ATTACHMENT O

Wetland Delineation Report

Goose Prairie Solar Project
Wetland Delineation Report

Prepared for:

OER WA Solar 1 LLC

Prepared by:

TETRA TECH

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CONFIDENTIAL BUSINESS INFORMATION

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Acronyms and Abbreviations

AW Supplement	*Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West* (Version 2.0)
CRP	Conservation Reserve Program
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
GPS	global positioning system
LRR	Land Resource Region
NHD	National Hydrography Dataset
NI	No Indicator
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate
OHWM	Ordinary High Water Mark
OHWM Field Guide	*A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States*
Project	Goose Prairie Solar Project
R4SBC	riverine, intermittent, streambed, seasonally flooded
SAV	submerged aquatic vegetation
SDAM	Streamflow Duration Assessment Method
Tetra Tech	Tetra Tech, Inc.
the Manual	Wetlands Delineation Manual, Technical Report Y-87-1
UPL	Upland
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
WETS	Climate Analysis for Wetlands Tables
YCC	Yakima County Code

1.0 Introduction

OER WA Solar 1, LLC is proposing the Goose Prairie Solar Project (Project) southeast of Moxee in Yakima County, Washington. The Project area is located on eight parcels of land east of Yakima on Washington Highway 24 (Appendix A, Figure A-1). Three of the parcels are currently in the Conservation Reserve Program (CRP), four of the parcels are currently used for grazing, and the eighth parcel is under active agricultural production. OER WA Solar 1, LLC contracted Tetra Tech, Inc. (Tetra Tech) to perform a wetland and other waters of the U.S. delineation within the Project area. The Project study area consists of approximately 809 acres as shown in Appendix A, Figure A-1.

Tetra Tech biologist Karen Brimacombe conducted the wetland and other waters of the U.S. delineations. Ms. Brimacombe has more than 12 years of experience conducting wetland and other waters of the U.S. assessments in the Pacific Northwest and the central and western United States, including the arid west region.

2.0 Landscape Setting and Land Use

2.1 Project Study Area

The approximately 809-acre Project study area was evaluated for wetlands and other potentially jurisdictional waters. The Project study area consists of a mix of sagebrush-steppe, mixed perennial and annual grassland and forbland, and active cropland. Land use in the Project study area includes grazing lands in the north, CRP land in the south, and a small area under active agricultural production in the east-central area. The Project study area is located in Township 12 N, Range 21 E, Sections 7, 8, and 18 (Appendix A, Figure A-2). Appendix A, Figure A-3, shows the tax lots crossed by the Project study area.

2.2 Landscape Setting

The Project is located within the Level III Columbia Plateau Ecoregion and the Yakima Folds Level IV Ecoregion (EPA 2019). 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, is equivalent to the 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* (AW Supplement; USACE 2008).

Plant species names and associated wetland indicator status ratings noted in this report are from the State of Washington 2018 Wetland Plant List (USACE 2018). The following wetland indicator ratings are ordered according to the percent likelihood, from most likely to least likely, of the plant occurring in wetlands: 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 2018 wetland plant list and are thereby considered to be Upland plants.

The northeastern and west-central portions of the Project study area are a mix of sagebrush-steppe and grassland vegetation with interspersed pasture areas. The dominant shrub species found within these areas are big sagebrush (*Artemisia tridentata*, NI). Other shrub species observed include bitterbrush (*Purshia tridentata,* NI), yellow rabbitbrush (*Chrysothamnus viscidiflorus,* NI), spiny hopsage (*Grayia spinosa*, NI), purple sage (*Salvia dorrii*, NI), and mock orange (*Philadelphus lewisii*, NI). Dominant grass species found within these portions of the Project study area include cheatgrass (*Bromus tectorum*, NI), bulbous blue grass (*Poa bulbosa*, FACU), and curly blue grass (*Poa secunda* ssp. *secunda*, FACU). Herbaceous species observed include prickly lettuce (*Lactuca serriola*, FACU), tall hedge-mustard (*Sisymbrium altissimum*, FACU), Douglas' dustymaiden (*Chaenactis douglasii*, NI), Gray's biscuitroot (*Lomatium grayi*, NI), redstem stork's bill (*Erodium cicutarium*, NI), jagged chickweed (*Holosteum umbellatum*, NI), largeflower triteleia (*Triteleia grandiflora*, NI), and longleaf phlox (*Phlox longifolia,* NI).

The east-central and southern portions of the Project study area consist primarily of mixed perennial and annual grassland and forbland vegetation. The dominant grass species in these areas include cheatgrass (NI), bulbous bluegrass (FACU), crested wheatgrass (*Agropyron cristatum*, NI), and big bluegrass (cultivar of curly blue grass, FACU). Common herbaceous species in this area include tansymustard (*Descurainia* spp., NI), crossflower (*Chorispora tenella*, NI), tall hedge-mustard (FACU), redstem stork's bill (NI), jagged chickweed (NI), and largeflower triteleia (NI).

The Washington State Department of Ecology requests information of priority habitats and species from the Washington Department of Fish and Wildlife. Surveys for specialized habitats and species are being conducted as part of separate studies in support of this Project.

2.3 NWI, NHD, and NRCS Soils

Prior to field work, Tetra Tech reviewed the National Wetlands Inventory (NWI) database, National Hydrography Dataset (NHD), hydric soils data, and aerial photographs to identify potential wetlands and other waters occurring within the Project study area, as described below.

2.3.1 National Wetlands Inventory and National Hydrography Dataset

Desktop review of NWI data identified one riverine, intermittent, streambed, seasonally flooded (R4SBC) feature and one palustrine, emergent, persistent, temporary flooded wetland (PEM1A) within the Project study area (NWI 2019, 2020). These features correspond with two features mapped as intermittent streams by the NHD. The location of NWI- and NHD-mapped features within the Project study area are presented in Appendix A, Figure A-4.

2.3.2 Hydric Soils Data

Nine soil map units are mapped in the Project study area (NRCS 2020a; Table 1). The dominant soil in the Project study area is Willis silt loam, 2 to 5 percent slopes, that covers approximately 399.6 acres (49.4 percent) of the Project study area. Only the Moxee silt loam, 2 to 15 percent slopes, covering 168.6 acres (20.8 percent) of the Project study area, is listed as having a hydric component

(NRCS 2020a,b). Soil types mapped within the Project study area are presented in Appendix A, Figure A-5.

Table 1. Soils Mapped in the Project Study Area

Map Code and Unit Name	Acres	Percent of Study Area	Percent Hydric Soil
187: Willis silt loam, 2 to 5 percent slopes	399.6	49.4	0
83: Moxee silt loam, 2 to 15 percent slopes	168.6	20.8	5
188: Willis silt loam, 8 to 15 percent slopes	121.1	15.0	0
189: Willis silt loam, 5 to 8 percent slopes	65.8	8.1	0
36: Finley cobbly fine sandy loam, 0 to 5 percent slopes	38.6	4.8	0
68: Lickskillet very stony silt loam, 5 to 45 percent slopes	6.6	0.8	0
93: Pits	5.6	0.7	0
65: Kiona stony silt loam, 15 to 45 percent slopes	2.1	0.3	0
101: Ritzville silt loam, 8 to 15 percent slopes	1.4	0.2	0
Total	809.4	100.0	
Sources: NRCS 2020a,b			

3.0 Site Alterations

Site alterations are those activities 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 of the feature. Land use in the Project study area includes grazing, active agricultural fields and associated infrastructure (e.g., fences, farm roads), as well as lands enrolled in the CRP, a portion of which was previously used for row crops. These land uses have resulted in various levels of removal and disturbance of native vegetation. Development of roads, and other drainage alterations associated with land development including agricultural development, may have affected the geographic size and/or the hydroperiod of wetlands and other waters.

4.0 Precipitation Data and Analysis

Precipitation data for the period preceding and during field work were collected from the National Weather Service, Yakima Airport, Washington Station (NOAA 2019, 2020). Data from the NRCS Climate Analysis for Wetlands Tables (WETS) Station in Moxee, Washington, were used to compare historical precipitation data with recent precipitation records (NRCS 2020c).

During the 10-day span preceding field work in 2019, which occurred on May 3 and 4, no precipitation was measured (NOAA 2019). Monthly precipitation in January and February 2019 were well above average; precipitation in March 2019 was slightly below average, but within the normal range for that period; and precipitation in April 2019 was average (NOAA 2019; Table 2).

For the Water Year May 2018 through April 30, 2019, precipitation was 101 percent of average, with some months recording below average precipitation and others recording above average precipitation (Table 2). Based on the precipitation data for the 3 months prior to the site visits (i.e., February, March, and April 2019), rainfall was approximately 1.8 inches above the average; thus, it was estimated that when field surveys were conducted in early May 2019, the groundwater table was likely closer to the surface than what is usually encountered at that time of year.

During the 10-day span preceding field work in 2020, which occurred on April 9, a trace of precipitation was measured on April 1, 3, and 5 (NOAA 2020). Monthly precipitation in December 2019 was below average and precipitation in January 2020 was above average, but both were within the normal range (NOAA 2020; Table 2). Monthly precipitation in February and March 2020 were below average.

For the Water Year April 2019 through March 2020, precipitation was 71 percent of average, with 8 months recording below average precipitation, 3 months recording above average, and 1 month recording average precipitation (Table 2). Based on the precipitation data for the 3 months prior to the site visits (i.e., January, February, and March 2020), rainfall was approximately 0.69 inch below the average; thus, it was estimated that when field surveys were conducted in early April 2020, the groundwater table was likely lower than what is usually encountered at that time of year. Below average precipitation levels did not affect the delineation of other waters, as determination of intermittent versus ephemeral streams were made using indicators described in the Streamflow Duration Assessment Method (Nadeau 2015), which relies on multiple indicators independent of the presence or absence of hydrology.

Table 2. Precipitation Data – Current and Historical

Precipitation	May 2018	June 2018	July 2018	Aug 2018	Sept 2018	Oct 2018	Nov 2018	Dec 2018	Jan 2019	Feb 2019	Mar 2019	April 2019	Water Year to Date Total
Recorded Monthly Precipitation Totals (inches); Yakima Airport WA[1]	0.13	0.53	0.00	T	0.01	1.07	0.42	0.68	1.42	2.41	0.61	0.68	7.96
WETS Average Monthly Precipitation (inches); Moxee, WA[2]	0.80	0.61	0.22	0.39	0.34	0.65	0.93	1.09	0.92	0.58	0.68	0.68	7.89
Recorded Precipitation Relative to WETS Average Monthly Precipitation	16%	87%	0%	0%	3%	165%	45%	62%	154%	415%	88%	100%	101%
Average Monthly Range of Precipitation (inches)[2]	0.42-0.98	0.22-0.69	0.08-0.22	0.07-0.35	0.11-0.36	0.31-0.77	0.52-1.12	0.56-1.32	0.47-1.13	0.29-0.7	0.34-0.83	0.32-0.81	
Precipitation	**April 2019**	**May 2019**	**June 2019**	**July 2019**	**Aug 2019**	**Sept 2019**	**Oct 2019**	**Nov 2019**	**Dec 2019**	**Jan 2020**	**Feb 2020**	**Mar 2020**	**Water Year to Date Total**
Recorded Monthly Precipitation Totals (inches); Yakima Airport WA[3]	0.68	0.77	0.04	0.11	0.75	0.52	0.51	0.04	0.66	1.05	0.11	0.33	5.57
WETS Average Monthly Precipitation (inches); Moxee, WA[4]	0.68	0.80	0.61	0.22	0.39	0.34	0.65	0.93	1.09	0.92	0.58	0.68	7.89
Recorded Precipitation Relative to WETS Average Monthly Precipitation	100%	96%	6%	50%	192%	153%	78%	4%	61%	114%	19%	48%	71%
Average Monthly Range of Precipitation (inches)[4]	0.32-0.81	0.42-0.98	0.22-0.69	0.08-0.22	0.07-0.35	0.11-0.36	0.31-0.77	0.52-1.12	0.56-1.32	0.47-1.13	0.29-0.7	0.34-0.83	

[1] NOAA 2019
[2] WETS table for Moxee, Washington, years 1971-2019 (NRCS 2020c)
[3] NOAA 2020
[4] WETS table for Moxee, Washington, years 1971-2020 (NRCS 2020c)
T = trace

5.0 Methods

5.1 Pre-field Work

In preparation for the field work, Tetra Tech reviewed the NWI database, NHD, hydric soils data, and aerial photographs to identify potential wetlands and other waters within the Project study area, 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, using the Collector for ArcGIS application, to assist field staff in identifying and delineating the locations of wetlands and non-wetland waters within or adjacent to the Project study area.

Wetlands and surface water data were obtained from the NWI (NWI 2019, 2020) and the NHD (USGS 2019, 2020). Soils data were obtained from the NRCS Web Soil Survey (NRCS, 2020a,b). Tetra Tech used high-resolution USDA National Agriculture Imagery Program imagery captured in 2017 because it provided recent 1-meter resolution aerial imagery taken during the peak of the growing season (USDA-FSA AFPO 2017). Tetra Tech also reviewed the Washington Natural Heritage Program for high-quality wetlands in or near the Project study area (WNHP 2018). No high-quality wetlands were noted as occurring in the Project study area. The following guidance documents and procedures were also reviewed:

- AW Supplement (USACE 2008);
- Wetlands Delineation Manual, Technical Report Y-87-1 (the Manual) (USACE 1987);
- Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979);
- A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (OHWM Field Guide; Lichvar and McColley 2008);
- Updated datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (Curtis and Lichvar 2010);
- Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State (Anderson et al. 2016); and
- Streamflow Duration Assessment Method (SDAM) for the Pacific Northwest (Nadeau 2015).

5.2 Field Work

Field investigations to document wetlands and other waters within the Project study area were conducted on May 3 and 4, 2019 and April 9, 2020. Field investigations on May 3 and 4, 2019, were conducted within the original Project study area as noted in Appendix A, Figures A-6a and A-6b. Subsequent to the field investigations in 2019, two additional areas were added to the Project study area. This expanded Project study area is noted in Appendix A, Figures A-1 through A-6.

5.2.1 Wetland Delineations

Wetland presence was determined as per methods in the Manual and the AW Supplement. Three field indicators of wetlands (hydrophytic vegetation, hydric soils, and wetland hydrology) must be present to make a positive wetland determination. Based on these criteria, no wetlands were identified within the Project study area.

5.2.2 Non-wetland Waters Evaluations

Non-wetland waters were evaluated using the following criteria.

- Flow duration for non-wetland waters was determined using criteria in the Streamflow Duration Assessment Methodology (Nadeau 2015).
- The centerline of non-wetland waters less than 6 feet in width was recorded as a line feature and buffered to the stream width determined in the field.
- Non-wetland waters greater than 6 feet wide were recorded as left and right bank lines.

5.2.3 Mapping Methods

Non-wetland water boundaries and photograph locations were recorded using Juniper Geode series global positioning system (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 2018).

Non-wetland water boundaries were recorded as line features using GPS units set to collect vertices every 2 seconds. For non-wetland waters less than 6 feet in width, the centerline of the feature was recorded, and the line was then buffered based on the width of the stream as determined in the field. For non-wetland waters greater than 6 feet in width, the left and right banks of the feature were recorded as separate lines.

6.0 Description of Wetlands and Other Non-wetland Waters

6.1 Wetlands

As stated in Section 5.2.1, no wetlands were identified within the Project study area. See Section 7.0 for additional information regarding the NWI-mapped wetland features within the Project study area and why these areas were not considered to be wetlands.

6.2 Non-wetland Waters

Five non-wetland waters were identified within the Project study area. All five features were determined to be ephemeral drainages, which are classified as Type 5 streams under the Yakima County Code (YCC Section 16C.06.06).

In general, all five ephemeral drainages were rocky, dry, and vegetated with upland grasses and forbs, such as cheatgrass, tall hedge-mustard, and redstem stork's bill. The drainages were typically bordered by a variety of upland shrubs, grasses, and forbs, including big sagebrush, cheatgrass, tall hedge-mustard, Gray's biscuit root, prickly lettuce, and redstem stork's bill.

Table 3 below provides additional information on these five features. The locations of these features are presented in Appendix A, Figures A-6a and A-6b, SDAM field forms are provided in Appendix B, and representative photographs are provided in Appendix C. As demonstrated in Appendix C, Photos 10 and 11, features STR-1 and STR-2 were much more heavily vegetated during field investigations in May 2019 as compared to during field investigations in April 2020. This is likely, in part, due to the later dates of field surveys. Additionally, the OHWM was much wider and more distinct along the west end of feature STR-1 in April 9, 2020 as compared to May 4, 2019 (Appendix C, Photos 1 and 2). This is likely due to heavy rainfalls occurring over a short period in January 2020, including rainfall of 0.67 inch (64 percent of the month's total) recorded the week of January 21 to January 28, 2020, including 0.3 inch on January 27, 2020.

6.3 Other Features

In addition to the five non-wetland water features delineated within the Project study area, one additional area was investigated due to the observed aerial signature. During the field investigation, this area lacked a defined channel and evidence of past water conveyance. Therefore, it was determined that no wetland, or non-wetland water feature, is present in this area (see Appendix C, Photo 22).

Table 3. Non-wetland Waters Delineated within in the Project Study Area

Feature Name	Latitude[1]	Longitude[1]	Flow Duration	Flow Direction	OHWM Width (feet)	OHWM Height (feet)	Photo Number	Notes	Acres/ Linear Feet
STR-1	46.53725 46.53365	-120.22476 -120.25028	Ephemeral	WSW	25	0.5	1 – 8	Channel generally single-thread; one-side channel noted. Feature flows into Project study area. Riparian vegetation absent. No submerged aquatic vegetation (SAV), FACW, or OBL plants observed. No hydrology or macroinvertebrates or casings observed. OHWM field indicators: textural change of depositional sediment and change in vegetation type and cover. Gradient approximately 3%.	4.02 / 7,005
STR-1a	46.53956 46.53858	-120.22233 -120.22300	Ephemeral	SSW	5	0.5	9		0.25/ 435
STR-2	46.54200 46.53398	-120.23651 -120.24874	Ephemeral	SSW	25	1	10 – 15, 21	Channel generally single thread; one side channel noted. Feature flows into Project study area and joins feature STR-1. Riparian vegetation absent. No SAV, FACW, or OBL plants observed. No macro-invertebrates or casings observed. No hydrology observed. OHWM field indicators: textural change of depositional sediment, change in vegetation type and cover, litter deposits, and break in bank slope. Gradient approximately 3%.	2.63 / 5,4745
STR-2a	46.54203 46.54171	-120.23609 -120.23640	Ephemeral	S	4	0.5	16, 17	Channel is single thread. Feature flows into Project study area and joins feature STR-2. These two features may re-connect upstream, north of the Project area boundary. No SAV, FACW, or OBL plants observed. No hydrology or macro-invertebrates or casings observed. OHWM field indicators: textural change of depositional sediment, change in vegetation type and cover, and break in bank slope. Gradient approximately 7%.	0.04 / 155
STR-3	46.54207 46.54089	-120.23239 -120.23675	Ephemeral	SW	3	0.5	18 - 20	Channel is single thread. Feature flows into Project study area and joins feature STR-2. No SAV, FACW, or OBL plants observed. No hydrology or macro-invertebrates or casings observed. OHWM field indicators: textural change of depositional sediment, change in vegetation type and cover, and break in bank slope. Gradient approximately 5%.	0.28 / 1,240
								Total Other Waters Acreage and Linear Feet	**7.22 / 13,410**

[1] Top number is latitude and longitude at upstream end of stream segment; bottom number is latitude and longitude at downstream end of stream segment.

7.0 Deviation from NWI

Deviations are features that are mapped by the NWI that differ from field observations. As noted in Section 2.3.1 and displayed in Appendix A, Figure A-4, two features, one riverine (RS4BC) wetland and one freshwater emergent (PEM1A) wetland, are mapped by the NWI within the Project study area. In addition, as noted in Section 2.3.1, the location of these NWI-mapped wetland features corresponds with areas mapped by the NHD as intermittent streams.

During the field delineation conducted in May of 2019 and April of 2020, it was determined, based on the lack of wetland indicators, that no wetlands occur in the Project study area, including the areas mapped as wetland by the NWI. The areas mapped by the NWI as riverine wetlands correspond with three non-wetland water features, STR-1, STR-1a, and STR-2, delineated during the field delineation. As noted in Section 6.2 and in Table 3, all non-wetland waters delineated within the Project study area were determined to be ephemeral drainages that lacked hydrology and hydrophytic vegetation associated with intermittent or perennial streams. Due to the lack of wetland indicators, it was determined that no wetlands occur along these features.

Additionally, field investigations determined that no wetland occurs in the area mapped as a freshwater emergent wetland by the NWI. This area was determined to be an ephemeral drainage (portions of features STR-2 and STR-2a) that lacked wetland characteristics. As illustrated in Appendix C, Photos 15 through 18 and 21, this area consisted of a dry, very sparsely vegetated drainage. Vegetation that was observed in the channel included cheatgrass (NI), bulbous bluegrass (FACU), redstem stork's bill (NI), tall hedge-mustard (FACU), great mullein (*Verbascum thapsus*; FACU), and common dandelion (*Taraxacum officinale*; FACU).

8.0 Results and Conclusions

Using methods recommended in the OHWM Field Guide, the Manual, and AW Supplement, five non-wetland water features were delineated and documented within the Project study area. The total area of non-wetland waters delineated within the Project study area boundary is 7.22 acres and 13,410 linear feet acres (Table 3). These five features were determined to be ephemeral drainages that would be classified as Type 5 streams under the Yakima County Code (YCC Section 16C.06.06). Per Section 16C.06.16 of the YCC:

> "Type 5 streams are not regulated through buffer requirements. However, activities such as clearing, grading, dumping, filling, or activities that restrict or block flow, redirect flow to a point other than the original exit point from the property or result in the potential to deliver sediment to a drainage way/channel, are regulated under clearing and grading regulations. These drainages may also be protected under geologically hazardous area, floodplain, stormwater, building and construction, or other development regulations."

On April 21, 2020, the U.S. Environmental Protection Agency and the Department of the Army published the Navigable Waters Protection Rule to define "Waters of the United States" (85(77) *Federal Register* 22250–22342). Under this rule, *ephemeral features that flow only in direct response to precipitation, including ephemeral streams, swales, gullies, rills, and pools* are not considered waters of the United States. Notwithstanding potential litigation, this new rule took effect on June 22, 2020, in which case the five non-wetland water features would likely be considered non-jurisdictional by the U.S. Army Corps of Engineers (USACE).

Regardless of federal jurisdictional status, all non-wetland waters identified in this report would likely be subject to regulations by the Washington State Department of Ecology.

9.0 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 used at your own risk unless it has been reviewed and approved in writing by the USACE and the Washington State Department of Ecology.

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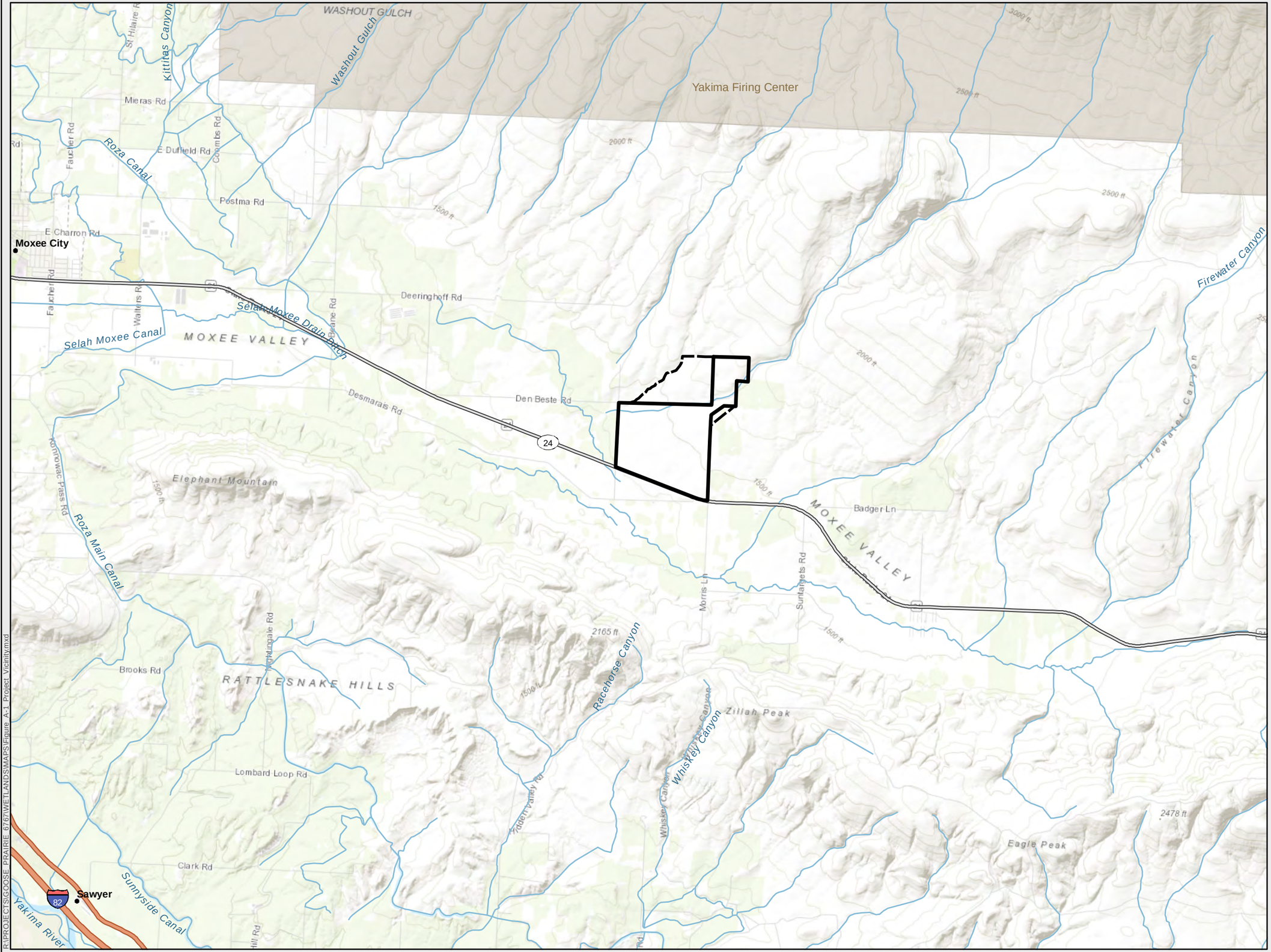
Appendix A:

Figures

Goose Prairie Solar Project

Figure A-1
Project Vicinity

Yakima County, Washington



Project Study Area
Expanded Project Study Area
Town
River
Interstate
Highway

N

0 0.5 1 2
Miles

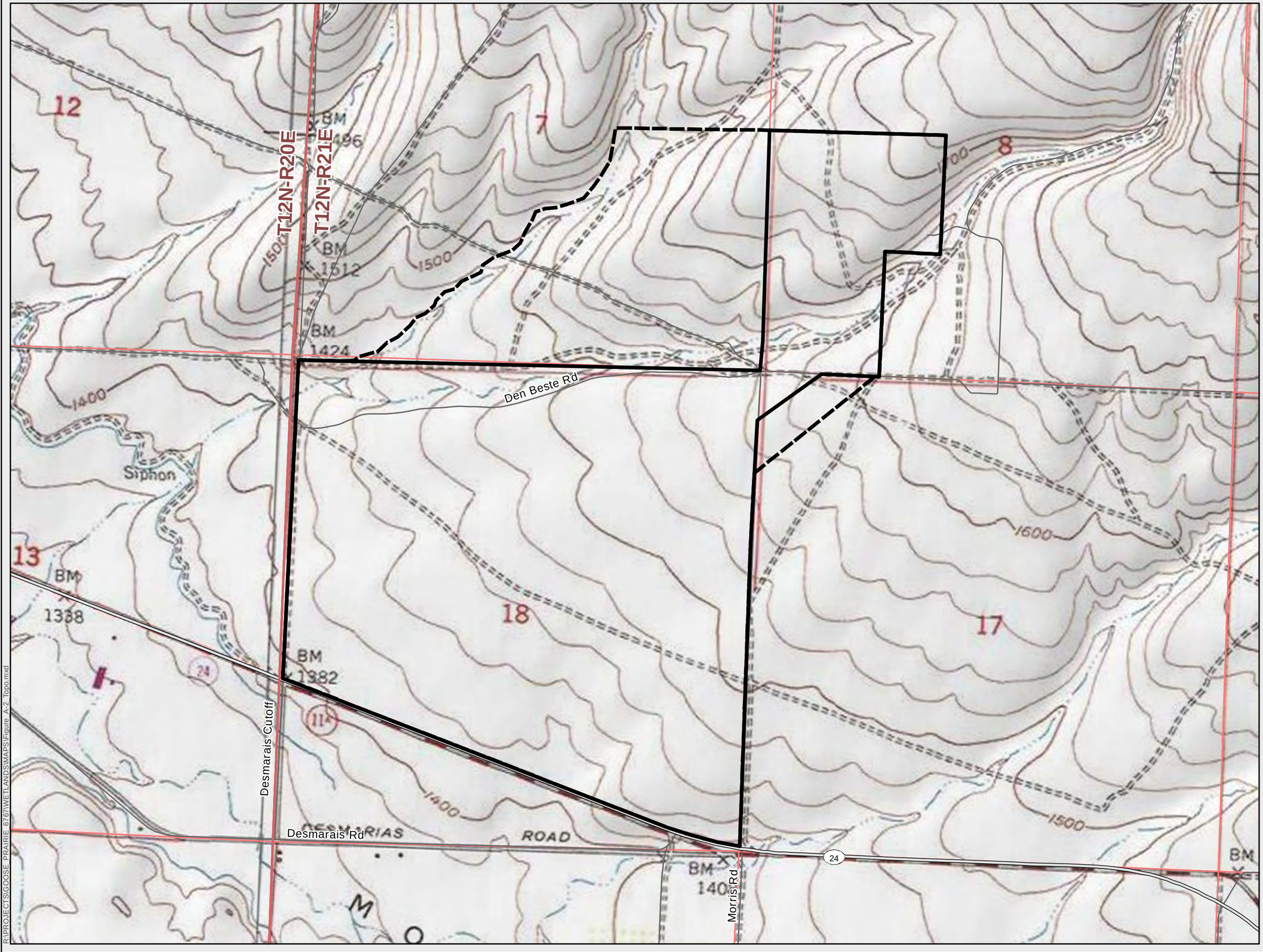
TETRA TECH
OneEnergy RENEWABLES

R:\PROJECTS\GOOSE PRAIRIE 6767\WETLANDS\MAPS\Figure A-1 Project Vicinity.mxd

Goose Prairie Solar Project

Figure A-2
Topographic Map

Yakima County, Washington



- Project Study Area
- Expanded Project Study Area
- PLSS Township/Range
- PLSS Section
- Highway
- Local Road

N

0 500 1,000 2,000

Feet

TETRA TECH

OneEnergy Renewables

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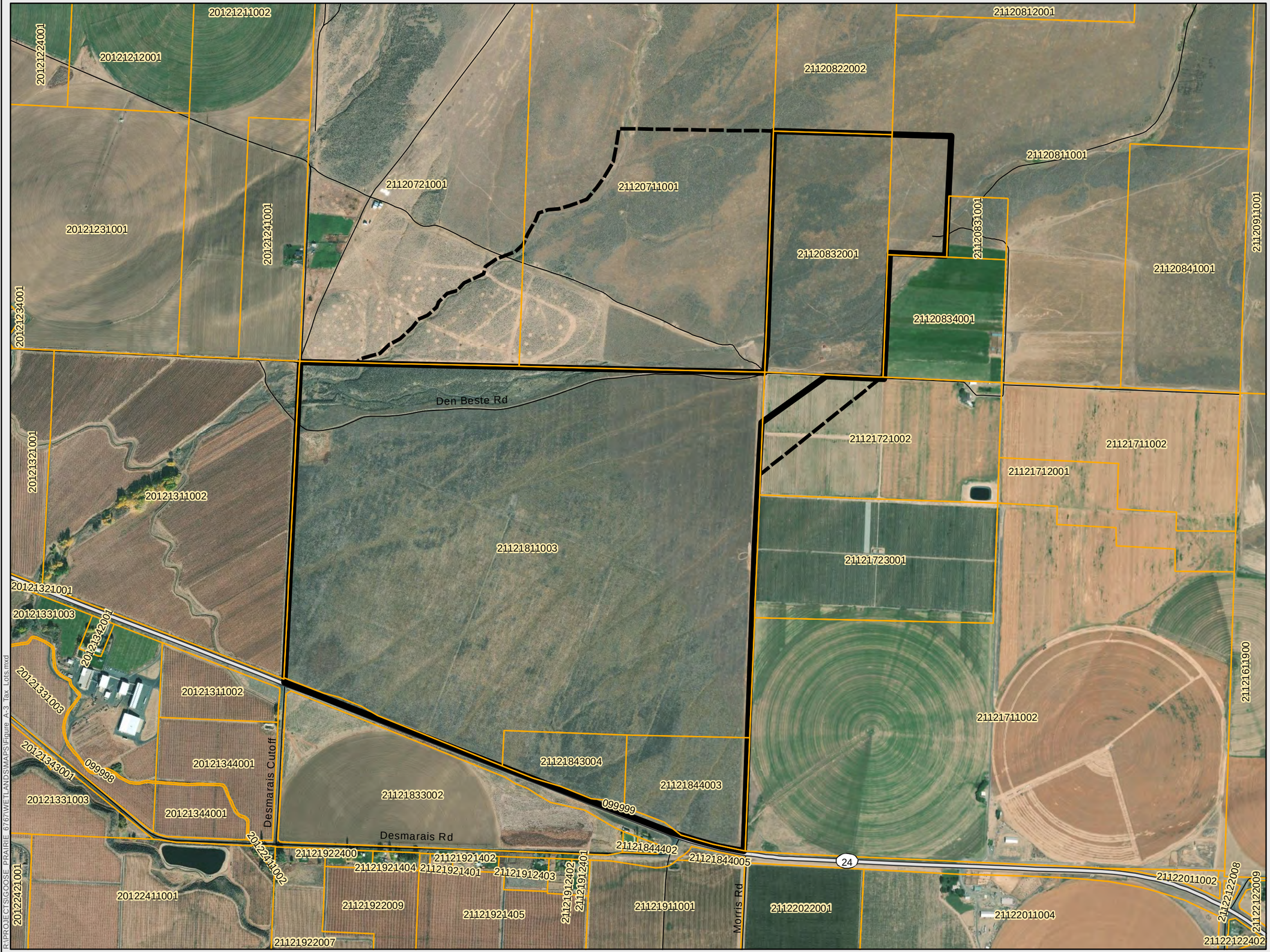
Goose Prairie Solar Project

Figure A-3
Tax Lots

Yakima County, Washington



- Project Study Area
- Expanded Project Study Area
- Tax Lots
- Highway
- Local Road

N

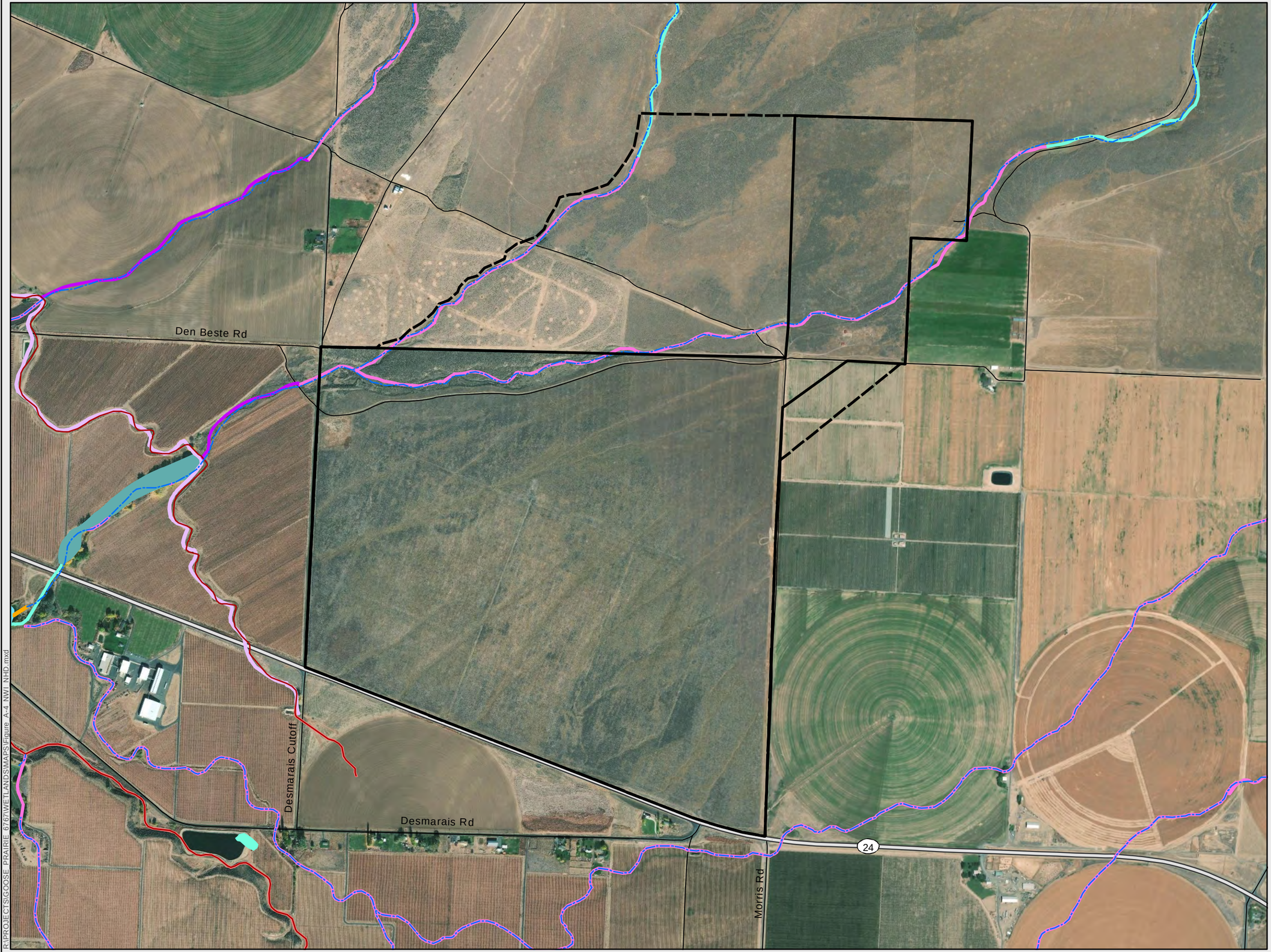
0 500 1,000 2,000

Feet

TETRA TECH

OneEnergy

R:\PROJECTS\GOOSE PRAIRIE 6767\WETLANDS\MAPS\Figure A-3 Tax Lots.mxd



Goose Prairie Solar Project

Figure A-4
NWI Wetlands and
NHD Flowlines

Yakima County, Washington

- Project Study Area
- Expanded Project Study Area
- Highway
- Local Road

NHD Flowline

- Canal/Ditch
- Intermittent Stream

NWI Wetland Type

- Freshwater Emergent Wetland (PEM1/FO1A)
- Freshwater Emergent Wetland (PEM1A)
- Freshwater Pond (PUBFh)
- Riverine (R2UBHx)
- Riverine (R4SBA)
- Riverine (R4SBC)
- Riverine (R5UBFx)
- Riverine (R5UBH)

N

0 500 1,000 2,000
Feet

TETRA TECH OneEnergy

R:\PROJECTS\GOOSE_PRAIRIE_67\67\WETLANDS\MAPS\Figure_A-4_NWI_NHD.mxd

Goose Prairie Solar Project

Figure A-5
NRCS Soils

Yakima County, Washington

- Project Study Area
- Expanded Project Study Area
- Highway
- Local Road
- Soil Unit: Soil Name

36: Finley cobbly fine sandy loam, 0-5% slopes

65: Kiona stony silt loam, 15-45% slopes

68: Lickskillet very stony silt loam, 5-45% slopes

83: Moxee silt loam, 2-15% slopes

93: Pits

101: Ritzville silt loam, 8-15% slopes

187: Willis silt loam, 2-5% slopes

188: Willis silt loam, 5-8% slopes

189: Willis silt loam, 8-15% slopes

N

0 500 1,000 2,000

Feet

TETRA TECH

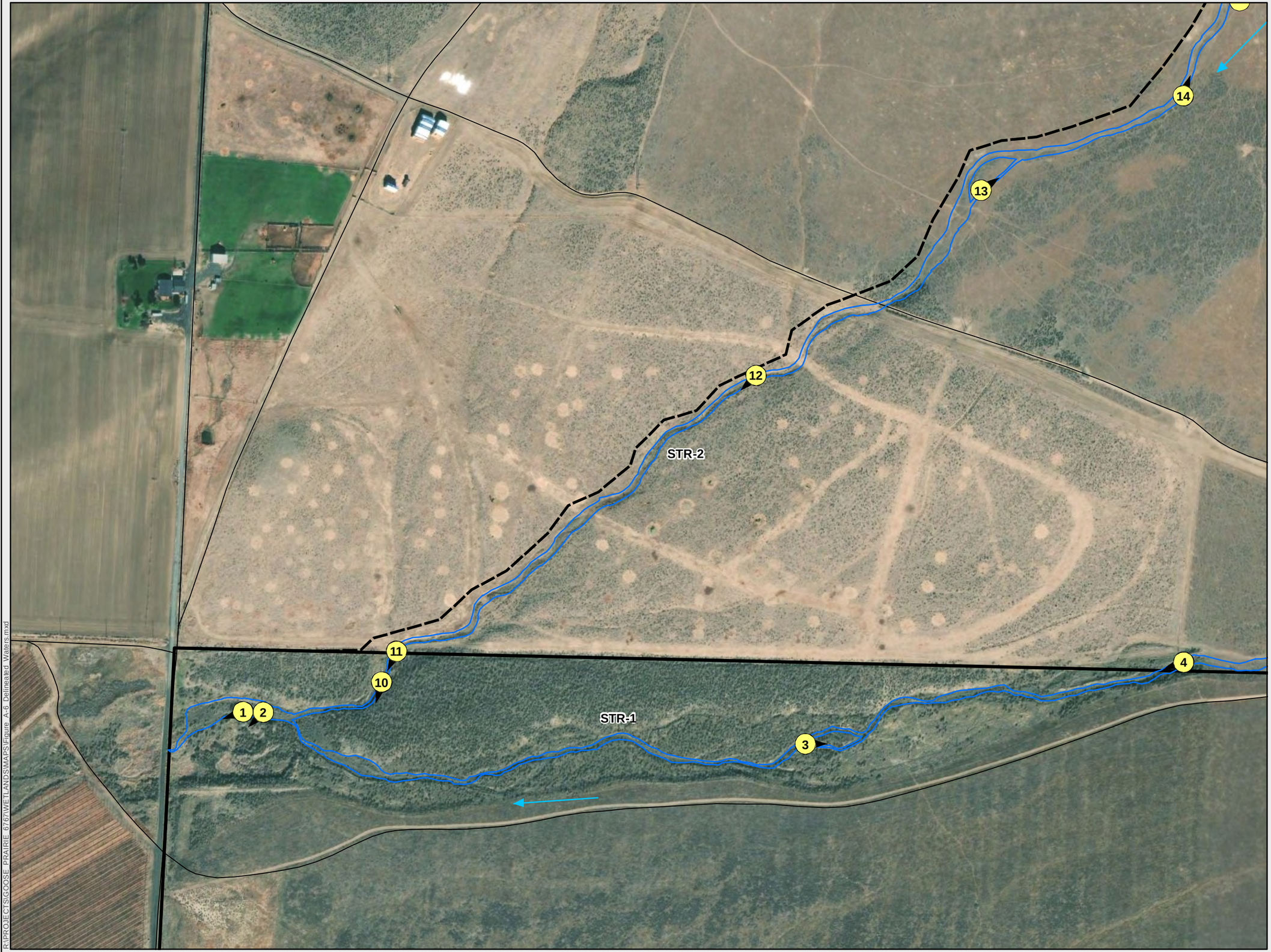
OneEnergy RENEWABLES

R:\PROJECTS\GOOSE PRAIRIE 6767\WETLANDS\MAPS\Figure A-5 Soils.mxd

Goose Prairie Solar Project

Figure A-6a
Delineated Non-wetland Waters

Yakima County, Washington



- Project Study Area
- Expanded Project Study Area
- Delineated Stream
- Flow Direction
- Photo Location and Direction
- Highway
- Local Road

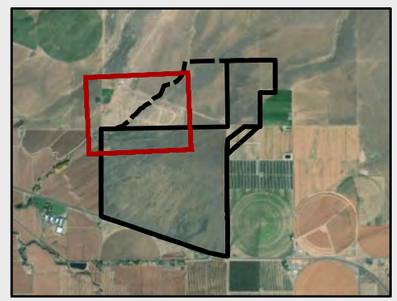
N

0 100 200 400

Feet

TETRA TECH

OneEnergy



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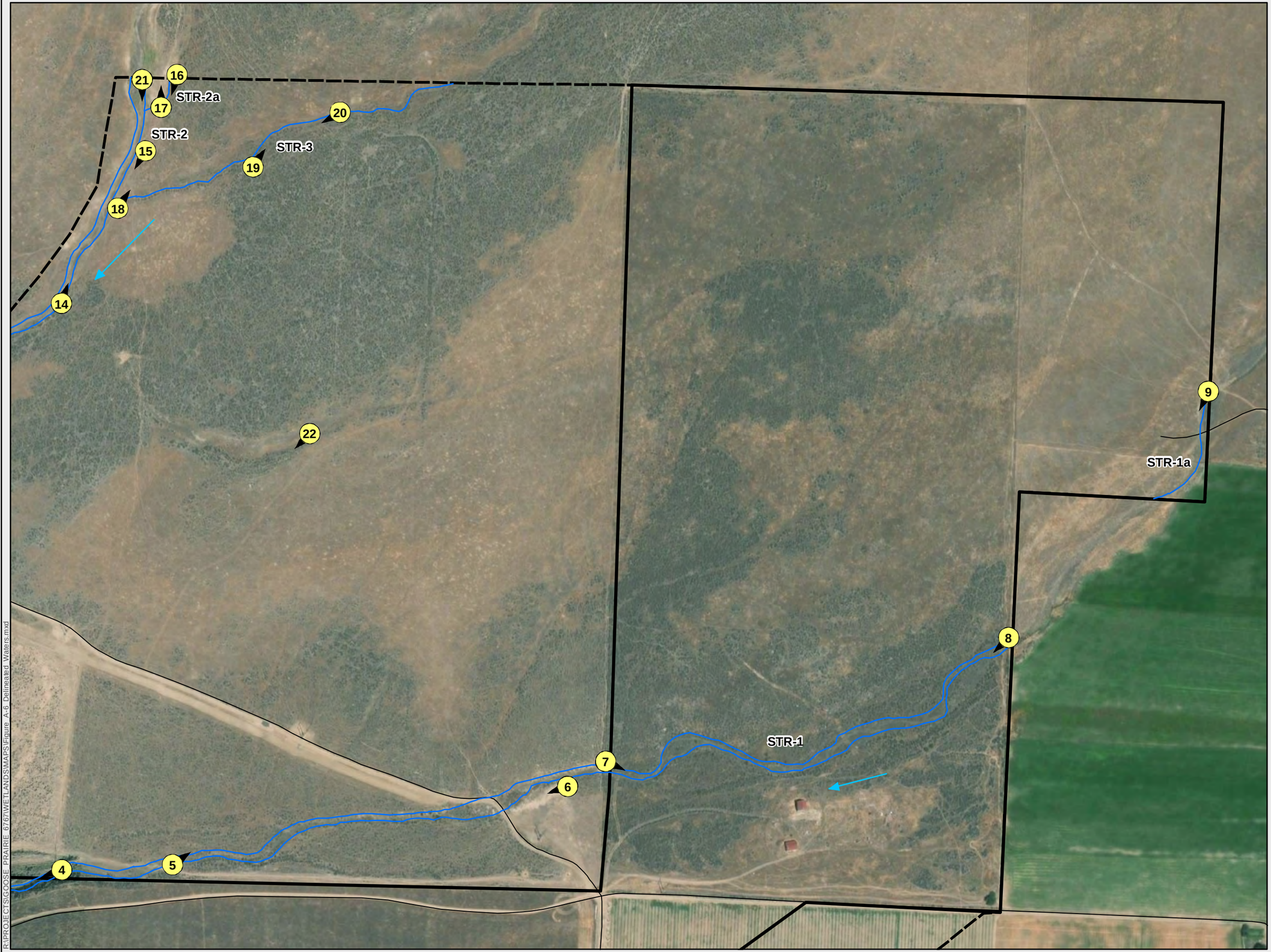
Goose Prairie Solar Project

Figure A-6b
Delineated Non-wetland Waters

Yakima County, Washington



Project Study Area

Expanded Project Study Area

Delineated Stream

Flow Direction

Photo Location and Direction

Highway

Local Road

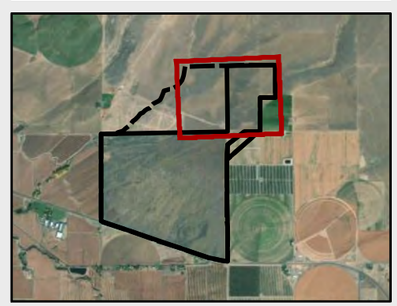
N

0 100 200 400

Feet

TETRA TECH

OneEnergy



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Appendix B:

Streamflow Duration Field Assessment Forms

Streamflow Duration Field Assessment Form

Project # / Name	Goose Prairie Solar Power Project	Assessor	**Karen Brimacombe**
Address	Moxee, Washington	Date	05/03/2019 and 04/09/2020
Waterway Name	STR-1	Coordinates at downstream end (ddd.mm.ss)	Lat. 46.533646 N
Reach Boundaries			Long. -120.25028 W
Precipitation w/in 48 hours (cm)	0	Channel Width (m) 7.6	☐ 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 (and indicator status): None

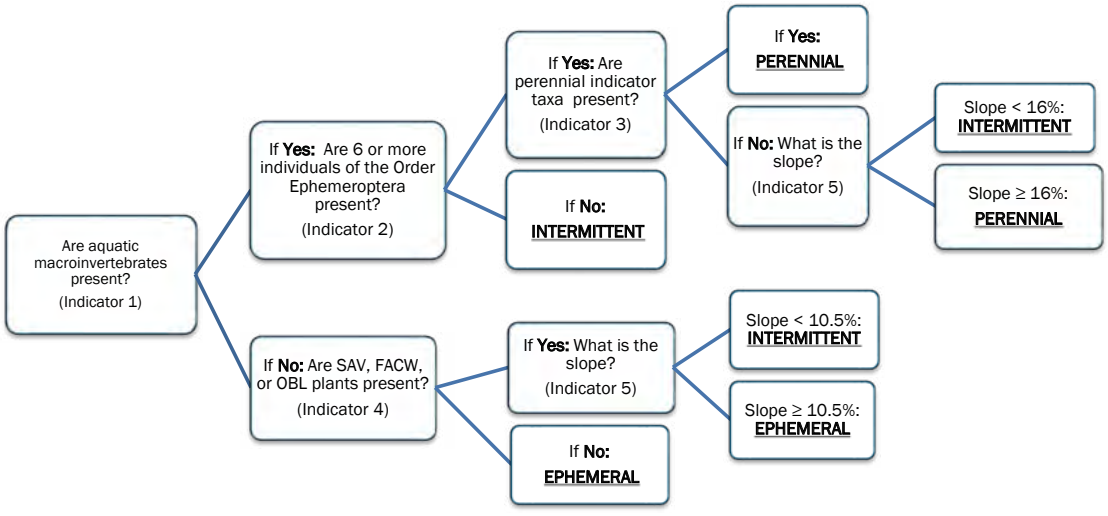
Observed Macroinvertebrates: None

Taxon	Indicator Status	Ephemer-optera?	# of Individuals

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)	3 %	

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.

Dry, rocky channel; no macroinvertebrate casings under rocks.
See Table 3 of report for more details on STR-1. Also see Photos 1-8 Appendix C and Appendix A, Figure A-6a and Figure A-6b

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	Goose Prairie Solar Power Project	Assessor	**Karen Brimacombe**
Address	Moxee, Washington	Date	05/03/2019
Waterway Name	STR-1a	Coordinates at downstream end (ddd.mm.ss)	Lat. 46.538583 N
Reach Boundaries			Long. -120.223002 W
Precipitation w/in 48 hours (cm)	0	Channel Width (m)	1.5
☐ 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 (and indicator status): None

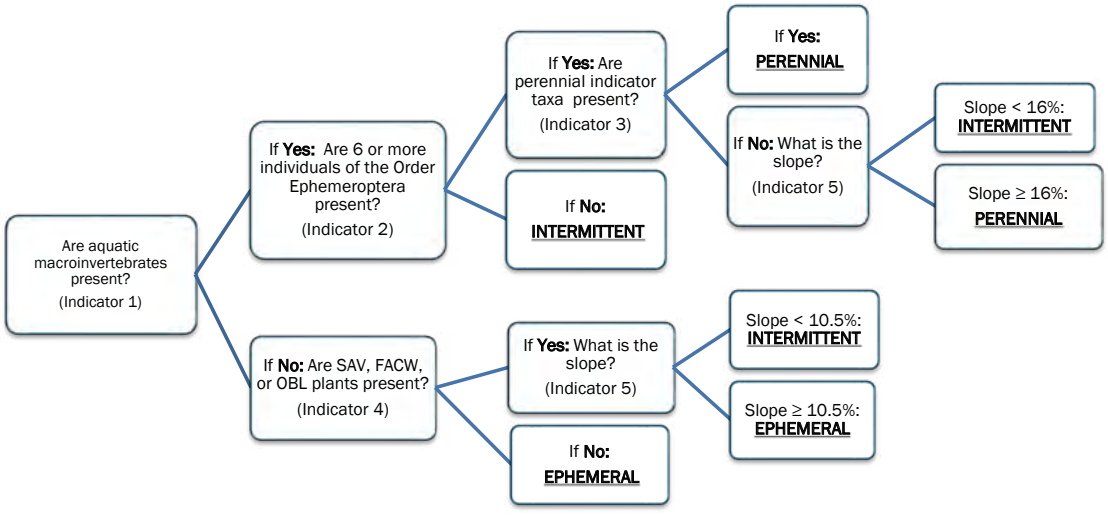
Observed Macroinvertebrates: None

Taxon	Indicator Status	Ephemer-optera?	# of Individuals

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)	3 %	

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.

Dry, rocky channel; no macroinvertebrate casings under rocks.
See Table 3 of report for additional details on STR-1a. Also see photo 9 in Appendix C and Appendix A, Figure A-6b

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	Goose Prairie Solar Power Project	Assessor	**Karen Brimacombe**
Address	Moxee, Washington	Date	05/03/2019 and 04/09/2020
Waterway Name	STR-2	Coordinates at downstream end (ddd.mm.ss)	Lat. 46.533985 N
Reach Boundaries			Long. -120.248741 W
Precipitation w/in 48 hours (cm)	0	Channel Width (m)	4.6
☐ 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 (and indicator status): None

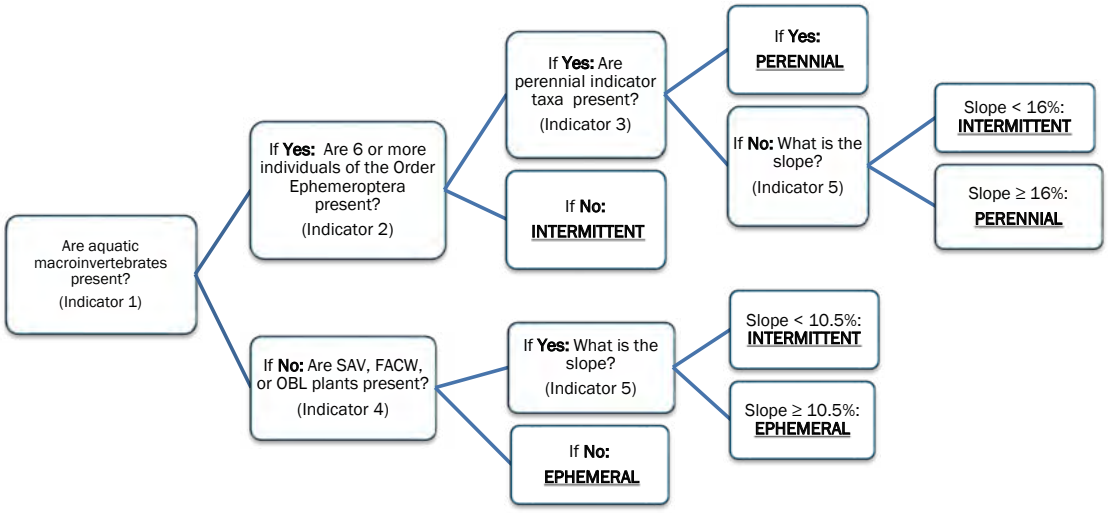
Observed Macroinvertebrates: None

Taxon	Indicator Status	Ephemer-optera?	# of Individuals

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)	____3__ %	

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.

Dry, rocky channel; no macroinvertebrate casings under rocks.
See Table 3 of report for additional details for STR-2. Also see photos 10-15, and 21 in Appendix C and Appendix A, Figure A-6a and Figure A-6b

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	**Goose Prairie Solar Power Project**	Assessor	**Karen Brimacombe**
Address	**Moxee, Washington**	Date	04/09/2020
Waterway Name	**STR-2a**	Coordinates at downstream end (ddd.mm.ss)	Lat. 46.541712 N
Reach Boundaries			Long. -120.236403 W
Precipitation w/in 48 hours (cm)	0	Channel Width (m) 3.6	☐ 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 (and indicator status): None

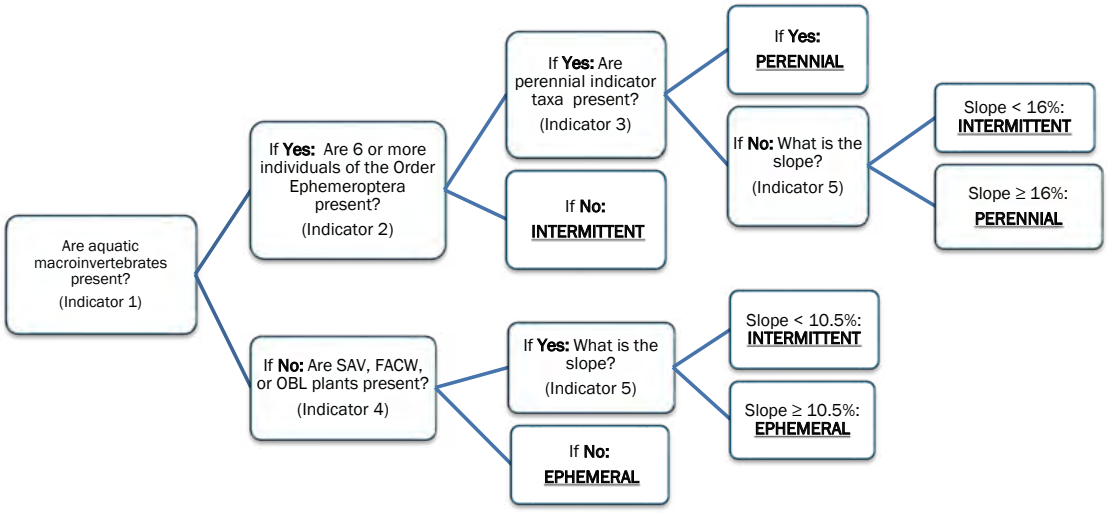
Observed Macroinvertebrates: None

Taxon	Indicator Status	Ephemer-optera?	# of Individuals

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)	7 %	

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.

Dry, rocky channel; no macroinvertebrate casings under rocks.
See Table 3 of report for additional details for STR-2a. Also see photos 16 and 17 in Appendix C and Appendix A, Figure A-6b

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	Goose Prairie Solar Power Project	Assessor	**Karen Brimacombe**
Address	Moxee, Washington	Date	04/09/2020
Waterway Name	STR-3	Coordinates at downstream end (ddd.mm.ss)	Lat. 46.540892 N
Reach Boundaries			Long. -120.236752 W
Precipitation w/in 48 hours (cm)	0	Channel Width (m) 1.5	☐ 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 (and indicator status): None

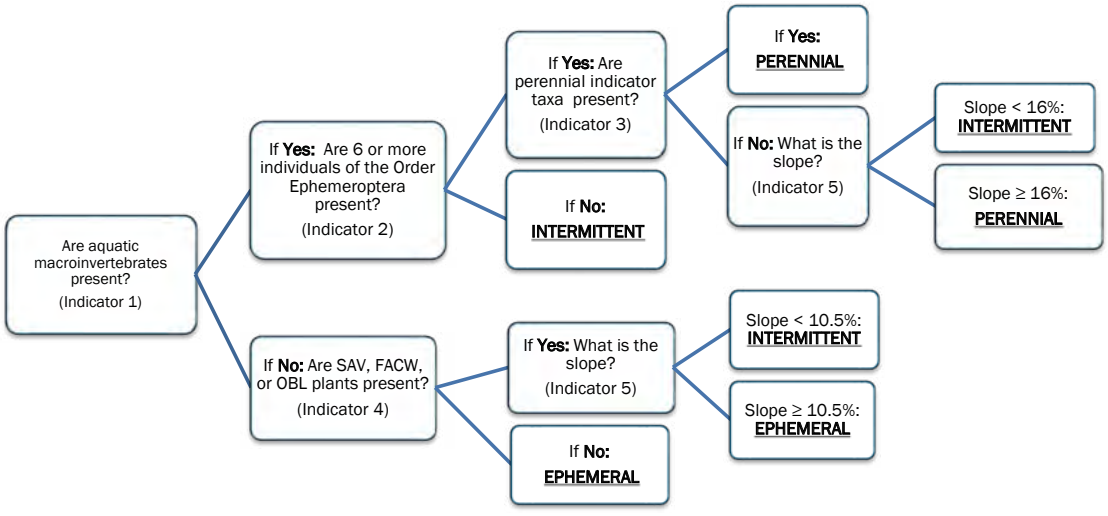
Observed Macroinvertebrates: None

Taxon	Indicator Status	Ephemer-optera?	# of Individuals

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.

Dry, rocky channel; no macroinvertebrate casings under rocks.
See Table 3 for additional details for STR-3. Also see photos 18-20 in Appendix C and Appendix A, Figure A-6b

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Appendix C:

Photolog

Appendix C:

Photolog

Photo 1. Feature STR-1: Rocky ephemeral drainage within sagebrush-steppe habitat. West end of Feature STR-1. Facing west-southwest. Date: May 4, 2019

Photo 2. Feature STR-1: Same location as Photo 1. Date: April 9, 2020.

Photo 3. Rocky, side channel of Feature STR-1: Facing east. Date: May 3, 2019.

Photo 4. Feature STR-1: Rocky ephemeral drainage within sagebrush-steppe habitat. Facing west-southwest. Date: May 3, 2019.

Photo 5. Feature STR-1: Rocky ephemeral drainage within sagebrush-steppe habitat. Facing east-northeast. Date: April 9, 2020.

Photo 6. Feature STR-1: Rocky, ephemeral drainage within sagebrush-steppe habitat. Facing west-southwest. Date: April 9, 2020.

Photo 7. Feature STR-1: Overview of this ephemeral drainage. Facing east-southeast. Date: May 3, 2019.

Photo 8. Feature STR-1: West end of this ephemeral drainage; drainage continues to east outside Project study area. Facing southwest. Date: May 3, 2019.

Photo 9. Feature STR-1a: Rocky, vegetated ephemeral channel. At east end of Project study area. Facing south-southwest. Date: May 3, 2019.

Photo 10. Feature STR-2: Rocky ephemeral channel within sagebrush-steppe habitat. At south end of feature near confluence with STR-1. Facing south-southwest.

Photo 11. Feature STR-2: Taken near location of Photo 10 approximately one year prior. Facing south-southwest. Date: May 3, 2019.

Photo 12. Feature STR-2: Ephemeral drainage within heavily grazed sagebrush-steppe habitat. Facing southwest. Date: April 9, 2020.

Photo 13. Feature STR-2: Ephemeral, erosional side channel likely created during heavy rains in January 2020. Facing northeast. Date: April 9, 2020.

Photo 14. Feature STR-2: Rocky, ephemeral drainage in grazed grassland and sagebrush-steppe habitat. Facing north-northeast. Date: April 9, 2020.

Photo 15. Feature STR-2: Near north end of Project study area Facing south-southwest. Date: April 9, 2020.

Photo 16. Feature STR-2a: Rocky, ephemeral drainage at north end of portion of drainage within Project study area. Facing south-southwest. Date: April 9, 2020.

Photo 17. Feature STR-2a: Rocky, ephemeral drainage in grazed grassland and sagebrush-steppe habitat. Facing north-northeast. Date: April 9, 2020.

Photo 18. Feature STR-3: At confluence with feature STR-2. Facing east-northeast. Date: April 9, 2020.

Photo 19. Feature STR-3: Narrow, rocky, ephemeral drainage. Facing east-northeast. Date: April 9, 2020.

Photo 20. Feature STR-3: Taken near the northern border of the Project study area. Facing west-southwest. Date: April 9, 2020.

Photo 21. Feature STR-2: At north end of Project study area Facing south. Date: April 9, 2020.

Photo 22. Area investigated due to aerial signature. No stream characteristics observed. Facing southwest. Date: April 9, 2020.