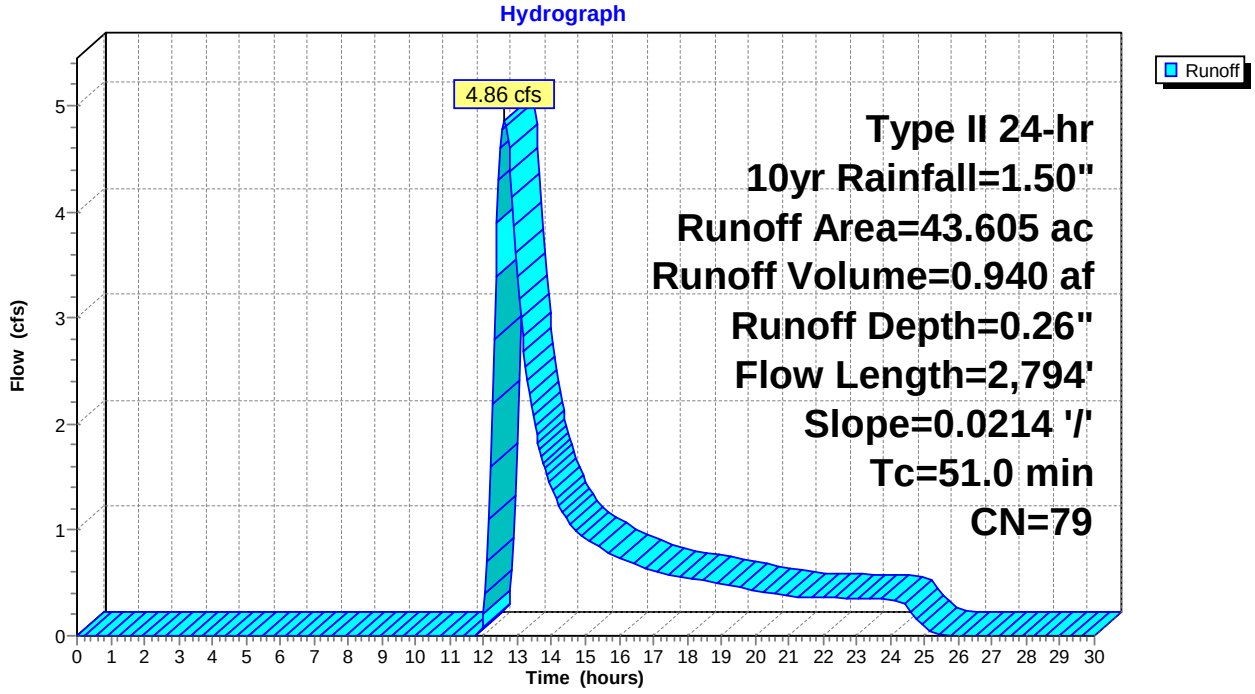
Runoff = 4.86 cfs @ 12.63 hrs, Volume= 0.940 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	43.605	79	
	43.605		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.0	2,794	0.0214	0.91		**Lag/CN Method,**

Subcatchment 143S: DC-137



Summary for Subcatchment 144S: DC-138

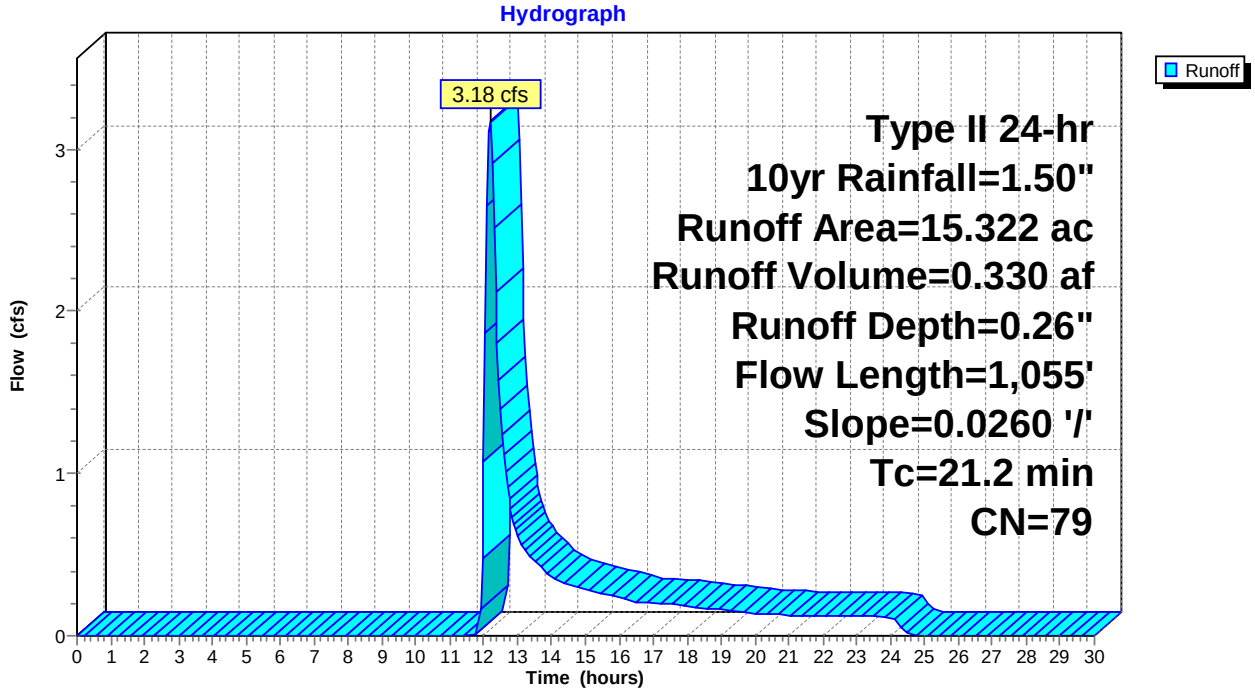
Runoff = 3.18 cfs @ 12.18 hrs, Volume= 0.330 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	15.322	79	
	15.322		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.2	1,055	0.0260	0.83		**Lag/CN Method,**

Subcatchment 144S: DC-138



Summary for Subcatchment 145S: DC-141

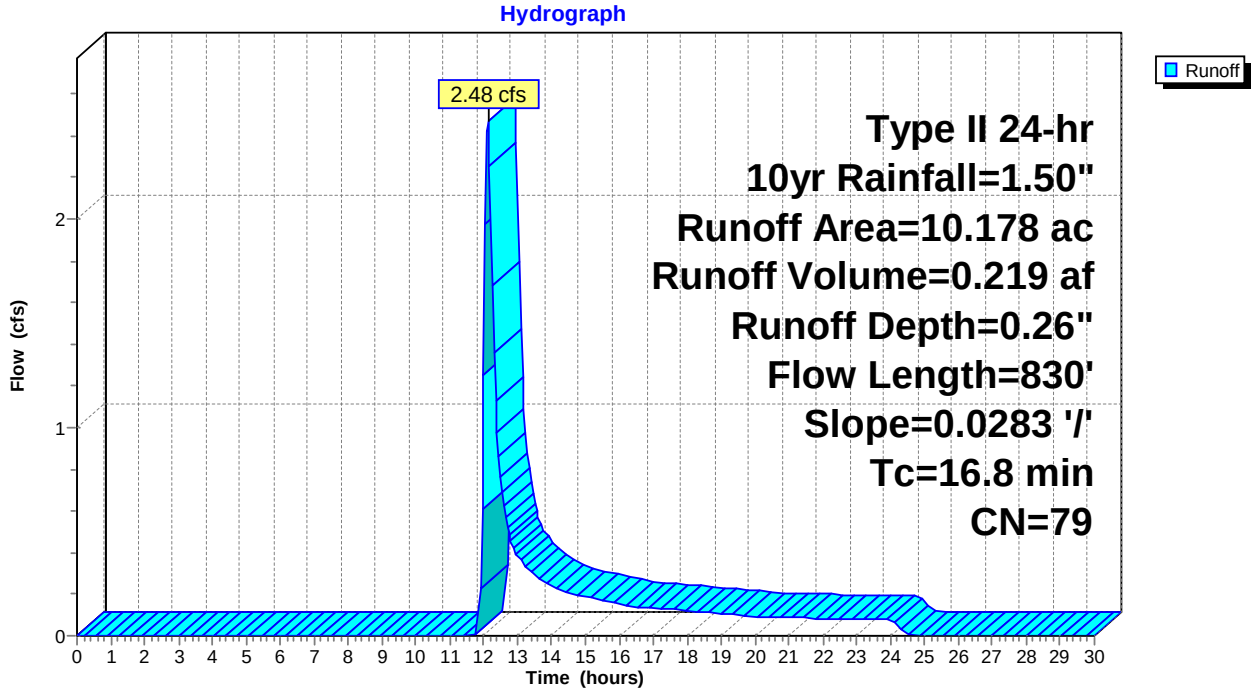
Runoff = 2.48 cfs @ 12.12 hrs, Volume= 0.219 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	10.178	79	
	10.178		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8	830	0.0283	0.82		**Lag/CN Method,**

Subcatchment 145S: DC-141



Summary for Subcatchment 146S: DC-142

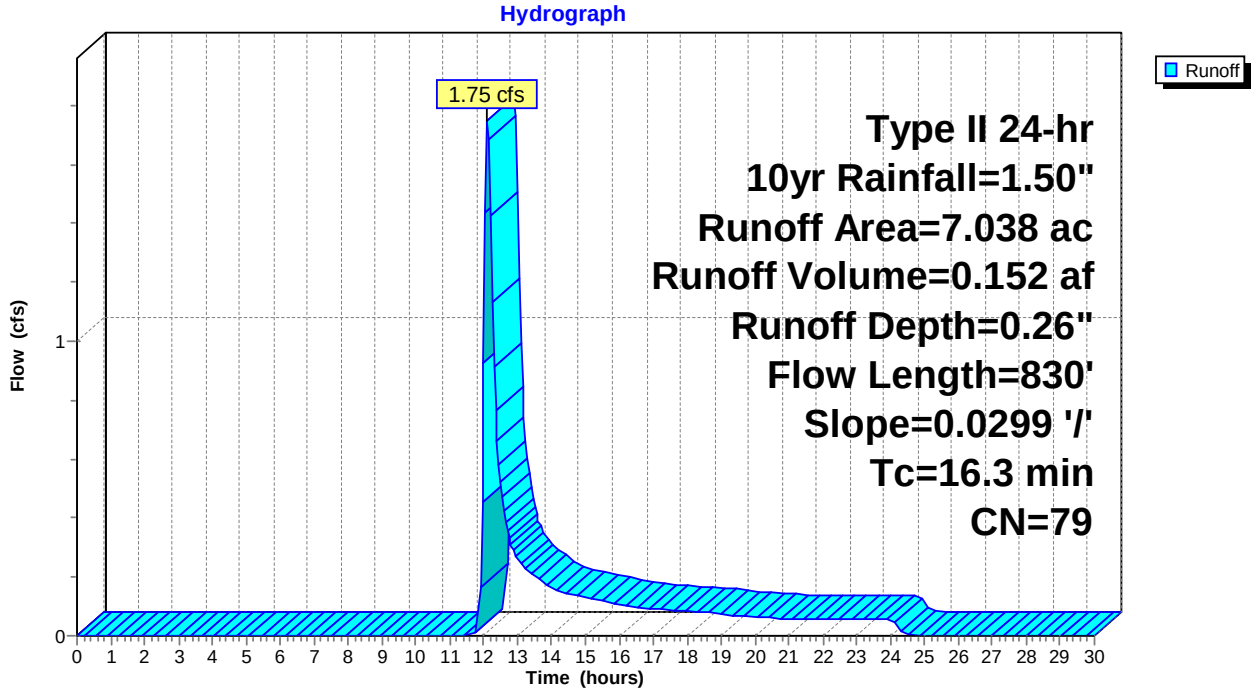
Runoff = 1.75 cfs @ 12.12 hrs, Volume= 0.152 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	7.038	79	
	7.038		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	830	0.0299	0.85		**Lag/CN Method,**

Subcatchment 146S: DC-142



Summary for Subcatchment 147S: DC-143

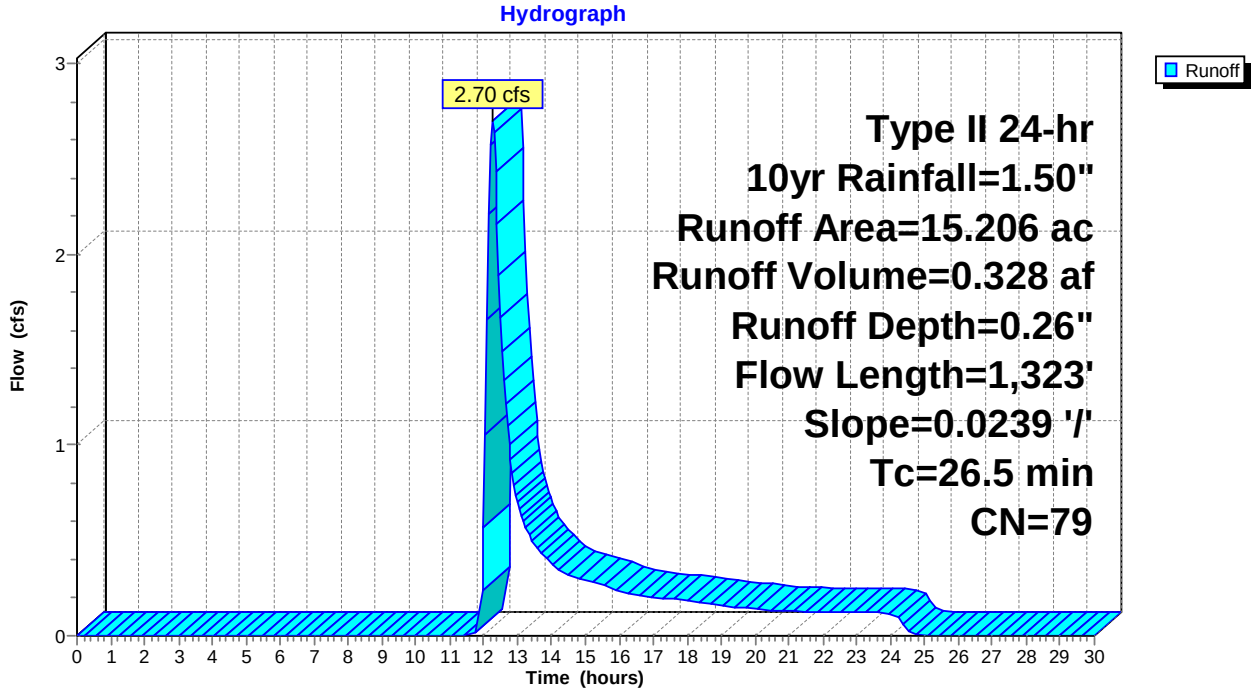
Runoff = 2.70 cfs @ 12.26 hrs, Volume= 0.328 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	15.206	79	
	15.206		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.5	1,323	0.0239	0.83		**Lag/CN Method,**

Subcatchment 147S: DC-143



Summary for Subcatchment 148S: DC-144

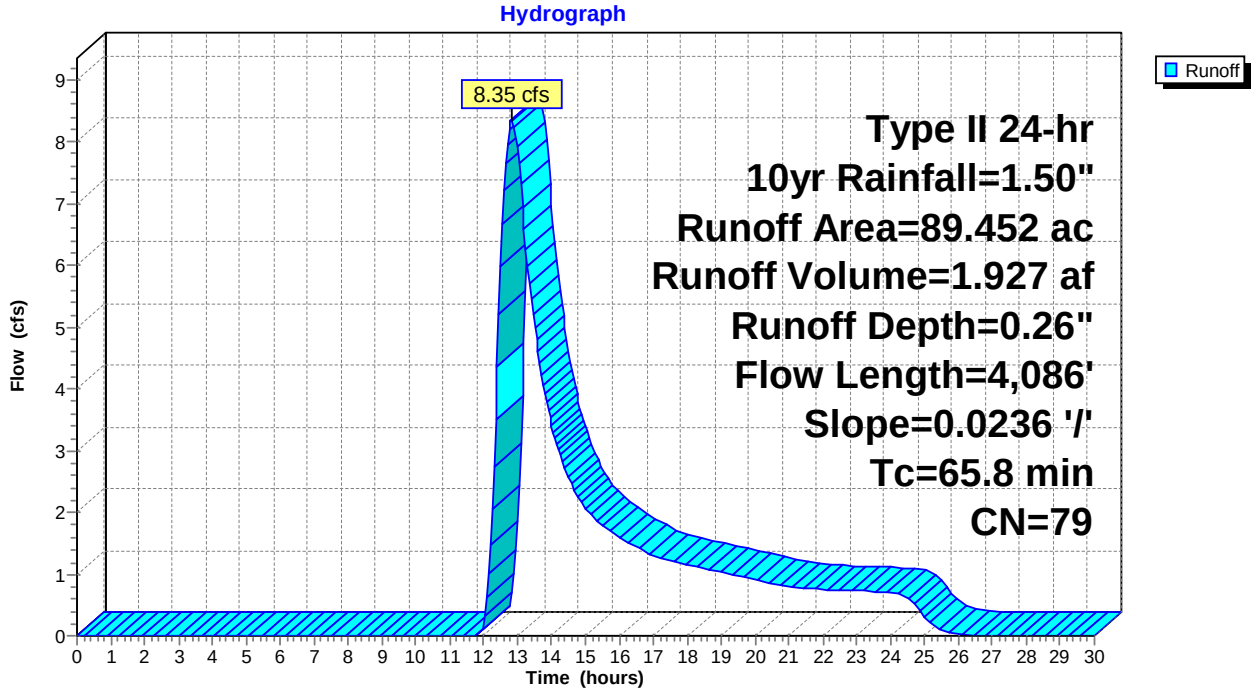
Runoff = 8.35 cfs @ 12.82 hrs, Volume= 1.927 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	89.452	79	
	89.452		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.8	4,086	0.0236	1.04		**Lag/CN Method,**

Subcatchment 148S: DC-144



Summary for Subcatchment 149S: DC-145

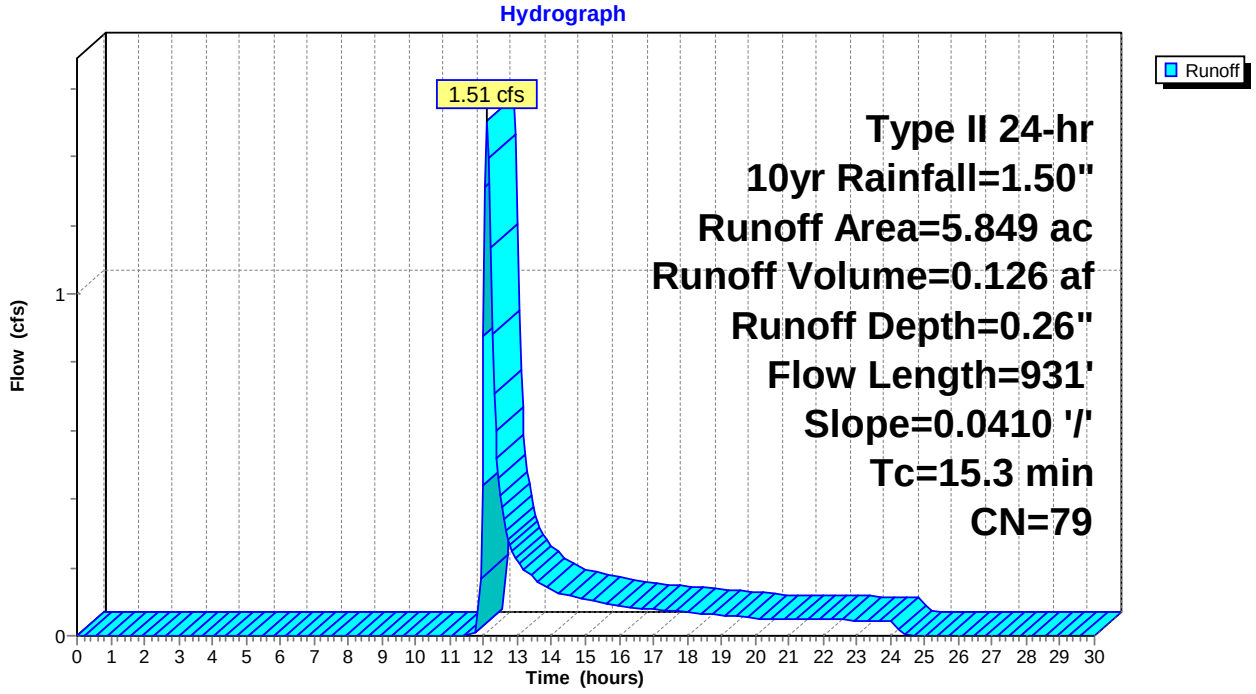
Runoff = 1.51 cfs @ 12.11 hrs, Volume= 0.126 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	5.849	79	
	5.849		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	931	0.0410	1.02		**Lag/CN Method,**

Subcatchment 149S: DC-145



Summary for Subcatchment 150S: DC-146

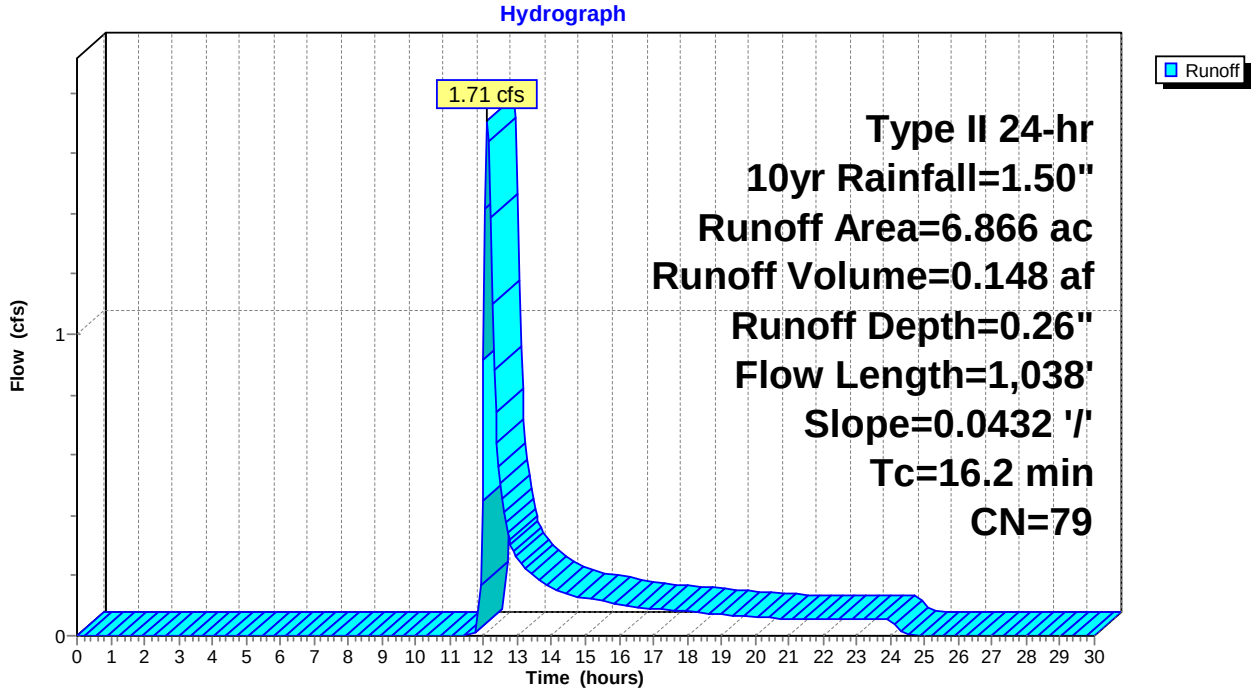
Runoff = 1.71 cfs @ 12.12 hrs, Volume= 0.148 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	6.866	79	
	6.866		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	1,038	0.0432	1.06		**Lag/CN Method,**

Subcatchment 150S: DC-146



Summary for Subcatchment 151S: DC-147

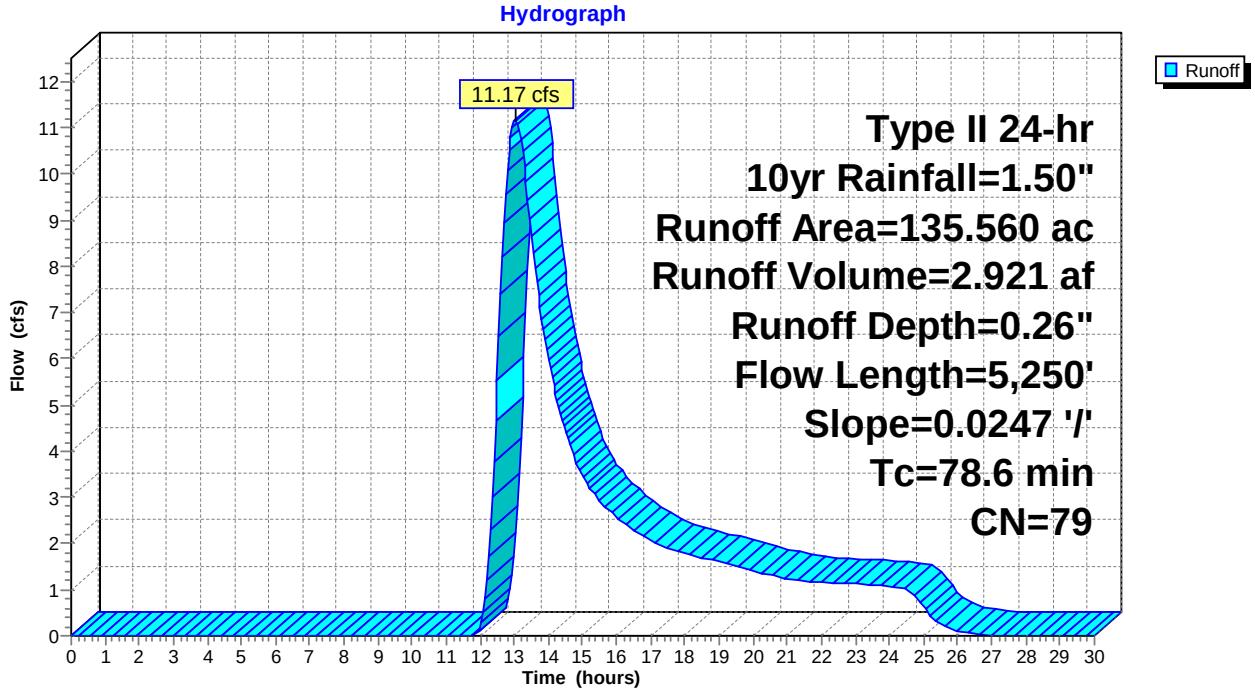
Runoff = 11.17 cfs @ 13.03 hrs, Volume= 2.921 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	135.560	79	
	135.560		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.6	5,250	0.0247	1.11		**Lag/CN Method,**

Subcatchment 151S: DC-147



Summary for Subcatchment 152S: DC-149

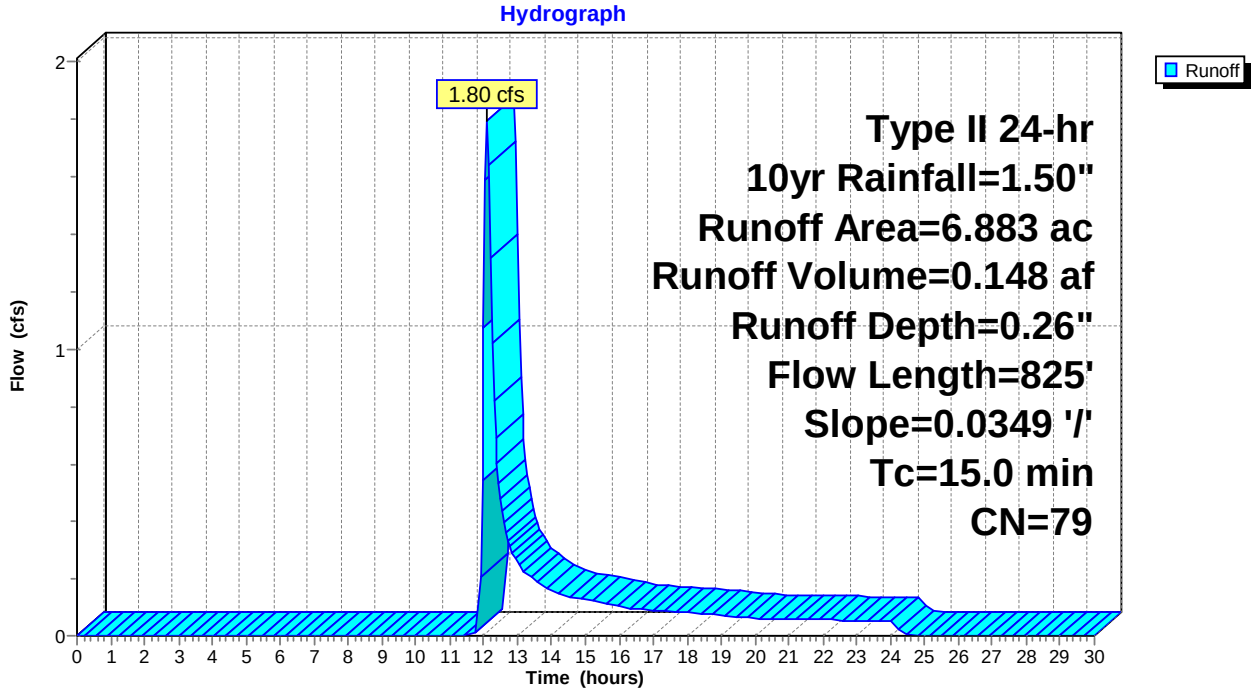
Runoff = 1.80 cfs @ 12.10 hrs, Volume= 0.148 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	6.883	79	
	6.883		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	825	0.0349	0.91		**Lag/CN Method,**

Subcatchment 152S: DC-149



Summary for Subcatchment 153S: DC-150

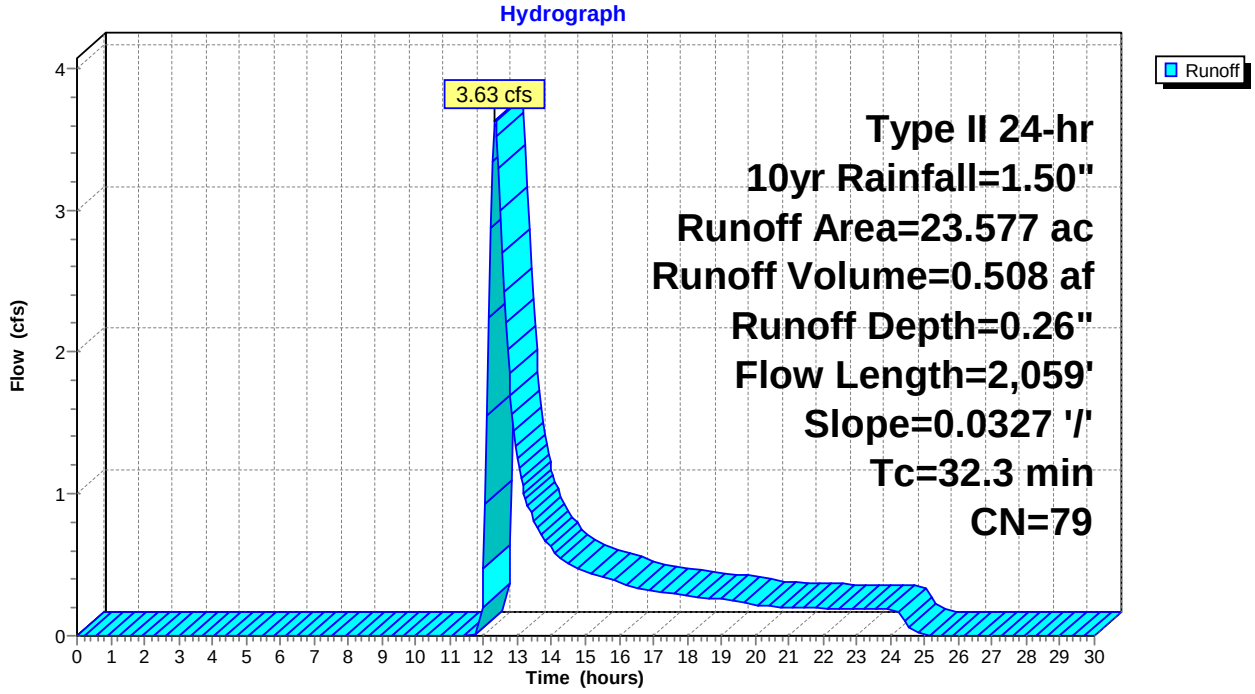
Runoff = 3.63 cfs @ 12.34 hrs, Volume= 0.508 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	23.577	79	
	23.577		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.3	2,059	0.0327	1.06		**Lag/CN Method,**

Subcatchment 153S: DC-150



Summary for Subcatchment 154S: DC-151

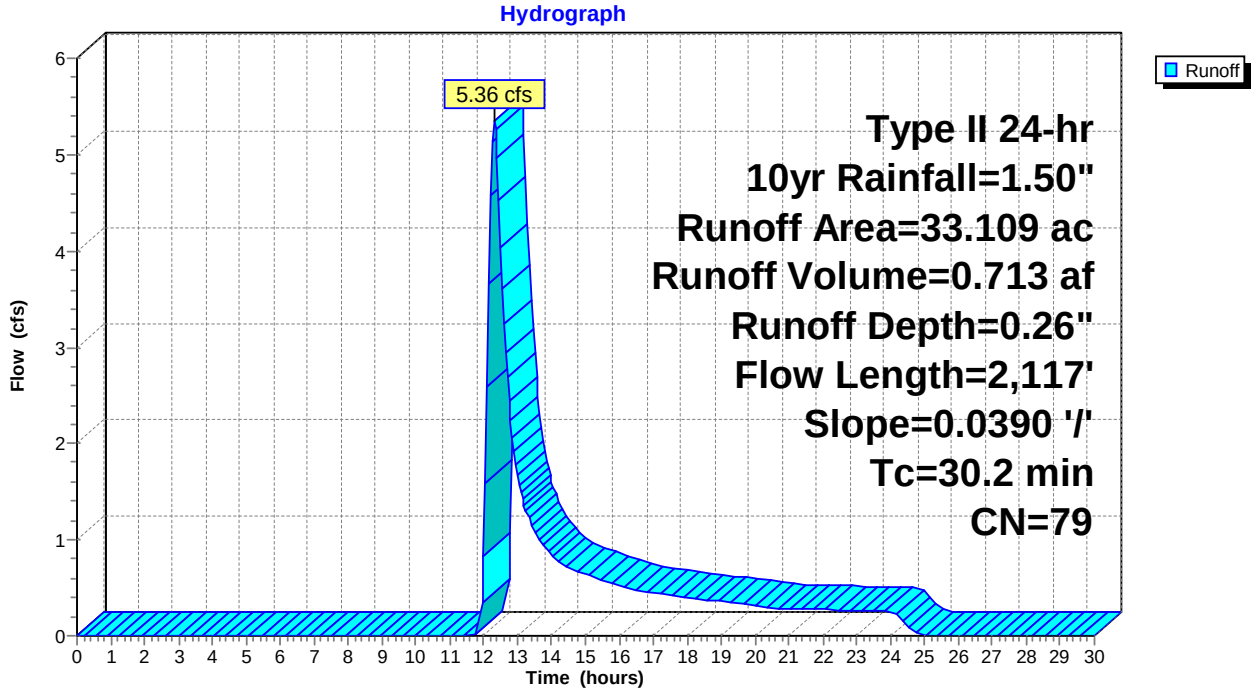
Runoff = 5.36 cfs @ 12.31 hrs, Volume= 0.713 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	33.109	79	
	33.109		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.2	2,117	0.0390	1.17		**Lag/CN Method,**

Subcatchment 154S: DC-151



Summary for Subcatchment 155S: DC-152

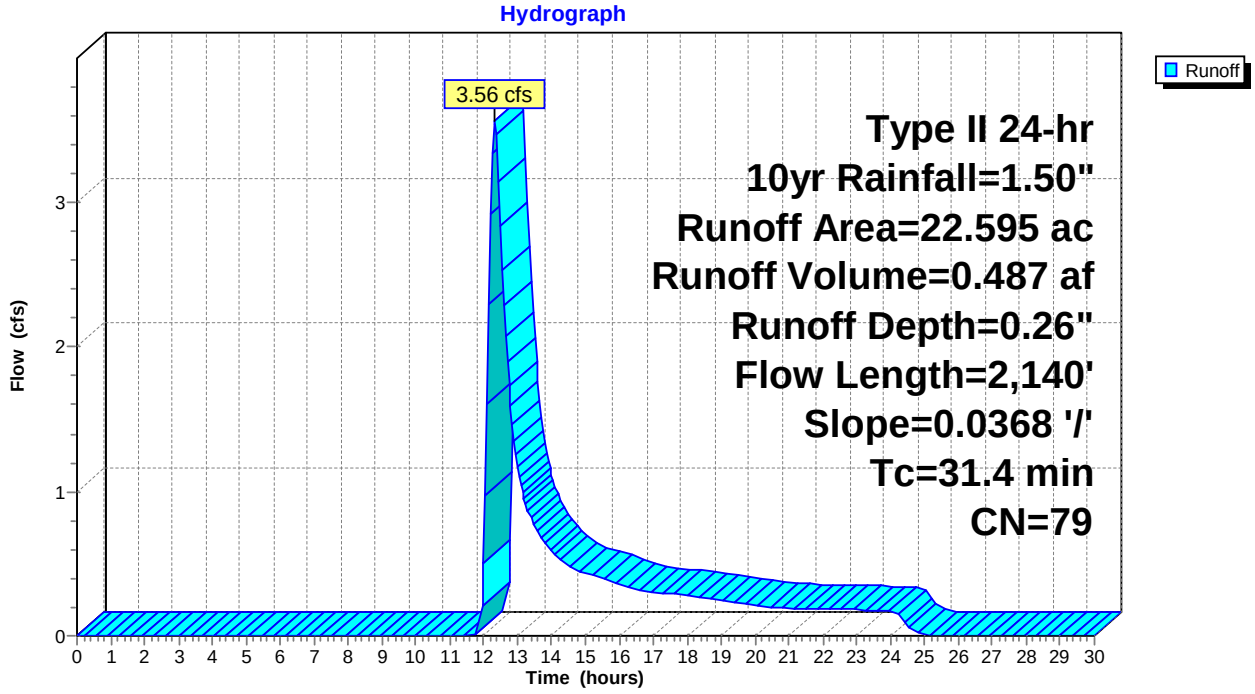
Runoff = 3.56 cfs @ 12.32 hrs, Volume= 0.487 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	22.595	79	
	22.595		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.4	2,140	0.0368	1.14		**Lag/CN Method,**

Subcatchment 155S: DC-152



Summary for Subcatchment 156S: DC-153

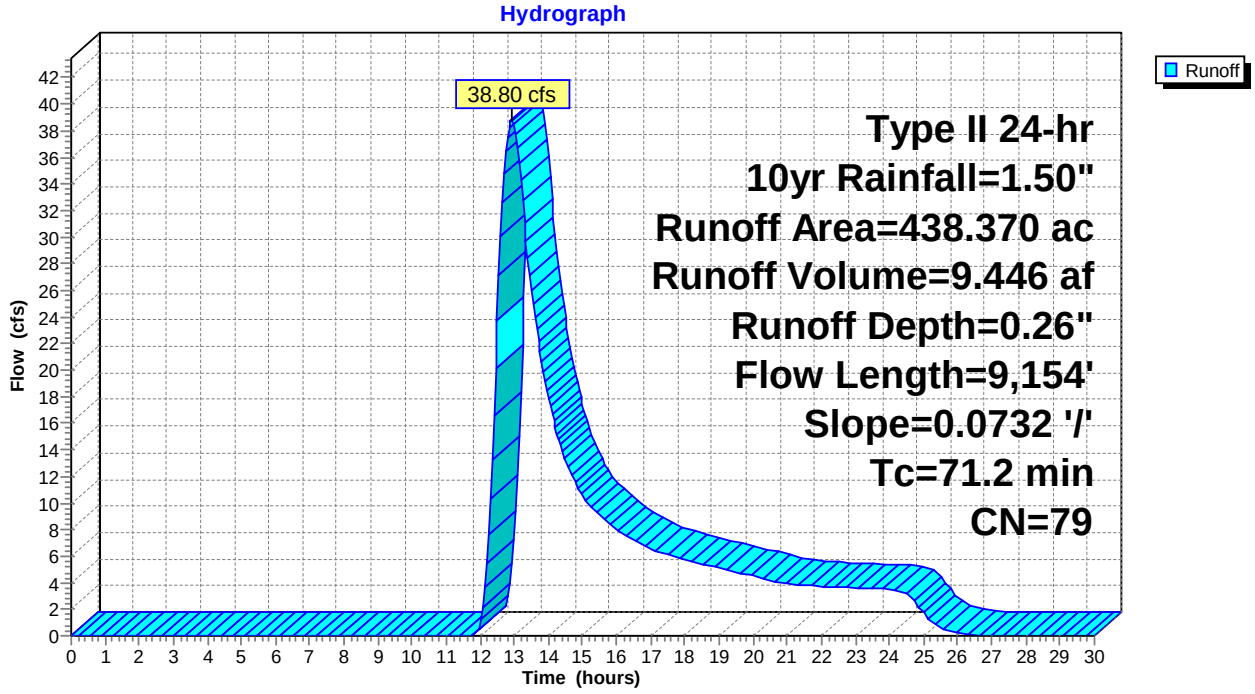
Runoff = 38.80 cfs @ 12.92 hrs, Volume= 9.446 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	438.370	79	
	438.370		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
71.2	9,154	0.0732	2.14		**Lag/CN Method,**

Subcatchment 156S: DC-153



Summary for Subcatchment 157S: DC-154

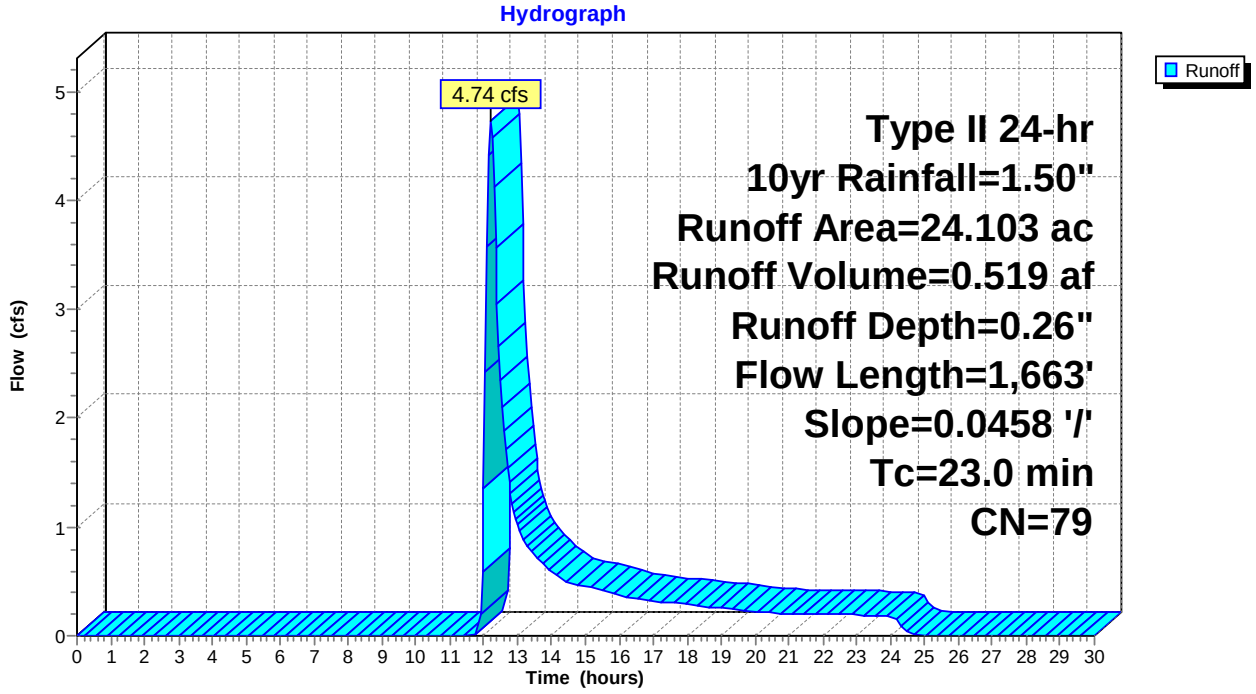
Runoff = 4.74 cfs @ 12.21 hrs, Volume= 0.519 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	24.103	79	
	24.103		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	1,663	0.0458	1.20		**Lag/CN Method,**

Subcatchment 157S: DC-154



Summary for Subcatchment 158S: DC-155

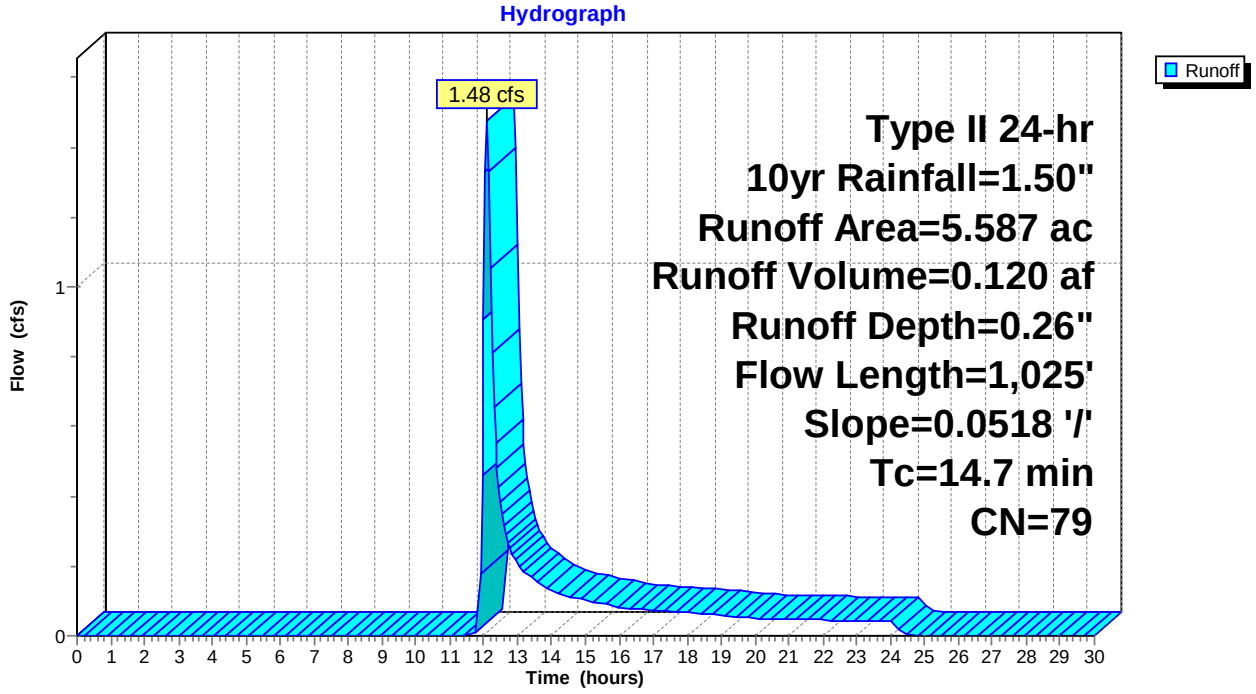
Runoff = 1.48 cfs @ 12.10 hrs, Volume= 0.120 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	5.587	79	
	5.587		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	1,025	0.0518	1.16		**Lag/CN Method,**

Subcatchment 158S: DC-155



Summary for Subcatchment 159S: DC-157

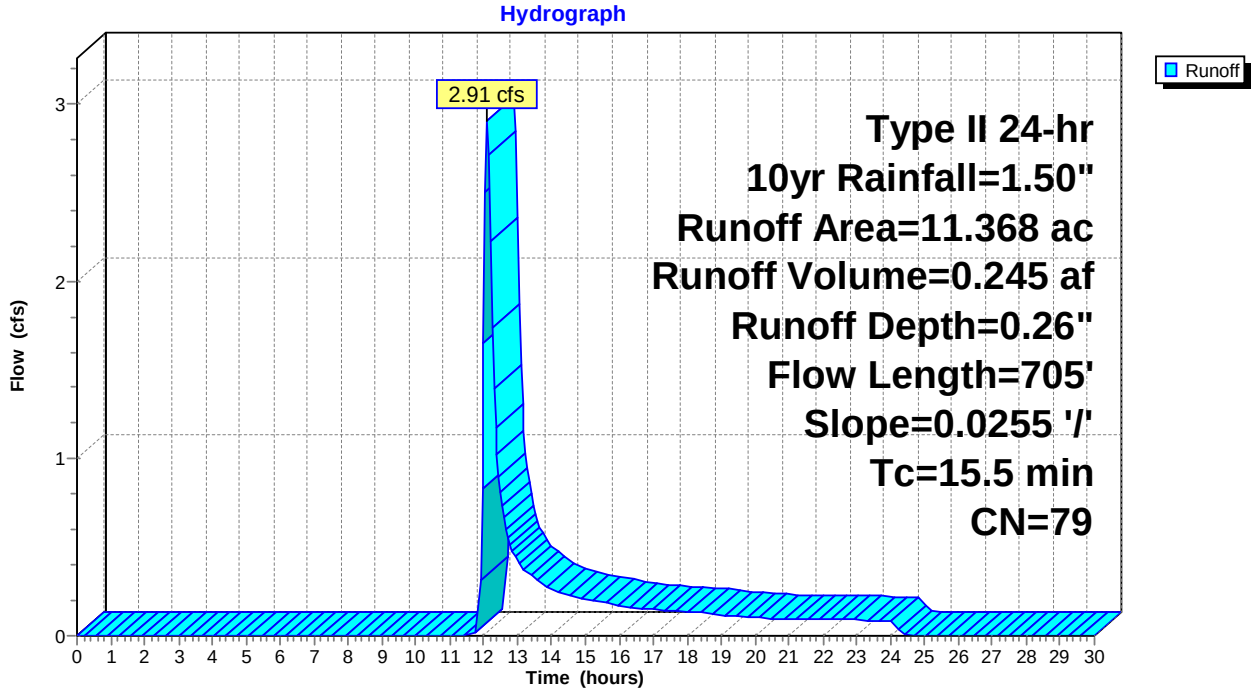
Runoff = 2.91 cfs @ 12.11 hrs, Volume= 0.245 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	11.368	79	
	11.368		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	705	0.0255	0.76		**Lag/CN Method,**

Subcatchment 159S: DC-157



Summary for Subcatchment 160S: DC-158

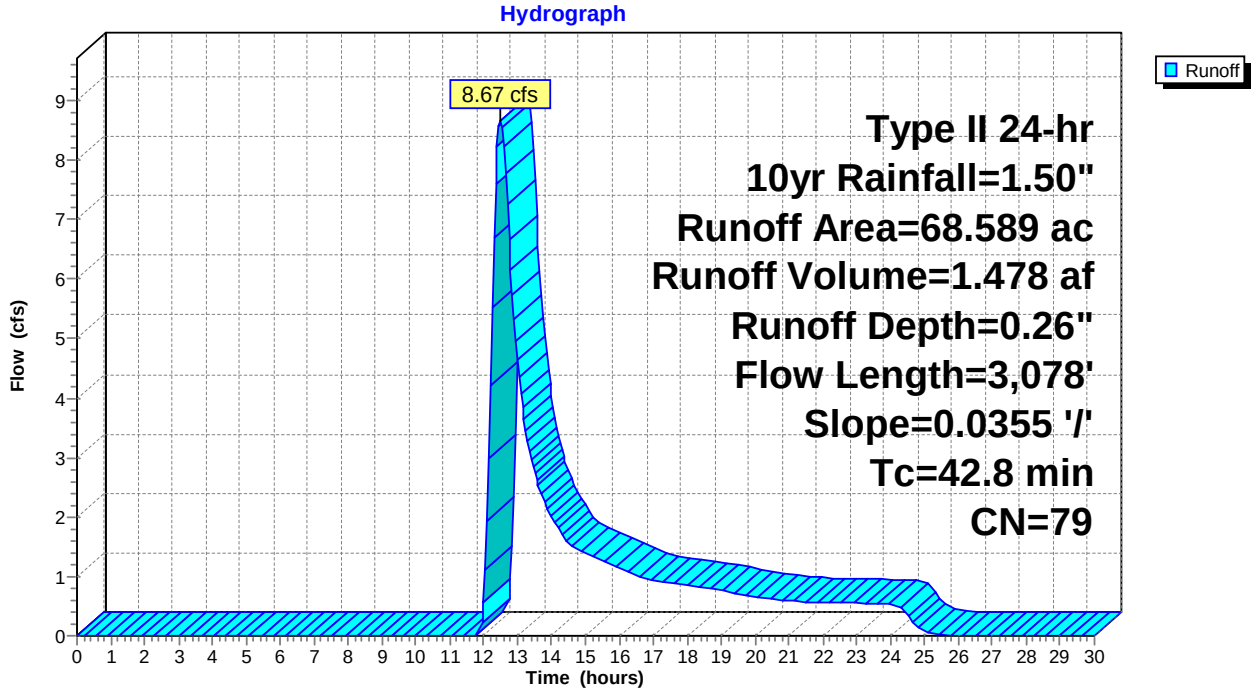
Runoff = 8.67 cfs @ 12.50 hrs, Volume= 1.478 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	68.589	79	
	68.589		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.8	3,078	0.0355	1.20		**Lag/CN Method,**

Subcatchment 160S: DC-158



Summary for Subcatchment 161S: DC-159

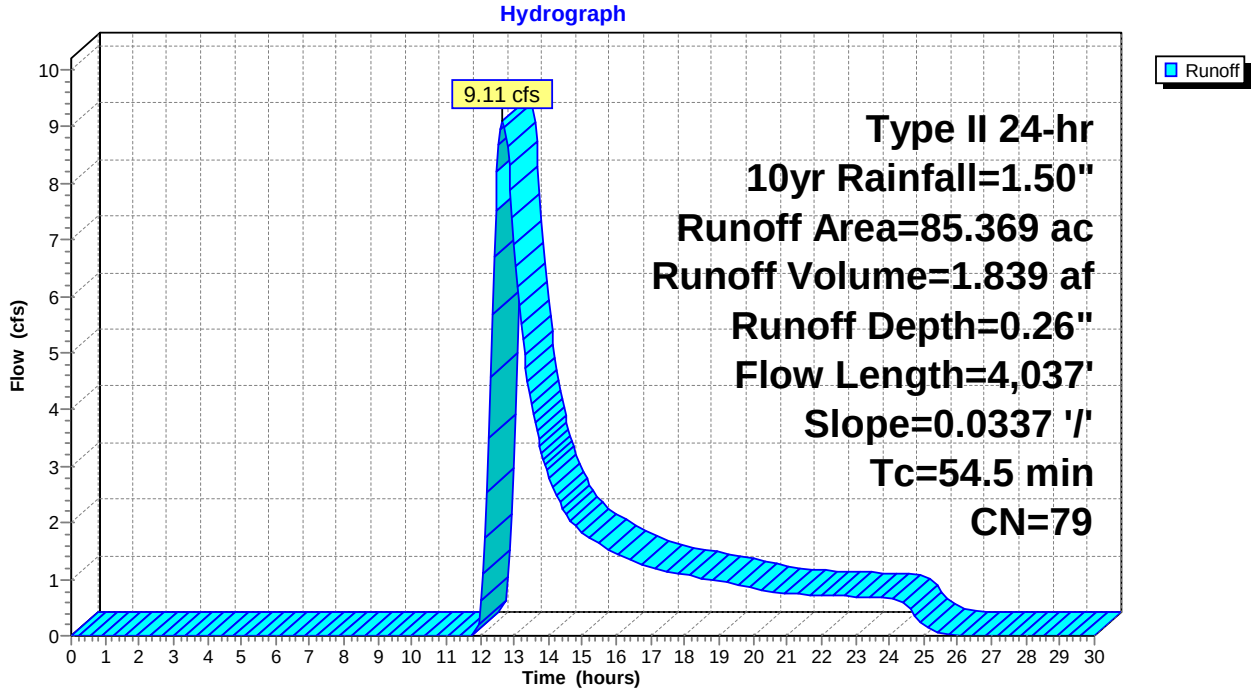
Runoff = 9.11 cfs @ 12.67 hrs, Volume= 1.839 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	85.369	79	
	85.369		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
54.5	4,037	0.0337	1.23		**Lag/CN Method,**

Subcatchment 161S: DC-159



Summary for Subcatchment 162S: DC-160

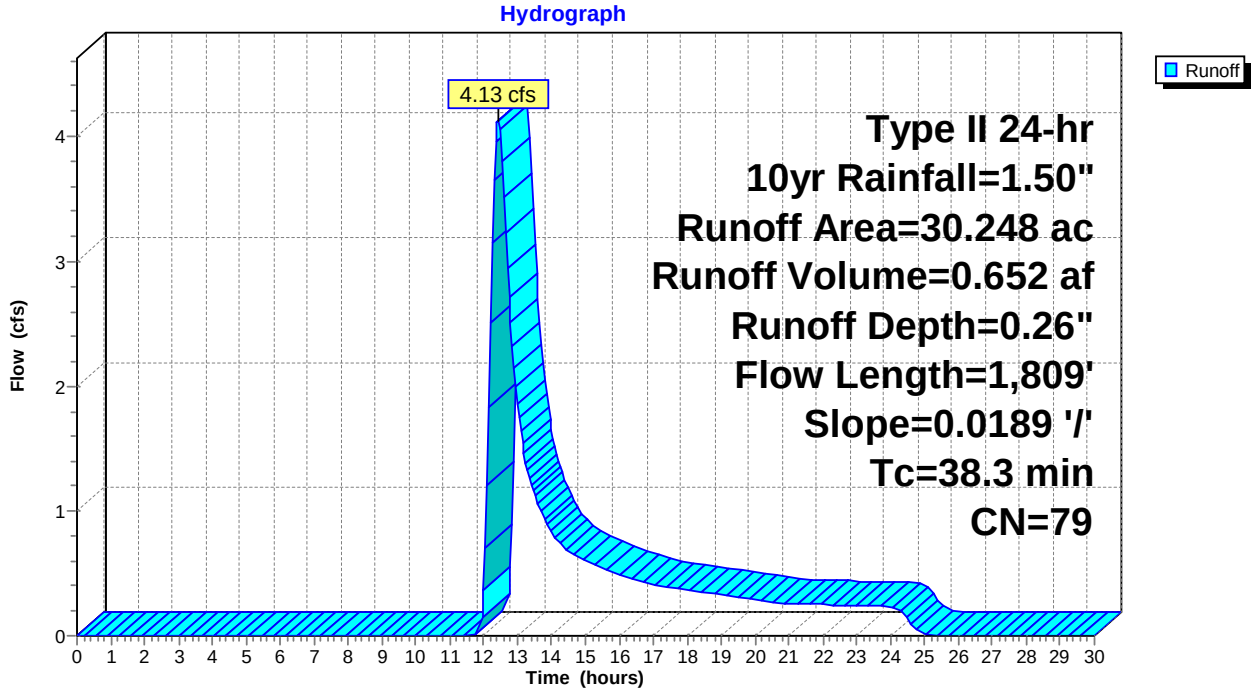
Runoff = 4.13 cfs @ 12.43 hrs, Volume= 0.652 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	30.248	79	
	30.248		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.3	1,809	0.0189	0.79		**Lag/CN Method,**

Subcatchment 162S: DC-160



Summary for Subcatchment 163S: DC-161

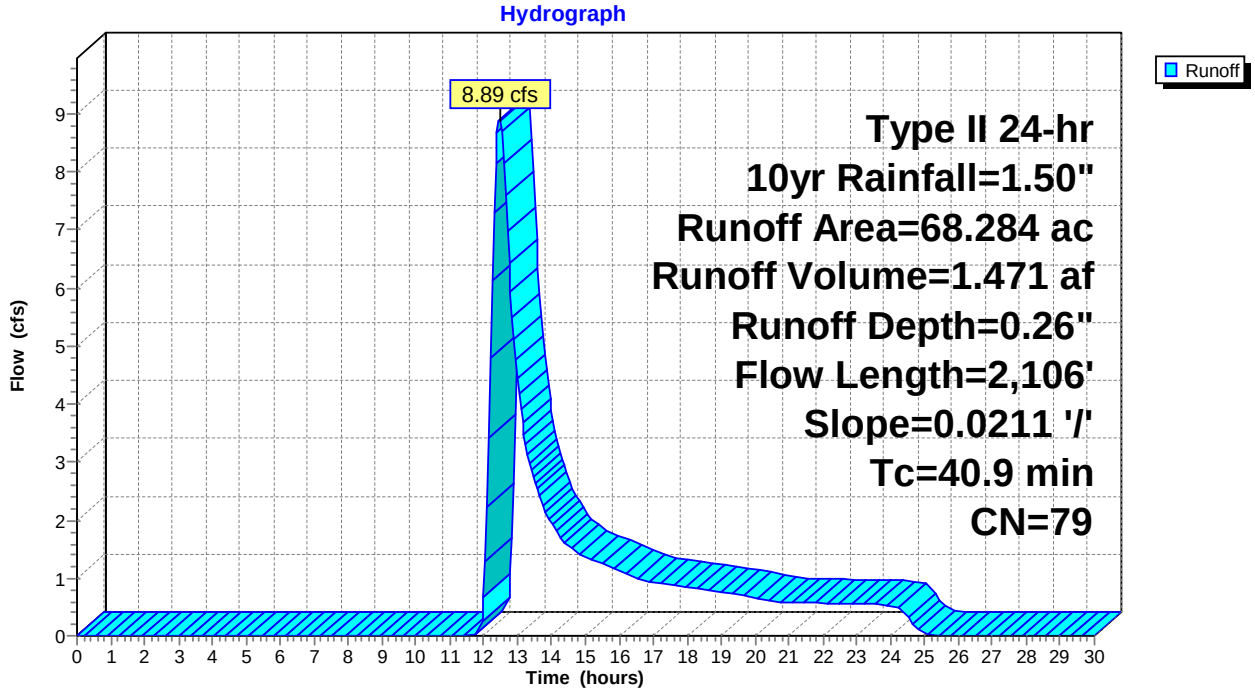
Runoff = 8.89 cfs @ 12.47 hrs, Volume= 1.471 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	68.284	79	
	68.284		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.9	2,106	0.0211	0.86		**Lag/CN Method,**

Subcatchment 163S: DC-161



Summary for Subcatchment 164S: DC-162

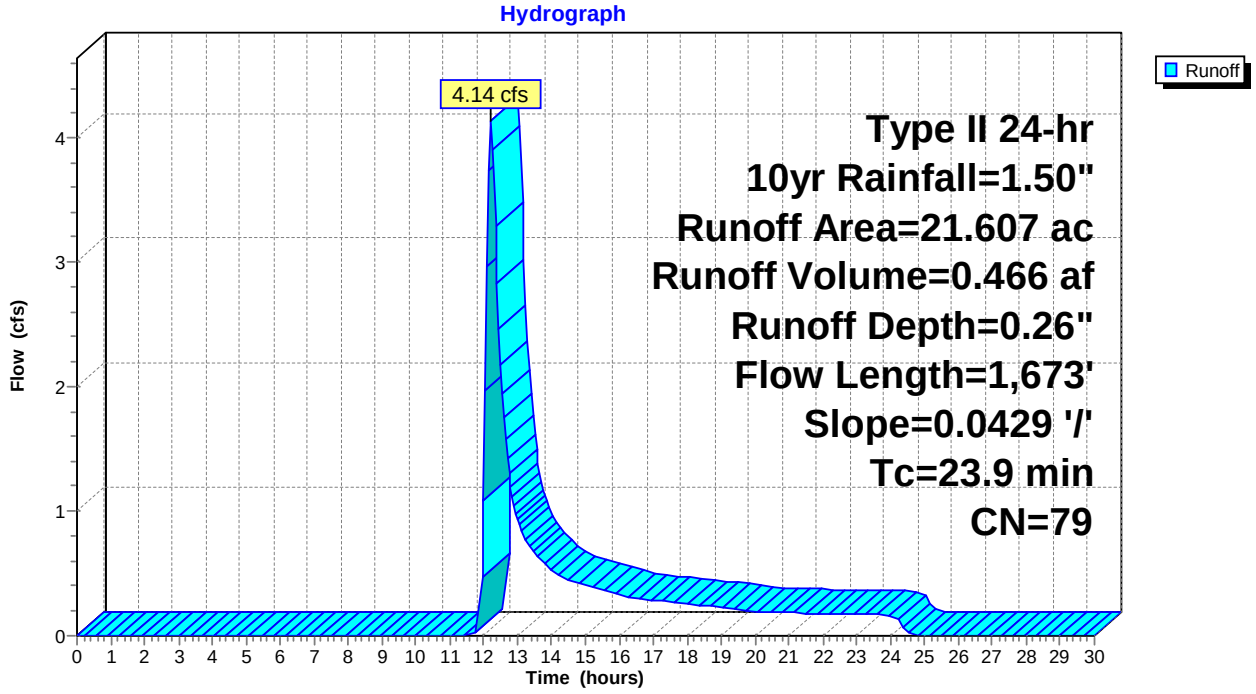
Runoff = 4.14 cfs @ 12.22 hrs, Volume= 0.466 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	21.607	79	
	21.607		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.9	1,673	0.0429	1.17		**Lag/CN Method,**

Subcatchment 164S: DC-162



Summary for Subcatchment 165S: DC-163

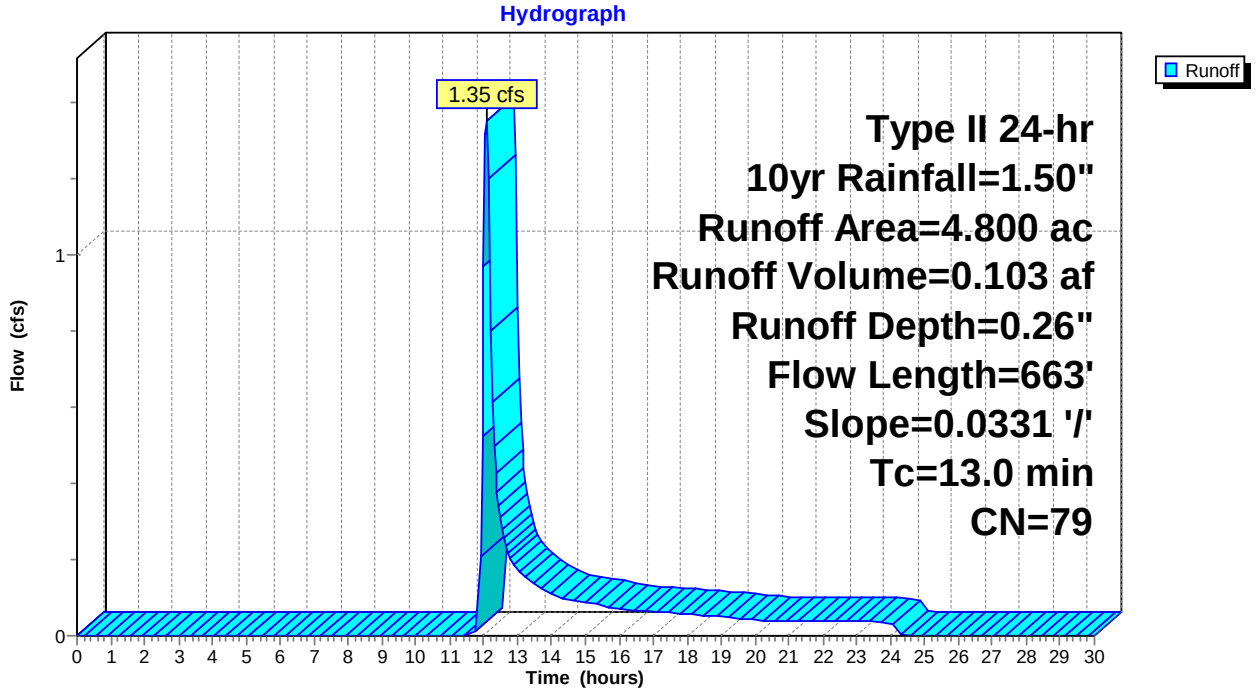
Runoff = 1.35 cfs @ 12.08 hrs, Volume= 0.103 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	4.800	79	
	4.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	663	0.0331	0.85		**Lag/CN Method,**

Subcatchment 165S: DC-163



Summary for Subcatchment 166S: DC-165

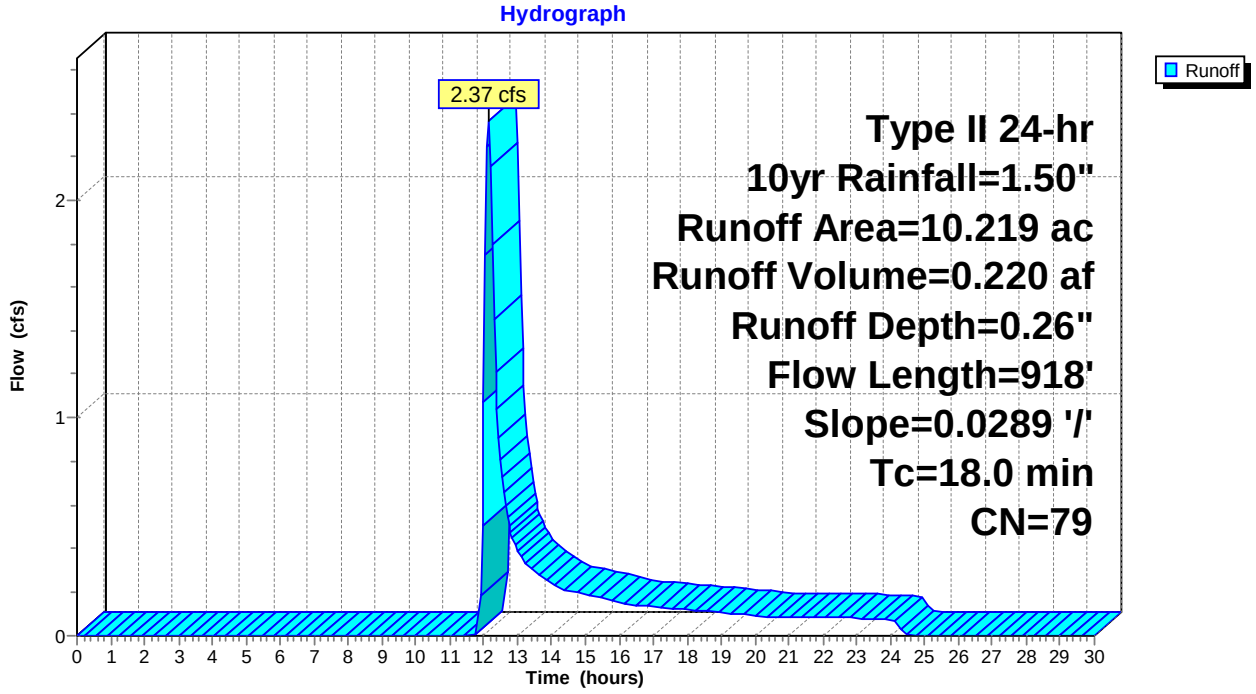
Runoff = 2.37 cfs @ 12.14 hrs, Volume= 0.220 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	10.219	79	
	10.219		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	918	0.0289	0.85		**Lag/CN Method,**

Subcatchment 166S: DC-165



Summary for Subcatchment 167S: DC-166

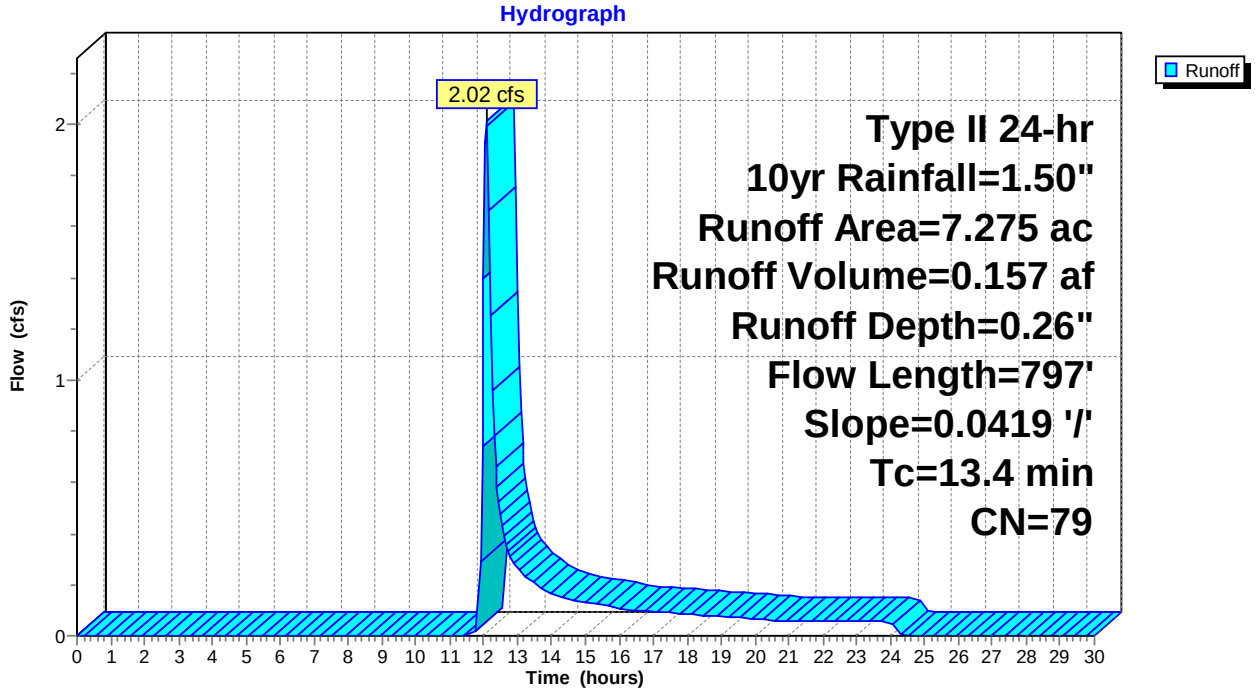
Runoff = 2.02 cfs @ 12.08 hrs, Volume= 0.157 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	7.275	79	
	7.275		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	797	0.0419	0.99		**Lag/CN Method,**

Subcatchment 167S: DC-166



Summary for Subcatchment 168S: DC-168

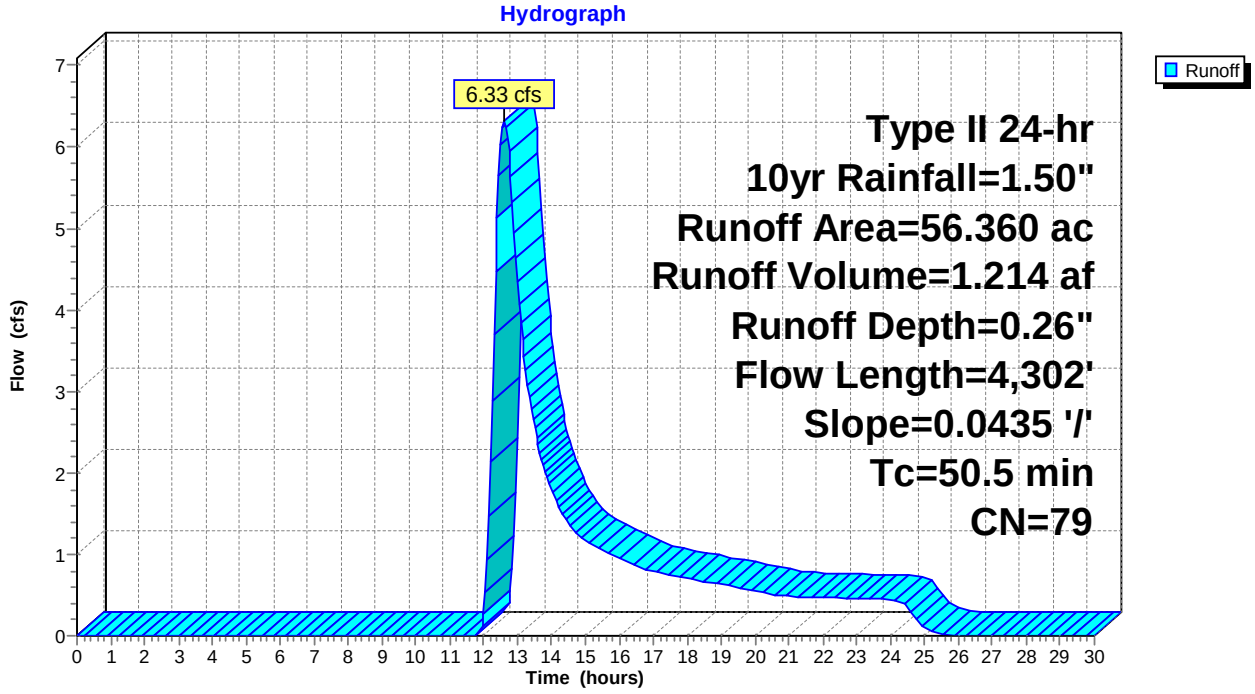
Runoff = 6.33 cfs @ 12.61 hrs, Volume= 1.214 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	56.360	79	
	56.360		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.5	4,302	0.0435	1.42		**Lag/CN Method,**

Subcatchment 168S: DC-168



Summary for Subcatchment 169S: DC-169

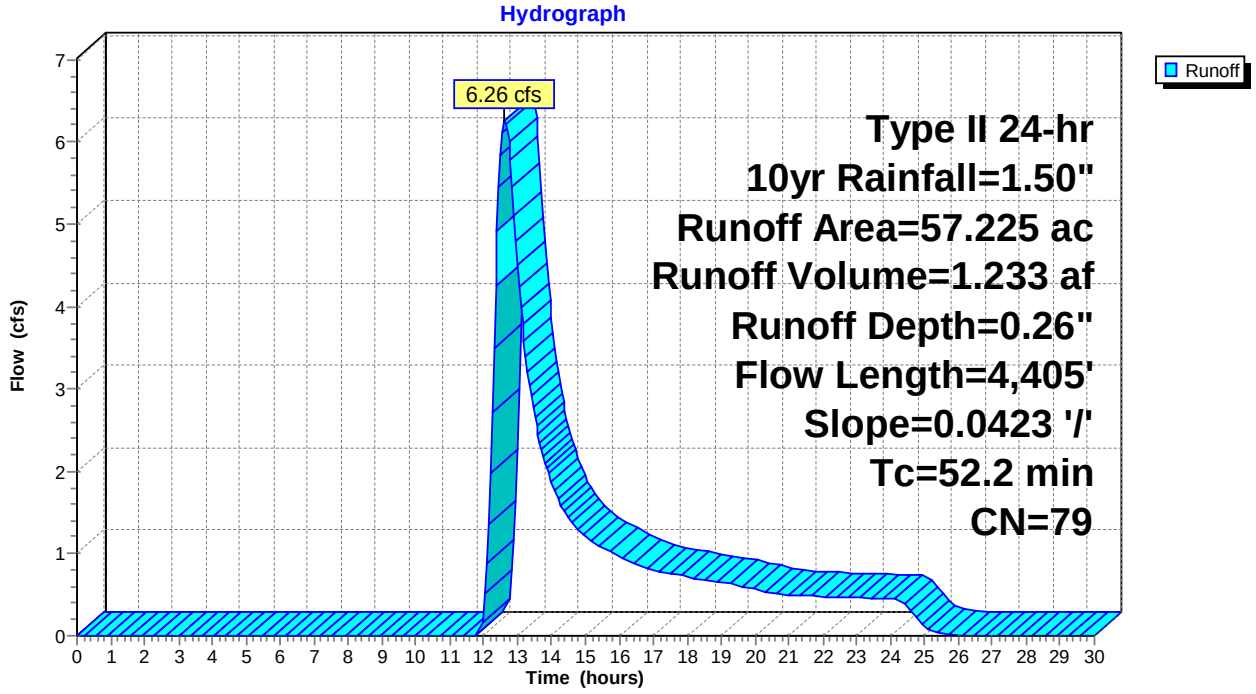
Runoff = 6.26 cfs @ 12.63 hrs, Volume= 1.233 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	57.225	79	
	57.225		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.2	4,405	0.0423	1.41		**Lag/CN Method,**

Subcatchment 169S: DC-169



Summary for Subcatchment 170S: DC-170

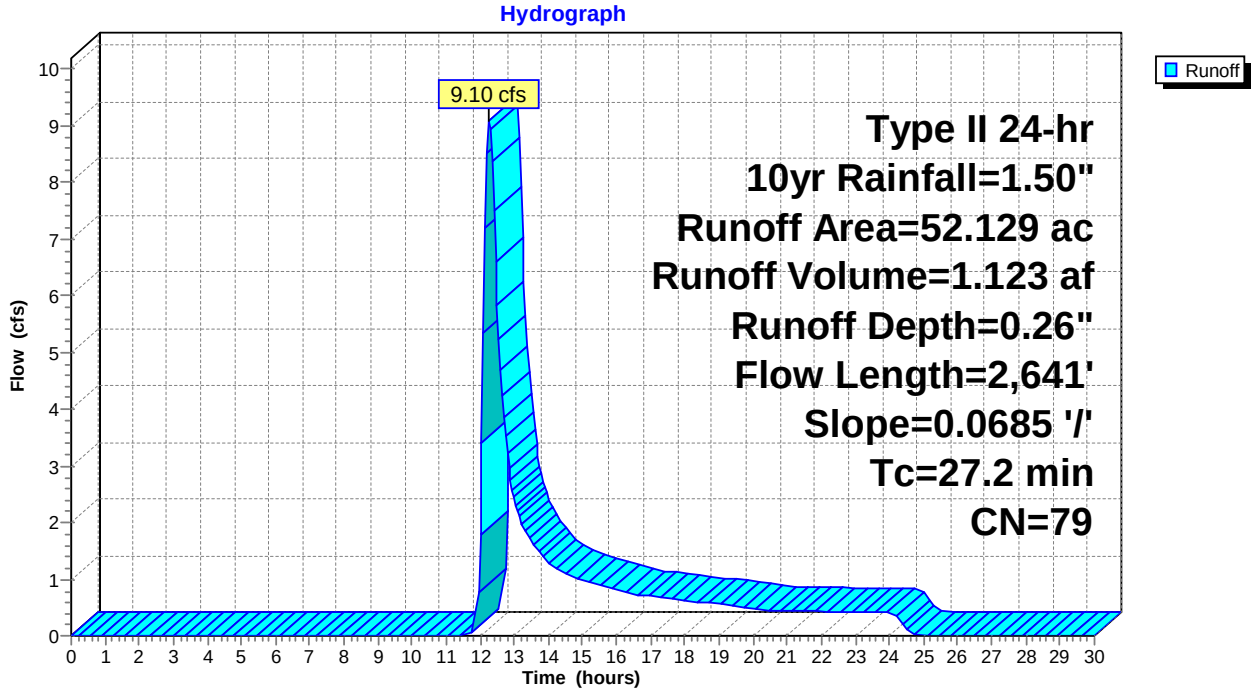
Runoff = 9.10 cfs @ 12.27 hrs, Volume= 1.123 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	52.129	79	
	52.129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.2	2,641	0.0685	1.62		**Lag/CN Method,**

Subcatchment 170S: DC-170



Summary for Subcatchment 171S: DC-171

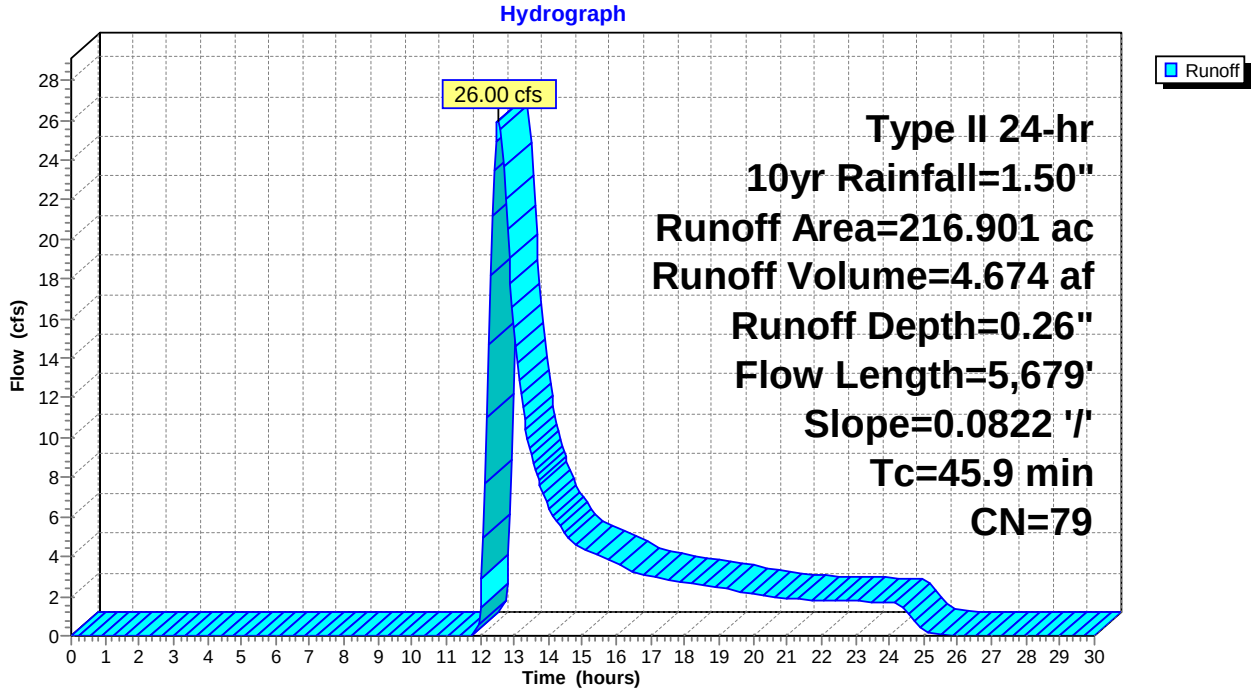
Runoff = 26.00 cfs @ 12.54 hrs, Volume= 4.674 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	216.901	79	
	216.901		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
45.9	5,679	0.0822	2.06		**Lag/CN Method,**

Subcatchment 171S: DC-171



Summary for Subcatchment 172S: DC-172

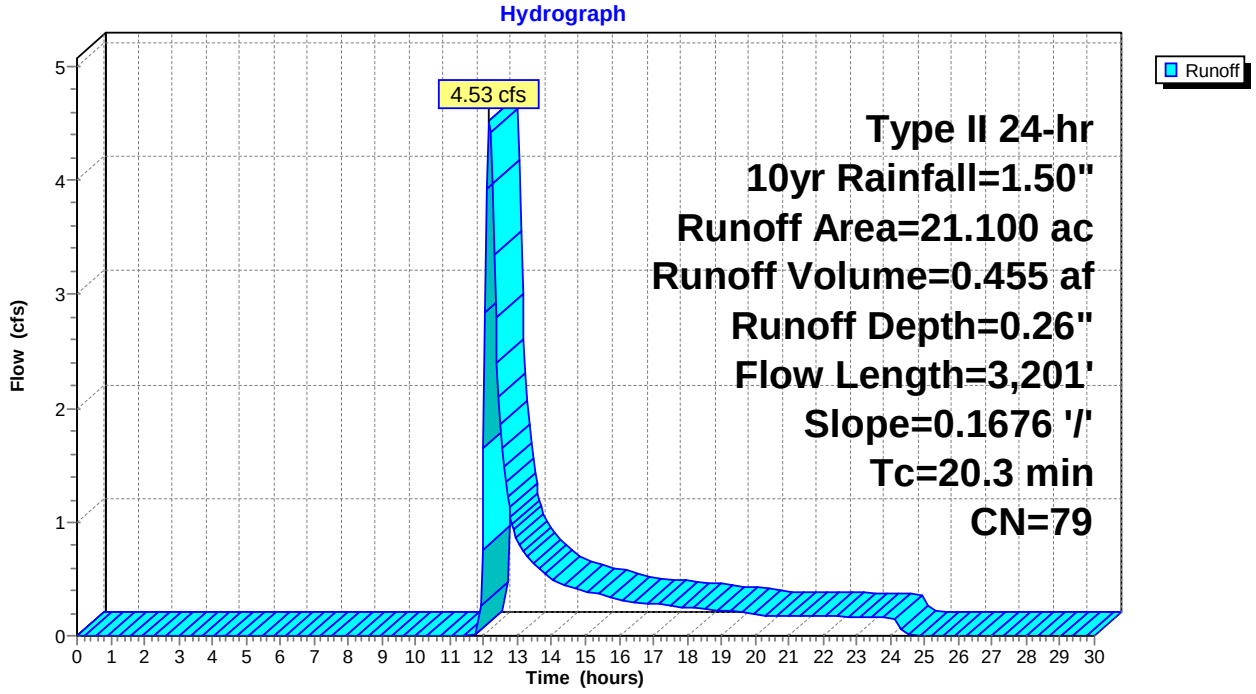
Runoff = 4.53 cfs @ 12.17 hrs, Volume= 0.455 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	21.100	79	
	21.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.3	3,201	0.1676	2.63		**Lag/CN Method,**

Subcatchment 172S: DC-172



Summary for Subcatchment 173S: DC-173

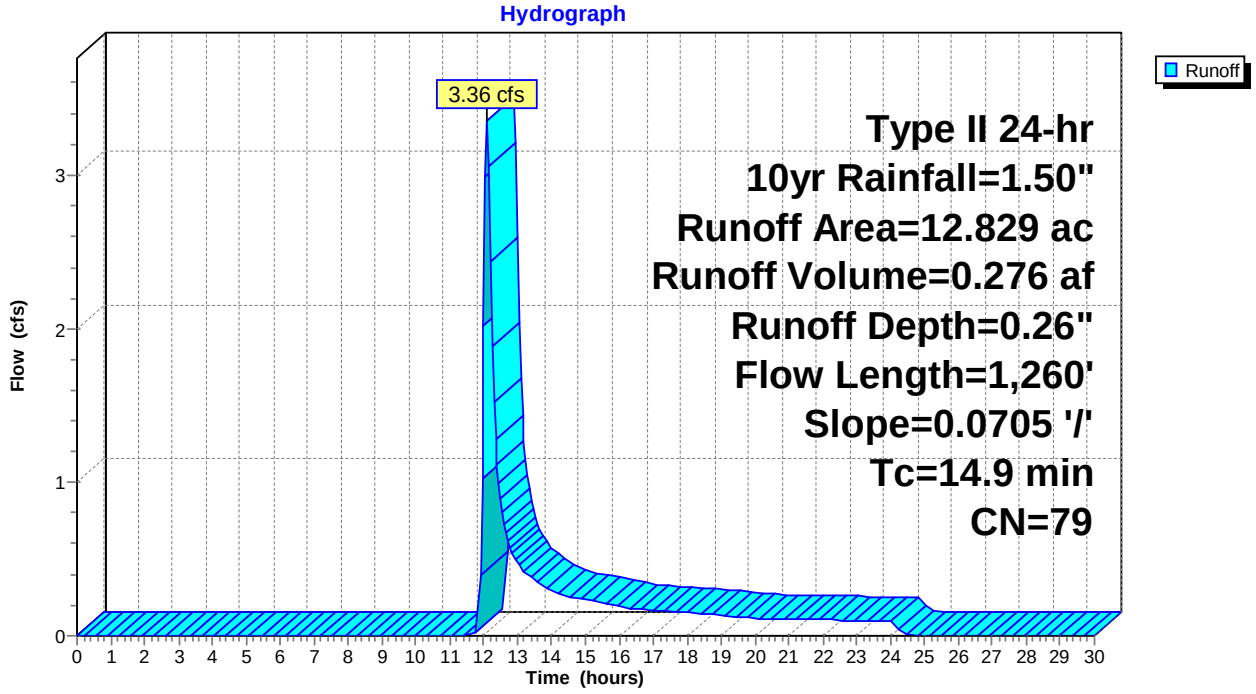
Runoff = 3.36 cfs @ 12.10 hrs, Volume= 0.276 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	12.829	79	
	12.829		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	1,260	0.0705	1.41		**Lag/CN Method,**

Subcatchment 173S: DC-173



Summary for Subcatchment 174S: DC-174

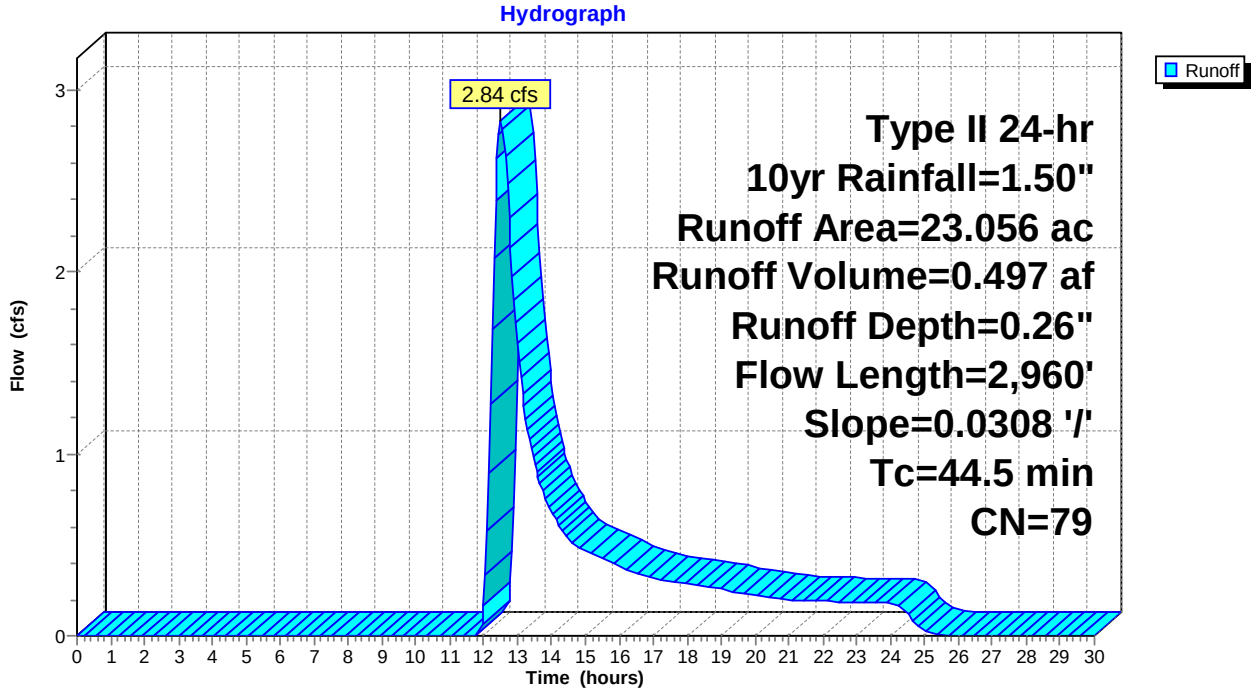
Runoff = 2.84 cfs @ 12.52 hrs, Volume= 0.497 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	23.056	79	
	23.056		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
44.5	2,960	0.0308	1.11		**Lag/CN Method,**

Subcatchment 174S: DC-174



Summary for Subcatchment 175S: DC-175

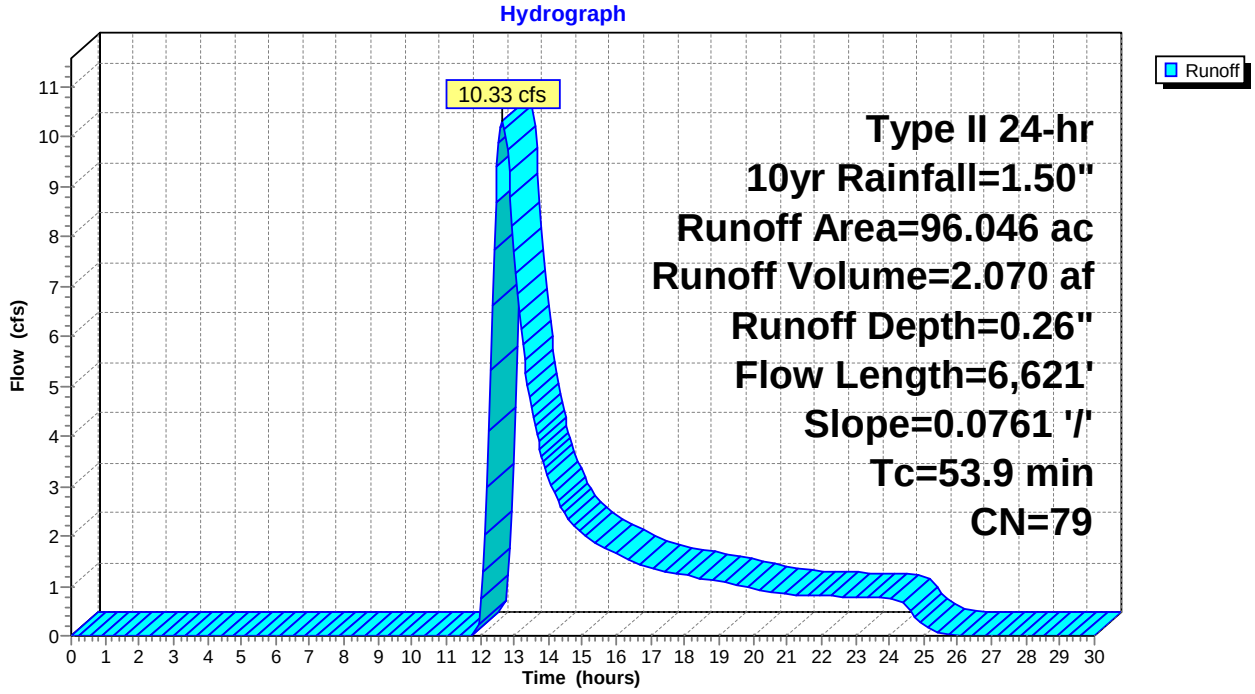
Runoff = 10.33 cfs @ 12.66 hrs, Volume= 2.070 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	96.046	79	
	96.046		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
53.9	6,621	0.0761	2.05		**Lag/CN Method,**

Subcatchment 175S: DC-175



Summary for Subcatchment 176S: DC-176

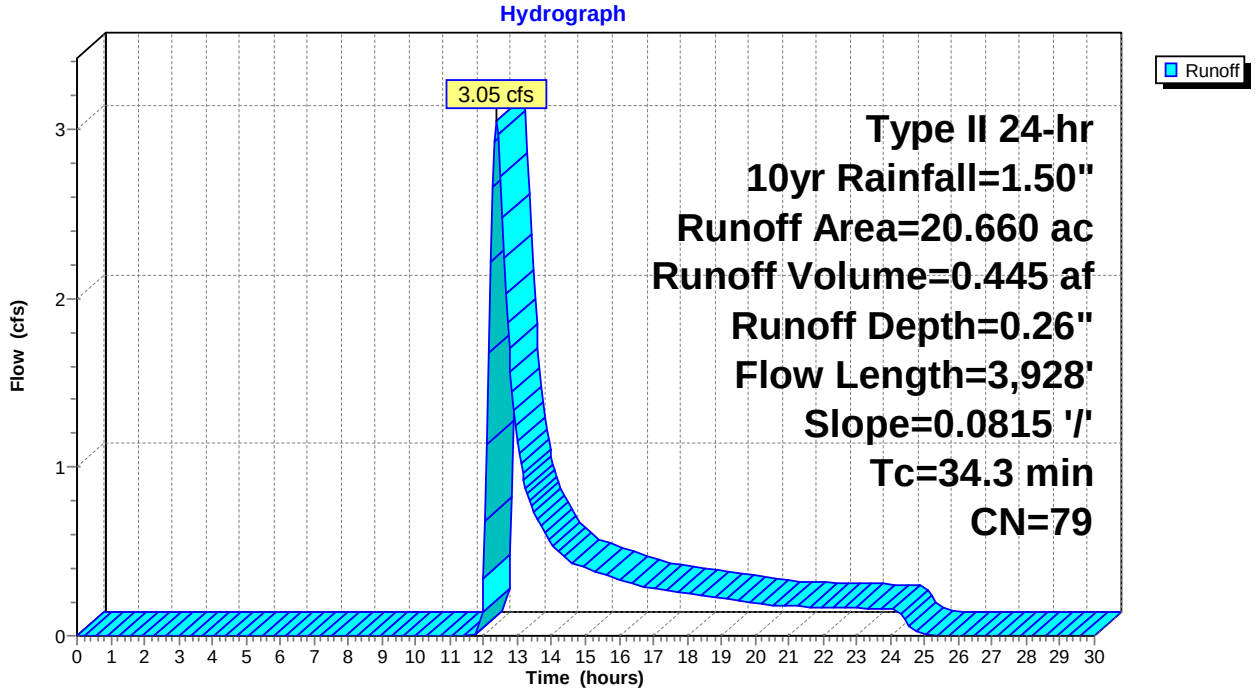
Runoff = 3.05 cfs @ 12.37 hrs, Volume= 0.445 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	20.660	79	
	20.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.3	3,928	0.0815	1.91		**Lag/CN Method,**

Subcatchment 176S: DC-176



Summary for Subcatchment 177S: DC-177

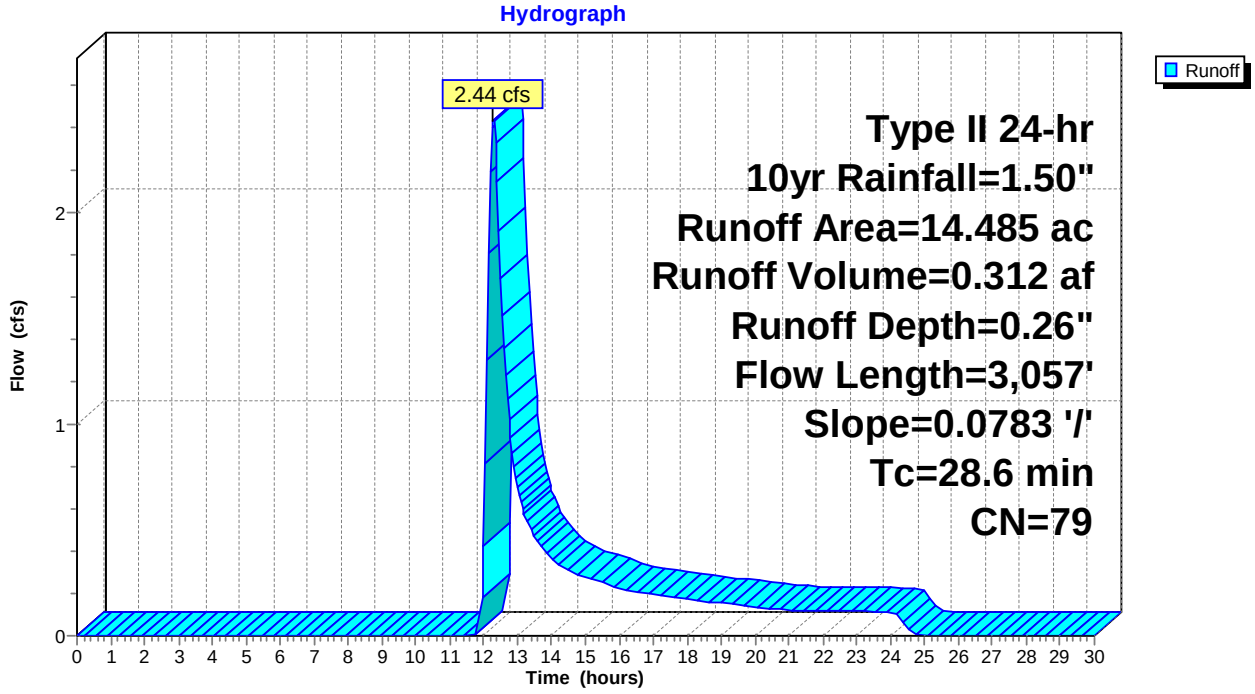
Runoff = 2.44 cfs @ 12.29 hrs, Volume= 0.312 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	14.485	79	
	14.485		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.6	3,057	0.0783	1.78		**Lag/CN Method,**

Subcatchment 177S: DC-177



Summary for Subcatchment 178S: DC-178

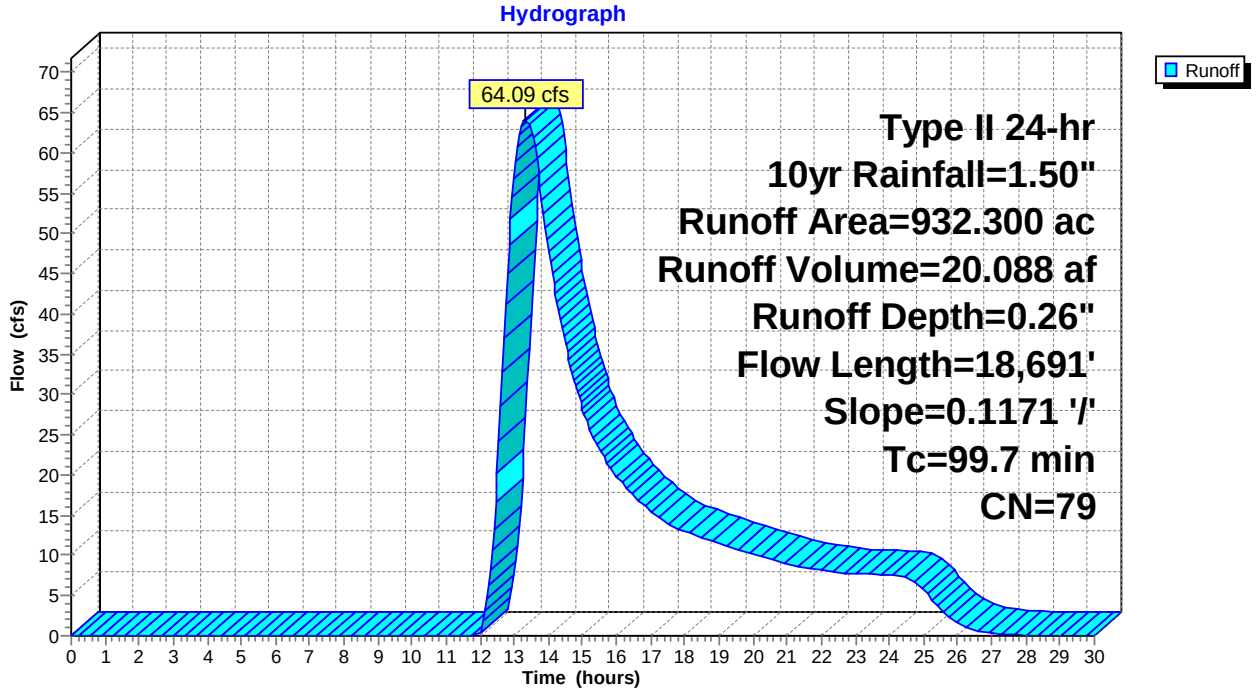
Runoff = 64.09 cfs @ 13.34 hrs, Volume= 20.088 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	932.300	79	
	932.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
99.7	18,691	0.1171	3.13		**Lag/CN Method,**

Subcatchment 178S: DC-178



Summary for Subcatchment 179S: DC-179

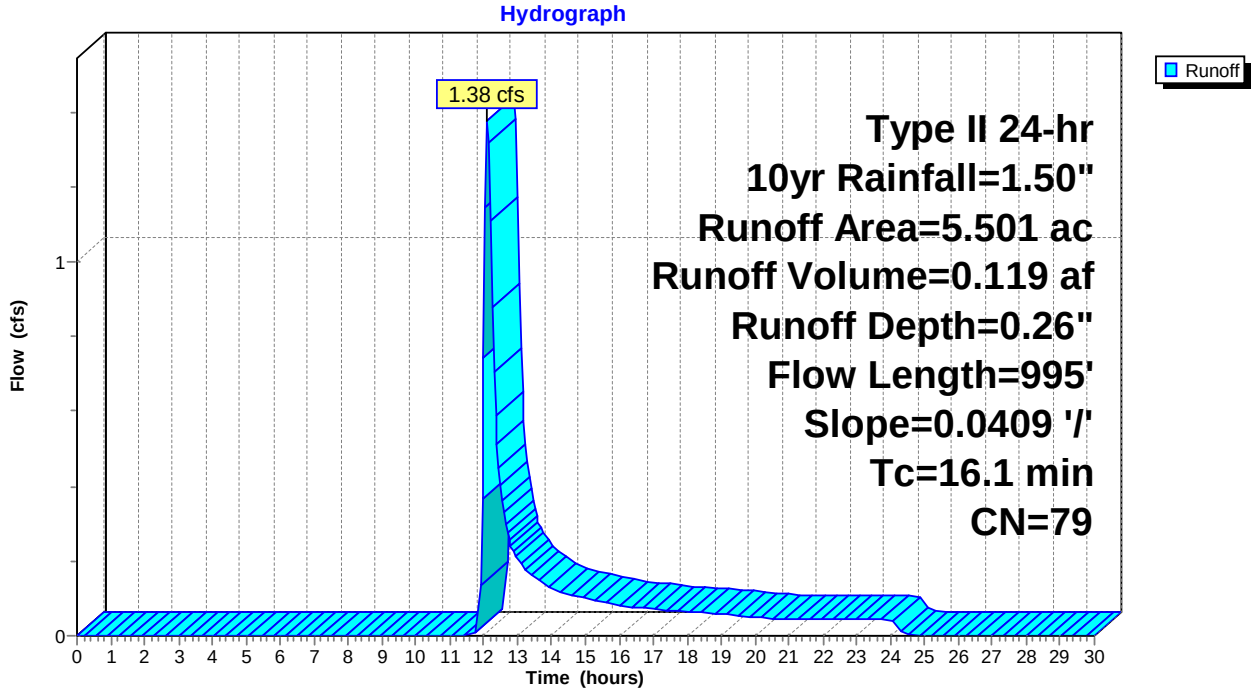
Runoff = 1.38 cfs @ 12.12 hrs, Volume= 0.119 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	5.501	79	
	5.501		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	995	0.0409	1.03		**Lag/CN Method,**

Subcatchment 179S: DC-179



Summary for Subcatchment 180S: DC-180

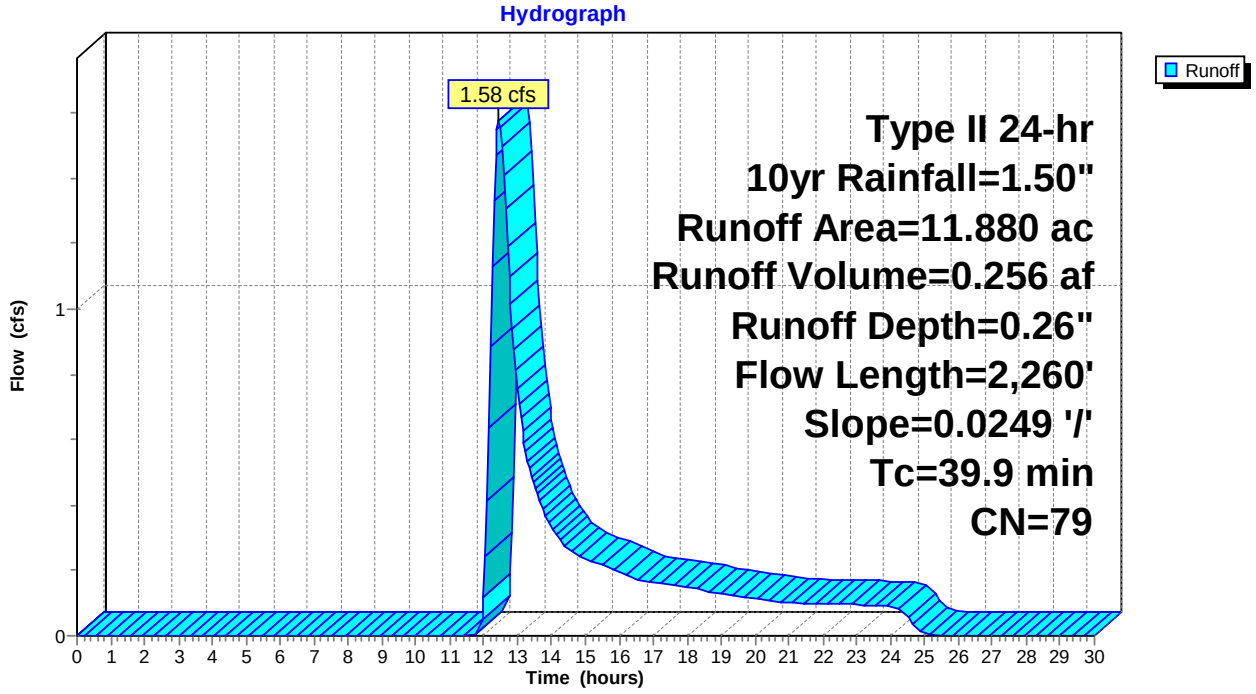
Runoff = 1.58 cfs @ 12.45 hrs, Volume= 0.256 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	11.880	79	
	11.880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.9	2,260	0.0249	0.94		**Lag/CN Method,**

Subcatchment 180S: DC-180



Summary for Subcatchment 181S: DC-181

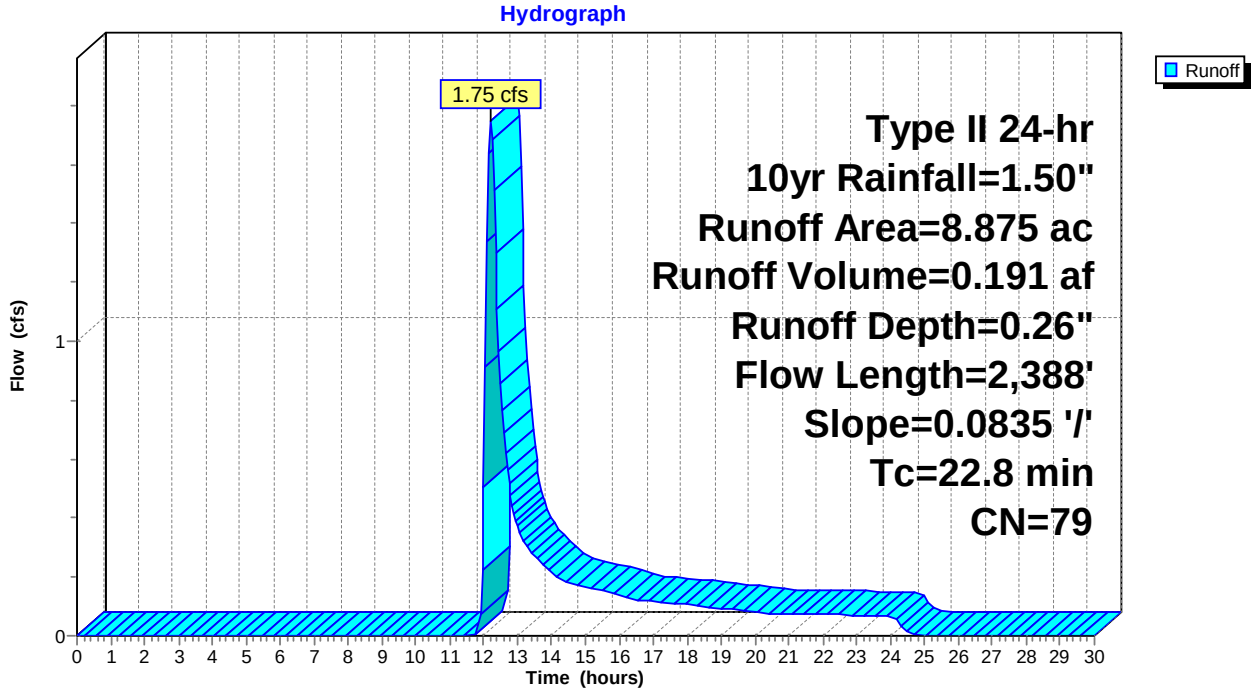
Runoff = 1.75 cfs @ 12.21 hrs, Volume= 0.191 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	8.875	79	
	8.875		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.8	2,388	0.0835	1.75		**Lag/CN Method,**

Subcatchment 181S: DC-181



Summary for Subcatchment 182S: DC-182

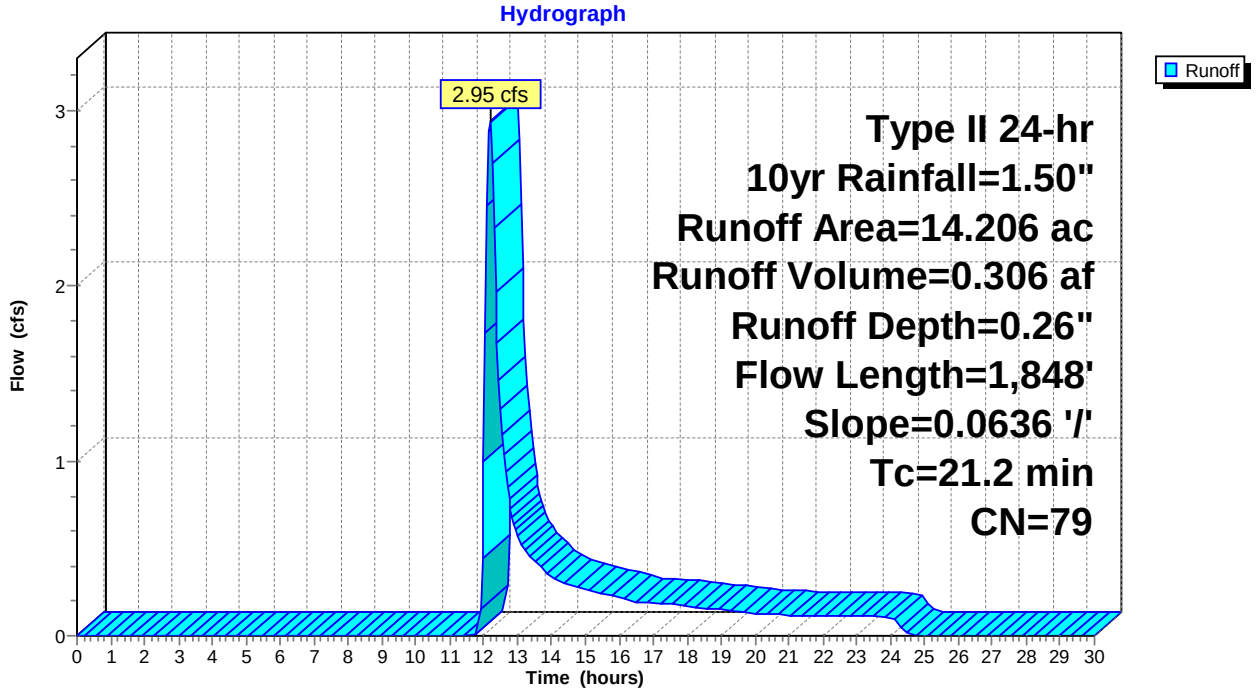
Runoff = 2.95 cfs @ 12.18 hrs, Volume= 0.306 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10yr Rainfall=1.50"

	Area (ac)	CN	Description
*	14.206	79	
	14.206		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.2	1,848	0.0636	1.45		**Lag/CN Method,**

Subcatchment 182S: DC-182



Drainage Crossing Schedule

Crossing ID	10-Year Culvert Diameter (in)	10-Year LWC	10-Year LWC Lengths (ft)	Watershed Area (ac)	10-Year Peak Flow Rate (cfs)
DC-001	1-30"; 2-24"; 3-18"	Standard Duty	50	169.39	21.53
DC-002	1-18"	Standard Duty	50	17.04	2.1
DC-003	1-18"	Standard Duty	50	13.59	1.93
DC-004	1-30"; 2-24"; 4-18"	Standard Duty	50	157.89	23.62
DC-005	1-18"	Standard Duty	50	45.45	4.87
DC-006	1-18"	Standard Duty	50	17.42	2
DC-007	1-84"; 2-60"; 3-54"	Heavy Duty	80	5998.51	262.89
DC-008	1-18"	Standard Duty	50	45.08	4.39
DC-009	1-18"	Standard Duty	50	13.79	1.61
DC-010	1-18"	Standard Duty	50	8.61	1.23
DC-011	1-18"	Standard Duty	50	53.97	4.38
DC-012	1-18"	Standard Duty	50	6.21	1.09
DC-013	1-18"	Standard Duty	50	17.26	1.98
DC-014	1-84"; 2-60"; 3-54"	Heavy Duty	100	6051.36	265.21
DC-015	1-54"; 2-36"; 4-30"	Standard Duty	100	1458.52	82.9
DC-016	1-84"; 2-60"; 3-54"	Heavy Duty	150	6168.95	269.34
DC-017	1-18"	Standard Duty	50	19.91	2.7
DC-018	1-18"	Standard Duty	50	17.01	2.62
DC-019	1-18"	Standard Duty	50	5.69	0.97
DC-020	1-54"; 2-42"; 3-36"	Standard Duty	70	1380.39	87.6
DC-021	1-36"; 2-30"; 3-24"	Standard Duty	50	423.74	34.78
DC-022	1-30"; 2-24"; 3-18"	Standard Duty	50	102.94	18.72
DC-023	1-42"; 2-36"; 3-30"	Standard Duty	50	854.32	56.77
DC-024	1-18"	Standard Duty	50	23.12	3.11
DC-025	1-18"	Standard Duty	50	35.05	5.73
DC-026	1-18"	Standard Duty	50	11.18	2.18
DC-027	1-48"; 2-36"; 3-30"	Standard Duty	50	1463.99	81.23
DC-028	1-24"; 2-18"	Standard Duty	50	115.06	11.77
DC-029	1-18"	Standard Duty	50	16.58	2.23
DC-030	1-30"; 2-24"; 3-18"	Standard Duty	50	245.26	20.79
DC-031	1-30"; 2-24"; 3-18"	Standard Duty	50	247.98	19.63
DC-032	1-18"	Standard Duty	50	30.85	3.65
DC-033	1-18"	Standard Duty	50	18.83	2.59
DC-034	1-48"; 2-36"; 3-30"	Standard Duty	50	1104.04	75.11
DC-035	1-18"	Standard Duty	50	34.99	3.68
DC-036	1-18"	Standard Duty	50	15.69	1.71
DC-037	1-18"	Standard Duty	50	0.84	0.31
DC-038	1-18"	Standard Duty	50	8.11	2.23
DC-039	1-18"	Standard Duty	50	3.20	0.97
DC-040	1-18"	Standard Duty	50	53.41	5.66
DC-041	1-48"; 2-36"; 4-30"	Standard Duty	50	1087.47	82.08
DC-042	1-18"	Standard Duty	50	10.93	1.72
DC-043	1-30"; 2-24"; 4-18"	Standard Duty	50	230.43	23.29
DC-044	1-42"; 2-30"; 3-24"	Standard Duty	100	558.43	43.08
DC-045	1-18"	Standard Duty	50	47.18	5.52
DC-046	1-18"	Standard Duty	50	6.86	1.49
DC-047	1-18"	Standard Duty	50	18.11	3.85
DC-048	1-18"	Standard Duty	50	1.42	0.45
DC-049	1-36"; 2-30"; 3-24"	Standard Duty	50	502.77	42.4
DC-050	1-18"	Standard Duty	50	2.92	0.77
DC-051	1-30"; 2-24"; 4-18"	Standard Duty	50	180.76	23.51

Highlighted cells represent culvert sizes greater than 1-60"

DC-052	1-18"	Standard Duty	50	20.18	3.67
DC-053	1-24"; 2-18"	Standard Duty	50	95.83	14.45
DC-054	1-24"; 2-18"	Standard Duty	50	94.98	15.12
DC-055	1-42"; 2-30"; 3-24"	Standard Duty	75	493.80	44.07
DC-056	1-18"	Standard Duty	50	8.66	3.24
DC-057	1-18"	Standard Duty	50	24.35	3.92
DC-058	1-18"	Standard Duty	50	35.71	4.93
DC-059	1-18"	Standard Duty	50	7.01	1.56
DC-060	1-18"	Standard Duty	50	18.61	3.85
DC-061	1-18"	Standard Duty	50	5.54	1.46
DC-062	1-18"	Standard Duty	50	8.95	2.26
DC-063	1-18"	Standard Duty	50	17.33	2.04
DC-064	1-48"; 2-36"; 3-30"	Standard Duty	50	1166.26	75.05
DC-065	1-18"	Standard Duty	50	61.33	5.05
DC-066	1-48"; 2-36"; 3-30"	Standard Duty	100	1232.71	78.4
DC-067	1-60"; 2-42"; 3-36"	Heavy Duty	150	1703.52	113.45
DC-068	1-18"	Standard Duty	50	1.25	0.46
DC-069	1-18"	Standard Duty	50	22.27	2.13
DC-070	1-18"	Standard Duty	50	5.48	1.31
DC-071	1-18"	Standard Duty	50	19.25	2.06
DC-072	1-60"; 2-42"; 3-36"	Heavy Duty	150	1697.80	118.82
DC-073	1-18"	Standard Duty	50	12.23	1.43
DC-074	1-42"; 2-30"; 3-24"	Standard Duty	50	660.81	46.67
DC-075	1-18"	Standard Duty	50	22.83	2.52
DC-076	1-18"	Standard Duty	50	77.36	7.51
DC-077	1-18"	Standard Duty	50	74.60	7.26
DC-078	1-36"; 2-30"; 3-24"	Standard Duty	50	555.49	42
DC-079	1-24"; 2-18"	Standard Duty	75	89.96	8.33
DC-080	1-18"	Standard Duty	50	12.86	1.9
DC-081	1-60"; 2-48"; 3-36"	Heavy Duty	150	1640.70	121.49
DC-082	1-48"; 2-36"; 3-30"	Heavy Duty	150	855.40	63.34
DC-083	1-48"; 2-36"; 3-30"	Standard Duty	50	781.35	62.39
DC-084	1-18"	Standard Duty	50	53.30	6.25
DC-085	1-42"; 2-30"; 3-24"	Standard Duty	50	534.89	45.71
DC-086	1-18"	Standard Duty	50	44.85	5.83
DC-087	1-18"	Standard Duty	50	7.42	1.33
DC-088	1-48"; 2-36"; 3-30"	Standard Duty	70	918.25	66.87
DC-089	1-18"	Standard Duty	50	9.63	1.59
DC-090	1-48"; 2-36"; 3-30"	Standard Duty	50	721.07	71.94
DC-091	1-18"	Standard Duty	50	37.20	4.3
DC-092	1-18"	Standard Duty	50	71.39	6.5
DC-093	1-18"	Standard Duty	50	48.15	4.87
DC-094	1-18"	Standard Duty	50	3.14	0.64
DC-095	1-18"	Standard Duty	50	65.49	5.83
DC-096	1-18"	Standard Duty	50	14.38	2.42
DC-097	1-24"; 2-18"	Standard Duty	50	136.26	10.86
DC-098	1-48"; 2-36"; 3-30"	Standard Duty	50	746.26	64.37
DC-099	1-48"; 2-36"; 3-30"	Standard Duty	100	946.61	68.94
DC-100	1-18"	Standard Duty	50	8.25	1.57
DC-101	1-18"	Standard Duty	50	32.59	4.1
DC-102	1-18"	Standard Duty	50	34.73	6.09
DC-103	1-42"; 2-36"; 3-30"	Standard Duty	50	683.21	57.53
DC-104	1-18"	Standard Duty	50	9.29	1.74
DC-105	1-18"	Standard Duty	50	12.63	1.96
DC-106	1-18"	Standard Duty	50	9.80	1.67

Highlighted cells represent culvert sizes greater than 1-60"

DC-107	1-36"; 2-30"; 3-24"	Standard Duty	50	353.84	34.24
DC-108	1-30"; 2-24"; 3-18"	Standard Duty	50	160.98	16.8
DC-109	1-18"	Standard Duty	50	10.57	1.98
DC-110	1-18"	Standard Duty	50	6.97	1.6
DC-111	1-48"; 2-36"; 3-30"	Standard Duty	50	831.50	64.4
DC-112	1-18"	Standard Duty	50	53.27	6.03
DC-113	1-18"	Standard Duty	50	43.23	5.41
DC-114	1-42"; 2-30"; 4-24"	Standard Duty	50	614.24	51.45
DC-115	1-18"	Standard Duty	50	14.48	2.53
DC-116	1-18"	Standard Duty	50	54.89	5.9
DC-117	1-18"	Standard Duty	50	14.91	1.98
DC-118	1-18"	Standard Duty	50	15.97	4.72
DC-119	1-42"; 2-36"; 3-30"	Standard Duty	50	613.16	56.69
DC-120	1-18"	Standard Duty	50	4.54	1.18
DC-121	1-24"; 2-18"	Standard Duty	50	57.44	8.23
DC-122	1-18"	Standard Duty	50	7.09	1.62
DC-123	1-18"	Standard Duty	50	20.89	3
DC-124	1-18"	Standard Duty	50	5.92	1.3
DC-125	1-18"	Standard Duty	50	4.47	1.09
DC-126	1-48"; 2-36"; 3-30"	Standard Duty	50	805.10	66.18
DC-127	1-18"	Standard Duty	50	33.29	4.56
DC-128	1-18"	Standard Duty	50	39.54	6.09
DC-129	1-42"; 2-30"; 4-24"	Standard Duty	50	598.03	53.09
DC-130	1-42"; 2-30"; 4-24"	Standard Duty	50	616.78	49.59
DC-131	1-18"	Standard Duty	50	11.11	2
DC-132	1-18"	Standard Duty	50	7.96	1.65
DC-133	1-18"	Standard Duty	50	24.05	3.34
DC-134	1-18"	Standard Duty	50	17.70	3.03
DC-135	1-18"	Standard Duty	50	7.32	1.78
DC-136	1-18"	Standard Duty	50	16.78	2.89
DC-137	1-18"	Standard Duty	50	43.61	4.86
DC-138	1-18"	Standard Duty	50	15.32	3.18
DC-139	1-18"	Standard Duty	50	4.10	1.64
DC-140	1-18"	Standard Duty	50	4.70	1.48
DC-141	1-18"	Standard Duty	50	10.18	2.48
DC-142	1-18"	Standard Duty	50	7.04	1.75
DC-143	1-18"	Standard Duty	50	15.21	2.7
DC-144	1-24"; 2-18"	Standard Duty	50	89.45	8.35
DC-145	1-18"	Standard Duty	50	5.85	1.51
DC-146	1-18"	Standard Duty	50	6.87	1.71
DC-147	1-24"; 2-18"	Standard Duty	50	135.56	11.17
DC-148	1-18"	Standard Duty	50	4.39	1.21
DC-149	1-18"	Standard Duty	50	6.88	1.8
DC-150	1-18"	Standard Duty	50	23.58	3.63
DC-151	1-18"	Standard Duty	50	33.11	5.36
DC-152	1-18"	Standard Duty	50	22.60	3.56
DC-153	1-36"; 2-30"; 3-24"	Standard Duty	50	438.37	38.8
DC-154	1-18"	Standard Duty	50	24.10	4.74
DC-155	1-18"	Standard Duty	50	5.59	1.48
DC-156	1-18"	Standard Duty	50	5.04	1.25
DC-157	1-18"	Standard Duty	50	11.37	2.91
DC-158	1-24"; 2-18"	Standard Duty	50	68.59	8.67
DC-159	1-24"; 2-18"	Standard Duty	50	85.37	9.11
DC-160	1-18"	Standard Duty	50	30.25	4.13
DC-161	1-24"; 2-18"	Standard Duty	50	68.28	8.89

Highlighted cells represent culvert sizes greater than 1-60"

DC-162	1-18"	Standard Duty	50	21.61	4.14
DC-163	1-18"	Standard Duty	50	4.80	1.35
DC-164	1-18"	Standard Duty	50	5.40	1.52
DC-165	1-18"	Standard Duty	50	10.22	2.37
DC-166	1-18"	Standard Duty	50	7.28	2.02
DC-167	1-18"	Standard Duty	50	32.46	5.47
DC-168	1-18"	Standard Duty	50	56.36	6.33
DC-169	1-18"	Standard Duty	50	57.23	6.26
DC-170	1-24"; 2-18"	Standard Duty	50	52.13	9.1
DC-171	1-30"; 2-24"; 4-18"	Standard Duty	50	216.90	26
DC-172	1-18"	Standard Duty	50	21.10	4.53
DC-173	1-18"	Standard Duty	50	12.83	3.36
DC-174	1-18"	Standard Duty	50	23.06	2.84
DC-175	1-24"; 2-18"	Standard Duty	50	96.05	10.33
DC-176	1-18"	Standard Duty	50	20.66	3.05
DC-177	1-18"	Standard Duty	50	14.49	2.44
DC-178	1-48"; 2-36"; 3-30"	Standard Duty	50	932.30	64.09
DC-179	1-18"	Standard Duty	50	5.50	1.38
DC-180	1-18"	Standard Duty	50	11.88	1.58
DC-181	1-18"	Standard Duty	50	8.88	1.75
DC-182	1-18"	Standard Duty	50	14.21	2.95

Highlighted cells represent culvert sizes greater than 1-60"

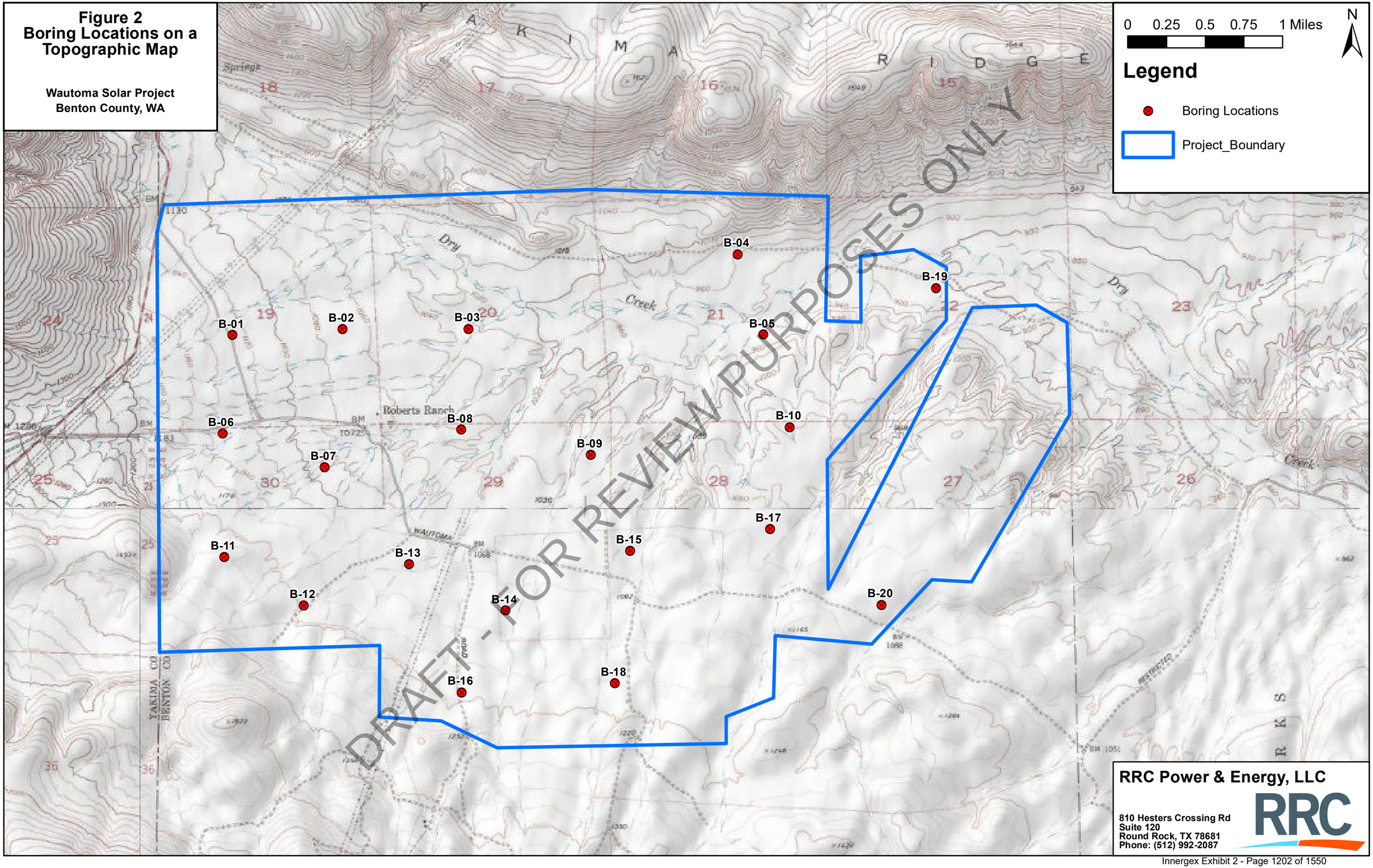
	Culvert Number								
	1	2	3	4	5	6	7	8	9
Min 18	1.44	2.87	4.30	5.73	7.20	8.64	10.08	11.52	12.96
18	7.74	15.48	23.21	30.95	38.70	46.44	54.18	61.92	69.66
24	15.78	31.56	47.33	63.11	78.90	94.68	110.46	126.24	142.02
30	27.25	54.50	81.74	108.99	136.25	163.50	190.75	218.00	245.25
36	42.41	84.82	127.22	169.63	212.05	254.46	296.87	339.28	381.69
42	60.74	121.48	182.21	242.95	303.70	364.44	425.18	485.92	546.66
48	82.60	165.19	247.78	330.37	413.00	495.60	578.20	660.80	743.40
54	108.21	216.42	324.63	432.83	541.05	649.26	757.47	865.68	973.89
60	137.80	275.60	413.39	551.18	689.00	826.80	964.60	1102.40	1240.20
66	171.52	343.03	514.54	686.05	857.60	1029.12	1200.64	1372.16	1543.68
72	209.54	409.07	628.61	838.14	1047.70	1257.24	1466.78	1676.32	1885.86
78	252.06	504.12	756.17	1008.23	1260.30	1512.36	1764.42	2016.48	2268.54
84	299.21	598.42	897.63	1196.83	1496.05	1795.26	2094.47	2393.68	2692.89
90	351.13	702.26	1053.38	1404.51	1755.65	2106.78	2457.91	2809.04	3160.17
96	407.97	815.93	1223.88	1631.85	2039.85	2447.82	2855.79	3263.76	3671.73
102	469.86	939.70	1409.57	1879.42	2349.30	2819.16	3289.02	3758.88	4228.74
108	536.95	1073.90	1610.84	2147.79	2684.75	3221.70	3758.65	4295.60	4832.55
114	609.38	1218.74	1828.13	2437.49	3046.90	3656.28	4265.66	4875.04	5484.42
120	687.28	1374.55	2061.83	2749.10	3436.40	4123.68	4810.96	5498.24	6185.52

Appendix F

Geotechnical Report

Figure 2
Boring Locations on a Topographic Map

Wautoma Solar Project
Benton County, WA



RRC Power & Energy, LLC

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Phone: (512) 992-2087

LOG OF BORING B-01

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052
DATE(S) DRILLED: 10/25/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													8 in. Topsoil
	1												SILT (ML), with Gravel, brown, stiff to hard, dry to moist
	2		N = 14	3									
	3												
	4												
	5		N = 83/11"	3									
	6												
	7												
	8		N = 50/3"										
	9												
	10		N = 42										
	11												
	12		N = 50/2"										
													Total Depth = 12.5 ft.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.510995, Long. -119.867412
Auger Refusal at 12.5 ft.

DRAFT - FOR REVIEW PURPOSES ONLY

RENEWABLE LOG - LOG A GNNL01.GDT - 11/23/21 17:33 - R:\OPERATIONS\OP2\02 DESIGN\GEOTECHNICAL\G DRIVE\GINT\PROJECTS\2021\WAUTOMA SOLAR-GE2110052\WAUTOMA SOLAR-GE2110052.GPJ

LOG OF BORING B-02

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052
DATE(S) DRILLED: 10/25/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													8 in. Topsoil
	1												SILT (ML), with Gravel, brown, very stiff to hard, dry to moist
	2		N = 30										
	3												
	4												
	5		N = 45										
	6												
	7												
	8		N = 29										
	9												
	10		N = 38										
	11												
	12		N = 50/3"										
													Total Depth = 12.5 ft.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.511383, Long. -119.857110
Auger Refusal at 12.5 ft.

DRAFT - FOR REVIEW PURPOSES ONLY

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LOG OF BORING B-03

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052
DATE(S) DRILLED: 10/25/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													1 ft. Topsoil
	1												SILT (ML), trace Sand, brown, stiff to hard, dry to moist, trace roots
	2		N = 13	7									
	3												
	4												Roots grade out
	5		N = 26										
	6												
	7												
	8		N = 32	7									
	9												
	10		N = 30										
	11												
	12												SILTY GRAVEL (GM), brown, dense to very dense, dry to moist, fine grained
	13		N = 48										
	14												
	15		N = 53										
													Total Depth = 15.5 ft.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.511393, Long. -119.845316

DRAFT - FOR REVIEW PURPOSES ONLY

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LOG OF BORING B-04

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052
DATE(S) DRILLED: 10/26/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													1 ft. Topsoil
	1												SILTY SAND (SM), light brown, soft to hard, dry to moist
	2		N = 5	6	NP	NP	NP					36	
	3												
	4												
	5		N = 23	9									
	6												
	7												
	8		N = 18										
	9												
	10		N = 25										
	11												
	12												
	13		N = 39										
	14												
	15		N = 52										
													Total Depth = 15.5 ft.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.516197, Long. -119.820139

DRAFT - FOR REVIEW PURPOSES ONLY

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LOG OF BORING B-05

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052
DATE(S) DRILLED: 10/26/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													1 ft. Topsoil
	1												SILT (ML), trace Sand, light brown, medium stiff to hard, dry to moist
	2		N = 8										
	3												
	4												Grading with Sand
	5		N = 4	8	NP	NP	NP					74	
	6												
	7												
	8		N = 21	6									
	9												Grading trace Gravel
	10		N = 50/5"										
	11												
	12												
			N = 50/6"										SILTY GRAVEL (GM), brown, very dense, dry to moist, medium grained
													Total Depth = 12.5 ft.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.511022, Long. -119.817713
Auger Refusal at 12.5 ft.

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LOG OF BORING B-06

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052
DATE(S) DRILLED: 10/26/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													1 ft. Topsoil
	1												SILT (ML), trace Sand, light brown, very stiff to hard, dry to moist
	2		N = 17										
	3												
	4												Grading trace Gravel
	5		N = 55										
	6												
	7		N = 50/5"										Grading with Gravel, brown
													Total Depth = 7.5 ft.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.504646, Long. -119.868338
Auger Refusal at 7.5 ft.

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LOG OF BORING B-07

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052
DATE(S) DRILLED: 10/26/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													1 ft. Topsoil
	1												
	2		N = 4	7									SILT (ML), trace Sand, light brown, soft to very stiff, dry to moist
	3												
	4												Grading trace Gravel
	5		N = 20										
	6												
	7												SILTY SAND (SM), trace Gravel, brown, very dense, dry to moist, fine grained
	8		N = 50/3"										
	9												
	10		N = 55	6									
													Total Depth = 10.5 ft.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.502490, Long. -119.858760
Auger Refusal at 10.5 ft.

DRAFT - FOR REVIEW PURPOSES ONLY

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LOG OF BORING B-08

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052
DATE(S) DRILLED: 10/26/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													1 ft. Topsoil
	1												SILT (ML), trace Sand, brown, stiff to very stiff, dry to moist
	2		N = 9										
	3												
	4												
	5		N = 18										
	6												
	7												
	8		N = 14										
	9												
	10		N = 17										
	11												
	12												
	13		N = 14										
	14												
	15		N = 15										
													Total Depth = 15.5 ft.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.505053, Long. -119.845929

DRAFT - FOR REVIEW PURPOSES ONLY

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LOG OF BORING B-09

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052
DATE(S) DRILLED: 10/27/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													1 ft. Topsoil
	1												SILT (ML), trace Sand, light brown, stiff to hard, dry to moist
	2		N = 9	8									
	3												
	4												
	5		N = 21	7									
	6												
	7												
	8		N = 11	8									
	9												
	10		N = 14										
	11												
	12												
	13		N = 25	11									
	14												
	15		N = 35										
													Total Depth = 15.5 ft.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.503270, Long. -119.833846

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LOG OF BORING B-10

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052
DATE(S) DRILLED: 10/27/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													1 ft. Topsoil
	1												SILT (ML), trace Sand, light brown, stiff to hard, dry to moist
	2		N = 15										
	3												
	4												
	5		N = 25										
	6												
	7												Grading with Gravel, brown
	8		N = 83										
													Total Depth = 8.5 ft.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.505070, Long. -119.815266
Auger Refusal at 8.5 ft.

DRAFT - FOR REVIEW PURPOSES ONLY

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LOG OF BORING B-11

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052
DATE(S) DRILLED: 10/28/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													6 in. Topsoil
	1												SILT (ML), with Gravel, light brown, hard, dry to moist
	2		N = 81										
	3												
	4												
	5		N = 69										
	6												
	7												
	8		N = 94/8"										
													Total Depth = 8.5 ft.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.496697, Long. -119.868162
Auger Refusal at 8.5 ft.

DRAFT - FOR REVIEW PURPOSES ONLY

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LOG OF BORING B-12

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052
DATE(S) DRILLED: 10/28/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													6 in. Topsoil
	1												SILT (ML), trace Sand, light brown, stiff to hard, dry to moist
	2		N = 12	4									
	3												
	4												
	5		N = 31	4									
	6												
	7												Grading with Gravel
	8		N = 80/11"										
													Total Depth = 8.5 ft.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.493569, Long. -119.860740
Auger Refusal at 8.5 ft.

DRAFT - FOR REVIEW PURPOSES ONLY

RENEWABLE LOG - LOG A GNNL01.GDT - 11/23/21 17:33 - R:\OPERATIONS\OP2\02 DESIGN\GEOTECHNICAL\G DRIVE\GINT\PROJECTS\2021\WAUTOMA SOLAR-GE2110052\WAUTOMA SOLAR-GE2110052.GPJ

LOG OF BORING B-13

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052
DATE(S) DRILLED: 10/28/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													5 in. Topsoil
	1												SILT (ML), trace Sand, light brown, very stiff to hard, dry to moist
	2		N = 36										
	3												
	4												Grading with Gravel
	5		N = 22										
													Total Depth = 5.5 ft.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.496232, Long. -119.850880
Auger Refusal at 5.5 ft.

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RENEWABLE LOG - LOG A GNNL01.GDT - 11/23/21 17:33 - R:\OPERATIONS\OP2\02 DESIGN\GEOTECHNICAL\G DRIVE\GINT\PROJECTS\2021\WAUTOMA SOLAR-GE2110052\WAUTOMA SOLAR-GE2110052.GPJ

LOG OF BORING B-14

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052

DATE(S) DRILLED: 10/27/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													1 ft. Topsoil
	1												
	2		N = 7	7	NP	NP	NP					62	SANDY SILT (ML), with Gravel, light brown, medium stiff to hard, dry to moist
	3												
	4												
	5		N = 9										
	6												
	7												
	8		N = 16	7									
	9												
	10		N = 17										
	11												
	12												
	13		N = 32										
	14												
	15		N = 51										
													Total Depth = 15.5 ft.

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N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.493063, Long. -119.841913

RENEWABLE LOG - LOG A GNNL01.GDT - 11/23/21 17:33 - R:\OPERATIONS\OP2\02 DESIGN\GEOTECHNICAL\G DRIVE\GINT\PROJECTS\2021\WAUTOMA SOLAR-GE2110052\WAUTOMA SOLAR-GE2110052.GPJ

LOG OF BORING B-15

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052
DATE(S) DRILLED: 10/27/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													1 ft. Topsoil
	1												
	2		N = 5	9									SILT (ML), trace Sand, light brown, medium stiff to hard, dry to moist
	3												
	4												
	5		N = 8	6									
	6												
	7												Grading with Gravel
	8		N = 71										
	9												
	10		N = 50/6"										
	11												
	12												
	13		N = 44										
	14												
	15		N = 52										
													Total Depth = 15.5 ft.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.497007, Long. -119.829622

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LOG OF BORING B-16

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052
DATE(S) DRILLED: 10/27/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													1 ft. Topsoil
	1												SILT (ML), trace Sand, light brown, medium stiff to stiff, dry to moist
	2		N = 9	6									
	3												
	4												Grading trace Gravel
	5		N = 6										
	6												
	7												SILTY SAND (SM), light brown, loose to very dense, dry to moist, fine grained
	8		N = 7	6	NP	NP	NP					46	
	9												Grading with Gravel, brown
	10		N = 20	4									
	11												
	12												
	13		N = 68										
	14		N = 50/6"										
													Total Depth = 14.5 ft.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.487972, Long. -119.845966

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LOG OF BORING B-17

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052
DATE(S) DRILLED: 10/27/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													1 ft. Topsoil
	1												SILT (ML), trace Sand, light brown, stiff to hard, dry to moist
	2		N = 15										
	3												
	4												
	5		N = 10										
	6												
	7												
	8		N = 20										
	9												Grading trace Gravel
	10		N = 32										
	11												
	12												
	13		N = 19										
	14												
	15		N = 41										
													Total Depth = 15.5 ft.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.498500, Long. -119.817108

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LOG OF BORING B-18

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052
DATE(S) DRILLED: 10/27/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													10 in. Topsoil
	1												SILT (ML), with Gravel, brown, very stiff to hard, dry to moist
	2		N = 18										
	3												
	4												
	5		N = 28										
	6												
	7												
	8		N = 31										
	9												
	10		N = 21										
	11												
	12												
	13		N = 44										
	14												
	15		N = 57										
													Total Depth = 15.5 ft.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.488571, Long. -119.831616

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LOG OF BORING B-19

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052
DATE(S) DRILLED: 10/28/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

FIELD DATA				LABORATORY DATA									
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	 PLASTIC LIMIT PL	 PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													6 in. Topsoil
	1												SILT (ML), trace Sand, light brown, stiff to hard, dry to moist
	2		N = 13	5									
	3												
	4												Grading with Gravel
	5		N = 23	4									
	6												
	7												
	8		N = 16										
	9												
	10		N = 50/6"										Total Depth = 10 ft.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.514033, Long. -119.801567
Auger Refusal at 10.5 ft.

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LOG OF BORING B-20

RRC Power & Energy, LLC
810 Hesters Crossing Rd, Suite 120
Round Rock, TX 78681
Telephone: (512) 992-2087

CLIENT: Innergex Renewables US, LLC
PROJECT: Wautoma Solar
LOCATION: Benton County, Washington
NUMBER: GE2110052
DATE(S) DRILLED: 10/28/2021

DRILLING METHOD(S):
Hollow Stem Auger

GROUNDWATER INFORMATION:
Groundwater not encountered during or immediately after drilling

SURFACE ELEVATION (FT):

SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT LL	ATTERBERG LIMITS PLASTIC LIMIT PL	ATTERBERG LIMITS PLASTICITY INDEX PI	DRY DENSITY POUNDS/CU.FT	COMPRESSIVE STRENGTH (TONS/SQ. FT)	STRAIN AT FAILURE (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)	DESCRIPTION OF STRATUM
													8 in. Topsoil
	1												SILT (ML), with Sand, light brown, medium stiff to hard, dry to moist
	2		N = 5	5	NP	NP	NP					74	
	3												
	4												Grading with Gravel
	5		N = 89/11"	7									
													Total Depth = 5.5 ft.

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
R - ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

REMARKS:
GPS COORDINATES: Lat. 46.493615, Long. -119.806662
Auger Refusal at 5.5 ft.

DRAFT - FOR REVIEW PURPOSES ONLY

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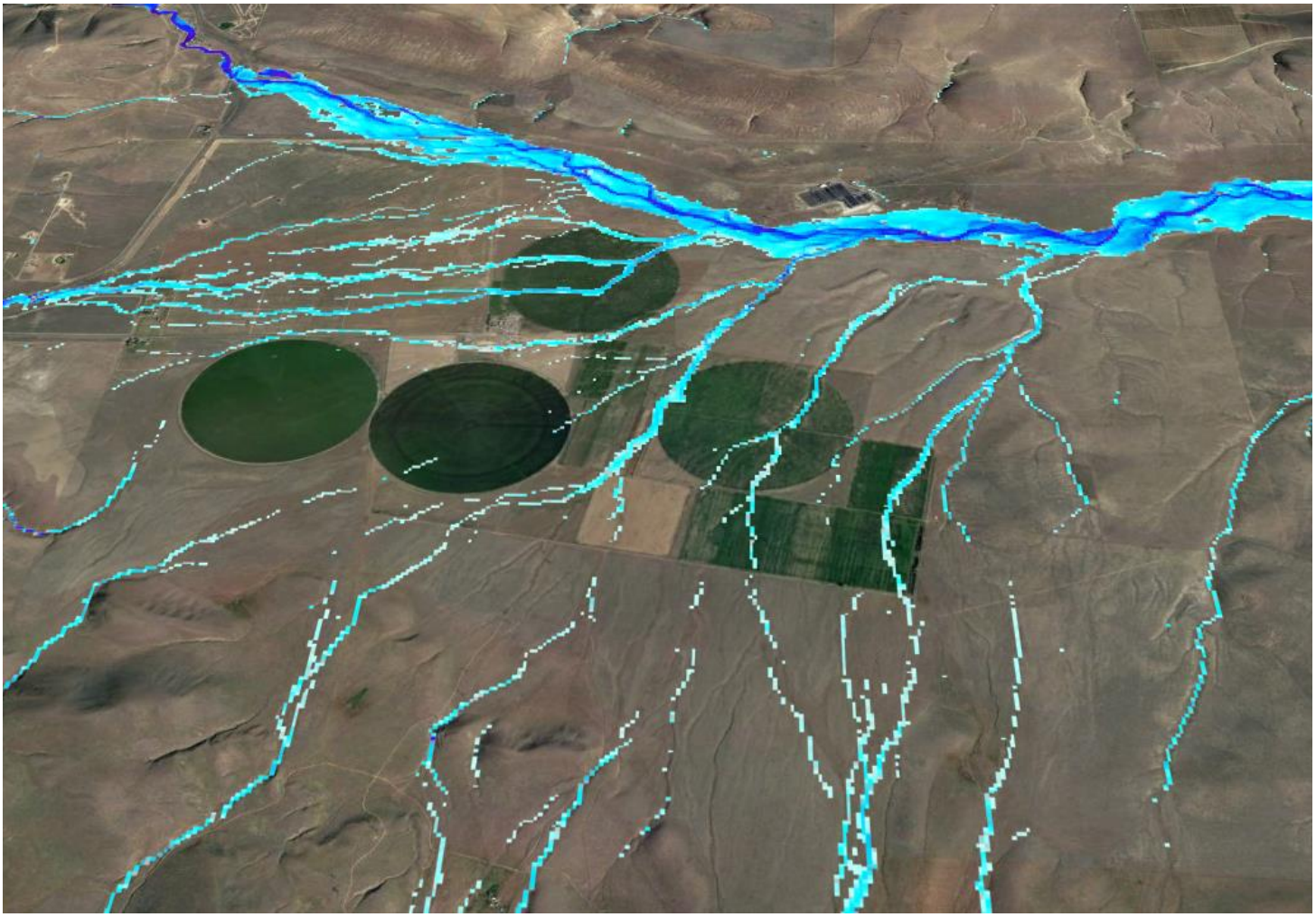
ATTACHMENT K: PRELIMINARY HYDROLOGY STUDY



PRELIMINARY HYDROLOGY STUDY

Wautoma Solar Project

Benton County, Washington

DECEMBER 9, 2021

PREPARED FOR:

INNERGEX

PREPARED BY:

Westwood

Westwood

Preliminary Hydrology Study

Wautoma Solar Project

Benton County, Washington

Prepared For:

Innergex Renewable Energy
1225, rue Saint-Charles Ouest
10e étage, Longueuil (Québec) J4K 0B9

Prepared By:

Westwood
12701 Whitewater Drive, Suite 300
Minnetonka, MN 55343
(952) 937-5150

Project Number: R0033629.00
Date: December 9, 2021

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Exhibits

Exhibit 1: Location Map
Exhibit 2: Base Hydrologic Map
Exhibit 3: Soils Map
Exhibit 4: Landcover Map
Exhibit 5: Curve Number and Topographic Source Map
Exhibit 6: 100-Year Max Flood Depth Map
Exhibit 6a: 100-Year Max Flood Depth Project Area Map
Exhibit 7: 100-Year Peak Velocity Map
Exhibit 7a: 100-Year Peak Velocity Project Area Map
Exhibit 8: 100-Year Scour Map

Appendices

Appendix A: NOAA Atlas 2 Precipitation Data
Appendix B: Curve Number Table
Appendix C: FEMA Flood Insurance Rate Map (FIRM)

Executive Summary

The purpose of this study is to analyze and review the existing hydrology of the Wautoma Solar Project (Project or Site) and any impacts that the hydrology may play in the design of the proposed solar array. This report was prepared to be used by the Project team in the design and layout of the Project and not intended for submittal to reviewing agencies for stormwater permitting.

The Site is proposed on approximately 4,875 acres and is located approximately 30 miles northwest of the city of Richland in Benton County, Washington. The Site is located on varying terrain that generally slopes to the north in the southern portion and east in the northern portion. The modeled watershed area encompasses approximately 101 square miles and generally slopes east.

The analysis shows low to moderate water depths and velocities (Exhibits 6 through 7A) across the majority of the site. Higher flood depths exist within Dry Creek and its surrounding areas located within and adjacent to the site. Minimal scour is expected onsite except within and adjacent to Dry Creek.

Based on experience with similar projects, the majority of the site is suitable for the planned development by avoiding or designing to areas of high flood depths.

1.0 Data Sources

Table 1 – Data Sources

Task	Format	Source	Use
Elevation	1-meter LiDAR data 10-meter DEM data	USGS USGS	FLO-2D Model Elevations
Crop Data	Shapefile	USDA 2013 Crop Data Layer	Landcover
Soils	Shapefile	USGS SSURGO Dataset	Curve Numbers
Precipitation	PDF File	Atlas 2	Design Storms
HUC-12 Drainage Boundary	Shapefile	USGS	Define Model Extents
Site Boundary	KMZ	Innergex Renewable Energy	Define Model Extents
2014 Aerial Photography	ArcGIS Map Service	USDA FSA	Reference
FEMA Flood Zones	PDF	FEMA	Reference
Culvert Locating and Sizing	Aerial Imagery	Google Earth	Culvert Modeling

2.0 Coordinate System

Table 2 – Coordinate System Used

Projection	State Plane Coordinate System
Zone	Washington South (FIPS 4602)
Datum	NAD83
Planar Units	Feet (U.S. Survey)

3.0 Existing Conditions

3.1 Project Location

The Site is approximately 4,875 acres and is located within Benton County, Washington (Exhibit 1). The Project Site is located approximately 30 miles northwest of Richland, Washington, which is the closest city to the Project (Exhibit 1).

3.2 Watershed Hydrology

The modeled watershed area encompasses approximately 101 square miles that generally slopes to the east following Dry Creek. Dry Creek is a non-perennial stream that flows east through the northern portion of the Site and through the central portion of the modeled watershed.

3.3 Onsite Conditions

The Project is located within the valley that contains Dry Creek. The southern portion of the Site drains north along several concentrated flow paths towards Dry Creek. The northern portion of the Site drains east following Dry Creek. A small part of the eastern portion of the Project drains east. In general, the Site is on semi-flat terrain with slopes of less than 3%, although there are locations where the slopes reach roughly 10%.

US Fish and Wildlife Service National Wetlands Inventory (NWI Wetlands) provides information on the distribution of US wetlands and are shown in Exhibit 2. The NWI Wetlands dataset is not all-inclusive and other wetlands not shown may exist. The landcover on the Project area is primarily shrubland, pasture, and cropland (Exhibit 4), and the soils onsite primarily belong to Hydrologic Soil Groups A and B (Exhibit 3). Typically, A soils are Sands and B soils are Silty Sands.

The main potential hydrologic issues on Site are flooding and erosive velocities.

3.4 FEMA Flood Zones

FEMA has completed a study to determine flood hazards for part of the selected location; the Project area is covered by Flood Insurance Rate Map (FIRM) panels 5302370125B and 5302370250B (Appendix C). FIRM 5302370125B has been digitized and the flood zones can be seen in Exhibits 2 and 6-8. The flood hazards for the area within FIRM 5302370250B have not been studied. The Project contains areas of FEMA Zone A flood hazards surrounding Dry Creek (Exhibits 2 and 6-8). A FEMA Zone A flood hazard is a 100-year flood hazard with no defined base flood elevations. No preliminary or pending FEMA changes are proposed within the Project area.

4.0 Proposed Conditions

4.1 Proposed Conditions

The majority of the proposed solar facility will consist of above ground mounted solar modules. A climate-specific grass seed mix should be planted below the modules and would make up the majority of the land cover. A small amount of impervious surface will be added from the gravel access roads and electrical equipment pads. The Project should be designed to minimize grading and maintain existing drainage patterns. A flood analysis of pre-development and post development depths will need to be completed once civil design is finalized for permitting purposes.

4.2 Post-Construction Stormwater Management

Benton County has adopted the Washington Department of Ecology Stormwater Management Manual for Eastern Washington (SWMMEW) as their basis of design and review. In compliance with SWMMEW, the proposed development will require storage onsite for any increase in runoff for the 100-year, 24-hour storm. The basin design for any required storage will also follow the requirements outlined in the SWMMEW. As the project design advances, the post-construction stormwater management should be reviewed in further detail with the County Engineer.

5.0 FLO-2D Modeling

5.1 FLO-2D Modeling Overview

FLO-2D is a physical process model that routes rainfall runoff and flood hydrographs over flow surfaces or in channels using the dynamic wave approximation to the momentum equation. FLO-2D offers advantages over 1-D models and unit hydrograph methods by allowing for breakout flows and visualization of flows across a potential site. The primary inputs are a DTM (elevation data), curve numbers, and precipitation. No culverts were included in the model; all roadways and berms were assumed to overtop.

A FLO-2D model with 50-foot grid cells was utilized to model the watershed within and directly impacting the Site.

5.2 Elevation Data

The elevation data input into the FLO-2D model was a blend of 1-meter LiDAR data from USGS and 10-meter DEM data from USGS (Exhibit 5). The 1-meter LiDAR data was used for topographic coverage of the eastern portion of the modeled watershed, including onsite areas, and the 10-meter DEM data was used for topographic coverage of the western portion of the contributing watershed

(Exhibit 5). This data was incorporated into the DTM using the export to XYZ function in Global Mapper. These XYZ files are read directly into FLO-2D.

5.3 Watershed Soils and Land Cover

USDA-NRCS SSURGO soil data provides soil types within the Project boundary and full coverage of the contributing watershed. Soils are primarily classified as Hydrologic Soil Groups A and B within the Project boundary (Exhibit 3). Land cover was obtained from the USDA 2013 Crop Data Layer. Exhibit 4 displays the land cover classes for the entire watershed. Curve numbers were applied to each grid cell in the FLO-2D model based on intersecting the grid with the curve numbers (Exhibit 5).

5.4 Precipitation

Precipitation data was downloaded from NOAA Atlas 2 (Appendix A) and used for the FLO-2D analysis for the 100-Year, 24-Hour storm event. Using the 100-Year rainfall depth of 2.29 inches for this location allows for the best initial analysis in order to determine the worst areas of flooding and erosion. Rainfall inputs were distributed based on a SCS Type II distribution pattern.

6.0 Flood Analysis Results

6.1 Existing Conditions Flood Analysis

The analysis shows low to moderate water depths and velocities (Exhibits 6 through 7A) across the majority of the Site. During a 100-year storm, the flood depths across the majority of the Project area are less than 0.5 feet with velocities less than 1 foot/second, with the exception of within and adjacent to Dry Creek where the depths can reach as high as 6 feet. Several concentrated flow paths in the southern portion of the Site have higher flood depths but are generally less than 2.5 feet. See Table 3 below for a breakdown of flood depths within the Project.

Table 3 – Flood Depths Onsite

Peak Flow Depth (ft)	Percentage of Project Area
0.00 - 0.49	89.6%
0.50 - 1.00	4.6%
1.01 - 1.50	2.4%
1.51 - 2.00	1.4%
2.01 - 2.50	0.7%
2.51 - 3.00	0.5%
3.01 - 4.00	0.6%
4.01 - 6.00	0.2%
6.01+	0.0%

See Exhibits 6 through 7A for areas within the Project with higher flood depths and velocities.

6.2 Scour

Minimal scour is expected onsite except within and adjacent to Dry Creek (Exhibit 8). The scour depths calculated for this project are based on HEC-18 Pier Scour Equations of a 6-inch-wide pile perpendicular to flow. Scour calculations consist of local scour only with unarmored soils and pile bases to provide the conservative local scour results. These scour results do not account for general, rill, or gully scour.

7.0 Recommendations

Based on experience on similar projects, the Site is suitable for the planned development and hydrologic concerns can be addressed by either avoiding areas of high flood depths or through detailed engineering design.

8.0 Next Steps

1. Final engineering design should account for the flood depths and velocities presented in Exhibits 6-7A.
2. Facilities to be elevated 1' above the 100-year, 24-hour peak flood elevations.
3. Proposed facilities should avoid FEMA Flood Zones located onsite.
4. Stormwater management should be revisited to ensure the final design meets the local and state requirements.

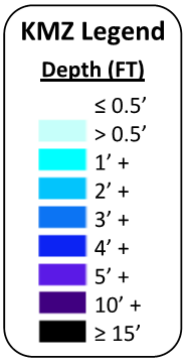
9.0 Included Output Files

1. Shapefile of 100-Year Rain Event Flow Depth
   2021-11-24_Wautoma_100YearFlowDepth.shp
   Attribute "ID" = Grid Cell Number
   Attribute "VAR" = Max Flow Depth (Feet)

2. KMZ of 100-Year Rain Event Flow Depth
   2021-11-24_Wautoma_100YearFlowDepth.kmz
   Overlay in Google Earth for graphical representation.

3. Shapefile of 100-Year Rain Event Velocity
   2021-11-24_Wautoma_100YearVelocity.shp
   Attribute "ID" = Grid Cell Number
   Attribute "VAR" = Max Velocity (Feet)

4. KMZ of 100-Year Rain Event Velocity
   2021-11-24_Wautoma_100YearVelocity.kmz
   Overlay in Google Earth for graphical representation.



10.0 References Cited

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Exhibits

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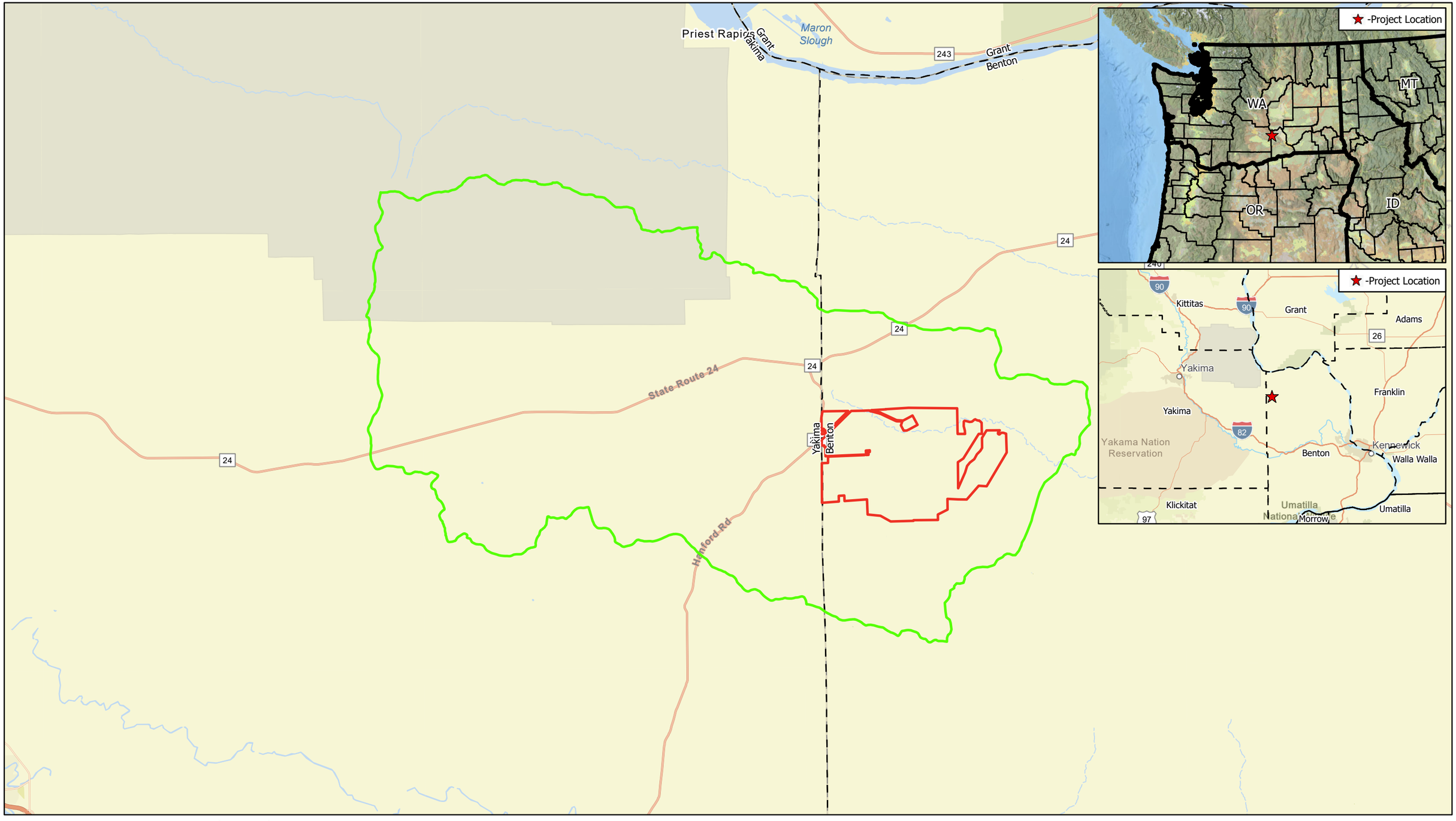

Data Source(s): Westwood (2021); Esri WMS Basemap Imagery (Accessed 2021); USGS (2021); FEMA (2021); USDA (2021)

Legend

- Project Boundary
- County Boundary
- FLO-2D Boundary

Westwood
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N

0 Miles 2

Wautoma Solar Project

Benton County, Washington

Exhibit 1: Location Map

December 7, 2021

N:\0033629.00_GIS_Working\Hydro Exhibits\2021-12-06 Hydro 1-5\Wautoma Solar Project\Wautoma Solar Project.aprx
Location Map - Location Map | 12/7/2021 4:29 PM | KLWalter

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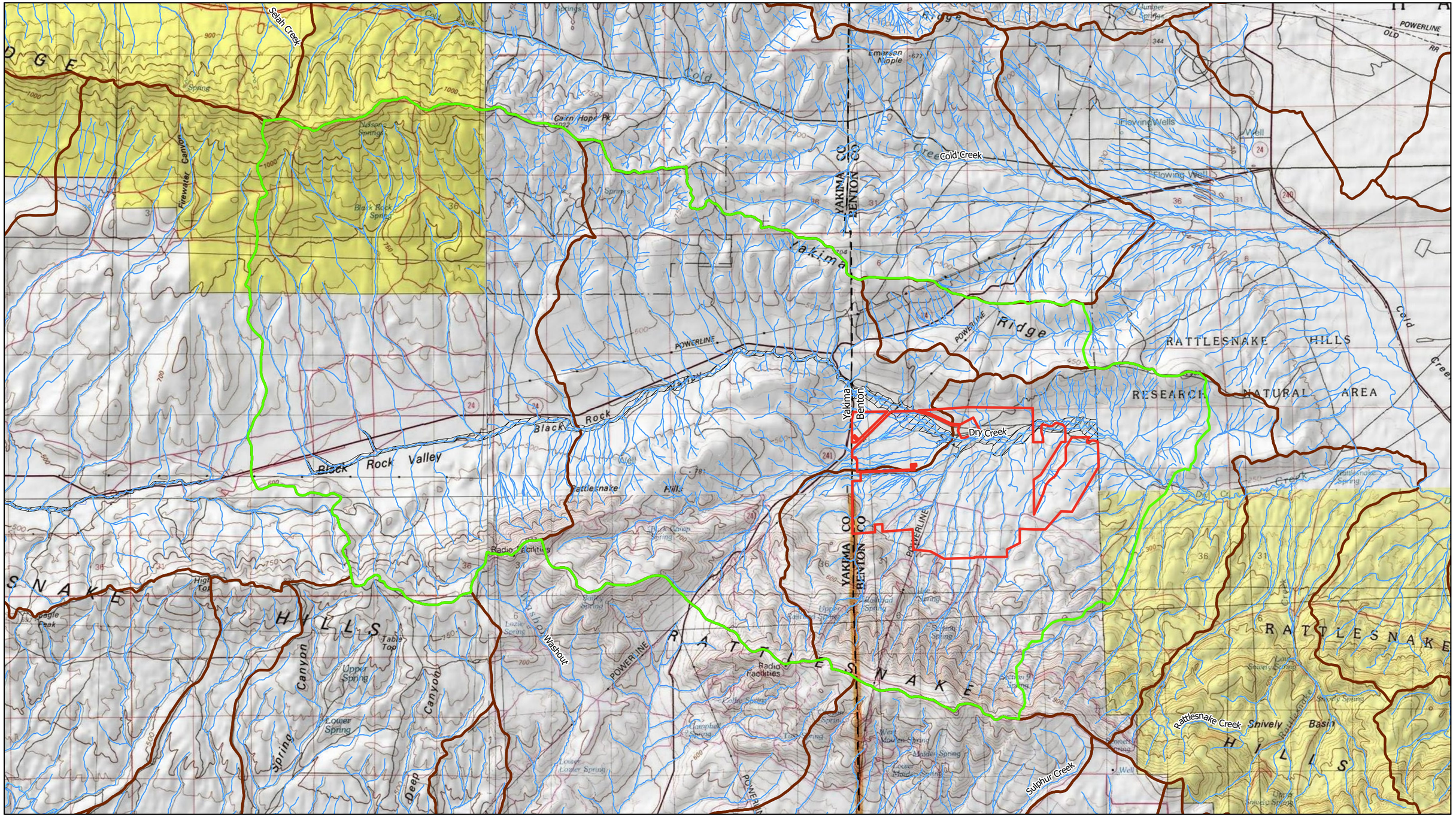

Data Source(s): Westwood (2021); Esri WMS Basemap Imagery (Accessed 2021); USGS (2021); FEMA (2021); USDA (2021)

Legend

- Project Boundary
- FLO-2D Boundary
- County Boundary
- HUC 12 Boundary
- FEMA Zone A*
- NWI Wetlands
- NHD Flowline

*FEMA Data not available for the southern portion of the site

N

0 Miles 1.5

Wautoma Solar Project

Benton County, Washington

Exhibit 2: Base Map

December 8, 2021

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N:\0033\629.00_GIS_Working\Hydro Exhibits\2021-12-06 Hydro 1-5\Wautoma Solar Project\Wautoma Solar Project.aprx
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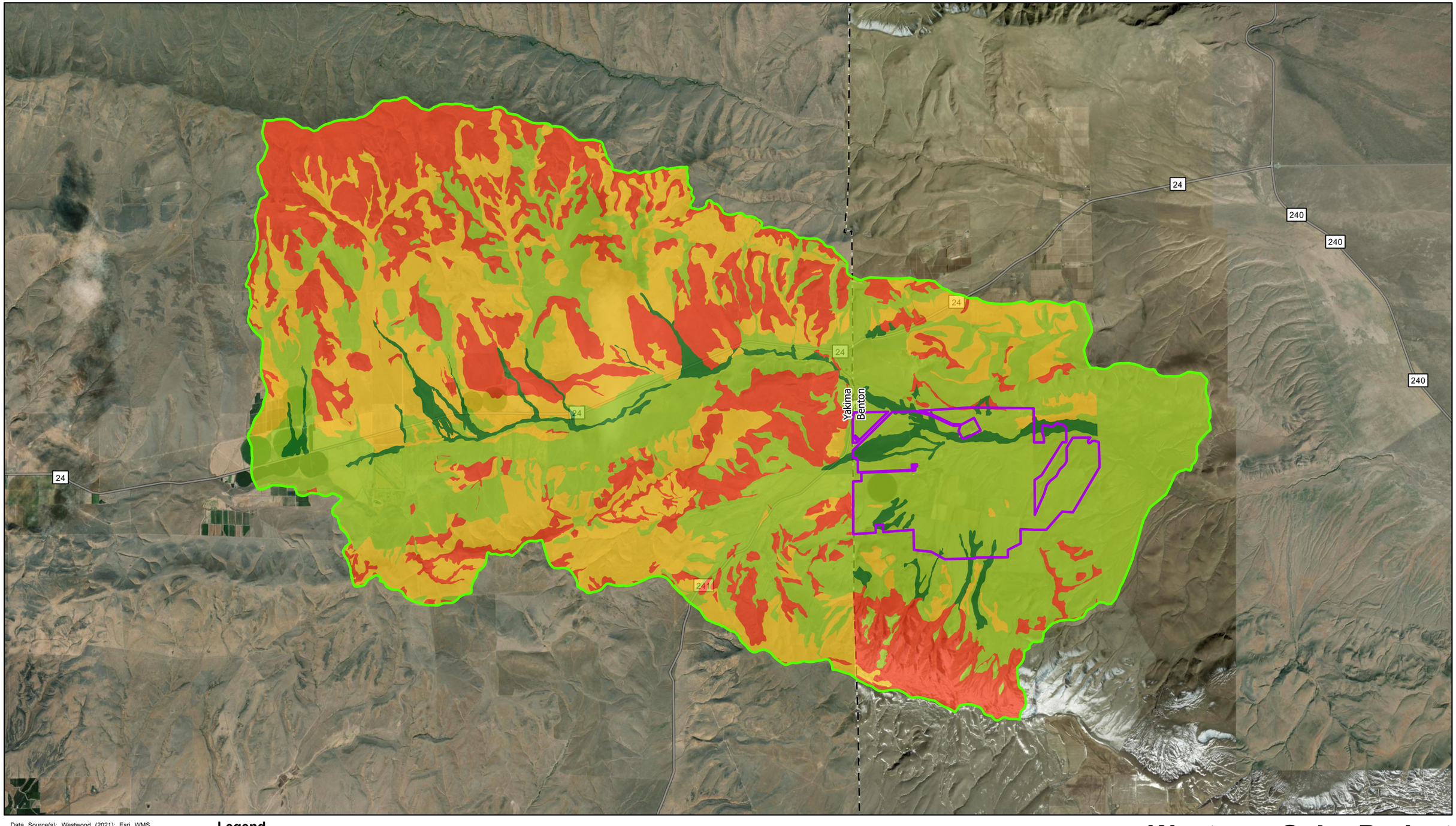

Data Source(s): Westwood (2021); Esri WMS Basemap Imagery (Accessed 2021); USGS (2021); FEMA (2021); USDA (2021)

Legend

- Project Boundary
- FLO-2D Boundary
- County Boundary
- Hydrologic Soil Group
  - A
  - B
  - C
  - D

N

0 Miles 1.5

Wautoma Solar Project

Benton County, Washington

Exhibit 3: Soils Map

December 8, 2021

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N:\0033629.00_GIS_Working\Hydro Exhibits\2021-12-06 Hydro 1-5\Wautoma Solar Project\Wautoma Solar Project.aprx
Soils Map - Soils Map | 12/8/2021 10:32 AM | KDeaser

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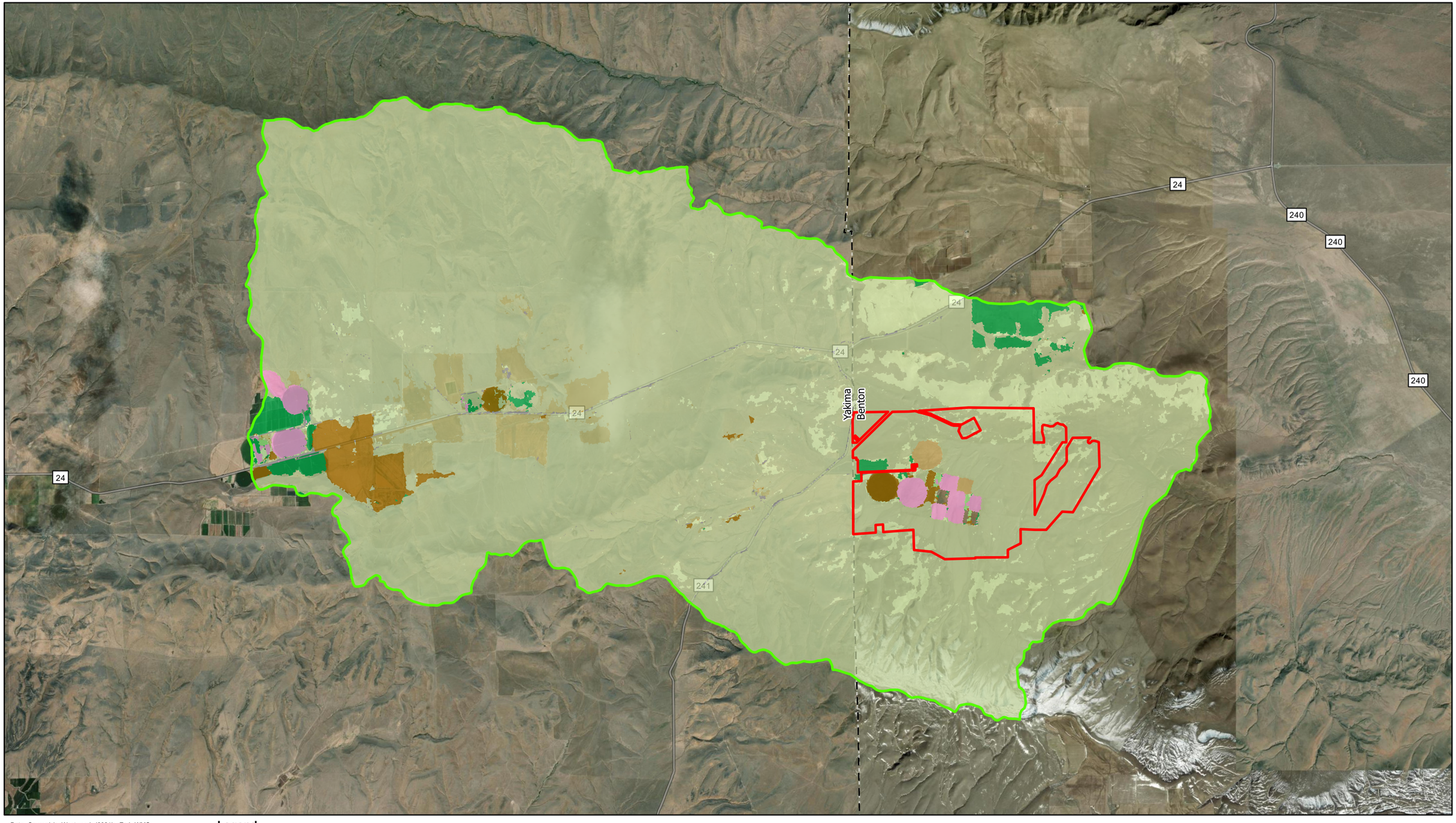

Data Source(s): Westwood (2021); Esri WMS Basemap Imagery (Accessed 2021); USGS (2021); FEMA (2021); USDA (2021)

Legend

- Project Boundary
- FLO-2D Boundary
- County Boundary

Landcover

- Alfalfa
- Developed
- Forest
- Fallow/Idle Cropland
- Other Cropland
- Grassland/Pasture
- Other Hay/Non Alfalfa
- Shrubland
- Spring Wheat
- Winter Wheat

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N

0 Miles 1.5

Wautoma Solar Project

Benton County, Washington

Exhibit 4: Landcover Map

December 8, 2021

N:\0033829.00_GIS_Working\Hydro Exhibits\2021-12-06 Hydro 1-5\Wautoma Solar Project\Wautoma Solar Project.aprx
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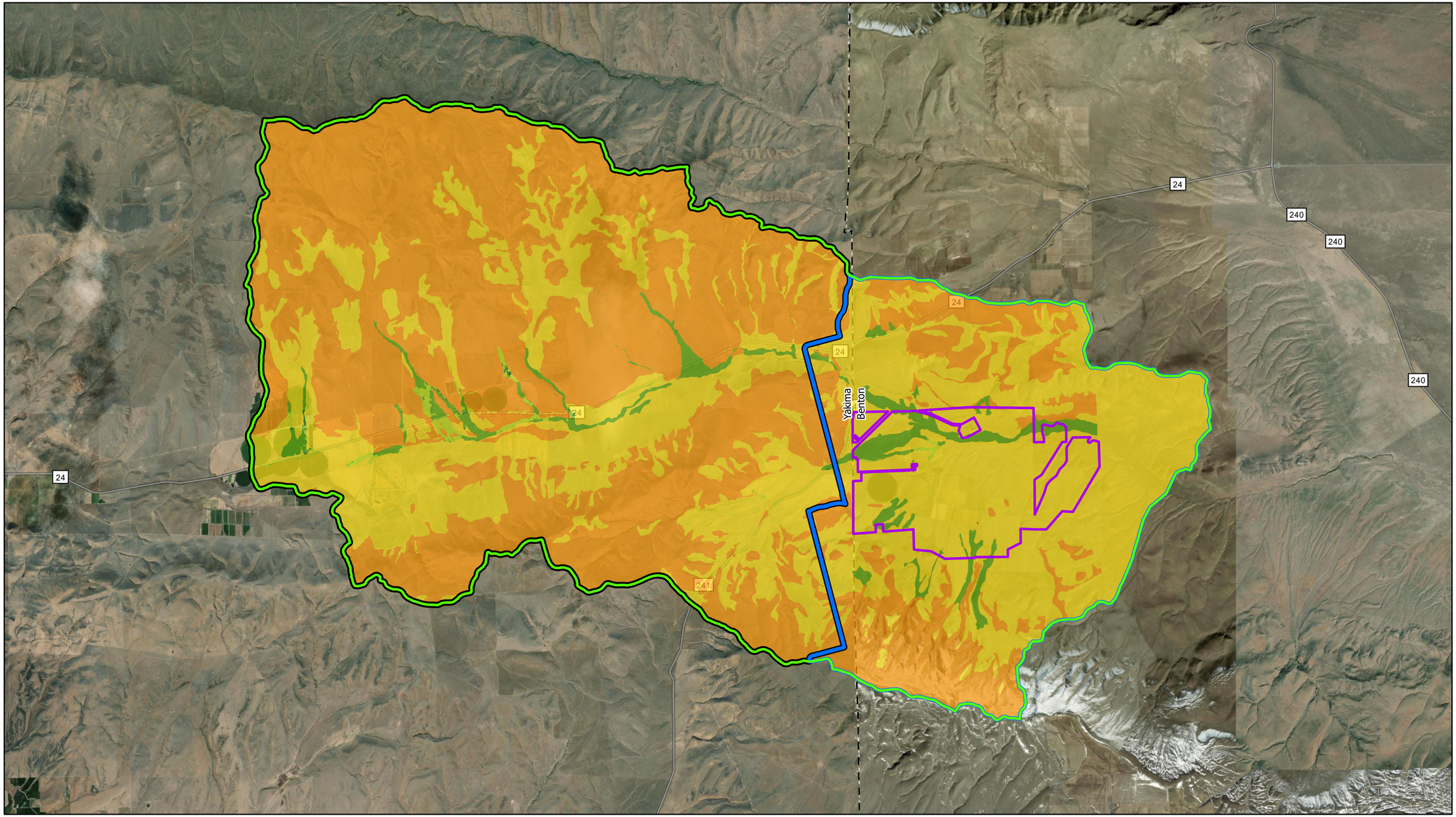

Data Source(s): Westwood (2021); Esri WMS Basemap Imagery (Accessed 2021); USGS (2021); FEMA (2021); USDA (2021)

Legend

- Project Boundary
- FLO-2D Boundary
- County Boundary
- 1-Meter Extents
- 10-Meter Extents

Curve Number

- 40 - 49
- 50 - 59
- 60 - 69
- 70 - 79
- 80 - 89
- 90 - 99

N

0 Miles 1.5

Wautoma Solar Project

Benton County, Washington

Exhibit 5: Curve Number and Topographic Source Map

December 8, 2021

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N:\0033629.00_GIS_Working\Hydro Exhibits\2021-12-06 Hydro 1-5\Wautoma Solar Project\Wautoma Solar Project.aprx
CN And Topo Sources - CN and Topo Sources | 12/8/2021 1:34 PM | KLHauser

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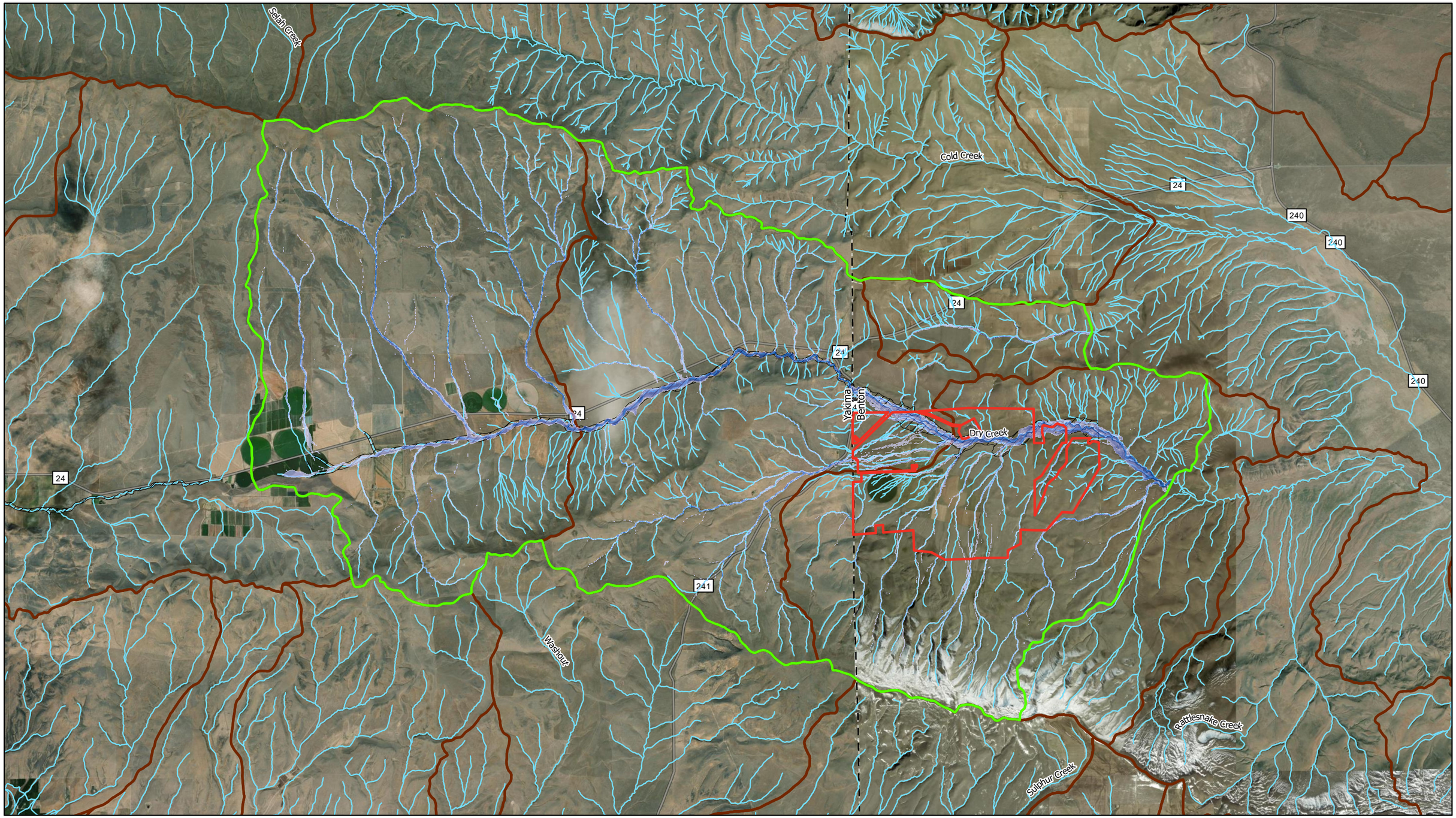

Data Source(s): Westwood (2021); Esri WMS Basemap Imagery (Accessed 2021); USGS (2021); FEMA (2021); USDA (2021)

Legend

- Project Boundary
- FLO-2D Boundary
- County Boundary
- HUC 12 Boundary
- FEMA Zone A*
- NHD Flowline

Peak Flow Depth (ft)

- 0.50 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00
- 2.01 - 2.50
- 2.51 - 3.00
- 3.01 - 4.00
- 4.01 - 6.00
- 6.01 +

*FEMA Data not available for the southern portion of the site

N

0 Miles 1.5

Wautoma Solar Project

Benton County, Washington

Exhibit 6: 100-Year Max Flood Depth Map

December 9, 2021

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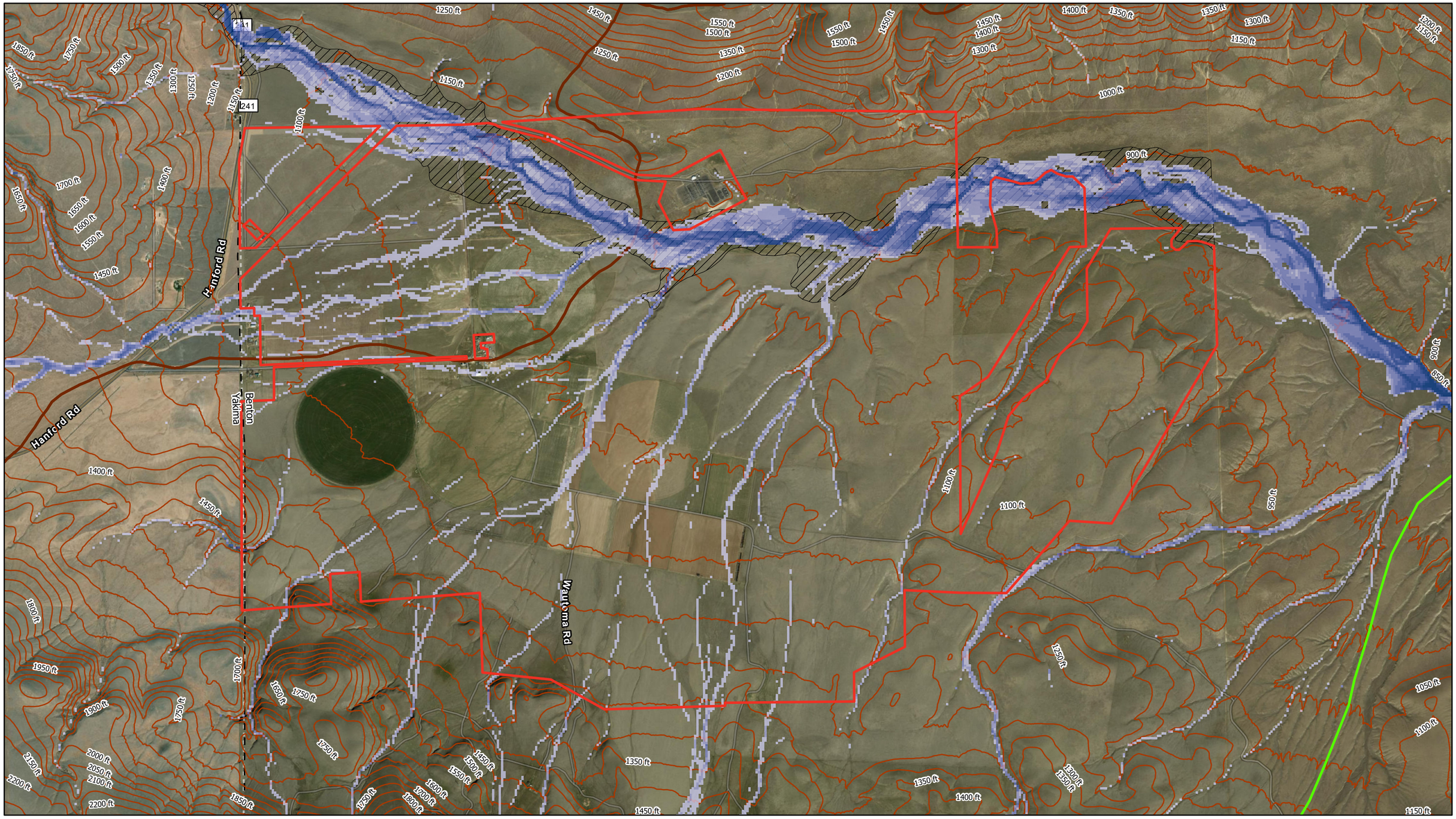
N:\0033629.00_GIS_Working\Hydro Exhibits\2021-12-08 Hydro 6-8\Wautoma Solar Project\Wautoma Solar Project.aprx
100 Yr Max Water Depth Map - 100 Yr Max Water Depth | 12/9/2021 3:49 PM | KLHauser

© 2021 Westwood



Data Source(s): Westwood (2021); Esri WMS Basemap Imagery (Accessed 2021); USGS (2021); FEMA (2021); USDA (2021)

Legend

- Project Boundary
- FLO-2D Boundary
- County Boundary
- HUC 12 Boundary
- FEMA Zone A*
- 50' Contours

Peak Flow Depth (ft)

- 0.50 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00
- 2.01 - 2.50
- 2.51 - 3.00
- 3.01 - 4.00
- 4.01 - 6.00
- 6.01 +

*FEMA Data not available for the southern portion of the site

N

0 Feet 2,000

Wautoma Solar Project

Benton County, Washington

Exhibit 6A: 100-Year Max Flood Depth Project Area Map

December 9, 2021

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N:\0033629.00_GIS_Working\Hydro Exhibits\2021-12-08 Hydro 6-8\Wautoma Solar Project\Wautoma Solar Project.aprx
100 Yr Max Water Depth Project Area.jpg - 100 Yr Max Water Depth Project Area | 12/9/2021 3:55 PM | KCHeiser

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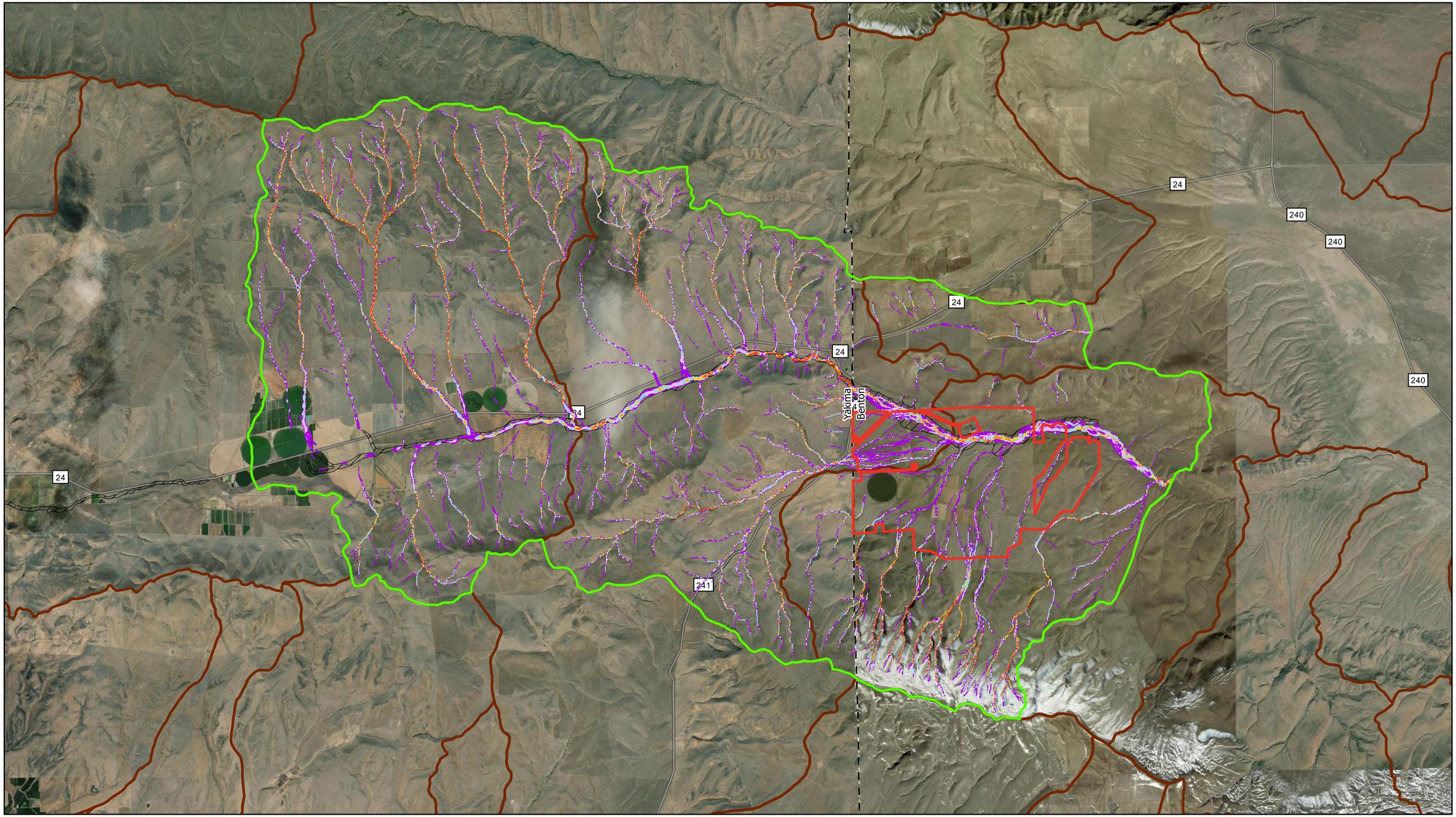

Data Source(s): Westwood (2021); Esri WMS Basemap Imagery (Accessed 2021); USGS (2021); FEMA (2021); USDA (2021)

Legend

- Project Boundary
- FLO-2D Boundary
- County Boundary
- HUC 12 Boundary
- FEMA Zone A*

Peak Velocity (fps)

- 1.00 - 1.50
- 1.51 - 2.00
- 2.01 - 2.50
- 2.51 - 3.00
- 3.01 - 4.00
- 4.01 +

*FEMA Data not available for the southern portion of the site

N

Miles
0 1.5

Wautoma Solar Project

Benton County, Washington

Exhibit 7: 100-Year Peak Velocity Map

December 9, 2021

Westwood
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N:\0033\639.00_GIS_Working\Hydro Exhibits\2021.12.08 Hydro 6.8\Wautoma Solar Project\Wautoma Solar Project.aprx
100 Yr Peak Velocity Map - 100 Yr Peak Velocity | 12/9/2021 3:39 PM | KLHauser

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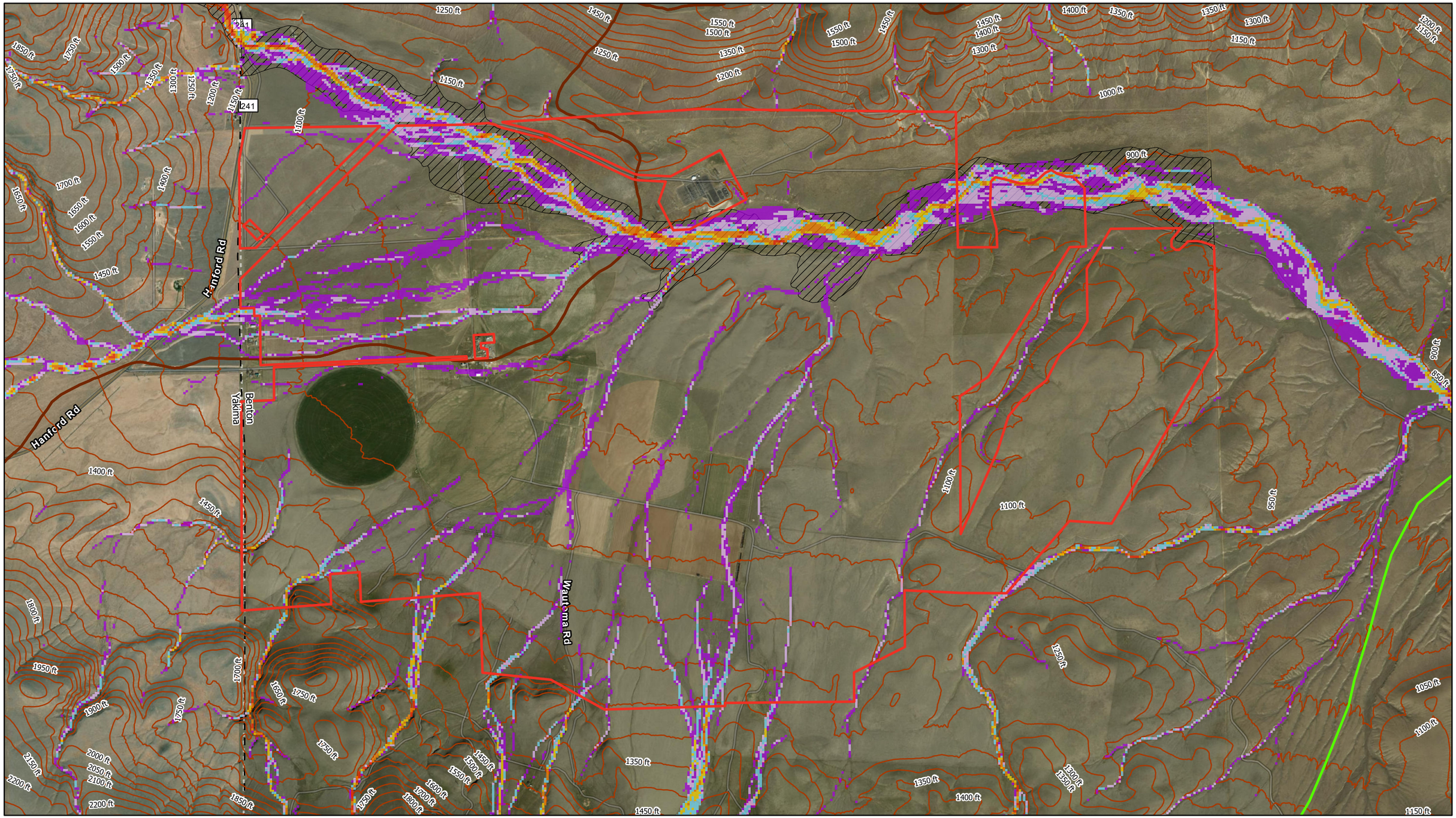

Data Source(s): Westwood (2021); Esri WMS Basemap Imagery (Accessed 2021); USGS (2021); FEMA (2021); USDA (2021)

Westwood

Toll Free (888) 937-5150 westwoodps.com

Legend

- Project Boundary
- FLO-2D Boundary
- County Boundary
- HUC 12 Boundary
- FEMA Zone A*
- 50' Contours

Peak Velocity (fps)

- 1.00 - 1.50
- 1.51 - 2.00
- 2.01 - 2.50
- 2.51 - 3.00
- 3.01 - 4.00
- 4.01 +

*FEMA Data not available for the southern portion of the site

N

0 Feet 2,000

Wautoma Solar Project

Benton County, Washington

Exhibit 7A: 100-Year Peak Velocity Project Area Map

December 9, 2021

N:\0033929.00_GIS_Working\Hydro Exhibits\2021-12-08 Hydro 6-8\Wautoma Solar Project\Wautoma Solar Project.aprx
100-Yr Peak Velocity Project Area Maps - 100-Yr Peak Velocity Project Area | 12/9/2021 4:05 PM | KLHauser

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Hanford Rd

Hanford Rd

Yakima

Benton

241

241

Wautoma Rd

Data Source(s): Westwood (2021); Esri WMS Basemap Imagery (Accessed 2021); USGS (2021); FEMA (2021); USDA (2021)

Legend

- Project Boundary
- FLO-2D Boundary
- County Boundary
- HUC 12 Boundary
- FEMA Zone A*
- 50' Contours

Scour (ft)

- 1.00 - 1.50
- 1.51 - 2.00
- 2.01 +

*FEMA Data not available for the southern portion of the site

N

0 Feet 2,000

Wautoma Solar Project

Benton County, Washington

Exhibit 8: 100-Year Scour Map

December 9, 2021

Westwood
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N:\0033929.00_GIS_Working\Hydro Exhibits\2021-12-08 Hydro 6-8\Wautoma Solar Project\Wautoma Solar Project.aprx
100 yr Scour Map - 100 yr Scour | 12/9/2021 4:48 PM | Kshauser

Appendix A

Atlas 2 Rainfall Data

Precipitation Frequency Data Output

NOAA Atlas 2

Washington 46.59017908°N 120.04977851°W
Site-specific Estimates

Map	Precipitation (inches)	Precipitation Intensity (in/hr)
2-year 6-hour	0.68	0.11
2-year 24-hour	1.04	0.04
100-year 6-hour	1.48	0.25
100-year 24-hour	2.29	0.10

Go to PFDS
Go to NA2

Hydrometeorological Design Studies Center - NOAA/National Weather Service
1325 East-West Highway - Silver Spring, MD 20910 - (301) 713-1669
Mon Nov 22 15:08:51 2021

Appendix B

Curve Number Table

Table 2. Semi-Arid Curve Numbers (adapted from NEH 630)

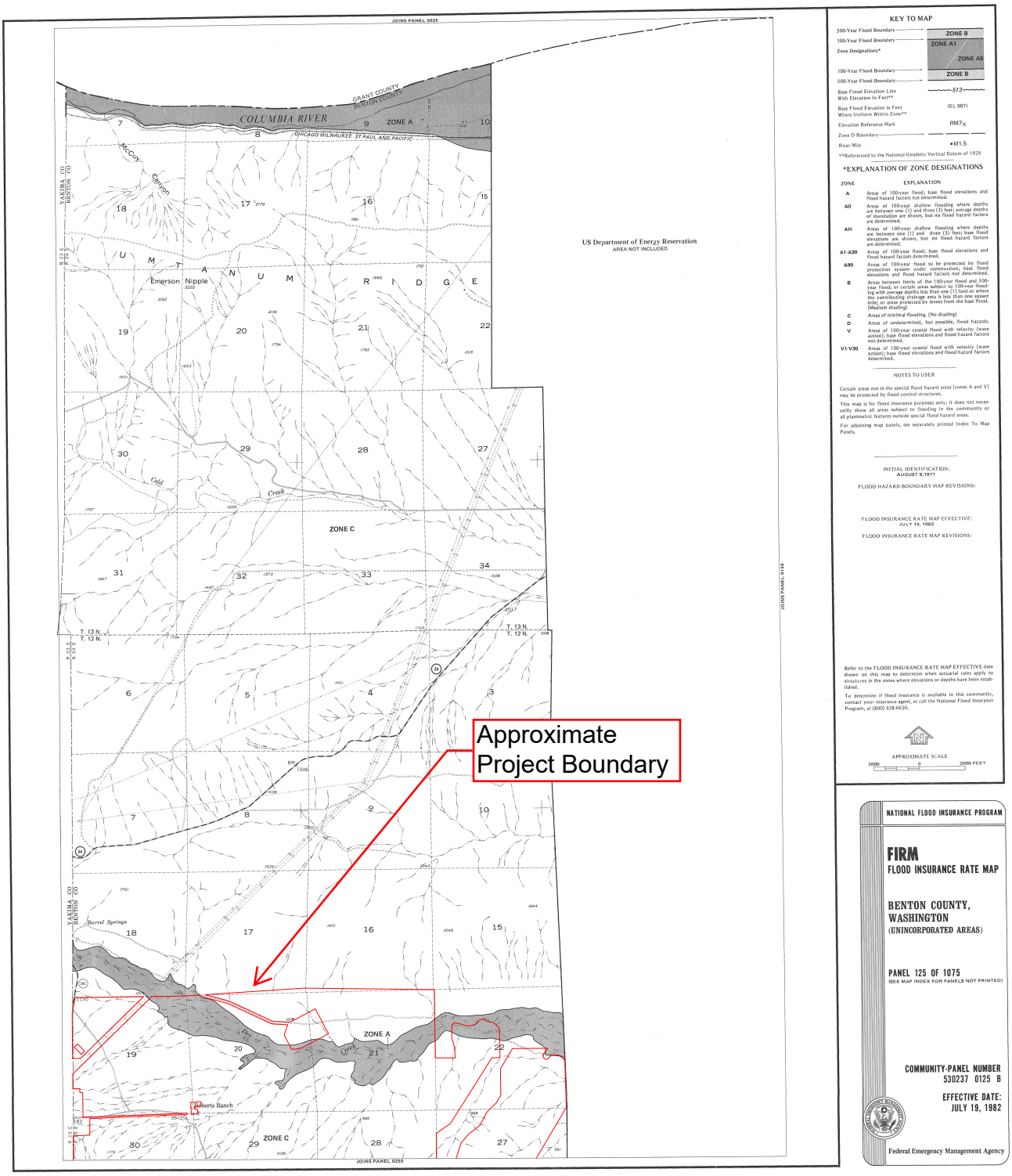
Class	Value	Classification Description	Curve Number				
			Soil Type*				
			A	B	C	D	W
Water	11	Open Water - areas of open water, generally with less than 25% cover of vegetation or soil.	98	98	98	98	100
	12	Perennial Ice/Snow - areas characterized by a perennial cover of ice and/or snow, generally greater than 25% of total cover.	98	98	98	98	100
Developed	21	Developed, Open Space - areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.	46	65	77	82	100
	22	Developed, Low Intensity - areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% percent of total cover. These areas most commonly include single-family housing units.	61	75	83	87	100
	23	Developed, Medium Intensity – areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50% to 79% of the total cover. These areas most commonly include single-family housing units.	77	85	90	95	100
	24	Developed High Intensity -highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80% to 100% of the total cover.	89	92	94	95	100
Barren	31	Barren Land (Rock/Sand/Clay) - areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.	77	86	91	94	100
Forest	41	Deciduous Forest - areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species shed foliage simultaneously in response to seasonal change.	43	55	70	77	100
	42	Evergreen Forest - areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.	43	55	70	77	100
	43	Mixed Forest - areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75% of total tree cover.	43	55	70	77	100
Shrubland	51	Dwarf Scrub - Alaska only areas dominated by shrubs less than 20 centimeters tall with shrub canopy typically greater than 20% of total vegetation. This type is often co-associated with grasses, sedges, herbs, and non-vascular vegetation.	55	71	81	89	100
	52	Shrub/Scrub - areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions.	55	71	81	89	100
Herbaceous	71	Grassland/Herbaceous - areas dominated by gramanoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.	55	71	81	89	100
	72	Sedge/Herbaceous - Alaska only areas dominated by sedges and forbs, generally greater than 80% of total vegetation. This type can occur with significant other grasses or other grass like plants, and includes sedge tundra, and sedge tussock tundra.	55	71	81	89	100
	73	Lichens - Alaska only areas dominated by fruticose or foliose lichens generally greater than 80% of total vegetation.	55	71	81	89	100
	74	Moss - Alaska only areas dominated by mosses, generally greater than 80% of total vegetation.	55	71	81	89	100
Planted/Cultivated	81	Pasture/Hay – areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20% of total vegetation.	55	71	81	89	100
	82	Cultivated Crops – areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20% of total vegetation. This class also includes all land being actively tilled.	67	78	85	89	100
	83	Small Grains	63	75	83	87	100
Wetlands	91	Woody Wetlands - areas where forest or shrubland vegetation accounts for greater than 20% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.	45	66	77	83	100
	92	Emergent Herbaceous Wetlands - Areas where perennial herbaceous vegetation accounts for greater than 80% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.	45	66	77	83	100

*A/D, B/D and C/D soils lumped as D soils, W denotes water

**Curve Numbers for NLCD Codes 41-43 have been increased from 30 to 43 as many of these areas are partially grazed Woods-grass combination.

Appendix C

FEMA FIRM Panels



KEY TO MAP

500-Year Flood Boundary
100-Year Flood Boundary
Zone Designations*
ZONE B
ZONE A1
ZONE A5
ZONE B
100-Year Flood Boundary
500-Year Flood Boundary
Base Flood Elevation Line With Elevation In Feet**
513
Base Flood Elevation In Feet Where Uniform Within Zone**
(EL 987)
Elevation Reference Mark
RM7×
Zone D Boundary
River Mile
•M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile, or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION:
AUGUST 9,1977

FLOOD HAZARD BOUNDARY MAP REVISIONS:

FLOOD INSURANCE RATE MAP EFFECTIVE:
JULY 19, 1982

FLOOD INSURANCE RATE MAP REVISIONS:

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE date shown on this map to determine when actuarial rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620.

APPROXIMATE SCALE
2000 0 2000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

BENTON COUNTY, WASHINGTON
(UNINCORPORATED AREAS)

PANEL 125 OF 1075
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
530237 0125 B

EFFECTIVE DATE:
JULY 19, 1982

Federal Emergency Management Agency

ATTACHMENT L: RAPTOR NEST SURVEY REPORT

2021 Raptor Nest Survey for the Wautoma Solar Project

Prepared for:

Innergex Renewable Development USA, LLC
3636 Nobel Drive, Suite 260
San Diego, CA 92122

Prepared by:

Tetra Tech, Inc.
19803 North Creek Parkway
Bothell, WA 98011

January 2022

Table of Contents

1.0 Introduction 1
2.0 Description of the Survey Area 1
3.0 Agency Coordination 1
4.0 Methods 2
4.1 Field Surveys 2
4.2 Data Collection 3
5.0 Results and Discussion 4
6.0 Conclusion and Recommendations 8
7.0 References 8

List of Tables

Table 1. Wautoma Solar Project 2021 Raptor Nest Survey Results 6

List of Figures

Figure 1. Project Location

Figure 2. Wautoma Solar Project 2021 Raptor Nest Survey Results (Confidential)

Acronyms and Abbreviations

Innergex	Innergex Renewable Development USA, LLC
PHS	Priority Habitats and Species
Project	Wautoma Solar Project
Tetra Tech	Tetra Tech, Inc.
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife

1.0 Introduction

Innergex Renewable Development USA, LLC (Innergex) plans to develop the Wautoma Solar Project (Project) located in Benton County, Washington approximately 12.5 miles northeast of the city of Sunnyside (Figure 1).

As part of its environmental due diligence, Innergex contracted Tetra Tech, Inc. (Tetra Tech) to conduct raptor nest surveys for the Project. The purpose of the raptor nest surveys was to inventory raptor nests within the approximately 4,819-acre Project area and a 0.5-mile buffer (Survey Area) to support Project permitting and inform potential avoidance and minimization measures (Confidential Figure 2). Because the U.S. Fish and Wildlife Service (USFWS) and the Washington Department of Fish and Wildlife (WDFW) have not issued guidance pertaining to raptor nest surveys for solar projects, the survey approach was based on wind energy guidelines (USFWS 2012, USFWS 2013, USFWS 2016, USFWS 2020, WDFW 2009) and in coordination with WDFW, as described below.

2.0 Description of the Survey Area

The Survey Area is the Project area and 0.5-mile buffer of the Project area as shown on Figure 2 (Confidential). Tetra Tech performed three rounds of ground-based surveys in 2021. The first two survey rounds occurred during the breeding season and covered the Project area (which was approximately 3,658 acres at the time of survey) plus a 0.5-mile buffer (i.e., Spring 2021 Survey Area; Confidential Figure 2). Afterwards, the Project area was expanded by approximately 990 acres. To accommodate the areas added to the Project area, Tetra Tech performed a third round of surveys in the fall, outside the period of active nest use by raptor species. The fall survey covered the newly added portions of the Project area plus a 0.5-mile buffer (i.e., Fall 2021 Survey Area; Confidential Figure 2).

3.0 Agency Coordination

Innergex and Tetra Tech met with WDFW via video meeting on March 8, 2021, to introduce the Project and discuss planned wildlife, habitat, and rare plant surveys. At the meeting, WDFW concurred with the raptor nest survey approach and gave a verbal description of known raptor nest locations and special-status wildlife that may occur in the Project vicinity. Based on anticipated impacts to raptors from construction and operation of a solar project, WDFW recommended reducing an initially proposed survey area of a 2-mile buffer around the Project area to a 0.5-mile buffer (Michael Ritter, personal communication, March 8, 2021).

Tetra Tech requested fish and wildlife information within 5 miles of the Project area from the WDFW Priority Habitats and Species (PHS) Program in February 2021. The PHS database had nine nest records of raptors tracked by PHS within 5 miles of the Project area, including five ferruginous

hawk (*Buteo regalis*; designated state threatened at the time of surveys and subsequently uplisted to endangered) nests, three prairie falcon (*Falco mexicanus*) nests, and one burrowing owl (*Athene cunicularia*; state candidate) nest (WDFW 2020, 2021a, 2021b). However, the burrowing owl nest was the only nest located within the Survey Area, located approximately 0.25 mile north of the Project area. Although golden eagles (*Aquila chrysaetos*) are commonly identified within the open habitats of eastern Washington, the PHS database had no golden eagle nest records within the Survey Area. The PHS program does not track bald eagle (*Haliaeetus leucocephalus*) nests, but nesting bald eagles are rare or absent from the Columbia Basin and southeastern Washington (WDFW 2021a) and, based on a lack of suitable habitat conditions (Buehler 2020), bald eagle nests were not expected to be observed during the surveys.

4.0 Methods

4.1 Field Surveys

As described in Section 2.0, Tetra Tech performed three rounds of ground-based surveys in 2021. All three survey rounds were performed by a biologist experienced in identifying raptor nests found in the region. Nesting substrate within the Survey Area was investigated along public and private roads (two tracks) by vehicle and cross country on foot. The 0.5-mile buffers were searched by scanning the area from public roads or the lease boundary. The biologist made periodic stops to scan areas with suitable habitat and examine nests with the aid of binoculars and a spotting scope. The location of any concentrations of prey for golden eagles and ferruginous hawks (such as ground squirrel colonies, large herds of elk or mule deer, and carrion), and incidental observations of eagles or threatened or endangered wildlife species were to be recorded by the biologist.

The first survey round was conducted March 13, 2021. The timing of the first survey coincided with the early nesting period when most breeding pairs exhibit courtship, nest-building, or incubation behaviors, and prior to the emergence of foliage on broadleaf trees. The biologist attempted to check the status of the historical PHS burrowing owl nest and recorded all new raptor nests observed within the Spring 2021 Survey Area.

The second survey was conducted May 10-12, 2021. During this period, most raptors were engaged in mid- to late-breeding season reproductive activities (e.g., incubating, brooding, feeding nestlings). The biologist searched for new nests checked the status of the nests found during the initial survey.

The third survey was conducted on October 2, 2021, after leaves had begun to fall from trees, to maximize the number of nests detected. The objective of the fall survey was to locate unoccupied (inactive) above ground raptor nest structures within the Fall 2021 Survey Area. The biologist searched for new nests and checked on the status of known nests found during spring 2021 that were located within the Fall 2021 Survey Area. Any incidental ground nests (e.g., burrowing owl burrows) detected by the biologist were to be recorded.

4.2 Data Collection

A tablet computer with ArcGIS mapping software and electronic data forms was used during the surveys to aid in navigation and record data. For each raptor nest, the following data were collected:

- **Nest Identification Number:** Corresponding with the coordinates of the site location.
- **Raptor Species:** If identified, the type of species was recorded. If species using the nest could not be determined, the species was recorded as unknown.
- **Adult Present:** Proximity of the adult to the nest (e.g., on nest, nearby, or unknown).
- **Eggs or Young:** Number of eggs or young observed.
- **Nest Size:** Classified as large or small; small nests were those estimated by the biologist as having a diameter of less than 24 inches, comprised of smaller sticks, and with other characteristics typical of nests used by smaller raptors and not by eagles. Large nests were those estimated by the biologist as having a diameter of 24 inches or greater, comprised of larger sticks, and with other characteristics typical of nests used by eagles and other large raptors.
- **Nest Substrate:** Structure in which nest was located (e.g., broadleaf tree, cliff, artificial nest structure, etc.).
- **Nest Height:** Height relative to the structure it was on (e.g., on top of transmission pole, 3/4 of height of tree).
- **Nest Status:** To assess nest status, the following terms were adapted from the USFWS Eagle Rule (USFWS 2016) and Postupalsky (1974):
    - Inactive: Defined by the absence of any adult, egg, or dependent young at the nest, or signs of building or adding to the nest in preparation for egg-laying. This term is specific to non-eagle nests.
    - In-use nest: The presence of eggs, dependent young, or adult on the nest, or signs of building or adding to the nest in preparation for egg-laying. This term applies to eagle and non-eagle nests.
    - Alternate nest: One of potentially several nests within an eagle territory that is not an in-use nest at the time of surveys. When there is no in-use nest, all nests in the territory are alternate nests. This term is specific to eagle nests.
    - Unknown: A nest not detected during the first round of surveys which may have gone undetected or been built subsequent to the survey, or a nest that is present but for which surveyors are unable to determine status (e.g., vegetation around the nest site obscured the view of nest, etc.). This term applies to eagle and non-eagle nests.

- No Longer Present: A nest that was located during a previous survey but has subsequently been positively ascertained to be destroyed and no evidence of the nest remains. This term applies to eagle and non-eagle nests.
- Not Found: A previously known nest that could not be located (e.g., road or access limitations), but that may still exist (not the same as "No Longer Present" above). This term applies to eagle and non-eagle nests.
- Not Surveyed: A known nest that occurred outside of the given survey area, or that could not be surveyed due to other reasons (e.g., no landowner permission, the presence of nearby cattle, etc.). This term applies to eagle and non-eagle nests.
- Failed: A nest for which evidence indicates nest initiation (egg-laying), but the nest failed to produce any chicks to fledging age. This term applies to eagle and non-eagle nests.

- **Nest Condition:** To assess nest condition, the following criteria were used (Postupalsky 1974):
  - Excellent: Defined cup or nest bowl with a well-maintained rim; adult or young present.
  - Good: Nest bowl intact and rim defined; minor repair needed for nest to be used; margins of nest in loose configuration, minor slumping occurring.
  - Fair: Nest bowl intact and nest not dilapidated but needs significant repair in order to be used; material is slumping or sliding.
  - Poor: Loose structure of nest bowl still present; nest walls and side falling out; nest is in need of major repair to be used.
  - Remnant: Nest bowl not defined; scant material remaining and not usable unless fully rebuilt.
  - Unknown: The nest cannot be found, was not surveyed, or the nest is present, but because of its location, a determination cannot be made.
  - Not Applicable: Nest no longer present.

5.0 Results and Discussion

A total of 15 nests were detected during the surveys, including three in-use burrowing owl nests, two in-use Swainson's hawk (*Buteo swainsoni*) nests, one in-use red tailed hawk (*Buteo jamaicensis*) nest, one in-use great horned owl (*Bubo virginianus*) nest, five in-use common raven (*Corvus corax*) nests, and three small inactive nests with unknown species determinations (Table 1; Confidential Figure 2). Although not raptors, common raven nests were recorded during raptor nest surveys because they could be used by nesting raptors during subsequent breeding seasons. All of the

inactive nests were small and not consistent with the size of a golden eagle or ferruginous hawk nest. Common raven Nest 003 was in-use during the first survey but no longer present during the second survey. The biologist suspected that ravens removed nesting material from Nest 003 and added to it to an adjacent common raven nest (Nest 106; Table 1). Because Nest 003 was no longer present, it is not depicted in Confidential Figure 2.

All of the nests were found during the spring surveys; six nests were found during the first survey, nine nests were found during the second survey, and no nests were found during the third survey. Although all three known nests checked during the third survey were still present (Nests 002, 100, and 108; Confidential Figure 2), the nests were no longer in excellent condition (one was in good condition and the other two were in poor condition). The historical PHS burrowing owl nest was not visible from the lease boundary; therefore, the status of the nest is unknown.

Suitable nesting habitat within the Survey Area was primarily limited to utility towers and poles, a few large mature trees and shrubs, and the ground. No suitable cliffs or rock outcrops were observed within the within the Survey Area. Eight of the nests were located on manmade structures (seven on utility towers and one on a power pole), four were in trees (two in broadleaf trees, one in a conifer, and one in a snag) and three were burrows in the ground; Table 1).

No eagles or federally-listed threatened or endangered species were documented during the raptor nest surveys. WDFW has designated the burrowing owl as a candidate for listing as state endangered, threatened, or sensitive, and thus, it is a WDFW priority species. No potential burrowing owl burrows or other ground nests were observed during the third survey round. No ferruginous hawk individuals or ferruginous hawk nests were observed during this survey; however, a single ferruginous hawk was observed briefly soaring in an area of native grassland habitat in the far southwestern edge of the Project during the Spring 2021 habitat and general wildlife survey (Tetra Tech 2022). More comprehensive pedestrian sweeps will be performed across the Fall 2021 Survey Area during habitat and general wildlife surveys planned for spring 2022.

Table 1. Wautoma Solar Project 2021 Raptor Nest Survey Results

Nest ID	Species	First Round Nest Status	Second Round Nest Status	Third Round Nest Status	Nest Size	Nest Substrate	Survey Notes
102	Burrowing Owl	Unknown	In-use	Not Surveyed	Not Applicable	Ground	Two adults observed at burrow during the second round.
103	Burrowing Owl	Unknown	In-use	Not Surveyed	Not Applicable	Ground	One adult observed at burrow during the second round.
104	Burrowing Owl	Unknown	In-use	Not Surveyed	Not Applicable	Ground	One adult observed at burrow during the second round.
003	Common Raven	In-use	No Longer Present	Not Surveyed	Small	Utility Tower	It appears that the ravens took the material from this nest and added it to adjacent Nest 106.
006	Common Raven	Inactive	In-use	Not Surveyed	Small	Utility Tower	
101	Common Raven	Unknown	In-use	Not Surveyed	Small	Broadleaf Tree	
105	Common Raven	Unknown	In-use	Not Surveyed	Small	Utility Tower	
106	Common Raven	Unknown	In-use	Not Surveyed	Small	Utility Tower	Recently added nest material is possibly from adjacent Nest 003, which was present during the first round but was no longer present during the second round.
002	Great Horned Owl	In-use	In-use	Inactive	Small	Broadleaf Tree	One chick observed in the nest and another observed on a branch of nest tree during the second round. Nest went from excellent condition in the first and second rounds to poor condition in the third round.
001	Red-tailed Hawk	Inactive	In-use	Not Surveyed	Small	Utility Tower	One chick observed in the nest during the second round.
100	Swainson's Hawk	Unknown	In-use	Inactive	Small	Snag	Nest went from excellent condition in the first and second rounds to good condition in the third round.

Nest ID	Species	First Round Nest Status	Second Round Nest Status	Third Round Nest Status	Nest Size	Nest Substrate	Survey Notes
108	Swainson's Hawk	Unknown	In-use	Inactive	Small	Conifer Tree	Nest was located on May 12 after initially observing an adult flush from the row of conifers where the nest is located on May 10. Nest went from excellent condition in the first and second rounds to poor condition in the third round.
004	Unknown	Inactive	Inactive	Not Surveyed	Small	Utility Tower	
005	Unknown	Inactive	Inactive	Not Surveyed	Small	Utility Tower	
107	Unknown	Unknown	Inactive	Not Surveyed	Small	Power Pole	Nest noted to be falling apart when found during the second round.

6.0 Conclusion and Recommendations

Natural resource agencies often recommend that non-disturbance buffers be placed around active (in-use) raptor nests to avoid potential adverse impacts to nesting birds. The USFWS and WDFW have not issued guidance pertaining to raptor nest setbacks for solar projects, but WDFW has provided management recommendations for priority bird species that include non-disturbance buffers for some priority species (Larsen et al. 2004). For burrowing owls, WDFW recommends that direct destruction of burrows be avoided and sources of human disturbance be avoided within a 0.5-mile buffer of burrows between February 15 and September 25 (Larsen et al. 2004). The Project Area is located beyond this recommended buffer. Tetra Tech recommends coordination with WDFW to develop appropriate spatial and temporal non-disturbance buffers around active nests of other raptor species.

Raptor nest locations vary from year to year based on a number of factors such as food supply, nest-site availability, and weather conditions. Therefore, additional pre-construction surveys may be needed if construction activities occur during the breeding season (February through August).

In addition to determining the timing and extent of the non-disturbance buffers described above, the following additional measures may be implemented to avoid and minimize impacts to raptors:

- Conduct pre-construction surveys to identify active nests prior to the start of construction.
- Conduct vegetation clearing prior to construction outside of the breeding season (e.g., September to January) for raptors and other migratory birds.
- Design overhead transmission lines in compliance with Avian Power Line Interaction Committee standards (APLIC 2012).

7.0 References

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Figures

Wautoma Solar

Figure 1
Project Location

BENTON AND YAKIMA COUNTIES, WA

Grant County

Yakima County

Benton County

243

24

240

241

223

82

Granger

Sunnyside

Spring 2021 Survey Area

Fall 2021 Survey Area

County Boundary

INNERGEX

TETRA TECH

Reference Map

R:\PROJECTS\INNERGEX_WAUTOMA\BOTANY\MAPS\Wautoma_Figure_1_Location.mxd

1:150,000

NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 1 2 4 Miles

NOT FOR CONSTRUCTION

Figure 2 is not included because it contains confidential information and is not intended for public distribution.

ATTACHMENT M: HABITAT MANAGEMENT PLAN UPDATED PER WDFW

Revised Draft Habitat Management Plan for the Wautoma Solar Energy Project

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October 2022

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Acronyms and Abbreviations

Applicant	Innergex Renewable Development USA, LLC
ASC	Application for Site Certification
BCC	Benton County Code
BESS	battery energy storage system
BPA	Bonneville Power Administration
CAO	Critical Areas Ordinance
CRP	Conservation Reserve Program
EFSEC	Energy Facility Site Evaluation Council
FHWCA	fish and wildlife habitat conservation areas
GMA	Growth Management Act
HMP	Habitat Management Plan
JARPA	Joint Aquatic Resource Permit Application
O&M	operations and maintenance
Project	Wautoma Solar Energy Project
PV	photovoltaic
RCW	Revised Code of Washington
SCA	Site Certification Agreement
SEPA	State Environmental Policy Act
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife

1.0 Introduction

Innergex Renewable Development USA, LLC (Applicant) proposes to construct and operate the Wautoma Solar Energy Project (Project) in unincorporated Benton County, Washington. The Project is a 470-megawatt[1] solar photovoltaic (PV) generation facility coupled with a 4-hour battery energy storage system (BESS) sized to the maximum capacity of the Project, as well as related interconnection and ancillary support infrastructure. The Project consists of solar PV modules (or panels), support structures, electrical collector lines, power conversion systems, electrical inverters, BESS, Project substation, operations and maintenance (O&M) building, access roads, perimeter fencing, and overhead generation-tie transmission line that would connect the Project to the Bonneville Power Administration (BPA) transmission system at the BPA Wautoma Substation.

The Project Lease Boundary (i.e., the extent of parcels in which the Applicant has executed or is pursuing a lease to construct the Project) consists of 5,852 acres encompassing 35 privately owned parcels. Within this area, the Project would be sited within a smaller 4,573-acre Project Area. The Applicant is also pursuing easements/crossing agreements with the Bonneville Power Administration for Project access roads, collection lines, and transmission interconnection as needed within the Project Area.

The Applicant has prepared this Draft Habitat Management Plan (HMP) to support the Project's Energy Facility Site Evaluation Council (EFSEC) Application for Site Certification (ASC) and compliance with applicable regulations.

2.0 Regulations and Guidelines

2.1 EFSEC

Energy facilities subject to review by EFSEC include thermal electrical generation, pipelines, electrical transmission lines, petroleum refineries, petroleum storage, and alternative energy electrical generation (wind, solar, geothermal, landfill gas, wave or tidal action, and biomass). In the state of Washington, however, alternative energy facilities (of any size) are not required to enter the EFSEC process; the Applicant may opt in to the EFSEC process, or may choose to permit the project at the local level. For the proposed Project, the Applicant has elected to be sited under EFSEC jurisdiction.

Once an alternative energy facility has elected EFSEC permitting, EFSEC coordinates all evaluation and licensing steps. EFSEC specifies the conditions of construction and operation. If approved, a Site Certification Agreement (SCA) is issued in lieu of other individual state or local agency permits. Chapter 80.50 of the Revised Code of Washington (RCW) includes the laws EFSEC must follow in

[1] Megawatt rating provided in alternating current (MWac)

siting and regulating major energy facilities. Title 463 of the Washington Administrative Code (WAC) sets forth the regulations establishing how EFSEC functions under state and federal law.

EFSEC is responsible for evaluating applications under the Washington State Environmental Policy Act (SEPA; see Section 2.3) and to ensure that environmental and socioeconomic impacts are considered before a site is approved. After evaluating an application, EFSEC submits a recommendation to the Governor. If EFSEC determines that constructing and operating the facility will produce minimal adverse effects on the environment, ecology of the land and wildlife, and ecology of the state waters and aquatic life, and meets its construction and operation standards, then it recommends that a SCA be approved and signed by the Governor. The SCA lists the conditions the applicant must meet during construction and while operating the facility.

WAC 463-60-332 outlines how potential impacts to habitat, vegetation, fish, and wildlife must be addressed in the EFSEC ASC. This information has been prepared and presented in Sections 4.3, 4.8, and 4.9 of the Applicant's ASC. This Draft HMP has been prepared pursuant to WAC 463-60-332(3), which requires that the EFSEC ASC include a detailed mitigation plan. In addition, this Draft HMP describes how the Project follows the habitat characterization and mitigation provisions of the WDFW Wind Power Guidelines (WDFW 2009), as applicable, and Policy M-5002, pursuant to WAC 463-60-332(4).

2.2 Benton County Critical Areas Ordinance

Under Washington State's Growth Management Act (GMA), all cities and counties are directed to adopt critical areas regulations. Counties and cities are required to include the best available science in developing policies and development regulations to protect the functions and values of critical areas (RCW 36.70A.172). Benton County's Critical Areas Ordinance (CAO) was developed to comply with the requirements of the GMA, and was most recently updated on August 21, 2018, consistent with the GMA periodic review requirement in RCW 36.70A.130.

Benton County's regulations regarding critical areas are established in Title 15 of the Benton County Code (BCC). Title 15 defines critical areas as including any of the following areas or ecosystems: 1) wetlands (see Chapter 15.04 BCC), 2) critical aquifer recharge areas (see Chapter 15.06 BCC), 3) frequently flooded areas (see Chapter 15.08 BCC), 4) geologically hazardous areas (see Chapter 15.12 BCC), and 5) fish and wildlife habitat conservation areas (FWHCA; see Chapter 15.14 BCC).

Per BCC 15.14.010, FWHCAs include the following: 1) areas where federal or state designated endangered, threatened, and sensitive species have a primary association[2]; 2) state priority habitats and areas associated with state priority species; 3) habitats and species of local importance

[2] Primary association area - The area used on a regular basis by, in close association with, or is necessary for the proper functioning of the habitat of a critical species. Regular basis means that the habitat area is normally, or usually known to contain a critical species, or based on known habitat requirements of the species, the area is likely to contain the critical species. Regular basis is species and population dependent. Species that exist in low numbers may be present infrequently yet rely on certain habitat types (Benton County 2018).

as designated by Benton County (i.e., shrub-steppe habitat); 4) waters of the state; 5) naturally occurring ponds under 20 acres and their submerged aquatic beds that provide fish or wildlife habitat; 6) lakes, ponds, streams, and rivers planted with native fish populations; 7) Washington State Wildlife Areas; and 8) Washington State Natural Area Preserves and Natural Resource Conservation Areas (Benton County 2018). Information provided in Sections 4.8 and 4.9 of the EFSEC ASC submitted for this Project, as well as this HMP, addresses the requirement per BCC 15.14.030 for the Applicant to provide a habitat assessment and discuss the habitat avoidance, minimization, and mitigation measures proposed for the Project.

As described in Sections 4.8 and 4.9 of the EFSEC ASC, the Project would include disturbance in areas considered FWHCAs as defined by the CAO (e.g., shrub-steppe and associated wildlife species; elk winter range). This HMP addresses avoidance, minimization, and potential compensatory mitigation for impacts to upland habitats, including upland areas considered FWHCAs. In addition, as described in Section 4.3 of the EFSEC ASC, surveys for the Project identified three emergent wetlands and 34 ephemeral stream segments (which are considered waters of the state) within the Project Area (Tetra Tech 2022). The Project has been designed to avoid wetlands, and no wetland or wetland buffers impacts (temporary or permanent) are proposed in the current Project layout. Some Project impacts for temporary and permanent access road crossings will occur within ephemeral streams and frequently flooded areas as described in Part 3 Section 3,and Part 4, Section 4.3 of the ASC, and the Joint Aquatic Resources Permit Application (JARPA) in ASC Attachment T. The Applicant is designing the Project to minimize impacts to ephemeral streams to the extent feasible and will obtain a Washington Hydraulic Project Approval and Clean Water Act Nationwide Permit through the JARPA once potential stream impacts are verified with final design prior to construction. Appropriate avoidance, minimization, and mitigation measures consistent with the Benton County CAO will be developed during development of the JARPA (e.g., erosion control measures). In addition, Part 4, Section 4.3 of the ASC provides additional details on measures that would be implemented to minimize impacts on ephemeral streams within the Project Area.

2.3 Washington State Environmental Policy Act

SEPA is the state interdisciplinary policy that identifies and analyzes environmental impacts associated with state governmental decisions, including permits to construct energy facilities. The applicable SEPA statutes and regulations include RCW Ch. 43.21C, Washington Environmental Policy Act, WAC Ch. 197-11, Washington State Department of Ecology SEPA Rules, and Section 6.35 of the BCC, which establish requirements for compliance with SEPA. As the Applicant has elected to be sited under EFSEC jurisdiction, as discussed above, EFSEC will serve as the lead agency for SEPA review.

This Draft HMP, in addition to the analysis provided in Sections 4.3, 4.8, and 4.9 of the Project's EFSEC ASC, supports the finding that, with the implementation of proposed mitigation, probable significant adverse environmental impacts can be reduced to a level of non-significance as defined and understood in SEPA.

2.4 WDFW Wind Guidelines

The Washington Department of Fish and Wildlife (WDFW) published the Wind Power Guidelines in 2009 to provide consistent statewide guidance for the development of land-based wind energy projects that avoid, minimize, and mitigate impacts to fish and wildlife habitats in Washington state (WDFW 2009). The permitting authority (e.g., EFSEC) is responsible for SEPA review before issuing a project permit. However, WDFW is considered an agency with environmental expertise through SEPA and provides review and comments on environmental documents. Solar power-specific guidelines for solar energy developers to utilize in consideration of mitigation in the state of Washington are not available. Absent this guidance, and consistent with approved mitigation plans for other solar projects in Washington, the Applicant used the Wind Power Guidelines to develop this HMP where applicable, including the mitigation considerations listed below, which summarize the priorities for the habitat selected to replace the functions and values of habitat impacted by the Project (i.e., replacement habitat):

- Like-kind (e.g., shrub-steppe for shrub-steppe, grassland for grassland) and/or of equal or higher habitat value than the impacted area, noting that an alternative ratio may be negotiated for replacement habitat that differs from impacted habitat;
- Given legal protection (through acquisition in fee, a conservation easement, or other enforceable means);
- Protected from degradation, including development, for the life of the project to improve habitat function and value over time;
- In the same geographical region as the impacted habitat; and
- At some risk of development or habitat degradation and the mitigation results in a net habitat benefit.

2.5 WDFW Policy M-5002

WDFW established Policy M-5002 requiring or recommending mitigation in 1999. This policy applies to all habitat protection assignments where WDFW is issuing or commenting on environmental protection permits, documents, or violation settlements; or when seeking commensurate compensation for impacts to fish and wildlife resources resulting from oil or other toxic spills. The Applicant reviewed Policy M-5002 to support the development of this HMP, including the following considerations:

- The goal is to achieve no loss of habitat functions and values. Mitigation credits and debits will be based on a scientifically valid measure of habitat function, value, and area.
- WDFW uses the following definition of mitigation in which avoiding impacts is the highest mitigation priority: actions that shall be required or recommended to avoid or compensate for impacts to fish, wildlife, or habitat from the proposed project activity. The type(s) of mitigation required shall be considered and implemented, where feasible, in the following sequential order of preference:

  - Avoid the impact altogether by not taking a certain action or parts of an action.
  - Minimize impacts by limiting the degree or magnitude of the action and its implementation.
  - Rectify the impact by repairing, rehabilitating, or restoring the affected environment.
  - Reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action.
  - Compensate for the impact by replacing or providing substitute resources or environments.
  - Monitor the impact and take appropriate corrective measures to achieve the identified goal.
- On-site in-kind mitigation is preferred.
- Mitigation plans will include the following: baseline data; estimate of impacts; mitigation measures; goals and objectives; detailed implementation plan; adequate replacement ratio; performance standards to measure whether goals are being reached; maps and drawings of proposal; as-built drawings; operation and maintenance plans (including who will perform); monitoring and evaluation plans (including schedules); contingency plans, including corrective actions that will be taken if mitigation developments do not meet goals and objectives; and any agreements on performance bonds or other guarantees that the proponent will fulfill the mitigation, operation and maintenance, monitoring, and contingency plan.
- Mitigation measures will be completed before or during project construction.
- Mitigation site will be protected for the life of the project.
- Mitigation banking may be an acceptable form of mitigation.

3.0 Agency Consultation History

The Applicant met with representatives of WDFW on March 8, 2021, to introduce the Project and discuss planned wildlife, habitat, and rare plant surveys. At the meeting, WDFW concurred with the habitat and wildlife survey timing and survey approach, as well as gave a verbal description of special-status wildlife that may occur in the Project vicinity. The input from WDFW provided during this meeting was used to inform the habitat and wildlife background review and field surveys.

The Applicant met with representatives of WDFW again on February 16, 2022, to discuss the findings of wildlife, habitat, and rare plant surveys conducted within the Project Lease Boundary, as well as to describe the Project's permitting approach and anticipated Project size and components. WDFW noted that the general area where the Project is located has a history of being overgrazed (sheep grazing). In addition, the area has experienced several fires in the last 20 years and there are very few resources available to fight fires in this area of the state. WDFW noted that fire would be a

concern for this Project and offered to advise on fire prevention measures during a subsequent meeting. WDFW also noted that if the Project was able to control for wildfire and grazing in the Project Lease Boundary, it would provide an opportunity to see what would return to the landscape, possibly with limited revegetation given that the area is dry with limited annual rainfall (approximately 8 inches per year). WDFW noted that if ground disturbance is kept to the bare minimum during construction of the solar arrays, active revegetation in these areas may not be required (i.e., following construction, wait and observe what type of vegetation colonizes naturally within the solar arrays once grazing and fire have been removed). If passive revegetation is not successful, adaptive management (e.g., active seeding) could be implemented for revegetation. The discussion of using sheep to control vegetation within the solar arrays was also discussed, and WDFW noted that this should be considered. WDFW also noted that rabbitbrush shrubland habitat should be considered "early-stage succession for shrub-steppe" and should be treated as equivalent to shrub-steppe for mitigation. Section 4.0 describes how the Project addresses rabbitbrush shrubland.

Additional wildlife, habitat, and rare plant surveys were conducted for the Project in the fall of 2021 and spring of 2022 within portions of the Project Lease Boundary that had not been surveyed in the spring of 2021. The Applicant met with representatives of EFSEC and WDFW on August 18, 2022, to discuss the findings of these additional surveys as well as the proposed Draft Habitat Management Plan. During this meeting, WDFW suggested that the Applicant review the area currently classified as eastside (interior) grassland habitat where some burned sagebrush was documented and consider reclassifying it to shrub-steppe. WDFW also noted they are researching the status of an agreement with the landowner on maintaining the existing hedgerows mapped within the Project Area where Swainson's Hawk (*Buteo swainsoni*) nests were identified to determine if the agreement is still active. During this meeting, the Applicant also discussed new active burrowing owl (*Athene cunicularia*) burrows documented during the 2022 surveys near the center of the Project Area in an area previously documented in 2021 as being used by coyotes. Potential options were discussed with WDFW, including creating artificial burrows or avoiding impacts to the current burrow locations with a small buffer. WDFW noted that artificial burrows can be difficult to maintain and indicated they would prefer avoidance of the burrows themselves along with a buffer. Additional discussion included potentially creating additional corridors for big game, as well as other mitigation options such as firebreaks, restoration or enhancement of degraded lands, and weed management throughout the Project Area to reduce fire potential. Sections 4.0 and 7.0 describes how the Project addresses the suggested modifications from this meeting.

4.0 Habitat Mapping

The Applicant conducted field surveys to map and characterize habitat within the Project Area in 2021, as described in Sections 3.8 and 4.8 of the EFSEC ASC as well as the Habitat and General Wildlife Survey Report (Tetra Tech 2022). In general, habitat types were adapted from habitat descriptions in the Washington Department of Fish and Wildlife Wind Power Guidelines (WDFW 2009) and Wildlife-Habitat Relationships in Oregon and Washington (Johnson and O'Neil 2001),

with some modifications as described below. Descriptions of habitat types mapped within the Project Area are provided in the Habitat and General Wildlife Survey Report (Tetra Tech 2022). Table 1 provides a crosswalk between habitats mapped at the Project, Johnson and O'Neil (2001) Habitat Types, and WDFW Habitat Types and Classifications (WDFW 2008, 2009). Vegetation within much of the Project Lease Boundary has been heavily modified by historic and current agricultural use as well as extensive grazing by cattle and sheep, resulting in decreased habitat function. Non-native invasive grasses and forbs are common throughout much of the Project Lease Boundary as a result of historic and current farming and grazing activity.

Three WDFW Priority Habitats were mapped within the Project Lease Boundary: shrub-steppe, eastside steppe (i.e., eastside [interior] grassland), and talus (WDFW 2008). Per discussion with WDFW, approximately 52.5 acres previously mapped as eastside (interior) grassland habitat (Class III) in the southwestern portion of the Project Area has been reclassified to shrub-steppe (Class II).

Table 1. Project Habitat Type Crosswalk with WDFW Habitat Type and Classification

<table>
<tr><th>Project Habitat Type</th><th>Johnson and O'Neil (2001) Habitat Type</th><th>WDFW (2008) Priority Habitat</th><th>WDFW (2009) Wind Power Guidelines Habitat Type</th><th>WDFW (2009) Wind Power Guidelines Classification</th></tr>
<tr><td>Rabbitbrush shrubland1/</td><td>Not a defined habitat type</td><td>Not a Priority Habitat</td><td>Not a defined habitat type</td><td rowspan="3">Class II</td></tr>
<tr><td>Shrub-steppe</td><td>Shrub-steppe</td><td>Shrub-steppe</td><td>Shrub-steppe</td></tr>
<tr><td>Talus</td><td>Talus</td><td>Talus</td><td>None</td></tr>
<tr><td>Eastside (interior) grassland</td><td>Eastside (Interior) Grasslands2/</td><td>Eastside Steppe</td><td>Eastside (Interior) Grasslands</td><td rowspan="3">Class III</td></tr>
<tr><td>Rabbitbrush shrubland</td><td>Not a defined habitat type</td><td>Not a Priority Habitat</td><td>Not a defined habitat type</td></tr>
<tr><td>Planted grassland</td><td rowspan="3">Agriculture, Pastures and Mixed Environs</td><td rowspan="4">Not a Priority Habitat</td><td rowspan="2">Conservation Reserve Program (CRP) Lands</td></tr>
<tr><td>Irrigated hedgerows</td></tr>
<tr><td>Agricultural land</td><td rowspan="2">Croplands, Pasture, Urban and Mixed Environs</td><td rowspan="2">Class IV</td></tr>
<tr><td>Non-native grassland and forbland</td></tr>
<tr><td>Developed/disturbed</td><td>Urban and Mixed Environs</td><td>Urban and Mixed Environs</td></tr>
<tr><td colspan="5">1/ As discussed in the text below this table, the rabbitbrush shrubland habitat type corresponds most closely to the eastside (interior) grassland (Class III) WDFW habitat types. However, the Project is voluntarily including rabbitbrush shrubland habitat as Class II habitat (i.e., the equivalent of shrub-steppe) for the purposes of this Draft HMP.
2/ In Johnson and O'Neil (2001), this habitat type is also called eastside grasslands.</td></tr>
</table>

Of the nine upland habitat types mapped within the Project Lease Boundary, four were not readily classified based on existing habitat descriptions from the Washington Department of Fish and Wildlife Wind Power Guidelines (WDFW 2009): rabbitbrush shrubland, non-native grassland and forbland, planted grassland, and irrigated hedgerows. The rabbitbrush shrubland habitat type corresponds most closely to the eastside (interior) grassland (Class III) WDFW habitat types.

Rabbitbrush (*Chrysothamnus viscidiflorus* and *Ericameria nauseosa*), which is the primary shrub found in rabbitbrush shrubland habitat mapped at the Project, readily colonizes disturbed sites such as abandoned agriculture lands, previously grass-dominated areas disturbed by overgrazing or fire, or rangelands that have been replanted (Faber-Langendoen et al. 2013; Tirmenstein 1999; USDA 2017). All of these factors have occurred within the Project Area and have likely facilitated the colonization of rabbitbrush shrubs in the area. These factors would likely continue at the site and would likely continue to hinder the succession of rabbitbrush shrubland into shrub-steppe habitat. However, per consultation with the WDFW (see Section 3.0), rabbitbrush shrubland habitat is considered early-stage succession for shrub-steppe and was therefore treated as equivalent to shrub-steppe (Class II) habitat for the purposes of this Draft HMP.

The non-native grassland and forbland habitat type corresponds most closely with pasture and mixed environs (Class IV) WDFW habitat. Per WDFW (2009), unimproved pastures are "*predominately non-native grassland sites, often abandoned fields that have little or no active management*…". Per Johnson and O'Neil (2001), modified grasslands, a subcategory of the Agriculture, Pastures and Mixed Environs habitat type, are "generally overgrazed habitats that formerly were native eastside grasslands or shrub-steppe but are now dominated by annual plants with only remnant individual plants of the native vegetation". Modified grasslands, per Johnson and O'Neil (2001) are dominated by non-native grasses, including cheatgrass (*Bromus tectorum*) and other annual bromes, bulbous bluegrass (*Poa bulbosa*), and knapweeds (*Centaurea* spp.), such as the non-native grasslands and forblands mapped at the Project.

Planted grassland most readily falls into the "Unimproved Pasture" subtype of the "Agriculture, Pastures, and Mixed Environs" habitat type (Johnson and O'Neil 2001). Per Johnson and O'Neil (2001), unimproved pastures include *"…rangelands planted to exotic grasses that are found on private land, state wildlife areas, federal wildlife refuges and U.S. Department of Agriculture Conservation Reserve Program (CRP) sites*." Areas mapped as planted grassland in the eastern portion of the Project Area are currently enrolled in the CRP program. Areas mapped as planted grassland in the central and western portions of the Project Area are not enrolled in the CRP program; however, these areas are likely restoration plantings to restore areas burned during past wildfires. Although not currently enrolled in the CRP, these areas were also considered Class III grassland habitat per the WDFW Wind Power Guidelines (WDFW 2009) because these areas appear to have been planted with non-native grasses and native grasses, and are therefore the functional equivalent of typical CRP lands. Similarly, the irrigated hedgerow habitat was considered the functional equivalent of Class III CRP habitat because, per WDFW (2009), habitats classified as CRP includes not only areas planted with grasses, but also "wildlife plantings, trees, filterstrips, or riparian buffers".

5.0 Project Impacts

Construction and operation of the Project would result in both permanent and temporary impacts on vegetation, as well as permanent alterations of vegetation within the solar array's perimeter fence lines. Table 2 provides the anticipated acres of impact to each habitat type from construction

and operation of the Project, including acres of temporary, permanent, and altered impacts. The following defines the terms used when discussing the various habit impact types considered in this HMP:

- Permanent impacts include locations where permanent Project components would occur (e.g., solar array panel posts, inverter pads, new permanent access roads, O&M building, Project substation, poles for overhead transmission lines). Vegetation in these areas would be removed for the life of the Project and constitute a permanent habitat loss.
- Temporary impact areas include work areas located outside the solar array perimeter fence that would be disturbed during construction and revegetated following construction, such as laydown areas and pulling areas for the transmission line, a corridor for trenching to install collector lines, and temporary access roads. Temporarily disturbed areas would be revegetated in accordance with a Revegetation and Weed Management Plan that will be developed and agreed upon by EFSEC, with input from Benton County Noxious Weed Control Board and WDFW, prior to construction.
- Altered habitat impacts include lands within the solar array perimeter fence, minus any areas occupied by permanent Project structures. These areas would either be passively or actively revegetated. Passive revegetation would involve waiting to see what plant species colonize naturally following construction (see Section 3.0 above). If passive revegetation is not successful (e.g., native species fail to colonize and site is dominated by non-native species), active revegetation could then occur. If necessary, active revegetation would include revegetating with low-growing vegetation consisting of native species and/or a mix of native and desirable non-native, non-invasive species. Inclusion of non-native, non-invasive species may be desirable in some instances. For example, some non-native, non-invasive species may provide more rapid soil stabilization and vegetative cover than slower-growing native species. Rapid vegetative cover of these species may also reduce the fuel load created by proliferation of non-native species such as cheatgrass. Following construction and revegetation, these areas would contain an altered vegetation community compatible with solar arrays and support an altered wildlife community that is able to pass over, under, or through the perimeter fence, but would retain value to wildlife as described in Section 6.0 of this HMP.

Table 2. Anticipated Impacts to Habitat Types from the Project

Habitat Type	Temporary Impacts (Acres)[1/]	Altered Habitat Impacts (Acres)[2/]	Permanent Impacts (Acres)[3/]	Total[4/]
Planted grassland	66.4	1,438.8	80.9	**1,586.1**
Agricultural land	5.2	729.4	28.9	**763.5**
Non-native grassland and forbland	34.6	563.0	25.7	**623.3**
Rabbitbrush shrubland	2.7	84.7	4.4	**91.8**
Developed/disturbed	0.6	9.9	0.7	**11.2**
Irrigated hedgerow	0.2	7.3	0.9	**8.3**

Habitat Type	Temporary Impacts (Acres)[1/]	Altered Habitat Impacts (Acres)[2/]	Permanent Impacts (Acres)[3/]	Total[4/]
Eastside (interior) grassland	2.3	1.5	0.1	**3.9**
Shrub-steppe	2.6	1.6	0.1	**4.2**
Total[4/]	**114.7**	**2,836.2**	**141.6**	**3,092.5**

1/ Temporary impacts include: collector lines, temporary access roads, and work areas located outside the solar array perimeter fence lines and laydown and pulling areas associated with the transmission line.

2/ Altered habitat impacts consists of all lands within the perimeter fence lines, minus any areas occupied by permanent Project features/structures.

3/ Permanent impacts include solar array panel posts, inverter pads, permanent access roads, substation, O&M building, and poles for transmission line.

4/ Totals may not sum exactly due to rounding.

6.0 Scientific Basis

WDFW (2009) defines permanent impacts to habitat as those impacts that are anticipated to persist and cannot be restored within the life of the project, which may include "new permanent roads, operations and maintenance facilities, turbine pads, impervious and/or areas devoid of native vegetation resulting from project operations." Areas that would be revegetated under the solar arrays following construction of the Project would not be impervious, would not be devoid of native vegetation, and would be revegetated within the life of the Project; therefore, these areas are not considered permanently impacted habitat. Following completion of construction, areas under the solar arrays would be revegetated with either low-growing native vegetation or a mix of native and non-native, non-invasive vegetation.

A recent study demonstrated that successful revegetation under solar panels is possible, even with native grass species adapted to full-sun conditions (Beatty et al. 2017). This study demonstrated that revegetation under solar panels was able to "achieve ground cover sufficient to control erosion and begin to restore wildlife habitat" (Beatty et al. 2017). Research in Oregon (Hassanpour Adeh et al. 2018) quantified changes to the microclimatology, soil moisture, water usage, and biomass productivity due to the presence of solar panels. In this study, areas under PV panels maintained higher soil moisture, showed a significant increase in late season biomass (90 percent more biomass), and were significantly more water efficient (328 percent more efficient), although caution should be used in applying these results from west of the Cascade Mountains to the drier Columbia Plateau (Hassanpour Adeh et al. 2018). Similarly, pre- and post-construction biological monitoring data at a PV solar facility in California indicated similar to higher vegetation productivity on-site compared to reference sites (Sinha et al. 2018). As a result, areas under solar panels that would be revegetated are considered altered habitat impacts rather than temporary or permanent impacts.

Habitat within the solar fence line would remain available to wildlife such as small mammals, birds, reptiles, and invertebrates in an altered condition. Limited research is available regarding the effects of PV array development (including the effects of fencing and shading) on residual wildlife habitat value; however, preliminary studies indicate residual habitat value remains for various species of birds, and the value may differ based on restoration and vegetation management practices. For example, DeVault

et al. (2014) studied avian abundance at PV array fields and paired airport grassland areas using transect surveys. The results indicated that airport grasslands generally had greater species diversity and PV arrays generally had more total birds observed; however, overall bird mass was comparable at airport grasslands and PV arrays, suggesting smaller birds tended to use the PV arrays rather than the airport grasslands. Similarly, Visser et al. (2018) measured bird abundance and diversity at a PV array facility in South Africa using point counts within and outside the facility. The primary conclusion of the study was that bird diversity and density were higher outside of the facility, but the facility was not absent of birds. Visser et al. (2018) found that the bird community inside the facility comprised birds that were generalist species or those that use grassland habitat. Thus, the species composition appeared to be associated with a change from a shrub/woodland habitat to a grassland habitat within the facility. H.T. Harvey and Associates (2015) studied avian abundance and behavior using point count methods at a PV array in grassland habitat. Counts were conducted inside the facility and in undeveloped reference areas over a 3-year period before, during, and after construction. The results were highly variable, with some species (e.g., horned lark [*Eremophila alpestris*]) showing increases in abundance over time and within the facility, while others (e.g., mourning doves [*Zenaida macroura*] and raptors) showed decreases during construction and increases in use upon transitioning to operations, but overall higher use in reference areas compared to the facility. This limited research demonstrates that while bird species use may change at PV arrays, use of the area is not eliminated; instead, the altered habitat supports an altered avifaunal community.

Similarly, post-construction biological monitoring data at a PV solar facility in California documented the presence of dozens of wildlife species, including California horned lark (*Eremophila alpestris actia*), ferruginous hawk (*Buteo regalis*), loggerhead shrike (*Lanius ludovicianus*), prairie falcon (*Falco mexicanus*), black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Otospermophilus beecheyi*), San Joaquin kit fox (*Vulpes macrotis mutica*), and coast range fence lizard (*Sceloporus occidentalis bocourtii*) (Sinha et al. 2018). This California site was reseeded with native flora species to allow vegetation to grow beneath the solar panels, creating new habitats, providing sources of food for various wildlife species, and providing dust control (Sinha et al. 2018). The results of monitoring indicated that although solar facility construction activities do involve short-term disturbance, responsibly developed solar facilities can provide shelter, protection, and stable use of land to support biodiversity (Sinha et al. 2018).

7.0 Proposed Avoidance, Minimization, and Mitigation Measures

The final Project layout will be designed to avoid and minimize impacts on vegetation and wildlife to the extent possible. For impacts that cannot be avoided, mitigation is proposed. As described in WDFW's Policy M-5002 (see Section 2.4), avoidance of impacts is the highest mitigation priority. When impacts cannot be avoided, they should be minimized, restored, reduced, or compensated for, in that order of priority. Benton County's CAO describes mitigation requirements that are consistent with Policy M-5002. The plan presented here is consistent with both the Benton County CAO mitigation guidelines and the WDFW mitigation policy.

7.1 Avoidance and Minimization

Avoidance and minimization measures would be implemented during design, construction, and operation. The following avoidance and minimization measures were either applied during Project development or are proposed for Project construction and operations:

- To minimize impacts to wildlife and habitat, baseline studies were conducted at the Project in coordination with the WDFW and consistent with the WDFW Wind Power Guidelines (WDFW 2009). In order to minimize impacts to and avoid wildlife resources and habitat, the Applicant used the results of these baseline studies to inform the layout design.
- Project facilities were sited on previously disturbed (e.g., cultivated agricultural land, non-native grassland and forbland) areas as feasible to avoid impacts to native habitats and associated wildlife species.
- Project facilities that were sited avoided talus slopes (i.e., a Priority Habitat) by at least 125 feet and burrowing owl nests by 2,800 feet along the northern Project boundary, and impacts to shrub-steppe habitat were minimized to the extent feasible.
- The Project will use industry standard BMPs to minimize impacts to vegetation, waters, and wildlife.
- To the extent feasible, the solar array fence lines have been designed to enclose smaller solar arrays within the Project Area rather than enclosing one large, fenced array, which will minimize habitat fragmentation and allow wildlife passage through the area.
- With the exception of fencing around the Project substation, which will extend to the ground, perimeter fencing will be designed to be at least 4 inches above ground. No barbed wire will be used on perimeter fencing around the solar arrays.
- The layout of the perimeter fence was also modified to maintain open access to the ephemeral drainages within the Project Area that are used by mule deer and elk for movement corridors as well as for water sources.
- The Applicant is also in discussions with WDFW and affected landowners to see if existing artificial water sources (primarily developed for livestock) can be moved outside of the fenced areas in order to maintain wildlife access to these water sources (including access for elk and mule deer).
- Evening and nighttime construction activities will be avoided to the extent practicable, which will limit the impacts of construction noise to wildlife.
- Vehicle speeds will be limited to 25 mph on internal Project access roads to avoid wildlife collisions. Existing posted speed limits on county and private roads will be followed outside of the Project Area.
- If construction occurs during the bird nesting season, nest clearance surveys will be conducted prior to site disturbance.

- All Project facilities, including solar arrays, security fencing, access roads and collection lines, currently avoid all active burrowing owl burrows documented in the central portion of the Project Area during 2022 surveys. These burrows will be monitored. In addition, the following measures would be implemented:
    - Conduct preconstruction surveys to ensure that occupied burrows are not disturbed during the nesting season (February 15 through September 25) unless a qualified biologist approved by the WDFW verifies through non-invasive methods that either: (1) burrowing owls are not present; (2) the birds have not begun egg-laying and incubation; (3) that juveniles from the occupied burrows are foraging independently and are capable of independent survival; or (4) have dispersed from the site.
    - A no disturbance buffer of a minimum of 150 meters (~500 feet) would apply to any occupied burrow during the nesting period, **from February 15 through September 25,** or until burrowing owls have dispersed from the site.
    - If avoidance is not possible; use or development of nearby natural or artificial burrow systems would be developed in coordination with WDFW.
- Prior to construction, construction personnel will be instructed on wildlife resource protection measures, including: 1) applicable federal and state laws (e.g., those that prohibit animal collection or removal); and 2) the importance of these resources and the purpose and necessity of protecting these resources. Construction personnel will be trained in the following areas when appropriate: awareness of biological resources (including Priority Habitats and special status species), potential bird nesting areas, and general wildlife issues.
- Overhead power lines are required to connect the Project to the grid. These lines will be designed and constructed to minimize avian electrocution, according to guidelines outlined in Avian Power Line Interaction Committee standards (APLIC 2012).
- The Applicant may also establish and maintain fire and fuel breaks in key areas and have been in discussion with WDFW staff to continue green-stripping areas along the boundaries of the leased parcels. In addition, access roads will be developed and maintained with an approximate 24-foot width to provide sufficient access for fire fighters to the area as well as provide additional fire breaks.
- Fire hazards from vehicles and human activities will be reduced via use of spark arrestors on power equipment, avoiding driving vehicles off roads, and allowing smoking only in designated areas per the requirements of WAC 463-60-352. The Applicant will prepare an Emergency Management Plan that contains fire safety measures, which will be developed with input from applicable agencies.
- During construction, recommended seasonal buffers for all raptor nests would be observed to avoid disturbing nesting activities.

- The Applicant does not anticipate using pesticides during Project construction or operation; if unforeseen circumstances arise that require the use of pesticides, the Applicant will consult with WDFW and EFSEC regarding the use of pesticides to avoid and minimize impacts to burrowing owl (per Larsen et al. 2004).
- Unnecessary lighting will be turned off at night to limit attraction of migratory birds to the area. This includes using lights with timed shutoff, downward-directed lighting to minimize horizontal or skyward illumination, and avoidance of steady-burning, high-intensity lights.
- The Project was sited outside of wetlands and waters to the extent feasible to avoid and minimize impacts to these resources as described in Sections 4.3 and 4.5 of the EFSEC ASC, which will also avoid and minimize impacts to species that use these habitats.
- The Applicant will obtain a Hydraulic Project Approval and Nationwide Permit prior to construction.
- The Project design has been revised to avoid rare plant species documented during surveys. If new individuals or populations of rare plants are located during final design or construction, and avoidance is not possible, mitigation measures for impacts would be developed in consultation with the applicable agencies.
- The Applicant will limit construction disturbance by flagging any sensitive areas (e.g., wetlands, rare plant populations, if present) and will conduct ongoing environmental monitoring during construction to ensure flagged areas are avoided.

7.2 Restoration

A Vegetation and Weed Management Plan would be developed in consultation with the Benton County Weed Control Board and WDFW prior to construction. The Vegetation and Weed Management Plan would include measures designed to ensure successful revegetation, including measures for re-establishing vegetation where appropriate, controlling the establishment or spread of invasive species, weed control, monitoring; it may also include, in coordination with WDFW, adaptive management within the fenced areas (see Section 3.0). Additionally, the Vegetation and Weed Management Plan would include benchmarks and timelines to ensure revegetation success, which incorporate components of the mitigation proposal.

7.3 Fire Protection

During consultation with the WDFW (see Section 3.0), the WDFW informed the Applicant that vegetated “green strips” (i.e., areas planted with grasses and forbs that germinate early and stay green late enough into the season to reduce the spread of wildfires) that serve as fire breaks have been planted in the vicinity of the Project in conjunction with private landowners. WDFW recommended that green strips be incorporated into the Project as a fire prevention measure. The Applicant will work with the WDFW to determine if there are areas within the Project Lease Boundary or in the vicinity where the use of green strips would be beneficial. If green strips are

selected as a fire protection measure, the Applicant would work with WDFW to determine an appropriate width, linear distance, and seed mix for the green strips. Depending on the location of these green strips, they would be considered an uplift action that would reduce overall mitigation requirements discussed in Section 7.4.

7.4 Compensatory Mitigation

After avoidance and minimization measures have been implemented, some impacts to wildlife habitat would remain. This section describes the options being considered for compensatory mitigation to account for the effects of unavoidable impacts to habitat, in compliance with the regulations and guidelines described in Section 2.0.

Table 3 provides the estimated acres of mitigation based on the acres of each habitat type anticipated to be impacted by the Project as currently designed. In Table 3, the acres of impact are multiplied by the appropriate mitigation ratio, depending on impact type/duration as well as habitat type, in order to determine the necessary mitigation. The mitigation ratios related to temporarily and permanently lost habitats shown in Table 3 are based on the WDFW (2009) Wind Power Guidelines. In the absence of solar-specific guidelines, the Wind Power Guidelines are used here to help achieve WDFW's Policy M-5002 goal of "protecting the productive capacity and opportunities reasonably expected of a site in the future." The altered habitat impact mitigation ratios were developed in the absence of solar development guidelines and considering that revegetated habitat under solar arrays does not meet the definition of temporary or permanent impacts from WDFW (2009) (see Section 6.0). As noted in Section 4.0, the rabbitbrush shrubland habitat at the Project corresponds most closely to the eastside (interior) grassland (Class III) WDFW habitat types. However, in consultation with the WDFW (see Section 3.0), the Applicant is voluntarily considering rabbitbrush shrubland habitat as early-stage succession for shrub-steppe and including rabbitbrush shrubland as Class II habitat (equivalent to shrub-steppe) for the purposes of establishing compensatory mitigation in this Draft HMP. In addition, 52.5 acres of eastside (interior) grassland in the southwestern portion of the Project also documented a few individual burned out sagebrush plants during surveys, and has also been included as Class II habitat (equivalent to shrub-steppe).

Table 3 depicts anticipated impacts and mitigation ratios based on the layout described in the Project's EFSEC ASC. These impacts and resulting mitigation acreages will be updated as appropriate once the final design has been completed. As discussed above and in Part 2 of the ASC, the Applicant is considering various design layouts within the Project Area. The preliminary layout of the PV solar system and supporting components accounts for Project size, topography, and other constraints; however, the precise equipment and layout have not yet been finalized and the Applicant seeks to permit a range of technology to preserve design flexibility. The exact locations of Project components may be revised during final Project design, and impacts from the Project could occur anywhere within the Project Area up to the acreage identified in Table 2. The Applicant seeks the ability to scale mitigation identified in Table 3 accordingly. Additionally, per WDFW (2009), alternative ratios may be negotiated for replacement habitat that differs from impacted habitat.

Table 3. Anticipated Impacts by Habitat and Impact Type and Estimated Mitigation Need

Habitat Type	WDFW Classification	Impact (Acres)	Mitigation Ratio	Estimated Mitigation (Acres)
Temporary Impacts[1/]				
Rabbitbrush shrubland[2/]	Class II	2.7	1:1	2.7
Shrub-steppe		2.6		2.6
Eastside (interior) grassland	Class III	2.3	0.1:1	0.2
Irrigated hedgerows		0.2		<0.1
Planted grassland		66.4		6.6
Agriculture	Class IV	5.2	0:1	0.0
Developed/disturbed		0.6		
Non-native grassland and forbland		34.6		
Altered Habitat Impacts[3/]				
Rabbitbrush shrubland[2/]	Class II	84.7	1:1	84.7
Shrub-steppe		1.6		1.6
Eastside (interior) grassland	Class III	1.5	0.5:1	0.8
Irrigated hedgerows		7.3		3.6
Planted grassland		1,438.8		719.4
Agriculture	Class IV	729.4	0:1	0.0
Developed/disturbed		9.9		0.0
Non-native grassland and forbland		563.0		0.0
Permanent Impacts[4/]				
Rabbitbrush shrubland[2/]	Class II	4.4	2:1	8.8
Shrub-steppe		0.1		0.2
Eastside (interior) grassland	Class III	0.1	1:1	0.1
Irrigated hedgerows		0.9		0.9
Planted grassland		80.9		80.9
Agriculture	Class IV	28.9	0:1	0.0
Developed/disturbed		0.7		0.0
Non-native grassland and forbland		25.7		0.0
Total[5/]				**913.1**

1/ Temporary impacts include collector lines, temporary access roads, and work areas located outside the solar array perimeter fence lines and laydown and pulling areas associated with the transmission line.

2/ The rabbitbrush shrubland habitat type corresponds most closely to the eastside (interior) grassland (Class III) WDFW habitat types (see Section 4.0). However, as discussed above, the Project is voluntarily including rabbitbrush shrubland habitat as Class II habitat (i.e., the equivalent of shrub-steppe).

3/ Altered habitat impacts consists of all lands within the perimeter fence lines, minus any areas occupied by permanent Project features/structures.

4/ Permanent impacts include solar array panel posts, inverter pads, permanent access roads, substation, O&M building, and poles for transmission line.

5/ Total may not sum exactly due to rounding.

Mitigation would be achieved by one of the following options, pending concurrence from EFSEC and with further input from WDFW:

- Conservation Easement Option: A conservation easement would be put in place on land acceptable to EFSEC to preserve the acreage noted in Table 3. Mitigation land will be chosen with an emphasis on mitigating those functions and values being impacted by the Project. The actual mitigation acres may be adjusted to account for these functions and values. For example, fewer acres of mitigation land may be required if that land is higher functioning (e.g., provides higher quality habitat, supports WDFW priority species) relative to the Project site or provides a beneficial expansion of high-value habitat (e.g., adjacent to existing or assumed future protected land).
- Conservation Project Funding Option: The Applicant would provide funding to a conservation project to be designated by EFSEC, in an amount to be calculated based on the cost of an easement for the acreage noted in Table 3.

As noted above, the Applicant may also establish and maintain fire and fuel breaks in key areas and have been in discussion with WDFW staff about green-stripping areas along the boundaries of the leased parcels outside of the fenced solar array. Establishment of green-strips, which if planted with a predominantly native seed mix, would not only reduce potential fires in the area, but would also provide beneficial habitat if established in currently disturbed ground dominated by non-native species. If this option is pursued, the Applicant would work with WDFW to determine the number of acres credited as compensatory mitigation to the Project from implementation of this option.

This HMP would be updated and/or supplemented prior to construction to identify the mitigation option selected, and the mitigation would be implemented concurrently with Project construction and continue through the life of the Project. Prior to construction, the Applicant would confirm the selected mitigation option and update or supplement this HMP to describe the mitigation area, as well as provide documentation of a conservation easement and/or a long-term financial commitment, depending on the option selected.

7.5 Monitoring and Reporting

Once the Project design has been finalized, and prior to construction, Table 3 above would be revised to reflect actual habitat impacts and associated mitigation acres as appropriate. The Applicant would provide a memorandum to EFSEC with the updated acreage impact calculations and proposed conservation easement location or conservation project funding (as applicable) for approval by EFSEC. Once the conservation easement has been put in place, a copy of the deed restriction would be provided to EFSEC.

If the conservation easement option is chosen, the mitigation area would be protected from degradation, including development, for the life of the Project, and thus, habitat function and value would likely improve over time as degrading forces are removed. The Applicant would also monitor the habitat impacts following construction to verify the extent of impacts and document post-construction recovery of areas disturbed temporarily or altered as a result of the Project. The

Applicant would report the results of monitoring annually for the first 5 years following construction to EFSEC.

For the conservation project funding option, part of the payment would likely fund a stewardship endowment that would cover costs for the conservation project steward to monitor and report on how they have implemented the funding to meet the mitigation needs of the Project. The Applicant would not be directly involved in this effort, beyond providing the funding necessary to conduct the effort.

7.6 Success Criteria

Mitigation of the impacts to wildlife habitat from the Project may be considered successful if the Applicant 1) protects sufficient habitat to meet the estimated habitat replacement requirements as described in Table 3, allowing for some variance based on functions and values and benefits to wildlife and wildlife habitat provided by the chosen mitigation area, as described in Sections 2 and 7.4; or 2) provides commensurate funding to a conservation project. For the funding option, mitigation would be considered successful at the time of payment to EFSEC.

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ATTACHMENT N: SOCIOECONOMIC REVIEW

Wautoma Solar Energy Project
Socioeconomic Review

Prepared for:

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Prepared by:

April 2022

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Acronyms and Abbreviations

ASC	Application for Site Certification
BESS	battery energy storage system
BPA	Bonneville Power Administration
GMA	Growth Management Act
MSA	Metropolitan Statistical Area
Project	Wautoma Solar Energy Project
PV	photovoltaic
RV	recreational vehicle
SR	State Route
WAC	Washington Administrative Code

1. Project Overview

Innergex is planning to construct the Wautoma Solar Energy Project (Project) in northwestern Benton County. Located approximately 1 mile south of the State Route (SR) 241 and SR 24 interchange, the Project is a 470-megawatt[1] solar photovoltaic (PV) generation facility coupled with a 4-hour battery energy storage system (BESS), as well as related interconnection and ancillary support infrastructure. The Project Lease Boundary encompasses approximately 5,852 acres and is located entirely on private land. The Project will connect to the Bonneville Power Administration (BPA) transmission system at the existing BPA Wautoma Substation, which is located on BPA-managed federal lands surrounded by the Project Area. The Applicant intends to begin construction in 2024.

2. Summary of Results

This Socioeconomic Review addresses components of Washington Administrative Code (WAC) 463-60-535 for the Application for Site Certification (ASC). The document contains information about impacts to population, labor force, and housing. The following review indicates that, at peak construction, the locally available workforce should be sufficient to meet demand for local direct workers, which are expected to account for about 45 to 65 percent of the total construction workforce. Local workers are those who normally reside within daily commuting distance of the Project site and would commute daily to the Project site from their homes. Non-local workers hired from outside the area are expected to temporarily relocate to the vicinity of the Project for the duration of their employment. The following review suggests that there are sufficient housing resources to accommodate non-local workers, and the temporary influx of these workers is not expected to constrain the housing market for existing residents or result in changes in housing values, rents, or new housing construction.

3. Socioeconomic Study Area

The primary socioeconomic study area for this analysis is based on WAC 463-60-535 and incorporates areas that may be affected by employment within a 1-hour commute of the Project area. The Project area is located in northwestern Benton County, immediately adjacent to the Benton-Yakima county line. The areas within 1 hour include the city of Yakima; the Tri-Cities of Kennewick, Pasco, and Richland; 20 other smaller incorporated communities; and unincorporated areas in five counties. The five counties are Adams, Benton, Franklin, Grant, and Yakima counties, Washington.

Together, Benton and Franklin counties make up the Kennewick-Richland Metropolitan Statistical Area (MSA). MSAs consist of integrated geographic regions typically made up of an urbanized

[1] Megawatt rating provided in alternating current (MWac)

economic core and economically related counties (Office of Management and Budget 2020). The Tri-Cities of Kennewick, Pasco, and Richland are the core of the Kennewick-Richland MSA. Benton and Franklin counties are the economically related counties that share a high degree of economic integration with the urbanized core and one another. The cities of Kennewick and Richland are located in Benton County; the city of Pasco is located in Franklin County. Yakima County makes up the Yakima MSA. The city of Yakima is the urbanized core, which shares a high degree of economic integration with the surrounding county. These three counties—Benton, Franklin, and Yakima counties—make up the study area for the following review.

Adams and Grant counties are also partially within an approximate 1-hour commute of the Project area. Although within a 1-hour approximate commute, existing employment and commuting patterns suggest that Project employment would have limited impacts on these counties. These counties are, therefore, not included as part of the study area.

4. Population, Labor Force, and Housing

This section addresses components of WAC 463-60-535 related to population, labor force, and housing.

4.1 Population and Labor Force Impacts

(a) Population and growth rate data for the most current ten-year period for the county or counties and incorporated cities in the study area.

Benton County had an estimated population of 209,400 in 2021 (Table 1). A majority of the population (82 percent) lived in one of five incorporated communities, with more than two-thirds of the total living in Kennewick (40 percent) and Richland (29 percent). The tenth most populated county in Washington, Benton County had an average population density of 123.2 people per square mile in 2021 compared to a statewide average of 116.9 people per square mile (Washington OFM 2021a).

Total population in Benton County increased by 29,400 people or 16.3 percent between 2012 and 2021, an increase above the state average of 13.9 percent (Table 1). Population growth results from either net in-migration or natural increase. Net in-migration occurs when more people move to an area than leave. Natural increase occurs when there are more births than deaths. Migration accounted for 70 percent of statewide population growth between 2012 and 2021, with natural increase accounting for the remaining 30 percent. Migration played a slightly smaller role in Benton County, accounting for approximately 65 percent of population growth over this period, with natural increase accounting for the remaining 35 percent (Washington OFM 2021b).

Franklin County had an estimated population of 98,350 in 2021 (Table 1). The majority of the population (80 percent) lives in the city of Pasco, with the remaining population divided between three other incorporated communities (Mesa, Connell, and Kahlotus; 6 percent) and unincorporated areas (14 percent). Franklin County had an average population density of 79.2 people per square mile in 2021 compared to a statewide average of 116.9 people per square mile (Washington OFM 2021a).

Table 1. Population

Geographic Area	Population Estimates		2012 to 2021		
	2012	2021	Net Change	Percent Change	Annual Growth Rate
Benton County[1]	**180,000**	**209,400**	**29,400**	**16.3**	**1.5**
Benton City	3,295	3,500	205	6.2	0.6
Kennewick	75,160	84,620	9,460	12.6	1.2
Prosser	5,785	6,130	345	6.0	0.6
Richland	49,890	61,320	11,430	22.9	2.1
West Richland	12,570	17,070	4,500	35.8	3.1
Unincorporated	33,300	36,760	3,460	10.4	1.0
Franklin County	**82,500**	**98,350**	**15,850**	**19.2**	**1.8**
Pasco	62,670	78,700	16,030	25.6	2.3
Other Incorporated[2]	6,010	5,660	-350	-5.8	-0.6
Unincorporated	13,820	13,990	170	1.2	0.1
Yakima County[1]	**246,000**	**258,100**	**12,100**	**4.9**	**0.5**
Grandview	11,000	10,960	-40	-0.4	0.0
Granger	3,285	3,690	405	12.3	1.2
Harrah	650	580	-70	-10.8	-1.1
Mabton	2,290	1,975	-315	-13.8	-1.5
Moxee	3,505	4,405	900	25.7	2.3
Naches	805	1,110	305	37.9	3.3
Selah	7,290	8,235	945	13.0	1.2
Sunnyside	16,130	16,400	270	1.7	0.2
Tieton	1,195	1,430	235	19.7	1.8
Toppenish	8,950	8,870	-80	-0.9	-0.1
Union Gap	6,105	6,595	490	8.0	0.8
Wapato	5,030	4,610	-420	-8.3	-0.9
Yakima	91,930	97,810	5,880	6.4	0.6
Zillah	3,035	3,190	155	5.1	0.5
Unincorporated	84,800	88,240	3,440	4.1	0.4
Washington State	**6,817,770**	**7,766,975**	**949,205**	**13.9**	**1.3**

Notes:
1. All five incorporated communities in Benton County are within an approximate 1-hour commute from the Project; this is also the case with all 14 incorporated communities in Yakima County.
2. The other incorporated communities in Franklin County (Connell, Kahlotus, and Mesa) are more than an approximately 1-hour commute from the Project.

Source: Washington OFM 2021c

Total population in Franklin County increased by an estimated 15,850 people or 19.2 percent between 2012 and 2021, an increase above the state average of 13.9 percent (Table 1). Natural increase accounted for more than two-thirds (67 percent) of the increase, with net in-migration making up the remaining 33 percent (Washington OFM 2021b).

Yakima County had an estimated population of 258,100 in 2021 (Table 1). More than one-third of the population (38 percent) lives in the city of Yakima, 28 percent lives in one of the 13 other incorporated communities, and the remaining 34 percent live in unincorporated parts of the county. Yakima County had an average population density of 60.1 people per square mile in 2021 compared to a statewide average of 116.9 people per square mile (Washington OFM 2021a).

Total population in Yakima County increased by an estimated 12,100 people or 4.9 percent between 2012 and 2021, an increase below the state average of 13.9 percent (Table 1). More people moved from than to Yakima County over this period, resulting in a loss of 3,900 people through net out-migration. This loss was, however, more than offset by natural increase, which accounted for all of the population gain over this period (Washington OFM 2021b). A number of the smaller communities in Yakima County lost population over this period (Table 1).

(b) Published forecast population figures for the study area for both the construction and operation periods.

The Washington OFM prepares county population projections for planning under Washington State's Growth Management Act (GMA). High-, medium-, and low-growth expectations are prepared for each county, with the medium series considered the most likely because it is based on assumptions that have been validated with past and current information (Washington OFM 2018). Current projections developed in support of the GMA extend through 2040, with supplemental projections developed from 2040 through 2050 to provide additional data for counties.

The Project is expected to have an operational life of 35 years, which would extend beyond the available population projections. However, projections are available through 2050 and provide useful insight into anticipated population growth over the operational life of the Project. Population is projected to continue grow from 2020 through 2050 in the study area counties, as well as statewide (Table 2).

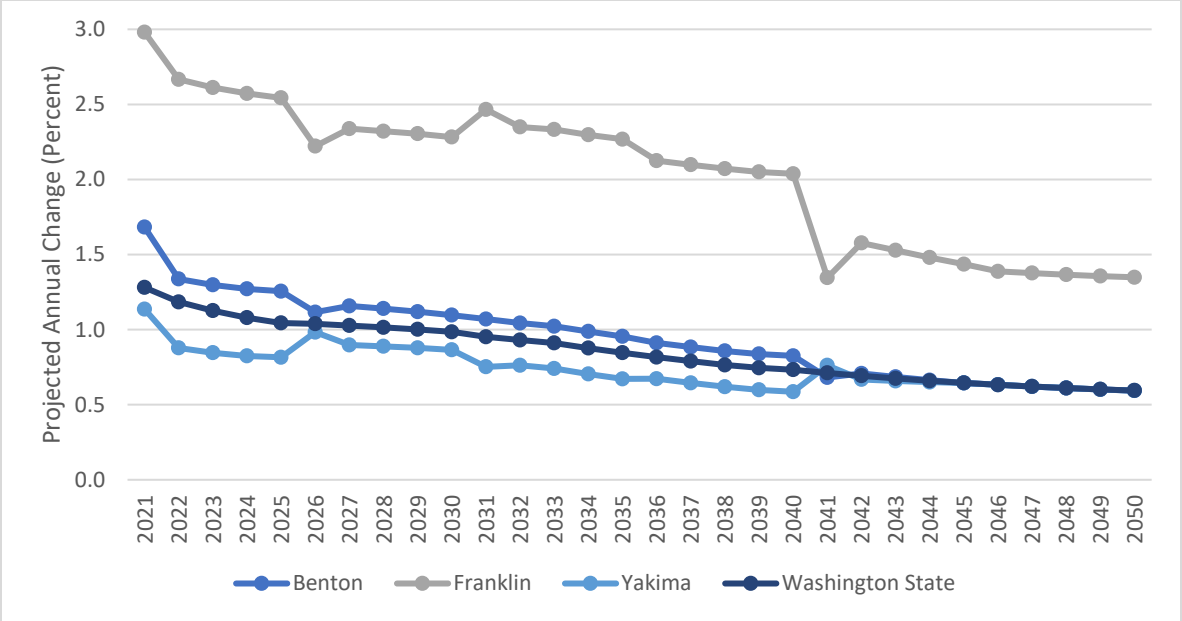
From 2020 to 2025, population was projected to increase by 7 percent and 15 percent in Benton and Franklin counties, respectively, and 5 percent in Yakima County compared to a statewide average of 6 percent. Population is also projected to increase at a faster rate in Franklin County from 2020 to 2050, with a projected increase of about 83 percent (82,900 people), compared to smaller relative increases of 33 percent (65,600 people) in Benton County, 25 percent (65,100 people) in Yakima County, and 29 percent (2.2 million people) statewide (Table 2). Annual growth rates in Franklin County are expected to be more than twice the state average for almost the entire period. Projected annual rates in Benton County are higher than the state average from 2020 to 2040 and the same from 2041 to 2050 (Figure 1). Annual gains in Yakima County are mostly lower than the state average from 2021 to 2040 and mostly the same from 2041 to 2050.

Table 2. Population Projections 2020 to 2050

Geographic Area	2020 (Census Count)[1]	2020 (Projection)[2]	2025	2030	2040	2050
Benton County	206,873	201,563	215,740	228,162	250,524	267,139
Franklin County	96,749	99,712	113,781	127,443	158,574	182,589
Yakima County	256,728	262,887	274,932	287,567	307,591	327,994
Washington State	**7,707,047**	**7,638,415**	**8,085,043**	**8,503,178**	**9,242,022**	**9,855,117**

Notes:
1. U.S. Census counts for 2020 are federal census counts for that year. Estimates for 2021 are provided in Table 1.
2. The population projections here, including the 2020 projection, are Medium series projections developed in 2017 in support of Washington State's GMA.

Sources: Washington OFM 2018, 2021c



Source: Washington OFM 2018

Figure 1. Projected Annual Change in Population, 2021 to 2050

(c) Numbers and percentages describing the race/ethnic composition of the cities and counties in the study area.

According to the most recent U.S. Census estimates, more than two-thirds (68.5 percent) of the population of Washington state is White. Persons of Hispanic or Latino origin were identified as the single largest minority group, accounting for 12.7 percent of the total population (Table 3). A similar share of the total population in Benton County was identified as White (70.4 percent), with persons of Hispanic or Latino origin accounting for a much larger share than the statewide average (21.7 percent compared to 12.7 percent) (Table 3). The majority of the populations in four of the incorporated communities in Benton County were White, with White populations ranging from 63.9 percent (Benton City) to 79.8 percent (West Richland). In Prosser, the other incorporated community in Benton County, slightly less than half of the population (48.7 percent) was identified as White, with persons of Hispanic or Latino origin accounting for 46.4 percent of the total (Table 3).

Less than half (40.4 percent) of the population in Franklin County was identified as White, with persons of Hispanic or Latino origin accounting for an estimated 53.1 percent of the total. In Pasco the corresponding totals were 38.1 percent (White) and 55.5 percent (Hispanic or Latino) (Table 3).

Similar to Franklin County, in Yakima County, less than half (43.2 percent) of the population was identified as White, with persons of Hispanic or Latino origin accounting for an estimated 49.3 percent of the total. The Hispanic/Latino share of the population exceeded the county average in 10 of the 14 incorporated communities in Yakima County, ranging from about 51 percent (Moxee) to 94 percent (Mabton) of the total (Table 3). The American Indian share of the population in Yakima County also exceeded the state average, 3.5 percent compared to 1.1 percent. The American Indian population exceeded the county average in three of the incorporated communities in Yakima County: Zillah (5.4 percent), Wapato (12.7 percent), and Harrah (18.3 percent) (Table 3).

Table 3. Race and Ethnicity, 2019

Geographic Area	Total Population[1]	Percent of Total				
		White[2]	Hispanic or Latino	American Indian and Alaska Native[2]	Some other race[2,3]	Two or more races[2]
Benton County	**197,518**	**70.4**	**21.7**	**0.6**	**4.3**	**3.0**
Benton City	3,373	63.9	32.7	1.9	0.1	1.4
Kennewick	81,479	64.9	26.9	0.4	4.6	3.1
Prosser	6,202	48.7	46.4	1.8	3.1	0.0
Richland	56,399	78.0	11.4	0.5	6.4	3.7
West Richland	14,495	79.8	12.6	0.9	3.0	3.6
Franklin County	**92,009**	**40.4**	**53.1**	**0.3**	**4.2**	**2.0**
Pasco	72,899	38.1	55.5	0.3	4.1	2.1
Yakima County	**249,697**	**43.2**	**49.3**	**3.5**	**2.1**	**2.0**
Grandview	11,116	14.1	84.6	0.0	1.0	0.3
Granger	3,756	10.0	88.4	0.6	0.8	0.3
Harrah	613	15.7	62.8	18.3	0.2	3.1
Mabton	2,087	5.0	93.8	0.0	1.0	0.3
Moxee	4,012	40.4	51.1	3.1	3.5	1.8
Naches	627	88.2	7.8	0.5	3.5	0.0
Selah	7,856	75.2	20.2	0.3	1.6	2.7
Sunnyside	16,559	13.4	85.3	0.1	0.5	0.7
Tieton	1,686	12.9	85.0	1.4	0.5	0.2
Toppenish	8,873	9.0	86.6	3.1	0.8	0.5
Union Gap	6,163	40.7	56.5	1.5	0.5	0.8
Wapato	5,041	6.1	78.7	12.7	1.1	1.4
Yakima	93,413	47.9	45.7	1.3	3.1	2.0
Zillah	3,116	57.8	33.6	5.4	0.0	3.2
Washington	**7,404,107**	**68.5**	**12.7**	**1.1**	**12.9**	**4.8**

Notes:
1. All estimates are annual totals developed as part of the 2015-2019 American Community Survey 5-Year Estimates.
2. Non-Hispanic only. The federal government considers race and Hispanic/Latino origin to be two separate and distinct concepts. People identifying as Hispanic or Latino origin may be of any race. The data summarized in this table present Hispanic/Latino as a separate category.
3. The "Other" category presented here includes census respondents identifying as: Black or African American; Asian; Native Hawaiian and Other Pacific Islander; or Some Other Race.

Source: U.S. Census Bureau 2020a

(d) Aggregate per capita and household incomes, including the number and percentages of the population below the poverty level for the cities and counties within the study area.

Per capita and median household incomes were below the state averages in all three counties. This was also the case for all the incorporated communities within an approximately 1-hour commute of the Project Lease Boundary, with the exception of Richland and West Richland in Benton County (Table 4). Both per capita and median household income were higher than the state averages in Richland. In West Richland, median household income was higher than the state median.

Table 4. Income and Poverty by County and City

Geographic Area[1]	Per Capita Income		Median Household Income		Poverty	
	2019 Dollars	Percent of State Per Capita	2019 Dollars	Percent of State Median	Population Below Poverty Level	Percent of Total Population[2]
Benton County	**32,882**	**84**	**69,023**	**94**	**23,336**	**11.9**
Benton City	25,950	67	55,175	75	406	12.2
Kennewick	27,731	71	59,533	81	12,432	15.5
Prosser	23,848	61	50,164	68	1,122	18.1
Richland	40,100	103	77,686	105	4,990	8.9
West Richland	36,191	93	99,817	135	1,192	8.3
Franklin County	**24,380**	**63**	**63,584**	**86**	**13,558**	**15.2**
Pasco	24,230	62	62,775	85	11,191	15.5
Yakima County	**23,459**	**60**	**51,637**	**70**	**42,755**	**17.4**
Grandview	16,783	43	49,002	66	1,724	15.7
Granger	15,322	39	49,958	68	703	18.7
Harrah	21,251	55	57,917	79	106	17.3
Mabton	13,656	35	42,378	57	416	20.3
Moxee	20,561	53	59,297	80	701	17.5
Naches	31,848	82	61,528	83	61	9.9
Selah	30,451	78	58,120	79	731	9.5
Sunnyside	16,259	42	42,780	58	3,696	22.6
Tieton	13,849	36	45,852	62	446	26.5
Toppenish	16,384	42	50,089	68	1,565	17.9
Union Gap	17,832	46	41,310	56	1,570	25.9
Wapato	14,565	37	40,772	55	1,517	30.9
Yakima	23,514	60	44,950	61	18,544	20.4
Zillah	27,548	71	63,667	86	500	16.0
Washington State	**38,915**	**100**	**73,775**	**100**	**785,244**	**10.8**

Notes:
1. Estimates are annual totals developed as part of the 2015-2019 American Community Survey 5-Year Estimates.
2. This represents the percent of the total population for whom poverty status is determined. Poverty status is determined for all people except institutionalized people, people in military group quarters and college dormitories, and unrelated individuals under 15 years old.

Sources: U.S. Census Bureau 2020b,c,d

The estimated share of the population below the poverty level in Washington state was 10.8 percent in 2019. The corresponding rates in all three counties were higher than the state average, ranging from 11.9 percent in Benton County to 17.4 percent in Yakima County, with an estimated 15.2 percent of the population below the poverty level in Franklin County. In Benton County, the share of households below the poverty level in the five incorporated communities within 1 mile of the Project area ranged from 8.3 percent (West Richland) to 18.1 percent (Prosser). The corresponding share in Pasco (15.5 percent) was slightly higher than the county average (15.2 percent). In Yakima County, the corresponding shares ranged from 9.5 percent (Selah) to 30.9 percent (Wapato). The share of the population below the poverty rate also exceeded 20 percent in five of the other communities in Yakima County (Mabton, Sunnyside, Tieton, Union Gap, and Yakima) (Table 4).

(e) A description of whether or not any minority or low-income populations would be displaced by this project or disproportionately impacted.

As indicated in Part 3, Section 15 of the ASC, the Project is not expected to displace existing or future housing, including housing for minority or low-income populations. No residences are located within the Project Lease Boundary, and none will be displaced as a result of the Project.

(f) The average annual work force size, total number of employed workers, and the number and percentage of unemployed workers including the year that data are most recently available. Employment numbers and percentage of the total work force should be provided for the primary employment sectors.

The average annual work force size, total number of employed workers, and the number and percentage of unemployed workers are presented for Benton, Franklin, and Yakima counties and Washington state in Table 5. Statewide, the average annual employment rate in 2021 was 5.2 percent. Viewed by county, the corresponding rates were 5.6 percent (Benton County), 6.6 percent (Franklin County), and 7.0 percent (Yakima County) (Table 5).

Table 5. Average Annual Workforce, 2021

Geographic Area	Civilian Labor Force	Employment	Unemployment	Unemployment Rate
Benton County	104,709	98,851	5,858	5.6%
Franklin County	43,810	40,929	2,881	6.6%
Yakima County	131,144	121,998	9,146	7.0%
Washington State	**3,913,513**	**3,708,738**	**204,775**	**5.2%**
Source: Washington Employment Security Department 2022				

An estimated 111,173 people were employed in Benton County in 2020. Health care and social assistance was the largest economic sector based on employment, accounting for about 13.5 percent of total employment, followed by government, which accounted for 11.2 percent (Table 6). In Franklin County, an estimated 42,590 people were employed in 2020. Government was the largest sector, accounting for 16.3 percent of total employment (Table 6). An estimated 132,124 people were employed in Yakima County in 2020. Agriculture was the largest employer, accounting for 14.6 percent of employment, followed by the health care and social assistance sector and government, each accounting for almost 14 percent of the total (Table 6).

Table 6. Employment by Economic Sector, 2020

Economic Sector	Benton County	Franklin County	Yakima County	Washington State
Total Employment[1]	**111,173**	**42,590**	**132,124**	**4,385,827**
Percent of Total[2]				
Agriculture	4.6	9.5	14.6	2.1
Forestry, fishing, and hunting	(D)	(D)	7.9	1.0
Mining	(D)	(D)	0.1	0.1
Utilities	0.1	(D)	0.1	0.1
Construction	8.2	7.5	4.1	6.2

Table 6. Employment by Economic Sector, 2020

Economic Sector	Benton County	Franklin County	Yakima County	Washington State
Manufacturing	4.4	9.0	6.5	6.6
Wholesale trade	1.5	4.9	3.7	3.2
Retail trade	10.6	9.7	9.8	10.4
Transportation and warehousing	2.1	(D)	3.5	4.3
Information	0.7	0.4	0.5	3.7
Finance and insurance	3.4	1.7	2.2	3.9
Real estate, rental, and leasing	3.5	3.2	2.8	4.6
Professional, scientific, and technical services	10.0	2.8	2.5	7.8
Management of companies and enterprises	0.5	0.1	0.6	1.1
Administrative and waste management services	10.3	3.6	2.3	4.9
Educational services	1.0	1.4	1.5	1.8
Healthcare and social assistance	13.5	8.8	13.8	11.2
Arts, entertainment, and recreation	1.4	1.0	1.0	1.8
Accommodation and food services	6.5	4.8	4.9	5.6
Other services (except public administration)	4.4	5.2	3.9	4.8
Government	11.2	16.3	13.7	14.6

Notes:
(D) Not shown to avoid disclosure of confidential information; estimates for this item are, however, included in the totals.
1. Employment estimates include self-employed individuals. Employment data are by place of work, not place of residence, and therefore include people who work in the area but do not live there. Employment is measured as the average annual number of jobs, both full-time and part-time, with each job counted at full weight.
2. Percentages for two of the counties (Benton and Franklin) do not sum to 100 because employment counts are not provided for some sectors to avoid disclosing confidential information (identified by [D] in the table).

Source: U.S. Bureau of Economic Analysis 2021

(g) An estimate by month of the average size of the project construction, operational work force by trade, and work force peak periods.

The proposed schedule and workforce are summarized in Table 7 and Figure 2. Construction is expected to begin in 2024 and will require approximately 22 months to complete. During the first 60 days, there would be site clearing and grading of access roads. Construction personnel would likely involve about 30 to 50 workers during this period. Once Project construction begins, the number of workers employed on-site will increase and peak at approximately 515 workers. On average, 225 workers will be employed on-site over the 22-month construction period (Table 7). Construction employment will generally follow a bell-shaped curve, with the on-site workforce dropping back to approximately 50 workers during the final months of construction (Figure 2).

Table 7. Proposed Schedule and Workforce

Phase	Proposed Timing	Duration	Employee Numbers on Site and Frequency
Site preparation	2024	60 days	Approximately 30 to 50 workers
Construction	2024 to 2025	22 months	On average 225, with a peak construction workforce of 515
Operation/use	2026	35 years	Up to 4
Closure/reclamation	2061	6 months	Similar to, or less than those required for construction

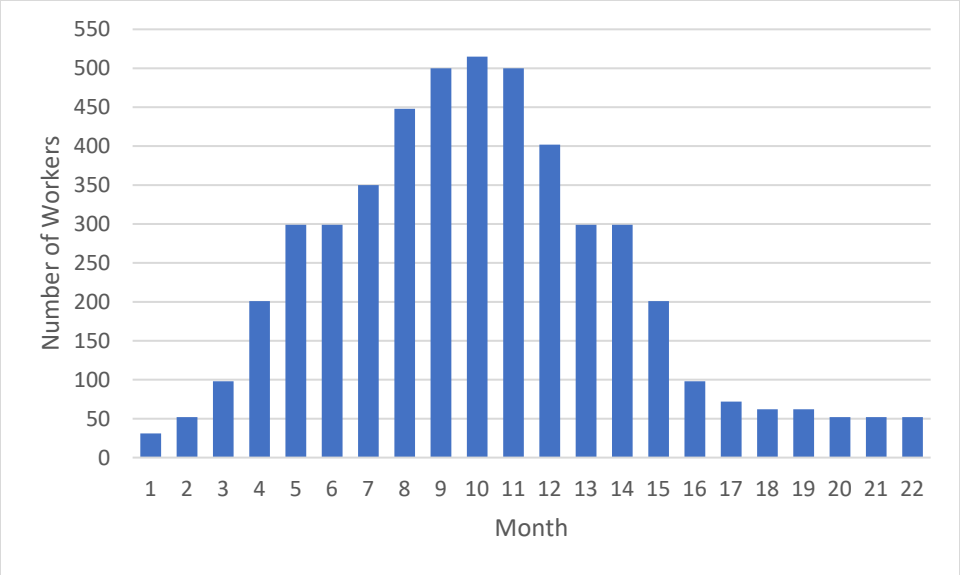


Figure 2. Estimated On-Site Construction Workforce by Month

During operation, the Applicant anticipates that up to four workers will be on-site, but not necessarily every day. On-site workers will include one site manager employed directly by the Applicant and two to three technicians from their O&M provider.

(h) An analysis of whether or not the locally available work force would be sufficient to meet the anticipated demand for direct workers and an estimate of the number of construction and operation workers that would be hired from outside of the study area if the locally available work force would not meet the demand.

As indicated in Part 2, Section A.2, the Applicant is developing a strategy to ensure that local benefits reach the community, local landowners, local skilled workers, and local businesses. A campaign will be run during construction to maximize local construction worker hiring (i.e., within 1 hour from the Project and within Washington). This strategy will include a local procurement policy, community event sponsorship, and participation throughout the Project's life cycle.

With this in mind, the Applicant anticipates that a majority of the on-site construction workforce will be hired locally to the extent workers are available, with an estimated 45 to 65 percent of the workforce expected to already reside within a 1-hour commute of the Project area. Based on this estimate, the local workforce employed on-site would average 101 to 146 workers over the 22-month construction period, with a peak of about 232 to 335 workers.

Review of occupational data for the two MSAs within 1 hour indicates that the area has a large construction workforce pool. Representative occupational employment estimates for the disciplines required to construct the Project are presented for the Kennewick-Richland and Yakima MSAs in Tables 8 and 9, respectively. In addition to total employment, Tables 8 and 9 also provide location quotient information as well as mean hourly and annual wage data. The location quotients, which are a measure of relative economic specialization, indicate that the local share of employment in the representative occupations identified in Table 8 for the Kennewick-Richland MSA exceeds the corresponding national averages in five of the six identified occupations. The

corresponding shares for the Yakima MSA exceed the national averages for two of the occupations (Table 9).

Table 8. Existing Construction Workforce in the Kennewick-Richland MSA by Occupation

SOC Code[1]	Labor Discipline	Total Employment	Location Quotient[2]	Mean Hourly Wage[3]	Mean Annual Wage[3]
11-9021	Construction Managers	420	1.79	48.81	101,520
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	920	1.82	40.35	83,920
47-2061	Construction Laborers	1,410	1.77	23.69	49,270
47-2073	Operating Engineers and Other Construction Equipment Operators	380	1.16	32.10	66,760
47-2111	Electricians	1,230	2.29	37.89	78,820
53-3032	Heavy and Tractor-Trailer Truck Drivers	1,300	0.88	24.08	50,090

Notes:
SOC = standard occupational classification
1. Data are for May 2020, the most current data available.
2. The location quotients estimated here by the U.S. Bureau of Labor Statistics show an occupation's share of an area's employment relative to the national average. A location quotient above 1.0 indicates that an occupation accounts for a larger share of employment in an area than it does nationally, and a location quotient below 1.0 indicates the area's share of employment in the occupation is lower than the national share.
3. These wage estimates represent wages and salaries only, and do not include employee bonuses or nonwage costs to the employer, such as health insurance or employer contributions to retirement plans.

Source: U.S. Bureau of Labor Statistics 2022

Table 9. Existing Construction Workforce in the Yakima MSA by Occupation

SOC Code[1]	Labor Discipline	Total Employment	Location Quotient[2]	Mean Hourly Wage[3]	Mean Annual Wage[3]
11-9021	Construction Managers	100	0.52	41.46	86,240
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	210	0.53	35.39	73,620
47-2061	Construction Laborers	580	0.92	20.46	42,560
47-2073	Operating Engineers and Other Construction Equipment Operators	110	0.44	25.89	53,850
47-2111	Electricians	430	1.01	26.90	55,950
53-3032	Heavy and Tractor-Trailer Truck Drivers	1,360	1.16	23.68	49,260

Notes:
See notes to Table 8.
Source: U.S. Bureau of Labor Statistics 2022

(i) A list of the required trades for the proposed project construction.

Trades required during the construction phase of the Project include:

- Construction managers and supervisors
- Construction laborers
- Equipment operators
- Electricians
- Truck drivers

The corresponding occupational categories are identified above in Tables 8 and 9.

(j) An estimate of how many direct or indirect operation and maintenance workers (including family members and/or dependents) would temporarily relocate.

Operation and maintenance of the Project is anticipated to employ up to four workers (Table 7). These workers and their families are likely to reside within daily commuting distance and will either already reside in the area or permanently relocate. Up to four workers and their family members could potentially relocate. The average U.S. family household consisted of 3.13 people per family in 2021 (U.S. Census Bureau 2021). Applying this average family household size results in up to 13 people permanently relocating to the Project vicinity during Project operation.

(k) An estimate of how many workers would potentially commute on a daily basis and where they would originate.

Workers hired locally (i.e., within Benton, Franklin, and Yakima counties) would commute daily between the Project and their normal place of residence. During construction, an estimated average of 101 to 146 local workers would commute daily to the Project site, with an estimated 232 to 335 local workers on-site during peak construction (see Section (h) above). Based on the existing distribution of population in the three counties, the majority of these workers would likely normally reside in the larger cities of Kennewick, Richland, Pasco, and Yakima (see Table 1).

The remainder of the estimated construction workforce (an average of 79 to 124 workers, with a peak of 180 to 283) would be non-local and would temporarily relocate to the vicinity of the Project for the duration of their employment. The majority of these workers would likely seek temporary accommodation in the larger nearby communities, where much of this type of accommodation is located (see Housing Impacts, Section (a), below). These workers would commute daily between the Project and their temporary place of residence.

During operations, an estimated two to four workers would commute daily to and from the Project.

4.2 Housing Impacts

(a) Housing data from the most recent ten-year period that data are available, including the total number of housing units in the study area, number of units occupied, number and percentage of units vacant, median home value, and median gross rent. A description of the available hotels, motels, bed and breakfasts, campgrounds or other recreational facilities.

Housing resources are summarized by city, county, and state in Table 10. The data presented in this table are annual estimates for 2019 prepared by the U.S. Census Bureau using 5 years of data (2015 to 2019) (U.S. Census Bureau 2020e). The U.S. Census Bureau defines a housing unit as a house, apartment, mobile home or trailer, group of rooms, or single room occupied or intended to be occupied as separate living quarters. There were an estimated 76,241 housing units in Benton County in 2019, with the cities of Kennewick and Richland together accounting for almost three-quarters of the total, 41 percent and 31 percent, respectively (Table 10). An estimated total of 4,120 units were vacant in Benton County in 2019, approximately 5.4 percent of the total. Median values for owner-occupied homes were below the state median ranging from about $148,400 in Benton City to about $270,500 in West Richland. Median rent for renter-occupied units ranged from $835 (Prosser) to more than $1,000 (Richland and West Richland).

Franklin County had an estimated total of 28,063 housing units in 2019, with the city of Pasco accounting for 81 percent of the total (Table 10). An estimated total of 1,340 units were vacant in Franklin County in 2019, approximately 4.8 percent of the total. Median values for owner-occupied homes were lower than in adjacent Benton County, with a county-wide median of $202,400 compared to a Benton County median of $235,800. Median rent for renter-occupied units in Franklin County was $913, slightly lower than the median in Benton County ($974) (Table 9).

Yakima County had an estimated total of approximately 88,700 housing units in 2019. The city of Yakima accounted for 40 percent of the total, with 24 percent located in the other 13 incorporated communities and the remaining 36 percent of the total located in unincorporated areas (Table 10). An estimated total of 5,650 units were vacant in Yakima County in 2019, approximately 6.4 percent of the total. Median values for owner-occupied homes ($175,900) and median rent for renter-occupied units ($825) were both lower than the corresponding values for Benton and Franklin counties (Table 10).

Table 10. Housing Characteristics

Geographic Area	Total Housing Units	Occupied Housing Units	Vacant Housing Units		Median Home Value (dollars)	Median Gross Rent (dollars)
			Number	Percent of Total		
Benton County	**76,241**	**72,121**	**4,120**	**5.4**	**235,800**	**974**
Benton City	1,276	1,245	31	2.4	148,400	863
Kennewick	31,093	29,341	1,752	5.6	215,500	922
Prosser	2,635	2,534	101	3.8	182,900	835
Richland	23,582	22,263	1,319	5.6	263,500	1,087
West Richland	4,931	4,746	185	3.8	270,500	1,280
Franklin County	**28,063**	**26,723**	**1,340**	**4.8**	**202,400**	**913**
Pasco	22,736	21,824	912	4.0	199,400	922
Yakima County	**88,698**	**83,048**	**5,650**	**6.4**	**175,900**	**825**
Grandview	3,445	3,275	170	4.9	145,400	782
Granger	902	863	39	4.3	115,200	809
Harrah	192	188	4	2.1	122,600	832
Mabton	569	528	41	7.2	100,000	730
Moxee	1,103	1,063	40	3.6	171,700	1,150
Naches	325	296	29	8.9	155,900	921
Selah	3,104	2,935	169	5.4	224,800	1,027
Sunnyside	4,885	4,561	324	6.6	129,400	722
Tieton	457	425	32	7.0	120,400	820
Toppenish	2,538	2,448	90	3.5	130,100	704
Union Gap	2,236	2,081	155	6.9	107,800	868
Wapato	1,353	1,279	74	5.5	112,400	687
Yakima	35,800	33,772	2,028	5.7	173,000	820
Zillah	1,276	1,144	132	10.3	178,400	921
Washington	**3,106,528**	**2,848,396**	**258,132**	**8.3**	**339,000**	**1,258**

Note:
1. Estimates are annual totals developed as part of the 2015-2019 American Community Survey 5-Year Estimates.
Source: U.S. Census Bureau 2020e

The number of housing units has increased statewide and in all three counties since 2010, with net gains of about 12,800 units (18.6 percent), 6,000 units (24.6 percent), and 5,800 units (6.8 percent) in Benton, Franklin, and Yakima counties, respectively (Table 11). Viewed by community, the largest absolute increase (6,140 units) and second largest relative increase (32.7 percent) was in Pasco, followed by Richland (5,030 units) and Kennewick (4,160 units) (Table 11).

Table 11. Number of Housing Units, 2010 to 2021

Geographic Area	2010	2021	2010 to 2021	
			Net Change	Percent Change
Benton County	**68,618**	**81,386**	**12,768**	**18.6**
Benton City	1,162	1,403	241	20.7
Kennewick	28,507	32,668	4,161	14.6
Prosser	2,129	2,375	246	11.6
Richland	20,876	25,905	5,029	24.1
West Richland	4,298	6,104	1,806	42.0
Franklin County	**24,423**	**30,441**	**6,018**	**24.6**
Pasco	18,782	24,924	6,142	32.7
Yakima County	**85,474**	**91,292**	**5,818**	**6.8**
Grandview	3,136	3,292	156	5.0
Granger	813	967	154	18.9
Harrah	180	187	7	3.9
Mabton	548	563	15	2.7
Moxee	1,032	1,392	360	34.9
Naches	346	405	59	17.1
Selah	2,759	3,108	349	12.6
Sunnyside	4,556	4,864	308	6.8
Tieton	385	468	83	21.6
Toppenish	2,334	2,463	129	5.5
Union Gap	2,173	2,293	120	5.5
Wapato	1,293	1,322	29	2.2
Yakima	34,887	37,743	2,856	8.2
Zillah	1,105	1,154	49	4.4
Washington State	**2,885,677**	**3,248,713**	**363,036**	**12.6**

Source: Washington OFM 2022

Rental housing resources are summarized in Table 12. Viewed by county, these estimates suggest that rental housing is available in all three counties, with an estimated 1,232 units available for rent in Benton County, 234 units available in Franklin County, and 904 units in Yakima County. More than 90 percent of the estimated units available in Benton County are in Kennewick (49 percent) and Richland (45 percent). Kennewick and Richland both had estimated rental vacancy rates (5.2 percent and 6.6 percent, respectively) that exceeded the Benton County average (5.1 percent) (Table 11).

These data suggest that rental housing markets are tighter in Franklin and Yakima counties, with respective estimated vacancy rates of 2.7 percent and 2.8 percent. In Franklin County, an estimated 234 housing units were available for rent, with two-thirds (66 percent, 155 units) of this total located in the city of Pasco (Table 11). In Yakima County, an estimated 904 units were available for

rent, with 60 percent (546 units) located in the city of Yakima. Additional units classified for seasonal, recreational, or occasional use may also be available in both counties (Table 11).

Rental housing options may also include other special living situations, such as Airbnb units and spare bedrooms in homes that residents would be willing to rent to construction workers. These types of potential housing opportunities are not included in the data presented in Table 12.

Table 12. Rental Housing, 2019

Geographic Area	Total Vacant Housing Units[1]	Rental Vacancy Rate[1]	Units Available for Rent[1]	Seasonal, Recreational, or Occasional Use[1,2]
Benton County	**4,120**	**5.1**	**1,232**	**661**
Benton City	31	1.4	4	12
Kennewick	1,752	5.2	602	173
Prosser	101	0	0	0
Richland	1,319	6.6	557	172
West Richland	185	0	0	70
Franklin County	**1,340**	**2.7**	**234**	**112**
Pasco	912	2.3	155	56
Yakima County	**5,650**	**2.8**	**904**	**1,234**
Grandview	170	1.3	19	0
Granger	39	4.3	16	0
Harrah	4	1.5	1	1
Mabton	41	12.1	17	0
Moxee	40	0	0	0
Naches	29	0	0	0
Selah	169	0	0	47
Sunnyside	324	2.1	41	29
Tieton	32	0	0	19
Toppenish	90	0.8	7	7
Union Gap	155	6.9	48	10
Wapato	74	7.5	52	0
Yakima	2,028	3.4	546	189
Zillah	132	6.8	32	16
Washington State	**258,132**	**3.6**	**40,176**	**94,397**

Notes:
1. All data are annual estimates from the American Community Survey 5-year estimates for 2015-2019.
2. Housing units for seasonal, recreational, or occasional use are generally considered to be vacation homes. They are not included in the estimated number of housing units shown here as available for rent.

Sources: U.S. Census Bureau 2020e,f

Temporary housing is also available in the form of hotel and motel rooms. Data compiled by STR Global, a travel research firm, identified 44 hotels in the Tri-Cities area in November 2017, with a total of 4,063 guestrooms (ECONorthwest 2018). STR Global compiles data for commercial lodging establishments with at least 15 rooms. They do not count single-room occupancy hotels, most bed and breakfast inns, or short-term rentals like Airbnb. A number of new hotels have opened in the Tri-Cities in recent years and several others are currently under construction. With these additions,

the number of guestrooms in the Tri-Cities is expected to increase to about 4,700 (Culverwell 2020). Other recent trends in the area include the potential conversion of existing hotels and motels to micro-apartments (Carter 2022, Culverwell 2022). Lodging facilities available elsewhere in Benton County include four hotels in Prosser, with more than 140 guestrooms.

Hotels in the Tri-Cities had an overall average occupancy rate of 62.5 percent from December 2016 to November 2017. The market is seasonal, with monthly occupancy rates ranging from 42 percent in December to 77 percent in June. Occupancy in July and August averaged 69 percent. The Tri-Cities attracts a larger than average share of business and meeting visitors, which tends to support fairly strong occupancy in the shoulder seasons (spring and fall) (ECONorthwest 2018).

In Yakima, there were 30 hotels and motels in 2017, with an estimated total of 2,400 guestrooms. Occupancy rates in the area have historically averaged around 55 to 60 percent (Hoang 2017).

Temporary accommodation in the study area also includes recreational vehicle (RV) parks and campsites. Facilities in Benton and Franklin counties within 1 hour of the Project area include 15 RV parks and campgrounds, with a total of 1,640 RV spaces. Parks and campgrounds are located in Richland, West Richland, Pasco, Prosser, Benton City, and Vantage. An additional six RV parks and campgrounds, with a total of 390 spaces, are located within 1 hour of the Project area in Yakima County, including locations in Yakima, Sunnyside, and Selah.[2]

(b) How and where the direct construction and indirect work force would likely be housed. A description of the potential impacts on area hotels, motels, bed and breakfasts, campgrounds and recreational facilities.

Project construction is expected to begin in 2024 and require approximately 22 months to complete. On average, 225 workers will be employed on-site with an estimated peak of 515 workers on-site at one time. The non-local share of the workforce is estimated to be approximately 35 to 55 percent, with non-local workers expected to temporarily relocate to the vicinity of the Project for the duration of their employment. As a result, an estimated average of 79 to 124 workers are expected to seek temporary accommodation in the Project vicinity, with an estimated peak of 180 to 283 workers.

Non-local workers are expected to seek a range of temporary accommodations, including rental housing (houses, apartments, mobile homes), hotel/motel rooms, and RV parks/campgrounds, as well as other special living situations such as Airbnb units and spare bedrooms. The review of temporary housing resources presented above indicates that temporary housing resources in the study area include approximately 2,100 housing units that are vacant and available for rent, with additional units classified for seasonal, recreational, or occasional use that may also be available (Table 12). Temporary housing is also available in the form of hotel and motel rooms. Available estimates indicate that there are about 7,100 hotel and motel rooms in the vicinity of the Project.

[2] Data on RV parks and campsites were compiled from a number of online sources, including visittri-cities.com, rvshare.com, goodsam.com, and campgroundreviews.com, as well as individual campground web sites.

Assuming a peak occupancy of 77 percent suggests that approximately 1,630 rooms are normally empty and available for rent.

This review indicates that existing temporary housing resources in the study area that are normally vacant and available for rent exceed estimated Project construction-related demand. Viewed as a share of the supply of housing units available for rent (2,100 units) and the normally available supply of hotel and motel rooms (1,630 rooms), peak demand (180 to 283 workers) would be equivalent to about 5 to 8 percent of the normally available supply. Note that this likely overestimates the number of units that would be required (up to 283 during peak construction) because it assumes that the estimated demand will be single occupancy. In practice, workers are likely to share rental accommodations and also consider sharing hotel/motel rooms to reduce costs.

In addition, temporary accommodation in the study area includes 21 RV parks and campgrounds, with a combined total of more than 2,030 RV spaces (see the preceding section). There are also a number of homes for seasonal, recreational, or occasional use in the Project vicinity, and workers may seek alternative living situations including Airbnb units and spare bedrooms in homes that residents would be willing to rent to construction workers.

(c) Whether or not meeting the direct construction and indirect work force's housing needs might constrain the housing market for existing residents and whether or not increased demand could lead to increased median housing values or median gross rents and/or new housing construction. Describe mitigation plans, if needed, to meet shortfalls in housing needs for these direct and indirect work forces.

As discussed in the preceding section, the estimated normally available supply of temporary housing resources exceeds estimated construction-related demand, and meeting the construction workforce's housing needs is not expected to constrain the housing market for existing residents or lead to changes in housing values, rents, or new housing construction.

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ATTACHMENT O: ACOUSTIC ASSESSMENT REPORT

Wautoma Solar Energy Project
Acoustic Assessment Report

Prepared for:

Innergex Renewable Development USA, LLC

Prepared by:

TETRA TECH

January 2023

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Acronyms and Abbreviations

AC	alternating current
Applicant	Innergex Renewable Development USA, LLC
BESS	battery energy storage system
BPA	Bonneville Power Administration
CadnaA	Computer-Aided Noise Abatement
dB	decibel
dBA	A-weighted decibel
dBL	linear decibel
DC	direct current
EDNA	Environmental Designation for Noise Abatement
EFSEC	Energy Project Site Evaluation Council
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
Hz	hertz
ISO	International Organization for Standardization
kV	kilovolt
L_{dn}	day-night average sound level
L_{eq}	equivalent sound level
L_{max}	maximum sound level
L_P	sound pressure level
L_w	sound power level
µPa	microPascal
NSR	noise sensitive receptor
Project	Wautoma Solar Energy Project
PV	photovoltaic
Tetra Tech	Tetra Tech, Inc.
WAC	Washington Administrative Code

1.0 Introduction

Innergex Renewable Development USA, LLC (the Applicant) is seeking to develop the Wautoma Solar Energy Project (Project) in unincorporated Benton County, Washington. The Project is a 470-megawatt[1] solar photovoltaic (PV) generation facility coupled with a 4-hour battery energy storage system (BESS) sized to the maximum capacity of the Project, as well as related interconnection and ancillary support infrastructure. The Project is generally located 12.5 miles northeast of the city of Sunnyside and 1 mile south of the State Route 241 and State Route 24 interchange in in Benton County, Washington.

Tetra Tech, Inc. (Tetra Tech) has prepared this acoustic assessment for the Project, evaluating potential sound impacts relative to the applicable noise regulations prescribed in the Washington Administrative Code (WAC). The existing ambient acoustic environment was characterized based on land use, population density, and proximity to major roadways. An acoustic modeling analysis was conducted simulating sound produced during both construction and operation. Operational sound sources consisted primarily of the inverters, step-up transformers, battery storage, and transformer at the on-site substation. The overall objectives of this assessment were to 1) identify Project sound sources and estimate sound propagation characteristics, 2) computer-simulate sound levels using internationally accepted calculation standards, and 3) confirm that the Project will operate in compliance with the applicable noise regulations.

1.1 Project Area

The Project Lease Boundary is approximately 5,852 acres that encompasses 35 privately owned assessor parcels for which the Applicant has executed or is pursuing a lease agreement with the underlying property owner. The approximately 4,573-acre Project Area will accommodate all of the Project facilities, including solar PV system and BESS, Project substation, transmission line, and operations and maintenance building. The solar PV system will consist of a series of solar PV panels mounted on a solar tracker racking system and related electrical equipment. The system includes the solar panels, tracker racking system, posts, collector lines, and power conversion systems, which consists of the direct current (DC)-coupled BESS, inverters, and transformers. The DC--coupled BESS can either store electricity for future use or, as required based on grid demand, convert DC electricity to alternating current (AC) electricity and send the AC electricity to the step-up transformer. As an alternative, a centralized AC-coupled BESS may be constructed. An acoustic analysis for this alternative also is provided in this memorandum.

Current land uses in the Project Area include irrigated agriculture, rangeland, undeveloped land, local roads, and existing electrical utility infrastructure. Lands to the north, west, and south are zoned for agricultural purposes in Benton and Yakima counties with similar land uses as the Project Lease Boundary, as well as several rural residences. The Hanford Reach National Monument Rattlesnake Unit is located to the east.

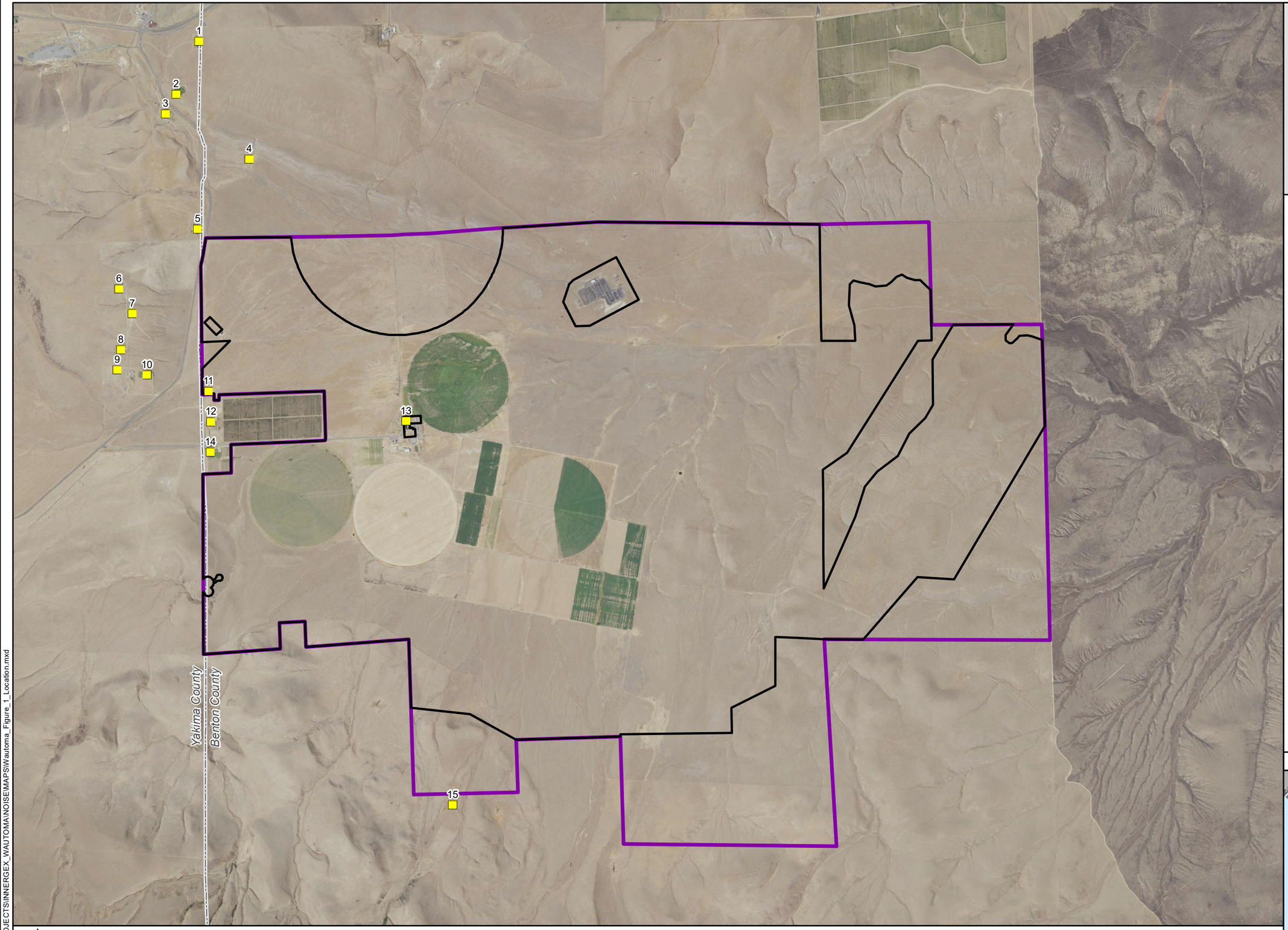
[1] Megawatt rating provided in alternating current (MWac)

The preliminary design accounts for Project size, topography, and other constraints; however, the solar modules, supporting components, and precise layout of the solar array have not yet been finalized. Figure 1 provides an overview of the Project area and provides the locations of nearby participating and non-participating residences, which are considered noise sensitive receptors (NRSs, i.e., residences).

Wautoma Solar

Figure 1
Project Location

BENTON AND YAKIMA COUNTIES, WA



- Project Lease Boundary
- Project Area
- County Boundary
- Noise Sensitive Receptor

INNERGEX

TETRA TECH

Reference Map

1:28,000

NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\INNERGEX_WAUTOMA\NOISE\MAPS\Wautoma_Figure_1_Location.mxd

1.2 Acoustic Metrics and Terminology

All sounds originate with a source, whether it is a human voice, motor vehicles on a roadway, or a combustion turbine. Energy is required to produce sound, and this sound energy is transmitted through the air in the form of sound waves – tiny, quick oscillations of pressure just above and just below atmospheric pressure. These oscillations, or sound pressures, impinge on the ear, creating the sound we hear. A sound source is defined by a sound power level (L_W), which is independent of any external factors. By definition, sound power is the rate at which acoustical energy is radiated outward and is expressed in units of watts.

A source sound power level cannot be measured directly. It is calculated from measurements of sound intensity or sound pressure at a given distance from the source outside the acoustic and geometric near-field. A sound pressure level (L_P) is a measure of the sound wave fluctuation at a given receiver location and can be obtained through the use of a microphone or calculated from information about the source sound power level and the surrounding environment. The sound pressure level in decibels (dB) is the logarithm of the ratio of the sound pressure of the source to the reference sound pressure of 20 microPascals (µPa), multiplied by 20.1. The range of sound pressures that can be detected by a person with normal hearing is very wide, ranging from about 20 µPa for very faint sounds at the threshold of hearing, to nearly 10 million µPa for extremely loud sounds such as a jet during take-off at a distance of 300 feet.

Broadband sound includes sound energy summed across the entire audible frequency spectrum. In addition to broadband sound pressure levels, analysis of the various frequency components of the sound spectrum can be completed to determine tonal characteristics. The unit of frequency is hertz (Hz), measuring the cycles per second of the sound pressure waves. Typically, the frequency analysis examines 11 octave bands ranging from 16 Hz (low) to 16,000 Hz (high). Since the human ear does not perceive every frequency with equal loudness, spectrally-varying sounds are often adjusted with a weighting filter. The A-weighted filter is applied to compensate for the frequency response of the human auditory system and is represented in A-weighted decibels (dBA).

Sound can be measured, modeled, and presented in various formats, with the most common metric being the equivalent sound level (L_{eq}). The L_{eq} has been shown to provide both an effective and uniform method for comparing time-varying sound levels and is widely used in acoustic assessments in the state of Washington. Estimates of noise sources and outdoor acoustic environments, and the comparison of relative loudness, are presented in Table 1. Table 2 presents additional reference information on terminology used in the report.

Table 1. Sound Pressure Levels and Relative Loudness of Typical Noise Sources and Acoustic Environments

Noise Source or Activity	Sound Level (dBA)	Subjective Impression
Vacuum cleaner (10 feet)	70	Moderate
Passenger car at 65 miles per hour (25 feet)	65	
Large store air-conditioning unit (20 feet)	60	
Light auto traffic (100 feet)	50	Quiet
Quiet rural residential area with no activity	45	
Bedroom or quiet living room; bird calls	40	Faint
Typical wilderness area	35	
Quiet library, soft whisper (15 feet)	30	Very quiet
Wilderness with no wind or animal activity	25	Extremely quiet
High-quality recording studio	20	
Acoustic test chamber	10	Just audible
	0	Threshold of hearing

Adapted from: Beranek (1988) and EPA (1971a)

Table 2. Acoustic Terms and Definitions

Term	Definition
Noise	Typically defined as unwanted sound. This word adds the subjective response of humans to the physical phenomenon of sound. It is commonly used when negative effects on people are known to occur.
Sound Pressure Level (LP)	Pressure fluctuations in a medium. Sound pressure is measured in dB referenced to 20 µPa, the approximate threshold of human perception to sound at 1,000 Hz.
Sound Power Level (LW)	The total acoustic power of a sound source measured in dB referenced to picowatts (one trillionth of a watt). Noise specifications are provided by equipment manufacturers as sound power as it is independent of the environment in which it is located. A sound level meter does not directly measure sound power.
Equivalent Sound Level (L_{eq})	The L_{eq} is the continuous equivalent sound level, defined as the single sound pressure level that, if constant over the stated measurement period, would contain the same sound energy as the actual monitored sound that is fluctuating in level over the measurement period.
A-Weighted Decibel (dBA)	Environmental sound is typically composed of acoustic energy across all frequencies. To compensate for the auditory frequency response of the human ear, an A-weighting filter is commonly used for describing environmental sound levels. Sound levels that are A-weighted are presented as dBA in this report.
Unweighted Decibels (dBL)	Unweighted sound levels are referred to as linear. Linear decibels are used to determine a sound's tonality and to engineer solutions to reduce or control noise as techniques are different for low and high frequency noise. Sound levels that are linear are presented as dBL in this report.
Propagation and Attenuation	Propagation is the decrease in amplitude of an acoustic signal due to geometric spreading losses with increased distance from the source. Additional sound attenuation factors include air absorption, terrain effects, sound interaction with the ground, diffraction of sound around objects and topographical features, foliage, and meteorological conditions including wind velocity, temperature, humidity, and atmospheric conditions.

1.3 Noise Regulations and Guidelines

1.3.1 Federal Regulations

There are no federal noise regulations applicable to the Project.

1.3.2 Washington Administrative Code State Regulations

Environmental noise limits have been established by the Washington Administrative Code (WAC 173-60). WAC 173-60 establishes noise limits based on the Environmental Designation for Noise Abatement (EDNA) of the sound source and the receiving properties.

- Class A EDNA – Lands where people reside and sleep. They typically include residential property; multiple family living accommodations; recreational facilities with overnight accommodations such as camps, parks, camping facilities, and resorts; and community service facilities including orphanages, homes for the aged, hospitals, and health and correctional facilities.
- Class B EDNA – Lands involving uses requiring protection against noise interference with speech. These typically will include commercial living accommodations; commercial dining establishments; motor vehicle services; retail services; banks and office buildings; recreation and entertainment property not used for human habitation such as theaters, stadiums, fairgrounds, and amusement parks; and community service facilities not used for human habitation (e.g., educational, religious, governmental, cultural and recreational facilities).
- Class C EDNA –Lands involving economic activities of a nature that noise levels higher than those experienced in other areas are normally to be anticipated. Typical Class A EDNA uses generally are not permitted in such areas. Typically, Class C EDNA include storage, warehouse, and distribution facilities; industrial property used for the production and fabrication of durable and nondurable man-made goods; and agricultural and silvicultural property used for the production of crops, wood products, or livestock.

Land use that is considered agricultural is defined as Class C receiving properties. Conversely, agricultural properties principally used for residential purposes with no clearly visible farming or ranching activities are identified as Class A receiving properties. The WAC does maintain flexibility for interpretation in the classification of the appropriate EDNA on both the state and local level. In this assessment, receiving properties consist of Class C Lands and Class C Lands containing Class A residential structures. Between the hours of 10:00 p.m. and 7:00 a.m., the noise limitations are reduced by 10 dBA for receiving property within Class A EDNAs. WAC 173.60.050 exempts temporary construction noise from the state noise limits.

The noise level limits by EDNA classifications are presented in Table 3. The WAC allows these limits to be exceeded for certain periods of time: 5 dBA for no more than 15 minutes in any hour, 10 dBA for no more than 5 minutes of any hour, and 15 dBA for no more than 1.5 minutes of any hour;

these are commonly presented as L_n statistical sound levels as well as maximum sound levels (L_{max}), as shown in Table 4.

Table 3. Washington State Environmental Noise Limits

EDNA of Source Property	EDNA of Receiving Property		
	Class A Land Day/Night	Class B Land	Class C Land
Class A Land	55/45	57	60
Class B Land	57/47	60	65
Class C Land	60/50	65	70

Source: WAC 173-60-040

Table 4. L_n Environmental Noise Limits for Class C Sources

EDNA of Source Property	Statistical Sound Level Limits			
	LN_{25}	$LN_{8.3}$	$LN_{2.5}$	L_{MAX}
Class A Land	60/50	65/55	70/60	75/65
Class B Land	65	70	75	80
Class C Land	70	75	80	85

Source: WAC 173-60-040 (b) and (c)

The Project site is located on land zoned GMAAD (Benton County), which is considered Class C land. Adjacent land also is zoned GMAAD in Benton County, and zoned Agriculture in Yakima County immediately to the west of the Project Lease Boundary. See Figure 1 in Attachment D to this Application for zoning designations in the Project vicinity. Agricultural land is considered Class C under the definitions provided above; however, some of these agricultural lands contain residential structures. This analysis conservatively considers agricultural lands with non-participating residences to be Class A receptors. Table 3 shows that the applicable daytime and nighttime noise limits will vary based on each abutting land use class. In this memorandum, compliance with applicable limits will be assessed at the Project lease boundary. For agricultural land containing non-participating residential structures, limits of 60 dBA and 50 dBA apply to daytime and nighttime hours, respectively. For Class C land containing participating residential structures, a daytime and nighttime limit of 70 dBA is applicable. The Applicant is voluntarily setting a design target for participating residential structures of no greater than 60 dBA.

The WAC regulatory limits are absolute and independent of the existing acoustic environment; therefore, a baseline noise survey is not requisite to determine conformance.

1.3.3 Benton County Code

Chapter 6A.15 in the Benton County Code regulates noise as a public nuisance and does not provide numerical decibel limits.

2.0 Existing Sound Environment

The degree of audibility of a new or modified sound source is dependent, in a large part, on the relative level of the ambient noise. A range of noise settings occurs within the Project Area. Variations in acoustic environment are due, in part, to existing land uses, population density, and proximity to transportation corridors. Elevated existing ambient sound levels in the region occur near major transportation corridors such as interstate highways and in areas with higher population densities. Nearby rural airstrips and airports, including the Desert Aire Regional Airport and Sunnyside Municipal Airport, also contribute to ambient noise levels in both surrounding urban and rural areas. Principal contributors to the existing acoustic environment likely include motor vehicle traffic, mobile farming equipment, all-terrain vehicles, local roadways, periodic aircraft flyovers, and natural sounds such as birds, insects, and leaf or vegetation rustle during elevated wind conditions. Diurnal effects result in sound levels that are typically quieter during the night than during the daytime, except during periods when evening and nighttime insect noise dominates in warmer seasons.

The analysis area is inclusive of all areas that could be potentially affected by construction or operational noise resulting from the Project. The analysis area for noise around the Project was defined as the area bounded by a perimeter extending approximately 1.2 miles (2 kilometers) from the Project Area. In the absence of ambient measurement data, the existing sound level environment in the vicinity of Project was estimated with a method published by the Federal Highway Administration (FHWA) in its Transit Noise and Vibration Impact Assessment (FHWA 2006). This document presents the general assessment of existing noise exposure based on the population density per square mile and proximity to area sound sources such as roadways and rail lines.

The proposed Project is approximately 10 miles (16.2 kilometers) southeast of the city of Desert Aire, which has a population density of 2,288 per square mile according to the U.S. Census Bureau (2020). Table 5 indicates the estimated baseline sound levels based on population density for daytime, evening, and nighttime L_{eq}, as well as the day-night average sound level (L_{dn}). The L_{dn} is the average equivalent sound level over a 24-hour period, with a 10 dB penalty added for noise during the nighttime hours of 10:00 p.m. – 7:00 a.m.

Table 5. Estimated Baseline Sound Levels in Proximity to the Project

Average Sound Level (dBA)	L_{eq} (Day)	L_{eq} (Evening)	L_{eq} (Night)	L_{dn}
	50	45	40	50

3.0 Project Construction

Construction of the Project is expected to be typical of other solar power generating facilities in terms of schedule, equipment, and activities. Construction is anticipated to occur over approximately 22 months and would require a variety of equipment and vehicles.

3.1 Noise Calculation Methodology

Acoustic emission levels for activities associated with Project construction were based on typical ranges of energy equivalent noise levels at construction sites, as documented by the U.S. Environmental Protection Agency (EPA; 1971b) and the EPA's "Construction Noise Control Technology Initiatives" (EPA 1980). The EPA methodology distinguishes between type of construction and construction stage. Using those energy equivalent noise levels as input to a basic propagation model, construction noise levels were calculated at a series of set reference distances.

The basic model assumed spherical wave divergence from a point source located at the closest point of the Project site. Furthermore, the model conservatively assumed that all pieces of construction equipment associated with an activity would operate simultaneously for the duration of that activity. An additional level of conservatism was built into the construction noise model by excluding potential shielding effects due to intervening structures and buildings along the propagation path from the site to receiver locations.

3.2 Projected Noise Levels During Construction

Table 6 summarizes the expected equipment to be used during Project construction, organized into the following work stages: site preparation and grading, trenching and road construction, equipment installation, and commissioning. Table 6 also shows the maximum noise level at 50 feet and the usage factor percentage for the expected equipment phases.

Table 6. Project Construction Noise Levels by Phase

Phase No.	Construction Phase	Construction Equipment	Usage Factor %	Maximum (L_{max}) Equipment Noise Level at 50 feet
1	Site Preparation and Grading	(2) Graders (174 hp) (1) Rubber Tired Loaders (164 hp) (1) Scrapers (313 hp) (2) Water Trucks (189 hp) (2) Generator Sets	57 59 72 50 74	95
2	Trenching and Road Construction	(5) Excavators (168 hp) (2) Graders (174 hp) (2) Water Trucks (189 hp) (1) Trencher (63 hp) (2) Rubber Tired Loaders (164 hp) (2) Generator Sets	57 57 50 75 54 74	97

Phase No.	Construction Phase	Construction Equipment	Usage Factor %	Maximum (L_{max}) Equipment Noise Level at 50 feet
3	Equipment Installation	(1) Crane (399 hp) (1) Concrete Batch Plant (5) Forklifts (145 hp) (8) Pile drivers (15) Pickup Trucks/ATVs (2) Water Trucks (189 hp) (2) Generator Sets	43 15 30 20 40 50 74	110
4	Commissioning	(5) Pickup Trucks/ATVs	40	62

hp = horsepower; ATV = all-terrain vehicle

Table 7 shows the projected noise levels from Project construction per phase at nearby NSRs. Periodically, sound levels may be higher or lower than those presented in Table 7; however, the overall sound levels should generally be lower due to excess attenuation and the trend toward quieter construction equipment in the intervening decades since the EPA data were developed.

The construction of the Project may cause short-term, but unavoidable, noise impacts that could be loud enough at times to temporarily interfere with speech communication outdoors, and indoors with windows open. Noise levels resulting from the construction activities would vary significantly depending on several factors such as the type and age of equipment, specific equipment manufacturer and model, the operations being performed, and the overall condition of the equipment and exhaust system mufflers.

Project construction would generally occur during the day, Monday through Friday. Furthermore, all reasonable efforts would be made to minimize the impact of noise resulting from construction activities including implementation of standard noise reduction measures. Due to the infrequent nature of loud construction activities at the site, the limited hours of construction, and the implementation of noise mitigation measures, the temporary increase in noise due to construction is considered to be a less than significant impact.

Table 7. Project Construction Noise Levels by Phase, dBA L_{eq}

NSR ID	Distance (feet)	Phase 1	Phase 2	Phase 3	Phase 4
NSR-1	5,000	52	54	63	18
NSR-2	3,700	55	56	66	21
NSR-3	3,300	56	57	67	22
NSR-4	2,000	60	62	71	26
NSR-5	300	77	78	88	42
NSR-6	2,000	60	62	71	26
NSR-7	1,700	62	63	73	27
NSR-8	2,000	60	62	71	26
NSR-9	2,200	60	61	70	25

Table 7. Project Construction Noise Levels by Phase, dBA L_{eq}

NSR ID	Distance (feet)	Phase 1	Phase 2	Phase 3	Phase 4
NSR-10	1,400	63	65	74	29
NSR-11	50	92	94	103	58
NSR-12	550	72	73	82	37
NSR-13	50	92	94	103	58
NSR-14	500	72	74	83	38
NSR-15	2,250	59	61	70	25

3.3 Construction Noise Mitigation

Since construction equipment operates intermittently, and the types of machines in use at the Project site change with the stage of construction, noise emitted during construction would be mobile and highly variable, making it challenging to control. The construction management protocols would include the following noise mitigation measures to minimize noise impacts:

- Maintain all construction tools and equipment in good operating order according to manufacturers' specifications.
- Limit use of major excavating and earth-moving machinery to daytime hours.
- To the extent practicable, schedule construction activity during normal working hours on weekdays when higher sound levels are typically present and are found acceptable. Some limited activities, such as concrete pours, would be required to occur continuously until completion.
- Equip any internal combustion engine used for any purpose on the job or related to the job with a properly operating muffler that is free from rust, holes, and leaks.
- For construction devices that utilize internal combustion engines, ensure the engine's housing doors are kept closed, and install noise-insulating material mounted on the engine housing consistent with manufacturers' guidelines, if possible.
- Limit possible evening shift work to low-noise activities such as welding, wire pulling, and other similar activities, together with appropriate material-handling equipment.
- Utilize a complaint resolution procedure to address any noise complaints received from residents.

4.0 Operational Noise

This section describes the model used for the assessment, input assumptions used to calculate noise levels due to the Project's normal operation, a conceptual noise mitigation strategy, and the results of the noise impact analysis.

4.1 Noise Prediction Model

The CadnaA (Computer-Aided Noise Abatement) computer noise model was used to calculate sound pressure levels from the operation of the Project equipment in the vicinity of the Project site. An industry standard CadnaA was developed by DataKustik GmbH (2020) to provide an estimate of sound levels at distances from sources of known emission. It is used by acousticians and acoustic engineers due to the capability to accurately describe noise emission and propagation from complex facilities consisting of various equipment types like the Project, and in most cases, yields conservative results of operational noise levels in the surrounding community.

The outdoor noise propagation model is based on the International Organization for Standardization (ISO) 9613, Part 2: "Attenuation of Sound during Propagation Outdoors" (1996). The method described in this standard calculates sound attenuation under weather conditions that are favorable for sound propagation, such as for downwind propagation or atmospheric inversion, conditions which are typically considered worst-case. The calculation of sound propagation from source to receiver locations consists of full octave band sound frequency algorithms, which incorporate the following physical effects:

- Geometric spreading wave divergence;
- Reflection from surfaces;
- Atmospheric absorption at 10 degrees Celsius and 70 percent relative humidity;
- Screening by topography and obstacles;
- The effects of terrain features including relative elevations of noise sources;
- Sound power levels from stationary and mobile sources;
- The locations of noise-sensitive land use types such as residential land uses;
- Intervening objects including buildings and barrier walls, to the extent included in the design;
- Ground effects due to areas of pavement and unpaved ground;
- Sound power at multiple frequencies;
- Source directivity factors;
- Multiple noise sources and source type (point, area, and/or line); and
- Averaging predicted sound levels over a given time.

CadnaA allows for three basic types of sound sources to be introduced into the model: point, line, and area sources. Each noise-radiating element was modeled based on its noise emission pattern. Larger dimensional sources such as the transformers and inverters were modeled as area sources.

Off-site topography was obtained using the publicly available U.S. Geological Survey digital elevation data. A default ground attenuation factor of 0.5 was assumed for off-site sound

propagation over acoustically "mixed" ground. A conservative ground attenuation factor of 0.25 for a reflective surface was assumed onsite.

The output from CadnaA includes tabular sound level results at selected receiver locations and colored noise contour maps (isopleths) that show areas of equal and similar sound levels.

4.2 Input to the Noise Prediction Model

The Project's general arrangement was reviewed and directly imported into the acoustic model so that on-site equipment could be easily identified, buildings and structures could be added, and sound emission data could be assigned to sources as appropriate. The primary noise sources during operations are the inverters, their integrated step-up transformers, BESS units, and substation transformers. Electronic noise from inverters can be audible but is often reduced by a combination of shielding, noise cancellation, filtering, and noise suppression. The Project layout includes 159 step-up transformers distributed throughout the solar array areas. BESS units will either be positioned in groups of four at each step-up transformer location, or will be located in an approximately 16-acre area southwest of the substation. Both options for battery storage and their associated sound emissions were considered in the acoustic analysis.

Substations have switching, protection, and control equipment, as well as a main power transformer, which generate the sound generally described as a low humming. There are three chief noise sources associated with a transformer: core noise, load noise, and noise generated by the operation of the cooling equipment. The core is the principal noise source and does not vary significantly with electrical load. The load noise is primarily caused by the load current in the transformer's conducting coils (or windings), and consequently, the main frequency of this sound is twice the supply frequency: 120 Hz for 60 Hz transformers. The cooling equipment (fans and pumps) may also be an important noise component, depending on fan design. During air-forced cooling method, cooling fan noise is produced in addition to the core noise. The resulting audible sound is a combination of hum and the broadband fan noise. Breaker noise is a sound event of very short duration, expected to occur only a few times throughout the year. Just as horsepower ratings designate the power capacity of an electric motor, a transformer's megavolt amperes rating indicates its maximum power output capacity.

Reference sound power levels input to CadnaA were provided by equipment manufacturers, based on information contained in reference documents or developed using empirical methods. The source levels used in the predictive modeling are based on estimated sound power levels that are generally deemed to be conservative. The projected operational noise levels are based on Applicant-supplied sound power level data for the major sources of equipment. Table 8 summarizes the equipment sound power level data used as inputs to the acoustic modeling analysis. For the purpose of the analysis, it was assumed that all equipment would operate consistently during both daytime and nighttime periods.

Table 8. Modeled Octave Band Sound Power Level for Major Pieces of Project Equipment

Sound Source	Sound Power Level (L_W) by Octave Band Frequency dBL									Broadband Level
	31.5	63	125	250	500	1k	2k	4k	8k	dBA
Step-up Transformer	77	77	73	73	73	67	62	56	49	73
BESS	85	93	100	101	100	97	92	85	78	106
Substation Transformer	100	104	99	100	99	93	89	83	75	100
Transmission Line	45	53	69	68	74	80	81	82	79	87
Tracking Motor	40	40	44	48	52	52	48	44	40	57

In addition to the above, the modeling analysis accounts for the short (0.25 mile) 500-kilovolt (kV) transmission line, which extends from the Project substation to the point of interconnection at the existing the Bonneville Power Administration (BPA) transmission system at the BPA Wautoma Substation. The new 0.25-mile segment of 500-kV transmission line was incorporated into the CadnaA model as an elevated line source aligned with the proposed route. Transmission lines generate sound referred to as corona. The level of corona noise generated by a transmission line is highly dependent on weather conditions (i.e., foul weather), electrical gradient, altitude, and condition of the conductor wires. The corona effect is initiated where the conductor's electric field is concentrated by imperfections in the conductor surface such as nicks or scratches, or by substances on the lines such as water droplets, dirt or dust, and bird droppings. Corona activity increases with increasing altitude, and with increasing voltage in the line, but is generally not affected by system loading. Details pertaining the transmission line have not been finalized, but the audible sound level associated with transmission line operation under foul weather conditions was conservatively estimated at 69 dBA at a distance of 50 feet from the transmission line.

4.3 Noise Prediction Model Results

Broadband (dBA) sound pressure levels were calculated for expected normal Project operation assuming that all components identified previously are operating continuously and concurrently at the representative manufacturer-rated sound power level. It is expected that all sound-producing equipment would operate during both daytime and nighttime periods. After calculation, the sound energy was then summed to determine the equivalent continuous A-weighted downwind sound pressure level at a point of reception. Sound contour plots displaying broadband (dBA) sound levels presented as color-coded isopleths are provided in Figure 2 for operations with the BESS units distributed with the step-up transformers during foul weather conditions, and Figure 3 for operations with the BESS units located in an approximately 16-acre area, southwest of the substation, during foul weather conditions. The sound contours are graphical representations of the cumulative noise associated with full operation of the equipment and show how operational noise would be distributed over the surrounding area of the Project site. The contour lines shown are analogous to elevation contours on a topographic map (i.e., the sound contours are continuous lines of equal noise level around some source, or sources, of sound).

Table 9 shows the projected exterior sound levels resulting from full, normal operation of the Project during both daytime and nighttime hours, at all nearby NSRs. The Project is located on Class C land while the adjacent properties consist of a mix of both Class C land with Class A residential structures, which has a daytime limit of 60 dBA and nighttime limit of 50 dBA, and Class C land, which has a daytime and nighttime limit of 70 dBA.

The Project will comply with the 50 dBA nighttime limit at all non-participating NSRs implementing either BESS design configuration. In addition, the Project is predicted to comply with all the applicable WAC regulatory limits at the Project Lease Boundary implementing either BESS design configuration.

Table 9. Acoustic Modeling Results Summary

NSR ID	Participation Status	UTM Coordinates (meters) NAD83 UTM Zone 10		Operational Sound Levels (dBA)	
		Easting	Northing	BESS Distributed Layout	BESS Consolidated Layout
NSR-1	Non-participant	279573	5157308	39	38
NSR-2	Non-participant	279379	5156902	41	40
NSR-3	Non-participant	279290	5156752	43	43
NSR-4	Non-participant	279923	5156372	45	44
NSR-5	Non-participant	279500	5155848	45	44
NSR-6	Non-participant	278867	5155410	44	43
NSR-7	Non-participant	278962	5155211	45	44
NSR-8	Non-participant	278861	5154935	45	43
NSR-9	Non-participant	278825	5154780	45	43
NSR-10	Non-participant	279055	5154729	45	44
NSR-11	Participant	279528	5154582	50	48
NSR-12	Participant	279536	5154343	47	45
NSR-13	Participant	281051	5154282	53	50
NSR-14	Non-participant	279522	5154109	47	45
NSR-15	Participant	281283	5151280	50	46

Wautoma Solar

Figure 2
Operational Received Sound Levels –
BESS Distributed Layout

BENTON AND YAKIMA COUNTIES, WA

- Project Lease Boundary
- Project Area
- Overhead Transmission Line
- County Boundary
- Parcels

Noise Sensitive Receptor
- Participating
- Non-Participating

- BESS Unit
- Deactivated BESS Unit

Received Sound Levels (dBA)
- 50 - 55
- 55 - 60
- 60 - 65
- 65 - 70
- 70 - 75
- > 75

INNERGEX TETRA TECH

Reference Map

Yakima County
Benton County

1:25,000 NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

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Wautoma Solar

Figure 3
Operational Received Sound Levels – BESS Consolidated Layout

BENTON AND YAKIMA COUNTIES, WA

- Project Lease Boundary
- Project Area
- Overhead Transmission Line
- County Boundary
- Parcels

Noise Sensitive Receptor
- Participating
- Non-Participating

- BESS Unit

Received Sound Levels (dBA)
- 50 - 55
- 55 - 60
- 60 - 65
- 65 - 70
- 70 - 75
- > 75

INNERGEX TETRA TECH

Reference Map

Yakima County
Benton County

1:25,000 NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

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5.0 Conclusion

Tetra Tech completed a detailed acoustic assessment of the Wautoma Solar Energy Project, proposed in Benton County, Washington. The assessment included an evaluation of potential Project sound level impacts during construction and operation phases.

The construction noise assessment indicated that construction noise would be periodically audible at off-site locations; however, that noise would be temporary and minimized to the extent practicable through implementation of best management practices and noise mitigation measures as identified in Section 3.3. Traffic noise generated during construction onsite and offsite would also add to overall sound levels, but would be intermittent and short-term.

Operational sound levels were modeled and evaluated at nearby NSRs. Anticipated Project sound sources consist of the collector substation main power transformers, integrated inverter/ transformers, BESS units, and the 500-kV transmission line. Incorporating a number of conservative assumptions, acoustic modeling results indicate that the Project will comply with the 50-dBA nighttime limit at all non-participating NSRs implementing either BESS design configuration. In addition, the Project is predicted to comply with all the applicable WAC regulatory limits at the Project Lease Boundary implementing either BESS design configuration. Sound generated from existing sound sources in the Project Area, such as the operation of agricultural equipment, would be expected to be relatively higher than Project operations. Overall, sound emissions associated with the Project are expected to remain at a low level, consistent with other solar energy facilities of similar size and design.

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ATTACHMENT P: VISUAL IMPACT ASSESSMENT

Wautoma Solar Energy Project
Visual Impact Assessment

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Prepared by:

March 2022

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Appendix A: Visual Contrast Rating Worksheets

Acronyms and Abbreviations

AC	alternating current
Applicant	Innergex Renewable Development USA, LLC
ASC	Application for Site Certification
BESS	battery energy storage system
BLM	Bureau of Land Management
BPA	Bonneville Power Administration
DC	direct current
DC-coupled BESS	direct current-coupled battery energy storage system
EFSEC	Washington Energy Facility Site Evaluation Council
FHWA	Federal Highway Administration
GPS	global positioning system
KOP	Key Observation Point
kV	kilovolt
MW	megawatt
MWac	megawatt of alternating current
NEC	National Electric Code
O&M	operations and maintenance
PCS	power conversion system
POI	Point of Interconnection
Project	Wautoma Solar Energy Project
PV	photovoltaic
SEPA	State Environmental Policy Act
SR	State Route
ZVI	Zone of Visual Influence

1.0 Overview

Innergex Renewable Development USA, LLC, proposes to construct and operate Wautoma Solar Energy Project (Project). The Project is a 470-megawatt[1] solar photovoltaic (PV) generation facility coupled with a 4-hour battery energy storage system (BESS) sized to the maximum capacity of the Project, as well as related interconnection and ancillary support infrastructure, located in unincorporated Benton County, Washington (Figure 1).

2.0 Project Location and Site Setting

2.1 Location

The Project is generally located 12.5 miles northeast of the city of Sunnyside and 1 mile south of the State Route (SR) 241 and SR 24 interchange in in Benton County, Washington.

This following terms are used to describe areas associated with Project development:

- **Project Lease Boundary**: The approximately 5,852-acre area that encompasses 35 privately owned assessor parcels that the Applicant has executed or is pursuing a Lease Agreement with the underlying property owner (Figure 2). Construction and operation of the Project are limited to the Project Area described below.

- **Project Area:** The approximately 4,573-acre area that includes all of the Project facilities, including solar PV system and BESS, Project substation, transmission line, operations and maintenance (O&M) building, and associated access roads.

2.2 Existing Setting

Current land uses in the Project Area include irrigated agriculture, rangeland, undeveloped land, local roads, and existing electrical utility infrastructure. Lands to the north, west, and south are zoned for agricultural purposes in Benton and Yakima counties with similar land uses as the Project Lease Boundary, as well as several rural residences. The Hanford Reach National Monument Rattlesnake Unit is located to the east.

The Project is located entirely on parcels in unincorporated Benton County within the Growth Management Act Agricultural District zone, defined by Benton County Code.

[1] Megawatt rating provided in alternating current (MWac)

3.0 Project Description

3.1 Project Components

3.1.1 Solar Photovoltaic System

The solar PV system will consist of a series of solar panels mounted on a solar tracker racking system and related electrical equipment. The system includes the solar panels, tracker racking system, posts, collector lines, and power conversion system (PCS), which consists of the DC-coupled BESS, inverters, and transformers. The Applicant is considering a range of technologies to preserve design flexibility and incorporate rapidly changing advances in solar technology. During the final engineering design, the Applicant will consider micrositing factors and solar technology available at that time to design the most efficient and effective solar PV system. However, the actual equipment and layouts included in the final design will be selected to ensure that they do not exceed the Project Area evaluated in this Application for Site Certification (ASC).

3.1.1.1 Solar Panels and Racking Systems

The PV solar panels, or modules, will be bifacial panels comprised of mono-crystalline, poly-crystalline, cadmium telluride, or a combination thereof, used to generate electricity by converting sunlight into DC electrical energy. The solar PV panels in portrait orientation will be organized in rows (or "tables") within several solar array areas (or "blocks") mounted on a racking system. The length of each row may vary by topography and the number of panels that the racking system can hold. The row-to-row spacing will be approximately 36 feet (with approximately 15 to 21 feet of open space between adjacent rows). The panels themselves will be approximately 6.6 feet long by 4.1 feet wide and 2 inches thick.

The racking system will be on a single axis, oriented on a north-south axis, which will allow the panels to follow the sun in order to maximize power output. The racking system will be designed to support the panels, snow loads, and prevent wind uplift. Once mounted on the racking system, the highest point of the panels is expected to extend approximately 9 to 14 feet above the ground surface, with an average of approximately 2 to 5 feet of ground clearance below the panels. Project impact assumptions in this ASC are based on the use of 15,812 racking systems for the 470-MW of alternating current (AC) power (MWac) solar array. The actual number of racking systems will depend on the system selected.

The racking system will be supported by steep posts spaced approximately every 16 feet and installed to a depth of approximately 6 to 10 feet, with a maximum depth of 20 feet depending on specific soil conditions. The actual number of posts and foundation method may vary depending on the final racking system, topography, height of the solar modules, and site-specific geological conditions.

3.1.1.2 Direct Current Electrical Collector Lines

The PV panels will produce DC electricity at a low voltage. Within each solar array area, the DC electricity from the panels will be transmitted to one of the power conversion systems distributed throughout the solar array areas. The underground DC electrical wiring will be installed within trenches approximately 3 feet wide and 4 feet deep; however, final trench design will be determined by thermal resistivity studies. In areas where the desired depth cannot be achieved (due to bedrock or other prohibitive subsurface conditions), the collector lines may be housed in above-ground cable trays or covered with concrete slurry in accordance with the applicable National Electric Code (NEC) provisions. The buried cables associated with the fenced solar array are included in the estimated altered impacts associated with the fenced solar array (i.e., no separate temporary impacts are calculated for buried cables inside the perimeter fence).

3.1.1.3 Power Conversion Systems

The Project layout includes 159 PCSs distributed throughout the solar array areas. Each PCS includes up to five DC-coupled BESS units and a step-up transformer installed on a foundation approximately 50 feet (wide) by 150 feet (length).

Each DC-coupled BESS unit is approximately 11 feet (height) by 6 feet (width) by 30 feet (length). The DC-coupled BESS will be positioned in groups of up to five around a single step-up transformer, which is approximately 12 feet (height) by 11 feet (width) by 16 feet (length). The step-up transformer increases the AC voltage from the DC-coupled BESS units to 34.5 kilovolt (kV) where it will then be conveyed via AC medium voltage collector lines and combiner boxes to the Project substation where it is transformed to grid voltage. All components of the PCSs will be mounted on concrete pads or beam foundations. Each PCS unit will include and incorporate multiple layers of protection to avoid failures and risks of fire or spills and will comply with the applicable requirements of the NEC, National Fire Protection Association Standards, and Institute of Electrical and Electronics Engineers Standards.

For the purposes of the ASC, the Applicant assumes that 159 PCSs will be needed to convert the DC from the modules to produce 470 MWac. The final number of PCSs may vary depending on final design of the solar array.

The Applicant is additionally considering an optional design in which an AC-coupled BESS will be used in place of the DC-coupled system described above. Under this option, AC-coupled BESS units would be placed within an approximately 18- to 20-acre area located near the Project substation within the fenced solar array. The AC-coupled BESS area would replace the panels, and up to an additional 20 acres could be permanently impacted under this option. If this option is selected, it will be accounted for in the final design impact calculations and required habitat mitigation. The AC-coupled BESS units would be of a similar design and dimensions as that described above for the DC-coupled BESS. To provide flexibility in the final design, the ASC analyzes both BESS options.

Views of this area from publicly accessible locations are currently limited or obscured by existing terrain or will be obscured by Project solar panels in surrounding parcels. The DC-coupled BESS design will represent the most visible BESS version of the Project. Visual impacts associated with

the AC-coupled BESS design will be similar or less than those associated with the DC-coupled BESS design.

3.1.1.4 Project Substation

The Project substation will function to further increase the voltage in order to match the voltage of the Bonneville Power Administration (BPA) transmission system of 500 kV. The Project substation and associated interconnection infrastructure will include equipment such as free-standing steel switch-rack structures, one or more main power transformer(s), breakers, power meters, and associated electrical lines. Backup power for the Project substation will be provided by 2-by-10 12-volt lead-acid cell battery packs. The Project substation will be constructed on an approximately 8.5-acre area and will include concrete foundations. The Project substation will be separately fenced for electrical safety. The substation equipment will generally range in height from 15 to 25 feet above ground level.

3.1.1.5 Overhead Transmission Line

An approximately 0.25-mile long overhead 500-kV transmission line will extend from the Project substation to the point of interconnection (POI) at the existing the BPA transmission system at the BPA Wautoma Substation, which is located in on BPA federal lands surrounded by the Project Area. The line will be suspended above ground on H-frame steel structures that will be approximately 60 to 150 feet tall and installed on drilled concrete piers. The transmission line will span Dry Creek and associated 100-year floodplain, which is located between the Project substation and the POI. A temporary 50-foot-wide access corridor across the floodplain will be used during construction of the overhead line. Vehicle use of this crossing will be minimized to only that equipment required to carry the transmission wires (e.g., conductor, shield wire, etc.) and matting will be utilized to minimize impacts to this area.

3.1.1.6 Operations and Maintenance Building

The Project may include an O&M building that will consist of a single-story structure with office space, warehousing space, a bathroom, and breakroom facilities. The O&M building could be up to 4,500 square feet in size on an approximately 1-acre area including an on-site 10,000-square-foot graveled area for parking for employees and visitors (approximately 10 parking spaces) and an open staging area. The O&M building will be surrounded by a security fence separate from the solar array perimeter fence. In addition, the Project's O&M area may include a 10,000-gallon water cistern to store water for fire suppression needs.

3.1.1.7 Access Roads

The Project will be accessed primarily from SR 241 and Wautoma Road. A new approach from SR 241 will be constructed in the northwest corner of the Project. The northern solar array blocks and the POI will be accessed via the existing Black Rock Substation access road. The Applicant will consult with the Washington State Department of Transportation, Yakima County (for the portion

of Wautoma Road in Yakima County), and Benton County regarding the preferred approach and the necessary permits required for upgrading an approach from SR 241.

Access roads within the Project Area will consists of improvements to existing roads and new access road. Improvements to existing roads may include drainage upgrades, smoothing, and graveling as needed to accommodate construction vehicles. New access roads may require excavation and fill to achieve acceptable grades. Access roads will have a compacted gravel surface, with a permanent width of approximately 24 feet as well as the required clearance and turning radius needed for emergency response vehicles, in accordance with fire code.

3.1.1.8 Fencing and Lighting

Fencing will be installed around the perimeter of the Project for general security purposes and public safety. The fence is expected to be approximately 7 feet tall. A typical fence is a 6-foot-tall chain link fence with 1 foot of barbed wire (three or more strands) affixed on top, or other fence meeting the requirements of NEC. Gates 20 to 24 feet wide will be installed for approved pedestrian and vehicular access. In the southeast corner of the Project Area where an ephemeral drainage corridor bisects the Project Area, the area east of the drainage will be fenced separately from areas on the west side of the drainage. An access road and gates will be used to provide pedestrian and vehicular access between these fenced areas.

Lighting is needed at the O&M building for security and occasional after-hours work; however, the Applicant will limit the amount of lighting and will shield lighting as needed. In addition, applicable lighting will include motion-detector-activated lighting to minimize the amount of time lights need to be active. Lighting is also needed at the Project substation in accordance with North American Electric Reliability Corporation standards.

3.1.1.9 Temporary Laydown Areas

Approximately six temporary laydown (i.e., staging) areas (approximately 5 acres each) will be established within the fenced solar array area. Some grading may be needed to level the ground surface, with geotextile materials and compacted gravel installed as needed. Temporary laydown areas will be replaced by the solar array as the Project is built out.

3.2 Construction

The Project's construction is anticipated to begin in the second quarter of 2024, with a Commercial Operations Date planned for the first quarter of 2026 (22-month construction schedule). The Project may be built in phases up to the maximum Project generation capacity of 470 MWac. Construction phasing will be determined based on final offtake discussions with energy customers and contractual arrangements. If the Project is built in phases, the initial phase would likely include construction of the substation, transmission line, and O&M building, along with a subset of solar arrays, PCSs, and access roads, and site entrance road improvements. Subsequent phases would then consist of construction of the remaining solar panels with their associated PCSs and access roads. If construction is phased, the average and peak number of construction workers on site at a given time may be less than estimated here, but the total duration of construction may be longer

and may include an interim period during which little construction work is done. The construction of the Project will include transport and delivery of Project equipment and materials, site preparation, and equipment installation.

3.3 Operations and Maintenance

Following construction, the Project will be operated and maintained by up to four employees. Operation of the Project will consist of routine maintenance activities and panel washing once per year.

Periodic maintenance and inspection of the infrastructure will occur intermittently over the course of Project operations. Typical maintenance will follow basic monthly inspections, preventative quarterly inspections, and an in-depth annual maintenance program. However, the average number of employees to access the site on a daily basis for maintenance is assumed to be up to four (one site manager and two to three technicians). On average, up to four round trips per day are anticipated during operations.

No material quantities of chemicals of fuels will be stored in O&M facility. Only negligible amounts of lubricating oils, greases, and hydraulic fluids for solar tracking arrays, and negligible amount of raw materials for component parts for the maintenance of solar panels and batteries, will be stored onsite at the O&M facility.

Typical maintenance of the solar PV panels will include surface cleaning to remove accumulated dust and dirt to optimize performance. Based on environmental conditions and rainfall, it is anticipated that panel washing would occur twice per year across approximately 20 percent of the panels. A variety of equipment is available on the market for cleaning solar panels. Typical utility-scale solar projects utilize water trucks with an assortment of hoses and support personnel to scrub down panels that have heavier soiling. If panel washing occurs, the wash water will not contain additives and will not be discharged into nearby water bodies (i.e., it is expected infiltrate into the ground surface at and near the point of application). Innovative waterless and dry brushing techniques will be explored as an option.

Vegetation within the Project fence line will be managed throughout the life of the Project. A Vegetation and Weed Management Plan that will be developed prior to construction will be followed during operation to ensure that vegetation does not overgrow the PV panels, preventing solar radiation from reaching them. Vegetation management will also establish and maintain fire breaks around each solar array, PCS, the Project substation, and along the Project's fence line. Mechanical vegetation control, such as mowing, trimming, and pruning, will be the primary means for vegetation management. Mowing frequency is anticipated to be once per month during the growing season. Herbicides may be utilized for vegetation control; however, an effort will be made to minimize use and only apply bio-degradable, U.S. Environmental Protection Agency registered, organic solutions that are non-toxic to wildlife and used in a manner that fully complies with all applicable laws and regulations.

3.4 Site Restoration / Decommissioning

The Project is expected to have an operational life of approximately 35 years, following which the Project may be re-powered with new equipment (under subsequent permits/certification) or retired and restored adequately to a useful, non-hazardous condition. The Project will be decommissioned following the end of its useful life. Pursuant to Washington Administrative Code 463-72-040, the Applicant will provide the Washington Energy Facility Site Evaluation Council (EFSEC) with an Initial Site Restoration Plan at least 90 days prior to beginning Project site preparation.

Decommissioning will be conducted in accordance with EFSEC's rules and the Site Certification Agreement for this Project and will involve removal of all equipment associated with the Project and returning the area to substantially the same condition as that which existed prior to Project development. Decommissioning will include consideration of local environmental factors to minimize effects such as erosion during the removal process, and the recycling of materials demolished or removed from the site to the extent feasible. The activities that may occur as part of decommissioning are summarized below:

- Decommissioning will commence once the Project has been fully de-energized and isolated from all external electrical connections.
- Consistent with the measures described for construction and operation of the Project, best management practices will be implemented and maintained throughout the decommissioning phase as needed to avoid and minimize potential impacts to the surrounding environment, particularly those related to dust, erosion, and stormwater.
- Once the site has been adequately prepared for decommissioning, the following equipment will be removed: solar PV panels and racking system, including steel piles; power conversion systems, including DC-coupled BESS units and step-up transformers; electrical wiring and connections; Project substation components; communication equipment; and fencing. All above-grade foundations will be removed to a level of no less than 3 feet below the ground surface unless requested to be maintained by the property owner. The extent of which access roads will be removed will be coordinated with the landowners at the time of decommissioning.
- Equipment and materials will be salvaged or recycled to the extent feasible and in coordination with licensed subcontractors, local waste haulers and/or other facilities that recycle construction/demolition waste; the remaining materials will be disposed of by the contractor at authorized sites, in accordance with applicable laws. Reuse or recycling of materials will be prioritized over disposal. Recycling is an area of great focus in the solar industry, and programs for both batteries and solar panels are advancing every year. Panels and batteries will most likely be shipped to recycling facilities. All waste requiring special disposal (e.g., transformers) will be handled according to regulations that are in effect at the time of disposal.
- Following removal of Project equipment, site restoration will be conducted such that the physical conditions of the area are returned to substantially the same condition that existed

prior to Project development. These activities will include removal of gravel and other aggregate material, localized grading and disking to match surrounding elevations, replacement of topsoil from on-site stockpiles, and revegetation of disturbed areas with an appropriate hydroseed mix.

During decommissioning, the Applicant will adhere to federal, state, and local requirements, including obtaining and adhering to applicable permits and authorizations.

4.0 Visual Assessment Methodology

4.1 Visual Impact Criteria

4.1.1 Visual Impact Criteria

The purpose of preparing this Visual and Glare Impact Assessment for the Project is to provide information to meet the EFSEC ASC and State Environmental Policy Act (SEPA) Environmental Checklist requirements for aesthetics (visual) under Washington Administrative Code 197-11-960.

4.1.2 Visual Change Criteria

Visual impacts are generally defined in terms of a project's physical characteristics and potential visibility, as well as the extent to which the project's presence would change the perceived visual character and quality of the environment in which it would be located. Tetra Tech followed the contrast rating system used by the U.S. Bureau of Land Management (BLM) to objectively measure potential changes to the visual environment (BLM 1986). The BLM's contrast rating system is commonly used by federal agencies to assess potential visual resource impacts from proposed projects.

Potential visual impacts were characterized by determining the level of visual contrast introduced by the Project based on comparing existing conditions and photo simulations. Visual contrast is a means to evaluate the level of modification to existing landscape features. Existing landscape is defined by the visual characteristics (form, line, color, and texture) associated with the landform (including water), vegetation, and existing development. The level of visual contrast introduced by a project can be measured by changes in the visual characteristics that would occur as a result of project implementation. The greater the difference between the character elements found within the existing landscape and with a proposed project, the more apparent the level of visual contrast. The following general criteria were used when evaluating the degree of contrast:

- None – The contrast is not visible or perceived.
- Weak – The contrast can be seen but does not attract attention.
- Moderate – The element contrast begins to attract attention and begins to dominate the characteristic landscape.

- Strong – The element contrast demands attention, would not be overlooked, and is dominant in the landscape.

4.2 Key Observation Points/Viewshed

4.2.1 Key Observation Points Criteria

Key Observation Points (KOPs) were identified based on locations from which the Project infrastructure would potentially be visible and noticeable to the casual observer. The "casual observer" is considered an observer who is not actively looking or searching for the Project, but who is engaged in activities at locations with potential views of the Project. If the Project components are not noticeable to the casual observer, visual impacts can be considered minor to negligible (i.e., weak).

Viewer distance is a key factor in determining the level of visual effect, with perceived contrast generally diminishing as distance between the viewer and the affected area increases (BLM 1986). The BLM categorizes views into foreground/middleground, background, and seldom seen distance zones. These distance zones provide a frame of reference for classifying the degree to which details of the viewed Project would affect visual resources. The "foreground/middleground" zone is defined as occurring from zero to 5 miles from the Project. Details of Project elements would be visually clear in the foreground; viewers still have the potential to distinguish individual forms, and texture and color are still identifiable but become muted and less detailed in the middleground. In the "background," defined by the BLM as the area 5 to 15 miles from the Project, texture has disappeared and color has flattened, making objects appear "washed out." In the relatively flat landscape setting for the Project, although the shape and mass of the solar arrays may be visible at a distance of greater than 5 miles (background distance zone), their visibility would be limited and they would not appear as a prominent feature in the landscape setting, resulting in minimal or negligible visual impacts.

4.2.2 Viewshed

The viewshed is generally the area that is visible from an observer's viewpoint and includes the screening effects of intervening vegetation and/or physical structures. An initial assessment of the geographic extent of potential Project views was conducted through a viewshed analysis, which evaluated potential visibility of the solar array at distances up to 10 miles from the Project Area.

A viewshed analysis is a graphic representation of locations that may have views of all or portions of solar panels from areas near the Project based on topography within the Project Zone of Visual Influence (ZVI). A viewshed analysis is a graphic representation of the seen and unseen areas adjacent to the Project based on topography within the Project ZVI. The viewshed analysis was conducted using Esri ArcGIS geographic information system software with the Spatial Analyst extension to process 10-meter digital elevation models and the height of the solar arrays above ground surface (up to 14 feet with the modules of the solar array tilted at maximum rotation). The viewshed assumed "bare earth" conditions and was run from the Project area looking out to

determine areas with potential visibility. The assumed "bare earth" conditions mean identification of areas with potential views of the Project were based on topography only. A viewshed analysis was performed for the boundary of the Project Area (Figure 3). The analysis is also conservative because it does not account for screening by intervening structures, vegetation, small terrain changes, atmospheric conditions and attenuation, or other features, and because it includes panel visibility at maximum rotation, which occurs only for relatively brief periods in the morning and evening. As a result, some of the areas from which the Project may be visible will see only the top edges of panels during a short period each day. The ZVI was used to assist with the identification of potential KOPs.

4.2.3 Field Assessment

Based on the ZVI and the identification of publicly accessible routes and viewpoints, potential KOPs were identified and further assessed during the field assessment. During the field assessment, it was determined that visibility of the Project Area varies between viewpoints. From viewpoints to the west, north, and south, depending on the intervening terrain, views of the Project Area tend to only be available within a couple miles from the Project Area. From viewpoints to the east, views of the Project Area may be available from a greater distance, but in general, also tend to be limited to a short distance from the Project Area due to intervening terrain.

A field assessment was conducted at each of the KOPs that followed the protocols and methods for contrast rating evaluation (BLM 1986). The following information was collected at each of the KOPs:

- Global positioning system (GPS) location,
- Digital photographs for use for visual simulations,
- Data required for the BLM's Visual Contrast Rating Worksheet,
- Time of day and atmospheric conditions, and
- Existing structures and roads in the viewshed.

The visual resources at each KOP were documented in a Visual Contrast Rating Worksheet (Attachment A).

4.2.4 Key Observation Points

Five KOPs were selected as representative vantage points in the landscape with publicly accessible views of the Project Area (Figure 3). Factors considered in the selection of KOPs included locations with sensitive viewers (e.g., local residences, recreationists, and motorists) and potential for the Project Area to be visible (e.g., distance and view angle). The location of participating and non-participating residences are also shown on Figure 3.

Digital photographs were taken from the selected KOP locations to support the discussion on existing visual setting and the analysis of potential visual impacts associated with the Project

(Figures 4 through 8). Photographs of existing conditions were taken on January 31, 2022, using a digital single-lens reflex Canon 5D Mark III camera.

4.2.5 Visual Simulations

Three-dimensional visual simulations from two representative KOPs were rendered to approximate the visual conditions resulting with Project implementation. Using the photographs acquired at KOPs 3 and 4, a three-dimensional physical massing model was created that incorporated the solar module scale model. The model was then georeferenced and placed on GPS-controlled site-specific photographs to create simulations that demonstrate visual changes from the Project. Figures 9 and 10 present simulated views of Project features.

5.0 Environmental Setting

5.1 Regional Character

The Project is located in the Columbia Plateau Ecoregion, and within the further subdivided Channeled Scablands and Loess Islands ecoregions (Thorson et al. 2003). Covering portions of Washington, Oregon, Idaho, and British Columbia, the Columbia Plateau is the main geographic feature of the interior Columbia River Basin. The area is named for the massive basalt flows that underlie much of central and eastern Oregon, as well as southeastern Washington. In Washington, the Columbia Plateau covers roughly the southeastern one-third of the state.

The Project is located in the Cold Creek Valley and situated near the east-west trending Yakima Ridge to the north and west, and the Rattlesnake Hills to the south. Yakima Ridge and the Rattlesnake Hills are upfolded anticline basalt ridges (Lenfesty and Reedy 1985). The Columbia and Snake rivers, located to the north and east, are the major drainages of the Project region. Dry Creek runs through the north part of the Project Area and is fed by several ephemeral tributary streams that channel runoff from Rattlesnake Hills.

The Project site can be accessed from the north from SR 24 to SR 241 (Hanford Road) onto Wautoma Road, or from the south off of SR 241 (Hanford Road) and again onto Wautoma Road. SR 24 is 0.8 mile to the north of the Project Area. SR 241 runs adjacent to the Project Area to the west. Wautoma Road partially bisects the Project Area. Another major transportation route, SR 240, is approximately 5.5 miles to the east.

The closest airports to the Project Area are the Desert Aire Regional airport (privately-owned airstrip; 11.4 nautical miles north/northwest of the Project Area), and the Sunnyside Municipal Airport (public; 11.9 nautical miles southwest of the Project Area).

5.2 Local Setting

The visual setting of the Project Area is agricultural land with a mix of irrigated cropland, dryland agriculture, and open rangeland with a low number of related agricultural buildings and rural residential development. There is an existing substation facility surrounded by the two most

northeastern Project parcels with existing transmission lines crossing the northern end of the Project Area. The Project Area is situated on private land with scattered Washington Department of Natural Resources and BLM-managed land within an approximately 2-mile vicinity. The Hanford Reach National Monument is approximately 1 mile east of the Project Area; however, this nearby area of the Monument is part of the Fitzner-Eberhardt Arid Lands Ecology Reserve, use of which is limited to agency-approved ecological research and environmental education activities (USFWS 2022). No designated federal, state, or local public recreation areas were identified within a 2-mile buffer of the Project Area. No roads in the vicinity of the Project Area have been identified as scenic roads or byways (FHWA 2022). There are a handful of rural residences adjacent to the Project Area and approximately 1 to 3 miles to the north, 4 participating residences and 12 non-participating residences (Figure 3). The nearest developed communities are Desert Aire, Washington, approximately 11 miles to the north/northwest, and Sunnyside, Washington, approximately 12 miles to the southwest.

5.3 Visual Resources

The state of Washington contains two All-American Roads and five National Scenic Byways (FHWA 2022). The closest of these scenic drives to the Project Area is the Mountains to Sound Greenway – Interstate 90 National Scenic Byway. This Scenic Byway is the portion of Interstate 90 that runs from Seattle for 100 miles to the east. At its eastern terminus, it is approximately 30 miles to the north of the Project Area. Due to the distance and the intervening terrain, the Project Area would not be visible from this Scenic Byway.

5.4 Existing Visual Character

Five KOPs were selected to assess the level of visual change resulting, based on the BLM's contrast rating system (Section 4.1.2), from the construction of the Project as described in Section 3 on the existing environment. The location of the five KOPs and site photograph locations are presented in Figure 3. Photographs from each KOP are presented in Figures 4 through 8.

5.4.1 Key Observation Point 1

KOP 1 is on SR 241, approximately 2.6 miles south of SR 24. The western end of the Project Area is approximately 1 mile east of this viewpoint. As shown on Figure 4, the existing landscape setting is characterized by agricultural land with generally rolling to hilly terrain. Existing structural features include fencing, road, transmission towers and lines, utility poles and lines, substation, residential buildings, and agricultural structures. Vegetation includes grasses and trees. Dominant colors for the landscape are tans, browns, and greens, while the structures are gray, white, and brown. The vegetation consists of irregular, organic forms: grasses are continuous with irregular shaped trees. The linear and horizontal lines associated with the structures are visible and prominent from this viewpoint. This KOP provides a typical view for drivers traveling north along SR 241. Considering the short duration of viewing while driving along SR 241, viewers would have a low viewer sensitivity to the visual changes in the area. This KOP also provides a view for the non-participating residence near this viewpoint to the west. Considering the potential frequency of views from this

location from the residence, viewers would have a moderate sensitivity to the visual changes in the area.

5.4.2 Key Observation Point 2

KOP 2 is on Wautoma Road, approximately 0.6 mile east of SR 241. This KOP is in the west-central end of the Project Area. As shown on Figure 5, the existing landscape setting is characterized by agricultural land with generally flat to rolling to hilly terrain. Existing structural features include fencing, vine trellises, road, transmission towers and lines, substation, utility poles and lines, residential buildings, and agricultural structures. Vegetation includes grasses and trees. Dominant colors for the landscape are tans, browns, and greens, while the structures are gray, white, and brown. The vegetation consists of irregular, organic forms: grasses are continuous with irregular shaped trees. The linear and horizontal lines associated with the structures are visible and prominent from this viewpoint. This KOP provides a typical view for drivers traveling along Wautoma Road. Considering the short duration of viewing while driving along Wautoma Road, viewers would have a low viewer sensitivity to the visual changes in the area. This KOP also provides a view for the non-participating residence near this viewpoint to the south. Considering the potential frequency of views from this location from the residence, viewers would have a moderate sensitivity to the visual changes in the area.

5.4.3 Key Observation Point 3

KOP 3 is on SR 241, approximately 1.6 miles south of SR 24. The western end of the Project Area is approximately 0.6 mile east of this viewpoint. As shown on Figure 6, the existing landscape setting is characterized by agricultural land with generally flat terrain with hilly terrain in the background. Existing structural features include fencing, road, transmission towers and lines, substation, and utility poles and lines. Vegetation includes grasses. Dominant colors for the landscape are tans and browns, while the structures are gray and brown. The vegetation consists of grasses with continuous, organic forms. The linear and horizontal lines associated with the structures are visible and prominent from this viewpoint. This KOP provides a typical view for drivers traveling along SR 241. Considering the short duration of viewing while driving along SR-241, viewers would have a low viewer sensitivity to the visual changes in the area. This KOP also provides a view for the 5 non-participating residences near this viewpoint to the west. Considering the potential frequency of views from this location from the residences, viewers would have a moderate sensitivity to the visual changes in the area.

5.4.4 Key Observation Point 4

KOP 4 is at the intersection of SR 241 and SR 24. The northern end of the Project Area is approximately 1 mile south of this viewpoint. As shown on Figure 7, the existing landscape setting is characterized by agricultural land with generally rolling to hilly terrain. Existing structural features include fencing, road, transmission towers and lines, utility poles and lines, residential buildings, and agricultural structures. Vegetation includes grasses and trees. Dominant colors for

the landscape are tans, browns, and greens, while the structures are gray, white, yellow, and brown. The vegetation consists of irregular, organic forms: grasses are continuous with irregular shaped trees. The linear and horizontal lines associated with the structures are visible and prominent from this viewpoint. This KOP provides a typical view for drivers traveling south along SR 241 and very briefly for drivers traveling on SR 24. Considering the short duration of viewing while driving along SR-241 and SR-24, viewers would have a low viewer sensitivity to the visual changes in the area. This KOP also provides a view for the 3 non-participating residences near this viewpoint to the south. Considering the potential frequency of views from this location from the residences, viewers would have a moderate sensitivity to the visual changes in the area.

5.4.5 Key Observation Point 5

KOP 5 is on SR 240, approximately 4.8 miles south of SR 24. The eastern end of the Project Area is approximately 6.3 miles west of this viewpoint. As shown on Figure 8, the existing landscape setting is characterized by agricultural land with generally flat terrain with hilly terrain in the background. Existing structural features include road and utility poles and lines. Vegetation includes grasses. Dominant colors for the landscape are tans and browns, while the structures are gray and brown. The vegetation consists of grasses with continuous, organic forms. The linear and horizontal lines associated with the structures are visible and prominent from this viewpoint. This KOP provides a typical view for drivers traveling along SR 240. Considering the short duration of viewing while driving along SR 240, viewers would have a low viewer sensitivity to the visual changes in the area.

6.0 Regulatory Setting

6.1 Benton County Code

Relevant policy from the Benton County Code: Title 6 Health, Welfare and Sanitation; Chapter 3.35 Benton County Code Environmental Policy; Section 6.35.120 Substantive Authority: (d)(1)(ii); Assure for all people of Washington safe, healthful, productive, and aesthetically and culturally pleasing surroundings (County of Benton 2022).

6.2 Benton County Code

Relevant policy from the Benton County Comprehensive Plan Update: Chapter 2.9 Parks, Recreation, Open Space, and Historic Preservation:

PL Goal 3: Conserve visually prominent naturally vegetated steep slopes and elevated ridges that define the Columbia Basin landscape and are uniquely a product of the ice age floods.

> Policy 1: Identify and preserve historically significant structures and sites whenever feasible.
>
> Policy 2: Encourage the public and/or private acquisition of the prominent ridges within unincorporated Benton County as Open Space Conservation, in order to preserve views,

protect native habitat, and provide for public access and recreation associated with these landscapes.

Policy 3: Pursue a variety of means and mechanisms such as the preparation of specific and area plans, conservation easements, clustered developments, land acquisitions and trades, statutory requirements to protect the natural landform and vegetative cover of the Rattlesnake uplift formation, notably Rattlesnake, Red, Candy, and Badger mountains and the Horse Heaven Hills (County of Benton 2021).

7.0 Impact Analysis

7.1 Potential Visual Effects

The following sections discuss the potential visual effects, where visible and noticeable, at each of the KOPs that the Project may incur during construction and operation.

7.1.1 KOP 1

KOP 1 represents a view of the Project for drivers traveling along SR 241 and the residence located approximately 0.5 miles from this viewpoint to the west. The western end of the Project Area is located to the east, approximately 1 mile and 1.5 miles of this viewpoint and the non-participating residence, respectively.

The Project would introduce dark gray color, geometric shapes, and horizontal lines into the landscape setting. The southern portion of the Project would not be visible from this location due to intervening topography. The northern portion of the Project may be visible from this location and would begin to attract the attention of a casual observer.

The colors, regular geometric forms, and horizontal lines associated with the solar arrays would result in a visual contrast with the irregular, organic forms and colors of the existing vegetation. Existing structures in the vicinity possess horizontal and vertical lines (fencing, roadway, transmission towers and lines, utility poles and lines, agricultural structures), and some are colored gray (roadway, buildings, transmission lines).

While the Project would begin to attract attention to the casual observer, the portion of the Project that would be visible would not dominate the landscape, and the contrast would be considered weak. These impacts would be short term for travelers. From the residence near this viewpoint, views of the Project components that are visible, while appearing as new features, would be consistent with other horizontal and vertical lines and geometric shapes visible throughout the landscape. Since the Project would not block views of the surrounding hills and the Project would not create a dominant feature of the landscape, significant visual impacts would be unlikely.

7.1.2 KOP 2

KOP 2 represents a view of the Project for drivers traveling along Wautoma Road and two residences located approximately 0.15 miles to the north and 0.11 miles to the west of this viewpoint. The closest portion of the Project Area is located to the southeast, approximately 0.8 miles from this viewpoint, 0.24 miles from the northern residence, and 0.17 miles from the western residence.

The Project would introduce dark gray color, geometric shapes, and horizontal lines into the landscape setting. Primary views of the Project would be mostly limited to the edges of the Project closest to Wautoma Road. Project facilities would screen views of the remainder of the Project to the north and south, though Project facilities located at higher elevations may be visible.

The colors, regular geometric forms, and horizontal lines associated with the solar arrays would result in a visual contrast with the irregular, organic forms and colors of the existing vegetation. Existing structures in the vicinity possess horizontal and vertical lines (fencing, vine trellises, road, transmission towers and lines, utility poles and lines, residential buildings, and agricultural structures), and some are colored gray (roadway, agricultural structures, transmission towers, substation).

Since views of the Project would demand attention, could not be overlooked by the casual observer and would dominate the landscape, the contrast would be considered strong. These impacts would be short term for travelers. Views of the Project from the adjacent participating and non-participating residences will be mostly obscured by existing structures and trees adjacent to the residences. Where the Project is visible, the Project components would be consistent with other horizontal and vertical lines and geometric shapes visible throughout the landscape and would not block views of the surrounding hills, however, the Project would introduce strong contrast given the proximity of the visual receptors (under 0.25 miles) to Project facilities.

7.1.3 KOP 3

KOP 3 represents a view of the Project of drivers traveling along SR 241 and the five non-participating residences approximately 0.3 to 0.4 miles from this viewpoint on the west side of SR 241. The western end of the Project Area is located to the east, approximately 0.2 miles from this KOP and 0.4 to 0.5 miles from the residences.

The Project would introduce dark gray color, geometric shapes, and horizontal lines into the landscape setting and would be visible from this location by a casual observer (see Figure 9). Primary views of the Project from SR-241 would be mostly limited to the edges of the Project closest to SR-241. Project facilities would screen views of the remainder of the Project to the east, though some additional Project facilities located at higher elevations would be visible. The residences to the west are at a slightly higher elevation than the western edge of the Project and will likely have a more expansive view of the Project.

The colors, regular geometric forms, and horizontal lines associated with the solar arrays would result in a visual contrast with the irregular organic forms and colors of the existing vegetation.

Existing structures in the vicinity possess horizontal and vertical lines (fencing, road, transmission towers and lines, substation, and utility poles and lines), and some are colored gray (transmission towers and lines, substation).

For views from SR-241, as the Project would attract attention to the casual observer and the Project would co-dominate the landscape, the contrast would be considered moderate. These impacts would be short term for travelers. For the views of the Project from the residences, as views of the Project would demand attention, could not be overlooked by the casual observer, and would dominate the landscape, the contrast would be considered strong. The Project components, while appearing as new features, would be consistent with other horizontal and vertical lines and geometric shapes visible throughout the landscape and would not block views of the surrounding hills and agricultural lands, however, the Project would introduce strong contrast given the proximity and elevation of the residential receptors.

7.1.4 KOP 4

KOP 4 represents a view of the Project for drivers traveling south along SR 241, very briefly for drivers traveling on SR 24, and the residences near this viewpoint to the south. The northern end of the Project Area is located to the south, approximately 1 mile from this viewpoint and 1 to 0.75 miles from the three non-participating residences.

The Project would introduce dark gray color, geometric shapes, and horizontal lines into the landscape setting (Figure 10). The portions of the Project would not be visible from this location due to intervening topography. The portions of the Project visible from this location would begin to attract the attention of a casual observer.

The colors, regular geometric forms, and horizontal lines associated with the solar arrays would result in a visual contrast with the irregular, organic forms and colors of the existing vegetation. Existing structures in the vicinity possess horizontal and vertical lines (fencing, road, transmission towers and lines, utility poles and lines, residential buildings, agricultural structures), and some are colored gray (roadway, transmission towers and lines, agricultural structures).

Because the Project would attract attention to the casual observer and the Project would co-dominate the landscape, the contrast would be considered moderate. These impacts would be short term for travelers. For the views of the Project from the residences, the Project components, while appearing as new features, would be consistent with other horizontal and vertical lines and geometric shapes visible throughout the landscape. Since the Project would not block views of the surrounding hills and the Project would not create a dominant feature of the landscape, significant visual impacts would be unlikely.

7.1.5 KOP 5

KOP 5 represents a view of the Project for drivers traveling along SR 240. The eastern end of the Project Area is approximately 6.3 miles west of this viewpoint. The Project would not be visible

from this location by a casual observer because of distance and the screening of the Project by terrain. Since the Project components are not visible or perceived, no visual impact would occur.

8.0 References

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Figures

Wautoma Solar

Figure 1
Regional Location

BENTON AND YAKIMA COUNTIES, WA

Project Area
County Boundary

INNERGEX TETRA TECH

Reference Map

1:150,000 NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 1 2 4 Miles

NOT FOR CONSTRUCTION

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Wautoma Solar

Figure 2
Preliminary Site Plan

BENTON AND YAKIMA COUNTIES, WA

Wautoma Substation Access Road

Site Entrance

Wautoma Substation

241

Site Entrance

Wautoma Rd

Yakima County

Benton County

- Project Area
- Solar Array
- Access Roads
- Inverters
- Security Fence
- Collection Lines (Underground)
- Transmission Line (Overhead)
- O&M Facility
- Project Substation
- Existing Transmission Lines
- County Boundary

INNERGEX

TETRA TECH

Reference Map

1:22,000

NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 0.25 0.5 1 Miles

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Wautoma Solar

Figure 3
Potential Project Visibility – Project Area

BENTON AND YAKIMA COUNTIES, WA

Grant County
Yakima County
Benton County
243
24
240
241
1
2
3
4
5

- Project Area
- KOP

Residence
- Participating
- Non-Participating

- Array
- Project Potentially Visible
- County Boundary

INNERGEX
TETRA TECH

Reference Map

1:125,000 NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 1 2 4 Miles

NOT FOR CONSTRUCTION

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Panoramic View

Single Frame View

Wautoma Solar Project

FIELD PHOTO LOG

FIGURE 4
KOP 1

VICINITY MAP

Photograph Information

Time of photograph: 2:50 p.m.
Date of photograph: 01/31/2022
Weather condition: Partly Cloudy
Viewing direction: Northeast
Latitude: 46.498801° N
Longitude: -119.898074° W
Photo Location: The photo was taken along Hanford Road (241).

Panoramic View

Single Frame View

Wautoma Solar Project

FIELD PHOTO LOG

FIGURE 5
KOP 2

VICINITY MAP

Photograph Information

Time of photograph: 2:40 p.m.
Date of photograph: 01/31/2022
Weather condition: Partly Cloudy
Viewing direction: East
Latitude: 46.504911° N
Longitude: -119.871353° W
Photo Location: The photo was taken along Wautoma Road.

Panoramic View

Single Frame View

Wautoma Solar Project

FIELD PHOTO LOG

FIGURE 6
KOP 3

VICINITY MAP

Photograph Information

Time of photograph: 2:50 p.m.
Date of photograph: 01/31/2022
Weather condition: Partly Cloudy
Viewing direction: East
Latitude: 46.512566° N
Longitude: -119.875781° W
Photo Location: The photo was taken along Hanford Road (241).

Panoramic View

Single Frame View

Wautoma Solar Project

FIELD PHOTO LOG

FIGURE 7
KOP 4

VICINITY MAP

Photograph Information

Time of photograph: 2:30 p.m.
Date of photograph: 01/31/2022
Weather condition: Partly Cloudy
Viewing direction: South southeast
Latitude: 46.532854° N
Longitude: -119.880559° W
Photo Location: The photo was taken at the intersection of Routes 24 and 241.

Panoramic View

Single Frame View

Wautoma Solar Project

FIELD PHOTO LOG

FIGURE 8
KOP 5

VICINITY MAP

Photograph Information

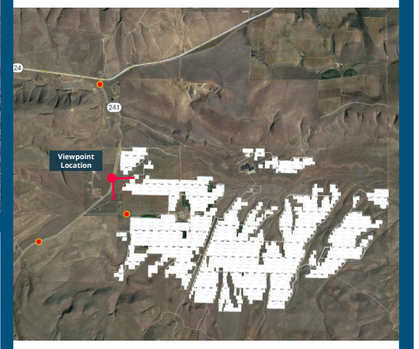
Time of photograph: 3:00 p.m.
Date of photograph: 01/31/2022
Weather condition: Partly Cloudy
Viewing direction: Southwest
Latitude: 46.518581° N
Longitude: -119.670209° W
Photo Location: The photo was taken along Route 240.

WAUTOMA SOLAR PROJECT

Benton County, WA

FIGURE 9

KOP 3:
Existing Conditions
and Simulation



Photograph Information

Time of photograph:	2:50pm
Date of photograph:	1/31/2022
Weather condition:	Partly Cloudy
Viewing direction:	Southeast
Latitude:	46.512566°
Longtitude:	-119.875781°

Disclaimer: visualizations and plans are for reference only; Not for construction

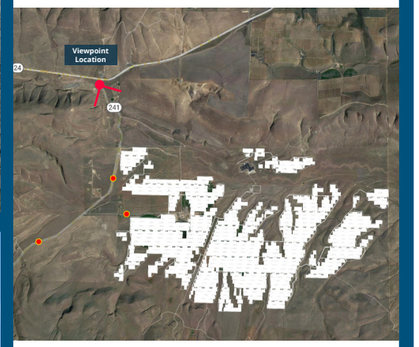
TETRA TECH

WAUTOMA SOLAR PROJECT

Benton County, WA

FIGURE 10

KOP 4:
Existing Conditions
and Simulation



Photograph Information

Time of photograph:	2:30pm
Date of photograph:	1/31/2022
Weather condition:	Partly Cloudy
Viewing direction:	Southeast
Latitude:	46.532854°
Longtitude:	-119.880559°

Disclaimer: visualizations and plans are for reference only; Not for construction

TETRA TECH

Appendix A: Visual Contrast Rating Worksheets

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date January 31, 2022

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name Wautoma Solar Project

2. Key Observation Point 1

3. VRM Class Unclassified/Not on Federal Land

4. Location
Township _____
Range _____
Section _____

5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rolling terrain to hilly terrain	Grass - regular, low Trees - irregular	Roadway - linear, fencing, transmission towers and lines, utility poles and lines, substation - angular and linear, buildings - rectangular
LINE	Silhouette-line	Grass - soft, contiguous Trees - complex, irregular	Roadway - horizontal, fencing, transmission towers and lines, utility poles and lines, substation - vertical, horizontal, buildings - rectangular
COLOR	Brown	Grass - tans, green Trees - greens	Roadway - gray, fencing - brown, transmission towers and lines, substation - gray, utility poles - brown, gray, buildings - tan, white, gray
TEXTURE	Coarse	Grass - fine Trees - uneven	Roadway - coarse, fencing, transmission towers and lines, utility poles, substation, buildings - medium

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rolling terrain to hilly terrain	Grass - regular, low Trees - irregular	Roadway - linear, fencing, transmission towers and lines, utility poles and lines, substation - angular and linear, buildings - rectangular, Project solar arrays - angular
LINE	Silhouette-line	Grass - soft, contiguous Trees - complex, irregular	Roadway - horizontal, fencing, transmission towers and lines, utility poles and lines, substation - vertical, horizontal, buildings - rectangular, Project solar arrays - vertical, horizontal
COLOR	Brown	Grass - tans, green Trees - greens	Roadway - gray, fencing - brown, transmission towers and lines, substation - gray, utility poles - brown, gray, buildings - tan, white, gray, Project solar arrays - gray,
TEXTURE	Coarse	Grass - fine Trees - uneven	Roadway - coarse, fencing, transmission towers and lines, utility poles, substation, buildings - medium, Project solar arrays - smooth

SECTION D. CONTRAST RATING ☐ SHORT TERM ☐ LONG TERM

1. DEGREE OF CONTRAST

ELEMENTS	FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Form			✓				✓				✓	
Line			✓				✓				✓	
Color			✓				✓				✓	
Texture			✓				✓				✓	

2. Does project design meet visual resource management objectives? ☐ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended ☐ Yes ☐ No (Explain on reverse side)

Evaluator's Names — Date

Jess Taylor — January 31, 2022
Paula Fell

Rel. 8-50
1/17/86

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date January 31, 2022

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name Wautoma Solar Project

2. Key Observation Point 2

3. VRM Class Unclassified/Not on Federal Land

4. Location

Township _____

Range _____

Section _____

5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Flat to rolling to hilly terrain	Grass - regular, low Trees - irregular	Roadway - linear, fencing, vine trellises, transmission towers and lines, utility poles and lines, substation - angular and linear, buildings - rectangular, cylindrical
LINE	Diffuse to silhouette-line	Grass - soft, contiguous Trees - complex, irregular	Roadway - horizontal, fencing, vine trellises, transmission towers and lines, utility poles and lines, substation - vertical, horizontal, buildings - rectangular, cylindrical
COLOR	Brown	Grass - tans, green Trees - green, brown	Roadway - gray, fencing - brown, black, vine trellises - brown, white, transmission towers and lines, substation - gray, utility poles - brown, gray, buildings - tan, white, gray
TEX-TURE	Coarse	Grass - fine Trees - uneven	Roadway, fencing, vine trellises - coarse, transmission towers and lines, utility poles, substation, buildings - medium

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Flat to rolling to hilly terrain	Grass - regular, low Trees - irregular	Roadway - linear, fencing, vine trellises, transmission towers and lines, utility poles and lines, substation - angular and linear, buildings - rectangular, cylindrical, Project solar arrays - angular
LINE	Diffuse to silhouette-line	Grass - soft, contiguous Trees - complex, irregular	Roadway - horizontal, fencing, vine trellises, transmission towers and lines, utility poles and lines, substation - vertical, horizontal, buildings - rectangular, cylindrical, Project solar arrays - vertical, horizontal
COLOR	Brown	Grass - tans, green Trees - green, brown	Roadway - gray, fencing - brown, black, vine trellises - brown, white, transmission towers and lines, substation - gray, utility poles - brown, gray, buildings - tan, white, gray, Project solar arrays - gray,
TEX-TURE	Coarse	Grass - fine Trees - uneven	Roadway, fencing, vine trellises - coarse, transmission towers and lines, utility poles, substation, buildings - medium, Project solar arrays - smooth

SECTION D. CONTRAST RATING ☐ SHORT TERM ☐ LONG TERM

1. DEGREE OF CONTRAST

ELEMENTS	FEATURES: LAND/WATER BODY (1) Strong	Moderate	Weak	None	VEGETATION (2) Strong	Moderate	Weak	None	STRUCTURES (3) Strong	Moderate	Weak	None
Form			✓			✓			✓			
Line			✓			✓			✓			
Color			✓			✓			✓			
Texture			✓			✓			✓			

2. Does project design meet visual resource management objectives? ☐ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended ☐ Yes ☐ No (Explain on reverse side)

Evaluator's Names	Date
Jess Taylor	January 31,
Paula Fell	2022

Rel. 8-50
1/17/86

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date January 31, 2022

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name Wautoma Solar Project

2. Key Observation Point 3

3. VRM Class Unclassified/Not on Federal Land

4. Location
Township _____
Range _____
Section _____

5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Flat to hilly terrain	Grass - regular, low	Roadway - linear, fencing, transmission towers and lines, utility poles and lines, substation - angular and linear
LINE	Diffuse to silhouette-line	Grass - soft, contiguous	Roadway - horizontal, fencing, transmission towers and lines, utility poles and lines, substation - vertical
COLOR	Brown	Grass - tans	Roadway - tan, fencing - brown, transmission towers and lines, substation - gray, utility poles - brown, gray
TEX-TURE	Coarse	Grass - fine	Roadway, fencing - coarse, transmission towers and lines, utility poles, substation - medium

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Flat to hilly terrain	Grass - regular, low	Roadway - linear, fencing, transmission towers and lines, utility poles and lines, substation - angular and linear, Project solar arrays - angular
LINE	Diffuse to silhouette-line	Grass - soft, contiguous	Roadway - horizontal, fencing, transmission towers and lines, utility poles and lines, substation - vertical, Project solar arrays - vertical, horizontal
COLOR	Brown	Grass - tans	Roadway - tan, fencing - brown, transmission towers and lines, substation - gray, utility poles - brown, gray, Project solar arrays - gray,
TEX-TURE	Coarse	Grass - fine	Roadway, fencing - coarse, transmission towers and lines, utility poles, substation - medium, Project solar arrays - smooth

SECTION D. CONTRAST RATING ☐ SHORT TERM ☐ LONG TERM

1. DEGREE OF CONTRAST

ELEMENTS	FEATURES: LAND/WATER BODY (1) Strong	Moderate	Weak	None	VEGETATION (2) Strong	Moderate	Weak	None	STRUCTURES (3) Strong	Moderate	Weak	None
Form			✓			✓			✓			
Line			✓			✓			✓			
Color			✓			✓			✓			
Texture			✓			✓			✓			

2. Does project design meet visual resource management objectives? ☐ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended ☐ Yes ☐ No (Explain on reverse side)

Evaluator's Names — Date

Jess Taylor — January 31, 2022
Paula Fell

Rel. 8-50
1/17/86

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date January 31, 2022

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name Wautoma Solar Project

2. Key Observation Point 4

3. VRM Class Unclassified/Not on Federal Land

4. Location
Township _____
Range _____
Section _____

5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rolling terrain to hilly terrain	Grass - regular, low Trees - irregular	Roadway - linear, fencing, transmission towers and lines, utility poles and lines - angular and linear, buildings - rectangular
LINE	Silhouette-line	Grass - soft, contiguous Trees - complex, irregular	Roadway - horizontal, fencing, transmission towers and lines, utility poles and lines - vertical, horizontal, buildings - rectangular
COLOR	Brown	Grass - tans, green Trees - green, brown	Roadway - gray, fencing - brown, transmission towers and lines, - gray, utility poles - brown, gray, buildings - tan, white, gray
TEX-TURE	Coarse	Grass - fine Trees - uneven	Roadway - coarse, fencing, transmission towers and lines, utility poles, buildings - medium

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rolling terrain to hilly terrain	Grass - regular, low Trees - irregular	Roadway - linear, fencing, transmission towers and lines, utility poles and lines, - angular and linear, buildings - rectangular, Project solar arrays - angular
LINE	Silhouette-line	Grass - soft, contiguous Trees - complex, irregular	Roadway - horizontal, fencing, transmission towers and lines, utility poles and lines, - vertical, horizontal, buildings - rectangular, Project solar arrays - vertical, horizontal
COLOR	Brown	Grass - tans, green Trees - green, brown	Roadway - gray, fencing - brown, transmission towers and lines - gray, utility poles - brown, gray, buildings - tan, white, gray, Project solar arrays - gray,
TEX-TURE	Coarse	Grass - fine Trees - uneven	Roadway - coarse, fencing, transmission towers and lines, utility poles, buildings - medium, Project solar arrays - smooth

SECTION D. CONTRAST RATING ☐ SHORT TERM ☐ LONG TERM

1. DEGREE OF CONTRAST

ELEMENTS	FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Form			✓				✓			✓		
Line			✓				✓			✓		
Color			✓				✓			✓		
Texture			✓				✓			✓		

2. Does project design meet visual resource management objectives? ☐ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended ☐ Yes ☐ No (Explain on reverse side)

Evaluator's Names — Date

Jess Taylor — January 31, 2022
Paula Fell — 2022

Rel. 8-50
1/17/86

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date January 31, 2022

District N/A

Resource Area N/A

Activity (program) N/A

SECTION A. PROJECT INFORMATION

1. Project Name Wautoma Solar Project

2. Key Observation Point 5

3. VRM Class Unclassified/Not on Federal Land

4. Location
Township _____
Range _____
Section _____

5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Flat to hilly terrain	Grass - regular, low	Roadway - linear, utility poles and lines - angular and linear
LINE	Diffuse to silhouette-line	Grass - soft, contiguous	Roadway - horizontal, utility poles and lines - vertical
COLOR	Brown	Grass - tans	Roadway - gray, utility poles - brown, gray
TEX-TURE	Coarse	Grass - fine	Roadway - coarse, utility poles, substation - medium

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Flat to hilly terrain	Grass - regular, low	Roadway - linear, utility poles and lines - angular and linear
LINE	Diffuse to silhouette-line	Grass - soft, contiguous	Roadway - horizontal, utility poles and lines - vertical
COLOR	Brown	Grass - tans	Roadway - gray, utility poles - brown, gray
TEX-TURE	Coarse	Grass - fine	Roadway - coarse, utility poles, substation - medium

SECTION D. CONTRAST RATING ☐ SHORT TERM ☐ LONG TERM

1. DEGREE OF CONTRAST

ELEMENTS	FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Form				✓				✓				✓
Line				✓				✓				✓
Color				✓				✓				✓
Texture				✓				✓				✓

2. Does project design meet visual resource management objectives? ☐ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended ☐ Yes ☐ No (Explain on reverse side)

Evaluator's Names — Date

Jess Taylor — January 31, 2022
Paula Fell — 2022

Rel. 8-50
1/17/86

ATTACHMENT Q: CULTURAL RESOURCES SURVEY REPORT

CONFIDENTIAL, Not for Public Distribution

The Cultural Resources Survey Report is not included because it contains confidential information and is not intended for public distribution.

ATTACHMENT R: DECOMISSIONING SUMMARY AND ESTIMATE

Attachment R. Decommissioning Summary and Estimate
Wautoma Solar Energy Project

CBS Position Code	Description	Forecast (T/O) Quantity	Unit of Measure	Unit Cost	Total Cost (Forecast)
1	**WAUTOMA SOLAR RETIREMENT**	**1.00**	**Lump Sum**	**$22,809,278.77**	**$22,809,278.77**
1.1	**Equipment & Facilities Mob / Demob**	**1.00**	**Lump Sum**	**$127,741.38**	**$127,741.38**
1.1.1	Equipment Mob	1.00	Lump Sum	$61,200.00	$61,200.00
1.1.2	Site Facilities	1.00	Lump Sum	$2,200.00	$2,200.00
1.1.3	Crew Mob & Site Setup	3.00	Day	$12,868.28	$38,604.83
1.1.4	Crew Demob & Site Cleanup	2.00	Day	$12,868.28	$25,736.55
1.2	**Project Site Support**	**1.00**	**Lump Sum**	**$805,320.82**	**$805,320.82**
1.2.1	Site Facilities	12.00	Month	$1,305.00	$15,660.00
1.2.2	Field Management	12.00	Month	$65,805.07	$789,660.82
1.3	**O&M Building Removal**	**1.00**	**Lump Sum**	**$19,997.26**	**$19,997.26**
1.3.1	Structure Demo	40.00	Ton	$252.59	$10,103.71
1.3.2	Remove Foundations To Subgrade	200.00	Cubic Yard	$35.54	$7,107.55
1.3.3	Trucking - Per Load	2.00	Each	$1,375.00	$2,750.00
1.3.4	Disposal Cost	1.00	Ton	$36.00	$36.00
1.4	**Substation & T-Line Retirement**	**1.00**	**Lump Sum**	**$345,111.94**	**$345,111.94**
1.4.1	Substation Retirement	1.00	Lump Sum	$296,486.71	$296,486.71
1.4.2	Transmission Line Retirement	1.00	Lump Sum	$48,625.23	$48,625.23
1.5	**Solar Array Retirement**	**1.00**	**Lump Sum**	**$15,247,454.08**	**$15,247,454.08**
1.5.1	Fence Removal	192,467.00	Linear Feet	$1.26	$241,940.46
1.5.2	Solar Panel Removal & Disposal	1,292,376.00	Each	$6.66	$8,609,369.94
1.5.3	Solar Rack (Trackers) & Post Removal	15,812.00	Each	$363.11	$5,741,558.14
1.5.4	Above Grade Cable Removal	3,953,000.00	Linear Feet	$0.17	$654,585.54
1.6	**Tesla Megapack Retirement**	**636.00**	**Each**	**$9,439.61**	**$6,003,594.05**
1.6.1	Transformer Removal	636.00	Each	$455.80	$289,886.66
1.6.2	Removal & Disposal - Ethylene Glycol From Megapacks	43,683.00	GL	$12.50	$545,917.41
1.6.3	Removal & Loadout - Battery Modules	8,268.00	EA	$156.05	$1,290,240.50
1.6.4	Process And Loadout	636.00	EA	$2,318.73	$1,474,711.20
1.6.5	T&D - Misc Waste	636.00	TN	$100.00	$63,600.00
1.6.6	Transport Scrap	2,544.00	TN	$35.00	$89,040.00
1.6.7	Transport Battery Modules To Telsa	9,927.96	TN	$200.00	$1,985,592.00
1.6.8	Remove Foundations To Subgrade	636.00	Each	$416.05	$264,606.28
1.7	**Site Restoration - Partial Site Seeding**	**1.00**	**Lump Sum**	**$1,104,230.75**	**$1,104,230.75**
1.7.1	Strip & Decompact Roads	183,794.00	Linear Feet	$1.43	$262,134.39
1.7.2	Removal & Disposal, Drainage Crossings	122.00	Each	$206.01	$25,133.65
1.7.3	Spot Grade Disturbed Areas	1,052.00	Acre	$281.33	$295,962.71
1.7.4	Re-Seed With Native Vegetation - Roads & Areas Disturbed By Construction	1,042.00	Acre	$500.00	$521,000.00
1.8	**Contractor Markups**	**1.00**	**Lump Sum**	**$4,411,368.49**	**$4,411,368.49**
1.8.1	Home Office, Project Management (5% Of Cost)	1.00	Lump Sum	$1,182,672.50	$1,182,672.50
1.8.2	Contractor OH & Fee (13% Of Cost)	1.00	Lump Sum	$3,228,695.99	$3,228,695.99
1.9	**Scrap Metal Credit**	**1.00**	**Lump Sum**	**-$5,255,540.00**	**-$5,255,540.00**
1.9.1	Scrap Credit - Substation	180.00	Ton	-$380.00	-$68,400.00
1.9.2	Scrap Credit - T-Line Structures	45.00	Ton	-$380.00	-$17,100.00
1.9.3	Scrap Credit - Fence	770.00	Ton	-$380.00	-$292,600.00
1.9.4	Scrap Credit - Megapack / Transformer	3,616.00	Ton	-$380.00	-$1,374,080.00
1.9.5	Scrap Credit - Module Rack	6,325.00	Ton	-$380.00	-$2,403,500.00
1.9.6	Scrap Credit - O&M Structure	39.00	Ton	-$380.00	-$14,820.00
1.9.7	Scrap Credit - Cable	198.00	Ton	-$5,480.00	-$1,085,040.00

Note:
1. The cost breakdown structure (CBS) code corresponds with the CBS position code for details provided in the following decommissioning estimate.

Estimate Summary
TETRA TECH EC, INC.
Job Code: Wautoma Solar
Description: Decommissioning Estimate

CBS Position Code	Quantity	UM	Description	Cost Item Days	Cost UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1	1.00	Lump Sum	WAUTOMA SOLAR RETIREMENT	2,398.19	0.00	Detail	U.S. Dollar	22,809,278.77	22,809,278.77
1.1	1.00	Lump Sum	Equipment & Facilities Mob / Demob	5.00	0.20	Detail	U.S. Dollar	127,741.38	127,741.38
1.1.1	1.00	Lump Sum	Equipment Mob	0.00	0.00	Detail	U.S. Dollar	61,200.00	61,200.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
UERNTRLG	Rental Equip Transp-Large		6.00	Each	U.S. Dollar	10,000.00	60,000.00
UERNTRSM	Rental Equip Transp-Small		8.00	Each	U.S. Dollar	150.00	1,200.00

1.1.2	1.00	Lump Sum	Site Facilities	0.00	0.00	Detail	U.S. Dollar	2,200.00	2,200.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
UOCONMOB	Connex Box Mob		2.00	Each	U.S. Dollar	300.00	600.00
UOTRLTRN	Trailer Trnsp/Setup/Trdwn		2.00	Each	U.S. Dollar	800.00	1,600.00

1.1.3	3.00	Day	Crew Mob & Site Setup	3.00	1.00	Detail	U.S. Dollar	12,868.28	38,604.83

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L060100	GENERAL LABORER	720.00	24.00	Each (hourly)	U.S. Dollar	40.69	29,296.43
L010101	OPERATOR	180.00	6.00	Each (hourly)	U.S. Dollar	51.71	9,308.40

1.1.4	2.00	Day	Crew Demob & Site Cleanup	2.00	1.00	Detail	U.S. Dollar	12,868.28	25,736.55

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L060100	GENERAL LABORER	480.00	24.00	Each (hourly)	U.S. Dollar	40.69	19,530.95
L010101	OPERATOR	120.00	6.00	Each (hourly)	U.S. Dollar	51.71	6,205.60

1.2	1.00	Lump Sum	Project Site Support	264.00	0.00	Detail	U.S. Dollar	805,320.82	805,320.82
1.2.1	12.00	Month	Site Facilities	0.00	0.00	Detail	U.S. Dollar	1,305.00	15,660.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
URCONNEX	Connex Box		12.00	Month	U.S. Dollar	150.00	1,800.00
UROFFTRL	Office Trailer -12x60		12.00	Month	U.S. Dollar	500.00	6,000.00
UO1STAID	1st Aid Supplies		12.00	Month	U.S. Dollar	300.00	3,600.00
UOOFFSUP	Office Supplies($/prs/mo)		12.00	Month	U.S. Dollar	55.00	660.00
URPRTAJH	Port-a-John Unit(s) (4)		12.00	Month	U.S. Dollar	300.00	3,600.00

1.2.2	12.00	Month	Field Management	264.00	0.05	Detail	U.S. Dollar	65,805.07	789,660.82

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L90FXX02	Field - Proj Superintendent	2,640.00	1.00	Each (hourly)	U.S. Dollar	83.18	219,600.48
RPUTRK05	F-250 4X4 3/4 TON PICKUP	10,560.00	4.00	Each (hourly)	U.S. Dollar	11.88	125,452.80
L90FEL00	Field - Engr. Tech	5,280.00	2.00	Each (hourly)	U.S. Dollar	39.57	208,950.84
L90FXX03	Field - SHSO	2,640.00	1.00	Each (hourly)	U.S. Dollar	89.26	235,656.70

1.3	1.00	Lump Sum	O&M Building Removal	4.80	0.21	Detail	U.S. Dollar	19,997.26	19,997.26
1.3.1	40.00	Ton	Structure Demo	2.00	20.00	Detail	U.S. Dollar	252.59	10,103.71

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
*REXCAV06A	Excav 100K w/ Bucket & Grapple	20.00	1.00	Each (hourly)	U.S. Dollar	129.71	2,594.20
*REXCAV06E	Excav 100K w/ Shear	20.00	1.00	Each (hourly)	U.S. Dollar	190.67	3,813.40
L010101	OPERATOR	40.00	2.00	Each (hourly)	U.S. Dollar	51.71	2,068.53
L060100	GENERAL LABORER	40.00	2.00	Each (hourly)	U.S. Dollar	40.69	1,627.58

Notes: **********
Assume steel structure
****

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CBS Position Code	Quantity	UM	Description	Days	Cost UM/Day	Cost Source	Currency	Unit Cost	Total Cost
			Cost Item						
1.3.2	200.00	Cubic Yard	Remove Foundations To Subgrade	2.80	71.43	Detail	U.S. Dollar	35.54	7,107.55
1.3.2.1	200.00	Cubic Yard	Excavate / Remove Foundation - Various Depth	0.80	250.00	Detail	U.S. Dollar	17.60	3,519.73

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L060100	GENERAL LABORER	8.00	1.00	Each (hourly)	U.S. Dollar	40.69	325.52
L010101	OPERATOR	16.00	2.00	Each (hourly)	U.S. Dollar	51.71	827.41
*REXCAV06C	Excav 100K w/ Hammer	8.00	1.00	Each (hourly)	U.S. Dollar	166.14	1,329.12
*REXCAV06A	Excav 100K w/ Bucket & Grapple	8.00	1.00	Each (hourly)	U.S. Dollar	129.71	1,037.68

1.3.2.2	200.00	Cubic Yard	Concrete Transport Offsite	2.00	100.00	Detail	U.S. Dollar	17.94	3,587.82

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
RDUTRK06	CAT D350D, 18CY-24CY	20.00	1.00	Each (hourly)	U.S. Dollar	76.71	1,534.20
L080940	TEAMSTER	20.00	1.00	Each (hourly)	U.S. Dollar	43.52	870.49
L010101	OPERATOR	10.00	0.50	Each (hourly)	U.S. Dollar	51.71	517.13
RFELWH09	CAT 966F LOADER, 4.25CY	10.00	0.50	Each (hourly)	U.S. Dollar	66.60	666.00

1.3.3	2.00	Each	Trucking - Per Load	0.00	0.00	Detail	U.S. Dollar	1,375.00	2,750.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USTRUCKING	Trucking Sub		2,750.00	Each	U.S. Dollar	1.00	2,750.00

Notes: **********
Assumption: 45,000 lbs per load
****

1.3.4	1.00	Ton	Disposal Cost	0.00	0.00	Detail	U.S. Dollar	36.00	36.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USDISPOSAL	Disposal Fee's		30.00	Each	U.S. Dollar	1.20	36.00

Notes: **********
Assumption: 324,016 modules x 60.63 lbs each
****

1.4	1.00	Lump Sum	Substation & T-Line Retirement	41.56	0.02	Detail	U.S. Dollar	345,111.94	345,111.94
1.4.1	1.00	Lump Sum	Substation Retirement	31.45	0.03	Detail	U.S. Dollar	296,486.71	296,486.71
1.4.1.1	1.00	Day	Fence Removal	1.00	1.00	Detail	U.S. Dollar	1,276.73	1,276.73

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L010101	OPERATOR	10.00	1.00	Each (hourly)	U.S. Dollar	51.71	517.13
L060100	GENERAL LABORER	10.00	1.00	Each (hourly)	U.S. Dollar	40.69	406.89
RBACKH09	Deere 710J BACKHOE, 1.62CY	10.00	1.00	Each (hourly)	U.S. Dollar	35.27	352.70

1.4.1.2	2.00	Each	Transformer Removal	12.00	0.17	Detail	U.S. Dollar	104,217.02	208,434.04
1.4.1.2.1	2.00	Each	Oil Removal & Disposal	2.00	1.00	Detail	U.S. Dollar	69,388.79	138,777.58
1.4.1.2.1.1	2.00	Each	Oil Removal	2.00	1.00	Detail	U.S. Dollar	813.79	1,627.58

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L060100	GENERAL LABORER	40.00	2.00	Each (hourly)	U.S. Dollar	40.69	1,627.58

1.4.1.2.1.2	28,000.00	Gallon	Oil Disposal	0.00	0.00	Detail	U.S. Dollar	4.80	134,400.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USDISPOSAL	Disposal Fee's		112,000.00	Each	U.S. Dollar	1.20	134,400.00

1.4.1.2.1.3	2.00	Each	Trucking - Per Load	0.00	0.00	Detail	U.S. Dollar	1,375.00	2,750.00

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CBS Position Code	Quantity	UM	Description	Cost Item Days	Cost UM/Day	Cost Source	Currency	Unit Cost	Total Cost
Resource Code	**Description**		**Hours**	**Quantity**	**UM**		**Currency**	**Unit Cost**	**Total Cost**
USTRUCKING	Trucking Sub			2,750.00	Each		U.S. Dollar	1.00	2,750.00
1.4.1.2.2	2.00	Each	Dismantle & Loadout Transformer	10.00	0.20	Detail	U.S. Dollar	34,828.23	69,656.46
1.4.1.2.2.1	2.00	Each	Dismantle, Cut & Size	10.00	0.20	Detail	U.S. Dollar	29,328.23	58,656.46
Resource Code	**Description**		**Hours**	**Quantity**	**UM**		**Currency**	**Unit Cost**	**Total Cost**
L060100	GENERAL LABORER		400.00	4.00	Each (hourly)		U.S. Dollar	40.69	16,275.79
L010101	OPERATOR		200.00	2.00	Each (hourly)		U.S. Dollar	51.71	10,342.67
*REXCAV06A	Excav 100K w/ Bucket & Grapple		100.00	1.00	Each (hourly)		U.S. Dollar	129.71	12,971.00
*REXCAV06E	Excav 100K w/ Shear		100.00	1.00	Each (hourly)		U.S. Dollar	190.67	19,067.00
1.4.1.2.2.2	8.00	Each	Trucking - Per Load	0.00	0.00	Detail	U.S. Dollar	1,375.00	11,000.00
Resource Code	**Description**		**Hours**	**Quantity**	**UM**		**Currency**	**Unit Cost**	**Total Cost**
USTRUCKING	Trucking Sub			11,000.00	Each		U.S. Dollar	1.00	11,000.00
1.4.1.3	1.00	Each	Remove Control Building & Switchgear	1.00	1.00	Detail	U.S. Dollar	4,971.13	4,971.13
1.4.1.3.1	1.00	Each	Demo	1.00	1.00	Detail	U.S. Dollar	2,221.13	2,221.13
Resource Code	**Description**		**Hours**	**Quantity**	**UM**		**Currency**	**Unit Cost**	**Total Cost**
L060100	GENERAL LABORER		10.00	1.00	Each (hourly)		U.S. Dollar	40.69	406.89
L010101	OPERATOR		10.00	1.00	Each (hourly)		U.S. Dollar	51.71	517.13
*REXCAV06A	Excav 100K w/ Bucket & Grapple		10.00	1.00	Each (hourly)		U.S. Dollar	129.71	1,297.10
1.4.1.3.2	2.00	Each	Trucking - Per Load	0.00	0.00	Detail	U.S. Dollar	1,375.00	2,750.00
Resource Code	**Description**		**Hours**	**Quantity**	**UM**		**Currency**	**Unit Cost**	**Total Cost**
USTRUCKING	Trucking Sub			2,750.00	Each		U.S. Dollar	1.00	2,750.00
1.4.1.4	2.00	Day	UG Utility & Ground Removal	2.00	1.00	Detail	U.S. Dollar	1,276.73	2,553.46
Resource Code	**Description**		**Hours**	**Quantity**	**UM**		**Currency**	**Unit Cost**	**Total Cost**
L010101	OPERATOR		20.00	1.00	Each (hourly)		U.S. Dollar	51.71	1,034.27
L060100	GENERAL LABORER		20.00	1.00	Each (hourly)		U.S. Dollar	40.69	813.79
RBACKH09	Deere 710J BACKHOE, 1.62CY		20.00	1.00	Each (hourly)		U.S. Dollar	35.27	705.40
1.4.1.5	500.00	Cubic Yard	Remove Foundations To Subgrade	6.79	73.68	Detail	U.S. Dollar	27.74	13,868.25
1.4.1.5.1	500.00	Cubic Yard	Excavate / Remove Foundation - Various Depth	1.79	280.00	Detail	U.S. Dollar	15.71	7,856.54
Resource Code	**Description**		**Hours**	**Quantity**	**UM**		**Currency**	**Unit Cost**	**Total Cost**
L060100	GENERAL LABORER		17.86	1.00	Each (hourly)		U.S. Dollar	40.69	726.60
L010101	OPERATOR		35.71	2.00	Each (hourly)		U.S. Dollar	51.71	1,846.91
*REXCAV06C	Excav 100K w/ Hammer		17.86	1.00	Each (hourly)		U.S. Dollar	166.14	2,966.79
*REXCAV06A	Excav 100K w/ Bucket & Grapple		17.86	1.00	Each (hourly)		U.S. Dollar	129.71	2,316.25
1.4.1.5.2	500.00	Cubic Yard	Concrete Transport Offsite	5.00	100.00	Detail	U.S. Dollar	12.02	6,011.72
Resource Code	**Description**		**Hours**	**Quantity**	**UM**		**Currency**	**Unit Cost**	**Total Cost**
RDUTRK06	CAT D350D, 18CY-24CY		50.00	1.00	Each (hourly)		U.S. Dollar	76.71	3,835.50
L080940	TEAMSTER		50.00	1.00	Each (hourly)		U.S. Dollar	43.52	2,176.22
1.4.1.6	1.00	Lump Sum	Misc. Material Disposal	0.00	0.00	Detail	U.S. Dollar	1,735.00	1,735.00

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CBS Position Code	Quantity	UM	Description	Cost Item Days	Cost UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.4.1.6.1	1.00	Each	Trucking - Per Load	0.00	0.00	Detail	U.S. Dollar	1,375.00	1,375.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USTRUCKING	Trucking Sub		1,375.00	Each	U.S. Dollar	1.00	1,375.00

1.4.1.6.2	10.00	Ton	Disposal Cost	0.00	0.00	Detail	U.S. Dollar	36.00	360.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USDISPOSAL	Disposal Fee's		300.00	Each	U.S. Dollar	1.20	360.00

1.4.1.7	1.00	Lump Sum	Restore Yard	8.67	0.12	Detail	U.S. Dollar	63,648.10	63,648.10
1.4.1.7.1	4.00	Acre	Backfill / Regrade	2.00	2.00	Detail	U.S. Dollar	1,626.25	6,504.99

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L060100	GENERAL LABORER	40.00	2.00	Each (hourly)	U.S. Dollar	40.69	1,627.58
L010101	OPERATOR	40.00	2.00	Each (hourly)	U.S. Dollar	51.71	2,068.53
REXCAV06B	Gradall - Excavator	20.00	1.00	Each (hourly)	U.S. Dollar	79.62	1,592.47
*RDOZER08	CAT D6 LGP Dozer	20.00	1.00	Each (hourly)	U.S. Dollar	60.82	1,216.40

1.4.1.7.2	2,000.00	Cubic Yard	Vegetative Cover	6.67	300.00	Detail	U.S. Dollar	27.57	55,143.11
1.4.1.7.2.1	2,000.00	Cubic Yard	Topsoil, Delivered	0.00	0.00	Detail	U.S. Dollar	20.00	40,000.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
IMSOIL	Topsoil		2,000.00	Cubic Yard	U.S. Dollar	20.00	40,000.00

1.4.1.7.2.2	2,000.00	Cubic Yard	Placement	6.67	300.00	Detail	U.S. Dollar	7.57	15,143.11

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L010101	OPERATOR	133.33	2.00	Each (hourly)	U.S. Dollar	51.71	6,895.11
RDOZER08	CAT D6N XL	133.33	2.00	Each (hourly)	U.S. Dollar	61.86	8,248.00

1.4.1.7.3	4.00	Acre	Re-Seed With Native Vegetation	0.00	0.00	Detail	U.S. Dollar	500.00	2,000.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USLANDSCAPE	Landscape Sub		4.00	Acre	U.S. Dollar	500.00	2,000.00

1.4.2	1.00	Lump Sum	Transmission Line Retirement	10.11	0.10	Detail	U.S. Dollar	48,625.23	48,625.23
1.4.2.1	5.00	Each	Structure Removal	5.00	1.00	Detail	U.S. Dollar	4,892.61	24,463.04
1.4.2.1.1	5.00	Each	Cut / Lower Structure	2.50	2.00	Detail	U.S. Dollar	1,830.06	9,150.28

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L060100	GENERAL LABORER	100.00	4.00	Each (hourly)	U.S. Dollar	40.69	4,068.95
L010101	OPERATOR	25.00	1.00	Each (hourly)	U.S. Dollar	51.71	1,292.83
*RXMISC14	MAN LIFT GAS 125ft	25.00	1.00	Each (hourly)	U.S. Dollar	54.88	1,372.00
*RXMISC23	GROVE RT 200 TON	25.00	1.00	Each (hourly)	U.S. Dollar	96.66	2,416.50

1.4.2.1.2	5.00	Each	Cut / Size Structure & Loadout	2.50	2.00	Detail	U.S. Dollar	1,962.55	9,812.76

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L060100	GENERAL LABORER	150.00	6.00	Each (hourly)	U.S. Dollar	40.69	6,103.42
L010101	OPERATOR	25.00	1.00	Each (hourly)	U.S. Dollar	51.71	1,292.83
*RXMISC23	GROVE RT 200 TON	25.00	1.00	Each (hourly)	U.S. Dollar	96.66	2,416.50

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CBS Position Code	Quantity	UM	Description	Days	Cost UM/Day	Cost Source	Currency	Unit Cost	Total Cost
			Cost Item						
1.4.2.1.3	4.00	Each	Trucking - Per Load	0.00	0.00	Detail	U.S. Dollar	1,375.00	5,500.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USTRUCKING	Trucking Sub		5,500.00	Each	U.S. Dollar	1.00	5,500.00

Notes: **********
Assume 9 ton per steel structure and cable span
****

1.4.2.2	5.00	Each	Remove Foundations To Subgrade	5.11	0.98	Detail	U.S. Dollar	4,832.44	24,162.19
1.4.2.2.1	5.00	Each	Excavate / Remove Foundation - Various Depth	5.00	1.00	Detail	U.S. Dollar	4,806.56	24,032.78

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L060100	GENERAL LABORER	100.00	2.00	Each (hourly)	U.S. Dollar	40.69	4,068.95
L010101	OPERATOR	100.00	2.00	Each (hourly)	U.S. Dollar	51.71	5,171.34
*REXCAV06C	Excav 100K w/ Hammer	50.00	1.00	Each (hourly)	U.S. Dollar	166.14	8,307.00
*REXCAV06A	Excav 100K w/ Bucket & Grapple	50.00	1.00	Each (hourly)	U.S. Dollar	129.71	6,485.50

1.4.2.2.2	8.07	Cubic Yard	Concrete Transport Offsite	0.11	75.00	Detail	U.S. Dollar	16.03	129.41

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
RDUTRK06	CAT D350D, 18CY-24CY	1.08	1.00	Each (hourly)	U.S. Dollar	76.71	82.56
L080940	TEAMSTER	1.08	1.00	Each (hourly)	U.S. Dollar	43.52	46.85

1.5	1.00	Lump Sum	Solar Array Retirement	702.81	0.00	Detail	U.S. Dollar	15,247,454.08	15,247,454.08
1.5.1	192,467.00	Linear Feet	Fence Removal	37.56	5,124.80	Detail	U.S. Dollar	1.26	241,940.46
1.5.1.1	192,467.00	Linear Feet	Fence Removal	37.56	5,124.80	Detail	U.S. Dollar	0.99	189,690.46

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L010101	OPERATOR	1,126.68	3.00	Each (hourly)	U.S. Dollar	51.71	58,264.40
L060100	GENERAL LABORER	2,253.36	6.00	Each (hourly)	U.S. Dollar	40.69	91,688.05
RBACKH09	Deere 710J BACKHOE, 1.62CY	1,126.68	3.00	Each (hourly)	U.S. Dollar	35.27	39,738.01

1.5.1.2	38.00	Each	Trucking - Per Load	0.00	0.00	Detail	U.S. Dollar	1,375.00	52,250.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USTRUCKING	Trucking Sub		52,250.00	Each	U.S. Dollar	1.00	52,250.00

1.5.2	1,292,376.00	Each	Solar Panel Removal & Disposal	269.25	4,800.00	Detail	U.S. Dollar	6.66	8,609,369.94
1.5.2.1	1,292,376.00	Each	Solar Panel Removal	269.25	4,800.00	Detail	U.S. Dollar	2.97	3,835,630.94

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
RLIFTS05	JCB 508C, 8,000lbs FRKLFT	16,154.70	6.00	Each (hourly)	U.S. Dollar	22.96	370,911.91
L010101	OPERATOR	16,154.70	6.00	Each (hourly)	U.S. Dollar	51.71	835,413.66
L060100	GENERAL LABORER	64,618.80	24.00	Each (hourly)	U.S. Dollar	40.69	2,629,305.37

Notes: **********
Assumed production: 20 panels per laborer per hour,
Includes packaging and preparing for shipment offsite.
****

1.5.2.2	2,185.00	Each	Trucking - Per Load	0.00	0.00	Detail	U.S. Dollar	1,375.00	3,004,375.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USTRUCKING	Trucking Sub		3,004,375.00	Each	U.S. Dollar	1.00	3,004,375.00

Notes: **********
Assumption: 45,000 lbs per load
****

1.5.2.3	49,149.00	Ton	Disposal Cost	0.00	0.00	Detail	U.S. Dollar	36.00	1,769,364.00

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CBS Position Code	Quantity	UM	Description	Cost Item Days	Cost UM/Day	Cost Source	Currency	Unit Cost	Total Cost

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USDISPOSAL	Disposal Fee's		1,474,470.00	Each	U.S. Dollar	1.20	1,769,364.00

Notes: **********
Assumption: 626,332 modules x 76.06 lbs each
****

1.5.3	15,812.00	Each	Solar Rack (Trackers) & Post Removal	132.47	119.36	Detail	U.S. Dollar	363.11	5,741,558.14
1.5.3.1	15,812.00	Each	Solar Rack (Trackers) & Post Removal	132.47	119.36	Detail	U.S. Dollar	338.59	5,353,808.14

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L010101	OPERATOR	21,195.41	16.00	Each (hourly)	U.S. Dollar	51.71	1,096,085.56
L060100	GENERAL LABORER	21,195.41	16.00	Each (hourly)	U.S. Dollar	40.69	862,430.14
*REXCAV06A	Excav 100K w/ Bucket & Grapple	10,597.70	8.00	Each (hourly)	U.S. Dollar	129.71	1,374,628.20
*REXCAV06E	Excav 100K w/ Shear	10,597.70	8.00	Each (hourly)	U.S. Dollar	190.67	2,020,664.24

Notes: **********
Crew to include
1 excavator w/shear, 1 excavator w/grapple, 2 operators and 2 laborers. Includes post removal and sizing of steel for sale as scrap, and loadout to haul trucks.
****

1.5.3.2	282.00	Each	Trucking - Per Load	0.00	0.00	Detail	U.S. Dollar	1,375.00	387,750.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USTRUCKING	Trucking Sub		387,750.00	Each	U.S. Dollar	1.00	387,750.00

Notes: **********
Assumption: 45,000 lbs per load
****

1.5.4	3,953,000.00	Linear Feet	Above Grade Cable Removal	263.53	15,000.00	Detail	U.S. Dollar	0.17	654,585.54
1.5.4.1	3,953,000.00	Linear Feet	Remove Cable From Rack	263.53	15,000.00	Detail	U.S. Dollar	0.16	625,710.54

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
RLIFTS05	JCB 508C, 8,000lbs FRKLFT	2,635.33	1.00	Each (hourly)	U.S. Dollar	22.96	60,507.25
L010101	OPERATOR	2,635.33	1.00	Each (hourly)	U.S. Dollar	51.71	136,281.92
L060100	GENERAL LABORER	10,541.33	4.00	Each (hourly)	U.S. Dollar	40.69	428,921.37

Notes: **********
Assume .10 lbs per lf, 250 lf per rack
****

1.5.4.2	21.00	Each	Trucking - Per Load	0.00	0.00	Detail	U.S. Dollar	1,375.00	28,875.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USTRUCKING	Trucking Sub		28,875.00	Each	U.S. Dollar	1.00	28,875.00
1.6	636.00	Each	Tesla Megapack Retirement	1,162.80	0.55	Detail	U.S. Dollar	9,439.61	6,003,594.05
1.6.1	636.00	Each	Transformer Removal	127.20	5.00	Detail	U.S. Dollar	455.80	289,886.66
1.6.1.1	636.00	Each	Disconnect Electrical	63.60	10.00	Detail	U.S. Dollar	108.56	69,043.42

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L010110	ELECTRCIAN	636.00	1.00	Each (hourly)	U.S. Dollar	55.99	35,609.23
L060100	GENERAL LABORER	636.00	1.00	Each (hourly)	U.S. Dollar	40.69	25,878.51
RPUTRK05	F-250 4X4 3/4 TON PICKUP	636.00	1.00	Each (hourly)	U.S. Dollar	11.88	7,555.68
1.6.1.2	636.00	Each	Loadout Transformer	63.60	10.00	Detail	U.S. Dollar	284.54	180,968.25

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L060100	GENERAL LABORER	2,544.00	4.00	Each (hourly)	U.S. Dollar	40.69	103,514.04
L010101	OPERATOR	636.00	1.00	Each (hourly)	U.S. Dollar	51.71	32,889.69
RHYDCR06	GROVE RT880 73 TON	636.00	1.00	Each (hourly)	U.S. Dollar	70.07	44,564.52

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CBS Position Code	Quantity	UM	Description	Days	Cost UM/Day	Cost Source	Currency	Unit Cost	Total Cost
1.6.1.3	29.00	Each	Trucking - Per Load	0.00	0.00	Detail	U.S. Dollar	1,375.00	39,875.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USTRUCKING	Trucking Sub		39,875.00	Each	U.S. Dollar	1.00	39,875.00

1.6.2	43,683.00	GL	Removal & Disposal - Ethylene Glycol From Megapacks	174.73	250.00	Detail	U.S. Dollar	12.50	545,917.41

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L010101	OPERATOR	1,747.32	1.00	Each (hourly)	U.S. Dollar	51.71	90,359.77
L060100	GENERAL LABORER	6,989.28	4.00	Each (hourly)	U.S. Dollar	40.69	284,390.17
RLIFTS05	JCB 508C, 8,000lbs FRKLFT	1,747.32	1.00	Each (hourly)	U.S. Dollar	22.96	40,118.47
USTDOIL	T&D of Oil & Glycol		43,683.00	Gallon	U.S. Dollar	3.00	131,049.00

Notes: **********
Assume 20 l per battery module, 13 modules per Megapack, 636 Megapacks = 165,360 l / 43,683 gallons
Assumed production: 250 gallons per day
****

1.6.3	8,268.00	EA	Removal & Loadout - Battery Modules	413.40	20.00	Detail	U.S. Dollar	156.05	1,290,240.50

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L010101	OPERATOR	8,268.00	2.00	Each (hourly)	U.S. Dollar	51.71	427,565.98
L060100	GENERAL LABORER	16,536.00	4.00	Each (hourly)	U.S. Dollar	40.69	672,841.24
RLIFTS05	JCB 508C, 8,000lbs FRKLFT	8,268.00	2.00	Each (hourly)	U.S. Dollar	22.96	189,833.28

Notes: **********
Assume 13 modules per Megapack
****

1.6.4	636.00	EA	Process And Loadout	318.00	2.00	Detail	U.S. Dollar	2,318.73	1,474,711.20

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L010101	OPERATOR	6,360.00	2.00	Each (hourly)	U.S. Dollar	51.71	328,896.91
L060100	GENERAL LABORER	6,360.00	2.00	Each (hourly)	U.S. Dollar	40.69	258,785.09
REXSCAV04	Excavator with Shear	3,180.00	1.00	Each (hourly)	U.S. Dollar	139.47	443,514.60
REXCAV03	Excavator with Bucket and Grapple	3,180.00	1.00	Each (hourly)	U.S. Dollar	139.47	443,514.60

1.6.5	636.00	TN	T&D - Misc Waste	0.00	0.00	Detail	U.S. Dollar	100.00	63,600.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
UST&D03	T&D of Construction Debris		636.00	Ton	U.S. Dollar	100.00	63,600.00

1.6.6	2,544.00	TN	Transport Scrap	0.00	0.00	Detail	U.S. Dollar	35.00	89,040.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USTDSTEEL	T&D - Steel		2,544.00	Ton	U.S. Dollar	35.00	89,040.00

1.6.7	9,927.96	TN	Transport Battery Modules To Telsa	0.00	0.00	Detail	U.S. Dollar	200.00	1,985,592.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USTDINSUL	Battery Transport		9,927.96	Ton	U.S. Dollar	200.00	1,985,592.00

1.6.8	636.00	Each	Remove Foundations To Subgrade	129.47	4.91	Detail	U.S. Dollar	416.05	264,606.28

Notes: **********
Assumption: 10.5 x37x1 concrete pad per inverter/ transformer
****

1.6.8.1	9,540.00	Cubic Yard	Excavate / Remove Foundation	34.07	280.00	Detail	U.S. Dollar	15.71	149,902.76

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
L060100	GENERAL LABORER	340.71	1.00	Each (hourly)	U.S. Dollar	40.69	13,863.49
L010101	OPERATOR	681.43	2.00	Each (hourly)	U.S. Dollar	51.71	35,238.95
*REXCAV06C	Excav 100K w/ Hammer	340.71	1.00	Each (hourly)	U.S. Dollar	166.14	56,606.27

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CBS Position Code	Quantity	UM	Description	Cost Item Days	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
*REXCAV06A	Excav 100K w/ Bucket & Grapple		340.71	1.00	Each (hourly)		U.S. Dollar	129.71	44,194.05
1.6.8.2	9,540.00	Cubic Yard	Concrete Transport Offsite	95.40	100.00	Detail	U.S. Dollar	12.02	114,703.52

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
RDUTRK06	CAT D350D, 18CY-24CY	954.00	1.00	Each (hourly)	U.S. Dollar	76.71	73,181.34
L080940	TEAMSTER	954.00	1.00	Each (hourly)	U.S. Dollar	43.52	41,522.18

1.7	1.00	Lump Sum	Site Restoration - Partial Site Seeding	217.22	0.00	Detail	U.S. Dollar	1,104,230.75	1,104,230.75
1.7.1	183,794.00	Linear Feet	Strip & Decompact Roads	73.52	2,500.00	Detail	U.S. Dollar	1.43	262,134.39

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
*RDOZER08	CAT D6 LGP Dozer	1,470.35	2.00	Each (hourly)	U.S. Dollar	60.82	89,426.81
L010101	OPERATOR	2,205.53	3.00	Each (hourly)	U.S. Dollar	51.71	114,055.24
*RFELWH08C	CAT 980 LOADER	735.18	1.00	Each (hourly)	U.S. Dollar	79.78	58,652.34

Notes: **********
Decompaction to include discing and regrading
Assume removed road base transported offsite at no charge
****

1.7.2	122.00	Each	Removal & Disposal, Drainage Crossings	12.20	10.00	Detail	U.S. Dollar	206.01	25,133.65
1.7.2.1	122.00	Each	Remove Drainage Crossings	12.20	10.00	Detail	U.S. Dollar	181.42	22,133.65

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
*REXCAV06A	Excav 100K w/ Bucket & Grapple	122.00	1.00	Each (hourly)	U.S. Dollar	129.71	15,824.62
L010101	OPERATOR	122.00	1.00	Each (hourly)	U.S. Dollar	51.71	6,309.03

1.7.2.2	30.00	TN	T&D - Misc Waste	0.00	0.00	Detail	U.S. Dollar	100.00	3,000.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
UST&D03	T&D of Construction Debris		30.00	Ton	U.S. Dollar	100.00	3,000.00

1.7.3	1,052.00	Acre	Spot Grade Disturbed Areas	131.50	8.00	Detail	U.S. Dollar	281.33	295,962.71

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
*RDOZER08	CAT D6 LGP Dozer	2,630.00	2.00	Each (hourly)	U.S. Dollar	60.82	159,956.60
L010101	OPERATOR	2,630.00	2.00	Each (hourly)	U.S. Dollar	51.71	136,006.11

Notes: **********
Assumtion: 2,975 acres total property area.
Assume that 35% of the area distrubed by construction
will be regraded.
****

1.7.4	1,042.00	Acre	Re-Seed With Native Vegetation - Roads & Areas Disturbed By Construction	0.00	0.00	Detail	U.S. Dollar	500.00	521,000.00

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USLANDSCAPE	Landscape Sub		1,042.00	Acre	U.S. Dollar	500.00	521,000.00

Notes: **********
Assumtion: 2,975 acres total property area.
Assume that 35% of the area distrubed by construction
will be re-seeded.
****

1.8	1.00	Lump Sum	Contractor Markups	0.00	0.00	Detail	U.S. Dollar	4,411,368.49	4,411,368.49
1.8.1	1.00	Lump Sum	Home Office, Project Management (5% Of Cost)	0.00	0.00	Detail	U.S. Dollar	1,182,672.50	1,182,672.50

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
USMARKUP5	5% Markup		23,653,450.00	Each	U.S. Dollar	0.05	1,182,672.50

1.8.2	1.00	Lump Sum	Contractor OH & Fee (13% Of Cost)	0.00	0.00	Detail	U.S. Dollar	3,228,695.99	3,228,695.99

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost

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CBS Position Code	Quantity	UM	Description	Cost Item Days	UM/Day	Cost Source	Currency	Unit Cost	Total Cost
USMARKUP	13% Markup			24,836,123.00	Each		U.S. Dollar	0.13	3,228,695.99
1.9	1.00	Lump Sum	Scrap Metal Credit	0.00	0.00	Detail	U.S. Dollar	(5,255,540.00)	(5,255,540.00)
1.9.1	180.00	Ton	Scrap Credit - Substation	0.00	0.00	Detail	U.S. Dollar	(380.00)	(68,400.00)

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
UODCFERROUS	Ferrous Metal Scrap		180.00	Ton	U.S. Dollar	(380.00)	(68,400.00)

1.9.2	45.00	Ton	Scrap Credit - T-Line Structures	0.00	0.00	Detail	U.S. Dollar	(380.00)	(17,100.00)

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
UODCFERROUS	Ferrous Metal Scrap		45.00	Ton	U.S. Dollar	(380.00)	(17,100.00)

Notes: **********
Assume 9 ton per steel structure and cable span
****

1.9.3	770.00	Ton	Scrap Credit - Fence	0.00	0.00	Detail	U.S. Dollar	(380.00)	(292,600.00)

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
UODCFERROUS	Ferrous Metal Scrap		770.00	Ton	U.S. Dollar	(380.00)	(292,600.00)

Notes: **********
Assume 8 lbs per ft fence & posts
****

1.9.4	3,616.00	Ton	Scrap Credit - Megapack / Transformer	0.00	0.00	Detail	U.S. Dollar	(380.00)	(1,374,080.00)

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
UODCFERROUS	Ferrous Metal Scrap		3,616.00	Ton	U.S. Dollar	(380.00)	(1,374,080.00)

Notes: **********
Assume 6 ton per Megapack / Transformer
****

1.9.5	6,325.00	Ton	Scrap Credit - Module Rack	0.00	0.00	Detail	U.S. Dollar	(380.00)	(2,403,500.00)

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
UODCFERROUS	Ferrous Metal Scrap		6,325.00	Ton	U.S. Dollar	(380.00)	(2,403,500.00)

Notes: **********
Assume 800 Lbs per rack w/ piles
****

1.9.6	39.00	Ton	Scrap Credit - O&M Structure	0.00	0.00	Detail	U.S. Dollar	(380.00)	(14,820.00)

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
UODCFERROUS	Ferrous Metal Scrap		39.00	Ton	U.S. Dollar	(380.00)	(14,820.00)

1.9.7	198.00	Ton	Scrap Credit - Cable	0.00	0.00	Detail	U.S. Dollar	(5,480.00)	(1,085,040.00)

Resource Code	Description	Hours	Quantity	UM	Currency	Unit Cost	Total Cost
UODCCOP	Copper Scrap		198.00	Ton	U.S. Dollar	(5,480.00)	(1,085,040.00)

Notes: **********
Assume .10 lbs per lf
****

Report Total:				2,398.19					22,809,278.77

Category	Total
Labor	9,550,230.42
Rented Equipment	5,756,868.86
Supplies	4,260.00
Materials	40,000.00
Subcontract	12,711,259.49
ODCs	2,200.00
Scrap Credit	(5,255,540.00)

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ATTACHMENT T: JOINT AQUATIC RESOURCES PERMIT APPLICATION (JARPA) FORM

WASHINGTON STATE
Joint Aquatic Resources Permit Application (JARPA) Form[1,2] [help]

US Army Corps of Engineers ®
Seattle District

USE BLACK OR BLUE INK TO ENTER ANSWERS IN THE WHITE SPACES BELOW.

AGENCY USE ONLY

Date received:

Agency reference #: _____

Tax Parcel #(s): _____

_____

Part 1–Project Identification

1. Project Name (A name for your project that you create. Examples: Smith's Dock or Seabrook Lane Development) [help]
Wautoma Solar Energy Project (Project)

Part 2–Applicant

The person and/or organization responsible for the project. [help]

2a. Name (Last, First, Middle)			
O'Neill, Laura			
2b. Organization (If applicable)			
Innergex Renewable Development USA, LLC			
2c. Mailing Address (Street or PO Box)			
3636 Nobel Drive, Suite 260			
2d. City, State, Zip			
San Diego, California 92122			
2e. Phone (1)	**2f.** Phone (2)	**2g.** Fax	**2h.** E-mail
604-633-9990 x2015	778-689-1565	604-633-9991	loneill@innergex.com

[1]Additional forms may be required for the following permits:
- If your project may qualify for Department of the Army authorization through a Regional General Permit (RGP), contact the U.S. Army Corps of Engineers for application information (206) 764-3495.
- Not all cities and counties accept the JARPA for their local Shoreline permits. If you need a Shoreline permit, contact the appropriate city or county government to make sure they accept the JARPA.

[2]To access an online JARPA form with [help] screens, go to http://www.epermitting.wa.gov/site/alias__resourcecenter/jarpa_jarpa_form/9984/jarpa_form.aspx.

For other help, contact the Governor's Office for Regulatory Innovation and Assistance at (800) 917-0043 or help@oria.wa.gov.

Part 3–Authorized Agent or Contact

Person authorized to represent the applicant about the project. (Note: Authorized agent(s) must sign 11b of this application.) [help]

3a. Name (Last, First, Middle)			
Fossum, Linnea			
3b. Organization (If applicable)			
Tetra Tech, Inc.			
3c. Mailing Address (Street or PO Box)			
19803 North Creek Parkway			
3d. City, State, Zip			
Bothell, WA 98011			
3e. Phone (1)	**3f.** Phone (2)	**3g.** Fax	**3h.** E-mail
425-482-7823			linnea.fossum@tetratech.com

Part 4–Property Owner(s)

Contact information for people or organizations owning the property(ies) where the project will occur. Consider both **upland and aquatic** ownership because the upland owners may not own the adjacent aquatic land. [help]

☐ Same as applicant. (Skip to Part 5.)

☐ Repair or maintenance activities on existing rights-of-way or easements. (Skip to Part 5.)

☒ There are multiple upland property owners. Complete the section below and fill out JARPA Attachment A for each additional property owner.

☐ Your project is on Department of Natural Resources (DNR)-managed aquatic lands. If you don't know, contact the DNR at (360) 902-1100 to determine aquatic land ownership. If yes, complete JARPA Attachment E to apply for the Aquatic Use Authorization.

4a. Name (Last, First, Middle)			
Keeler, Allison			
4b. Organization (If applicable)			
Wautoma Energy LLC			
4c. Mailing Address (Street or PO Box)			
2448 76th Ave SE, Suite 220			
4d. City, State, Zip			
Mercer Island, WA 98040			
4e. Phone (1)	**4f.** Phone (2)	**4g.** Fax	**4h.** E-mail
206-601-8964			

Part 5–Project Location(s)

Identifying information about the property or properties where the project will occur. [help]

☐ There are multiple project locations (e.g. linear projects). Complete the section below and use JARPA Attachment B for each additional project location.

5a. Indicate the type of ownership of the property. (Check all that apply.) [help]

☒ Private
☐ Federal
☐ Publicly owned (state, county, city, special districts like schools, ports, etc.)
☐ Tribal
☐ Department of Natural Resources (DNR) – managed aquatic lands (Complete JARPA Attachment E)

5b. Street Address (Cannot be a PO Box. If there is no address, provide other location information in 5p.) [help]

1.5 miles south of the intersection of Highway 24 and Highway 241

5c. City, State, Zip (If the project is not in a city or town, provide the name of the nearest city or town.) [help]

Sunnyside, WA 98944

5d. County [help]

Benton

5e. Provide the section, township, and range for the project location. [help]

¼ Section	Section	Township	Range
	19-21 and 28-30	12 North	24 East

5f. Provide the latitude and longitude of the project location. [help]

- Example: 47.03922 N lat. / -122.89142 W long. (Use decimal degrees - NAD 83)

46.502734°, -119.840369°

5g. List the tax parcel number(s) for the project location. [help]

- The local county assessor's office can provide this information.

Assessor Parcel Number[1/]

119241012749001	120241000001000	120243011787001	122242000000000	128243000000000	130241000000000
119243000001001	120242000001000	120244000000000	122243000001000	129241000000000	130242000001000
119244000001001	120243000002000	121241000001000	122243000002000	129242000001000	130242000003000
119244000001002	120243000003000	121243000000000	127240000000000	129243000001000	130244000000000
119244000002000	120243000004000	122241000000000	128241000000000	129244000000000	132241000001000
132241000002000	133240000000000				

[1/] Assessor parcel information is based on current Benton County assessment records last updated by the County on March 2, 2022, and prior to submittal of this JARPA.

5h. Contact information for all adjoining property owners. (If you need more space, use JARPA Attachment C.) [help]

Name	Mailing Address	Tax Parcel # (if known)
Roberts Ranch 5+LLC	1521 Wautoma Rd. Sunnyside, WA 98944	104141000000000, 104142000000000, 120243011787002 134241000000000, 134242000000000, 134243000000000
Joseph and Donna Balmelli	132 Newaukum Valley Rd. Chehalis, WA 98532	117240000000000
Jack E Griffith	4205 Rd. 111 Pasco, WA 99301	130243000000000
Stuckrath-Myers LLC	310 South Bradley St. Chelan, WA 98816	23122414005, 23122441003

5i. List all wetlands on or adjacent to the project location. [help]

There are three palustrine emergent wetlands within the Project Area (labeled WT500, WT501, WT502 in the attached wetland delineation report). They are all the result of long-term leaks in an irrigation pipeline that is positioned on the soil surface.

5j. List all waterbodies (other than wetlands) on or adjacent to the project location. [help]

There are 34 ephemeral stream segments within the Project Area. The streams are characterized and labeled in the attached wetland delineation report, and only one has an official name in the National Hydrography Dataset maps. Dry Creek (also labeled ST-207 in the attached wetland delineation report) is in the northern end of the Project Area and has a 100-year floodplain listed on the Federal Emergency Management Agency maps.

5k. Is any part of the project area within a 100-year floodplain? [help]

☒ Yes ☐ No ☐ Don't know

5l. Briefly describe the vegetation and habitat conditions on the property. [help]

Much of the Project Area is planted with forb and grass mixes to provide pasture for livestock including cattle, goats, and sheep. The land that is not actively being grazed is either irrigated cropland or in well-maintained stands of native grasses, shrubs, and forbs. The stands of native plants are presumed to be a restoration planting on former cropland (Conservation Reserve Program) due to the shape of the field and the species present. There are some irrigated hedgerows that are intended to provide wildlife habitat bordering the irrigated croplands, although recent fires have destroyed the hedgerows on the southwest side of the Project Area. Also present in several locations around the site are temporary livestock watering ponds. The farmer and landowner uses buried pipelines from springs located in the hills to fill low spots (i.e. watering ponds) around the Project Area. The low spots are filled only for a few weeks at a time when the cattle are present in that section of the rotationally grazed range areas.

5m. Describe how the property is currently used. [help]

Current land uses in the Project Area include irrigated agriculture, rangeland, undeveloped land, local roads, and existing electrical utility infrastructure.

5n. Describe how the adjacent properties are currently used. [help]

Lands to the north, west, and south of the Project Area are zoned for agricultural purposes in Benton and Yakima counties with similar land uses as the Project Lease Boundary, as well as several rural residences. The Hanford Reach National Monument Rattlesnake Unit is located to the east.

5o. Describe the structures (above and below ground) on the property, including their purpose(s) and current condition. [help]

There are several structures in the center of the Project Area associated with the current agricultural operations, including six grain silos, a pump house, a corral and two associated livestock sheds, three equipment sheds, and buried 2-inch PVC pipelines to supply water from the springs (outside of the Project Area) to the livestock watering ponds.

5p. Provide driving directions from the closest highway to the project location, and attach a map. [help]

Drive 1.5 miles south from the intersection of Highway 24 and Highway 241. A location map is attached to this application (see Figure 1).

Part 6–Project Description

6a. Briefly summarize the overall project. You can provide more detail in 6b. [help]

The Project is a 470-megawatt solar photovoltaic (PV) generation facility coupled with a 4-hour battery energy storage system (BESS) sized to the maximum capacity of the Project, as well as related interconnection and ancillary support infrastructure, located in unincorporated Benton County, Washington.

The Project's solar PV system will convert energy from the sun into electric power. The solar PV system will consist of a series of solar PV panels mounted on a solar tracker racking system and related electrical equipment. The system includes the solar panels, tracker racking system, posts, collector lines, and power conversion systems (PCS), which consists of the DC-coupled BESS, inverters, and transformers. The DC-coupled BESS can either store direct current (DC) electricity for future use or convert DC electricity to alternating current (AC) electricity, which is then sent to the step-up transformer as required based on grid demand.

The Project also includes the following supporting components: Project substation, overhead 500-kilovolt (kV) generation-tie transmission line, operations and maintenance (O&M) building, associated Project access roads, and perimeter fencing. Chain-link fencing will be installed around the perimeter of the solar array, Project substation, and O&M building area. The Point of Interconnection (POI) is the Bonneville Power Administration (BPA) transmission system at the BPA Wautoma Substation, which is located on BPA federal lands surrounded by the Project Area. An approximately 0.25-mile-long overhead 500-kV transmission line will extend from the Project substation to the POI.

6b. Describe the purpose of the project and why you want or need to perform it. [help]

In 2019, Washington passed Senate Bill 5116: the Clean Energy Transformation Act (CETA) which requires state utilities to meeting 100% of their load with carbon-free resources by 2045. Clean electricity will allow Washington residents and businesses to power their buildings and homes, vehicles, and appliances with carbon free resources, such as wind and solar. Reductions in fossil fuel will improve health of communities, grow the economy, create family-sustaining jobs, and enable the state to achieve its long-term climate goals. The introduction of CETA is a major reason why Innergex is now actively searching for new business opportunities in Washington. Advancement in solar photovoltaic technology over the last ten years has led to significant decreases in solar equipment pricing. As a result new facilities such as Wautoma Solar represent an effective option to meeting Washington state's clean energy goals. These goals outlined in the CETA are also closely aligned with Innergex's own goals.

Innergex believes in a better world where abundant renewable energy promotes healthier communities and creates shared prosperity. Innergex contributes to this vision by leveraging its long-term commercial commitment, proven expertise, entrepreneurial spirit, and innovative approach. We remain committed to responsible growth that balances people, our planet, and prosperity. The Project will make major direct and indirect contributions to the local community. Landowners participating in the Project will receive direct compensation in the form of long-term land lease payments. Furthermore, the Project will also pay property tax to Benton County which will increase the county's tax base revenues and will benefit county residents significantly for the life of the project. When operational, the Project will be a relatively quiet renewable energy facility with limited visual impacts and will be a major source of clean power in the region.

6c. Indicate the project category. (Check all that apply) [help]

☒ Commercial ☐ Residential ☐ Institutional ☐ Transportation ☐ Recreational

☐ Maintenance ☐ Environmental Enhancement

6d. Indicate the major elements of your project. (Check all that apply) [help]

☐ Aquaculture	☐ Culvert	☐ Float	☐ Retaining Wall (upland)
☐ Bank Stabilization	☐ Dam / Weir	☐ Floating Home	☐ Road
☐ Boat House	☐ Dike / Levee / Jetty	☐ Geotechnical Survey	☐ Scientific Measurement Device
☐ Boat Launch	☐ Ditch	☐ Land Clearing	☐ Stairs
☐ Boat Lift	☐ Dock / Pier	☐ Marina / Moorage	☐ Stormwater facility
☐ Bridge	☐ Dredging	☐ Mining	☐ Swimming Pool
☐ Bulkhead	☐ Fence	☐ Outfall Structure	☐ Utility Line
☐ Buoy	☐ Ferry Terminal	☐ Piling/Dolphin	
☐ Channel Modification	☐ Fishway	☐ Raft	

☒ Other: Solar Energy Facility including a permanent Operations and Management Facility.

6e. Describe how you plan to construct each project element checked in 6d. Include specific construction methods and equipment to be used. [help]

- Identify where each element will occur in relation to the nearest waterbody.
- Indicate which activities are within the 100-year floodplain.

The Project components include the solar array, underground collection lines, overhead transmission line, inverters, security fences, access roads, an O&M facility, and the Project substation. These are shown in the attached Figure 2.

The Project was designed to minimize impacts to wetlands and waterways. The Project has been designed to avoid wetlands, and no wetland or wetland buffers impacts (temporary or permanent) are proposed in the current Project layout. Project components that will intersect with waterways (ephemeral streams) and Benton County critical areas ordinance regulated stream buffers include:

- A temporary 100-year floodplain and stream crossing for the installation of the overhead transmission lines. This crossing is illustrated in Figure 3.
- Collection lines will be bored underneath the ephemeral waterways in four locations. Boring locations 2, 3, and 4 will be located outside of the stream buffers. Boring location 1 is located outside of the stream buffer and an associated 100-year floodplain. The boring locations are illustrated in detail in Figures 4, 5, 6, and 7. A schematic of the collection line boring is illustrated in Figure 9.
- The temporary and permanent widening of an existing access road that lies in between two ephemeral drainages. This road widening is co-located with boring location 3. All temporary and permanent impacts associated with the road widening are located outside of the adjacent ephemeral drainages and stream buffers. This is illustrated in Figure 8. A schematic of the road widening permanent footprint is illustrated in Figure 10.

6f. What are the anticipated start and end dates for project construction? (Month/Year) [help]

- If the project will be constructed in phases or stages, use JARPA Attachment D to list the start and end dates of each phase or stage.

Start Date: Q1 2024 End Date: Q3 2025 ☐ See JARPA Attachment D

6g. Fair market value of the project, including materials, labor, machine rentals, etc. [help]

A 470-megawatt solar PV facility coupled with a 4-hour battery energy storage system (BESS) sized to the maximum capacity of the Project is estimated to cost about $1.1 billion.

6h. Will any portion of the project receive federal funding? [help]

- **If yes**, list each agency providing funds.

☐ Yes ☒ No ☐ Don't know

Part 7–Wetlands: Impacts and Mitigation

☒ Check here if there are wetlands or wetland buffers on or adjacent to the project area.
(If there are none, skip to Part 8.) [help]

7a. Describe how the project has been designed to avoid and minimize adverse impacts to wetlands. [help]

☐ Not applicable

The Project has been designed to avoid wetlands, and no wetland or wetland buffers impacts (temporary or permanent) are proposed in the Project layout. Additional safeguards will be put in place during construction to prevent any stormwater runoff from entering the wetlands or their associated buffers. Mitigation actions and best management practices will be implemented during construction, such as revegetating disturbed soils to minimize erosion/runoff and implementing an ESCP, SWPPP, and Vegetation and Weed Management Plan.

7b. Will the project impact wetlands? [help]

☐ Yes ☒ No ☐ Don't know

7c. Will the project impact wetland buffers? [help]

☐ Yes ☒ No ☐ Don't know

7d. Has a wetland delineation report been prepared? [help]

- **If Yes**, submit the report, including data sheets, with the JARPA package.

☒ Yes ☐ No

7e. Have the wetlands been rated using the Western Washington or Eastern Washington Wetland Rating System? [help]

- **If Yes**, submit the wetland rating forms and figures with the JARPA package.

☒ Yes ☐ No ☐ Don't know

7f. Have you prepared a mitigation plan to compensate for any adverse impacts to wetlands? [help]

- **If Yes**, submit the plan with the JARPA package and answer 7g.
- **If No, or Not applicable**, explain below why a mitigation plan should not be required.

☐ Yes ☒ No ☐ Don't know

Wetlands and their buffers will not be impacted by the Project.

7g. Summarize what the mitigation plan is meant to accomplish, and describe how a watershed approach was used to design the plan. [help]

N/A

7h. Use the table below to list the type and rating of each wetland impacted, the extent and duration of the impact, and the type and amount of mitigation proposed. Or if you are submitting a mitigation plan with a similar table, you can state (below) where we can find this information in the plan. [help]

Activity (fill, drain, excavate, flood, etc.)	Wetland Name[1]	Wetland type and rating category[2]	Impact area (sq. ft. or Acres)	Duration of impact[3]	Proposed mitigation type[4]	Wetland mitigation area (sq. ft. or acres)
N/A	N/A	N/A	N/A	N/A	N/A	N/A

[1] If no official name for the wetland exists, create a unique name (such as "Wetland 1"). The name should be consistent with other project documents, such as a wetland delineation report.
[2] Ecology wetland category based on current Western Washington or Eastern Washington Wetland Rating System. Provide the wetland rating forms with the JARPA package.
[3] Indicate the days, months or years the wetland will be measurably impacted by the activity. Enter "permanent" if applicable.
[4] Creation (C), Re-establishment/Rehabilitation (R), Enhancement (E), Preservation (P), Mitigation Bank/In-lieu fee (B)

Page number(s) for similar information in the mitigation plan, if available: _____

7i. For all filling activities identified in 7h, describe the source and nature of the fill material, the amount in cubic yards that will be used, and how and where it will be placed into the wetland. [help]

N/A

7j. For all excavating activities identified in 7h, describe the excavation method, type and amount of material in cubic yards you will remove, and where the material will be disposed. [help]

N/A

Part 8–Waterbodies (other than wetlands): Impacts and Mitigation

In Part 8, “waterbodies” refers to non-wetland waterbodies. (See Part 7 for information related to wetlands.) [help]

☒ Check here if there are waterbodies on or adjacent to the project area. (If there are none, skip to Part 9.)

8a. Describe how the project is designed to avoid and minimize adverse impacts to the aquatic environment. [help]

☐ Not applicable

The majority of the ephemeral drainages and their buffers will be avoided. There are four locations where collector lines will be installed at least four feet underneath ephemeral drainages by boring underneath the stream bed. The boring entrance and exit locations and associated work areas will be located outside of the buffers on those ephemeral drainages and the 100-year floodplain. The Project’s overheard transmission line between the Project substation and POI will span Dry Creek and the associated 100-year floodplain. A temporary 50-foot-wide access corridor across the floodplain and Dry Creek will be used during construction of the overhead line. To minimize impacts to this area, only vehicles equipped to carry the transmission wires (conductor, shield wire, etc.) will be allowed. Appropriate BMPs such as matting, geotextile, or hog fuel will be placed during construction to minimize disturbance to the floodplain and stream bed. An additional access road crossing of an area in between two ephemeral streams will occur in the southeast corner of the Project Area. In this location, an existing access road will be improved to accommodate Project construction and operations. The temporary and permanent disturbance associated with the access road widening will not impact the adjacent ephemeral streams or their buffers.

8b. Will your project impact a waterbody or the area around a waterbody? [help]

☒ Yes ☐ No

8c. Have you prepared a mitigation plan to compensate for the project's adverse impacts to non-wetland waterbodies? [help]

- **If Yes**, submit the plan with the JARPA package and answer 8d.
- **If No, or Not applicable,** explain below why a mitigation plan should not be required.

☐ Yes ☒ No ☐ Don't know

No, a mitigation plan is not necessary because there are no permanent impacts to non-wetland waterbodies. The four boring locations will be located outside of the non-wetland waterbodies, their buffers, and floodplain. The temporary crossing on Dry Creek will be fully rehabilitated and restored after construction per the Project's Revegetation and Weed Management Plan. In addition, a Habitat Management Plan will be developed that will detail the requirements for mitigation of habitat impacts.

The road widening will be in an area between two ephemeral waterways that, while outside of the waterways and their regulated buffers, is included because the Washington Department of Fish and Wildlife (WDFW) has indicated that this type of crossing may require an Hydraulic Project Approval (HPA). The Applicant understands that WDFW will make a determination on whether an HPA is required on the basis of a review of this application. This area is also subject to both the Revegetation and Weed Management Plan and the Habitat Management Plan.

8d. Summarize what the mitigation plan is meant to accomplish. Describe how a watershed approach was used to design the plan.

- If you already completed 7g you do not need to restate your answer here. [help]

N/A

8e. Summarize impact(s) to each waterbody in the table below. [help]

Activity (clear, dredge, fill, pile drive, etc.)	Waterbody name[1]	Impact location[2]	Duration of impact[3]	Amount of material (cubic yards) to be placed in or removed from waterbody	Area (sq. ft. or linear ft.) of waterbody directly affected
Temporary Access Corridor	Dry Creek	100-year floodplain	Temporary	0	875 linear feet x 50 feet wide = 43,750 sq. ft.
Temporary Access Corridor	Dry Creek	Within the Ordinary High Water (OHW)	Temporary	0	4 foot wide OHW x 50 feet wide = 200 sq. ft.
Boring location 1 under ephemeral drainage for collection line	Dry Creek	Boring work areas will occur outside of the 100-year floodplain and OHW for Dry Creek	Temporary	0	0
Boring location 2 under ephemeral drainage for collection line	Unnamed ephemeral drainage, labeled ST-218 in the attached report	Boring work area will occur outside of the OHW and buffer of this drainage	Temporary	0	0

Boring location 3 in between two ephemeral drainages	Unnamed ephemeral drainages, labeled ST-216 and ST-217 in attached report	Boring work area will occur outside of the buffers on either waterway	Temporary	0	0
Boring location 4 for collection line under ephemeral drainage for collection line	Unnamed ephemeral drainage, labeled ST-709 in the attached report	Boring work ear will occur outside of the OHW and buffer of this drainage	Temporary	0	0
Widening of existing access road and installation of one 36-inch culvert under the road – temporary work area	Unnamed ephemeral drainages, labeled ST-216 and ST-217 in attached report	The current road is built up between the end of one ephemeral drainage and the beginning of another. Impacts will be outside the OHW and buffers for these waterways.	Temporary	0	4,040 sq. ft of temporary impacts to location between two ephemeral drainages for work area disturbance
Widening of existing access road and installation of one 36-inch culvert under the road – CMP culvert	Unnamed ephemeral drainages, labeled ST-216 and ST-217 in attached report	The current road is built up between the end of one ephemeral drainage and the beginning of another. Impacts will be outside the OHW and buffers for these waterways.	Permanent	Assuming that the culvert is 30 feet long (extending beyond the roadbed for 3 feet at each end).and 36 inches in diameter, the volume of fill for the culvert is 8 cubic yards (CY).	90 sq. ft. of permanent impacts to location between two ephemeral drainages Note: this area is within the larger permanent impact areas identified below and the temporary work area identified above

Widening of existing access road and installation of one 36-inch culvert under the road – coarse aggregate bedding	Unnamed ephemeral drainages, labeled ST-216 and ST-217 in attached report	The current road is built up between the end of one ephemeral drainage and the beginning of another. Impacts will be outside the OHW and buffers for these waterways.	Permanent	24 inches of coarse aggregate bedding material. The proposed road widening will be 24 feet wide by 101 feet long (to capture the 50-foot buffer on each side of the waterways and their average width of 1 foot). The volume of fill for the coarse aggregate bedding is 180 CY.	2,424 sq. ft. of permanent impacts to location between two ephemeral drainages
Widening of existing access road and installation of one 36-inch culvert under the road – road fill	Unnamed ephemeral drainages, labeled ST-216 and ST-217 in attached report	The current road is built up between the end of one ephemeral drainage and the beginning of another. Impacts will be outside the OHW and buffers for these waterways.	Permanent	Road fill includes 1 foot of roadbed above the culvert and extending to a total depth of 4 feet in the center to accommodate the culvert, rising to meet the existing ground at each side. Total volume of fill for the road fill is 180 CY.	2,424 sq. ft. of permanent impacts to location between two ephemeral drainages Note: this overlaps with the area of permanent impact identified above
Widening of existing access road and installation of one 36-inch culvert under the road – road surface	Unnamed ephemeral drainages, labeled ST-216 and ST-217 in attached report	The current road is built up between the end of one ephemeral drainage and the beginning of another. Impacts will be outside the OHW and buffers for these waterways.	Permanent	Road surfacing includes 6 inches of aggregate. Total volume of fill for the road surface is 45 CY.	2,424 sq. ft. of permanent impacts to location between two ephemeral drainages Note: this overlaps with the area of permanent impact identified above

Widening of existing access road and installation of one 36-inch culvert under the road – culvert riprap	Unnamed ephemeral drainages, labeled ST-216 and ST-217 in attached report	The current road is built up between the end of one ephemeral drainage and the beginning of another. Impacts will be outside the OHW and buffers for these waterways.	Permanent	Class II riprap will be placed at the culvert inlet and outlet. Total volume of fill for the culvert riprap is 11 CY.	288 sq. ft. of permanent impacts to location between two ephemeral drainages

[1] If no official name for the waterbody exists, create a unique name (such as "Stream 1") The name should be consistent with other documents provided.
[2] Indicate whether the impact will occur in or adjacent to the waterbody. If adjacent, provide the distance between the impact and the waterbody and indicate whether the impact will occur within the 100-year flood plain.
[3] Indicate the days, months or years the waterbody will be measurably impacted by the work. Enter "permanent" if applicable.

8f. For all activities identified in 8e, describe the source and nature of the fill material, amount (in cubic yards) you will use, and how and where it will be placed into the waterbody. [help]

- The work areas for the four boring locations will be located outside of the waterways and their buffers, as well as the floodplain.
- The temporary access corridor across Dry Creek and 100-year floodplain will use appropriate BMPs such as matting and limit the amount of traffic on the access corridor. No fill is anticipated.
- The road widening is located between two ephemeral streams and will not involve fill in the waterways or their buffers.

8g. For all excavating or dredging activities identified in 8e, describe the method for excavating or dredging, type and amount of material you will remove, and where the material will be disposed. [help]

- The work areas for the four boring locations will be located outside of the waterways and their buffers, as well as the floodplain.
- The temporary access corridor across Dry Creek and 100-year floodplain will use appropriate BMPs such as matting, geotextile, or hog fuel and limit the amount of traffic on the access corridor. No excavation is anticipated.
- The road widening is located between two ephemeral streams and will not involve excavation in the waterways or their buffers.

Part 9–Additional Information

Any additional information you can provide helps the reviewer(s) understand your project. Complete as much of this section as you can. It is ok if you cannot answer a question.

9a. If you have already worked with any government agencies on this project, list them below. [help]

Agency Name	Contact Name	Phone	Most Recent Date of Contact
USACE	Dave Moore	206-316-3166	01/25/2022

9b. Are any of the wetlands or waterbodies identified in Part 7 or Part 8 of this JARPA on the Washington Department of Ecology's 303(d) List? [help]

- **If Yes,** list the parameter(s) below.
- If you don't know, use Washington Department of Ecology's Water Quality Assessment tools at: https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-improvement/Assessment-of-state-waters-303d.

☐ Yes ☒ No

9c. What U.S. Geological Survey Hydrological Unit Code (HUC) is the project in? [help]

- Go to http://cfpub.epa.gov/surf/locate/index.cfm to help identify the HUC.

170300031104

9d. What Water Resource Inventory Area Number (WRIA #) is the project in? [help]

- Go to https://ecology.wa.gov/Water-Shorelines/Water-supply/Water-availability/Watershed-look-up to find the WRIA #.

Lower Yakima, WRIA 37

9e. Will the in-water construction work comply with the State of Washington water quality standards for turbidity? [help]

- Go to https://ecology.wa.gov/Water-Shorelines/Water-quality/Freshwater/Surface-water-quality-standards/Criteria for the standards.

☐ Yes ☐ No ☒ Not applicable

9f. If the project is within the jurisdiction of the Shoreline Management Act, what is the local shoreline environment designation? [help]

- If you don't know, contact the local planning department.
- For more information, go to: https://ecology.wa.gov/Water-Shorelines/Shoreline-coastal-management/Shoreline-coastal-planning/Shoreline-laws-rules-and-cases.

☐ Urban ☐ Natural ☐ Aquatic ☐ Conservancy ☒ Other: N/A, not in SMA

9g. What is the Washington Department of Natural Resources Water Type? [help]

- Go to http://www.dnr.wa.gov/forest-practices-water-typing for the Forest Practices Water Typing System.

☐ Shoreline ☐ Fish ☐ Non-Fish Perennial ☒ Non-Fish Seasonal

The waterways in the Project Area are listed as "unknown" on the DNR website. The attached wetland and water delineation report describes the waterways onsite.

9h. Will this project be designed to meet the Washington Department of Ecology's most current stormwater manual? [help]

- **If No**, provide the name of the manual your project is designed to meet.

☒ Yes ☐ No

Name of manual: Stormwater Management Manual for Eastern Washington, 2019 version

9i. Does the project site have known contaminated sediment? [help]

- **If Yes**, please describe below.

☐ Yes ☒ No

9j. If you know what the property was used for in the past, describe below. [help]

The property has been in the landowner's family since the mid-1800s. The land has been used for agriculture and residential purposes since that time.

9k. Has a cultural resource (archaeological) survey been performed on the project area? [help]

- **If Yes**, attach it to your JARPA package.

☒ Yes ☐ No

9l. Name each species listed under the federal Endangered Species Act that occurs in the vicinity of the project area or might be affected by the proposed work. [help]

Common Name	Scientific Name	Federal Status[1]
Bald eagle	*Haliaeetus leucocephalus*	BGEPA, BCC
Brewer's sparrow	*Spizella breweri*	BCC
Burrowing owl	*Athene cunicularia*	SOC
Ferruginous hawk	*Buteo regalis*	SOC, BCC
Golden eagle	*Aquila chrysaetos*	BGEPA, BCC
Greater sage-grouse (Columbia Basin DPS)	*Centrocercus urophasianus*	BCC
Loggerhead shrike	*Lanius ludovicianus*	BCC
Prairie falcon	*Falco mexicanus*	BCC
Sage thrasher	*Oreoscoptes montanus*	BCC

1. U.S. Fish and Wildlife Service: SOC = Species of Concern, BCC = Bird of Conservation Concern, BGEPA = Bald and Golden Eagle Protection Act

9m. Name each species or habitat on the Washington Department of Fish and Wildlife's Priority Habitats and Species List that might be affected by the proposed work. [help]

Common Name	Scientific Name	State Status[1]
Birds		
American white pelican	*Pelecanus erythrorhynchos*	T, PS
Bald eagle	*Haliaeetus leucocephalus*	PS
Burrowing owl	*Athene cunicularia*	C, PS
Chukar	*Alectoris chukar*	PS
Ferruginous hawk	*Buteo regalis*	T, PS
Golden eagle	*Aquila chrysaetos*	PS
Great blue heron	*Ardea Herodias*	PS
Greater sage-grouse (Columbia Basin DPS)	*Centrocercus urophasianus*	T, PS
Loggerhead shrike	*Lanius ludovicianus*	C, PS
Prairie falcon	*Falco mexicanus*	PS
Ring-necked pheasant	*Phasianus colchicus*	PS
Sagebrush sparrow	*Artemisiospiza nevadensis*	C, PS
Sage thrasher	*Oreoscoptes montanus*	C, PS
Sandhill crane	*Antigone canadensis*	E, PS
Tundra swan	*Cygnus columbianus*	PS
Vaux's swift	*Chaetura vauxi*	C, PS
Mammals		
Black-tailed jackrabbit	*Lepus californicus*	C, PS
Elk	*Cervus elaphus*	PS
Mule deer	*Odocoileus hemionus hemionus*	PS
Townsend's big-eared bat	*Corynorhinus townsendii*	C, PS
Townsend's ground squirrel	*Urocitellus townsendii nancyae*	C, PS
White-tailed jackrabbit	*Lepus townsendii*	C, PS
Reptiles & Amphibians		
Sagebrush lizard	*Sceloporus graciosus*	C, PS
Striped whipsnake	*Masticophis taeniatus*	C, PS

1. Washington Department of Fish and Wildlife: E = Endangered, T = Threatened, C = Candidate, PS = Priority Species

Part 10–SEPA Compliance and Permits

Use the resources and checklist below to identify the permits you are applying for.

- Online Project Questionnaire at http://apps.oria.wa.gov/opas/.
- Governor's Office for Regulatory Innovation and Assistance at (800) 917-0043 or help@oria.wa.gov.
- For a list of addresses to send your JARPA to, click on agency addresses for completed JARPA.

10a. Compliance with the State Environmental Policy Act (SEPA). (Check all that apply.) [help]

- For more information about SEPA, go to https://ecology.wa.gov/regulations-permits/SEPA-environmental-review.

☐ A copy of the SEPA determination or letter of exemption is included with this application.

☒ A SEPA determination is pending with Energy Facility Siting Evaluation Council (EFSEC) (lead agency). The expected decision date is mid-2023.

☐ I am applying for a Fish Habitat Enhancement Exemption. (Check the box below in 10b.) [help]

☐ This project is exempt (choose type of exemption below).

☐ Categorical Exemption. Under what section of the SEPA administrative code (WAC) is it exempt?

_____

☐ Other: _____

☐ SEPA is pre-empted by federal law.

10b. Indicate the permits you are applying for. (Check all that apply.) [help]

LOCAL GOVERNMENT

Local Government Shoreline permits:

☐ Substantial Development ☐ Conditional Use ☐ Variance

☐ Shoreline Exemption Type (explain): _____

The Project is located outside of the Benton County Shoreline Management Area. Further, the Project is seeking site certification through EFSEC.

Other City/County permits:

☒ Floodplain Development Permit ☐ Critical Areas Ordinance

The Project is seeking site certification through EFSEC. A review of critical areas ordinance compliance will be completed through the EFSEC process.

STATE GOVERNMENT

Washington Department of Fish and Wildlife:

☒ Hydraulic Project Approval (HPA) ☐ Fish Habitat Enhancement Exemption – Attach Exemption Form

Washington Department of Natural Resources:

☐ Aquatic Use Authorization

Complete JARPA Attachment E and submit a check for $25 payable to the Washington Department of Natural Resources. **Do not send cash.**

Washington Department of Ecology:

☐ Section 401 Water Quality Certification ☐ Non-Federally Regulated Waters

FEDERAL AND TRIBAL GOVERNMENT
United States Department of the Army (U.S. Army Corps of Engineers): ☐ Section 404 (discharges into waters of the U.S.) ☐ Section 10 (work in navigable waters) The need for a Section 404 permit is pending coordination with the USACE. The Applicant submitted a request for an approved jurisdictional determination to the USACE on December 13, 2021 (reference number NWS-2021-1146).
United States Coast Guard: For projects or bridges over waters of the United States, contact the U.S. Coast Guard at: d13-pf-d13bridges@uscg.mil ☐ Bridge Permit ☐ Private Aids to Navigation (or other non-bridge permits)
United States Environmental Protection Agency: ☐ Section 401 Water Quality Certification (discharges into waters of the U.S.) on tribal lands where tribes do not have treatment as a state (TAS)
Tribal Permits: (Check with the tribe to see if there are other tribal permits, e.g., Tribal Environmental Protection Act, Shoreline Permits, Hydraulic Project Permits, or other in addition to CWA Section 401 WQC) ☐ Section 401 Water Quality Certification (discharges into waters of the U.S.) where the tribe has treatment as a state (TAS).

Part 11–Authorizing Signatures

Signatures are required before submitting the JARPA package. The JARPA package includes the JARPA form, project plans, photos, etc. [help]

11a. Applicant Signature (required) [help]

I certify that to the best of my knowledge and belief, the information provided in this application is true, complete, and accurate. I also certify that I have the authority to carry out the proposed activities, and I agree to start work only after I have received all necessary permits.

I hereby authorize the agent named in Part 3 of this application to act on my behalf in matters related to this application. LO (initial)

By initialing here, I state that I have the authority to grant access to the property. I also give my consent to the permitting agencies entering the property where the project is located to inspect the project site or any work related to the project. LO (initial)

Laura O'Neill	ONeill Laura INNERGEX Signed with ConsignO Cloud (2022/05/04) Verify with verifio.com or Adobe Reader.	May 4, 2022
Applicant Printed Name	Applicant Signature	Date

11b. Authorized Agent Signature [help]

I certify that to the best of my knowledge and belief, the information provided in this application is true, complete, and accurate. I also certify that I have the authority to carry out the proposed activities and I agree to start work only after all necessary permits have been issued.

Authorized Agent Printed Name	Authorized Agent Signature	Date

11c. Property Owner Signature (if not applicant) [help]

Not required if project is on existing rights-of-way or easements (provide copy of easement with JARPA).

I consent to the permitting agencies entering the property where the project is located to inspect the project site or any work. These inspections shall occur at reasonable times and, if practical, with prior notice to the landowner.

See JARPA Attachment A		
Property Owner Printed Name	Property Owner Signature	Date

18 U.S.C §1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious, or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious, or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than 5 years or both.

If you require this document in another format, contact the Governor's Office for Regulatory Innovation and Assistance (ORIA) at (800) 917-0043. People with hearing loss can call 711 for Washington Relay Service. People with a speech disability can call (877) 833-6341. ORIA publication number: ORIA-16-011 rev. 09/2018

Wautoma Solar

Figure 1
Project Location

BENTON AND YAKIMA COUNTIES, WA

Project Area

County Boundary

INNERGEX

TETRA TECH

Reference Map

24

241

Wautoma Rd

Yakima County

Benton County

1:36,000

NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 0.25 0.5 1 Miles

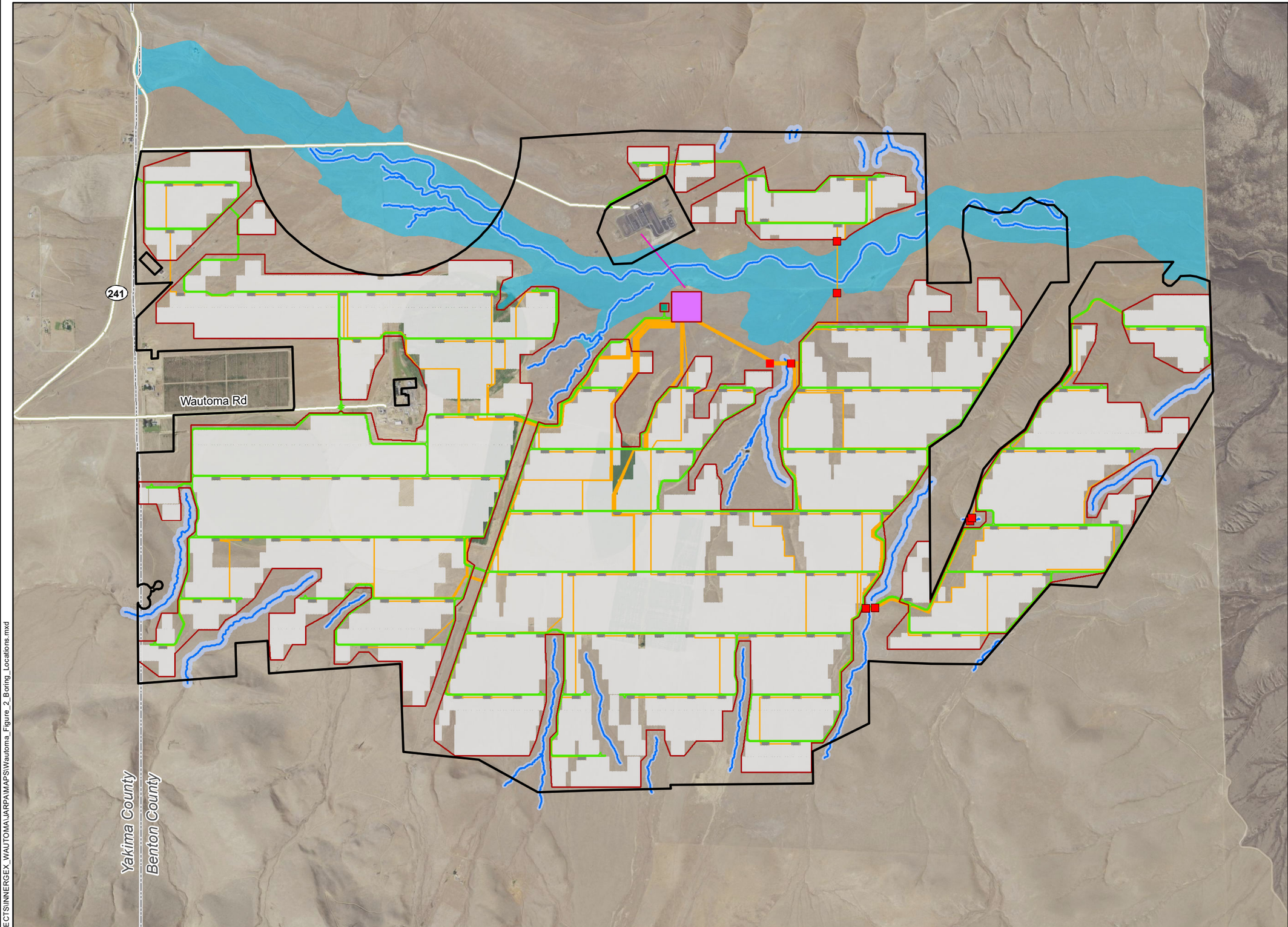
NOT FOR CONSTRUCTION

R:\PROJECTS\INNERGEX_WAUTOMA\JARPA\MAPS\JARPA_Location.mxd

Wautoma Solar

Figure 2
Site Components and Boring Locations Overview

BENTON AND YAKIMA COUNTIES, WA



- Project Area
- Solar Array
- Inverters
- Access Roads
- Security Fence
- Collection Lines (Underground)
- Transmission Line (Overhead)
- O&M Facility
- Project Substation
- Boring Location
- Ephemeral Stream
- Stream Buffer
- FEMA 1% Annual Chance Flood Hazard Area
- County Boundary

INNERGEX TETRA TECH

Reference Map

1:22,000 NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

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Wautoma Solar

Figure 3
Temporary Stream Crossing

BENTON AND YAKIMA COUNTIES, WA

- Project Area
- Solar Array
- Inverters
- Access Roads
- Security Fence
- Collection Lines (Underground)
- Transmission Line (Overhead)
- O&M Facility
- Project Substation
- Temporary Stream Crossing
- Ephemeral Stream
- Stream Buffer
- FEMA 1% Annual Chance Flood Hazard Area

INNERGEX TETRA TECH

Reference Map

1:4,000

NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 250 500 1,000 Feet

NOT FOR CONSTRUCTION

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Wautoma Solar

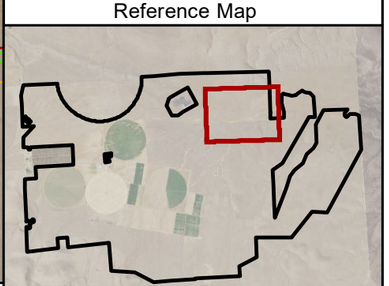
Figure 4
Boring Location 1

BENTON AND YAKIMA COUNTIES, WA

- Project Area
- Solar Array
- Inverters
- Access Roads
- Security Fence
- Collection Lines (Underground)
- Transmission Line (Overhead)
- O&M Facility
- Project Substation
- Boring Location
- Ephemeral Stream
- Stream Buffer
- FEMA 1% Annual Chance Flood Hazard Area

INNERGEX TETRA TECH

Reference Map



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1:4,000

NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 250 500 1,000 Feet

NOT FOR CONSTRUCTION

Wautoma Solar

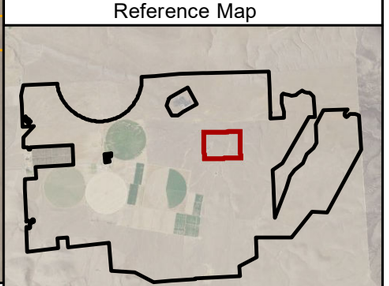
Figure 5
Boring Location 2

BENTON AND YAKIMA COUNTIES, WA

- Project Area
- Solar Array
- Inverters
- Access Roads
- Security Fence
- Collection Lines (Underground)
- Transmission Line (Overhead)
- O&M Facility
- Project Substation
- Boring Location
- Ephemeral Stream
- Stream Buffer
- FEMA 1% Annual Chance Flood Hazard Area

INNERGEX TETRA TECH

Reference Map



1:2,000 NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 250 500 1,000 Feet

NOT FOR CONSTRUCTION

R:\PROJECTS\INNERGEX_WAUTOMA\JARPA\MAPS\Wautoma_Figure_5_Boring_Location_2.mxd

Wautoma Solar

Figure 6
Boring Location 3

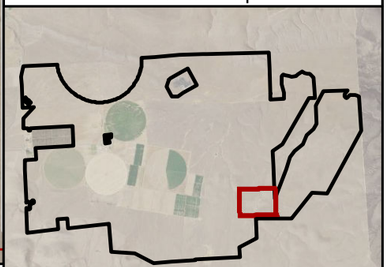
BENTON AND YAKIMA COUNTIES, WA

- Project Area
- Solar Array
- Inverters
- Access Roads
- Security Fence
- Collection Lines (Underground)
- Transmission Line (Overhead)
- O&M Facility
- Project Substation
- Boring Location
- Ephemeral Stream
- Stream Buffer

INNERGEX

TETRA TECH

Reference Map



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1:2,000

NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 100 200 400 Feet

NOT FOR CONSTRUCTION

Wautoma Solar

Figure 7
Boring Location 4

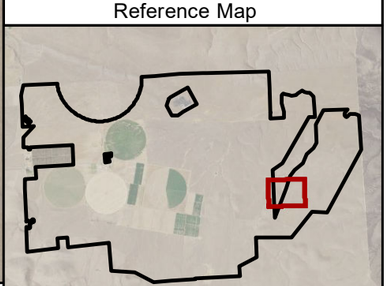
BENTON AND YAKIMA COUNTIES, WA

- Project Area
- Solar Array
- Inverters
- Access Roads
- Security Fence
- Collection Lines (Underground)
- Transmission Line (Overhead)
- O&M Facility
- Project Substation
- Boring Location
- Ephemeral Stream
- Stream Buffer

INNERGEX

TETRA TECH

Reference Map



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NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 50 100 200 Feet

NOT FOR CONSTRUCTION

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Wautoma Solar

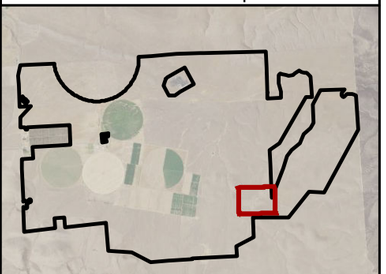
Figure 8
Permanent Road Widening Adjacent to Ephemeral Waterways

BENTON AND YAKIMA COUNTIES, WA

- Project Area
- Solar Array
- Inverters
- Access Roads
- Security Fence
- Collection Lines (Underground)
- Area of Permanent and Temporary Improvement
- Ephemeral Stream
- Stream Buffer
- County Boundary

INNERGEX TETRA TECH

Reference Map



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NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 100 200 400 Feet

NOT FOR CONSTRUCTION

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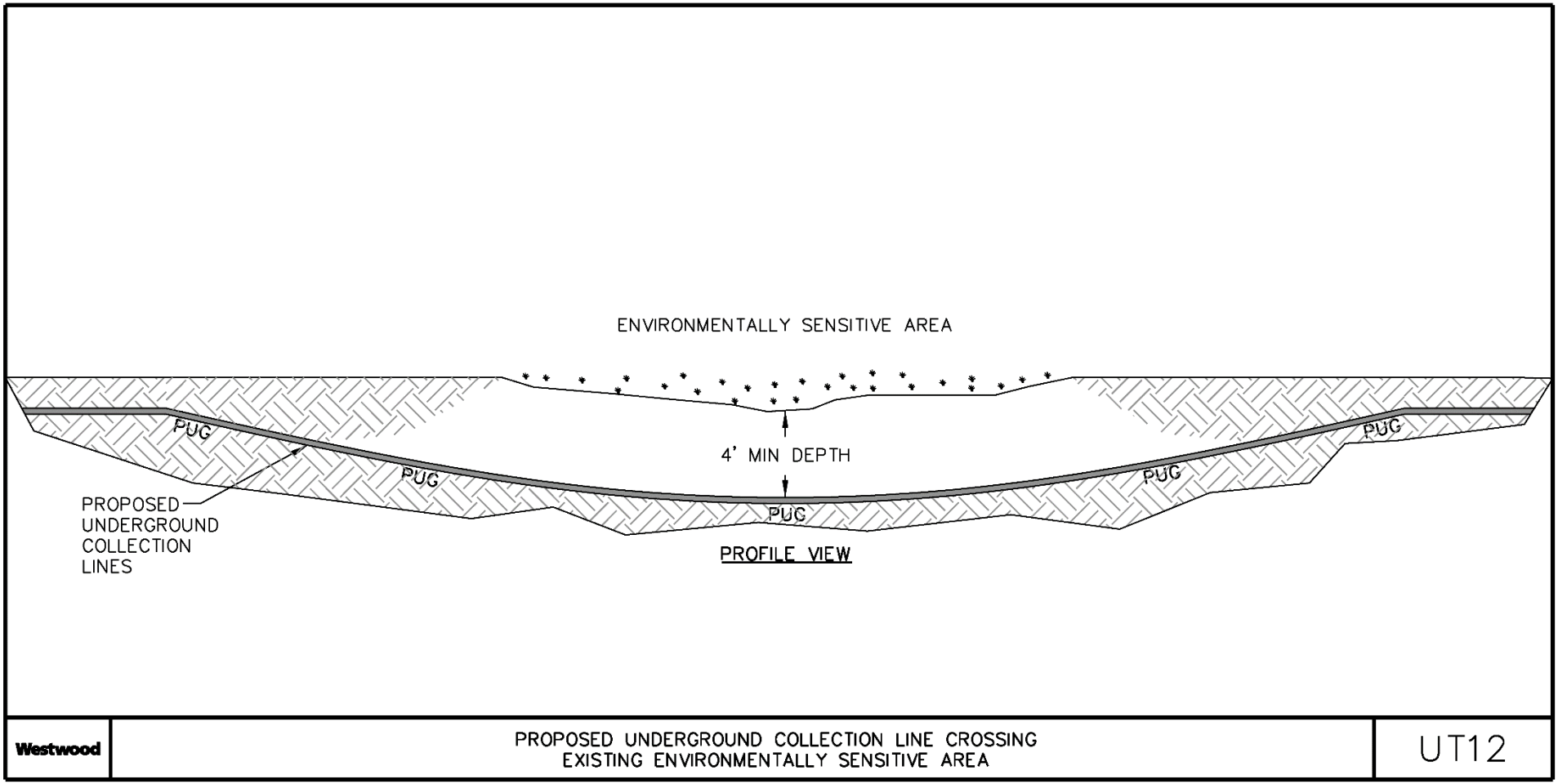

Figure 9. Collection Line Boring Schematic

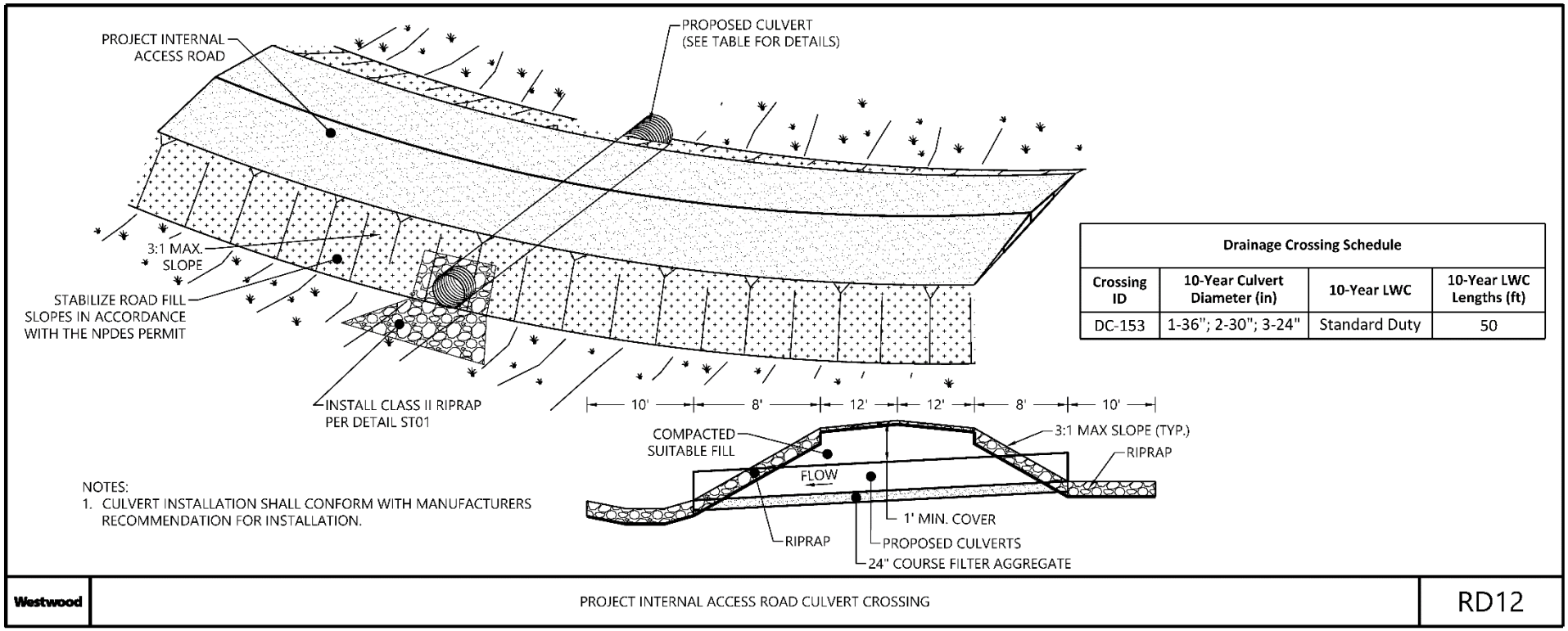

Figure 10. Access Road Crossing Schematic

2022-005359 LEASE
02/14/2022 01:36:29 PM Page 1 of 14 Fees: $216.50
Brenda Chilton, County Auditor, Benton County, WA

After Recording Return to:

Innergex Renewable Development USA, LLC
c/o Innergex Renewable Energy Inc.
1100-888 Dunsmuir St.
Vancouver, B.C. Canada
V6C 3K4
Attn: General Counsel

MEMORANDUM OF SOLAR ENERGY LEASE

GRANTOR/OWNER: HIGH VALLEY LAND, LLC, a Washington limited liability company

GRANTEE/LESSEE: INNERGEX RENEWABLE DEVELOPMENT USA, LLC, a Delaware limited liability company

Legal Description:
Abbreviated Form: E ½ of SW ¼, Sec. 22, Twp. 12N Range 24E, W.M.
NW ¼, Sec. 22, Twp. 12N, Range 24E, W.M.
W ½ of SW ¼, Sec. 22, Twp. 12N Range 24E, W.M.
Sec. 27, Twp. 12N, Range 24E, W.M.

Additional Legal is on Exhibit A attached to document

Assessor's Tax Parcel ID No. 122243000001000; 122242000000000; 122243000002000; and 127240000000000

Reference Number(s) of Related Documents(s): N/A

MEMORANDUM OF SOLAR ENERGY LEASE

THIS MEMORANDUM OF SOLAR ENERGY LEASE (this "Memorandum") is being made this 24th day of January, 2022, but shall be effective as of the 24th day of January, 2022, by and between High Valley Land, LLC, a Washington limited liability company, having an address at 1221 Plateau Drive, Richland, Washington 99352-7338 ("Owner"), and INNERGEX RENEWABLE DEVELOPMENT USA, LLC, a Delaware limited liability company, having an address at c/o Innergex Renewable Energy Inc., Suite 1100 – 888 Dunsmuir St., Vancouver, B.C. V6C 3K4, Canada, Attn: Legal (together with its successors and assigns, "Lessee"), who agree as follows:

1. Lease Agreement: Owner and Lessee certify that they have entered into that certain Solar Energy Lease (the "Lease") with an effective date of January ___, 2022 (the "Effective Date"), and hereby make specific reference to the terms, provisions, and conditions of the Lease as hereinafter set forth. Unless otherwise expressly provided herein, all capitalized terms used in this Memorandum shall have the same meanings ascribed to such terms in the Lease.

2. Premises: All that certain property containing approximately 1,120 acres of land described on Exhibit "A" attached hereto and made a part hereof, together with all surface rights and air space rights above, over, and across such land. The exact portion of the Premises to be leased by Lessee for the siting of the Generating Facility (the "Site") shall be determined prior to the end of the Development Term (as defined below), based on the results of a survey to be obtained by Lessee during the Development Term.

3. Development Term: The period commencing on the Effective Date and ending on the earlier of (i) the fifth (5th) anniversary of the Effective Date, or (ii) the date Lessee begins the initial construction (the "Construction State Date") of a solar energy generating facility (the "Generating Facility") on the Premises; provided however, that Lessee shall have the option to extend the Development Term for one (1) period of one (1) year, subject to the terms and conditions set forth in the Lease.

4. Construction Term: The period commencing on the Construction Start Date and ending on the first (1st) day the Generating Facility generates, sells, and delivers electricity in commercial quantities (i.e., excluding test runs of the facilities) to a purchaser, including but not limited to a utility or cooperative, subject to the terms and conditions set forth in the Lease (the "Commercial Operation Date").

5. Lease Term: The period commencing on the Commercial Operation Date and expiring on the thirtieth (30th) anniversary of the Commercial Operation Date (the "Initial Lease Term"); provided, however, that Lessee, at its option, shall have the right to extend the term of

the Lease for two additional periods of ten (10) years each (each, an "Extension Term"), commencing on the expiration of the Initial Lease Term, or the expiration of the first Extension Term, as applicable. The Development Term, Construction Term, and Lease Term shall hereafter be collectively referred to as the "Term."

6. Automatic Termination: If construction of the Generating Facility Assets on the Premises has not started before the expiration of the Development Term, the Lease shall terminate and be of no further force or effect except for obligations set forth therein that expressly survive such termination, without any further action being necessary on the part of Owner or Lessee.

7. Use of the Premises:

A. During the Term, Lessee has the right to use the Premises to conduct studies of, without limitation, solar radiation, solar energy, and soils, and collect other meteorological, archaeological, biological, hydrological, and geotechnical data, for surveys, and for installation, construction, operation, maintenance, repair, improvement, replacement, and removal of the Generating Facility and uses incidental thereto (the "Permitted Use"), and for no other business or purpose. During the Construction Term and Lease Term, Lessee shall have exclusive possession of the Site and shall have the sole and exclusive right to use the Site for solar operations and to convert all of the solar resources of the Site for solar energy generation and purposes ancillary thereto. The Permitted Use includes, without limitation, the following:

(i) the exclusive easement and right to erect, construct, reconstruct, install, reinstall, replace, relocate, remove, operate, maintain and use the following from time to time, on, under, over, and across the Premises, in connection with the Generating Facility, whether such Generating Facility is located on the Premises or elsewhere on one or more solar energy projects (in such locations as Lessee shall determine from time to time in the exercise of its sole discretion after notice to Owner): (a) solar energy collection cells, panels, mirrors, lenses, combiner boxes, inverters, battery and energy storage facilities, and other related facilities necessary to harness and store sunlight for photovoltaic or solar thermal electric energy generation, including without limitation, fossil fuel-based boilers, heating, and power generation systems installed in connection with the foregoing facilities, existing and future technologies used or useful in connection with the generation of electricity from sunlight, and associated support structures, foundations, racking, braces, wiring, plumbing, and related equipment constructed on the Premises; (b) a line or lines of towers, with such wires and cables as from time to time are suspended therefrom, and above ground and/or underground wires and cables, for the transmission, distribution, and collection of electrical energy and/or for communication purposes, and all necessary and proper foundations, footings, cross-arms, and other appliances and fixtures for use in connection with said towers, wires, and cables; (c) facilities consisting of: (1) one or more substations for electrical collection, to step up the voltage, interconnect to transmission line or lines, and meter electricity, together with the right

to perform all other ancillary activities normally associated with such a facility as may be necessary or appropriate as determined by Lessee to service the Generating Facility, regardless where located, and regardless of whether required by any applicable law, governmental entity, transmission operator, or otherwise, and (2) an operations and maintenance building, equipment, and storage yard for purposes of performing operations and maintenance service on the Generating Facility, regardless of where located, together with the right to perform all other ancillary activities normally associated with such an operation, including the installation of a well to provide water to such operations and maintenance building; (d) any other improvements, including roads, fixtures, facilities, fences, gates, machinery, and equipment useful or appropriate to accomplish any of the foregoing (the facilities described in (a) through (d) shall also constitute "Generating Facility Assets"); and (e) with all necessary easements therefor;

(ii) an exclusive easement and right over and across the Premises and any adjacent property owned by Owner not included in the Site for any audio, visual, view, light, shadow, noise, vibration, electromagnetic, or other effect of any kind or nature whatsoever resulting, directly or indirectly, from the Generating Facility;

(iii) an exclusive easement and right to capture, use, convert, and maintain the unobstructed solar resources over and across the Premises and any adjacent property owned by Owner not included in the Site; any obstruction to the receipt of and access to sunlight throughout the entire area of the Premises is prohibited;

(iv) an easement and right on the Premises and any other property of the Owner adjacent thereto to prevent measurable diminishment in output due to obstruction of the sunlight across the Premises including but not limited to an easement right to trim, cut down and remove all trees (whether natural or cultivated), brush, vegetation and fire and electrical hazards now or hereafter existing on the Premises which might obstruct receipt of or access to sunlight throughout the Premises or interfere with or endanger the Generating Facility or Lessee's operations, as determined by Lessee;

(v) the easement and right of subjacent and lateral support on the Premises to whatever is necessary for the operation and maintenance of the Generating Facility, including, without limitation, guy wires and supports;

(vi) a non-exclusive easement for audio, visual, view, light, electromagnetic, electrical and radio frequency interference, and any other effects attributable or ancillary to the Generating Facility or Lessee's operations (such as transmission of radio waves or communication signals);

(vii) an easement and right over and across any adjacent property owned by Owner not included in the Premises (in such locations as Lessee shall determine from time to time in the exercise of its reasonable discretion after notice to Owner) for ingress and egress to and from the Premises (including, without limitation, to transmit electrical energy

from) and to connect the Premises and the Generating Facility Assets thereon to the Project; and

(viii) the easement and right to undertake any such purposes or other activities, whether accomplished by Lessee or a third party authorized by Lessee, that Lessee determines are necessary, useful or appropriate to accomplish any of the purposes or uses set forth in this Memorandum or that are compatible with or related to such purposes or uses.

The easement rights granted by Owner under the Lease constitute **EASEMENTS IN GROSS**, personal to and for the benefit of Lessee, its successors and assigns, as owner and holder of such easements, and the parties expressly agree that such easement rights shall be transferable in accordance with the assignment provisions of the Lease. The parties expressly intend for all easement rights in the Lease to be, and for the Lease to create, **EASEMENTS IN GROSS** in Lessee, and neither such easements nor the Lease shall be appurtenant to any other property or interest.

B. Lessee shall have the right to construct structures on the Site Lessee determines are reasonably necessary, required, or useful in conjunction with the operation or maintenance of the Generating Facility or enabling the Generating Facility to be connected to an electricity distribution or transmission network.

C. If any portion of the Premises is designated as Mineral Holdouts (as defined in the Lease), then, notwithstanding anything to the contrary herein or in the Lease, Lessee may utilize such Mineral Holdouts as a construction lay-down area during the Construction Term and Lease Term if such area is not then being used for mineral development. Lessee and Owner shall cooperate with each other to provide reasonable accommodation for any holders of mineral rights to access and utilize the Mineral Holdouts space, provided that such activity does not interfere in any respect with the Permitted Use.

D. Lessee shall have the sole and exclusive right to collect and convert all of the solar resources of, and to conduct its operations on, the Premises. Owner shall not grant any rights in the Premises purporting to permit others to conduct operations on the Premises in derogation of Lessee's sole and exclusive rights. Without the prior written consent of Lessee, Owner shall not (i) waive any right available to Owner or grant any right or privilege subject to the consent of Owner by law or contract, including without limitation any environmental regulation, land use ordinance, or zoning regulation, with respect to setback requirements, noise limitations, or other restrictions and conditions respecting the placement or use of the Generating Facility and other equipment ancillary to the Project (as defined in the Lease) on parcels adjacent to or in the vicinity of the Premises, or (ii) grant, confirm, acknowledge, recognize, or acquiesce in any right claimed by any other Person to conduct operations on the Premises whether arising in judicial proceedings or otherwise, and Owner agrees to give Lessee notice of any such claims or proceeding with respect to such claims and to cooperate with Lessee in resisting and disputing such claims.

8. Ownership:

A. Owner acknowledges and agrees that Lessee or its affiliate, successor, or assignee is the exclusive owner and operator of the Generating Facility, Owner has no rights to the Generating Facility or any part of it (notwithstanding that the Generating Facility or any of the Generating Facility Assets may be deemed improvements or fixtures on the Site), and Owner may not sell, lease, assign, mortgage, pledge, or otherwise alienate or encumber the Generating Facility or any interest therein or the leasehold rights to the Site, whether with the fee interest or any other rights to the Site otherwise held by Owner.

B. Owner agrees and acknowledges that the Generating Facility and all Generating Facility Assets shall remain the property of Lessee, and Lessee shall have the right to remove the same at any time during the Term, whether or not said items are considered improvements, fixtures or attachments to real property under applicable laws. Owner shall have no ownership, lien, security interest, or other interest in any part of the Generating Facility, the Generating Facility Assets, or any profits or proceeds derived therefrom. Owner hereby waives all rights or claims (whether under statutory law, common law, or otherwise) that it may have in or otherwise with respect to the Generating Facility and the Generating Facility Assets, including, without limitation, any Owner's lien or other encumbrance on any property of Lessee.

C. Owner acknowledges that Lessee (or, as applicable, its affiliate(s), successor(s), or assignee(s)) is the exclusive owner of all (i) energy generated by the Generating Facility and (ii) Environmental Attributes and Environmental Incentives of the Generating Facility (as such terms are defined in the Lease).

D. Notwithstanding the exclusive nature of the Lease, but without limiting any of Lessee's obligations under the Lease, nothing expressly stated or implied in the Lease or represented to Owner shall be construed as requiring Lessee to: (i) undertake construction, installation or operation of all or any portion of the Project on the Premises or elsewhere; (ii) generate or sell any minimum or maximum amount of energy from the Site or any other portion of the Premises; (iii) continue operations of all or any portion of the Project from time to time located on the Site or elsewhere; or (iv) prohibit Lessee from removing all or any portion of the Project from the Premises.

9. No Interference: Lessee shall peaceably, quietly, and exclusively hold and enjoy the Premises from and after the Effective Date and continuing until the expiration or earlier termination of the Lease, without hindrance from Owner or those claiming title or possession by, through or under Owner, subject to the Existing Rights (as defined in the Lease) and the performance by Lessee of all of the terms and conditions of the Lease to be performed by Lessee. Owner will not interfere with the passage of solar radiation onto the Premises during the Lease Term or take any action that would interfere with such passage while the Project is

in operation. Owner shall not conduct any activity, or grant any rights to any third party, whether on the Premises or elsewhere, that would interfere in any way with or materially increase the cost of Lessee's use of the Premises or exercise of any of the rights granted under the Lease, including for greater certainty the planting of trees, unmaintained growth of foliage, construction of any improvement, structure, impediment, wall, fence, or other object on the Premises or other adjacent real property that could adversely affect the passage of solar radiation onto the Site.

10. Ownership and Use by Owner of Mineral Rights. The parties agree that Owner shall retain all mineral rights and water rights in connection with the Site owned by Owner as of the Effective Date (the "Mineral Rights") with the limitation during the Term that Owner expressly releases and waives, on behalf of itself and its successors and assigns, all rights of ingress and egress to enter upon the surface of the Site (other than the Mineral Holdouts), and the area located between the surface and one thousand (1,000) feet beneath the surface of the Site for purposes of exploring for, developing, drilling, producing, transporting, or any other purposes incident to the development or production of oil, gas, or other minerals. The foregoing provision shall be a covenant running with the land binding upon any party owning any interest in, or rights to develop or use the Mineral Rights, and all future owners and lessees of any such rights, titles, or interests in or to the Mineral Rights, shall be subject to and burdened by the foregoing waiver of rights and automatically be deemed to include a contractual waiver by the lessee, assignee, or grantee, as applicable. However, nothing herein contained shall be construed to prevent Owner, its successors and assigns, from obtaining oil, gas and other minerals by directional drilling under the Site from well sites located on the Mineral Holdouts or tracts other than the Site, so long as such directional drilling is located at a minimum depth of one thousand (1,000) feet below the surface of the Site.

11. Use of Water by Lessee. During the Term Lessee shall be entitled to use all available water on or extracted from the Premises as Lessee deems necessary to conduct its operations. Lessee may drill, dig, and/or excavate one or more wells on the Premises, and extract water therefrom, for the purposes of servicing, construction, operating, and maintaining the Project, including purposes ancillary thereto such as dust mitigation.

12. Termination by Lessee. Lessee may, at any time without any prior notice and from time to time during the Term of the Lease, release all or any portion of its right, title and interest in the Lease (as to all or any portion or portions of the Premises) by executing and causing to be acknowledged and recorded in the Recorder's Office, a release describing with particularity the portion of such rights, title or interest so released and the part of the Premises to which it applies. For greater certainty, if Lessee releases any portion of the Premises, Lessee shall provide Owner with reasonable access to such unused portion. Such release shall become effective and shall be deemed delivered to and accepted by Owner upon such recordation. Upon any such release by Lessee, the parties' respective rights and obligations under the Lease shall cease as to the portion of the Premises or the right, title or interest herein as to which such release applies, but the Lease and the parties' respective rights and obligations hereunder shall

remain in full force and effect as to any portions of the Premises and any right, title and interest of Lessee not so released. Upon any surrender, termination or expiration of the Term (whether before or after the Commercial Operation Date), Lessee shall promptly record an amendment to, or termination of, this Memorandum and shall, within one (1) year, restore the surrendered or terminated portions of the Premises substantially to their original condition that existed as of the Effective Date.

13. Liens: Owner represents that Owner has not granted, and agrees that Owner will not grant, any mortgages, deeds of trust, voluntary liens, security interests or any other encumbrance encumbering all or any portion of the Premises, other than as set forth on Exhibit "D" to the Lease or shown of record in the Recorder's Office of Benton County, Washington. Owner agrees to execute all documents reasonably requested by Lessee as are determined by Lessee to be necessary or appropriate to allow Lessee to enjoy the Premises without material interference.

14. Right of Purchase or Refusal. Lessee does not have any right of purchase of or refusal on the Premises or any part thereof.

15. Division into Separate Leases. Owner acknowledges that the Premises may be used for multiple Projects and may be developed into multiple projects or phases. If Lessee elects to divide the Premises into multiple Projects, Owner shall, within ten (10) days after written request from Lessee, and without demanding any additional consideration, subdivide the Lease into separate leases apportioning the Owner's and Lessee's obligations and rights among the subdivided Premises by entering into and delivering to Lessee one or more subdivided leases (which shall supersede and replace the Lease) that provide Lessee with separate Leasehold Estates (as defined below) in different portions of the Premises, as designated by Lessee. Each of such subdivided leases shall: (a) specify the portion(s) of the Premises to be covered thereby, (b) contain the same terms and conditions as the Lease (except for any requirements that have been fulfilled by Lessee prior to the execution of such subdivided leases, and except for any modifications that may be required to ensure that each party's combined obligations under such subdivided leases do not exceed such party's obligations under the Lease) and be in a form reasonably acceptable to Lessee; (c) be for a term equal to the remaining Term; and (d) enjoy the same priority as the Lease over any lien, encumbrance or other interest created by Owner. Further, notwithstanding any other provision of the Lease, in the event of any uncured default under any such subdivided lease, such default shall not affect, or cause a termination of, any other such subdivided lease or any rights or interests granted under any other such subdivided lease.

16. New Lease to Lender. If the Lease or a sublease (a) terminates because of Lessee's uncured Event of Default or (b) is rejected or disaffirmed pursuant to bankruptcy law or any other law affecting creditors' rights, then, so long as a Lender holding a mortgage on Lessee's interest in the Premises has cured any such monetary Event of Default and is making commercially reasonable efforts to cure any such non-monetary Event of Default as provided

herein, Owner shall, upon written request from such Lender received within forty-five (45) days after any such event, without demanding additional consideration therefor, enter into a new lease in favor of such Lender, which new lease shall (i) contain the same terms as the Lease (except for any requirements that have been fulfilled by Lessee prior to such termination, foreclosure, rejection or disaffirmance hereinafter referred to as a "Terminating Event"), (ii) be for a term commencing on the date of such Terminating Event, and continuing for the remaining Term of the Lease before giving effect to such Terminating Event, (iii) contain a lease of the Premises or such portion thereof as to which such Lender held a Lender's Lien on the date of such Terminating Event, (iv) contain a grant to the Lender of access, transmission, communications, utility, and other rights covering such portion or portions of the Premises to the same extent as set forth in the Lease as such Lender may reasonably designate, and (v) enjoy the same priority as the Lease over any lien, encumbrance, or other interest created by Owner; and, until such time as such new lease is executed and delivered, such Lender may use the Premises and conduct operations thereon as if the Lease were still in effect. At the option of such Lender, the new lease may be executed by a designee of such Lender, without such Lender assuming the burdens and obligations of Lessee thereunder.

17. Transfer of the Premises. Nothing in the Lease shall be construed to be a limitation or prohibition of any type against Owner's right or freedom to devise, convey, gift, assign, transfer and/or sell Owner's title to the Premises (but in no event shall Lessee be obligated to recognize the severance of any solar rights from the Premises except to the extent such severance is supported by applicable Washington law). Owner agrees to provide at least thirty (30) days' prior written notice to Lessee at the address specified herein of any such devise, conveyance, gift, assignment, transfer or sale (an "Owner Transfer"), and in the event of an Owner Transfer of less than all of the Premises, Lessee shall have the right to require all parties owning fee title to deliver a written agreement setting forth the manner in which payments under the Lease are to be made among such parties, and in the event such parties do not agree, Lessee shall have no liability to any party for such payments so long as Lessee either (a) makes such payments into an escrow account or an account maintained by a court with jurisdiction over the Premises in connection with such payments or (b) makes such payments to the parties Lessee reasonably determines in good faith are entitled to such payments based on the information provided to Lessee. Until such notice of an Owner Transfer is received by Lessee, Lessee shall have no duty to any successor owner, and Lessee shall not be in default under the Lease if it continues to make all payments to the original Owner before such notice of an Owner Transfer is received. The rights and obligations contained in the Lease shall run with the land for the duration of the Lease and shall be binding upon and shall inure to the benefit of Owner and Lessee and their respective successors, assigns, and heirs.

18. Interpretation; Conflicts: This Memorandum contains only selected provisions of the Lease, and reference is made to the full text of the Lease for the full terms and conditions. This Memorandum shall in no way alter, amend, modify, change, supersede or be used to interpret the Lease in any respect. This Memorandum is executed by the parties solely for the purpose of recordation in the Recorder's Office of Yakima/Benton County,

Washington, and it is the intent of the parties that it shall give notice to and confirm the Lease to the same extent as if all of the provisions of the Lease were fully set forth herein. The Lease is hereby incorporated by reference into this Memorandum, and the parties hereby ratify and confirm all of the provisions of the Lease. In the event of any conflict or inconsistency between the provisions of this Memorandum and the provisions of the Lease, the provisions of the Lease shall control. A copy of the Lease is on file with Owner and Lessee and information regarding the Lease may be obtained from either Owner or Lessee at its address noted in the recitals to this Memorandum.

19. Governing Law: This Memorandum shall be construed in accordance with the laws of the State of Washington.

20. Counterparts: This Memorandum may be executed in two or more counterparts, each of which shall be deemed an original and all of which taken together shall constitute a single instrument.

[signature pages follow]

IN WITNESS WHEREOF, this Memorandum is effective as of the date first written above.

OWNER:

HIGH VALLEY LAND, LLC

By: _____
Name: Richard Nall
Title: Managing Member

STATE OF WASHINGTON)
) SS.
COUNTY OF Benton)

This record was acknowledged before me on 2-02-22 by Richard Nall, as Managing Member of High Valley Land, LLC, a Washington limited liability company.

_____
Notary Public in and for the State of Washington

My Commission Expires: June 16, 2025

Notary Public
State of Washington
URIEL RODRIGUEZ
License Number 21022916
MY COMMISSION EXPIRES
JUNE 16, 2025

[signatures continue on following page]

LESSEE:

INNERGEX RENEWABLE DEVELOPMENT USA, LLC
a Delaware limited liability company

By: _____
Name: David Little
Title: Vice President & Managing Director - USA

_____ OF _____)
) SS.
COUNTY OF _____)

The foregoing instrument was acknowledged before me this _____ day of _____, 20___, by _____, as _____ of Innergex Renewable Development USA, LLC, a Delaware limited liability company, on behalf of such company.

_____
Notary Public in and for the State of _____

My Commission Expires: _____

SEE ATTACHED CALIFORNIA ACKNOWLEDGMENT

CALIFORNIA ACKNOWLEDGMENT CIVIL CODE § 1189

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of San Diego }

On 1/24/2022 (Date) before me, Rita Cannava, Notary Public (Here Insert Name and Title of the Officer),

personally appeared David Little (Name(s) of Signer(s)),

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

RITA CANNAVA
Notary Public - California
San Diego County
Commission # 2373588
My Comm. Expires Sep 3, 2025

Place Notary Seal and/or Stamp Above

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____
Signature of Notary Public

OPTIONAL

Completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document.

Description of Attached Document

Title or Type of Document: _____

Document Date: _____ Number of Pages: _____

Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: _____	Signer's Name: _____
☐ Corporate Officer – Title(s): _____	☐ Corporate Officer – Title(s): _____
☐ Partner – ☐ Limited ☐ General	☐ Partner – ☐ Limited ☐ General
☐ Individual ☐ Attorney in Fact	☐ Individual ☐ Attorney in Fact
☐ Trustee ☐ Guardian or Conservator	☐ Trustee ☐ Guardian or Conservator
☐ Other: _____	☐ Other: _____
Signer is Representing: _____	Signer is Representing: _____

©2019 National Notary Association

EXHIBIT "A"

LEGAL DESCRIPTION OF PREMISES

TRACT ONE: The East Half of the Southwest Quarter of Section 22, Township 12 North, Range 24 E.W.M., records of Benton County, Washington.

Approximately 80 acres total.

Auditor's Parcel Number: 122243000001000.

TRACT TWO: The Northwest Quarter of Section 22, Township 12 North, Range 24 E.W.M., records of Benton County, Washington.

Approximately 160 acres total.

Auditor's Parcel Number: 122242000000000.

TRACT THREE: The West Half of the Southwest Quarter of Section 22, Township 12 North, Range 24 E.W.M., records of Benton County, Washington

Approximately 80 acres total.

Auditor's Parcel Number: 122243000002000.

TRACT FOUR: All of Section 27, Township 12 North, Range 24 E.W.M., records of Benton County, Washington.

Approximately 640 acres total.

Auditor's Parcel Number: 127240000000000.

TRACT FOUR: The Southeast Quarter of Section 22, Township 12 North, Range 24, East W.M., records of Benton County, Washington

Approximately 160 acres total.

Auditor's Parcel Number: TBD, formerly a portion of 122241000000000.

2021-008162 MEMO
02/18/2021 11:24:53 AM Pages: 11 Fee: $113.50
Innergex Renewable Dev Usa
Benton County, Benton County Auditor's Office

After Recording Return to:

Innergex Renewable Development USA, LLC
4660 La Jolla Village Drive
Suite 680
San Diego, CA 92122
Attn: Landowner Relations

MEMORANDUM OF SOLAR ENERGY LEASE

GRANTOR/OWNER: Jean Emile Robert

GRANTEE/LESSEE: Innergex Renewable Development USA, LLC, a Delaware Limited Liability Company

Legal Description:
Abbreviated Form: NE ¼ Sec 29, T12E, R24 EWM

Additional Legal is on Exhibit A attached to document

Assessor's Tax Parcel ID No. 1-2924-100-0000-000

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MEMORANDUM OF SOLAR ENERGY LEASE

THIS MEMORANDUM OF SOLAR ENERGY LEASE (this "Memorandum") is being made this _____ day of June, 2020, but shall be effective as of the ___ day of June, 2020, by and between Jean Emile Robert having an address at 1521 Wautoma Road, Sunnyside, WA 98944 ("Owner"), and INNERGEX RENEWABLE DEVELOPMENT USA, LLC, a Delaware limited liability company, having an address at c/o Innergex Renewable Energy Inc., Suite 1100 – 888 Dunsmuir St., Vancouver, B.C. V6C 3K4, Canada, Attn: Legal (together with its successors and assigns, "Lessee"), who agree as follows:

1. Lease Agreement: Owner and Lessee certify that they have entered into that certain Solar Energy Lease (the "Lease") with an effective date of June _____, 2020 (the "Effective Date"), and hereby make specific reference to the terms, provisions, and conditions of the Lease as hereinafter set forth. Unless otherwise expressly provided herein, all capitalized terms used in this Memorandum shall have the same meanings ascribed to such terms in the Lease.

2. Premises: All that certain property containing approximately 160 acres of land described on Exhibit "A" attached hereto and made a part hereof, together with all surface rights and air space rights above, over, and across such land. The exact portion of the Premises to be leased by Lessee for the siting of the Generating Facility (the "Site") shall be determined prior to the end of the Development Term (as defined below), based on the results of a survey to be obtained by Lessee during the Development Term.

3. Development Term: The period commencing on the Effective Date and ending on the earlier of (i) the third (3rd) anniversary of the Effective Date, or (ii) the date Lessee begins the initial construction of Generating Facility Assets on the Premises (the "Construction Start Date"); provided however, that Lessee shall have the option to extend the Development Term for two (2) periods of one (1) year each, subject to the terms and conditions set forth in the Lease.

4. Construction Term: The period commencing on the Construction Start Date and ending on the first (1st) day the Project generates, sells, and delivers electricity in commercial quantities (i.e., excluding test runs of the facilities) to a purchaser, including but not limited to a utility or cooperative, subject to the terms and conditions set forth in the Lease (the "Commercial Operation Date").

5. Lease Term: The period commencing on the Commercial Operation Date and expiring on the thirtieth (30th) anniversary of the Commercial Operation Date (the "Initial Lease Term"); provided, however, that Lessee, at its option, shall have the right to extend the term of the Lease for two additional periods of ten (10) years each (each, an "Extension Term"),

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commencing on the expiration of the Initial Lease Term, or the expiration of the first Extension Term, as applicable. The Development Term, Construction Term, and Lease Term shall hereafter be collectively referred to as the "Term."

6. Automatic Termination: If construction of the Generating Facility Assets on the Premises has not started before the expiration of the Development Term, the Lease shall terminate and be of no further force or effect except for obligations set forth therein that expressly survive such termination, without any further action being necessary on the part of Owner or Lessee.

7. Use of the Premises:

A. During the Term, Lessee has the right to use the Premises to conduct studies of, without limitation, solar radiation, solar energy, and soils, and collect other meteorological, archaeological, biological, hydrological, and geotechnical data, for surveys, and for installation, construction, operation, maintenance, repair, improvement, replacement, and removal of the Generating Facility and uses incidental thereto (the "Permitted Use"), and for no other business or purpose. During the Construction Term and Lease Term, Lessee shall have exclusive possession of the Site and shall have the sole and exclusive right to use the Site for solar operations and to convert all of the solar resources of the Site for solar energy generation and purposes ancillary thereto. The Permitted Use includes, without limitation, the following:

(i) the exclusive easement and right to erect, construct, reconstruct, install, reinstall, replace, relocate, remove, operate, maintain and use the following from time to time, on, under, over, and across the Premises, in connection with the Generating Facility, whether such Generating Facility is located on the Premises or elsewhere on one or more solar energy projects (in such locations as Lessee shall determine from time to time in the exercise of its sole discretion after notice to Owner): (a) solar energy collection cells, panels, mirrors, lenses, combiner boxes, inverters, battery and energy storage facilities, and other related facilities necessary to harness and store sunlight for photovoltaic or solar thermal electric energy generation, including without limitation, fossil fuel-based boilers, heating, and power generation systems installed in connection with the foregoing facilities, existing and future technologies used or useful in connection with the generation of electricity from sunlight, and associated support structures, foundations, racking, braces, wiring, plumbing, and related equipment constructed on the Premises; (b) a line or lines of towers, with such wires and cables as from time to time are suspended therefrom, and above ground and/or underground wires and cables, for the transmission, distribution, and collection of electrical energy and/or for communication purposes, and all necessary and proper foundations, footings, cross-arms, and other appliances and fixtures for use in connection with said towers, wires, and cables; (c) facilities consisting of: (1) one or more substations for electrical collection, to step up the voltage, interconnect to transmission line or lines, and meter electricity, together with the right to perform all other ancillary activities normally associated with such a facility as may be

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necessary or appropriate as determined by Lessee to service the Generating Facility, regardless where located, and regardless of whether required by any applicable law, governmental entity, transmission operator, or otherwise, and (2) an operations and maintenance building, equipment, and storage yard for purposes of performing operations and maintenance service on the Generating Facility, regardless of where located, together with the right to perform all other ancillary activities normally associated with such an operation, including the installation of a well to provide water to such operations and maintenance building; (d) any other improvements, including roads, fixtures, facilities, fences, gates, machinery, and equipment useful or appropriate to accomplish any of the foregoing (the facilities described in (a) through (d) shall also constitute "Generating Facility Assets"); and (e) with all necessary easements therefor;

(ii) an exclusive easement and right over and across the Premises and any adjacent property owned by Owner not included in the Site for any audio, visual, view, light, shadow, noise, vibration, electromagnetic, or other effect of any kind or nature whatsoever resulting, directly or indirectly, from the Generating Facility;

(iii) an exclusive easement and right to capture, use, and convert the unobstructed solar resources over and across the Premises and any adjacent property owned by Owner not included in the Site; any obstruction to the receipt of and access to sunlight throughout the entire area of the Premises is prohibited;

(iv) an easement and right on the Premises to prevent measurable diminishment in output due to obstruction of the sunlight across the Premises including but not limited to an easement right to trim, cut down and remove all trees (whether natural or cultivated), brush, vegetation and fire and electrical hazards now or hereafter existing on the Premises which might obstruct receipt of or access to sunlight throughout the Premises or interfere with or endanger the Generating Facility or Lessee's operations, as determined by Lessee;

(v) the easement and right of subjacent and lateral support on the Premises to whatever is necessary for the operation and maintenance of the Generating Facility, including, without limitation, guy wires and supports;

(vi) a non-exclusive easement for audio, visual, view, light, electromagnetic, electrical and radio frequency interference, and any other effects attributable or ancillary to the Generating Facility or Lessee's operations (such as transmission of radio waves or communication signals); and

(vii) the easement and right to undertake any such purposes or other activities, whether accomplished by Lessee or a third party authorized by Lessee, that Lessee determines are necessary, useful or appropriate to accomplish any of the purposes or uses set forth in the Lease or that are compatible with or related to such purposes or uses.

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The easement rights granted by Owner under the Lease constitute **EASEMENTS IN GROSS**, personal to and for the benefit of Lessee, its successors and assigns, as owner and holder of such easements, and the parties expressly agree that such easement rights shall be transferable in accordance with the assignment provisions of the Lease. The parties expressly intend for all easement rights in the Lease to be, and for the Lease to create, **EASEMENTS IN GROSS** in Lessee, and neither such easements nor the Lease shall be appurtenant to any other property or interest.

B. Lessee shall have the right to construct structures on the Site Lessee determines are reasonably necessary, required, or useful in conjunction with the operation or maintenance of the Generating Facility or enabling the Generating Facility to be connected to an electricity distribution or transmission network.

C. If any portion of the Premises is designated as Mineral Holdouts (as defined in the Lease), then, notwithstanding anything to the contrary herein or in the Lease, Lessee may utilize such Mineral Holdouts as a construction lay-down area during the Construction Term and Lease Term if such area is not then being used for mineral development. Lessee and Owner shall cooperate with each other to provide reasonable accommodation for any holders of mineral rights to access and utilize the Mineral Holdouts space, provided that such activity does not interfere in any respect with the Permitted Use.

D. Lessee shall have the sole and exclusive right to collect and convert all of the solar resources of, and to conduct its operations on, the Premises. Owner shall not grant any rights in the Premises purporting to permit others to conduct operations on the Premises in derogation of Lessee's sole and exclusive rights. Without the prior written consent of Lessee, Owner shall not (i) waive any right available to Owner or grant any right or privilege subject to the consent of Owner by law or contract, including without limitation any environmental regulation, land use ordinance, or zoning regulation, with respect to setback requirements, noise limitations, or other restrictions and conditions respecting the placement or use of the Generating Facility and other equipment ancillary to the Project (as defined in the Lease) on parcels adjacent to or in the vicinity of the Premises, or (ii) grant, confirm, acknowledge, recognize, or acquiesce in any right claimed by any other Person to conduct operations on the Premises whether arising in judicial proceedings or otherwise, and Owner agrees to give Lessee notice of any such claims or proceeding with respect to such claims and to cooperate with Lessee in resisting and disputing such claims.

8. Ownership:

A. Owner acknowledges and agrees that Lessee or its affiliate, successor, or assignee is the exclusive owner and operator of the Generating Facility, Owner has no rights to the Generating Facility or any part of it (notwithstanding that the Generating Facility or any of the Generating Facility Assets may be deemed improvements or fixtures on the Site), and

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Owner may not sell, lease, assign, mortgage, pledge, or otherwise alienate or encumber (collectively, a "Transfer") the Generating Facility or any interest therein or the leasehold rights to the Site, whether with the fee interest or any other rights to the Site otherwise held by Owner. Owner shall give Lessee at least thirty (30) days' written notice prior to any Transfer of all or a portion of the Site identifying the transferee, the portion of Site to be transferred, and the proposed date of Transfer.

B. Owner agrees and acknowledges that the Generating Facility and all Generating Facility Assets shall remain the property of Lessee, and Lessee shall have the right to remove the same at any time during the Term, whether or not said items are considered improvements, fixtures or attachments to real property under applicable laws. Owner shall have no ownership, lien, security interest, or other interest in any part of the Generating Facility, the Generating Facility Assets, or any profits or proceeds derived therefrom. Owner hereby waives all rights or claims (whether under statutory law, common law, or otherwise) that it may have in or otherwise with respect to the Generating Facility and the Generating Facility Assets, including, without limitation, any Owner's lien or other encumbrance on any property of Lessee.

C. Owner acknowledges that Lessee (or, as applicable, its affiliate(s), successor(s), or assignee(s)) is the exclusive owner of all (i) energy generated by the Generating Facility and (ii) Environmental Attributes and Environmental Incentives of the Generating Facility (as such terms are defined in the Lease).

D. Notwithstanding the exclusive nature of the Lease, but without limiting any of Lessee's obligations under the Lease, nothing expressly stated or implied in the Lease or represented to Owner shall be construed as requiring Lessee to: (i) undertake construction, installation or operation of all or any portion of the Project on the Premises or elsewhere; (ii) generate or sell any minimum or maximum amount of energy from the Site or any other portion of the Premises; (iii) continue operations of all or any portion of the Project from time to time located on the Site or elsewhere; or (iv) prohibit Lessee from removing all or any portion of the Project from the Premises.

9. No Interference: Lessee shall peaceably, quietly, and exclusively hold and enjoy the Premises from and after the Effective Date and continuing until the expiration or earlier termination of the Lease, without hindrance from Owner or those claiming title or possession by, through or under Owner, subject to the Existing Rights (as defined in the Lease) and the performance by Lessee of all of the terms and conditions of the Lease to be performed by Lessee. Owner will not interfere with the passage of solar radiation onto the Premises during the Lease Term or take any action that would interfere with such passage while the Project is in operation. Owner shall not conduct any activity, or grant any rights to any third party, whether on the Premises or elsewhere, that would interfere in any way with or materially increase the cost of Lessee's use of the Premises or exercise of any of the rights granted under the Lease, including for greater certainty the planting of trees, unmaintained growth of foliage,

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construction of any improvement, structure, impediment, wall, fence, or other object on the Premises or other adjacent real property that could adversely affect the passage of solar radiation onto the Site.

10. Ownership and Use by Owner of Mineral Rights. The parties agree that Owner shall retain all mineral rights (the "Mineral Rights") and water rights in connection with the Site owned by Owner as of the Effective Date with the limitation during the Term that Owner expressly releases and waives, on behalf of itself and its successors and assigns, all rights of ingress and egress to enter upon the surface of the Site (other than the Mineral Holdouts), and the area located between the surface and one thousand (1,000) feet beneath the surface of the Site for purposes of exploring for, developing, drilling, producing, transporting, or any other purposes incident to the development or production of oil, gas, or other minerals. The foregoing provision shall be a covenant running with the land binding upon any party owning any interest in, or rights to develop or use the Mineral Rights, and all future owners and lessees of any such rights, titles, or interests in or to the Mineral Rights, shall be subject to and burdened by the foregoing waiver of rights and automatically be deemed to include a contractual waiver by the lessee, assignee, or grantee, as applicable. However, nothing herein contained shall be construed to prevent Owner, its successors and assigns, from obtaining oil, gas and other minerals by directional drilling under the Site from well sites located on the Mineral Holdouts or tracts other than the Site, so long as such directional drilling is located at a minimum depth of one thousand (1,000) feet below the surface of the Site.

11. Use of Water by Lessee. During the Term Lessee shall be entitled to use all available water on or extracted from the Premises as Lessee deems necessary to conduct its operations. Lessee may drill, dig, and/or excavate one or more wells on the Premises, and extract water therefrom, for the purposes of servicing, construction, operating, and maintaining the Project, including purposes ancillary thereto such as dust mitigation.

12. Termination by Lessee. In addition to Lessee's other termination rights set forth in the Lease, Lessee reserves the right to terminate the Lease at any time after the Commercial Operation Date upon not less than one (1) year's notice to Owner. Lessee further reserves the right to terminate the Lease as to any part of the Premises at any time after the Commercial Operation Date upon not less than one (1) year's notice to Owner. Notwithstanding the foregoing, prior to the Commercial Operation Date, Lessee may terminate the Lease at any time.

13. Liens: Owner represents that Owner has not granted, and agrees that Owner will not grant, any mortgages, deeds of trust, voluntary liens, security interests or any other encumbrance encumbering all or any portion of the Premises, other than as set forth on Exhibit "D" to the Lease or shown of record in the Recorder's Office of Yakima/Benton County, Washington. Owner agrees to execute all documents reasonably requested by Lessee as are determined by Lessee to be necessary or appropriate to allow Lessee to enjoy the Premises without material interference.

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14. Right of Purchase or Refusal. Lessee does not have any right of purchase of or refusal on the Premises or any part thereof.

15. Interpretation; Conflicts: This Memorandum contains only selected provisions of the Lease, and reference is made to the full text of the Lease for the full terms and conditions. This Memorandum shall in no way alter, amend, modify, change, supersede or be used to interpret the Lease in any respect. This Memorandum is executed by the parties solely for the purpose of recordation in the Recorder's Office of Yakima/Benton County, Washington, and it is the intent of the parties that it shall give notice to and confirm the Lease to the same extent as if all of the provisions of the Lease were fully set forth herein. The Lease is hereby incorporated by reference into this Memorandum, and the parties hereby ratify and confirm all of the provisions of the Lease. In the event of any conflict or inconsistency between the provisions of this Memorandum and the provisions of the Lease, the provisions of the Lease shall control. A copy of the Lease is on file with Owner and Lessee and information regarding the Lease may be obtained from either Owner or Lessee at its address noted in the recitals to this Memorandum.

15. Governing Law: This Memorandum shall be construed in accordance with the laws of the State of Washington.

17. Counterparts: This Memorandum may be executed in two or more counterparts, each of which shall be deemed an original and all of which taken together shall constitute a single instrument.

[signature pages follow]

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IN WITNESS WHEREOF, this Memorandum is effective as of the date first written above.

OWNER(S):

Jean Emile Robert

STATE OF WASHINGTON)
) SS.
COUNTY OF Yakima)

This record was acknowledged before me on June 22, 2020 by Jean Emile Robert.

Notary Public in and for the State of Washington

My Commission Expires: 8/19/2021

LISETTE RAMOS NOTARY PUBLIC COMMISSION EXPIRES 8-19-21 STATE OF WASHINGTON

[signatures continue on following page]

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LESSEE:

INNERGEX RENEWABLE DEVELOPMENT USA, LLC
a Delaware limited liability company

By: _____
Name: Colleen Giraux-Schmidt
Title: Vice President, Corporate Relations

Province OF British Columbia
City ~~COUNTY~~ OF Vancouver) SS.

The foregoing instrument was acknowledged before me this 18 day of June, 2020 by Colleen Giraux-Schmidt as VP of Innergex Renewable Development USA, LLC, a Delaware limited liability company, on behalf of such company.

_____
Notary Public in and for the ~~State~~ Province of British Columbia

My Commission Expires: Does not expire.

ROBERT R. JUNG
Barrister & Solicitor
INNERGEX RENEWABLE ENER
888 DUNSMUIR STREET, SUIT
VANCOUVER, B.C. V6C 3
TEL: (604) 693-9990 FAX: (604)

ROBERT R. JUNG NOTARY PUBLIC BRITISH COLUMBIA

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EXHIBIT "A"

LEGAL DESCRIPTION OF PREMISES

NE Quarter of Section 29, Township 12 east, Range 24 EWM, situated in the County of Benton, Washington.

Approximately 160 acres total.

Auditor's Parcel Number: 1-2924-100-0000-000.

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2021-046407 AMD
10/07/2021 10:20:18 AM Page 1 of 6 Fees: $208.50
Brenda Chilton, County Auditor, Benton County, WA

After Recording Return to:

Innergex Renewable Development USA, LLC
4660 La Jolla Village Drive
Suite 680
San Diego, CA 92122
Attn: Landowner Relations

AMENDED MEMORANDUM OF ENERGY LEASE

GRANTOR/OWNER: Robert Ranch 5+1 LLC, a Washington limited liability company

GRANTEE/LESSEE: Innergex Renewable Development USA, LLC, a Delaware Limited Liability Company

Legal Description:
Abbreviated Form: SEC 33, T12N, R24 EWM

Additional Legal is on Exhibit A attached to document

Assessor's Tax Parcel ID No. 1-3324-000-0000-000

Reference Number(s) of Related Documents(s): 2021-008163

AMENDMENT TO THE MEMORANDUM OF SOLAR ENERGY LEASE

THIS AMENDMENT TO THE MEMORANDUM OF SOLAR ENERGY LEASE (this "Amendment") is being made this _____ day of _____, 2021, but shall be effective as of the _____ day of _____, 2021, by and between Robert Ranch 5 + 1 LLC, a Washington limited liability company having an address at 1521 Wautoma Rd, Sunnyside, WA, 98944-000 ("Owner"), and INNERGEX RENEWABLE DEVELOPMENT USA, LLC, a Delaware limited liability company, having an address at c/o Innergex Renewable Energy Inc., Suite 1100 – 888 Dunsmuir St., Vancouver, B.C. V6C 3K4, Canada, Attn: Legal (together with its successors and assigns, "Lessee"), who agree as follows:

RECITALS

A. Owner and Lessee entered into that certain Memorandum of Lease dated as of June 16, 2020, filed of record in the Benton County official records as Auditor's File Number 2021-008163 (the "Memorandum of Lease") related to a Solar Energy Lease dated May 28, 2020 (the "Lease") (the Memorandum of Lease incorrectly noted the date of Lease as June 2020).

B. Owner and Lessee desire to enter into this Amendment for purposes of adding certain real property to the Premises as described in the Memorandum of Lease to reflect an amendment to the Lease which expands the Premises subject to the Lease.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto hereby agree as follows:

MEMORANDUM

1. Additional Premises. The Premises as described in Exhibit "A" of the Memorandum of Lease is hereby amended to add and include that certain property containing approximately 640 acres of land described on Exhibit "A-1" attached hereto and made a part hereof, together will all surface and air space rights above, over, and across such land. Any reference to the approximate acreage of the Premises in the Memorandum of Lease is hereby amended to read 2,076 acres. For avoidance of doubt, this Amendment does not subtract any portion of the Premises as described in the Memorandum of Lease.

2. Other Terms and Conditions. Except as specifically amended herein, all of the terms and conditions of the Memorandum of Lease shall remain in full force and effect.

3. Definitions. All terms used herein, unless otherwise specified, shall have the meanings ascribed to them in the Memorandum of Lease.
4. Counterparts: This Amendment may be executed in two or more counterparts, each of which shall be deemed an original and all of which taken together shall constitute a single instrument.

[signature pages follow]

IN WITNESS WHEREOF, this Amendment is effective as of the date first written above.

OWNER(S):

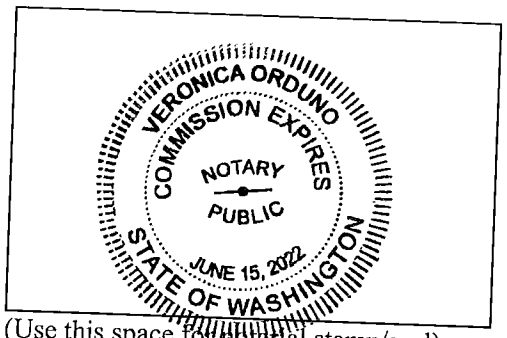
ROBERT RANCH 5 + 1 LLC,
a Washington limited liability company

By: ROBIN ROBERT
Name: Robin Robert
Title: MANAGER

ACKNOWLEDGMENT

STATE OF WASHINGTON)
) ss.
COUNTY OF YAKIMA)

This record was acknowledged before me on September 21, 2021 by Robin Robert as Manager of Robert Ranch 5 + 1 LLC, a Washington limited liability company.



(Use this space for notarial stamp/seal)

Veronica Orduno
Notary Public
Print Name veronica orduno
My commission expires 6-15-2022

[signatures continue on following page]

LESSEE:

INNERGEX RENEWABLE DEVELOPMENT USA, LLC
a Delaware limited liability company

By: _____
Name: MATTHEW KENNEDY
Title: VP ENVIRONMENT

ACKNOWLEDGMENT

Province ~~STATE~~ OF British Columbia)
City ~~COUNTY~~ OF Vancouver) ss.

This record was acknowledged before me on October 5, 2021 by Matt Kennedy, as VP-Environment of Innergex Renewable Development USA, LLC, a Delaware limited liability company.

ROBERT R. JUNG
Barrister & Solicitor
INNERGEX RENEWABLE ENERGY INC.
888 DUNSMUIR STREET, SUITE 1100
VANCOUVER, B.C. V6C 3K4
TEL: (604) 633-9990 FAX: (604) 633-9991

(Use this space for notarial stamp/seal)

_____
Notary Public
Print Name Robert Jung
My commission expires Does not expire.

EXHIBIT "A-1"

LEGAL DESCRIPTION OF ADDITIONAL PREMISES

TRACT FIVE:

ALL of Section 33, Township 12 North, Range 24, E.W.M., records of Benton County, Washington; Subject to patents, state or railroad deeds, buildings or use restrictions general to the area, zoning regulations, reserved oil and/or mineral rights, utility easements of record, rights of way or easements shown on the plat or visible by inspection, any future adjudication of surface water rights by appropriate federal and/or state proceeding, and any other easements, conditions, covenants, restrictions, agreements, reservations, and rights of way in use or of record, and liability for future assessments, if any. Approximately 640 acres total.

Auditor's Parcel Number: 1-3324-000-0000-000.

2021-008163 MEMO
02/18/2021 11:24:53 AM Pages: 15 Fee: $117.50
Innergex Renewable Dev Usa
Benton County, Benton County Auditor's Office

After Recording Return to:

Innergex Renewable Development USA, LLC
4660 La Jolla Village Drive
Suite 680
San Diego, CA 92122
Attn: Landowner Relations

MEMORANDUM OF SOLAR ENERGY LEASE

GRANTOR/OWNER: Robert 5+1 Ranch, LLC, a Washington limited liability company

GRANTEE/LESSEE: Innergex Renewable Development USA, LLC, a Delaware Limited Liability Company

Legal Description:
Abbreviated Form: Tract 1: Sec 28, T12N, R 24 EWM
Tract 2: E ½ W ½ Sec 29, T12N, R 24 EWM
Tract 3: S ½ Sec 21, T12N, R24 EWM
Tract 4: S 1.2 Sec 20, T12N, R24 EWM Exc Lots 2 & 3 Short Plat 1787

Additional Legal is on Exhibit A attached to document

Assessor's Tax Parcel ID No.: Tract 1: 1-2824-100-0000-000 and 1-2824-300-0000-000
Tract 2: 1-2924-300-0001-000
Tract 3: 1-2124-300-0000-000
Tract 4: 1-2024-400-0000-000, 1-2024-300-0003-000, 1-2024-300-0002-000, 1-2024-301-1787-001, and 1-2024-300-0004-000

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MEMORANDUM OF SOLAR ENERGY LEASE

THIS MEMORANDUM OF SOLAR ENERGY LEASE (this "Memorandum") is being made this 16th day of June, 2020, but shall be effective as of the ____ day of June, 2020, by and between Robert 5+1 Ranch, LLC, a Washington limited liability company, having an address at 1521 Wautoma Rd, Sunnyside, WA, 98944-0000 ("Owner"), and INNERGEX RENEWABLE DEVELOPMENT USA, LLC, a Delaware limited liability company, having an address at c/o Innergex Renewable Energy Inc., Suite 1100 – 888 Dunsmuir St., Vancouver, B.C. V6C 3K4, Canada, Attn: Legal (together with its successors and assigns, "Lessee"), who agree as follows:

1. Lease Agreement: Owner and Lessee certify that they have entered into that certain Solar Energy Lease (the "Lease") with an effective date of June ____, 2020 (the "Effective Date"), and hereby make specific reference to the terms, provisions, and conditions of the Lease as hereinafter set forth. Unless otherwise expressly provided herein, all capitalized terms used in this Memorandum shall have the same meanings ascribed to such terms in the Lease.

2. Premises: All that certain property containing approximately 1,436 acres of land described on Exhibit "A" attached hereto and made a part hereof, together with all surface rights and air space rights above, over, and across such land. The exact portion of the Premises to be leased by Lessee for the siting of the Generating Facility (the "Site") shall be determined prior to the end of the Development Term (as defined below), based on the results of a survey to be obtained by Lessee during the Development Term.

3. Development Term: The period commencing on the Effective Date and ending on the earlier of (i) the third (3rd) anniversary of the Effective Date, or (ii) the date Lessee begins the initial construction of Generating Facility Assets on the Premises (the "Construction Start Date"); provided however, that Lessee shall have the option to extend the Development Term for two (2) periods of one (1) year each, subject to the terms and conditions set forth in the Lease.

4. Construction Term: The period commencing on the Construction Start Date and ending on the first (1st) day the Project generates, sells, and delivers electricity in commercial quantities (i.e., excluding test runs of the facilities) to a purchaser, including but not limited to a utility or cooperative, subject to the terms and conditions set forth in the Lease (the "Commercial Operation Date").

5. Lease Term: The period commencing on the Commercial Operation Date and expiring on the thirtieth (30th) anniversary of the Commercial Operation Date (the "Initial Lease Term"); provided, however, that Lessee, at its option, shall have the right to extend the

term of the Lease for two additional periods of ten (10) years each (each, an "Extension Term"), commencing on the expiration of the Initial Lease Term, or the expiration of the first Extension Term, as applicable. The Development Term, Construction Term, and Lease Term shall hereafter be collectively referred to as the "Term."

6. Automatic Termination: If construction of the Generating Facility Assets on the Premises has not started before the expiration of the Development Term, the Lease shall terminate and be of no further force or effect except for obligations set forth therein that expressly survive such termination, without any further action being necessary on the part of Owner or Lessee.

7. Use of the Premises:

A. During the Term, Lessee has the right to use the Premises to conduct studies of, without limitation, solar radiation, solar energy, and soils, and collect other meteorological, archaeological, biological, hydrological, and geotechnical data, for surveys, and for installation, construction, operation, maintenance, repair, improvement, replacement, and removal of the Generating Facility and uses incidental thereto (the "Permitted Use"), and for no other business or purpose. During the Construction Term and Lease Term, Lessee shall have exclusive possession of the Site and shall have the sole and exclusive right to use the Site for solar operations and to convert all of the solar resources of the Site for solar energy generation and purposes ancillary thereto. The Permitted Use includes, without limitation, the following:

(i) the exclusive easement and right to erect, construct, reconstruct, install, reinstall, replace, relocate, remove, operate, maintain and use the following from time to time, on, under, over, and across the Premises, in connection with the Generating Facility, whether such Generating Facility is located on the Premises or elsewhere on one or more solar energy projects (in such locations as Lessee shall determine from time to time in the exercise of its sole discretion after notice to Owner): (a) solar energy collection cells, panels, mirrors, lenses, combiner boxes, inverters, battery and energy storage facilities, and other related facilities necessary to harness and store sunlight for photovoltaic or solar thermal electric energy generation, including without limitation, fossil fuel-based boilers, heating, and power generation systems installed in connection with the foregoing facilities, existing and future technologies used or useful in connection with the generation of electricity from sunlight, and associated support structures, foundations, racking, braces, wiring, plumbing, and related equipment constructed on the Premises; (b) a line or lines of towers, with such wires and cables as from time to time are suspended therefrom, and above ground and/or underground wires and cables, for the transmission, distribution, and collection of electrical energy and/or for communication purposes, and all necessary and proper foundations, footings, cross-arms, and other appliances and fixtures for use in connection with said towers, wires, and cables; (c) facilities consisting of: (1) one or more substations for electrical collection, to step up the voltage, interconnect to transmission line or lines, and meter electricity, together with the right

to perform all other ancillary activities normally associated with such a facility as may be necessary or appropriate as determined by Lessee to service the Generating Facility, regardless where located, and regardless of whether required by any applicable law, governmental entity, transmission operator, or otherwise, and (2) an operations and maintenance building, equipment, and storage yard for purposes of performing operations and maintenance service on the Generating Facility, regardless of where located, together with the right to perform all other ancillary activities normally associated with such an operation, including the installation of a well to provide water to such operations and maintenance building; (d) any other improvements, including roads, fixtures, facilities, fences, gates, machinery, and equipment useful or appropriate to accomplish any of the foregoing (the facilities described in (a) through (d) shall also constitute "Generating Facility Assets"); and (e) with all necessary easements therefor;

(ii) an exclusive easement and right over and across the Premises and any adjacent property owned by Owner not included in the Site for any audio, visual, view, light, shadow, noise, vibration, electromagnetic, or other effect of any kind or nature whatsoever resulting, directly or indirectly, from the Generating Facility;

(iii) an exclusive easement and right to capture, use, and convert the unobstructed solar resources over and across the Premises and any adjacent property owned by Owner not included in the Site; any obstruction to the receipt of and access to sunlight throughout the entire area of the Premises is prohibited;

(iv) an easement and right on the Premises to prevent measurable diminishment in output due to obstruction of the sunlight across the Premises including but not limited to an easement right to trim, cut down and remove all trees (whether natural or cultivated), brush, vegetation and fire and electrical hazards now or hereafter existing on the Premises which might obstruct receipt of or access to sunlight throughout the Premises or interfere with or endanger the Generating Facility or Lessee's operations, as determined by Lessee;

(v) the easement and right of subjacent and lateral support on the Premises to whatever is necessary for the operation and maintenance of the Generating Facility, including, without limitation, guy wires and supports;

(vi) a non-exclusive easement for audio, visual, view, light, electromagnetic, electrical and radio frequency interference, and any other effects attributable or ancillary to the Generating Facility or Lessee's operations (such as transmission of radio waves or communication signals); and

(vii) the easement and right to undertake any such purposes or other activities, whether accomplished by Lessee or a third party authorized by Lessee, that Lessee determines are necessary, useful or appropriate to accomplish any of the purposes or uses set forth in the Lease or that are compatible with or related to such purposes or uses.

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The easement rights granted by Owner under the Lease constitute **EASEMENTS IN GROSS**, personal to and for the benefit of Lessee, its successors and assigns, as owner and holder of such easements, and the parties expressly agree that such easement rights shall be transferable in accordance with the assignment provisions of the Lease. The parties expressly intend for all easement rights in the Lease to be, and for the Lease to create, **EASEMENTS IN GROSS** in Lessee, and neither such easements nor the Lease shall be appurtenant to any other property or interest.

B. Lessee shall have the right to construct structures on the Site Lessee determines are reasonably necessary, required, or useful in conjunction with the operation or maintenance of the Generating Facility or enabling the Generating Facility to be connected to an electricity distribution or transmission network.

C. If any portion of the Premises is designated as Mineral Holdouts (as defined in the Lease), then, notwithstanding anything to the contrary herein or in the Lease, Lessee may utilize such Mineral Holdouts as a construction lay-down area during the Construction Term and Lease Term if such area is not then being used for mineral development. Lessee and Owner shall cooperate with each other to provide reasonable accommodation for any holders of mineral rights to access and utilize the Mineral Holdouts space, provided that such activity does not interfere in any respect with the Permitted Use.

D. Lessee shall have the sole and exclusive right to collect and convert all of the solar resources of, and to conduct its operations on, the Premises. Owner shall not grant any rights in the Premises purporting to permit others to conduct operations on the Premises in derogation of Lessee's sole and exclusive rights. Without the prior written consent of Lessee, Owner shall not (i) waive any right available to Owner or grant any right or privilege subject to the consent of Owner by law or contract, including without limitation any environmental regulation, land use ordinance, or zoning regulation, with respect to setback requirements, noise limitations, or other restrictions and conditions respecting the placement or use of the Generating Facility and other equipment ancillary to the Project (as defined in the Lease) on parcels adjacent to or in the vicinity of the Premises, or (ii) grant, confirm, acknowledge, recognize, or acquiesce in any right claimed by any other Person to conduct operations on the Premises whether arising in judicial proceedings or otherwise, and Owner agrees to give Lessee notice of any such claims or proceeding with respect to such claims and to cooperate with Lessee in resisting and disputing such claims.

8. Ownership:

A. Owner acknowledges and agrees that Lessee or its affiliate, successor, or assignee is the exclusive owner and operator of the Generating Facility, Owner has no rights to the Generating Facility or any part of it (notwithstanding that the Generating Facility or any of the Generating Facility Assets may be deemed improvements or fixtures on the Site), and

Owner may not sell, lease, assign, mortgage, pledge, or otherwise alienate or encumber (collectively, a "Transfer") the Generating Facility or any interest therein or the leasehold rights to the Site, whether with the fee interest or any other rights to the Site otherwise held by Owner. Owner shall give Lessee at least thirty (30) days' written notice prior to any Transfer of all or a portion of the Site identifying the transferee, the portion of Site to be transferred, and the proposed date of Transfer.

B. Owner agrees and acknowledges that the Generating Facility and all Generating Facility Assets shall remain the property of Lessee, and Lessee shall have the right to remove the same at any time during the Term, whether or not said items are considered improvements, fixtures or attachments to real property under applicable laws. Owner shall have no ownership, lien, security interest, or other interest in any part of the Generating Facility, the Generating Facility Assets, or any profits or proceeds derived therefrom. Owner hereby waives all rights or claims (whether under statutory law, common law, or otherwise) that it may have in or otherwise with respect to the Generating Facility and the Generating Facility Assets, including, without limitation, any Owner's lien or other encumbrance on any property of Lessee.

C. Owner acknowledges that Lessee (or, as applicable, its affiliate(s), successor(s), or assignee(s)) is the exclusive owner of all (i) energy generated by the Generating Facility and (ii) Environmental Attributes and Environmental Incentives of the Generating Facility (as such terms are defined in the Lease).

D. Notwithstanding the exclusive nature of the Lease, but without limiting any of Lessee's obligations under the Lease, nothing expressly stated or implied in the Lease or represented to Owner shall be construed as requiring Lessee to: (i) undertake construction, installation or operation of all or any portion of the Project on the Premises or elsewhere; (ii) generate or sell any minimum or maximum amount of energy from the Site or any other portion of the Premises; (iii) continue operations of all or any portion of the Project from time to time located on the Site or elsewhere; or (iv) prohibit Lessee from removing all or any portion of the Project from the Premises.

9. No Interference: Lessee shall peaceably, quietly, and exclusively hold and enjoy the Premises from and after the Effective Date and continuing until the expiration or earlier termination of the Lease, without hindrance from Owner or those claiming title or possession by, through or under Owner, subject to the Existing Rights (as defined in the Lease) and the performance by Lessee of all of the terms and conditions of the Lease to be performed by Lessee. Owner will not interfere with the passage of solar radiation onto the Premises during the Lease Term or take any action that would interfere with such passage while the Project is in operation. Owner shall not conduct any activity, or grant any rights to any third party, whether on the Premises or elsewhere, that would interfere in any way with or materially increase the cost of Lessee's use of the Premises or exercise of any of the rights granted under the Lease, including for greater certainty the planting of trees, unmaintained growth of foliage,

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construction of any improvement, structure, impediment, wall, fence, or other object on the Premises or other adjacent real property that could adversely affect the passage of solar radiation onto the Site.

10. Ownership and Use by Owner of Mineral Rights. The parties agree that Owner shall retain all mineral rights (the "Mineral Rights") and water rights in connection with the Site owned by Owner as of the Effective Date with the limitation during the Term that Owner expressly releases and waives, on behalf of itself and its successors and assigns, all rights of ingress and egress to enter upon the surface of the Site (other than the Mineral Holdouts), and the area located between the surface and one thousand (1,000) feet beneath the surface of the Site for purposes of exploring for, developing, drilling, producing, transporting, or any other purposes incident to the development or production of oil, gas, or other minerals. The foregoing provision shall be a covenant running with the land binding upon any party owning any interest in, or rights to develop or use the Mineral Rights, and all future owners and lessees of any such rights, titles, or interests in or to the Mineral Rights, shall be subject to and burdened by the foregoing waiver of rights and automatically be deemed to include a contractual waiver by the lessee, assignee, or grantee, as applicable. However, nothing herein contained shall be construed to prevent Owner, its successors and assigns, from obtaining oil, gas and other minerals by directional drilling under the Site from well sites located on the Mineral Holdouts or tracts other than the Site, so long as such directional drilling is located at a minimum depth of one thousand (1,000) feet below the surface of the Site.

11. Use of Water by Lessee. During the Term Lessee shall be entitled to use all available water on or extracted from the Premises as Lessee deems necessary to conduct its operations. Lessee may drill, dig, and/or excavate one or more wells on the Premises, and extract water therefrom, for the purposes of servicing, construction, operating, and maintaining the Project, including purposes ancillary thereto such as dust mitigation.

12. Termination by Lessee. In addition to Lessee's other termination rights set forth in the Lease, Lessee reserves the right to terminate the Lease at any time after the Commercial Operation Date upon not less than one (1) year's notice to Owner. Lessee further reserves the right to terminate the Lease as to any part of the Premises at any time after the Commercial Operation Date upon not less than one (1) year's notice to Owner. Notwithstanding the foregoing, prior to the Commercial Operation Date, Lessee may terminate the Lease at any time.

13. Liens: Owner represents that Owner has not granted, and agrees that Owner will not grant, any mortgages, deeds of trust, voluntary liens, security interests or any other encumbrance encumbering all or any portion of the Premises, other than as set forth on Exhibit "D" to the Lease or shown of record in the Recorder's Office of Yakima/Benton County, Washington. Owner agrees to execute all documents reasonably requested by Lessee as are determined by Lessee to be necessary or appropriate to allow Lessee to enjoy the Premises without material interference.

14. Right of Purchase or Refusal. Lessee does not have any right of purchase of or refusal on the Premises or any part thereof.

15. Interpretation; Conflicts: This Memorandum contains only selected provisions of the Lease, and reference is made to the full text of the Lease for the full terms and conditions. This Memorandum shall in no way alter, amend, modify, change, supersede or be used to interpret the Lease in any respect. This Memorandum is executed by the parties solely for the purpose of recordation in the Recorder's Office of Yakima/Benton County, Washington, and it is the intent of the parties that it shall give notice to and confirm the Lease to the same extent as if all of the provisions of the Lease were fully set forth herein. The Lease is hereby incorporated by reference into this Memorandum, and the parties hereby ratify and confirm all of the provisions of the Lease. In the event of any conflict or inconsistency between the provisions of this Memorandum and the provisions of the Lease, the provisions of the Lease shall control. A copy of the Lease is on file with Owner and Lessee and information regarding the Lease may be obtained from either Owner or Lessee at its address noted in the recitals to this Memorandum.

15. Governing Law: This Memorandum shall be construed in accordance with the laws of the State of Washington.

17. Counterparts: This Memorandum may be executed in two or more counterparts, each of which shall be deemed an original and all of which taken together shall constitute a single instrument.

[signature pages follow]

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IN WITNESS WHEREOF, this Memorandum is effective as of the date first written above.

OWNER(S):

Robert 5+1 Ranch, LLC

By: Michael V. Robert
Name: Michael V. Robert
Title: ~~associate~~ mg member

By: Robin Robert
Name: ROBIN ROBERT
Title: MANAGER

By: Jean E Robert
Name: Jean E Robert
Title: Manager

By: David Robert
Name: David Robert
Title: member

By: Randy Robert
Name: Randy Robert
Title: member

By: Samantha Memon
Name: Samantha Memon
Title: member

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STATE OF ~~WASHINGTON~~ Oregon)
) SS.
COUNTY OF Clackamas)

This record was acknowledged before me this 16th day of June, 2020, by Michael V Kent, as ~~Pres~~ Member of Robert 5+1 Ranch, LLC, a Washington Limited Liability Company.

Notary Public in and for the State of Oregon

My Commission Expires: 12/9/2022

OFFICIAL STAMP
JUSTIN BRYANT APA
NOTARY PUBLIC-OREGON
COMMISSION NO. 981726
MY COMMISSION EXPIRES DECEMBER 9, 2022

STATE OF WASHINGTON)
) SS.
COUNTY OF Yakima)

This record was acknowledged before me this 22nd day of June, 2020, by Robin Robert, as manager of Robert 5+1 Ranch, LLC, a Washington Limited Liability Company.

Notary Public in and for the State of Washington

My Commission Expires: 8/19/2021

LISETTE RAMOS
NOTARY PUBLIC
STATE OF WASHINGTON
COMMISSION EXPIRES
8-19-21

Unofficial Copy

STATE OF WASHINGTON)
) SS.
COUNTY OF Yakima)

This record was acknowledged before me this 22nd day of June, 2020, by Jean E. Robert, as manager of Robert 5+1 Ranch, LLC, a Washington Limited Liability Company.

Notary Public in and for the State of Washington

My Commission Expires: 8/19/2021

LISETTE RAMOS NOTARY PUBLIC COMMISSION EXPIRES 8-19-21 STATE OF WASHINGTON

STATE OF WASHINGTON)
) SS.
COUNTY OF Yakima)

This record was acknowledged before me this 22nd day of June, 2020, by David A. Robert, as member of Robert 5+1 Ranch, LLC, a Washington Limited Liability Company.

Notary Public in and for the State of Washington

My Commission Expires: 8-19-2021

LISETTE RAMOS NOTARY PUBLIC COMMISSION EXPIRES 8-19-21 STATE OF WASHINGTON

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STATE OF WASHINGTON)
) SS.
COUNTY OF YAKIMA)

This record was acknowledged before me this 24th day of June, 2020, by Randy Robert, as member of Robert 5+1 Ranch, LLC, a Washington Limited Liability Company.

Erin Lynn Moloney
Notary Public in and for the State of WA

My Commission Expires: 9-1-2023

ERIN LYNN MOLONEY COMMISSION EXPIRES NOTARY PUBLIC SEPTEMBER 1, 2023 STATE OF WASHINGTON

STATE OF WASHINGTON)
) SS.
COUNTY OF Yakima)

This record was acknowledged before me this 24th day of June, 2020, by Samantha Mesman, as _____ of Robert 5+1 Ranch, LLC, a Washington Limited Liability Company.

Erin Lynn Moloney
Notary Public in and for the State of WA

My Commission Expires: 9-1-2023

ERIN LYNN MOLONEY COMMISSION EXPIRES NOTARY PUBLIC SEPTEMBER 1, 2023 STATE OF WASHINGTON

[signatures continue on following page]

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LESSEE:

INNERGEX RENEWABLE DEVELOPMENT USA, LLC
a Delaware limited liability company

By: _____
Name: Colleen Giroux-Schmidt
Title: Vice President, Corporate Relations

Province OF British Columbia
~~COUNTY~~ City OF Vancouver) SS.

The foregoing instrument was acknowledged before me this 18 day of June, 2020, by Colleen Giroux-Schmidt as VP of Innergex Renewable Development USA, LLC, a Delaware limited liability company, on behalf of such company.

_____
Notary Public in and for the State of British Columbia
Province

My Commission Expires: Does not expire.

ROBERT R. JUNG
Barrister & Solicitor
INNERGEX RENEWABLE ENERGY INC.
888 DUNSMUIR STREET, SUITE [illegible]
VANCOUVER, B.C. V6C 3K4
TEL: (604) 633-[illegible] FAX: (604) 633-[illegible]

RICHARD JUNG NOTARY PUBLIC OF BRITISH COLUMBIA

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EXHIBIT "A"

LEGAL DESCRIPTION OF PREMISES

TRACT ONE:

All of Section 28, Township 12, North, Range 24, E.W.M., records of Benton County, Washington. SUBJECT TO patents, state or railroad deeds, buildings or use restrictions general to the area, zoning regulations, reserved oil and/or mineral rights, utility easements of record, rights of way or easements shown on the plat or visible by inspection, any future adjudication of surface water rights by appropriate federal and/or state proceeding, and any other easements, conditions, covenants, restrictions, agreements, reservations, and rights of way in use or of record, and liability for future assessments, if any.

Approximately 640 acres total.

Auditor's Parcel Number: 1-2824-100-0000-000 and 1-2824-300-0000-000

TRACT TWO:

The East half of the West half of Section 29, Township 12 North, Range 24, E.W.M., records of Benton County, Washington. SUBJECT TO patents, state or railroad deeds, buildings or use restrictions general to the area, zoning regulations, reserved oil and/or mineral rights, utility easements of record, rights of way or easements shown on the plat or visible by inspection, any future adjudication of surface water rights by appropriate federal and/or state proceeding, and any other easements, conditions, covenants, restrictions, agreements, reservations, and rights of way in use or of record, and liability for future assessments, if any.

Approximately 160 acres total.

Auditor's Parcel Number: 1-2924-300-0001-000

TRACT THREE:

The South half of Section 21, Township 12 North, Range 24 E.W.M., records of Benton County, Washington. SUBJECT TO patents, state or railroad deeds, buildings or use restrictions general to the area, zoning regulations, reserved oil and/or mineral rights, utility easements of record, rights of way or easements shown on the plat or visible by inspection, any future adjudication of surface water rights by appropriate federal and/or state proceeding, and any other easements, conditions, covenants, restrictions, agreements, reservations, and rights of way in use or of record, and liability for future assessments, if any.

Approximately 320 acres total.

Auditor's Parcel Number: 1-2124-300-0000-000

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TRACT FOUR:

The South Half of Section 20, Township 12 North, Range 24, E.W.M., EXCEPT for Lots 2 and 3 of Short Plat No. 1787, records of Barton County Washington, SUBJECT TO patents, state or railroad deeds, buildings or use restrictions general to the area, zoning regulations, reserved oil and/or mineral rights, utility easements of record, rights of way or easements shown on the plat or visible by inspection, any future adjudication of surface water rights by appropriate federal and/or state proceeding, and any other easements, conditions, covenants, restrictions, agreements, reservations, and rights of way in use or of record, and liability for future assessments, if any.

Approximately 316 acres total.

Auditor's Parcel Number: 1-2024-400-0000-000, 1-2024-300-0003-000, 1-2024-300-0002-000, 1-2024-301-1787-001, and 1-2024-300-0004-000

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2021-008160 MEMO
02/18/2021 11:24:53 AM Pages: 15 Fee: $117.50
Innergex Renewable Dev Usa
Benton County, Benton County Auditor's Office

After Recording Return to:

Innergex Renewable Development USA, LLC
4660 La Jolla Village Drive
Suite 680
San Diego, CA 92122
Attn: Landowner Relations

MEMORANDUM OF SOLAR ENERGY LEASE

GRANTOR/OWNER: Marilyn R. Ford, an unmarried person; Michael V. Robert, an unmarried person; and Douglas L. Robert, a married person

GRANTEE/LESSEE: Innergex Renewable Development USA, LLC, a Delaware Limited Liability Company

Legal Description:
Abbreviated Form: Short Plat #2749, Lot 1, Abstract No. 2003-043722

Additional Legal is on Exhibit A attached to document

Assessor's Tax Parcel ID No. 1-1924-101-2749-001

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MEMORANDUM OF SOLAR ENERGY LEASE

THIS MEMORANDUM OF SOLAR ENERGY LEASE (this "Memorandum") is being made this _____ day of June, 2020, but shall be effective as of the ____ day of June, 2020, by and between Marilyn R. Ford, an unmarried person; Michael V. Robert, an unmarried person; and Douglas L. Robert, a married person, having an address at 5804 W. Walnut, Yakama, WA 98908 (collectively, "Owner"), and INNERGEX RENEWABLE DEVELOPMENT USA, LLC, a Delaware limited liability company, having an address at c/o Innergex Renewable Energy Inc., Suite 1100 – 888 Dunsmuir St., Vancouver, B.C. V6C 3K4, Canada, Attn: Legal (together with its successors and assigns, "Lessee"), who agree as follows:

1. Lease Agreement: Owner and Lessee certify that they have entered into that certain Solar Energy Lease (the "Lease") with an effective date of June _____, 2020 (the "Effective Date"), and hereby make specific reference to the terms, provisions, and conditions of the Lease as hereinafter set forth. Unless otherwise expressly provided herein, all capitalized terms used in this Memorandum shall have the same meanings ascribed to such terms in the Lease.

2. Premises: All that certain property containing approximately 267 acres of land described on Exhibit "A" attached hereto and made a part hereof, together with all surface rights and air space rights above, over, and across such land. The exact portion of the Premises to be leased by Lessee for the siting of the Generating Facility (the "Site") shall be determined prior to the end of the Development Term (as defined below), based on the results of a survey to be obtained by Lessee during the Development Term.

3. Development Term: The period commencing on the Effective Date and ending on the earlier of (i) the third (3rd) anniversary of the Effective Date, or (ii) the date Lessee begins the initial construction of Generating Facility Assets on the Premises (the "Construction Start Date"); provided however, that Lessee shall have the option to extend the Development Term for two (2) periods of one (1) year each, subject to the terms and conditions set forth in the Lease.

4. Construction Term: The period commencing on the Construction Start Date and ending on the first (1st) day the Project generates, sells, and delivers electricity in commercial quantities (i.e., excluding test runs of the facilities) to a purchaser, including but not limited to a utility or cooperative, subject to the terms and conditions set forth in the Lease (the "Commercial Operation Date").

5. Lease Term: The period commencing on the Commercial Operation Date and expiring on the thirtieth (30th) anniversary of the Commercial Operation Date (the "Initial Lease Term"); provided, however, that Lessee, at its option, shall have the right to extend the

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term of the Lease for two additional periods of ten (10) years each (each, an "Extension Term"), commencing on the expiration of the Initial Lease Term, or the expiration of the first Extension Term, as applicable. The Development Term, Construction Term, and Lease Term shall hereafter be collectively referred to as the "Term."

6. Automatic Termination: If construction of the Generating Facility Assets on the Premises has not started before the expiration of the Development Term, the Lease shall terminate and be of no further force or effect except for obligations set forth therein that expressly survive such termination, without any further action being necessary on the part of Owner or Lessee.

7. Use of the Premises:

A. During the Term, Lessee has the right to use the Premises to conduct studies of, without limitation, solar radiation, solar energy, and soils, and collect other meteorological, archaeological, biological, hydrological, and geotechnical data, for surveys, and for installation, construction, operation, maintenance, repair, improvement, replacement, and removal of the Generating Facility and uses incidental thereto (the "Permitted Use"), and for no other business or purpose. During the Construction Term and Lease Term, Lessee shall have exclusive possession of the Site and shall have the sole and exclusive right to use the Site for solar operations and to convert all of the solar resources of the Site for solar energy generation and purposes ancillary thereto. The Permitted Use includes, without limitation, the following:

(i) the exclusive easement and right to erect, construct, reconstruct, install, reinstall, replace, relocate, remove, operate, maintain and use the following from time to time, on, under, over, and across the Premises, in connection with the Generating Facility, whether such Generating Facility is located on the Premises or elsewhere on one or more solar energy projects (in such locations as Lessee shall determine from time to time in the exercise of its sole discretion after notice to Owner): (a) solar energy collection cells, panels, mirrors, lenses, combiner boxes, inverters, battery and energy storage facilities, and other related facilities necessary to harness and store sunlight for photovoltaic or solar thermal electric energy generation, including without limitation, fossil fuel-based boilers, heating, and power generation systems installed in connection with the foregoing facilities, existing and future technologies used or useful in connection with the generation of electricity from sunlight, and associated support structures, foundations, racking, braces, wiring, plumbing, and related equipment constructed on the Premises; (b) a line or lines of towers, with such wires and cables as from time to time are suspended therefrom, and above ground and/or underground wires and cables, for the transmission, distribution, and collection of electrical energy and/or for communication purposes, and all necessary and proper foundations, footings, cross-arms, and other appliances and fixtures for use in connection with said towers, wires, and cables; (c) facilities consisting of: (1) one or more substations for electrical collection, to step up the voltage, interconnect to transmission line or lines, and meter electricity, together with the right

to perform all other ancillary activities normally associated with such a facility as may be necessary or appropriate as determined by Lessee to service the Generating Facility, regardless where located, and regardless of whether required by any applicable law, governmental entity, transmission operator, or otherwise, and (2) an operations and maintenance building, equipment, and storage yard for purposes of performing operations and maintenance service on the Generating Facility, regardless of where located, together with the right to perform all other ancillary activities normally associated with such an operation, including the installation of a well to provide water to such operations and maintenance building; (d) any other improvements, including roads, fixtures, facilities, fences, gates, machinery, and equipment useful or appropriate to accomplish any of the foregoing (the facilities described in (a) through (d) shall also constitute "Generating Facility Assets"); and (e) with all necessary easements therefor;

(ii) an exclusive easement and right over and across the Premises and any adjacent property owned by Owner not included in the Site for any audio, visual, view, light, shadow, noise, vibration, electromagnetic, or other effect of any kind or nature whatsoever resulting, directly or indirectly, from the Generating Facility;

(iii) an exclusive easement and right to capture, use, and convert the unobstructed solar resources over and across the Premises and any adjacent property owned by Owner not included in the Site; any obstruction to the receipt of and access to sunlight throughout the entire area of the Premises is prohibited;

(iv) an easement and right on the Premises to prevent measurable diminishment in output due to obstruction of the sunlight across the Premises including but not limited to an easement right to trim, cut down and remove all trees (whether natural or cultivated), brush, vegetation and fire and electrical hazards now or hereafter existing on the Premises which might obstruct receipt of or access to sunlight throughout the Premises or interfere with or endanger the Generating Facility or Lessee's operations, as determined by Lessee;

(v) the easement and right of subjacent and lateral support on the Premises to whatever is necessary for the operation and maintenance of the Generating Facility, including, without limitation, guy wires and supports;

(vi) a non-exclusive easement for audio, visual, view, light, electromagnetic, electrical and radio frequency interference, and any other effects attributable or ancillary to the Generating Facility or Lessee's operations (such as transmission of radio waves or communication signals); and

(vii) the easement and right to undertake any such purposes or other activities, whether accomplished by Lessee or a third party authorized by Lessee, that Lessee determines are necessary, useful or appropriate to accomplish any of the purposes or uses set forth in the Lease or that are compatible with or related to such purposes or uses.

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The easement rights granted by Owner under the Lease constitute **EASEMENTS IN GROSS**, personal to and for the benefit of Lessee, its successors and assigns, as owner and holder of such easements, and the parties expressly agree that such easement rights shall be transferable in accordance with the assignment provisions of the Lease. The parties expressly intend for all easement rights in the Lease to be, and for the Lease to create, **EASEMENTS IN GROSS** in Lessee, and neither such easements nor the Lease shall be appurtenant to any other property or interest.

B. Lessee shall have the right to construct structures on the Site Lessee determines are reasonably necessary, required, or useful in conjunction with the operation or maintenance of the Generating Facility or enabling the Generating Facility to be connected to an electricity distribution or transmission network.

C. If any portion of the Premises is designated as Mineral Holdouts (as defined in the Lease), then, notwithstanding anything to the contrary herein or in the Lease, Lessee may utilize such Mineral Holdouts as a construction lay-down area during the Construction Term and Lease Term if such area is not then being used for mineral development. Lessee and Owner shall cooperate with each other to provide reasonable accommodation for any holders of mineral rights to access and utilize the Mineral Holdouts space, provided that such activity does not interfere in any respect with the Permitted Use.

D. Lessee shall have the sole and exclusive right to collect and convert all of the solar resources of, and to conduct its operations on, the Premises. Owner shall not grant any rights in the Premises purporting to permit others to conduct operations on the Premises in derogation of Lessee's sole and exclusive rights. Without the prior written consent of Lessee, Owner shall not (i) waive any right available to Owner or grant any right or privilege subject to the consent of Owner by law or contract, including without limitation any environmental regulation, land use ordinance, or zoning regulation, with respect to setback requirements, noise limitations, or other restrictions and conditions respecting the placement or use of the Generating Facility and other equipment ancillary to the Project (as defined in the Lease) on parcels adjacent to or in the vicinity of the Premises, or (ii) grant, confirm, acknowledge, recognize, or acquiesce in any right claimed by any other Person to conduct operations on the Premises whether arising in judicial proceedings or otherwise, and Owner agrees to give Lessee notice of any such claims or proceeding with respect to such claims and to cooperate with Lessee in resisting and disputing such claims.

8. Ownership:

A. Owner acknowledges and agrees that Lessee or its affiliate, successor, or assignee is the exclusive owner and operator of the Generating Facility, Owner has no rights to the Generating Facility or any part of it (notwithstanding that the Generating Facility or any of the Generating Facility Assets may be deemed improvements or fixtures on the Site), and

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Owner may not sell, lease, assign, mortgage, pledge, or otherwise alienate or encumber (collectively, a "Transfer") the Generating Facility or any interest therein or the leasehold rights to the Site, whether with the fee interest or any other rights to the Site otherwise held by Owner. Owner shall give Lessee at least thirty (30) days' written notice prior to any Transfer of all or a portion of the Site identifying the transferee, the portion of Site to be transferred, and the proposed date of Transfer.

B. Owner agrees and acknowledges that the Generating Facility and all Generating Facility Assets shall remain the property of Lessee, and Lessee shall have the right to remove the same at any time during the Term, whether or not said items are considered improvements, fixtures or attachments to real property under applicable laws. Owner shall have no ownership, lien, security interest, or other interest in any part of the Generating Facility, the Generating Facility Assets, or any profits or proceeds derived therefrom. Owner hereby waives all rights or claims (whether under statutory law, common law, or otherwise) that it may have in or otherwise with respect to the Generating Facility and the Generating Facility Assets, including, without limitation, any Owner's lien or other encumbrance on any property of Lessee.

C. Owner acknowledges that Lessee (or, as applicable, its affiliate(s), successor(s), or assignee(s)) is the exclusive owner of all (i) energy generated by the Generating Facility and (ii) Environmental Attributes and Environmental Incentives of the Generating Facility (as such terms are defined in the Lease).

D. Notwithstanding the exclusive nature of the Lease, but without limiting any of Lessee's obligations under the Lease, nothing expressly stated or implied in the Lease or represented to Owner shall be construed as requiring Lessee to: (i) undertake construction, installation or operation of all or any portion of the Project on the Premises or elsewhere; (ii) generate or sell any minimum or maximum amount of energy from the Site or any other portion of the Premises; (iii) continue operations of all or any portion of the Project from time to time located on the Site or elsewhere; or (iv) prohibit Lessee from removing all or any portion of the Project from the Premises.

9. No Interference: Lessee shall peaceably, quietly, and exclusively hold and enjoy the Premises from and after the Effective Date and continuing until the expiration or earlier termination of the Lease, without hindrance from Owner or those claiming title or possession by, through or under Owner, subject to the Existing Rights (as defined in the Lease) and the performance by Lessee of all of the terms and conditions of the Lease to be performed by Lessee. Owner will not interfere with the passage of solar radiation onto the Premises during the Lease Term or take any action that would interfere with such passage while the Project is in operation. Owner shall not conduct any activity, or grant any rights to any third party, whether on the Premises or elsewhere, that would interfere in any way with or materially increase the cost of Lessee's use of the Premises or exercise of any of the rights granted under the Lease, including for greater certainty the planting of trees, unmaintained growth of foliage,

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construction of any improvement, structure, impediment, wall, fence, or other object on the Premises or other adjacent real property that could adversely affect the passage of solar radiation onto the Site.

10. Ownership and Use by Owner of Mineral Rights. The parties agree that Owner shall retain all mineral rights (the "Mineral Rights") and water rights in connection with the Site owned by Owner as of the Effective Date with the limitation during the Term that Owner expressly releases and waives, on behalf of itself and its successors and assigns, all rights of ingress and egress to enter upon the surface of the Site (other than the Mineral Holdouts), and the area located between the surface and one thousand (1,000) feet beneath the surface of the Site for purposes of exploring for, developing, drilling, producing, transporting, or any other purposes incident to the development or production of oil, gas, or other minerals. The foregoing provision shall be a covenant running with the land binding upon any party owning any interest in, or rights to develop or use the Mineral Rights, and all future owners and lessees of any such rights, titles, or interests in or to the Mineral Rights, shall be subject to and burdened by the foregoing waiver of rights and automatically be deemed to include a contractual waiver by the lessee, assignee, or grantee, as applicable. However, nothing herein contained shall be construed to prevent Owner, its successors and assigns, from obtaining oil, gas and other minerals by directional drilling under the Site from well sites located on the Mineral Holdouts or tracts other than the Site, so long as such directional drilling is located at a minimum depth of one thousand (1,000) feet below the surface of the Site.

11. Use of Water by Lessee. During the Term Lessee shall be entitled to use all available water on or extracted from the Premises as Lessee deems necessary to conduct its operations. Lessee may drill, dig, and/or excavate one or more wells on the Premises, and extract water therefrom, for the purposes of servicing, construction, operating, and maintaining the Project, including purposes ancillary thereto such as dust mitigation.

12. Termination by Lessee. In addition to Lessee's other termination rights set forth in the Lease, Lessee reserves the right to terminate the Lease at any time after the Commercial Operation Date upon not less than one (1) year's notice to Owner. Lessee further reserves the right to terminate the Lease as to any part of the Premises at any time after the Commercial Operation Date upon not less than one (1) year's notice to Owner. Notwithstanding the foregoing, prior to the Commercial Operation Date, Lessee may terminate the Lease at any time.

13. Liens: Owner represents that Owner has not granted, and agrees that Owner will not grant, any mortgages, deeds of trust, voluntary liens, security interests or any other encumbrance encumbering all or any portion of the Premises, other than as set forth on Exhibit "D" to the Lease or shown of record in the Recorder's Office of Yakima/Benton County, Washington. Owner agrees to execute all documents reasonably requested by Lessee as are determined by Lessee to be necessary or appropriate to allow Lessee to enjoy the Premises without material interference.

WINOHIO

14. Right of Purchase or Refusal. Lessee does not have any right of purchase of or refusal on the Premises or any part thereof.

15. Interpretation; Conflicts: This Memorandum contains only selected provisions of the Lease, and reference is made to the full text of the Lease for the full terms and conditions. This Memorandum shall in no way alter, amend, modify, change, supersede or be used to interpret the Lease in any respect. This Memorandum is executed by the parties solely for the purpose of recordation in the Recorder's Office of Yakima/Benton County, Washington, and it is the intent of the parties that it shall give notice to and confirm the Lease to the same extent as if all of the provisions of the Lease were fully set forth herein. The Lease is hereby incorporated by reference into this Memorandum, and the parties hereby ratify and confirm all of the provisions of the Lease. In the event of any conflict or inconsistency between the provisions of this Memorandum and the provisions of the Lease, the provisions of the Lease shall control. A copy of the Lease is on file with Owner and Lessee and information regarding the Lease may be obtained from either Owner or Lessee at its address noted in the recitals to this Memorandum.

15. Governing Law: This Memorandum shall be construed in accordance with the laws of the State of Washington.

17. Counterparts: This Memorandum may be executed in two or more counterparts, each of which shall be deemed an original and all of which taken together shall constitute a single instrument.

[signature pages follow]

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IN WITNESS WHEREOF, this Memorandum is effective as of the date first written above.

OWNER(S):

Marilyn R. Ford

Marilyn R. Ford

Michael V. Robert

Douglas L. Robert

STATE OF WASHINGTON)
) SS.
COUNTY OF _____)

This record was acknowledged before me on _____ by Marilyn R. Ford, a married person.

Notary Public in and for the State of _____

My Commission Expires: _____

Unofficial Copy

STATE OF WASHINGTON)
)SS
COUNTY OF YAKIMA

On this day personally appeared before me Marilyn Ford to me known to be the individuals described in and who executed the within and foregoing instrument, and acknowledged that he/she/they signed the same as his/her/their free and voluntary act and deed, for the uses and purposes therein mentioned.

Given under my hand and official seal this 10th day of June, 2020.

KODY MCDONNELL NOTARY PUBLIC COMMISSION EXPIRES JUNE 27, 2020 STATE OF WASHINGTON

Notary Public in and for the State of WA
Washington, residing at Yakima
My appointment expires June 27, 2020

STATE OF WASHINGTON)
)SS
COUNTY OF YAKIMA

On this day personally appeared before me Douglas Robert to me known to be the individuals described in and who executed the within and foregoing instrument, and acknowledged that he/she/they signed the same as his/her/their free and voluntary act and deed, for the uses and purposes therein mentioned.

Given under my hand and official seal this 10th day of June, 2020.

KODY MCDONNELL NOTARY PUBLIC COMMISSION EXPIRES JUNE 27, 2020 STATE OF WASHINGTON

Notary Public in and for the State of WA
Washington, residing at Yakima
My appointment expires June 27, 2020

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IN WITNESS WHEREOF, the parties have executed this Lease to be effective as of (although not necessarily on) the Effective Date set forth in Section 1 above.

EXECUTED by Owner on this _____ day of _____, 2020.

OWNER:

Jean E Robert
Jean E. Robert
Jean E Robert

Michael V. Robert
Michael V. Robert
5-30-2020

EXECUTED by Lessee on this ____ day of _____, 2020

LESSEE:

INNERGEX RENEWABLE DEVELOPMENT USA, LLC

By: _____
Name: _____
Title: _____

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STATE OF WASHINGTON)
) SS.
COUNTY OF Yakima)

This record was acknowledged before me on May 29, 2020 by Jean Emile Robert.

Guadalupe Garcia
Notary Public in and for the State of Washington

My Commission Expires: November 28, 2020

GUADALUPE GARCIA
Notary Public
State of Washington
My Appointment Expires
November 28, 2020

[EXHIBITS "A", "B", "C", "D", "E", "F" and "G" TO SOLAR ENERGY LEASE FOLLOW]

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STATE OF ~~WASHINGTON~~ Oregon AS)

)SS

COUNTY OF Hood River

On this day personally appeared before me Michael V. Robert to me known to be the individuals described in and who executed the within and foregoing instrument, and acknowledged that he/she/they signed the same as his/her/their free and voluntary act and deed, for the uses and purposes therein mentioned.

Given under my hand and official seal this 30 day of May, 2020.

_____

Notary Public in and for the State of

~~Washington~~ Oregon AS, residing at Hood River

My appointment expires March 28, 2023

OFFICIAL STAMP
ANIK SUPRAPTI
NOTARY PUBLIC-OREGON
COMMISSION NO. 985850
MY COMMISSION EXPIRES MARCH 28, 2023

STATE OF WASHINGTON)

)SS

COUNTY OF _____

On this day personally appeared before me _____ to me known to be the individuals described in and who executed the within and foregoing instrument, and acknowledged that he/she/they signed the same as his/her/their free and voluntary act and deed, for the uses and purposes therein mentioned.

Given under my hand and official seal this ____ day of _____, 2020.

_____

Notary Public in and for the State of

Washington, residing at _____

My appointment expires _____

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LESSEE:

INNERGEX RENEWABLE DEVELOPMENT USA, LLC
a Delaware limited liability company

By: _____
Name: Colleen Giraux-Schmidt
Title: Vice President, Corporation Relations

Province OF British Columbia
City
~~COUNTY~~ OF Vancouver
) SS.
)

The foregoing instrument was acknowledged before me this 18 day of June, 2020 by Colleen Giraux-Schmidt as VP of Innergex Renewable Development USA, LLC, a Delaware limited liability company, on behalf of such company.

_____
Notary Public in and for the State of British Columbia
Province

My Commission Expires: Does not expire

ROBERT R. JUNG
Barrister & Solicitor
INNERGEX RENEWABLE ENERGY INC.
888 DUNSMUIR STREET, SUITE 1100
VANCOUVER, B.C. V6C 3K4
TEL: (604) 633-9900 FAX: (604) 633-9901

ROBERT R. JUNG NOTARY PUBLIC PROVINCE OF BRITISH COLUMBIA

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EXHIBIT "A"

LEGAL DESCRIPTION OF PREMISES

Short Plat #2749, Lot 1, Abstract No. 2003-043722, Benton County, Washington.

Approximately 267.00 acres total.

Auditor's Parcel Number: 1-1924-101-2749-001.

"Unofficial Copy"

2021-008161 MEMO
02/18/2021 11:24:53 AM Pages: 11 Fee: $113.50
Innergex Renewable Dev Usa
Benton County, Benton County Auditor's Office

After Recording Return to:

Innergex Renewable Development USA, LLC
4660 La Jolla Village Drive
Suite 680
San Diego, CA 92122
Attn: Landowner Relations

MEMORANDUM OF SOLAR ENERGY LEASE

GRANTOR/OWNER: Robin Robert

GRANTEE/LESSEE: Innergex Renewable Development USA, LLC, a Delaware Limited Liability Company

Legal Description:
Abbreviated Form: SE ¼ Sec 29, T12N, R 24

Additional Legal is on Exhibit A attached to document

Assessor's Tax Parcel ID No. 1-2924-400-0000-000

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MEMORANDUM OF SOLAR ENERGY LEASE

THIS MEMORANDUM OF SOLAR ENERGY LEASE (this "Memorandum") is being made this _____ day of June, 2020, but shall be effective as of the ___ day of June, 2020, by and between Robin Robert having an address at 1521 Wautoma Rd, Sunnyside, WA 98944 ("Owner"), and INNERGEX RENEWABLE DEVELOPMENT USA, LLC, a Delaware limited liability company, having an address at c/o Innergex Renewable Energy Inc., Suite 1100 – 888 Dunsmuir St., Vancouver, B.C. V6C 3K4, Canada, Attn: Legal (together with its successors and assigns, "Lessee"), who agree as follows:

1. Lease Agreement: Owner and Lessee certify that they have entered into that certain Solar Energy Lease (the "Lease") with an effective date of June _____, 2020 (the "Effective Date"), and hereby make specific reference to the terms, provisions, and conditions of the Lease as hereinafter set forth. Unless otherwise expressly provided herein, all capitalized terms used in this Memorandum shall have the same meanings ascribed to such terms in the Lease.

2. Premises: All that certain property containing approximately 160 acres of land described on Exhibit "A" attached hereto and made a part hereof, together with all surface rights and air space rights above, over, and across such land. The exact portion of the Premises to be leased by Lessee for the siting of the Generating Facility (the "Site") shall be determined prior to the end of the Development Term (as defined below), based on the results of a survey to be obtained by Lessee during the Development Term.

3. Development Term: The period commencing on the Effective Date and ending on the earlier of (i) the third (3rd) anniversary of the Effective Date, or (ii) the date Lessee begins the initial construction of Generating Facility Assets on the Premises (the "Construction Start Date"); provided however, that Lessee shall have the option to extend the Development Term for two (2) periods of one (1) year each, subject to the terms and conditions set forth in the Lease.

4. Construction Term: The period commencing on the Construction Start Date and ending on the first (1st) day the Project generates, sells, and delivers electricity in commercial quantities (i.e., excluding test runs of the facilities) to a purchaser, including but not limited to a utility or cooperative, subject to the terms and conditions set forth in the Lease (the "Commercial Operation Date").

5. Lease Term: The period commencing on the Commercial Operation Date and expiring on the thirtieth (30th) anniversary of the Commercial Operation Date (the "Initial Lease Term"); provided, however, that Lessee, at its option, shall have the right to extend the term of the Lease for two additional periods of ten (10) years each (each, an "Extension Term"),

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commencing on the expiration of the Initial Lease Term, or the expiration of the first Extension Term, as applicable. The Development Term, Construction Term, and Lease Term shall hereafter be collectively referred to as the "Term."

6. Automatic Termination: If construction of the Generating Facility Assets on the Premises has not started before the expiration of the Development Term, the Lease shall terminate and be of no further force or effect except for obligations set forth therein that expressly survive such termination, without any further action being necessary on the part of Owner or Lessee.

7. Use of the Premises:

A. During the Term, Lessee has the right to use the Premises to conduct studies of, without limitation, solar radiation, solar energy, and soils, and collect other meteorological, archaeological, biological, hydrological, and geotechnical data, for surveys, and for installation, construction, operation, maintenance, repair, improvement, replacement, and removal of the Generating Facility and uses incidental thereto (the "Permitted Use"), and for no other business or purpose. During the Construction Term and Lease Term, Lessee shall have exclusive possession of the Site and shall have the sole and exclusive right to use the Site for solar operations and to convert all of the solar resources of the Site for solar energy generation and purposes ancillary thereto. The Permitted Use includes, without limitation, the following:

(i) the exclusive easement and right to erect, construct, reconstruct, install, reinstall, replace, relocate, remove, operate, maintain and use the following from time to time, on, under, over, and across the Premises, in connection with the Generating Facility, whether such Generating Facility is located on the Premises or elsewhere on one or more solar energy projects (in such locations as Lessee shall determine from time to time in the exercise of its sole discretion after notice to Owner): (a) solar energy collection cells, panels, mirrors, lenses, combiner boxes, inverters, battery and energy storage facilities, and other related facilities necessary to harness and store sunlight for photovoltaic or solar thermal electric energy generation, including without limitation, fossil fuel-based boilers, heating, and power generation systems installed in connection with the foregoing facilities, existing and future technologies used or useful in connection with the generation of electricity from sunlight, and associated support structures, foundations, racking, braces, wiring, plumbing, and related equipment constructed on the Premises; (b) a line or lines of towers, with such wires and cables as from time to time are suspended therefrom, and above ground and/or underground wires and cables, for the transmission, distribution, and collection of electrical energy and/or for communication purposes, and all necessary and proper foundations, footings, cross-arms, and other appliances and fixtures for use in connection with said towers, wires, and cables; (c) facilities consisting of: (1) one or more substations for electrical collection, to step up the voltage, interconnect to transmission line or lines, and meter electricity, together with the right to perform all other ancillary activities normally associated with such a facility as may be

necessary or appropriate as determined by Lessee to service the Generating Facility, regardless where located, and regardless of whether required by any applicable law, governmental entity, transmission operator, or otherwise, and (2) an operations and maintenance building, equipment, and storage yard for purposes of performing operations and maintenance service on the Generating Facility, regardless of where located, together with the right to perform all other ancillary activities normally associated with such an operation, including the installation of a well to provide water to such operations and maintenance building; (d) any other improvements, including roads, fixtures, facilities, fences, gates, machinery, and equipment useful or appropriate to accomplish any of the foregoing (the facilities described in (a) through (d) shall also constitute "Generating Facility Assets"); and (e) with all necessary easements therefor;

(ii) an exclusive easement and right over and across the Premises and any adjacent property owned by Owner not included in the Site for any audio, visual, view, light, shadow, noise, vibration, electromagnetic, or other effect of any kind or nature whatsoever resulting, directly or indirectly, from the Generating Facility;

(iii) an exclusive easement and right to capture, use, and convert the unobstructed solar resources over and across the Premises and any adjacent property owned by Owner not included in the Site; any obstruction to the receipt of and access to sunlight throughout the entire area of the Premises is prohibited;

(iv) an easement and right on the Premises to prevent measurable diminishment in output due to obstruction of the sunlight across the Premises including but not limited to an easement right to trim, cut down and remove all trees (whether natural or cultivated), brush, vegetation and fire and electrical hazards now or hereafter existing on the Premises which might obstruct receipt of or access to sunlight throughout the Premises or interfere with or endanger the Generating Facility or Lessee's operations, as determined by Lessee;

(v) the easement and right of subjacent and lateral support on the Premises to whatever is necessary for the operation and maintenance of the Generating Facility, including, without limitation, guy wires and supports;

(vi) a non-exclusive easement for audio, visual, view, light, electromagnetic, electrical and radio frequency interference, and any other effects attributable or ancillary to the Generating Facility or Lessee's operations (such as transmission of radio waves or communication signals); and

(vii) the easement and right to undertake any such purposes or other activities, whether accomplished by Lessee or a third party authorized by Lessee, that Lessee determines are necessary, useful or appropriate to accomplish any of the purposes or uses set forth in the Lease or that are compatible with or related to such purposes or uses.

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The easement rights granted by Owner under the Lease constitute **EASEMENTS IN GROSS**, personal to and for the benefit of Lessee, its successors and assigns, as owner and holder of such easements, and the parties expressly agree that such easement rights shall be transferable in accordance with the assignment provisions of the Lease. The parties expressly intend for all easement rights in the Lease to be, and for the Lease to create, **EASEMENTS IN GROSS** in Lessee, and neither such easements nor the Lease shall be appurtenant to any other property or interest.

B. Lessee shall have the right to construct structures on the Site Lessee determines are reasonably necessary, required, or useful in conjunction with the operation or maintenance of the Generating Facility or enabling the Generating Facility to be connected to an electricity distribution or transmission network.

C. If any portion of the Premises is designated as Mineral Holdouts (as defined in the Lease), then, notwithstanding anything to the contrary herein or in the Lease, Lessee may utilize such Mineral Holdouts as a construction lay-down area during the Construction Term and Lease Term if such area is not then being used for mineral development. Lessee and Owner shall cooperate with each other to provide reasonable accommodation for any holders of mineral rights to access and utilize the Mineral Holdouts space, provided that such activity does not interfere in any respect with the Permitted Use.

D. Lessee shall have the sole and exclusive right to collect and convert all of the solar resources of, and to conduct its operations on, the Premises. Owner shall not grant any rights in the Premises purporting to permit others to conduct operations on the Premises in derogation of Lessee's sole and exclusive rights. Without the prior written consent of Lessee, Owner shall not (i) waive any right available to Owner or grant any right or privilege subject to the consent of Owner by law or contract, including without limitation any environmental regulation, land use ordinance, or zoning regulation, with respect to setback requirements, noise limitations, or other restrictions and conditions respecting the placement or use of the Generating Facility and other equipment ancillary to the Project (as defined in the Lease) on parcels adjacent to or in the vicinity of the Premises, or (ii) grant, confirm, acknowledge, recognize, or acquiesce in any right claimed by any other Person to conduct operations on the Premises whether arising in judicial proceedings or otherwise, and Owner agrees to give Lessee notice of any such claims or proceeding with respect to such claims and to cooperate with Lessee in resisting and disputing such claims.

8. Ownership:

A. Owner acknowledges and agrees that Lessee or its affiliate, successor, or assignee is the exclusive owner and operator of the Generating Facility, Owner has no rights to the Generating Facility or any part of it (notwithstanding that the Generating Facility or any of the Generating Facility Assets may be deemed improvements or fixtures on the Site), and

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Owner may not sell, lease, assign, mortgage, pledge, or otherwise alienate or encumber (collectively, a "Transfer") the Generating Facility or any interest therein or the leasehold rights to the Site, whether with the fee interest or any other rights to the Site otherwise held by Owner. Owner shall give Lessee at least thirty (30) days' written notice prior to any Transfer of all or a portion of the Site identifying the transferee, the portion of Site to be transferred, and the proposed date of Transfer.

B. Owner agrees and acknowledges that the Generating Facility and all Generating Facility Assets shall remain the property of Lessee, and Lessee shall have the right to remove the same at any time during the Term, whether or not said items are considered improvements, fixtures or attachments to real property under applicable laws. Owner shall have no ownership, lien, security interest, or other interest in any part of the Generating Facility, the Generating Facility Assets, or any profits or proceeds derived therefrom. Owner hereby waives all rights or claims (whether under statutory law, common law, or otherwise) that it may have in or otherwise with respect to the Generating Facility and the Generating Facility Assets, including, without limitation, any Owner's lien or other encumbrance on any property of Lessee.

C. Owner acknowledges that Lessee (or, as applicable, its affiliate(s), successor(s), or assignee(s)) is the exclusive owner of all (i) energy generated by the Generating Facility and (ii) Environmental Attributes and Environmental Incentives of the Generating Facility (as such terms are defined in the Lease).

D. Notwithstanding the exclusive nature of the Lease, but without limiting any of Lessee's obligations under the Lease, nothing expressly stated or implied in the Lease or represented to Owner shall be construed as requiring Lessee to: (i) undertake construction, installation or operation of all or any portion of the Project on the Premises or elsewhere; (ii) generate or sell any minimum or maximum amount of energy from the Site or any other portion of the Premises; (iii) continue operations of all or any portion of the Project from time to time located on the Site or elsewhere; or (iv) prohibit Lessee from removing all or any portion of the Project from the Premises.

9. No Interference: Lessee shall peaceably, quietly, and exclusively hold and enjoy the Premises from and after the Effective Date and continuing until the expiration or earlier termination of the Lease, without hindrance from Owner or those claiming title or possession by, through or under Owner, subject to the Existing Rights (as defined in the Lease) and the performance by Lessee of all of the terms and conditions of the Lease to be performed by Lessee. Owner will not interfere with the passage of solar radiation onto the Premises during the Lease Term or take any action that would interfere with such passage while the Project is in operation. Owner shall not conduct any activity, or grant any rights to any third party, whether on the Premises or elsewhere, that would interfere in any way with or materially increase the cost of Lessee's use of the Premises or exercise of any of the rights granted under the Lease, including for greater certainty the planting of trees, unmaintained growth of foliage,

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construction of any improvement, structure, impediment, wall, fence, or other object on the Premises or other adjacent real property that could adversely affect the passage of solar radiation onto the Site.

10. Ownership and Use by Owner of Mineral Rights. The parties agree that Owner shall retain all mineral rights (the "Mineral Rights") and water rights in connection with the Site owned by Owner as of the Effective Date with the limitation during the Term that Owner expressly releases and waives, on behalf of itself and its successors and assigns, all rights of ingress and egress to enter upon the surface of the Site (other than the Mineral Holdouts), and the area located between the surface and one thousand (1,000) feet beneath the surface of the Site for purposes of exploring for, developing, drilling, producing, transporting, or any other purposes incident to the development or production of oil, gas, or other minerals. The foregoing provision shall be a covenant running with the land binding upon any party owning any interest in, or rights to develop or use the Mineral Rights, and all future owners and lessees of any such rights, titles, or interests in or to the Mineral Rights, shall be subject to and burdened by the foregoing waiver of rights and automatically be deemed to include a contractual waiver by the lessee, assignee, or grantee, as applicable. However, nothing herein contained shall be construed to prevent Owner, its successors and assigns, from obtaining oil, gas and other minerals by directional drilling under the Site from well sites located on the Mineral Holdouts or tracts other than the Site, so long as such directional drilling is located at a minimum depth of one thousand (1,000) feet below the surface of the Site.

11. Use of Water by Lessee. During the Term Lessee shall be entitled to use all available water on or extracted from the Premises as Lessee deems necessary to conduct its operations. Lessee may drill, dig, and/or excavate one or more wells on the Premises, and extract water therefrom, for the purposes of servicing, construction, operating, and maintaining the Project, including purposes ancillary thereto such as dust mitigation.

12. Termination by Lessee. In addition to Lessee's other termination rights set forth in the Lease, Lessee reserves the right to terminate the Lease at any time after the Commercial Operation Date upon not less than one (1) year's notice to Owner. Lessee further reserves the right to terminate the Lease as to any part of the Premises at any time after the Commercial Operation Date upon not less than one (1) year's notice to Owner. Notwithstanding the foregoing, prior to the Commercial Operation Date, Lessee may terminate the Lease at any time.

13. Liens; Owner represents that Owner has not granted, and agrees that Owner will not grant, any mortgages, deeds of trust, voluntary liens, security interests or any other encumbrance encumbering all or any portion of the Premises, other than as set forth on Exhibit "D" to the Lease or shown of record in the Recorder's Office of Yakima/Benton County, Washington. Owner agrees to execute all documents reasonably requested by Lessee as are determined by Lessee to be necessary or appropriate to allow Lessee to enjoy the Premises without material interference.

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14. Right of Purchase or Refusal. Lessee does not have any right of purchase of or refusal on the Premises or any part thereof.

15. Interpretation; Conflicts: This Memorandum contains only selected provisions of the Lease, and reference is made to the full text of the Lease for the full terms and conditions. This Memorandum shall in no way alter, amend, modify, change, supersede or be used to interpret the Lease in any respect. This Memorandum is executed by the parties solely for the purpose of recordation in the Recorder's Office of Yakima/Benton County, Washington, and it is the intent of the parties that it shall give notice to and confirm the Lease to the same extent as if all of the provisions of the Lease were fully set forth herein. The Lease is hereby incorporated by reference into this Memorandum, and the parties hereby ratify and confirm all of the provisions of the Lease. In the event of any conflict or inconsistency between the provisions of this Memorandum and the provisions of the Lease, the provisions of the Lease shall control. A copy of the Lease is on file with Owner and Lessee and information regarding the Lease may be obtained from either Owner or Lessee at its address noted in the recitals to this Memorandum.

15. Governing Law: This Memorandum shall be construed in accordance with the laws of the State of Washington.

17. Counterparts: This Memorandum may be executed in two or more counterparts, each of which shall be deemed an original and all of which taken together shall constitute a single instrument.

[signature pages follow]

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IN WITNESS WHEREOF, this Memorandum is effective as of the date first written above.

OWNER(S):

Robin Robert

Robin Robert

STATE OF WASHINGTON)
) SS.
COUNTY OF Yakima)

This record was acknowledged before me on June 22, 2020 by Robin Robert.

Notary Public in and for the State of Washington

My Commission Expires: 8/19/2021

LISETTE RAMOS NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES 8-19-21

[signatures continue on following page]

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LESSEE:

INNERGEX RENEWABLE DEVELOPMENT USA, LLC
a Delaware limited liability company

By: _____
Name: Colleen Giroux-Schmidt
Title: Vice President, Corporate Relations

Province OF British Columbia)
~~City~~ COUNTY OF Vancouver) SS.
)

The foregoing instrument was acknowledged before me this 18 day of June, 2020 by Colleen Giroux-Schmidt as VP of Innergex Renewable Development USA, LLC, a Delaware limited liability company, on behalf of such company.

_____
Notary Public in and for the State of British Columbia
Province

My Commission Expires: Does not expire.

ROBERT R. JUNG
Barrister & Solicitor
INNERGEX RENEWABLE ENERGY INC.
888 DUNSMUIR STREET, SUITE 3100
VANCOUVER, B.C. V6C 3K4
TEL: (604) 633-0000 FAX: (604) 633-0001

NOTARY PUBLIC
PROVINCE OF BRITISH COLUMBIA

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EXHIBIT "A"

LEGAL DESCRIPTION OF PREMISES

The Southeast Quarter of Section 29, Township 12 North, Range 24, situated in Benton County, Washington.

Approximately 160 acres total.

Auditor's Parcel Number: 1-2924-400-0000-000.

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2022-014239 AMD
04/28/2022 08:12:39 AM Page 1 of 6 Fees: $208.50
Brenda Chilton, County Auditor, Benton County, WA

After Recording Return to:

Innergex Renewable Development USA, LLC
4660 La Jolla Village Drive
Suite 680
San Diego, CA 92122
Attn: Landowner Relations

AMENDED MEMORANDUM OF SOLAR ENERGY LEASE

GRANTOR/OWNER: Wautoma Valley LLC, a Washington limited liability company

GRANTEE/LESSEE: Innergex Renewable Development USA, LLC, a Delaware limited liability company

Legal Description:
Abbreviated Form: Tract 8: SEC 32, T12N, R24 EWM: N 60 Acres NE 1/4,
Tract 9: SEC 32, T12N, R24 EWM: N 1/2 SW 1/4; NW 1/4; S 100 Acres NE 1/4

Additional Legal is on Exhibit A attached to document

Assessor's Tax Parcel ID No.: Tract 8: 1-3324-100-0001-000
Tract 9: 1-3224-100-0002-000

Reference Number(s) of Related Documents(s): 2021-008159

AMENDMENT TO THE MEMORANDUM OF SOLAR ENERGY LEASE

THIS AMENDMENT TO THE MEMORANDUM OF SOLAR ENERGY LEASE (this "Amendment") is being made this 22 day of September, 2021, but shall be effective as of the 22 day of September, 2021, by and between Wautoma Valley LLC, a Washington limited liability company having an address at 5305 MACLAREN CT. YAKIMA WA 98908 ("Owner"), and INNERGEX RENEWABLE DEVELOPMENT USA, LLC, a Delaware limited liability company, having an address at c/o Innergex Renewable Energy Inc., Suite 1100 – 888 Dunsmuir St., Vancouver, B.C. V6C 3K4, Canada, Attn: Legal (together with its successors and assigns, "Lessee"), who agree as follows:

RECITALS

A. Owner and Lessee entered into that certain Memorandum of Lease dated as of June 10, 2020, filed of record in the Benton County official records as Auditor's File Number 2021-008159 (the "Memorandum of Lease") related to a Solar Energy Lease dated June 10, 2020 (the "Lease").

B. Owner and Lessee desire to enter into this Amendment for purposes of adding certain real property to the Premises as described in the Memorandum of Lease to reflect an amendment to the Lease which expands the Premises subject to the Lease.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto hereby agree as follows:

MEMORANDUM

1. Additional Premises. The Premises as described in Exhibit "A" of the Memorandum of Lease is hereby amended to add and include that certain property containing approximately 400 acres of land described on Exhibit "A-1" attached hereto and made a part hereof, together will all surface and air space rights above, over, and across such land. Any reference to the approximate acreage of the Premises in the Memorandum of Lease is hereby amended to read 1,996.01 acres. For avoidance of doubt, this Amendment does not subtract any portion of the Premises as described in the Memorandum of Lease.

2. Other Terms and Conditions. Except as specifically amended herein, all of the terms and conditions of the Memorandum of Lease shall remain in full force and effect.

3. Definitions. All terms used herein, unless otherwise specified, shall have the meanings ascribed to them in the Memorandum of Lease.

4. Counterparts: This Amendment may be executed in two or more counterparts, each of which shall be deemed an original and all of which taken together shall constitute a single instrument.

[signature pages follow]

IN WITNESS WHEREOF, this Amendment is effective as of the date first written above.

OWNER(S):

WAUTOMA VALLEY, LLC,
a Washington limited liability company

By: Douglas Robert
Name: Douglas Robert
Title: MEMBER/MANAGER

By: Marilyn R. Ford
Name: Marilyn R. Ford
Title: Member

By: _____
Name: _____
Title: _____

ACKNOWLEDGMENT

STATE OF Washington)
) ss.
COUNTY OF Yakima)

This record was acknowledged before me on 9/22/, 2021 by Douglas Robert & Marilyn Ford.
as members of Wautoma Valley LLC, a Washington limited liability company.

SANDRA MUNOZ
Commission Expires
03-02-2024
NOTARY PUBLIC
License Number 20103768
STATE OF WASHINGTON

(Use this space for notarial stamp/seal)

Notary Public
Print Name Sandra Munoz
My commission expires 03.02.2024

LESSEE:

INNERGEX RENEWABLE DEVELOPMENT USA, LLC
a Delaware limited liability company

By: _____
Name: MATTHEW KENNEDY
Title: VP ENVIRONMENT

ACKNOWLEDGMENT

Province
~~STATE~~ OF British Columbia)
City
~~COUNTY~~ OF Vancouver) ss.

This record was acknowledged before me on September 22 2021 by Matt Kennedy, as VP-Environment of Innergex Renewable Development USA, LLC, a Delaware limited liability company.

_____
Notary Public
Print Name Robert Jung
My commission expires Does not expire.

ROBERT R. JUNG
Barrister & Solicitor
INNERGEX RENEWABLE ENERGY INC.
888 DUNSMUIR STREET, SUITE 1100
VANCOUVER, B.C. V6C 3K4
TEL: (604) 633-9990 FAX: (604) 633-9991

(Use this space for notarial stamp/seal)

EXHIBIT "A-1"

LEGAL DESCRIPTION OF ADDITIONAL PREMISES

TRACT EIGHT:

The North 60 acres of the Northeast Quarter of Section 32, Township 12 North, Range 24, E.W.M., records of Benton County Washington. SUBJECT TO patents, state or railroad deeds, buildings or use restrictions general to the area, zoning regulations, reserved oil and/or mineral rights, utility easements of record, rights of way or easements shown on the plat or visible by inspection, any future adjudication of surface water rights by appropriate federal and/or state proceeding, and any other easements, conditions, covenants, restrictions, agreements, reservations, and rights of way in use or of record, and liability for future assessments, if any.

Approximately 60 acres total.

Auditor's Parcel Number: 1-3224-100-0001-000.

TRACT NINE:

The North Half of the Southwest Quarter, the Northwest Quarter, and the South 100 acres of the Northeast Quarter, all of Section 32, Township 12 North, Range 24, E.W.M., records of Benton County Washington, SUBJECT TO patents, state or railroad deeds, buildings or use restrictions general to the area, zoning regulations, reserved oil and/or mineral rights, utility easements of record, rights of way or easements shown on the plat or visible by inspection, any future adjudication of surface water rights by appropriate federal and/or state proceeding, and any other easements, conditions, covenants, restrictions, agreements, reservations, and rights of way in use or of record, and liability for future assessments, if any.

Approximately 340 acres total.

Auditor's Parcel Number: 1-3224-100-0002-000.

2021-008159 MEMO
02/10/2021 11:24:53 AM Pages: 17 Fee: $119.50
Innergex Renewable Dev Usa
Benton County, Benton County Auditor's Office

After Recording Return to:

Innergex Renewable Development USA, LLC
4660 La Jolla Village Drive
Suite 680
San Diego, CA 92122
Attn: Landowner Relations

MEMORANDUM OF SOLAR ENERGY LEASE

GRANTOR/OWNER: Wautoma Valley, LLC, a Washington Limited Liability Company

GRANTEE/LESSEE: Innergex Renewable Development USA, LLC, a Delaware Limited Liability Company

Legal Description:
Abbreviated Form:
Tract 1: Ptn Sec. 30, T12N, R24, E.W.M.
Tract 2: W ½, W ½, Sec. 19, T12N, R24, E.W.M.
Tract 3: Ptn SE ¼, Sec. 19, T12N, R24, E.W.M.
Tract 4: Ptn SW ¼, Sec. 19, T12N, R24, E.W.M.
Tract 5: Ptn E ½, SE ¼, Sec. 19, T12N, R24, E.W.M.
Tract 6: Ptn N ½, of Sec. 21, T12N, R24, E.W.M.,
Tract 7: Ptn N ½, of Sec. 20, T12N, R24, E.W.M.

Additional Legal is on Exhibit A attached to document

Assessor's Tax Parcel ID No. :
Tract 1: 1-3024-200-0001-000, 1-3024-100-0000-000, 1-3024-200-0003-000, and 1-3024-400-0000-000
Tract 2: 1-2924-200-0001-000
Tract 3: 1-1924-400-0001-001
Tract 4: 1-1924-300-0001-001
Tract 5: 1-1924-400-0002-000
Tract 6: 1-2124-100-0001-000
Tract 7: 1-2024-100-0001-000 and 1-2024-200-0001-000

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MEMORANDUM OF SOLAR ENERGY LEASE

THIS MEMORANDUM OF SOLAR ENERGY LEASE (this "Memorandum") is being made this 10 day of June, 2020, but shall be effective as of the 10 day of June, 2020, by and between Wautoma Valley, LLC having an address at YAKIMA, WA ("Owner"), and INNERGEX RENEWABLE DEVELOPMENT USA, LLC, a Delaware limited liability company, having an address at c/o Innergex Renewable Energy Inc., Suite 1100 – 888 Dunsmuir St., Vancouver, B.C. V6C 3K4, Canada, Attn: Legal (together with its successors and assigns, "Lessee"), who agree as follows:

1. Lease Agreement: Owner and Lessee certify that they have entered into that certain Solar Energy Lease (the "Lease") with an effective date of June 10, 2020 (the "Effective Date"), and hereby make specific reference to the terms, provisions, and conditions of the Lease as hereinafter set forth. Unless otherwise expressly provided herein, all capitalized terms used in this Memorandum shall have the same meanings ascribed to such terms in the Lease.

2. Premises: All that certain property containing approximately 1,596.01 acres of land described on Exhibit "A" attached hereto and made a part hereof, together with all surface rights and air space rights above, over, and across such land. The exact portion of the Premises to be leased by Lessee for the siting of the Generating Facility (the "Site") shall be determined prior to the end of the Development Term (as defined below), based on the results of a survey to be obtained by Lessee during the Development Term.

3. Development Term: The period commencing on the Effective Date and ending on the earlier of (i) the third (3rd) anniversary of the Effective Date, or (ii) the date Lessee begins the initial construction of Generating Facility Assets on the Premises (the "Construction Start Date"); provided however, that Lessee shall have the option to extend the Development Term for two (2) periods of one (1) year each, subject to the terms and conditions set forth in the Lease.

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4. Construction Term: The period commencing on the Construction Start Date and ending on the first (1st) day the Project generates, sells, and delivers electricity in commercial quantities (i.e., excluding test runs of the facilities) to a purchaser, including but not limited to a utility or cooperative, subject to the terms and conditions set forth in the Lease (the "Commercial Operation Date").

5. Lease Term: The period commencing on the Commercial Operation Date and expiring on the thirtieth (30th) anniversary of the Commercial Operation Date (the "Initial Lease Term"); provided, however, that Lessee, at its option, shall have the right to extend the term of the Lease for two additional periods of ten (10) years each (each, an "Extension Term"), commencing on the expiration of the Initial Lease Term, or the expiration of the first Extension Term, as applicable. The Development Term, Construction Term, and Lease Term shall hereafter be collectively referred to as the "Term."

6. Automatic Termination: If construction of the Generating Facility Assets on the Premises has not started before the expiration of the Development Term, the Lease shall terminate and be of no further force or effect except for obligations set forth therein that expressly survive such termination, without any further action being necessary on the part of Owner or Lessee.

7. Use of the Premises:

A. During the Term, Lessee has the right to use the Premises to conduct studies of, without limitation, solar radiation, solar energy, and soils, and collect other meteorological, archaeological, biological, hydrological, and geotechnical data, for surveys, and for installation, construction, operation, maintenance, repair, improvement, replacement, and removal of the Generating Facility and uses incidental thereto (the "Permitted Use"), and for no other business or purpose. During the Construction Term and Lease Term, Lessee shall have exclusive possession of the Site and shall have the sole and exclusive right to use the Site for solar operations and to convert all of the solar resources of the Site for solar energy generation and purposes ancillary thereto. The Permitted Use includes, without limitation, the following:

(i) the exclusive easement and right to erect, construct, reconstruct, install, reinstall, replace, relocate, remove, operate, maintain and use the following from time to time, on, under, over, and across the Premises, in connection with the Generating Facility, whether such Generating Facility is located on the Premises or elsewhere on one or more solar energy projects (in such locations as Lessee shall determine from time to time in the exercise of its sole discretion after notice to Owner): (a) solar energy collection cells, panels, mirrors, lenses, combiner boxes, inverters, battery and energy storage facilities, and other related facilities necessary to harness and store sunlight for photovoltaic or solar thermal electric energy generation, including without limitation, fossil fuel-based boilers, heating, and power generation systems installed in connection with the foregoing facilities, existing and future

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technologies used or useful in connection with the generation of electricity from sunlight, and associated support structures, foundations, racking, braces, wiring, plumbing, and related equipment constructed on the Premises; (b) a line or lines of towers, with such wires and cables as from time to time are suspended therefrom, and above ground and/or underground wires and cables, for the transmission, distribution, and collection of electrical energy and/or for communication purposes, and all necessary and proper foundations, footings, cross-arms, and other appliances and fixtures for use in connection with said towers, wires, and cables; (c) facilities consisting of: (1) one or more substations for electrical collection, to step up the voltage, interconnect to transmission line or lines, and meter electricity, together with the right to perform all other ancillary activities normally associated with such a facility as may be necessary or appropriate as determined by Lessee to service the Generating Facility, regardless where located, and regardless of whether required by any applicable law, governmental entity, transmission operator, or otherwise, and (2) an operations and maintenance building, equipment, and storage yard for purposes of performing operations and maintenance service on the Generating Facility, regardless of where located, together with the right to perform all other ancillary activities normally associated with such an operation, including the installation of a well to provide water to such operations and maintenance building; (d) any other improvements, including roads, fixtures, facilities, fences, gates, machinery, and equipment useful or appropriate to accomplish any of the foregoing (the facilities described in (a) through (d) shall also constitute "Generating Facility Assets"); and (e) with all necessary easements therefor;

(ii) an exclusive easement and right over and across the Premises and any adjacent property owned by Owner not included in the Site for any audio, visual, view, light, shadow, noise, vibration, electromagnetic, or other effect of any kind or nature whatsoever resulting, directly or indirectly, from the Generating Facility;

(iii) an exclusive easement and right to capture, use, and convert the unobstructed solar resources over and across the Premises and any adjacent property owned by Owner not included in the Site; any obstruction to the receipt of and access to sunlight throughout the entire area of the Premises is prohibited;

(iv) an easement and right on the Premises to prevent measurable diminishment in output due to obstruction of the sunlight across the Premises including but not limited to an easement right to trim, cut down and remove all trees (whether natural or cultivated), brush, vegetation and fire and electrical hazards now or hereafter existing on the Premises which might obstruct receipt of or access to sunlight throughout the Premises or interfere with or endanger the Generating Facility or Lessee's operations, as determined by Lessee;

(v) the easement and right of subjacent and lateral support on the Premises to whatever is necessary for the operation and maintenance of the Generating Facility, including, without limitation, guy wires and supports;

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(vi) a non-exclusive easement for audio, visual, view, light, electromagnetic, electrical and radio frequency interference, and any other effects attributable or ancillary to the Generating Facility or Lessee's operations (such as transmission of radio waves or communication signals); and

(vii) the easement and right to undertake any such purposes or other activities, whether accomplished by Lessee or a third party authorized by Lessee, that Lessee determines are necessary, useful or appropriate to accomplish any of the purposes or uses set forth in the Lease or that are compatible with or related to such purposes or uses.

The easement rights granted by Owner under the Lease constitute **EASEMENTS IN GROSS**, personal to and for the benefit of Lessee, its successors and assigns, as owner and holder of such easements, and the parties expressly agree that such easement rights shall be transferable in accordance with the assignment provisions of the Lease. The parties expressly intend for all easement rights in the Lease to be, and for the Lease to create, **EASEMENTS IN GROSS** in Lessee, and neither such easements nor the Lease shall be appurtenant to any other property or interest.

B. Lessee shall have the right to construct structures on the Site Lessee determines are reasonably necessary, required, or useful in conjunction with the operation or maintenance of the Generating Facility or enabling the Generating Facility to be connected to an electricity distribution or transmission network.

C. If any portion of the Premises is designated as Mineral Holdouts (as defined in the Lease), then, notwithstanding anything to the contrary herein or in the Lease, Lessee may utilize such Mineral Holdouts as a construction lay-down area during the Construction Term and Lease Term if such area is not then being used for mineral development. Lessee and Owner shall cooperate with each other to provide reasonable accommodation for any holders of mineral rights to access and utilize the Mineral Holdouts space, provided that such activity does not interfere in any respect with the Permitted Use.

D. Lessee shall have the sole and exclusive right to collect and convert all of the solar resources of, and to conduct its operations on, the Premises. Owner shall not grant any rights in the Premises purporting to permit others to conduct operations on the Premises in derogation of Lessee's sole and exclusive rights. Without the prior written consent of Lessee, Owner shall not (i) waive any right available to Owner or grant any right or privilege subject to the consent of Owner by law or contract, including without limitation any environmental regulation, land use ordinance, or zoning regulation, with respect to setback requirements, noise limitations, or other restrictions and conditions respecting the placement or use of the Generating Facility and other equipment ancillary to the Project (as defined in the Lease) on parcels adjacent to or in the vicinity of the Premises, or (ii) grant, confirm, acknowledge, recognize, or acquiesce in any right claimed by any other Person to conduct operations on the Premises whether arising in judicial proceedings or otherwise, and Owner agrees to give Lessee

notice of any such claims or proceeding with respect to such claims and to cooperate with Lessee in resisting and disputing such claims.

8. Ownership:

A. Owner acknowledges and agrees that Lessee or its affiliate, successor, or assignee is the exclusive owner and operator of the Generating Facility, Owner has no rights to the Generating Facility or any part of it (notwithstanding that the Generating Facility or any of the Generating Facility Assets may be deemed improvements or fixtures on the Site), and Owner may not sell, lease, assign, mortgage, pledge, or otherwise alienate or encumber (collectively, a "Transfer") the Generating Facility or any interest therein or the leasehold rights to the Site, whether with the fee interest or any other rights to the Site otherwise held by Owner. Owner shall give Lessee at least thirty (30) days' written notice prior to any Transfer of all or a portion of the Site identifying the transferee, the portion of Site to be transferred, and the proposed date of Transfer.

B. Owner agrees and acknowledges that the Generating Facility and all Generating Facility Assets shall remain the property of Lessee, and Lessee shall have the right to remove the same at any time during the Term, whether or not said items are considered improvements, fixtures or attachments to real property under applicable laws. Owner shall have no ownership, lien, security interest, or other interest in any part of the Generating Facility, the Generating Facility Assets, or any profits or proceeds derived therefrom. Owner hereby waives all rights or claims (whether under statutory law, common law, or otherwise) that it may have in or otherwise with respect to the Generating Facility and the Generating Facility Assets, including, without limitation, any Owner's lien or other encumbrance on any property of Lessee.

C. Owner acknowledges that Lessee (or, as applicable, its affiliate(s), successor(s), or assignee(s)) is the exclusive owner of all (i) energy generated by the Generating Facility and (ii) Environmental Attributes and Environmental Incentives of the Generating Facility (as such terms are defined in the Lease).

D. Notwithstanding the exclusive nature of the Lease, but without limiting any of Lessee's obligations under the Lease, nothing expressly stated or implied in the Lease or represented to Owner shall be construed as requiring Lessee to: (i) undertake construction, installation or operation of all or any portion of the Project on the Premises or elsewhere; (ii) generate or sell any minimum or maximum amount of energy from the Site or any other portion of the Premises; (iii) continue operations of all or any portion of the Project from time to time located on the Site or elsewhere; or (iv) prohibit Lessee from removing all or any portion of the Project from the Premises.

9. No Interference: Lessee shall peaceably, quietly, and exclusively hold and enjoy the Premises from and after the Effective Date and continuing until the expiration or earlier

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termination of the Lease, without hindrance from Owner or those claiming title or possession by, through or under Owner, subject to the Existing Rights (as defined in the Lease) and the performance by Lessee of all of the terms and conditions of the Lease to be performed by Lessee. Owner will not interfere with the passage of solar radiation onto the Premises during the Lease Term or take any action that would interfere with such passage while the Project is in operation. Owner shall not conduct any activity, or grant any rights to any third party, whether on the Premises or elsewhere, that would interfere in any way with or materially increase the cost of Lessee's use of the Premises or exercise of any of the rights granted under the Lease, including for greater certainty the planting of trees, unmaintained growth of foliage, construction of any improvement, structure, impediment, wall, fence, or other object on the Premises or other adjacent real property that could adversely affect the passage of solar radiation onto the Site.

10. Ownership and Use by Owner of Mineral Rights. The parties agree that Owner shall retain all mineral rights (the "Mineral Rights") and water rights in connection with the Site owned by Owner as of the Effective Date with the limitation during the Term that Owner expressly releases and waives, on behalf of itself and its successors and assigns, all rights of ingress and egress to enter upon the surface of the Site (other than the Mineral Holdouts), and the area located between the surface and one thousand (1,000) feet beneath the surface of the Site for purposes of exploring for, developing, drilling, producing, transporting, or any other purposes incident to the development or production of oil, gas, or other minerals. The foregoing provision shall be a covenant running with the land binding upon any party owning any interest in, or rights to develop or use the Mineral Rights, and all future owners and lessees of any such rights, titles, or interests in or to the Mineral Rights, shall be subject to and burdened by the foregoing waiver of rights and automatically be deemed to include a contractual waiver by the lessee, assignee, or grantee, as applicable. However, nothing herein contained shall be construed to prevent Owner, its successors and assigns, from obtaining oil, gas and other minerals by directional drilling under the Site from well sites located on the Mineral Holdouts or tracts other than the Site, so long as such directional drilling is located at a minimum depth of one thousand (1,000) feet below the surface of the Site.

11. Use of Water by Lessee. During the Term Lessee shall be entitled to use all available water on or extracted from the Premises as Lessee deems necessary to conduct its operations. Lessee may drill, dig, and/or excavate one or more wells on the Premises, and extract water therefrom, for the purposes of servicing, construction, operating, and maintaining the Project, including purposes ancillary thereto such as dust mitigation.

12. Termination by Lessee. In addition to Lessee's other termination rights set forth in the Lease, Lessee reserves the right to terminate the Lease at any time after the Commercial Operation Date upon not less than one (1) year's notice to Owner. Lessee further reserves the right to terminate the Lease as to any part of the Premises at any time after the Commercial Operation Date upon not less than one (1) year's notice to Owner. Notwithstanding the

foregoing, prior to the Commercial Operation Date, Lessee may terminate the Lease at any time.

13. Liens: Owner represents that Owner has not granted, and agrees that Owner will not grant, any mortgages, deeds of trust, voluntary liens, security interests or any other encumbrance encumbering all or any portion of the Premises, other than as set forth on Exhibit "D" to the Lease or shown of record in the Recorder's Office of Yakima/Benton County, Washington. Owner agrees to execute all documents reasonably requested by Lessee as are determined by Lessee to be necessary or appropriate to allow Lessee to enjoy the Premises without material interference.

14. Right of Purchase or Refusal. Lessee does not have any right of purchase of or refusal on the Premises or any part thereof.

15. Interpretation; Conflicts: This Memorandum contains only selected provisions of the Lease, and reference is made to the full text of the Lease for the full terms and conditions. This Memorandum shall in no way alter, amend, modify, change, supersede or be used to interpret the Lease in any respect. This Memorandum is executed by the parties solely for the purpose of recordation in the Recorder's Office of Yakima/Benton County, Washington, and it is the intent of the parties that it shall give notice to and confirm the Lease to the same extent as if all of the provisions of the Lease were fully set forth herein. The Lease is hereby incorporated by reference into this Memorandum, and the parties hereby ratify and confirm all of the provisions of the Lease. In the event of any conflict or inconsistency between the provisions of this Memorandum and the provisions of the Lease, the provisions of the Lease shall control. A copy of the Lease is on file with Owner and Lessee and information regarding the Lease may be obtained from either Owner or Lessee at its address noted in the recitals to this Memorandum.

15. Governing Law: This Memorandum shall be construed in accordance with the laws of the State of Washington.

17. Counterparts: This Memorandum may be executed in two or more counterparts, each of which shall be deemed an original and all of which taken together shall constitute a single instrument.

[signature pages follow]

Unofficial Copy

IN WITNESS WHEREOF, this Memorandum is effective as of the date first written above.

OWNER(S):

John Robert, Authorized Manager

STATE OF WASHINGTON)
) SS.
COUNTY OF YAKIMA)

This record was acknowledged before me this 10th day of June, 2020, by John Robert, as Authorized Manager of Wautoma Valley, LLC, a Washington Limited Liability Company.

Notary Public in and for the State of WA

My Commission Expires: June 27, 2020

KODY MCDONNELL
NOTARY PUBLIC
STATE OF WASHINGTON
COMMISSION EXPIRES
JUNE 27, 2020

[signatures continue on following page]

Unofficial Copy

STATE OF WASHINGTON)
)SS
COUNTY OF YAKIMA

On this day personally appeared before me Douglas L Robert to me known to be the individuals described in and who executed the within and foregoing instrument, and acknowledged that he/she/they signed the same as his/her/their free and voluntary act and deed, for the uses and purposes therein mentioned.

Given under my hand and official seal this 10th day of June, 2020.

KODY MCDONNELL COMMISSION EXPIRES NOTARY PUBLIC JUNE 27, 2020 STATE OF WASHINGTON

Notary Public in and for the State of WA
Washington, residing at Yakima
My appointment expires June 27, 2020

STATE OF WASHINGTON)
)SS
COUNTY OF YAKIMA

On this day personally appeared before me Marilyn R. Ford to me known to be the individuals described in and who executed the within and foregoing instrument, and acknowledged that he/she/they signed the same as his/her/their free and voluntary act and deed, for the uses and purposes therein mentioned.

Given under my hand and official seal this 10th day of June, 2020.

KODY MCDONNELL COMMISSION EXPIRES NOTARY PUBLIC JUNE 27, 2020 STATE OF WASHINGTON

Notary Public in and for the State of WA
Washington, residing at Yakima
My appointment expires June 27, 2020

Unofficial Document

LESSEE:

INNERGEX RENEWABLE DEVELOPMENT USA, LLC
a Delaware limited liability company

By: _____
Name: Colleen Giraux-Schmidt
Title: Vice President, Corporate Relations

Province OF British Columbia
City
~~COUNTY~~ OF Vancouver
) SS.
)

The foregoing instrument was acknowledged before me this 18 day of June, 2020, by VP-Colleen Giraux-Schmidt. VP of Innergex Renewable Development USA, LLC, a Delaware limited liability company, on behalf of such company.

_____
Notary Public in and for the State of British Columbia.
Province

My Commission Expires: Does not expire.

ROBERT R. JUNG
Barrister & Solicitor
INNERGEX RENEWABLE ENERGY INC.
888 DUNSMUIR STREET, SUITE 1100
VANCOUVER, B.C. V6C 3K4
TEL: (604) 688-6890 FAX: (604) 689-8691

ROBERT RICHARD JUNG
A NOTARY PUBLIC
BRITISH COLUMBIA

Unofficial Copy

EXHIBIT "A"

LEGAL DESCRIPTION OF PREMISES

[to be attached]

TRACT ONE:

All of Section 30, Township 12 North, Range 24, E.W.M., records of Benton County, Washington; EXCEPT Parcel No. 1-3024-200-0002-000, being the North 723 feet of he West 723 feet; AND EXCEPT Parcel No. 1-3024-3000-0000-000, being the SE ¼ of the SE ¼ of the SW ¼ of Section 30, Township 12 North, Range 24; SUBJECT TO patents, state or railroad deeds, buildings or use restrictions general to the area, zoning regulations, reserved oil and/or mineral rights, utility easements of record, rights of way or easements shown on the plat or visible by inspection, any future adjudication of surface water rights by appropriate federal and/or state proceeding, and any other covenants, restrictions, agreements, reservations, and rights of way in use or of record, and liability for future assessments, if any.

Approximately 580 acres total.

Auditor's Parcel Number: 1-3024-200-0001-000, 1-3024-100-0000-000, 1-302-200-0003-000, and 1-3024-400-0000-000.

TRACT TWO:

The West half of the West half of Section 29, Township 12 North, Range 24 East, W.M., Benton County, Washington.

Approximately 160 acres total.

Auditor's Parcel Number: 1-2924-200-0001-000.

.

TRACT THREE:

Section 19, Township 12 North, Range 24, described as follows: The East 200 Feet of the East One/Half of the Southeast Quarter 3-0-77 Except the East 46 Feet of the South 519.37 Feet of the South 519.37 Feet of the Southeast Quarter and Except the East 76 feet of the South 654.85 Feet of the Southeast Quarter and Except the West 124 Feet of the East 200 Feet of the South 60 Feet, Certificate of Water Right 10/27/77, Quit Claim Deed to County for Road 3/18/74 situated in Benton County, Washington.

Unofficial Copy

Approximately 11 acres total.

Auditor's Parcel Number: 1-1924-400-0001-001.

TRACT FOUR:

THE SOUTHWEST QUARTER OF SECTION 19, TOWNSHIP 12 NORTH, RANGE 24 EAST, W.M. EXCEPT THAT PORTION OF GOVERNMENT LOT 4 (SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER) OF SAID SECTION 19 DESCRIBED AS FOLLOWS; BEGINNING AT THE SOUTHWEST CORNER OF SAID SUBDIVISION, THENCE NORTH 87° 32' 11" EAST ALONG THE SOUTH LINE THEREOF (REFERENCE BEARING) 429.00 FEET; THENCE NORTH 0° 37' 12" WEST 1088.21 FEET; THENCE SOUTH 87° 32' 11" WEST 419.55 FEET, MORE OR LESS TO THE WEST LINE OF SAID SECTION 19; THENCE SOUTH 0° 07' 23" EAST FOR 1088.55 FEET MORE OR LESS TO THE SOUTHWEST CORNER OF SAID SECTION AND THE POINT OF BEGINNING. AND EXCEPT THE SOUTH 60.00 FEET THEREOF FOR ROAD; AND THE WEST HALF OF THE SOUTHEAST QUARTER OF SECTION 19, EXCEPT THE SOUTH 60.00 FEET THEREOF FOR ROAD; ALSO EXCEPT THE WEST HALF OF THE WEST HALF OF THE SOUTHWEST QUARTER OF SECTION 19, TOWNSHIP 12 NORTH, RANGE 24 EAST, W.M. EXCEPT THE SOUTH 1087.64 FEET THEREOF.

Approximately 195 acres total.

Auditor's Parcel Number: 1-1924-300-0001-001

TRACT FIVE:

The East 1/2 of the Southeast 1/4 of Section 19, Township 12 North, Range 24, E.W.M.; EXCEPT the East 200 feet; records of Benton County, Washington. SUBJECT TO patents, state or railroad deeds, buildings or use restrictions general to the area, zoning regulations, reserved oil and/or mineral rights, utility easements of record, rights of way or easements shown on the plat or visible by inspection, any future adjudication of surface water rights by appropriate federal and/or state proceeding, and any other covenants, restrictions, agreements, reservations, and rights of way in use or of record, and liability for future assessments, if any.

Approximately 68 acres total.

Auditor's Parcel Number: 1-1924-400-0002-000.

TRACT SIX:

Unofficial Document

The North ½ of Section 21, Township 12 North, Range 24, E.W.M., records of Benton County, Washington; EXCEPTING OUT A tract of land in the East half of the Northeast Quarter of Section 20 and the West half of the Northwest Quarter of Section 21, all in Township 12 North, Range 24 East, Willamette Meridian, Benton County, Washington, more particularly described with reference to the Washington Coordinate System (NAD83/91), South Zone, as follows: Beginning at a 3 1/4 inch Bonneville Power Administration (BPA) aluminum cap monument on the south line of the north half of said Section 20, said BPA monument bears South.87¦20'46"West, a distance of 357.07 feet from the East one-quarter comer of said Section 20, said comer evidenced by a 2 inch aluminum cap monument marked LS 16909; thence along said south line S.87¦20'46"West, a distance of 369.92 feet to a 3 1/4 inch BPA aluminum cap monument; thence leaving said south line North 28¦ 00'42"West, a. distance of 694.08 feet to a point on the easterly boundary of the 125 feet wide right-of-way for the BPA Big Eddy-Midway Transmission Line, said right-of-way described in Volume 109, Page 84, deed records of Benton County; thence along said easterly right-of-way boundary N.19¦18'22"E, a distance of 556.83 feet to a point on a line that bears S.61 ¦59' 18"W, from a 3 + inch BPA aluminum cap monument; thence leaving said easterly right-of-way boundary N.61 ¦59' 18"E, a distance of 1330.66 feet to said 3 1/4 inch BPA aluminum cap monument; thence S.28¦00' 42"E, a distance of 1230.00 feet to a 3 1/4 inch BPA aluminum cap monument; thence S.61¦59'18"W, a distance of 1405.72 feet to the point of beginning. Together with a strip of land 120 feet wide over and across the North + of the Northwest +, the West + of the Northeast 1/4, and that portion of the Southeast + of the Northeast 1/4 lying westerly of the hereinbefore described tract of land, all in said Section 20. The boundaries of said strip of land lie 60 feet on each side of and parallel with the survey line for the BPA Wautoma Substation Entrance Road. Said survey line is described with reference to the Washington Coordinate System (NAD83/91), South Zone, as follows: Beginning at survey station 0+00.0, a point in the SE l/4 NE l/4 of said Section 20 which bears N.23¦08'55"W, a distance of 1156.7 feet from the East one-quarter corner of said Section 20; thence N.58¦11 '05"W, a distance of 14.8 feet to survey station 0+14.8, the beginning of a tangent curve to the left having a radius of 68.0 feet; thence westerly along said curve through a central angle of 29¦04'18" an arc length of 34.5 feet to survey station 0+49.3; thence N.87¦15'23"W, a distance of 949.2 feet to survey station 9+98.5, the beginning of a tangent curve to the right having a radius of 500.0 feet; thence westerly along said curve through a central angle of 22¦10'09" an arc length of 193.4 feet to survey station 11+91.9; thence N.65¦05' 14"W, a distance of 1997,4 feet. to survey station 31+89.3, the beginning of a tangent curve to the left having a radius of 500.0 feet; thence westerly along said curve through a central angle of 10¦12'42" an arc length of 89.1 feet to survey station 32+78.4; thence N.75¦17'56"W, a distance of 957.5 feet to survey station 42+35.9, the beginning of a tangent curve to the right having radius of 500.0 feet; thence westerly along said curve through a central angle of 13¦22'37" an arc length of 116.7 feet to survey station 43+52.6; thence N.61¦55' 19"W, a distance of 26.8 feet to survey station 43+79.4, the beginning of a tangent curve to the left having a radius of 500.0 feet; thence westerly along said curve through a central angle of 31¦45'06" an arc length of 277.1 feet to survey station 46+56.5, a point in the Southwest l/4 of the Southwest 1/4 of Section 17, said Township and Range, which bears N.79¦01,27"E, a distance of 558.6 feet from the Southwest corner of said Section 17.WAUT-SS-l contains 57.75 acres, more or less. Together with easement described as follows: (AUC-62-A-1) That part of a 150 foot wide right-of-way for the Bonneville Power Administration (BPA) Schultz-Wautoma No.1 Transmission Line, over and across the NW1/4NW1/4 of Section 21, Township12 North, Range 24 East, of the Willamette

Meridian, Benton County, State of Washington. The boundary lines of said right-of- way lie 75 feet distant easterly from and 75 feet distant westerly from and parallel with the survey centerline as monumented on the ground for the BPA Schultz-Wautoma No. 1 Transmission Line. The southerly terminus of this right-of-way falls at survey centerline station 3103+00.9 on a line drawn as follows, to wit: Beginning at a found 31/4 inch BPA Aluminum cap on a 5/8 inch iron rebar, which point lies N.53¦57'06"E, a distance of 1094.0 feet from a found 2 inch Aluminum cap on a 1/2 inch iron rod marking the one-quarter comer common to sections 20 and 21, Township 12 North, Range 24 East, of the Willamette Meridian, Benton County, Washington; thence N.28¦00' 42"W, a distance of 1230.0 feet to a found 3 1/4 inch BPA Aluminum cap on a 5/8 inch iron rebar; thence S.61¦59'18"W, a distance of 457.6 feet to a found 3 1/4 inch BPA Aluminum cap on a 5/8 inch iron ,rebar marking the point of terminus. The survey centerline is described with reference to the Washington Coordinate System (NAD83/91), South Zone, as follows: Beginning at survey equation station 0+73.0 back equals 3000+00.0 ahead, which point is marked by a set 5/8 inch iron rod with 3 1/4 inch Aluminum cap, and which point lies S.38¦05' 17"W., a distance of 4964.1 feet from a found 5/8 inch iron rebar with yellow plastic cap marking the one-quarter section comer common to Sections 3 and 4, Township 12 North, Range 24 East, of the Willamette Meridian, Benton County, Washington; thence S.13¦27'50"W, a distance of 806.6 feet to survey station 3008+06.6; thence S.08¦44' 19"W, a distance of 4286.9 feet to survey station 3050+93.5; thence S.11 ¦02'41"W, a distance of 5667.6 feet to survey equation station 3107+61.1 back equals 1530+00.0 ahead, which point lies S.16¦52'43"E, a distance of 1517.2 feet from a found 2 inch Aluminum cap on a 5/8 inch iron rod marking the section comer common to Sections 16, 17, 20 and 21, Township 12 North, Range 24 East, of the Willamette Meridian, Benton County, Washington. BPA Tract AUC-62-A- 1 contains 3.5 acres, more or less. . SUBJECT TO patents, state or railroad deeds, buildings or use restrictions general to the area, zoning regulations, reserved oil and/or mineral rights, utility easements of record, rights of way or easements shown on the plat or visible by inspection, any future adjudication of surface water rights by appropriate federal and/or state proceeding, and any other easements, conditions, covenants, restrictions, agreements, reservations, and rights of way in use or of record, and liability for future assessments, if any.

Approximately 303 acres total.

Auditor's Parcel Number: 1-2124-100-0001-000.

TRACT SEVEN:

The North 1/2 of Section 20, Township 12 North, Range 24, E.W.M., records of Benton County, Washington; EXCEPTING OUT A tract of land in the East half of the Northeast Quarter of Section 20 and the West half of the Northwest Quarter of Section 21, all in Township 12 North, Range 24 East, Willamette Meridian, Benton County, Washington, more particularly described with reference to the Washington Coordinate System (NAD83/91), South Zone, as follows: Beginning at a 3 1/4 inch Bonneville Power Administration (BPA) aluminum cap monument on the south line of the north half of said Section 20, said BPA monument bears South.87¦20'46"West, a distance of 357.07 feet from the East one-quarter comer of said Section 20, said comer evidenced by a 2 inch aluminum cap monument marked LS 16909; thence along

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said south line S.87¦20'46"West, a distance of 369.92 feet to a 3 1/4 inch BPA aluminum cap monument; thence leaving said south line North 28¦ 00'42"West, a. distance of 694.08 feet to a point on the easterly boundary of the 125 feet wide right-of-way for the BPA Big Eddy-Midway Transmission Line, said right-of-way described in Volume 109, Page 84, deed records of Benton County; thence along said easterly right-of-way boundary N.19¦18'22"E, a distance of 556.83 feet to a point on a line that bears S.61 ¦59' 18"W, from a 3 + inch BPA aluminum cap monument; thence leaving said easterly right-of-way boundary N.61 ¦59' 18"E, a distance of 1330.66 feet to said 3 1/4 inch BPA aluminum cap monument; thence S.28¦00' 42"E, a distance of 1230.00 feet to a 3 1/4 inch BPA aluminum cap monument; thence S.61¦59'18"W, a distance of 1405.72 feet to the point of beginning. Together with a strip of land 120 feet wide over and across the North + of the Northwest +, the West + of the Northeast 1/4, and that portion of the Southeast + of the Northeast 1/4 lying westerly of the hereinbefore described tract of land, all in said Section 20. The boundaries of said strip of land lie 60 feet on each side of and parallel with the survey line for the BPA Wautoma Substation Entrance Road. Said survey line is described with reference to the Washington Coordinate System (NAD83/91), South Zone, as follows: Beginning at survey station 0+00.0, a point in the SEl/4NEl/4 of said Section 20 which bears N.23¦08'55"W, a distance of 1156.7 feet from the East one-quarter corner of said Section 20; thence N.58¦11 '05"W, a distance of 14.8 feet to survey station 0+14.8, the beginning of a tangent curve to the left having a radius of 68.0 feet; thence westerly along said curve through a central angle of 29¦04'18" an arc length of 34.5 feet to survey station 0+49.3; thence N.87¦15'23"W, a distance of 949.2 feet to survey station 9+98.5, the beginning of a tangent curve to the right having a radius of 500.0 feet; thence westerly along said curve through a central angle of 22¦10'09" an arc length of 193.4 feet to survey station 11+91.9; thence N.65¦05' 14"W, a distance of 1997,4 feet. to survey station 31+89.3, the beginning of a tangent curve to the left having a radius of 500.0 feet; thence westerly along said curve through a central angle of 10¦12'42" an arc length of 89.1 feet to survey station 32+78.4; thence N.75¦17'56"W, a distance of 957.5 feet to survey station 42+35.9, the beginning of a tangent curve to the right having radius of 500.0 feet; thence westerly along said curve through a central angle of 13¦22'37" an arc length of 116.7 feet to survey station 43+52.6; thence N.61¦55' 19"W, a distance of 26.8 feet to survey station 43+79.4, the beginning of a tangent curve to the left having a radius of 500.0 feet; thence westerly along said curve through a central angle of 31¦45'06" an arc length of 277.1 feet to survey station 46+56.5, a point in the Southwest l/4 of the Southwest 1/4 of Section 17, said Township and Range, which bears N.79¦01,27"E, a distance of 558.6 feet from the Southwest corner of said Section 17.WAUT-SS-1 contains 57.75 acres, more or less. Together with easement described as follows: (AUC-62-A-1) That part of a 150 foot wide right-of-way for the Bonneville Power Administration (BPA) Schultz-Wautoma No.1 Transmission Line, over and across the NW1/4NW1/4 of Section 21, Township12 North, Range 24 East, of the Willamette Meridian, Benton County, State of Washington. The boundary lines of said right-of- way lie 75 feet distant easterly from and 75 feet distant westerly from and parallel with the survey centerline as monumented on the ground for the BPA Schultz-Wautoma No. 1 Transmission Line. The southerly terminus of this right-of-way falls at survey centerline station 3103+00.9 on a line drawn as follows, to wit: Beginning at a found 31/4 inch BPA Aluminum cap on a 5/8 inch iron rebar, which point lies N.53¦57'06"E, a distance of 1094.0 feet from a found 2 inch Aluminum cap on a 1/2 inch iron rod marking the one-quarter comer common to sections 20 and 21, Township 12 North, Range 24 East, of the Willamette Meridian, Benton County, Washington; thence N.28¦00' 42"W, a distance of 1230.0 feet to a found 3 1/4 inch BPA Aluminum cap on a

5/8 inch iron rebar; thence S.61¦59'18"W, a distance of 457.6 feet to a found 3 1/4 inch BPA Aluminum cap on a 5/8 inch iron ,rebar marking the point of terminus. The survey centerline is described with reference to the Washington Coordinate System (NAD83/91), South Zone, as follows: Beginning at survey equation station 0+73.0 back equals 3000+00.0 ahead, which point is marked by a set 5/8 inch iron rod with 3 1/4 inch Aluminum cap, and which point lies S.38¦05' 17"W., a distance of 4964.1 feet from a found 5/8 inch iron rebar with yellow plastic cap marking the one-quarter section comer common to Sections 3 and 4, Township 12 North, Range 24 East, of the Willamette Meridian, Benton County, Washington; thence S.13¦27'50"W, a distance of 806.6 feet to survey station 3008+06.6; thence S.08¦44' 19"W, a distance of 4286.9 feet to survey station 3050+93.5; thence S.11 ¦02'41"W, a distance of 5667.6 feet to survey equation station 3107+61.1 back equals 1530+00.0 ahead, which point lies S.16¦52'43"E, a distance of 1517.2 feet from a found 2 inch Aluminum cap on a 5/8 inch iron rod marking the section comer common to Sections 16, 17, 20 and 21, Township 12 North, Range 24 East, of the Willamette Meridian, Benton County, Washington. BPA Tract AUC-62-A- 1 contains 3.5 acres, **more or less**. SUBJECT TO patents, state or railroad deeds, buildings or use restrictions general to the area, zoning regulations, reserved oil and/or mineral rights, utility easements of record, rights of way or easements shown on the plat or visible by inspection, any future adjudication of surface water rights by appropriate federal and/or state proceeding, and any other easements, conditions, covenants, restrictions, agreements, reservations, and rights of way in use or of record, and liability for future assessments, if any.

Approximately 279.01 acres total.

Auditor's Parcel Number: 1-2024-100-0001-000 and 1-2024-200-0001-000.

Unofficial Document

WASHINGTON STATE
Joint Aquatic Resources Permit Application (JARPA) [help]

US Army Corps of Engineers
Seattle District

AGENCY USE ONLY

Date received: _____

Agency reference #: _____

Tax Parcel #(s): _____

TO BE COMPLETED BY APPLICANT [help]

Project Name: _____

Location Name (if applicable): _____

Attachment C:
Contact information for adjoining property owners. [help]

Use this attachment only if you have more than four adjoining property owners.

Use black or blue ink to enter answers in white spaces below.

1. Contact information for all adjoining property owners. [help]

Name	Mailing Address	Tax Parcel # (if known)
Wautoma Valley LLC	5305 MacLaren CT Yakima, WA 98908	23122411004, 119243000002003, 120243011787003, 131241000000000, 131242000000000, 132243000001000, 132243000002000, 132244000000000
Western Land & Cattle LLC	1509 Maires Rd Yakima, WA 98908	23122511401, 23122541409
Zirkle Four Feathers Vineyards LLC	PO Box 190 Selah, WA 98942	115240000000000
State of Washington	DNR State Land Division PO Box 47016 Olympia, WA 98504	116240000000000
Wolf Lake Inc.	HANFORD RD S OF, ,WA	23122541406
HECTOR & JENNIFER SALGADO	HANFORD, WA	23122411003
BENTON RURAL ELECTRIC ASSN	PO BOX 1150 PROSSER, WA 99350-0953	119241012749002
DILL SARAH LYNNE	520 W WAUTOMA RD SUNNYSIDE, WA 98944	130242000002000

UNITED STATES OF AMERICA-DOE	BONNEVILLE POWER ADMINISTRATION PO BOX 61409 VANCOUVER, WA 98666-1409	120241000002000
WAUTOMA ENERGY LLC	2448 76TH AVE SE SUITE 220 MERCER ISLAND, WA 98040	119243000002002
WESTERN LAND & CATTLE LLC	HANFORD HWY S OF, ,WA	23122511401, 23122541409

If you require this document in another format, contact the Governor's Office for Regulatory Innovation and Assistance (ORIA) at (800) 917-0043. People with hearing loss can call 711 for Washington Relay Service. People with a speech disability can call (877) 833-6341. ORIA publication number: ORIA-16-014 rev. 10/2016

ATTACHMENT U: VEGETATION AND WEED MANAGEMENT PLAN

Draft Vegetation and Weed Management Plan

Wautoma Solar Energy Project

Benton County, Washington

Prepared for:

Innergex Renewable Development USA, LLC

Prepared by:

TETRA TECH

19803 North Creek Parkway
Bothell, WA 98011

February 2023

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LIST OF ATTACHMENTS

Attachment A. 2021 Washington State Noxious Weed List
Attachment B. 2022 Benton County Noxious Weed List

ACRONYMS AND ABBREVIATIONS

°F	degree Fahrenheit
Applicant	Innergex Renewable Development USA, LLC
ASC	Application for Site Certification
BESS	battery energy storage system
EFSEC or Council	Energy Facility Site Evaluation Council
Kv	kilovolt
MW	megawatt
O&M	operation and maintenance
PCS	power conversion system
Plan	Revegetation and Noxious Weed Management Plan
Project	Wautoma Solar Energy Project
PV	photovoltaic

1 INTRODUCTION

Innergex Renewable Development USA, LLC (the Applicant) is proposing to develop the Wautoma Solar Energy Project (Project) in unincorporated Benton County, Washington approximately 12.5 miles northeast of the city of Sunnyside (Figure 1). All of the parcels in the approximately 5,852-acre Project Lease Boundary are privately owned and actively managed for crop cultivation and livestock grazing; a small portion (approximately 524 acres) of the Lease Boundary is enrolled in the U.S. Department of Agriculture's Conservation Reserve Program. The Applicant is also pursuing easements/crossing/road use agreements with the Bonneville Power Administration (BPA) for Project access roads, collection lines, and transmission interconnection.

The Project Area is a subset of the Project Lease Boundary within which Project facilities may be constructed, in compliance with conditions that may be imposed by the Site Certification Agreement. The Project Area encompasses approximately 4,573 acres; however, as noted in Part 2 of the Application for Site Certification (ASC), a smaller area within the Project Area will be permanently or temporarily disturbed by Project construction.

This Draft Vegetation and Weed Management Plan (Plan) describes methods, success criteria, monitoring, and reporting for revegetation of areas temporarily disturbed during construction of the Project and revegetation of areas within the solar array perimeter fence. This Plan also provides methods, monitoring, and reporting associated with the prevention and control of the introduction and spread of noxious weeds from construction and operation of the Project. This Plan was developed to support the requirements of the Energy Facility Site Evaluation Council (EFSEC, or Council) Application for Site Certification (ASC), of which this is a part.

2 BACKGROUND

2.1 Project Area Existing Conditions

Benton County is located within a rain shadow created by the Cascade Mountains. In this region of Washington, the summers are short, hot, and mostly clear; winters are very cold and partly cloudy; and it is typically dry year-round (average annual precipitation is 7.0 inches). In winter, temperatures in Priest Rapids Dam (the closest monitoring station located approximately 10 miles north of the Project) average a high of 48.4 degrees Fahrenheit (°F) and a low of 28.6°F, with extreme lows below 20°F (Western Regional Climate Center 2021). In summer, temperatures average a high of 88.1°F and a low of 62.5°F, with extreme highs above 95°F.

The Project is located within the Columbia Plateau Ecoregion (Clarke and Bryce 1997), within the big sagebrush (*Artemisia tridentata*)/bluebunch wheatgrass (*Pseudoroegneria spicata* [*Agropyron spicatum*]) vegetation zone (Franklin and Dyrness 1988). The elevation within the Project Area ranges from approximately 960 to 1,240 feet above mean sea level (msl). The topography in the Project Area is defined by a relatively flat bottom area in between two ridges.

Based on information from the Natural Resources Conservation Service, 49 percent of soils within the Project Area are Warden silt loam, 0 to 5 percent slopes and 17 percent are Ritzville silt loam, 0 to 5 percent slopes. In general, the remainder of soils in the Project Area are silt loams, very stony silt loams, fine sandy loams, stony fine sandy loams, and very fine sandy loams, with bedrock or restrictive layer greater than 80 inches (See Table E-1 in Attachment E of the ASC).

Wautoma Solar

Figure 1
Project Location

BENTON AND YAKIMA COUNTIES, WA

- Project Lease Boundary
- Project Area
- County Boundary

INNERGEX TETRA TECH

Reference Map

1:150,000 NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 1 2 4 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\INNERGEX_WAUTOMA\EF SEC\MAPS\Wautoma_Figure_1_Location.mxd

Nine habitat types occur within the Project Area (see Section 4.8.B of the ASC). These include:

- Agricultural land
- Developed/disturbed
- Eastside (interior) grassland
- Irrigated hedgerows
- Non-native grassland and forbland
- Planted grassland
- Rabbitbrush shrubland
- Sagebrush shrub-steppe
- Talus

Native vegetation within the majority of the Project Area has been heavily modified due to historic and current agriculture and grazing activity. Three habitat types, planted grassland, non-native grassland and forbland, and agricultural land, comprise approximately 93 percent of the existing vegetation within the Project Area. The remaining 7 percent of the Project Area consists of the other six habitat types.

2.2 Project Description

The Project would consist of a 470-megawatt (MW) solar photovoltaic (PV) generation facility coupled with a four-hour, 470-MW battery energy storage system (BESS), as well as related interconnection and ancillary support infrastructure. The solar PV system would consist of a series of solar PV panels mounted on a solar tracker racking system and related electrical equipment. The power conversion system (PCS) consists of the BESS, inverters, and transformers. The BESS can either store electricity for future use or, as required based on grid demand, and convert direct current (DC) electricity to alternating current (AC) electricity and send the AC electricity to the Project's collector substation where it is transformed to grid voltage.

The Project also includes the following supporting components: DC and AC electrical collector lines, Project substation, overhead 500-kilovolt (kV) generation-tie transmission line (gen-tie line), operations and maintenance (O&M) building, associated Project access roads, temporary laydowns, and perimeter fencing. Chain-link fencing, enclosing 2,974 acres, would be installed around the perimeter of the solar arrays, Project substation, and O&M building area. The point of interconnection (POI) is the BPA transmission system at the BPA Wautoma Substation, which is located on BPA federal lands surrounded by the Project Area. An approximately 0.25-mile-long overhead 500 kV transmission line would extend from the Project to the POI.

2.3 Description of Project Impacts

Construction and operation of the Project would result in permanent and temporary impacts on vegetation, as well as permanent alterations of vegetation within the solar array's perimeter fence lines. Permanent impacts include locations where Project components would be installed for the operational life of the Project (e.g., solar array panel posts, inverter pads, new permanent access roads, O&M building, Project substation, poles for overhead gen-tie lines). Temporary impacts include work areas located outside the solar array perimeter fence that would be disturbed during construction and revegetated following construction, such as laydown areas and pulling areas for the transmission line, corridors for trenching to install collector lines, and temporary access roads. Altered habitat would occur in areas within the solar array fence lines but outside areas occupied by permanent Project structures. Table 1

presents the anticipated acreages of impact to each habitat type from construction and operation of the Project.

Following completion of construction, temporarily disturbed areas and areas under the solar arrays would be either passively or actively revegetated, as described in Section 3.0. This Plan addresses revegetation of areas temporarily disturbed for construction of Project facilities, including revegetation of low-growing vegetation located underneath the solar arrays.

Table 1. Anticipated Impacts to Habitat Types from the Project

Habitat Type	Temporary Impact (Acres) [1]	Altered Habitat Impact (Acres)[2]	Permanent Impact (Acres)[3]	Total[4]
Planted grassland	66.4	1,438.8	80.9	**1,586.1**
Agricultural land	5.2	729.4	28.9	**763.5**
Non-native grassland & forbland	34.6	563.0	25.7	**623.3**
Rabbitbrush shrubland	2.7	84.7	4.4	**91.8**
Developed/disturbed	0.6	9.9	0.7	**11.2**
Irrigated hedgerow	0.2	7.3	0.9	**8.3**
Shrub-steppe	2.6	1.6	0.1	**4.2**
Eastside (interior) grassland	2.3	1.5	0.1	**3.9**
Total[4]	**114.7**	**2,836.2**	**141.6**	**3,092.5**

Notes:
Acreages are subject to change following the final Project design, including, but not limited to potential incorporation of green strips and final placement of Project components.
[1] Temporary impacts include: collector lines, temporary access roads, and work areas located outside the solar array perimeter fence lines and laydown and pulling areas associated with the transmission line.
[2] Altered habitat impacts consist of all lands within the perimeter fence lines, minus any areas occupied by permanent Project features/structures. Following construction, low growing vegetation would be planted under the solar panels; therefore, these impacts would be considered an alteration of habitat versus a temporary or permanent impact.
[3] Permanent impacts include solar array panel posts, inverter pads, permanent access roads, substation, O&M building, and poles for transmission line.
[4] Totals may not sum exactly due to rounding,

2.4 Restoration of Agricultural Lands

Restoration of agricultural lands would occur in consultation with the landowner or farm operator. This Plan focuses on the restoration of non-agricultural lands; therefore, restoration of agricultural lands is not further discussed in this document.

3 REVEGETATION METHODS

Revegetation would consist of either passive, where practicable, or active revegetation. Where necessary, active revegetation would occur as soon as feasible following completion of construction activity and site preparation in the respective area. Seeding would be conducted within the appropriate season to facilitate germination (typically late fall or winter). Site preparation, passive revegetation, active revegetation, seeding techniques, and example seed mixes are described below.

3.1 Site Preparation

The Applicant would restore temporarily disturbed areas by re-establishing slope, surface stability, and drainage features, as needed. The intensity of the construction impact would vary based on the intensity of the construction activity taking place at that location as well as the final intended use of the affected area. In some areas, the impact would be relatively light (e.g., where minimal vegetation clearing and ground disturbance would occur); while in other areas, construction activity would remove all vegetation, remove topsoil, and potentially compact the remaining subsoil. Some areas of temporary disturbance (such as staging areas) would be graveled during construction; these areas would be reclaimed by removing the gravel surface, regrading to match adjacent contours, and reseeding.

In areas where soil is removed during construction, the topsoil would be stockpiled separately from the subsurface soils, where possible. The stockpiled soils would be put back in place following construction and prior to revegetation activities, where applicable. The Applicant may use mulching and other appropriate practices to control erosion and sediment during revegetation work, as required.

3.2 Passive Revegetation

Due to the extremely arid conditions of the Project Area and vicinity (annual rainfall is approximately 7.0 inches per year), successful establishment of native plant seedings is notoriously difficult. During discussions with representative of the Washington Department of Fish and Wildlife (WDFW) in February of 2022, the WDFW noted that if the Project was able to control for wildfire and grazing in the Project Area, it would provide an opportunity to see what would return to the landscape, with limited active revegetation. The WDFW noted that if ground disturbance is kept to the bare minimum during construction of the solar arrays, active revegetation in these areas may not be required (i.e., following construction, wait and observe what type of vegetation colonizes naturally within the solar arrays once grazing and fire have been removed). However, areas currently under agricultural cultivation are unlikely to contain available native seed bank, and therefore would be at high risk of noxious weed invasion. These areas are considered to be poor candidates for passive revegetation.

Passive revegetation will be implemented in areas that are assessed as good candidates based on the following criteria:

- Existing cover of desirable vegetation (i.e., native grass or forb species) meets or exceeds 50 percent and the area does not require additional final stabilization measures (see Section 5.2);
- Native root structures remain intact in at least 75 percent of the area;
- Soil seed banks are assessed as available; and
- Noxious weed prevalence and risk of introduction are assessed as low.

As noted above, implementation of passive revegetation would involve waiting to see what plant species colonize naturally following construction. If passive revegetation is not successful (i.e., native species fail to colonize and the site is dominated by non-native species, or vegetation cover and weed prevalence success criteria are not met as outlined in Section 5.2.2), active revegetation would then be implemented. If necessary, active revegetation would include revegetating areas under the solar arrays with low-growing vegetation consisting of native species and/or a mix of native and desirable non-native, non-invasive species as described in Section 3.3.

3.3 Active Revegetation

All areas of temporary disturbance (see Table 1) would be actively revegetated. In addition, as noted in Section 3.2, areas without native root structures or available seed banks, or where noxious weeds are anticipated, would receive active revegetation.

Active revegetation would consist of seeding revegetation areas with 1) a mix of native or non-invasive, non-persistent non-native grasses and forbs or 2) a mix of native or non-invasive, non-persistent non-native grasses, forbs, and shrubs. Inclusion of non-native, non-invasive species may be desirable in some instances. For example, some non-native, non-invasive species may provide more rapid soil stabilization and vegetative cover than slower-growing native species. Rapid vegetative cover of these species may also reduce the fuel load created by proliferation of non-native species such as cheatgrass. Final seed mixes will be developed in consultation with EFSEC and the WDFW.

Prior to seeding of revegetation areas, soils would be prepared to facilitate revegetation success. Soil preparation would include standard, commonly used methods, and would take into account relevant site-specific factors, including slope, size of area, and erosion potential. In general, the soil needs to be prepared into a firm, fine-textured seedbed that is relatively free of debris before seeding or planting. Shallow tilling with a disc, followed by a harrow or drag, if necessary and where feasible, can be effective at achieving this. If replaced soil is too soft, then seeds may be buried too deep to properly germinate; therefore, a roller or cultipacker would be used where necessary to pack the soil to the appropriate conditions.

3.3.1 Seeding Methods

Following soil preparation, active revegetation areas would be seeded. The Applicant would choose seeding methods based on site-specific factors such as slope, erosion potential, and the size of the area in need of revegetation. Two common seed application methods that may be used are described below.

3.3.1.1 Broadcast Seeding

Broadcast seeding is the application of seed directly on the ground surface. This method may be chosen for areas with shallow and rocky soils, and the type of broadcast spreader would depend on the size of the area to be seeded as well as the terrain.

In this method, the seed mix would be applied at the application rates specified by the seed supplier for broadcast seeding. Where feasible, half of the total mix would be applied in one direction and the second half of the mix would be applied in the perpendicular direction. A tracking dye may be added to facilitate uniform seed application. Immediately following seed application, certified weed-free straw may be applied at a rate of 2 tons per acre. Straw may be crimped into the ground to a depth of 2 inches using a crimping disc or similar device. As an alternative to crimping, a tackifier may be applied using hydroseed equipment. Prior to mixing the tackifier, the tank would be visually inspected for cleanliness and, if remnants from previous applications exist, the tank would be washed. Broadcast seeding would not be employed if winds exceed 5 miles per hour.

3.3.1.2 Drill Seeding

The drill seeding method may be chosen for larger areas with deeper soils and moderate to gentle terrain to accommodate mechanical equipment. This method provides the advantage of planting the seed at a uniform depth and provides better soil to seed contact.

Using an agricultural or range seed drill, seeds would be sown according to the application rates recommended by the seed supplier. Where feasible, half of the total mix would be applied in one direction

and the second half of mix in the perpendicular direction. If mulch has been previously applied, seed may be drilled through the mulch provided the drill can penetrate the straw resulting in seed-to-soil contact conducive for germination.

3.3.2 Seed Mixes

Four seed mixes are proposed for active revegetation efforts. Tables 2 through 5 present example seed mixes that would be considered for active revegetation. However, the number of seed mixes and composition of the final seed mixes would be determined based on pre-construction conditions and the availability of seed at the time of procurement.

Grassland Seed Mix #1 would be appropriate for use to revegetate all temporarily disturbed areas outside the solar arrays, with the exception of temporarily disturbed rabbitbrush shrubland and shrub-steppe habitat types and areas that would be returned to agricultural production following construction (as noted in Section 2.3). The example grassland seed mix is presented in Table 2 and contains a mixture of native grasses and pollinator-friendly forbs.

Table 2. Example Grassland Seed Mix #1

Growth Habit	Scientific Name	Common Name	Percent of Mix
Grasses	*Pseudoroegneria spicata*	Bluebunch wheatgrass	42
	Poa secunda	Sandberg bluegrass	24
	Elymus elymoides	Bottlebrush squirreltail	15
	Hesperostipa comata	Needle-and-thread grass	10
Forbs	*Achillea millefolium*	Yarrow	3
	Dieteria (*Machaeranthera*) *canescens*	Hoary-aster	2
	Erigeron pumilus	Shaggy fleabane	2
	Linum lewisii	Wild blue flax	2

A second grassland seed mix, Grassland Seed Mix #2, is suggested for active revegetation under the solar arrays, including areas that previously consisted of agricultural lands or areas at high risk of noxious weed invasion (see Section 3.2). The example seed mix presented in Table 3 contains a mixture of low-growing grasses and forbs which would be compatible with desired vegetation conditions under the solar arrays (i.e., species whose mature height would not interfere with or shade the solar array). Forb species for each grassland seed mix were also chosen because they support native pollinators.

Table 3. Example Grassland Seed Mix #2

Growth Habit	Scientific Name	Common Name	Percent of Mix
Grasses	*Poa secunda*	Sandberg bluegrass	30
	Elymus elymoides	Bottlebrush squirreltail	30
	Koeleria macrantha	Prairie Junegrass	15
	Achnatherum thurberiana	Thurber's needlegrass	15
Forbs	*Achillea millefolium*	Yarrow	2
	Astragalus spp.	Milkvetch	2

Growth Habit	Scientific Name	Common Name	Percent of Mix
	(*A. caricinus, A. purshii, A. spaldingii*, or *A. succumbens*)		
	Erigeron pumilus	Shaggy fleabane	2
	Eriophyllum lanatum	Oregon sunshine	2
	Linum lewisii	Wild blue flax	2

A Rabbitbrush Shrubland Seed Mix is suggested for the revegetation of temporarily disturbed rabbitbrush shrubland. The example seed mix presented in Table 4 contains a mixture of shrub, grass, and forb species currently found within the rabbitbrush shrubland habitat type within the Project Area.

Table 4. Example Rabbitbrush Shrubland Seed Mix

Growth Habit	Scientific Name	Common Name	Percent of Mix
Shrubs	*Ericameria nauseosa*	Rubber rabbitbrush	30
Grasses	*Poa secunda*	Sandberg bluegrass	25
	Pseudoroegneria spicata	Bluebunch wheatgrass	25
	Elymus elymoides	Bottlebrush squirreltail	12
Forbs	*Dieteria* (*Machaeranthera*) *canescens*	Hoary-aster	2
	Erigeron filifolius	Threadleaf fleabane	2
	Lupinus sulphureus or *L. bingenensis*	Sulfur or Bingen Lupine	2
	Phlox longifolia	Longleaf phlox	2

A Shrub-steppe Seed Mix is proposed for revegetation of temporarily disturbed sagebrush shrub-steppe habitat. The example seed mix presented in Table 5 contains a mixture of shrub, grass, and forb species currently found within the shrub-steppe habitat type within the Project Area.

Table 5. Example Shrub-steppe Seed Mix

Growth Habit	Scientific Name	Common Name	Percent of Mix
Shrubs	*Artemisia tridentata*	Big sagebrush	36
	Ericameria nauseosa	Rubber rabbitbrush	5
	Chrysothamnus viscidiflorus	Green rabbitbrush	4
Grasses	*Poa secunda*	Sandberg bluegrass	20
	Pseudoroegneria spicata	Bluebunch wheatgrass	20
	Elymus elymoides	Bottlebrush squirreltail	5
Forbs	*Achillea millefolium*	Yarrow	2
	Chaenactis douglasii	Douglas' dustymaidens	2
	Dieteria (*Machaeranthera*) *canescens*	Hoary-aster	2
	Erigeron filifolius	Threadleaf fleabane	2

Growth Habit	Scientific Name	Common Name	Percent of Mix
	Sphaeralcea munroana	Munro's globemallow	2

4 REVEGETATION DOCUMENTATION

Records would be kept of revegetation efforts and would include the following data:

- Date construction was completed in the area to be revegetated, or date phase of construction was completed if revegetation occurs at interim points during construction;
- Description of the affected area;
- Date revegetation work was initiated;
- Description of the revegetation work implemented; and
- Supporting figures representing the location and acres of each revegetation area.

The Applicant would update these records periodically as revegetation work occurs and would provide EFSEC with copies of these records.

5 REVEGETATION MONITORING

5.1 Monitoring Procedures

Following implementation of revegetation efforts, the Applicant would monitor the revegetation areas as described in this section, unless the landowner has converted the area to a use inconsistent with the success criteria (e.g., converted to agricultural land). Monitoring of the revegetation areas would be conducted by a qualified investigator annually for 5 years, or until all the Success Criteria (Section 5.2) are met, with the first monitoring period to occur during the first growing season following initial seeding.

During the annual monitoring, a representative cross section of the revegetated area would be inspected to determine if the area is meeting and/or on track to meeting the success criteria described in Section 5.2. The investigator would evaluate the following site conditions during annual monitoring:

- Species composition and percent cover of native forbs, grasses and shrubs;
- Species composition and percent cover of non-native forbs and grasses;
- Percent cover of bare soil;
- Degree of erosion;
- Percent cover of noxious weeds; and
- Qualitative assessment of overall vigor of vegetation within revegetated areas.

Following annual monitoring, a monitoring report would be prepared and would include the following:

- The results of annual monitoring;
- The investigator's assessment of whether the revegetated areas have or are trending toward meeting the success criteria;

- Assessment of factors impacting the ability of the revegetated area to trend towards meeting the success criteria;
- Any need to employ active seeding methods in locations where passive revegetation has been occurring; and
- Recommendations of remedial actions, if any.

The Applicant would submit the results of monitoring to EFSEC within 90 days of the annual monitoring inspection.

5.2 Success Criteria

In each monitoring report, the Applicant would include an assessment of whether the revegetated areas are meeting or trending toward meeting the success criteria. Revegetation areas would be deemed successfully revegetated when the success criteria outlined below are met. If the success criteria outlined in the sections below are not met by Year 5, a remedial action strategy as discussed in Section 5.3 would be outlined in the final report and implemented.

Additionally, the success criteria in this plan are intended to support the Project successfully filing for Notice of Termination (NOT) for the construction National Pollutant Discharge Elimination System (NPDES) permit. Eligibility criteria for NOT are provided in the Construction Stormwater General Permit (CSWGP) (Ecology 2020), and require that the site has undergone final stabilization. Final stabilization is defined in the CSWGP as "the completion of all soil disturbing activities at the site and the establishment of permanent vegetative cover, or equivalent permanent stabilization measures (such as pavement, riprap, gabions, or geotextiles) which will prevent erosion," and refers to the Stormwater Management Manual for Eastern Washington (SWMMEW) (Ecology 2019) for vegetative cover success criteria. The vegetative cover success criteria in the SWMMEW are provided as part of BMP C120E: Temporary and Permanent Seeding, and require that seeded areas establish greater than or equal to 50 percent cover (100 percent cover for areas that receive sheet or concentrated flows) of all seeded areas after 3 months of active growth following germination during the growing season.

5.2.1 Success Criteria for Active Revegetation of Temporarily Disturbed Areas

Success criteria for revegetation of areas temporarily disturbed by construction would be based on the habitat type of the revegetated area prior to construction (See Table 1) and the seed mix used to actively revegetate the area. An area would be deemed successfully revegetated when the following success criteria are met:

- Total cover of desirable[1] vegetation within revegetated areas of eastside (interior) and planted grassland habitat types exceeds 50 percent. In addition, cover of state or county designated noxious weeds (as discussed in Section 6) is less than 5 percent.
- For revegetated areas of non-native grassland & forbland and developed/disturbed habitat types, total cover of desirable vegetation exceeds 30 percent and density of state or county designated noxious weeds is equal to or less than the adjacent habitat.
- Total cover of seeded shrub species within revegetated rabbitbrush shrubland and sagebrush shrub-steppe habitat types exceeds 10 percent, cover of desirable grasses and forbs exceeds 25 percent, and cover of state or county designated noxious weeds is less than 5 percent.

[1] Desirable vegetation includes those species included in the seed mix as well as any native species that have established voluntarily.

5.2.2 Success Criteria for Revegetation within the Solar Array Perimeter Fence

Passively revegetated areas within the solar array perimeter fence would be deemed successfully revegetated when the following success criteria are met:

- Total cover of desirable vegetation (i.e., native grass or forb species) within revegetated habitat exceeds 50 percent.
- Total cover of state or county designated noxious weeds is less than 5 percent.

5.3 Remedial Action

Remedial action options would be identified in cases where success criteria are not met by Year 5 of annual monitoring, whether due to wildfire subsequent to Project construction or because of lower-than-expected rates of germination or survival. Remedial actions may include reseeding the affected area, planting container plants, additional noxious weed control, or other measures as needed. In addition, if during annual monitoring prior to Year 5, it is determined that the revegetation area does not appear to be trending toward meeting the success criteria, the investigator would make recommendations for remedial actions. The Applicant would include the investigator's recommendations for remedial actions and the measures taken in that year's monitoring report.

6 NOXIOUS WEED PREVENTION AND CONTROL

Noxious weeds are those invasive weed species that are of elevated economic or environmental concern to the State of Washington or local jurisdictions and receive priority during management planning and operations. In Benton County, control of noxious weeds is overseen by the Benton County Noxious Weed Control Board.

Noxious weed species can adversely affect the structure, composition, and success of revegetation efforts. The intent of noxious weed management outlined in this Plan is to provide clear methods to prevent the introduction and spread of designated noxious weeds from the construction and operation of the Project, to control existing populations of noxious weeds within construction and revegetation areas, and to monitor the effectiveness of efforts to prevent and control noxious weeds.

6.1 Noxious Weeds Identified within the Project Area

Eight Washington State and Benton County designated noxious weeds were documented within the Project Area during surveys conducted in 2021 and 2022 (Tetra Tech 2022a, b)[2]. These species and their state and county weed status are presented in Table 6. The current lists of Washington State and Benton County designated noxious weeds are provided in Attachments A and B, respectively.

Table 6. Noxious Weeds Documented within the Project Area

Scientific Name	Common Name	State and County Status[1]	Frequency[2]
Aegilops cylindrica	jointed goatgrass	C / C	Observed in one location in the 2021 survey area.

[2] In addition to the eight species listed in Table 6, one small population of kochia (*Bassia* [*Kochia*] *scoparia*) was documented within the Project Lease Boundary, but outside the Project Area, during surveys conducted for the Project.

Scientific Name	Common Name	State and County Status[1]	Frequency[2]
Centaurea diffusa	diffuse knapweed	B / B	Abundant in the 2021 survey area and common in the 2022 survey area.
Chondrilla juncea	rush skeletonweed	B / B	Common in the 2021 survey area.
Convolvulus arvensis	morning glory	C / C	Common in the 2021 survey area and observed in two locations in the 2022 survey area.
Elaeagnus angustifolia	Russian olive	C / Not listed	Observed in one location in the 2021 survey area.
Rhaponticum (Acroptilon) repens	Russian thistle	B / B	Observed in one location in the 2021 survey area.
Secale cereale	cereal rye	C / C	Abundant in the 2021 survey area and common in the 2022 survey area.
Taeniatherum caput-medusae	medusahead	C / C	Observed in 2 locations in the 2021 survey area.

[1] **"Class B" weeds:** Non-native species presently limited to portions of the state. Species are designated for required control in regions where they are not yet widespread. Preventing new infestations in these areas is a high priority. In regions where a Class B species is already abundant, control is decided at the local level, with containment as the primary goal.
"Class C" weeds: Noxious weeds that are typically widespread in the state or are of special interest to the state's agricultural industry. These weeds are selected by the County Board of Directors. The Class C status allows county weed boards to require control if locally desired, or they may choose to provide education or technical consultation (BCNWCB 2022; WSNWCB 2021).
[2] Frequency based on Tetra Tech 2022a, b. Locations of 2021 and 2022 survey areas are provided in Tetra Tech 2022a, b.

6.2 Noxious Weed Management

The Applicant's primary objective for weed management is to prevent the introduction of new noxious weed populations and control the spread of existing noxious weed populations. Early detection and management of small populations of noxious weeds before they expand into larger populations is extremely important for successful control of noxious weeds. Noxious weed prevention and control would occur during both construction and operation of the Project. Prevention and control methods are discussed in more detail below.

6.2.1 Education and Personnel Requirements

Prior to construction, all construction personnel would be instructed on the importance of controlling noxious weeds and would receive training regarding noxious weed identification and management. O&M personnel would be similarly trained. The importance of preventing the spread of noxious weeds in areas not currently infested, as well as controlling the proliferation of noxious weeds already present within or near the Project, would be emphasized. Information regarding noxious weed species would also be provided for reference at the O&M facilities.

6.2.2 Prevention

The following best management practices would be implemented to avoid and minimize the spread of noxious weeds during construction, revegetation efforts, and O&M activities.

- Areas of noxious weed infestations would be flagged, where practical, prior to construction to alert construction personnel to their presence and limit or prevent access to those areas.

- Vehicle access would be limited to designated routes, whether existing roads or newly constructed roads, and the outer limits of constructed-related disturbances.
- Vehicle traffic would be restricted or minimized in noxious weed-infested areas.
- Vehicles would be cleaned after performing work in noxious weed-infested areas.
- Topsoil and other soils that came from noxious weed–infested areas would be identified and placed next to the infested areas, so they are returned to their previous location during reclamation activities.
- Soils from infested areas would be treated with a pre-emergent herbicide prior to initiation of revegetation efforts, depending on site-specific conditions.
- Conditions favorable for noxious weed germination and spread would be minimized by revegetating temporarily disturbed areas as soon as practicable.
- Areas of disturbance would be monitored for noxious weeds after construction, during the normal course of revegetation of temporary workspaces, and control measures would be implemented as appropriate.
- Seed and straw mulch (used for site rehabilitation and revegetation) would be certified free of noxious weed seed and propagules.

6.2.3 Treatment

Noxious weed treatment would focus on control of existing populations of noxious weeds within areas proposed to be disturbed by construction, including revegetation areas. Additionally, if it is determined that noxious weeds have invaded areas immediately adjacent to disturbance areas as a result of construction, the Applicant would contact the landowner and seek approval to treat those noxious weed populations as well. This would help minimize recolonization or spread of noxious weeds from adjacent areas into revegetation areas. New noxious weeds detected in the Project area during post-construction restoration and revegetation would be considered a result of construction or revegetation activities and would also be controlled and treated accordingly.

The Applicant would be responsible for hiring a qualified contractor to implement the treatment of noxious weeds. Treatment of target noxious weeds would differ, depending on the disturbed area, the proximity to biologically sensitive areas (e.g., ephemeral streams), size of infestation, and the specific noxious weed being controlled. Control of noxious weeds would be implemented through manual and mechanical or chemical control measures, which are described further below.

6.2.3.1 Manual and Mechanical Treatment

Manual or mechanical control methods rely on removing plants, removing seed heads, and/or cutting roots with a shovel or other hand tools or equipment that can be used to remove, mow, or disc noxious weed populations. Hand removal of plants is also included under this treatment method. Mechanical methods are useful for smaller, isolated populations of noxious weeds or in areas of sensitive habitats. Additionally, hand removal of small infestations can minimize soil disturbance, allowing desirable species to remain and limiting the development of conditions that are favorable for noxious weeds (e.g., disturbed soils or areas cleared of vegetation).

Some rhizomatous plants can spread when the soil is disced or tilled; therefore, the decision whether to implement discing would be species and site-specific. If such a method is used in areas to be revegetated, subsequent seeding would be conducted to reestablish desirable vegetative cover that would stabilize the soils and reduce the potential for re-invasion of noxious weeds.

6.2.3.2 Chemical Treatment

Chemical control can effectively remove noxious weeds through use of selective herbicides. Only herbicides approved by the U.S. Environmental Protection Agency and Washington Department of Agriculture and specific to the noxious weeds being treated would be applied, and appropriate best management practices would be implemented during application. Prior to construction and every fall season during Project operation, the Applicant or its contractor would consult with the Benton County Weed Control website to determine if there have been changes to the county noxious weed list that may require a change to currently approved control methods.

7 NOXIOUS WEED MONITORING AND REPORTING

During construction, periodic monitoring for noxious weeds would be conducted by construction staff within and adjacent to areas disturbed by construction (the timing of these monitoring efforts is described below). Any signs of new noxious weed infestations, or of re-growth of existing noxious weeds in areas where treatment has previously occurred, would be addressed promptly with further herbicide or mechanical treatments or other best management practices.

Once construction has been completed and revegetation efforts have been initiated, a qualified investigator would be employed to assess noxious weed growth and to make recommendations on noxious weed control measures (see Section 5). Monitoring would be conducted annually for 5 years, or until all the Success Criteria (Section 5.2), are met, with the first monitoring period to occur during the first growing season following initial seeding of revegetation areas. Noxious weed monitoring would consist of a site survey, conducted during the growing season, to identify noxious weed species that have established within and adjacent to the revegetation areas, as well as inspections of treated areas to assess the success of previous noxious weed treatments. These inspections would be used to inform ongoing noxious weed control efforts.

The results of the first annual monitoring would be summarized in a monitoring report that details the locations of all noxious weed species observed and identifies treatment protocols for these species. Subsequent monitoring would assess the success of noxious weed treatments and would document any new noxious weed infestations observed. These results would be summarized in short memoranda that describe the treatment success or failure, make recommendations to improve treatment success (if necessary), and note any new noxious weed species or emergence. The annual monitoring report and memorandums would be submitted to EFSEC and the Benton County Noxious Weed Control Board following each annual inspection.

8 WILDFIRE RESTORATION

If a wildlife habitat mitigation area (see Wildlife Habitat Mitigation Plan) is damaged by wildfire during the first five years following project construction, the applicant would work with the landowner to restore the damaged area either through passive revegetation or active seeding generally as described in Section 3.3. The applicant would continue to report on revegetation progress during the remainder of the five-year period.

9 REFERENCES

BCNWCB (Benton County Noxious Weed Control Board). 2022. 2022 Benton County Noxious Weed List. Available online at: http://www.bentonweedboard.com/ (Accessed January 2023).

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ATTACHMENT A
2021 WASHINGTON STATE NOXIOUS WEED LIST

Class C Weeds

Aegilops cylindrica	jointed goatgrass
Ailanthus altissima	tree-of-heaven
Alopecurus myosuroides	blackgrass
Artemisia absinthium	absinth wormwood
Arum italicum	Italian arum
Berberis vulgaris	common barberry
Cenchrus longispinus	longspine sandbur
Centromadia pungens	spikeweed
Cirsium arvense	thistle, Canada
Cirsium vulgare	thistle, bull
Clematis vitalba	old man's beard
Convolvulus arvensis	field bindweed
Cortaderia jubata	jubata grass
Cortaderia selloana	Pampas grass
Crataegus monogyna	English hawthorn
Cuscuta approximata	smoothseed alfalfa dodder
Daucus carota	wild carrot (except where commercially grown)
Dipsacus fullonum	common teasel
Elaeagnus angustifolia	Russian olive
Gypsophila paniculata	babysbreath
Hedera helix 'Baltica', 'Pittsburgh', and 'Star', and *H. hibernica 'Hibernica'*	English ivy - four cultivars only
Hyoscyamus niger	black henbane
Hypericum perforatum	common St. Johnswort
Hypochaeris radicata	common catsear
Impatiens capensis	spotted jewelweed
Iris pseudacorus	yellow flag iris
Lepidium appelianum	hairy whitetop
Lepidium draba	hoary cress
Leucanthemum vulgare	oxeye daisy
Linaria vulgaris	yellow toadflax
Myriophyllum spicatum x *Myriophyllum sibiricum*	Eurasian watermilfoil hybrid
Nanozostera japonica	Japanese eelgrass
Nymphaea odorata	fragrant waterlily
Phalaris arundinacea	reed canarygrass
Potamogeton crispus	curlyleaf pondweed
Rorippa austriaca	Austrian fieldcress
Rubus bifrons (*Rubus armeniacus*)	Himalayan blackberry
Rubus laciniatus	evergreen blackberry
Secale cereale	cereal rye

Class C Weeds continued

Senecio vulgaris	common groundsel
Silene latifolia	white cockle
Solanum rostratum	buffalobur
Soliva sessilis	lawnweed
Sonchus arvensis	perennial sowthistle
Sphaerophysa salsula	Swainsonpea
Taeniatherum caput-medusae	medusahead
Tanacetum vulgare	common tansy
Tripleurospermum inodorum	scentless mayweed
Typha species	nonnative cattail species and hybrids (reminder, does not include the native common cattail, *Typha latifolia*)
Ventenata dubia	ventenata
Xanthium spinosum	spiny cocklebur

To learn more about noxious weeds and noxious weed control in Washington State, please contact:

WA State Noxious Weed Control Board
P.O. Box 42560
Olympia, WA 98504-2560
(360) 725-5764

Email: noxiousweeds@agr.wa.gov
Website: http://www.nwcb.wa.gov

Or

WA State Department of Agriculture
(509) 249-6973

Or

Your County Noxious Weed Control Board

Please help protect Washington's economy and environment from noxious weeds!

Cover photo of Turkish thistle by Mark Porter, Oregon Department of Agriculture

2021

Washington State Noxious Weed List

Turkish thistle, *Carduus cinereus*, is a new Class A noxious weed for 2021. This annual thistle is found close to Washington in northeastern Oregon and the adjacent area in Idaho. Eradication is required of Turkish thistle when found in Washington.

List arranged alphabetically by:

SCIENTIFIC NAME

Washington State Noxious Weed Control Board

Class A Weeds: Non-native species whose distribution in Washington is still limited. Preventing new infestations and eradicating existing infestations are the highest priority. **Eradication of all Class A plants is required by law.**

Class B Weeds: Non-native species presently limited to portions of the State. Species are **designated** for required control in regions where they are not yet widespread. Preventing new infestations in these areas is a high priority. In regions where a Class B species is already abundant, control is decided at the local level, with containment as the primary goal. Please contact your County Noxious Weed Control Board to learn which species are designated for control in your area.

Class C Weeds: Noxious weeds that are typically widespread in WA or are of special interest to the state's agricultural industry. The Class C status allows county weed boards to require control if locally desired, or they may choose to provide education or technical consultation.

Class A Weeds
Eradication is required

Alliaria petiolata	garlic mustard
Brachypodium sylvaticum	false brome
Butomus umbellatus	flowering rush
Carduus cinereus	thistle, Turkish
Carduus pycnocephalus	thistle, Italian
Carduus tenuiflorus	thistle, slenderflower
Centaurea calcitrapa	purple starthistle
Centaurea macrocephala	knapweed, bighead
Centaurea nigrescens	knapweed, Vochin
Clematis orientalis	oriental clematis
Crupina vulgaris	common crupina
Euphorbia oblongata	eggleaf spurge
Galega officinalis	goatsrue
Genista monspessulana	French broom
Glyceria maxima	reed sweetgrass
Helianthus ciliaris	Texas blueweed
Heracleum mantegazzianum	giant hogweed
Hydrilla verticillata	hydrilla
Impatiens parviflora	small-flowered jewelweed
Isatis tinctoria	dyer's woad
Limnobium laevigatum	South American spongeplant
Ludwigia peploides	floating primrose-willow
Mirabilis nyctaginea	wild four-o'clock
Myriophyllum heterophyllum	variable-leaf milfoil
Pueraria montana var. *lobata*	kudzu
Salvia aethiopis	sage, Mediterranean
Salvia pratensis	meadow clary
Salvia sclarea	sage, clary
Schoenoplectus mucronatus	ricefield bulrush
Silybum marianum	thistle, milk
Solanum elaeagnifolium	silverleaf nightshade
Sorghum halepense	Johnsongrass
Spartina alterniflora	cordgrass, smooth
Spartina anglica	cordgrass, common
Spartina densiflora	cordgrass, dense-flowered
Spartina patens	cordgrass, saltmeadow
Spartium junceum	Spanish broom
Zygophyllum fabago	Syrian beancaper

Class B Weeds

Abutilon theophrasti	velvetleaf
Alhagi maurorum	camelthorn
Amorpha fruticosa	indigobush
Anchusa officinalis	bugloss, common
Anthriscus sylvestris	wild chervil
Bassia scoparia	kochia
Berteroa incana	hoary alyssum
Bryonia alba	white bryony
Buddleja davidii	butterfly bush
Cabomba caroliniana	fanwort
Carduus acanthoides	thistle, plumeless
Carduus nutans	thistle, musk
Centaurea × *gerstlaueri*	knapweed, meadow
Centaurea diffusa	knapweed, diffuse
Centaurea jacea	knapweed, brown
Centaurea melitensis	Malta starthistle
Centaurea nigra	knapweed, black
Centaurea solstitialis	yellow starthistle
Centaurea stoebe	knapweed, spotted
Chondrilla juncea	rush skeletonweed
Conium maculatum	poison hemlock
Cynoglossum officinale	houndstongue
Cyperus esculentus	yellow nutsedge
Cytisus scoparius	Scotch broom
Daphne laureola	spurge laurel
Echium vulgare	blueweed
Egeria densa	Brazilian elodea
Epilobium hirsutum	hairy willowherb
Euphorbia myrsinites	spurge, myrtle
Euphorbia virgata	spurge, leafy
Fallopia × *bohemica*	knotweed, Bohemian
Fallopia japonica	knotweed, Japanese
Fallopia sachalinensis	knotweed, giant
Ficaria verna	lesser celandine
Foeniculum vulgare except *F. vulgare* var. *azoricum)*	common fennel, (except bulbing fennel)
Geranium lucidum	shiny geranium
Geranium robertianum	herb-Robert
Hieracium aurantiacum	hawkweed, orange
Hieracium, subgenus *Hieracium*	hawkweeds: All nonnative species and hybrids of the wall subgenus
Hieracium, subgenus *Pilosella*	hawkweeds: All nonnative species and hybrids of the meadow subgenus
Impatiens glandulifera	policeman's helmet
Jacobaea vulgaris	tansy ragwort
Lamiastrum galeobdolon	yellow archangel
Lepidium latifolium	perennial pepperweed
Linaria dalmatica ssp. *dalmatica*	Dalmatian toadflax
Ludwigia hexapetala	water primrose
Lycopsis arvensis	bugloss, annual
Lysimachia vulgaris	loosestrife, garden
Lythrum salicaria	loosestrife, purple
Lythrum virgatum	loosestrife, wand
Myriophyllum aquaticum	parrotfeather
Myriophyllum spicatum	Eurasian watermilfoil
Nymphoides peltata	yellow floatingheart
Onopordum acanthium	thistle, Scotch
Persicaria wallichii	knotweed, Himalayan
Phragmites australis	common reed (nonnative genotypes only)
Picris hieracioides	hawkweed oxtongue
Potentilla recta	sulfur cinquefoil
Rhaponticum repens	knapweed, Russian
Sagittaria graminea	grass-leaved arrowhead
Tamarix ramosissima	saltcedar
Thymelaea passerina	spurge flax
Tribulus terrestris	puncturevine
Tripidium ravennae	Ravenna grass
Tussilago farfara	European coltsfoot
Ulex europaeus	gorse

ATTACHMENT B
2022 BENTON COUNTY NOXIOUS WEED LIST

Benton County Noxious Weed Control Board

Philosophy and Weed Control Policy

The Benton County Noxious Weed Control Board (BCNWCB) was activated in 1991 pursuant to the Revised Code of Washington (RCW) 17010. The Weed Board is funded by the residents of Benton County at a rate of $5.00 per parcel and $0.005 per acre.

Philosophy

The Benton County Noxious Weed Control Board shall promote weed control by instituting a program which emphasizes education as a means to assist landowners in the identification of noxious weeds and implementation of appropriate management practices necessary to control or prevent the spread of designated plants on the Benton County Noxious Weed List.

The Board will provide trained field staff to assist the land owners. The Field staff are regulatory inspectors and if needed, will require control of weeds on the control list. The weed board will promote weed control through public seminars, newsletters, displays and regularly scheduled board meetings. Landowners are responsible for the control of noxious weeds on their property.

Weed Control Policy

The policy of the Benton County Noxious Weed Control Board is to work with growers, land owners, local and state agencies to identify noxious weed populations and to develop plans for noxious weed control.

It is Benton County Noxious Weed Control Board's primary objective to educate and encourage landowners to control noxious weeds voluntarily. When BCNWCB staff identifies a weed that is listed on the Noxious Weed Control List they will send the landowner a letter identifying the weed(s), their location, control alternatives and timeline for successful control. If a landowner or entity does not comply with a notice of control the weed board will not hesitate to take enforcement action. Washington State RCW 16.750 allows monetary penalties to be assessed per parcel, per noxious weed species, day after expiration of the notice to control.

With the exception of the test plots it is not the job BCNWCB staff to remove or control noxious weeds from private or public lands. Staff's primary job is to identify and educate landowners and entities on the proper control of noxious weeds. There may be limited cases when the Benton County Noxious Weed Control Board will enter into an MOU with a local or state entity to control listed noxious weed species on a cost reimbursement basis.

Above -Yellow starthistle with biological control (Eustenopus villosus)

Below -North side of Rattlesnake mountain with lupin

2022 Benton County Noxious Weed List

1841 Terminal Drive
Richland, WA 99354
Phone: 509-943-6005
E-mail: bcnwcb@frontier.com
Web: bentonweedboard.com

Class A Weeds: Non-native species whose distribution in Washington is still limited. Preventing new infestations and eradication is required by law.

flowering rush	*Butomus umbellatus*
common crupina	*Crupina vulgaris*
cordgrass, common	*Spartina anglica*
cordgrass, dense-flowered	*Spartina densiflora*
cordgrass, saltmeadow	*Spartina patens*
cordgrass, smooth	*Spartina alterniflora*
dyer's woad	*Isatis tinctoria*
eggleaf spurge	*Euphorbia oblongata*
false-brome	*Brachypodium sylvaticum*
floating primrose-willow	*Ludwigia peploides*
French broom	*Genista monspessulan*
garlic mustard	*Alliaria petiolata*
giant hogweed	*Heracleum mantegazzianum*
goatsrue	*Galega officinalis*
hydrilla	*Hydrilla verticillata*
Johnsongrass	*Sorghum halepense*
knapweed, bighead	*Centaurea macrocephala*
knapweed, Vochin	*Centaurea nigrescens*
kudzu	*Pueraria montana var. lobata*
meadow clary	*Salvia pratensis*
oriental clematis	*Clematis orientalis*
purple starthistle	*Centaurea calcitrapa*
reed sweetgrass	*Glyceria maxima*
ricefield bulrush	*Schoenoplectus mucronatus*
sage, clary	*Salvia sclarea*
sage, Mediterranean	*Salvia aethiopis*
silverleaf nightshade	*Solanum elaeagnifolium*
Small flower jewelweed	*Impatiens parvifora*
south American spongeplant	*Limnbium laevigatum*
spanish broom	*Spartium junceum*
spurge flax	*Thymelaea passerina*
syrian beancaper	*Zygophyllum fabago*
tyexas blueweed	*Helianthus ciliaris*
thistle, Italian	*Carduus pycnocephalus*
thistle, milk	*Silybum marianum*
thistle, slenderflower	*Carduus tenuiflorus*
thistle, Turkish	*Carduus cinereus*
variable-leaf milfoil	*Myriophyllum heterophyllum*
wild four-o'clock	*Mirabilis nyctaginea*

Class B Weeds: Non-native species presently limited to portions of the State. Species are designated for control in regions where they are not yet wide spread. Preventing new infestations in these areas is a high priority.

Class B Weeds Found in Benton County

camelthorn	***Alhagi maurorum***
common reed (nonnative genotypes)	***Phragmites australis***
dalmatian toadflax	***Linaria dalmatica ssp. dalmatica***
eurasian watermilfoil	***Myriophyllum spicatum***
hairy willowherb	***Epilobium hirsutum***
Houndstongue	***Cynoglossum officinale***
indigobush	***Amorpha fruticosa***
knapweed, diffuse	***Centaurea diffusa***
knapweed, Russian	***Rhaponticum repens***
knapweed, spotted	***Centaurea stoebe***
knotweed, Bohemian	***Polygonum x bohemicum***
knotweed, Japanese	***Fallopia japonica***
kochia	***Bassia scoparia***
loosestrife, purple	***Lythrum salicaria***
perennial pepperweed	***Lepidium latifolium***
poison-hemlock	***Conium maculatum***
puncturevine	***Tribulus terrestris***
ravenna grass	***Tripidum ravennae***
rush skeletonweed	***Chondrilla juncea***
saltcedar	***Tamarix ramosissima***
spurge, myrtle	***Euphorbia myrsinites***
thistle, musk	***Carduus nutans***
thistle, Scotch	***Onopordum acanthium***
velvetleaf	***Abutilon theophrasti***
white bryony	***Bryonia alba***
yellow nutsedge	***Cyperus esculentus***
yellow starthistle	***Centaurea solstitialis***

Additional Class B Weeds

blueweed	*Echium vulgare*
brazilian elodea	*Egeria densa*
bugloss, annual	*Anchusa arvensis*
bugloss, common	*Anchusa officinalis*
butterflybush	*Buddleja davidii*
common fennel (except bulbing fennel)	*Foeniculum vulgare (except F. vulgare var. azoricum)*
European coltsfoot	*Tussilago farfara*
fanwort	*Cabomba caroliniana*
gorse	*Ulex europaeus*
grass-leaved arrowhead	*Sagittaria graminea*
Hanging sedge	*Carex pesdula*
hawkweed oxtongue	*Picris hieracioides*
hawkweed, orange	*Hieracium aurantiacum*
Hawkweeds: all non-native species and hybrids	*Hieracium, subgenus Pilosella*
Hawkweeds: all nonnative species and hybrids	*Hieracium subgenus Hieracium*
herb-Robert	*Geranium robertianum*
hoary alyssum	*Berteroa incana*
knapweed, black	*Centaurea nigra*
knapweed, brown	*Centaurea jacea*
knapweed, meadow	*Centaurea x moncktonii*
knotweed, giant	*Polygonum sachalinense*
knotweed, Himalayan	*Persicaria wallichii*
lesser celandine	*Ficaria verna*
loosestrife, garden	*Lysimachia vulgaris*
loosestrife, wand	*Lythrum virgatum*
malta starthistle	*Centaurea melitensis*
parrotfeather	*Myriophyllum aquaticum*
policeman's helmet	*Impatiens glandulifera*
Scotch broom	*Cytisus scoparius*
Rough chervil	*Chaerophyllum temulum*
spurge flax	*Tymelaea passerina*
shiny geranium	*Geranium lucidum*
spurge laurel	*Daphne laureola*
spurge, leafy	*Euphorbia Euphorbia*
sulfur cinquefoil	*Potentilla recta*
tansy ragwort	*Jacobaea vulgaris*
thistle, plumeless	*Carduus acanthoides*
water primrose	*Ludwigia hexapetala*
wild chervil	*Anthriscus sylvestris*
Wild basil, Savory basil	*Clinopodium vulgare*
yellow archangel	*Lamiastrum galeobdolon*
yellow floatingheart	*Nymphoides peltata*

Class C Weeds: Are selected by the County Board of Directors. These weeds which are already widespread in WA or are of special interest to the state's agricultural industry.

babysbreath	***Gypsophila paniculata***
buffalobur	***Solanum rostratum***
cereal rye	***Secale cereale***
common St. johnswort	***Hypericum perforatum***
Common Teasel	***Dipsacus fullonum***
field bindweed	***Convolvulus arvensis***
fragrant waterlily	***Nymphaea odorata***
hairy whitetop	***Lepidium appelianum***
hoary cress	***Lepidium draba***
jointed goatgrass	***Aegilops cylindrica***
longspine sandbur	***Cenchrus longispinus***
Medusahead	***Taeniatherum caput-medusae***
pampas grass	***Cortaderia selloana***
reed canarygrass	***Phalaris arundinacea***
smoothseed alfalfa dodder	***Cuscuta approximata***
spikeweed	***Hemizonia pungens***
spiny cocklebur	***Xanthium spinosum***
Swansonpea	***Spherophysa salsula***
thistle, bull	***Cirsium vulgare***
thistle, Canada	***Cirsium arvense***
yellowflag iris	***Iris pseudacorus***

2022 Benton County Noxious Weed List

Controlling Noxious Weeds Is Everyone's Responsibility!

ATTACHMENT V: SOIL MONITORING MEMO

TETRA TECH

Memo

To: Laura O'Neill (Innergex Renewable Development USA, LLC)

From: Karen Brimacombe, Jonathan Thompson, Jess Taylor, Linnea Fossum (Tetra Tech)

Date: March 29, 2023

Subject: Wautoma Solar Facility Effects on Currently Irrigated Farmland

1.0 INTRODUCTION

The Wautoma Solar Energy Project (Project) is a proposed 470-megawatt solar photovoltaic (PV) generation facility coupled with a 4-hour battery energy storage system, located in unincorporated Benton County, Washington. The Energy Facility Site Evaluation Council (EFSEC) recently shared with Innergex Renewable Development USA, LLC (Innergex) concerns they had received from the Washington State Department of Agriculture (WSDA) regarding potential impacts to prime farmland if irrigated lands (hereafter referred to as prime farmland) from construction and operation of the proposed Project. This memorandum provides a summary of the irrigated farmland identified within the Project Area, summarizes Innergex's understanding of WSDA's concerns, and provides an overview of how current plans for revegetation, operations, and maintenance of the facility may affect soil health and future potential use for agricultural purposes.

2.0 PRIME FARMLAND IF IRRIGATED LANDS WITHIN PROJECT AREA

In May of 2021 and 2022, Tetra Tech performed field botanical and habitat field surveys within the approximately 4,819-acre Project Area, which includes the full extent of the Project Solar Siting Area. As a result of these field surveys, approximately 794 acres of the Project Area were mapped as agricultural land. Agricultural lands in the Project Area were also assessed using WSDA 2021 agricultural land use data (WSDA 2021)[1] and using Natural Resources Conservation Service (NRCS) soils data[2]. Of lands classified by the NRCS as prime farmland if irrigated, only 699 acres within the Project Fence Line are currently irrigated and thus considered prime farmland, and an additional 182 acres are considered farmland of unique[3] or statewide importance[4]. Details of these designations and determinations were provided in Attachment D to the Application for Site Certification.

[1] WSDA (Washington Department of Agriculture). 2021. Agricultural Land Use Data. Available at: https://agr.wa.gov/departments/land-and-water/natural-resources/agricultural-land-use.

[2] Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. (Natural Resources Conservation Service. 2022. "Prime and Other Important Farmlands Definitions, available online at https://efotg.sc.egov.usda.gov/references/public/LA/Prime_and_other_Important_Farmland.html)

[3] Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables (NRCS 2022)

[4] Land that does not meet the criteria for prime or unique farmland is considered to be farmland of statewide importance for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate state agencies. (NRCS 2022)

3.0 WASHINGTON DEPARTMENT OF AGRICULTURE INPUT

The WSDA expressed to EFSEC several concerns related to impacts to prime farmland from construction and operation of the proposed Project. These concerns include:

- soil cracking and changes in the soil profile due to the lack of continued irrigation;
- soil compaction; and
- loss of organic matter.

The WSDA is concerned that construction and operation of the Project would result in permanent impacts to soils that would create the loss of prime farmland. To prevent or mitigate for these potential impacts, the WSDA has suggested various approaches including:

- Agricultural dual use (i.e., agrivoltaics) with grazing;
- Application of water during construction and/or operation;
- Tilling between the solar panels every summer; and
- Soil testing and application of soil amendments.

4.0 PROPOSED AVOIDANCE AND MITIGATION MEASURES

Innergex has considered the WSDA's concerns regarding soil health and the loss of prime farmland and has considered WSDA's suggested approaches for minimizing these potential impacts. Innergex is currently evaluating options for agricultural dual use within the Project Area, specifically sheep grazing within the solar array areas. Although discussions are ongoing, Innergex is not able to formally commit to agricultural dual use with sheep grazing at this point. Additionally, Innergex is concerned about implementing ongoing water applications and annual tilling. Water application would not only be logistically challenging and an unwise use of this limited resource in the arid landscape within the Project vicinity, but would potentially promote growth of non-native, invasive plant species such as cheatgrass (*Bromus tectorum*), bulbous bluegrass (*Poa bulbosa*), and diffuse knapweed (*Centaurea diffusa*) that are prevalent within the Project Area. Cheatgrass and bulbous bluegrass are competitive species that can germinate in the late fall and early spring allowing them to outcompete native seedlings for water and nutrients (Locke and Burrill 1994[5]; Quintanilla 2017[6]; USDOE 2011[7]) Similarly, seasonal tilling would likely promote germination and growth of non-native, invasive plant species because soil disturbance can create suitable conditions for the establishment of invasive plants (CIPC 2012[8]). In addition to resulting in undesirable vegetative conditions and increased requirements for herbicide use to control weedy species, proliferation of non-native species such as cheatgrass can increase

[5] Locke, K. and L.C. Burrill. 1994. Bulbous Bluegass *Poa bulbosa L.* Available online at: https://ir.library.oregonstate.edu/downloads/9k41zd86x
[6] Quintanilla, J. 2017. Invasive Bulbous Bluegrass Choking Desirable Grasses. Available online at: http://www.uwyo.edu/barnbackyard/_files/documents/magazine/2017/winter/0117bulbous.pdf
[7] USDOE (U.S. Department of Energy). 2011. Hanford Site Revegetation Manual. Available online at: https://www.hanford.gov/files.cfm/DOE-RL-2011-116_-_Rev_01.pdf
[8] CIPC (California Invasive Plant Council). 2012. Preventing the Spread of Invasive Plants: Best Management Practices for Land Managers, 3rd Edition. Available online at: https://www.cal-ipc.org/docs/bmps/dd9jwo1ml8vttq9527zjhek99qr/BMPLandManager.pdf

the fuel load in this already fire-prone region of the state (CSU Extension 2012[9]). Annual tilling is also likely to increase erosion and fugitive dust generation and would not be compatible with revegetation expected to be required as part of the site certification as outlined in the Draft Vegetation and Weed Management Plan prepared for the Project.

As described in the Draft Vegetation and Weed Management Plan, all areas temporarily disturbed during construction, as well as areas within the solar arrays without native root structures or available seed banks, or where noxious weeds are anticipated (e.g., areas currently under agricultural cultivation), would be actively revegetated with a mix of native or non-invasive, non-persistent non-native grasses and forbs. Revegetation with native and non-native, non-invasive species (i.e., species that may provide more rapid soil stabilization and vegetative cover than slower-growing native species) will help avoid or minimize WSDA's concerns regarding soil compaction and loss of organic matter. Species chosen for revegetation, such as bluebunch wheatgrass (*Pseudoroegneria spicata*) and yarrow (*Achillea millefolium*), are deep-rooted and drought tolerant. The deep roots of these species will help de-compact and stabilize soils. Application of mulch, if required during revegetation, would help reduce erosion, as well as provide organic matter to the soil. Once established, the revegetated areas would improve the soil by increasing organic matter as revegetated plants die and decompose. Furthermore, revegetating with native plants under solar panels can help recharge groundwater and improve soil carbon sequestration (Neale and Atre 2020[10]). Annual tilling and grazing, if not managed correctly, would reduce the benefits provided by revegetation efforts. In addition the U.S. Department of Agriculture currently recommends no-till practices which have been shown to reduce wind and water erosion, increase soil-water holding capacity, and maintain or increase soil organic matter as compared to conventional tillage practices (USDA 2023[11]).

Additionally, the Draft Vegetation and Weed Management Plan contains success criteria that are intended to support the Project successfully filing for Notice of Termination (NOT) for the construction National Pollutant Discharge Elimination System (NPDES) permit. Eligibility criteria for NOT are provided in the Construction Stormwater General Permit (CSWGP) (Ecology 2020), and require that the site has undergone final stabilization. Any modifications to the revegetation plan should take into account the need to support the Notice of Termination and minimize future potential for erosion.

In order to further address WSDA's concerns, Innergex proposes to revise the Draft Vegetation and Weed Management Plan to:

- Clarify that areas compacted during construction will be de-compacted prior to implementation of revegetation activities.

[9] CSU Extension (Colorado State University Extension). 2012. Cheatgrass and Wildlfire, Fact Sheet No, 6.310. Available online at: https://extension.colostate.edu/docs/pubs/natres/06310.pdf
[10] Neal, A., and U. Atre. 2020. Pollinator-Friendly Solar Installations Benefit Wildlife, Farmers, Climate. Environmental and Energy Study Institute. Available online at: https://www.eesi.org/articles/view/pollinator-friendly-solar-installations-benefit-wildlife-farmers-climate.
[11] USDA (U.S. Department of Agriculture). 2023. Northwest No-Till Farming for Climate Resilience. Available online at: https://www.climatehubs.usda.gov/hubs/northwest/topic/northwest-no-till-farming-climate-resilience.

- If desired by EFSEC, WDFW, and Department of Agriculture, amend the proposed revegetation seed mixes to include species that will further enhance soil health, such as nitrogen-fixing species.

In addition to revising and implementing measures in the Draft Vegetation and Weed Management Plan, if requested by EFSEC, Innergex proposes to develop a Soil Monitoring Plan. This plan would include methods for:

- Monitoring soil compaction by testing the soil infiltration rate.
- Sampling the soil to determine physical characteristics such as topsoil depth, which is important for soil fertility, water-holding capacity, soil organic carbon content, and productivity, and soil structure (e.g., aggregate size), which affects retention and transmission of water and air in the soil, as well as the mechanical properties of the soil.
- Measuring nutrient, organic matter, and pH levels of the soil.

If monitoring shows a decline in soil conditions, adaptive management actions would be implemented. Adaptive management actions may include tilling of the soil, application of soil amendments to supply additional organic matter, or addition of nutrients or minerals to adjust soil pH. With implementation of measures in the Draft Vegetation and Weed Management Plan (with revisions as noted above) and development and implementation of a Soil Monitoring Plan, Innergex believes that the Project would not result in permanent adverse impacts to soils or result in the loss of prime farmland.