APPENDIX D

Starbuck Power Company—Engineering Report

D.1 Introduction

D.1.1 Background

This engineering report has been prepared for the Starbuck Power Company, L.L.C., of Bellevue, Washington, for the 1,200-megawatt (MW), natural gas fueled, combustion turbine generation plant to be built in Columbia County, Washington (Figure D.1-1). This report has been prepared in accordance with WAC 173-240-130 and WAC 463-42-195 and is a reference document for the Energy Facility Site Evaluation Council (EFSEC). This document is prepared to provide EFSEC with engineering information necessary to issue a wastewater discharge permit.

D.1.2 Purpose

A wastewater discharge permit is necessary for the Applicant to divert its wastewater to infiltration and evaporation ponds. This wastewater will be low in dissolved solids as a result of alternative processes to be used at the generation plant for the production of electrical power. The Washington Department of Ecology (Ecology) regulates the discharge of industrial wastewater through a permitting system (WAC 173-216). However, for generation plants that produce more than 350 MW, EFSEC has the permitting authority.

D.1.3 Water Supply Source

The Applicant is awaiting a recommendation on its groundwater right application. If the water right is granted, it will allow the Applicant to construct the proposed onsite well that will serve as the water supply for the generation plant (Elmer, April 2001). Because the groundwater right application is pending, water quality data from wells in the vicinity and two sources in the Town of Starbuck were used as a reference in this report.

As a water supply alternative in case the onsite well proves infeasible, the Applicant has secured an option to purchase up to 100 gallons per minute (gpm), or up to 144,000 gallons per day (gpd), of water from the Town of Starbuck under the Town's existing water right. Under this alternative, the Applicant would construct an approximately 6-mile-long, 4-inch-diameter water pipeline, primarily along an abandoned railroad bed, to connect the Town's water system to the site in order to supply water to the generation plant. Because the actual water supply characteristics may vary between the proposed onsite well and the Town water system via the alternative water pipeline, for purposes of the engineering report, a conservative approach was taken that uses the highest concentration of each constituent.

D.1.4 Evaluation of Treatment Methods

Through Black & Veatch Corporation, the Applicant evaluated several water treatment and disposal alternatives. Process alternatives were also evaluated to determine the method that

would minimize the amount of supply water required and generate the least amount of wastewater.

Water analyses determined that the well water supply should undergo pretreatment in a demineralization unit due to mineral content. High purity water is required for the production of steam in the generation plant. A mobile demineralization unit will treat the water using an ion-exchange process. The water will pass over resins, leaving behind dissolved solids. The clean water then will be fed to the steam generators and the "fogging" unit. The resin containing the solids will be used until regeneration is required. Because the demineralization unit is mobile, the trailer will be removed and the resin regenerated offsite, thus eliminating wastewater high in solids and containing spent regenerates.

The generation plant will be designed to use air-cooled condensers, "fogging," steam injection, and blowdown recovery. The improved qualities of each of these process alternatives are as follows: Other electrical generation processes include wet-cooled systems that use cooling towers. While a wet-cooled system is less costly, it requires a much larger water source and results in wastewater discharges containing biocides and chemical residuals.

- The use of "fogging" for inlet air cooling for the combustion turbines generates no wastewater, unlike evaporative coolers. This process injects "fog" (a water mist) into the intake of the turbines increasing their power output. This also reduces the amount of cooling water needed by the generation plant. The use of a "fogging" system eliminates a potential source of chemicals from the wastewater stream.

- Blowdown recovery is accomplished by recirculating the blowdown water instead of introducing fresh water into the system. Blowdown water discharge is eliminated through evaporation. This occurs once the recirculated blowdown water reaches a point of high solids concentration. This recovery process eliminates the introduction of boiler treatment chemicals, solids, and heat to the wastewater system.

Because sources of contamination will be removed from the wastewater stream, the following approach to wastewater treatment was taken. The main source of wastewater will be process wastewater which includes housekeeping water from generation plant drains and wash down areas, sanitary water, and rainfall. The Applicant will segregate its wastewater streams and provide separate disposal methods for the streams as follows:

- Process wastewater – infiltration/evaporation pond
- Sanitary wastewater – septic system to drain field
- Stormwater – infiltration/evaporation pond

Process wastewater that has the potential to contain oil or lubricants will be routed to an oil/water separator before discharge to the infiltration pond. It should be noted that the use of infiltration ponds will avoid having a discharge to the Snake River.

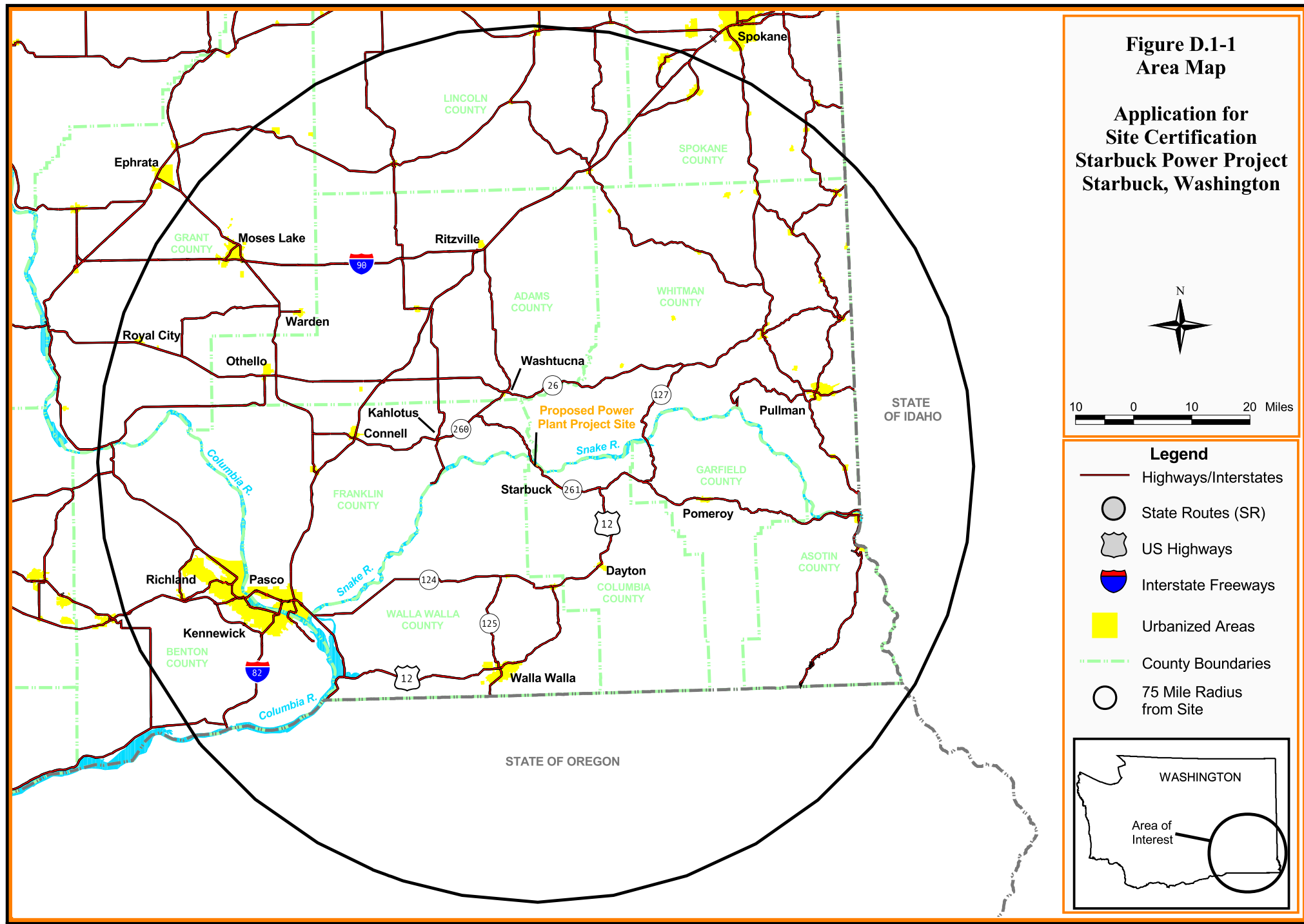


Figure D.1-1
Area Map

Application for Site Certification
Starbuck Power Project
Starbuck, Washington

N

10 0 10 20 Miles

Legend

- Highways/Interstates
- State Routes (SR)
- US Highways
- Interstate Freeways
- Urbanized Areas
- County Boundaries
- 75 Mile Radius from Site

D.2 Supporting Documentation

The following sections, which follow the format of *Washington Administrative Code* (WAC) 173-240-130, provide supporting documentation for permitting of a discharge of industrial water to groundwater (see Attachment 1 to Appendix D, Application for a Wastewater Discharge Permit for Discharge of Industrial Wastewater to Groundwater).

(a) Type of Industry or Business

The generation plant will be a 1,200-MW, natural-gas-fueled, combustion turbine generation plant. It will consist of a generation plant, a step-up substation, and auxiliary support units.

The generation plant will consist of combined-cycle combustion gas turbines, four heat recovery steam generators, two steam turbine generators, and air-cooled condensers. The administrative and general facility support areas will be located in the generation plant.

The required support units will include the Fire Pump Building, the Substation Control Building, the Ammonia Transfer System, and the mobile water treatment unit. The buildings will house necessary equipment and the systems will support operations.

The Fire Water Pump Building will house two redundant fire water pumps for maintaining fire fighting water system pressure. One pump will be electrical and the other will be diesel fueled, to be used in the event of a power outage. A diesel storage tank will be located adjacent to the building.

The Substation Control Building will contain the necessary equipment to transfer the electrical power generated into the new transmission line and through the Bonneville Power Administration (BPA) transmission corridor.

The Ammonia Transfer System will consist of a storage tank for aqueous ammonia, a vaporizing unit, dilution equipment, transfer pumps, and controls. A truck loading station will be a part of the system.

The water treatment unit will include a trailer-mounted demineralization unit with transfer equipment and controls. This unit will use resin to complete an ion exchange to produce high-purity water for the generation plant. When the resin is exhausted, the trailers will be moved offsite and regenerated.

Utilities at the generation plant will include water supplied from the proposed onsite well (or, alternatively, from the Town water system via the alternative water pipeline) and natural gas supplied from a mainline maintained by Gas Transmission-Northwest. Service water will be stored onsite in a 500,000-gallon tank. Sanitary water will be supplied from the stored water and treated through a septic system. The natural gas will be metered and regulated through a station located at the generation plant.

Figure D.2-1 shows the generation plant location and boundaries. Figure D.2-2 presents the site arrangement.

(b) The Kind and Quantity of Finished Product

The generation plant will generate about 1,200 MW of electrical power for residential and commercial use. Electricity will be transported from the generation plant to the BPA regional distribution system by connecting to one of two existing transmission lines, or to the proposed 500-kilovolt (kV) transmission line.

(c) The Quantity and Quality of Water Used by the Industry and a Description of How Consumed or Disposed of, Including:

(i) How Water Used by the Industry is Consumed or Disposed of

Well water pumped from the onsite well to the generation plant will be used as service water or sent to the mobile demineralization unit for purification before use in the generation plant. Water will be consumed in the steam turbine generators and "fogging" /steam injector unit. Well water will be stored for the fire fighting system.

Process wastewater, sanitary wastewater, and stormwater from the generation plant will be disposed of by the following methods, respectively:

- Process wastewater infiltration/evaporation pond
- Sanitary septic system/drain field
- Stormwater infiltration/evaporation pond

It is estimated that an average of 9 gallons per minute (gpm), or about 13,000 gallons per day (gpd), of wastewater will be sent to the process wastewater infiltration/evaporation pond. An estimated 1 gpm (1,440 gpd) of sanitary wastewater will be transferred to the sanitary septic system and then to the drain field. Discharges to the stormwater infiltration/evaporation pond will be based on the amount of rainfall in the area. The water mass balance shown in Figure D.2-3 shows numerically and graphically how water will be consumed and disposed of.

(ii) The Quality of Water Used by the Industry

Production of electricity through the use of steam turbines will require that high purity water be used in the process. The source of the service water will be from a proposed onsite well or, alternatively, from the Town water system via the alternative water pipeline. Before use in the generation plant, the water will be purified to remove dissolved solids. Table D.2-1 shows water quality data from two nearby wells, two Town of Starbuck sources, and a monitoring well at the generation plant site.

The samples were tested for inorganic chemicals and organic compounds by Anatek Labs, Inc. The water sources meet the drinking water standards set forth by the Washington State Department of Health except for the new onsite monitoring well (B-6), which exceeded maximum contaminant levels for manganese and iron and was positive for coliform bacteria. This well was not fully developed and further development could reduce these exceedance levels. It is not unusual to find high levels of manganese and iron in Washington wells; however, because the nearby Columbia County Grain Growers well and the rental house well are both under detection limits for these parameters, it is likely that the future production well could be low in both manganese and iron. In addition, it is not uncommon to have a positive coliform test after a well has been drilled, as a result of the well

Figure D.2-1
Vicinity Map

Application for Site Certification
Starbuck Power Project
Starbuck, Washington

Inset

WASHINGTON

Inset

Whitman County

Columbia County

Snake R.

261

Site Property

N

500 0 500 Feet

Whitman Co.
Columbia Co.

261

800

700

600

500

Snake River

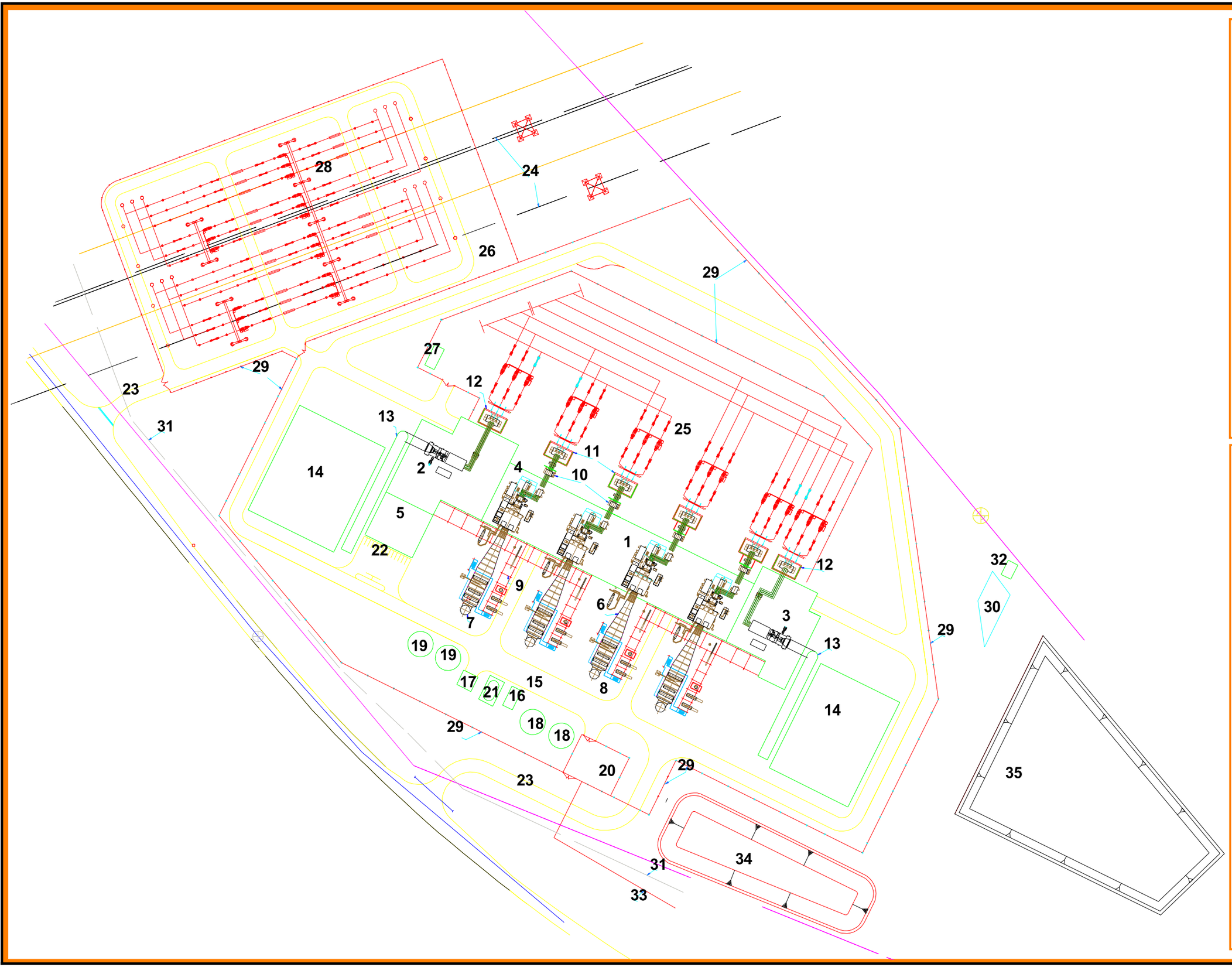
Columbia Co.
Grain Growers

Legend

- Proposed Site Property
- Facility Buildings
- Facility Ponds
- Septic Tank and Drainfield
- Other Buildings
- Proposed Facility
- Facility Roads
- Facility Fence
- Proposed Gas Lateral
- PG&E "A" Gas Pipeline
- Transmission Lines
- State Routes (SR)
- Secondary Roads
- Union Pacific Railroad
- Contours 100 Foot

Figure D.2-2
Site Arrangement

Application for Site Certification Starbuck Power Project Starbuck, Washington

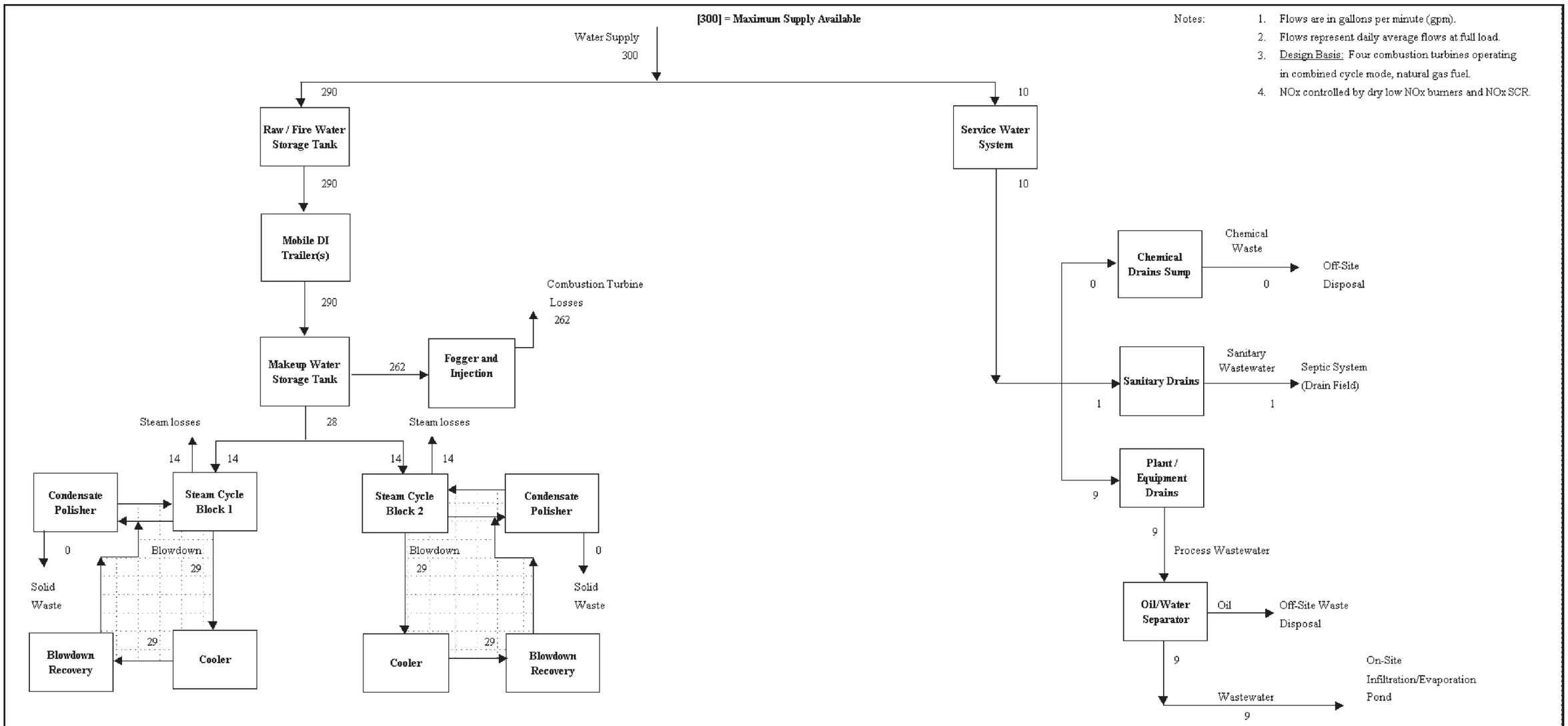


N

100 0 100 200 Feet

Key

1 - Combustion Turbine Building
2 - Steam Turbine Building Block 1
3 - Steam Turbine Building Block 2
4 - CT Air Inlet Filter
5 - Control/Administration Building
6 - Heat Recovery Steam Generator
7 - Exhaust Stack
8 - Emissions Monitoring Skid
9 - Exterior Steam Piping Piperack
10 - Isophase Bus Duct
11 - CT Generator Step-Up Transformer
12 - ST Generator Step-Up Transformer
13 - Steam Turbine Exhaust Duct to Condenser
14 - Air-Cooled Condenser
15 - Portable Water Treatment Equip. Parking
16 - Demin. Water Transfer Station
17 - Fire Pump Building
18 - Demin. Water Storage Tank
19 - Service/Fire Water Storage Tank
20 - Gas Metering Station
21 - SCR Ammonia Storage
22 - Parking
23 - Site Access Road
24 - Existing 500 kV Transmission Lines
25 - Step-Up Substation
26 - 75 Foot Easement to 500 kV Line
27 - Substation Control Building
28 - 500 kV Starbuck Substation (By Others)
29 - Site Perimeter Fencing and Gates
30 - Drainfield
31 - Relocated Existing Overhead Line (REA)
32 - Septic Tank
33 - Natural Gas Supply Line Corridor
34 - Stormwater Pond
35 - Infiltration/Evaporation Pond



Notes:

1. Flows are in gallons per minute (gpm).
2. Flows represent daily average flows at full load.
3. Design Basis: Four combustion turbines operating in combined cycle mode, natural gas fuel.
4. NOx controlled by dry low NOx burners and NOx SCR.

Rev	Date	Revision and Record of Issue	BY	CHK	APP
E	07-Jun-01	Revised steam flow	JLB		
D	22-May-01	Revised input variables	JLB		
C	14-May-01	Changed to 300 gpm max supply	JLB		
B	01-May-01	Increased air cooling to 8 hours	JLB		
A	11-Apr-01	Preliminary Issue to Client	JLB		

COMBUSTION TURBINE FUEL	Natural Gas	CYCLE MAKEUP EFF.	100%
NOMINAL PLANT OUTPUT (MW)	1200	STEAM LOSSES	0.5%
AV ANNUAL TEMP (F)	51	COOLING TOWER CYCLES	N/A
DUCT BURNERS	FIRED	COMBUSTION TURBINE	SWPC 501F
TURBINE CONFIGURATION	2 blk - 2 on 1	HEAT BALANCE	CASE 1
HEAT REJECTION SYSTEM	Air Cooled		

BLACK & VEATCH Corporation

Eng: JLB Dwg: JLB
Check: BAL Date: 02/11/01

Starbuck Power Company LLC
Starbuck Power Project

Maximum Use
Water Mass Balance

Drawing # 96344-DC-1004

Rev. E

FIGURE D.2-3
Water Mass Balance Flow Diagram
Application for Site Certification
STARBUCK POWER PROJECT
STARBUCK, WASHINGTON

construction process. Usually, disinfection of these newly drilled wells will provide future negative coliform analyses.

TABLE D.2-1
Water Source Analyses

WATER SOURCE:
1. Town of Starbuck Source S02
2. Town of Starbuck Source S01
3. Bar-Z Ranch Well
4. Columbia County Grain Growers Well
5. SPP Site Monitoring Well B6

	1	2	3	4	5
Parameter	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
Calcium (Ca)	26.7	29.9	29.2	38.6	40.3
Magnesium (Mg)	10.4	11.7	7.7	11.3	16.0
Sodium (Na)	10	10.7	11	18	21
Potassium (K)			3.14	4.86	6.4
Sulfate (SO_4)	148	ND	22	29	30
Chloride (Cl)	3.5	ND	< 20	< 20	< 20
Nitrate (NO_3)	0.6	0.5	1.3	2.0	1.3
Nitrite (NO_2)	0.4		< 0.1	< 0.1	< 0.1
Total Nitrate/Nitrite-N			1.3	2.0	1.3
Ammonia (as N)			< 1	< 1	< 1
Silica (SiO_2)		27.3	16	18	22
M alkalinity (as $CaCO_3$)		150			
Alkalinity (as $CaCO_3$)			78	92	100
Hardness ($CaCO_3$)			107	146	171
Specific Cond. (uS)		308	208	281	468
TDS	300	175	211	242	237
TSS (NTUs)	254	0.3			
Color (units)	0.2	ND	< 5	< 5	60
Turbidity (NTU)	10		0.2	0.1	> 40
Orthophosphate		ND	< 0.1	< 0.1	0.65
Aluminum (Al)			< 0.05	< 0.05	11.3
Antimony (Sb)			< 0.005	< 0.005	< 0.005
Arsenic (As)			< 0.01	< 0.01	0.01
Barium (Ba)	0.0005		< 0.1	< 0.1	0.1
Beryllium (Be)	0.005		< 0.003	< 0.003	< 0.003
Cadmium (Cd)	0.01	ND	< 0.002	0.003	< 0.002
Chromium (Cr)	0.034	ND	< 0.01	< 0.01	0.05
Copper (Cu)		ND	< 0.2	< 0.2	< 0.2
Fluoride (F)		0.5	< 0.5	< 0.5	1.6
Iron (Fe)		0.14	< 0.1	< 0.1	27.4
Lead (Pb)			< 0.002	< 0.002	< 0.002
Manganese (Mn)		ND	< 0.01	< 0.01	0.34
Mercury (Hg)			< 0.0005	< 0.0005	< 0.0005
Nickel (Ni)			< 0.04	< 0.04	< 0.04
Selenium (Se)			< 0.005	< 0.005	< 0.005

TABLE D.2-1
Water Source Analyses

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	1	2	3	4	5
Parameter	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
Silver (Ag)			< 0.01	< 0.01	< 0.01
Thallium (Tl)			< 0.002	< 0.002	< 0.002
Zinc (Zn)			0.20	0.02	0.03
Cyanide (CN)			< 0.05	< 0.05	< 0.05
Coliform			none present	None present	present

Notes:
ND = not detected, detection limit unknown.
> = not detected.
mg/L = milligrams per liter.

Sources:
Black & Veatch (2001).
Anatek Labs, Inc. (2001a).
Anatek Labs, Inc. (2001b).
CH2M HILL (C. Sauer) (2001).

(iii) The Quantity of Water Used by the Applicant

The average expected well water use for the generation plant is about 432,000 gpd or 300 gpm. The maximum instantaneous flow expected from the onsite well is about 300 gpm. Alternative supply water from the Town of Starbuck is expected to flow at 100 gpm (144,000 gpd). With the alternative supply, "fogging"/steam injection will be minimized or eliminated because of the smaller volume of water available. Under the proposed 300 gpm supply scenario, the water will be divided into two major flows as follows:

- About 290 gpm to the generation plant
- About 10 gpm to the service water system

The sanitary system will use about 1 percent of the total service water. The remaining 9 gpm of the service water primarily will be used in the generation plant for housekeeping purposes. Forty percent of the generation plant water will be sent directly to the demineralization unit for treatment before use. The balance will be stored for the fire fighting system.

(iv) Quantity of Water Consumed or Lost by Evaporation

The steam and evaporative losses between the two steam generators and the "fogging"/ steam injector unit are estimated to average 28 gpm (40,300 gpd) and 262 gpm (377,300 gpd), respectively. In addition, about 3 gpm of evaporative losses are expected from the infiltration/evaporation ponds.

(d) The Amount and Kind of Chemicals Used in the Treatment Process

There will be no chemicals used in the water and wastewater treatment processes at the generation plant. The resins in the ion-exchange demineralization unit will be regenerated offsite. None of the cooling towers will require biocides or other treatment chemicals. The

primary unit in the wastewater treatment system will be a gravity oil/water separator. Oil skimmed/drained from the unit will be collected and disposed of by an offsite contractor.

Cooling tower wash water drains and chemical drains will be routed to the chemical sump. These wastes may contain surfactants that interfere with oil/water separation. Thus, the sump will be monitored/tested and pumped out to a truck for offsite disposal.

(e) The Basic Design Data and Sizing Calculations of the Treatment Units

(i) Demineralization Unit

The demineralization unit was sized to purify 290 gpm of well water. This will be the amount of water available to operate the steam generating turbines and the "fogging"/steam injection unit.

(ii) Oil/Water Separator

The oil/water separator will have a 10,000-gallon capacity and will treat the 9 gpm of process wastewater. This capacity is based on the estimated number of oil/lubricant storage areas that will be located in the generation plant and the estimated amount of material to be stored at each contained area.

(iii) Sanitary Septic System

There will be about 10 people working each shift during a three-shift day at the generation plant. Current water consumption data estimate that one person uses about 25 gallons of water per day. As a result, a 750-gallon septic tank will be adequate. However, a 1,000-gallon septic tank will be installed to reduce the pump-out frequency. Water from the septic system will drain to a 1,100-square-foot tile drain field.

(iv) Stormwater Infiltration/Evaporation Pond

A 2-acre, 4-acre-foot stormwater basin will be constructed for natural drainage of rainfall. The volume of the basin was based on a 100-year, 24-hour storm event across the total square footage of the generation plant site. Estimated rainfall for this scenario is 4 inches (see Attachment 3).

(v) Process Wastewater Infiltration/Evaporation Pond

A 1.3-acre, 6.5-acre-foot infiltration pond will be constructed to receive the discharge from the oil/water separator. The size of this pond was based on a discharge flow rate of 9 gpm of process wastewater from the separator in addition to the amount of rain that would fall into the pond during a 100-year, 24-hour storm event (see Attachment 3).

(f) A Discussion of the Suitability of the Proposed Site for the Facility

The Applicant plans to contruct the generation plant on approximately 40 acres of a 100-acre site located about 6 miles northwest of the Town of Starbuck in Columbia County, Washington (Figure D.2-1). State Route 261 (SR-261), a two-lane highway, is adjacent to the southwest side of the property, and a Union Pacific rail line passes southwest of the highway. An additional 10 acres would be disturbed during the construction process.

The site is located at the top of a steep bluff of the Snake River, about 170 feet above normal river elevation and about 350 feet from the shoreline, between Little Goose Dam and Lower Monumental Dam. The Applicant has an option to purchase the property from the current owner, the BAR-Z Ranch, Inc. Figure D.2-4 shows the property boundaries and site characteristics. Although much of the site has been used for grazing in the past, it is currently zoned for heavy industrial uses, including energy facilities such as the generation plant.

Also shown in Figure D.2-4, two BPA 500-kV transmission lines cross the approximate center of the property. The generation plant will be constructed on the portion of the property southeast of those lines. The terrain in this area generally slopes to the south, away from the river. Figure D.2-5 depicts the site conceptual grading and drainage plan.

The selected site for the generation plant will reduce environmental impacts associated with the construction of a lengthy gas pipeline and transmission line corridors because these facilities will be located close to the generation plant. The GTN natural gas mainline is located within 200 feet of the Applicant's property and the BPA transmission lines for connection into the electrical transmission grid transect the property. The closest residence is about 1 mile away (at the Lyons Ferry Marina).

(g) A Discussion of the Treatment Process and Operation, Including a Flow Diagram

Figures D.2-6 through D.2-9 present process flow diagrams for the demineralization unit, the oil/water separator, the septic system treatment process, and the infiltration ponds.

(i) Demineralization Unit

Water pumped from the proposed onsite well will be transferred to a 500,000-gallon aboveground storage tank. This water then will be separated into two streams. One stream will be used as service water and the other sent to the demineralization unit. The water sent to the demineralization unit will enter the chambers and pass over the enclosed resins. The resin will remove the dissolved solids from the stream using an ion-exchange process. The high-purity water exiting the demineralization unit will be sent to storage and later used as boiler makeup water and for combustion turbine "fogging"/steam injection (Figure D.2-7). If the alternative water pipeline replaces the proposed onsite well, the "fogging" process will not be used.

(ii) Oil/Water Separator

Process water from indoor areas with the potential for oil or lubricant spills will drain to a central gravity oil/water separator. The oil that accumulates at the water surface will be skimmed/drained and disposed of by an offsite contractor. The water from the separator will be sent to the process wastewater infiltration/evaporation pond (Figure D.2-8).

(iii) Sanitary Septic System

A septic system will be used for the onsite treatment of sanitary wastes. The septic system will consist of a septic tank with a baffled entry and exit. There will be no chemical treatment of the water in the septic tank. In the septic tank the inlet and outlet of the tank both will be near the top of the tank, allowing the larger solids to settle to the bottom of the tank. A portion of the solids accumulating on the bottom of the tank eventually will be

LEGAL DESCRIPTION

The following describes property including any and all fixtures, buildings and appertunances located thereon, in Columbia County, State of Washington.

All that part of the following described real property lying between the former Starbuck-Lyons Ferry Road and the south bank of the Snake River:

The south half of the southwest Quarter; the Northwest Quarter of the southwest Quarter and the southwest Quarter of the Northwest Quarter of Section 29; the north half of the Northwest Quarter of Section 32; all in Township 13 North, Range 37, East Of the Willamette Meridian.

SUBJECT to easement for electric power transmission line and access road as granted to the United States of America, as described in V-that Easement Deed recorded in Book 49 at page 486, records of Columbia County, Washington.

SAVE AND EXCEPT the following two tracts.

TRACT 1:

A tract of land lying in Government Lots 6 and 7 and the Southwest Quarter of the Southwest quarter of Section 29, the east half of the Southeast Quarter of Section 30, and the east half of the Northwest Quarter and the Northwest Quarter of the Northwest Quarter and the Northeast Quarter of the Southwest Quarter of Section 32, all in Township 13 north, Range 37, East of the Willamette Meridian, Columbia County, Washington, said tract of land being more particularly described an follows:

Beginning at the point of intersection with the North-South center line of said Section 32 and a line bearing North 55°03, 20" West from a point lying South 41°27'11" East a distance of 4,653.64 feet from the Northwest corner of said Section 32;

thence northerly along said north-south center line to a point lying 1,450.0 feet south of the north line of said Section 32; thence North 69°30' West, a distance of 1,450-00 feet; thence northerly along a straight line to a point on the north line of said Section 32, said point lying 725,0 feet easterly of the northwest corner of said Section 37, thence northerly along a straight line to a point on the west line of said Section 29, said point lying 1,100.0 feet southerly of the quarter corner on the west line of said Section 29; thence northerly along said west line of Section 29 a distance of 900.0 feet; thence southerly along a straight line to a point an the north-south center line of said Section 32 said point lying 400.0 feet southerly of the north, line of said Section 32; thence northerly along said north-south center line, a distance of 400.0 feet to the north line of said section 32; thence easterly along the north line of said Section 32 to the line of ordinary high water (south bank) of the Snake River; thence northwesterly along said line of ordinary high water to the west line of Section 29; thence southerly along said west line of Section 29 to the Quarter corner thereof; thence westerly along the north line of the east half of the Southeast Quarter of said Section 30, to the Northwest corner thereof; thence southerly along the west line of said east half of the Southeast Quarter to the existing center line of the Starbuck-Lyons Ferry County Road Mullen Road): thence southeasterly along said center lime to the west line of the east half of the Northwest quarter of said Section 32; thence southerly along said west line of the east half of the Northwest Quarter to a point lying 400.0 feet southerly of the Southeast corner of the Northwest Quarter of the Northwest Quarter of said Section 32; thence South 52° 38'00" East, a distance of 890.0 feet; thence South 34° 56'40" West, a distance of 460.0 feet; thence southeasterly along a straight line to the point of beginning.

TRACT 2 :

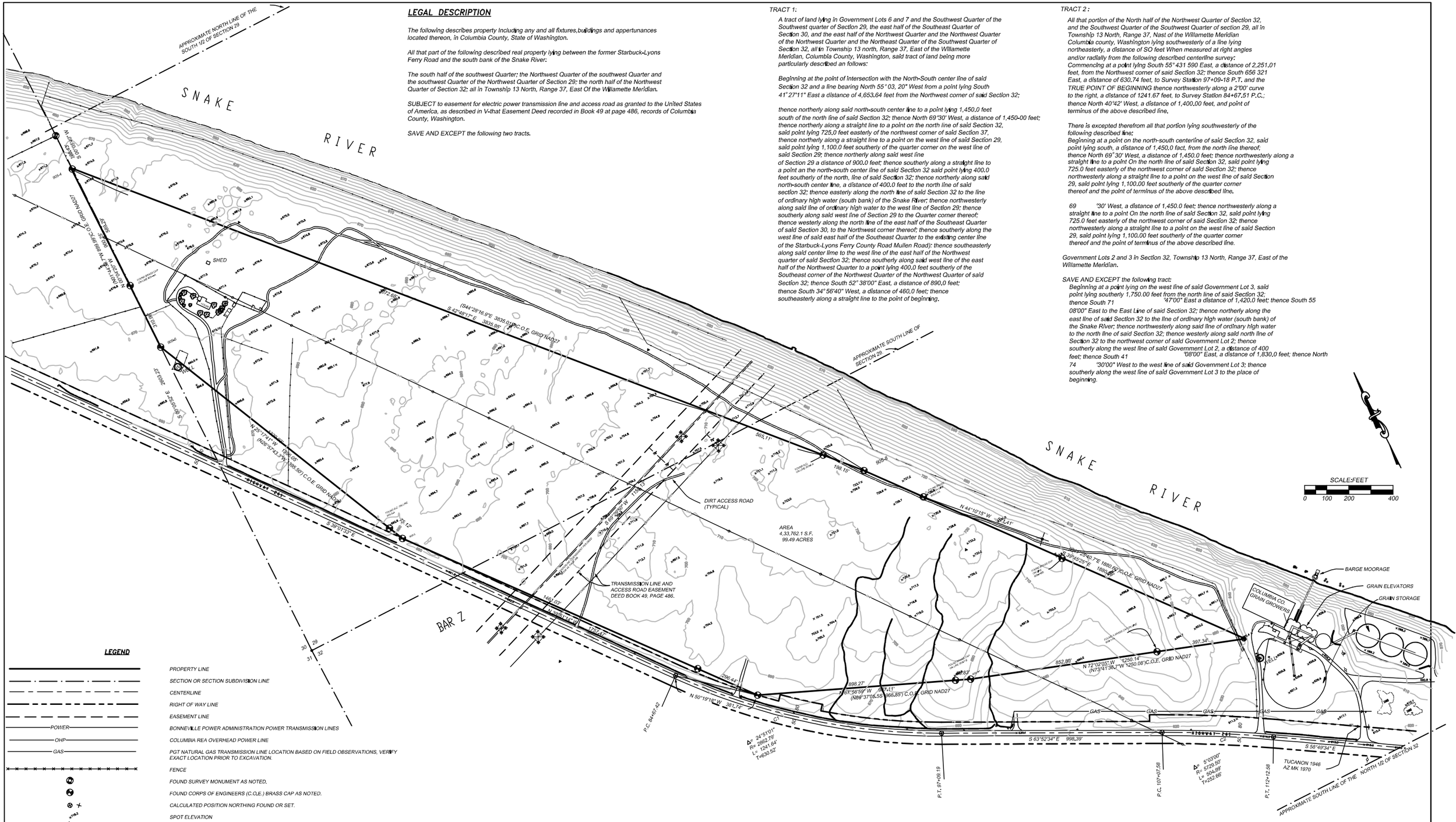
All that portion of the North half of the Northwest Quarter of Section 32, and the Southwest Quarter of the Southwest Quarter of section 29, all in Township 13 North, Range 37, Nast of the Willamette Meridian Columbia county, Washington lying southwesterly of a line lying northeasterly, a distance of SO feet When measured at right angles and/or radtally from the following descrlbed centerline survey: Commencing at a point lying South 55°431 590 East, a distance of 2,251.01 feet, from the Northwest corner of said Section 32; thence South 656 321 East, a distance of 630.74 feet, to Survey Station 97+09-18 P.T. and the TRUE POINT OF BEGINNING thence northwesterly along a 2'00' curve to the right, a distance of 1241.67 feet, to Survey Station 84+67.51 P.C.; thence North 40'42' West, a distance of 1,400.00 feet, and point of terminus of the above described line.

There is excepted therefrom all that portion lying southwesterly of the following described line: Beginning at a point on the north-south centerline of said Section 32, said point lying south, a distance of 1,450.0 fact, from the north line thereof; thence North 69°30' West, a distance of 1,450.0 feet; thence northwesterly along a straight line to a point On the north line of said Section 32, said point lying 725.0 feet easterly of the northwest corner of said Section 32; thence northwesterly along a straight line to a point on the west line of said Section 29, said point lying 1,100.00 feet southerly of the quarter corner thereof and the point of terminus of the above described line.

69 '30' West, a distance of 1,450.0 feet; thence northwesterly along a straight line to a point On the north line of said Section 32, said point lying 725.0 feet easterly of the northwest corner of said Section 32; thence northwesterly along a straight line to a point on the west line of said Section 29, said point lying 1,100.00 feet southerly of the quarter corner thereof and the point of terminus of the above described line.

Government Lots 2 and 3 in Section 32, Township 13 North, Range 37, East of the Willamette Meridian.

SAVE AND EXCEPT the following tract: Beginning at a point lying on the west line of said Government Lot 3, said point lying southerly 1,750.00 feet from the north line of said Section 32; thence South 71 '47'00" East a distance of 1,420.0 feet; thence South 55 08'00" East to the East Line of said Section 32; thence northerly along the east line of said Section 32 to the line of ordinary high water (south bank) of the Snake River; thence northwesterly along said line of ordinary high water to the north line of said Section 32; thence westerly along said north line of Section 32 to the northwest corner of said Government Lot 2; thence southerly along the west line of said Government Lot 2, a distance of 400 feet; thence South 41 "08'00" East, a distance of 1,830.0 feet; thence North 74 '30'00" West to the west line of said Government Lot 3; thence southerly along the west line of said Government Lot 3 to the place of beginning.



LEGEND

	PROPERTY LINE
	SECTION OR SECTION SUBDIVISION LINE
	CENTERLINE
	RIGHT OF WAY LINE
	EASEMENT LINE
POWER	BONNEVILLE POWER ADMINISTRATION POWER TRANSMISSION LINES
OHP	COLUMBIA REA OVERHEAD POWER LINE
GAS	PGT NATURAL GAS TRANSMISSION LINE LOCATION BASED ON FIELD OBSERVATIONS, VERIFY EXACT LOCATION PRIOR TO EXCAVATION.
	FENCE
	FOUND SURVEY MONUMENT AS NOTED.
	FOUND CORPS OF ENGINEERS (C.O.E.) BRASS CAP AS NOTED.
	CALCULATED POSITION NORTHING FOUND OR SET.
x718.2	SPOT ELEVATION
	BPA TOWER
	POWER POLE
720	CONTOUR LINE
WELL	WELL
(XOX)	DECIDUOUS TREE
	RECORD DIMENSION AS NOTED.
	TRENCH

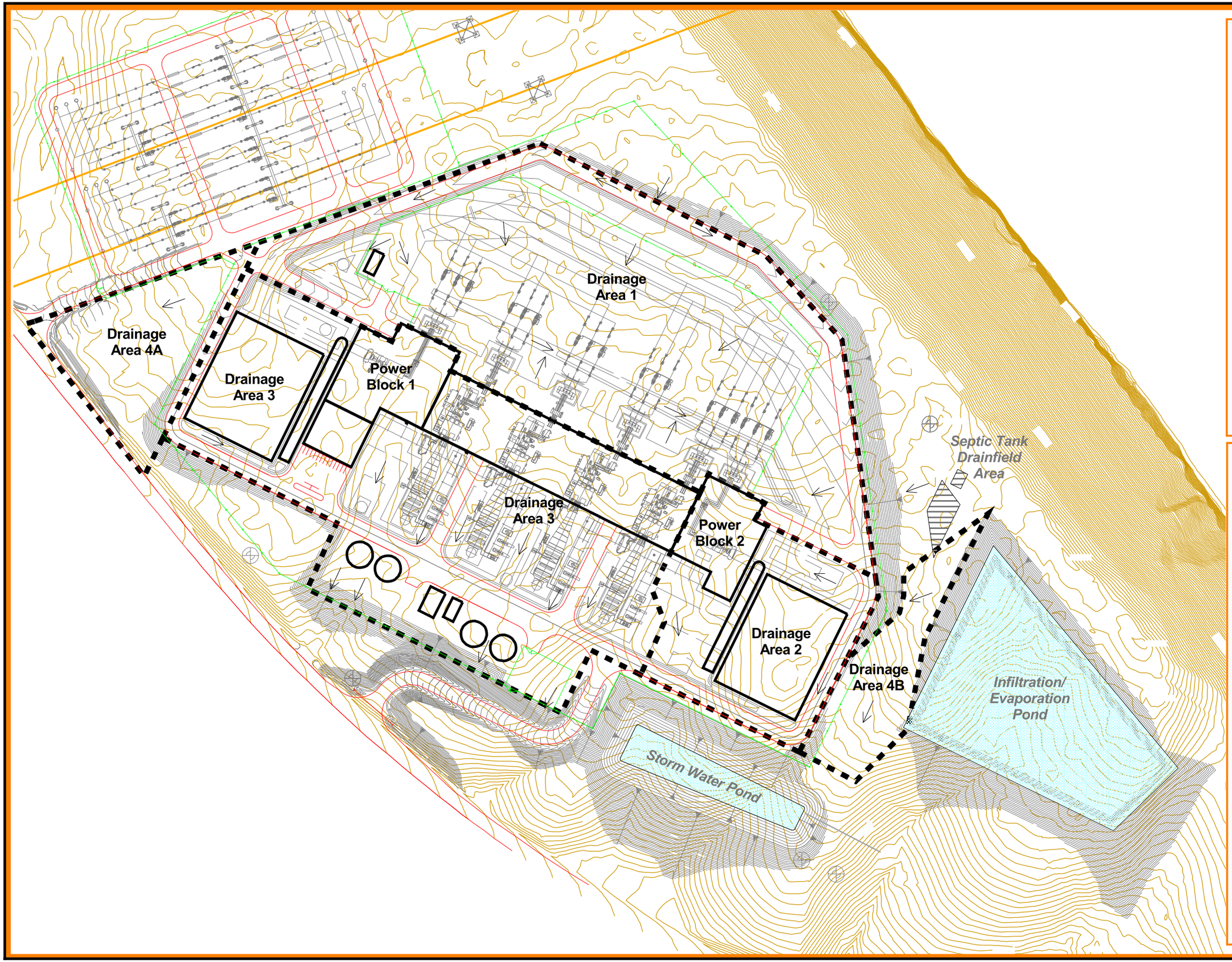
Figure D.2-4
Property Boundaries
Application for Site Certification
Starbuck Power Project
Starbuck, Washington

CH2MHILL

P:\Starbuck\155676\CAD TopoFigD.2-4.dwg

Figure D.2-5
Grading and Drainage

Application for Site Certification Starbuck Power Project Starbuck, Washington



N

100 0 100 200 Feet

Legend

- Proposed Facility
- Facility Buildings
- Facility Ponds
- Septic Tank and Drainfield
- Facility Roads
- Facility Fence
- Transmission Lines
- Contours - Existing
- Contours - Finished 1 Foot Interval
- Drainage Area Boundary
- Grade to Drain (Flow Arrow)

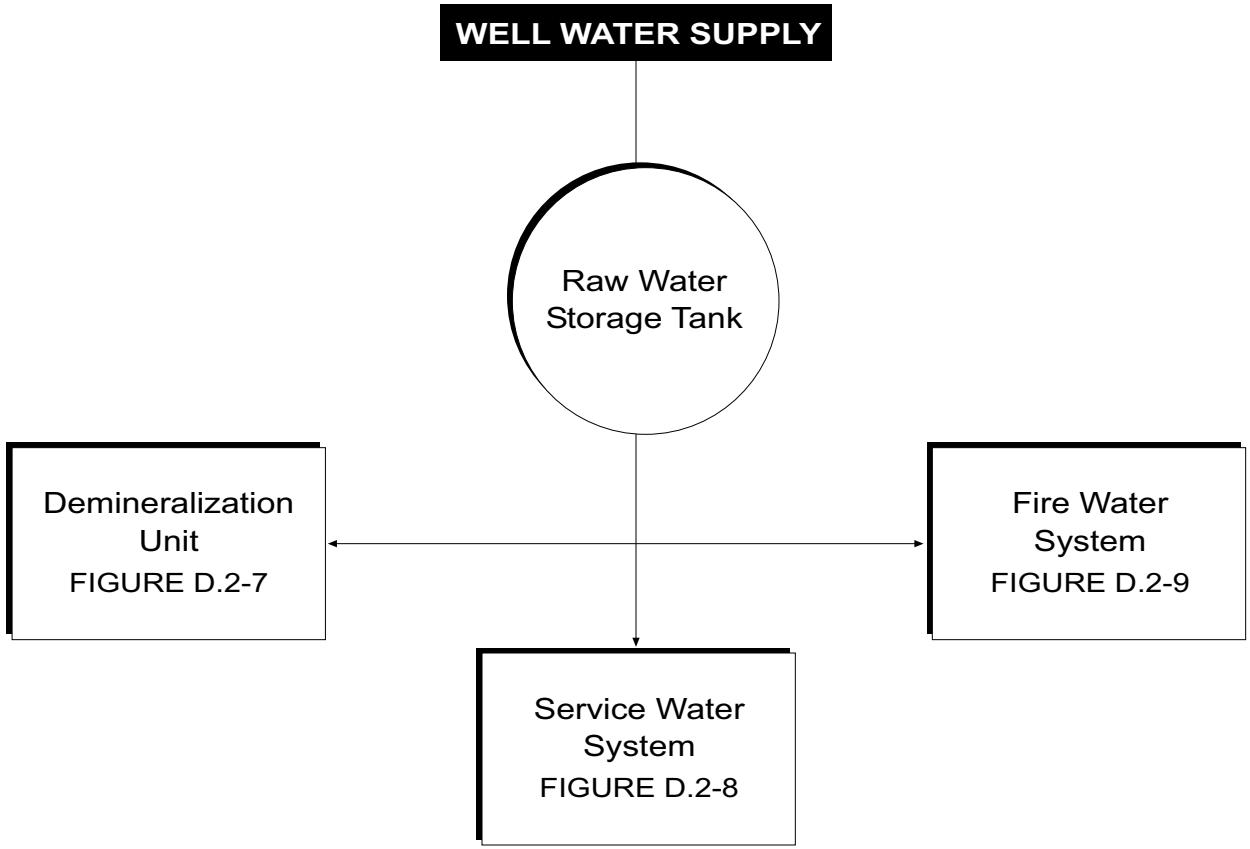


FIGURE D.2-6
Overall Water Distribution Process Flow Diagram Application for Site Certification
STARBUCK POWER PROJECT
STARBUCK, WASHINGTON

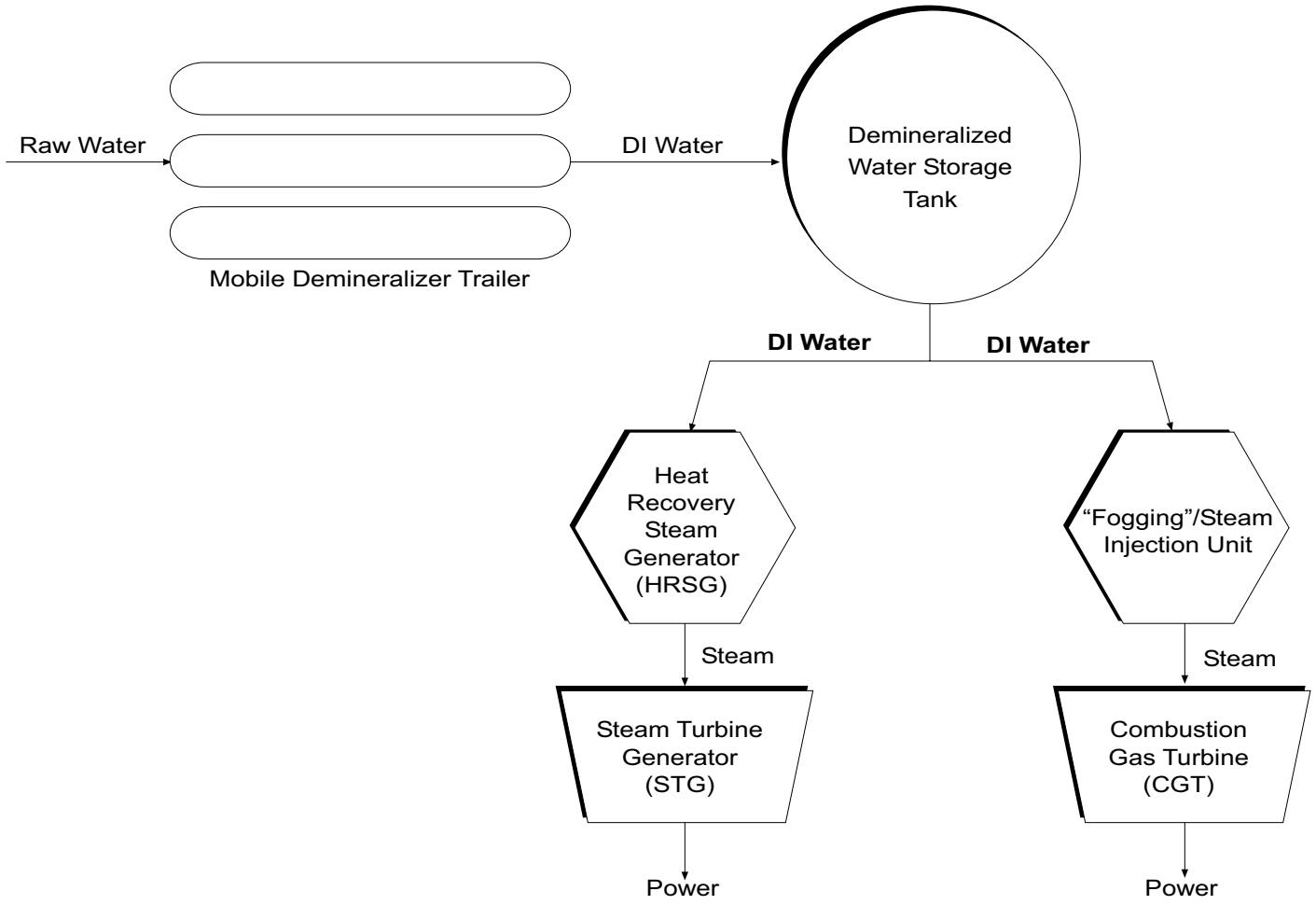


FIGURE D.2-7

Demineralization Unit Process Flow Diagram Application for Site Certification

STARBUCK POWER PROJECT
STARBUCK, WASHINGTON

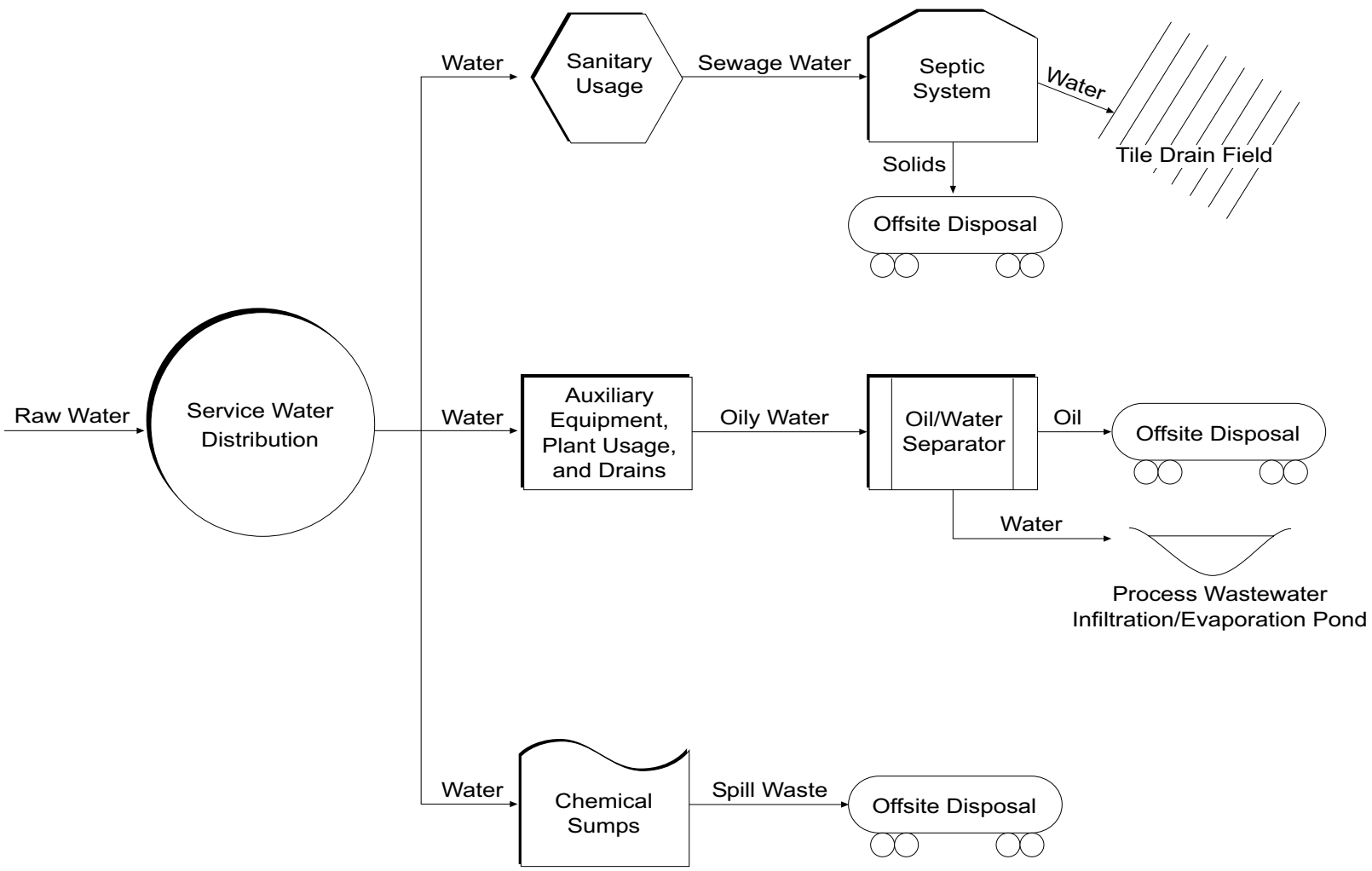
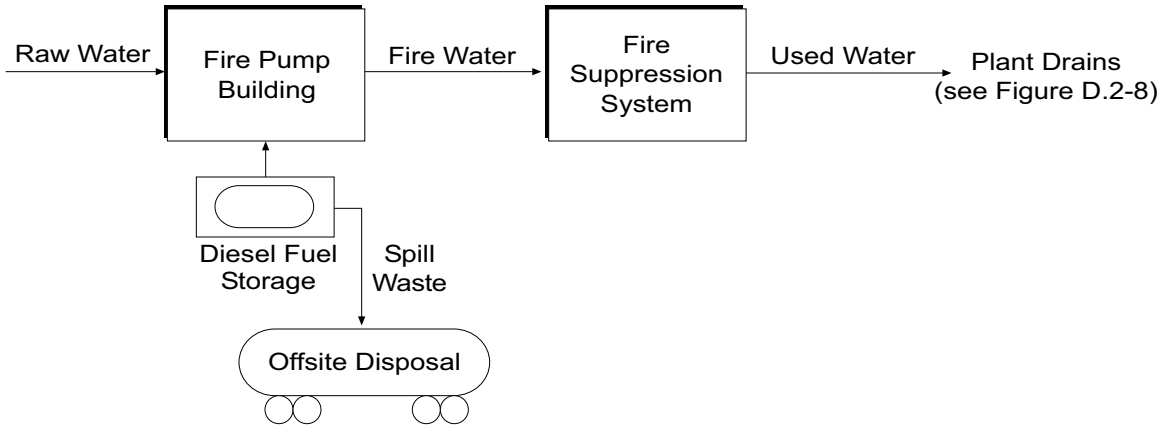


FIGURE D.2-8

Service Water System Process Flow Diagram Application for Site Certification

STARBUCK POWER PROJECT
STARBUCK, WASHINGTON



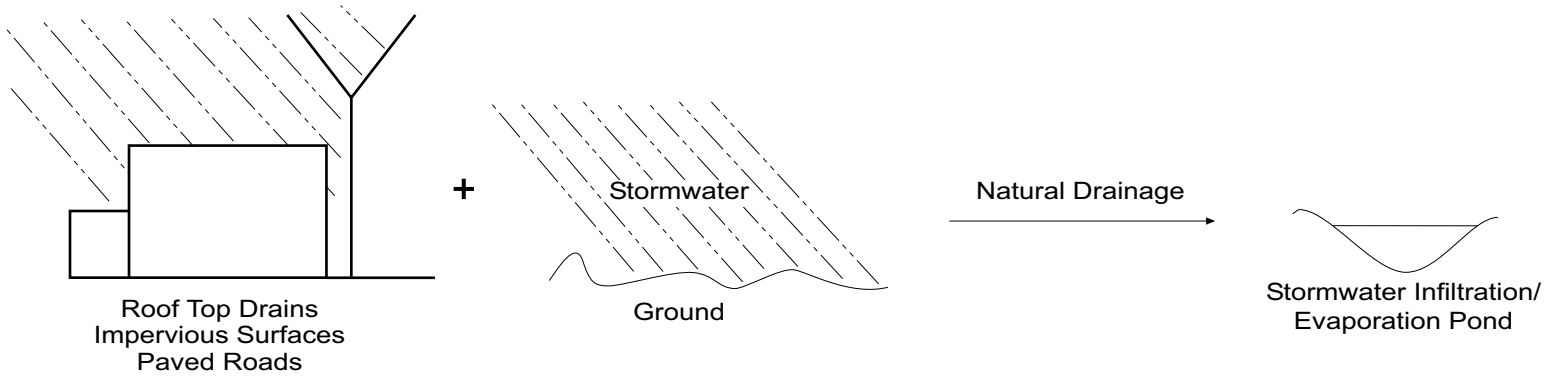


FIGURE D.2-9

Fire Water and Stormwater Systems Process Flow Diagram Application for Site Certification

STARBUCK POWER PROJECT
STARBUCK, WASHINGTON

"broken down" by anaerobic bacteria. The balance of the solids will be pumped out and disposed of offsite. Greases, oils, and lighter solids that float on top of the water in the tank will be prevented from exiting by baffles that cover the inlet and outlet of the tank, allowing only relatively cleaner water near the middle of the tank to exit. After the partially treated water exists the septic tank, the water will be pumped to a tile drain field made up of perforated pipes laid in gravel-filled trenches (Figure D.2-8).

(iv) Stormwater Infiltration/Evaporation Pond

Stormwater from impervious surfaces, paved roads, rooftop drains, and surfaces around the perimeter of the generation plant will be sent to the stormwater pond through natural drainage means (e.g., inclined culverts, shallow swales, ditches, and trenches) to the pond, which will be at the lowest point on the site. The collected stormwater will be allowed to infiltrate into the soil and to the ground. As a result, no industrial wastewater or contaminated stormwater will leave the site as surface runoff (Figure D.2-9).

(h) All Necessary Maps and Layout Sketches

Please see the Table of Contents for all figures, tables, and attachments associated with this engineering report.

(i) Provisions for Bypass, if Any

There are no provisions for bypass of untreated process or contaminated storm wastewater at the generation plant.

(j) Physical Provision for Oil and Hazardous Material Spill Control and/or Accidental Discharge Prevention

The generation plant building, administration building, and ancillary working areas will be designed to drain any spilled oils, chemicals, or wastewater to various treatment areas. Any spills that occur will be either (1) captured in containment areas that surround equipment or chemical storage tanks or (2) directed to drains that lead to the oil/water separator. Spills from the various areas will be segregated as follows:

(i) Diesel Fuel Storage Area

Fuel oil storage onsite during operation is expected to be limited to the diesel fuel stored for the diesel fire fighting pump, used for fire suppression. A concrete containment area located beneath the tank and the filling hook-up will be provided to capture and contain filling spills and overfills. A drain line will connect the containment to a separate holding tank, ensuring spilled diesel fuel will not reach the stormwater collection system. This holding tank will be emptied by an approved offsite contractor.

(ii) Ammonia Transfer and Storage Area

The ammonia truck unloading system will be designed for the safe transfer of aqueous ammonia reagent from the truck to the ammonia storage tank. The system will return displaced ammonia vapor to the unloading vehicle. The ammonia storage tank will be designed to hold a 1-week supply of ammonia (about 60,000 gallons). Common spill containment will be provided around both the truck unloading station and the ammonia

storage tank. In the event of a spill or tank rupture, the contents of the containment area will be pumped out and disposed of offsite by an approved contractor. An emergency response management and spill control plan will be developed for the aqueous ammonia storage and transfer system.

(iii) Indoor/Outdoor Process Drains

Indoor areas with the potential for oil or lubricant spills will be protected by concrete containment structures. The drains from these areas will be directed to the oil/water separator. Water from this oil/water separator will be discharged as wastewater to the process wastewater infiltration/evaporation pond. Oils will be drained and disposed of offsite.

Spills from outdoor areas of potential oil contamination, such as the oil spill containment structures around the transformers, will be pumped to trucks and disposed of offsite.

(iv) Chemical Sump

Areas housing chemicals will be protected with concrete containment areas. Drains in areas where chemical contamination could occur will be diverted to the dedicated chemical sump. Combustion turbine offline wash water will be collected in the dedicated sump. Wastewater from this sump will be tested to determine the chemical content and if necessary, collected and disposed of by an approved contractor.

(k) Results to be Expected from the Treatment Process Including the Predicted Wastewater Characteristics, as Shown in the Waste Discharge Permit

(i) Process Wastewater Infiltration/Evaporation Pond Discharge

Table D.2-2 summarizes the expected quality of the water discharged from the oil/water separator and percolating to the ground from the infiltration/evaporation pond. Because the potential exists to have two sources of water supply the generation plant, the quality values shown in Table D.2-2 were selected to represent the highest anticipated concentrations based on available analyses of two surrounding area wells and the two sources of water from the Town of Starbuck. The use of the highest concentrations of wastewater constituents in the analysis provides a conservative assessment. It is estimated that the water in the pond will concentrate 25 percent due to evaporation.

(ii) Sanitary Septic System Discharge to Tile Field

Table D.2-2 summarizes the expected quality of the water that will be discharged from the septic system and transferred to the drain field. Because there will be no chemical treatment of the sanitary wastewater in the septic tank, no further processing of the water is required prior to discharge.

(l) A Description of the Receiving Water, Location of the Point of Discharge, Applicable Water Quality Standards, and How Water Quality Standards Will be Met Outside of Any Applicable Dilution Zone

The generation plant is designed so that there will be no discharge of wastewater or contaminated stormwater to any surface water body, including the nearby Snake River. All

wastewater and contaminated stormwater will be collected in retention/evaporation ponds or drain fields for infiltration to ground and evaporation.

The applicable water quality standards governing the generation plant are those presented in WAC 173-200: Water Quality Standards for Ground Waters of the State of Washington. Constituents found in the discharge waters will not exceed the criteria set forth in that rule.

(m) Detailed Outfall Analysis

This section is not applicable to this report.

(n) The Relationship to Existing Treatment Facilities, If Any

This section is not applicable to this report.

TABLE D.2-2
Quality of Water to Ground
Starbuck Power Company – Engineering Report

WASTEWATER SOURCE:
1. Oil/Water Separator Discharge
2. Sanitary Septic System Discharge

	1	2
Parameter	**mg/L as $CaCO_3$**	**mg/L as $CaCO_3$**
Chloride	1	
Fluoride	1	
Nitrate	1	
Silica	28	
pH	6.5 to 9	
Total Alkalinity	190	
TDS (as such)	340	
Sulfate	5	
Calcium	93	
Magnesium	60	
Sodium	30	
Iron	0.1	

Remarks:
ND = Sampled but Not Detected within the sensitivity of the instrument.

Source:
Black & Veatch file; Water Treatment Writeup.doc by Bingham, Jerry L.; 5/14/2001
Black & Veatch file

(o) Where Discharge is to a Municipal Sewerage System, a Discussion of that Systems Ability to Transport and Treat the Proposed Industrial Waste Discharge Without Exceeding the Municipality's Allocated Industrial Capacity. Also, a Discussion of the Effects of the Proposed Industrial Discharge on Municipal Sludge Utilization or Disposal

This section is not applicable to this report.

(p) Where Discharge is Through Land Application, Including Seepage Lagoons, Irrigation, and Subsurface Disposal, a Geohydrologic Evaluation of Such Factors as:

The results of the geohydrologic evaluation can be found in Section 3.1, Earth, of this Application for Site Certification.

(i) Depth to Groundwater and Groundwater Movement During Different Times of the Year

Preliminary evaluations estimate that the generation plant will be located about 200 feet above groundwater, which will allow filtering of water before it reaches groundwater that may be hydraulically connected to the Snake River.

(ii) Water Balance Analysis of the Proposed Discharge Area

Stormwater Infiltration/Evaporation Pond

The 2-acre unlined stormwater pond is located in the southwest portion of the generation plant site, east of access Road No. 1 and south of the Block 2 air-cooled condenser. It is designed to accommodate a maximum stormwater event based on a 24-hour, 100-year storm event for this area, which has an average annual precipitation of 9.73 inches (at Lower Monumental Dam approximately 15 miles west–southwest of the plant site) to 11.37 inches (at Little Goose Dam approximately 8 miles east of the plant site). The areas used in stormwater calculations include 8.80 acres for asphalt, 12.6 acres for graveled areas, and 6.5 acres of grass for a total acreage of 27.9 acres. Travel time calculations were done for each of the four drainage areas to determine travel time by accounting for the distance to the stormwater pond, Manning's Coefficient, a 2-year/24-hour rainfall event, and slope (see the Stormwater Plan and Grading-Drainage Plan presented in Appendix H for more detailed information on the design of the stormwater pond and conveyance systems).

The 100-year storm event of 89 cubic feet per second (cfs) was calculated using the following guidelines from the Highway Runoff Manual published by the Washington State Department of Transportation: A 100-year, 24-hour duration rainfall volume of 4 inches was obtained from the previously mentioned manual. The curve numbers from hydrologic soil group D (Starbuck) were 73 for grass and 98 for parking lots, gravel, pavements, and roofs. These values were combined as follows to get a weighted CN value of 92.17:

$$\text{Weighted CN} = ((CN_1*A_1)+(CN_2*A_2)+\ldots\ldots(CN_n*A_n))/(A_1+A_2+\ldots\ldots A_n)$$

To calculate the travel time, T_t in minutes, four segments were used. The T_t value for each segment was 2.46, 3.8, 6.9, and 3.8. The T_t value for a sheet flow of up to 300 feet was calculated by using Manning's kinematic solution:

$$T_t = (0.42(n_s L)0.8)/((P2)0.527(s_o)0.4)$$

where:

T_t = travel time (min)
n_s = sheet flow Manning's coefficient = 0.011
L = flow length (ft) = 3
P2 = 2-year, 24-hour rainfall (in) = 2
s_o = slope of hydraulic grade line (land slope, ft/ft) = 0.053

After a maximum of 300 feet, the travel time was calculated by dividing the length (L) of each segment by each segment's average velocity (V).

$$T_t = L/(60*V)$$
$$V = (k)(s_o 0.5)$$

where:

k = time of concentration velocity factor (ft/s); for shallow concentrated k = k_s = 27, for channel flow (Intermittent) k = kc = 42.
s_o = slope of flow path (ft/ft)

Summing these travel times together, a time of concentration of 17 minutes, or 0.28 hour, was calculated.

HEC-1 was used to size the stormwater pond. The constraints placed on this stormwater pond were a peak inflow of 82 cfs, a peak outflow of 10 cfs, and a peak stage elevation of 691.75 feet. The required volume for this pond was 3.7 acre-feet. It has been sized to 4.0 acre-feet.

Process Water Infiltration/Evaporation Pond

The average flow of 9 gpm of process water (housekeeping water from equipment/plant drains) will be routed to an oil-water separator and then to an infiltration/evaporation pond. The maximum daily flow will be 29 gpm. The water is expected to concentrate about 25 percent as a result of evaporation from the infiltration pond. The assumptions for sizing the infiltration/evaporation pond for process wastewater are as follows:

- Infiltration rates used were based on 6- to 7-foot-deep test pits that were excavated to provide soil logs for review by the Columbia County Environmental Health District. The infiltration rates varied from 0.45 gallon per day per square foot (gpd/ft^2) to 0.80 gpd/ft^2. The estimated pond area was obtained using the lower, 0.45-gpd/ft^2 value.
- The pond size was estimated for an inflow rate of 9 gpm. For 9 gpm, the required pond size is estimated to be 1.3 acres. The size estimate is based on an assumed pond depth of 5 feet, with the pond acting solely as a percolation pond and no evaporation included. On the basis of the estimated depth to groundwater, it is assumed that the soil below the pond will be unsaturated. It is assumed that the pond will produce a saturated depth to the pond equal to one-half the depth of the water in the pond. Below this depth, unsaturated conditions are assumed. This estimate does not take into account the possibility that soil permeability may decrease with time. The Applicant will minimize

this phenomenon by removing any fines that may settle out at the top of the subgrade as a normal maintenance item, thereby restoring the permeability of the soils.

The process wastewater will be routed to a 10,000-gallon oil/water separator before reachng the infiltration/evaporation pond. The oil/water separator will be checked on a monthly basis unless an oil spill incident occurs during plant operations, in which case the oil/water separator will be checked immediately after the spill. When necessary, the separator will be cleaned out by a licensed contractor; this is expected to occur infrequently because, unless a spill occurs, there will be little to no oil to be collected and disposed of. The separator will be provided with an alarm in the event that the oil compartment fills with oil, and maintenance action would then be required. When necessary, a contractor will clean the oil-water separator and dispose of its contents at an approved disposal site.

Plant drains in areas where chemical contamination could occur will be diverted to a dedicated chemical drains sump (approximately 400 gallons). Wastewater from this sump will be tested to determine the chemical content and, if necessary, collected and disposed of by an approved contractor. No flow will be discharged from the sump to onsite disposal areas.

(iii) Overall Effects of the Proposed Facility upon the Groundwater in Conjunction with Any Other Land Application Facilities that May Be Present

All process wastewater discharged will be slightly warmer than well-temperature (basalt water is typically between 48 and 54°F) because the water will warm up as it is exposed to piping that is subjected to surface air temperatures. There will be no thermal impacts because the temperature of the infiltrated water that eventually will reach the groundwater and flow toward the Snake River is not expected to be higher than the temperature of the Snake River water.

(q) A Statement, Expressing Sound Engineering Justification Through the Use of Pilot Plant Data, Results from Other Similar Installations, and/or Scientific Evidence from the Literature, that the Effluent from the Proposed Facility will Meet Applicable Permit Effluent Limitations and/or Pretreatment Standards.

Statements addressing the basic design data and sizing calculations of the various treatment units can be found in Section D.2(e) of this report. The demineralization unit will be a packaged ion-exchange system and designed for a specific maximum water throughput. The use of gravity oil/water separators and infiltration/evaporation ponds are standard in treatment systems.

(r) Discussion of the Method of Final Sludge Disposal Selected and Any Alternatives Considered with Reasons for Rejection.

There will be no sludge associated with the use of the water demineralization unit or discharge water from the oil/water separator. Spent resins from the demineralization unit will be regenerated or disposed of offsite by an approved contractor. The sludge or solids generated from the sanitary septic system will be pumped out and disposed of by an offsite contractor.

(s) A Statement as to Who will Own, Operate, and Maintain the System After Construction

The Applicant will fully own and operate the demineralization unit, the oil/water separator, and any other processes associated with the generation plant. As indicated by the Applicant, the role of offsite contractors will be to dispose of waste.

(t) A Statement Regarding Compliance with Any State or Local Water Quality Management Plan or Any Such Plan Adopted Pursuant to the Federal Water Pollution Control Act as Amended

This generation plant will address current standards for infiltration of groundwater set forth by the State of Washington and is projected to meet established water quality standards developed under WAC 173-200. There are no TMDLs or 303(d) listed water bodies that are applicable to this project's discharges.

(u) Provisions for Any Committed Future Plans

At present, there are no plans for future expansion of the generation plant.

(v) A Discussion of the Various Alternatives Evaluated, if Any, and Reasons They Are Unacceptable

Because the wastewater generated at the generation plant will be low in dissolved solids, complex wastewater treatment will not be necessary. As a result, no other alternative treatment methods were considered.

(w) A Timetable for Final Design and Construction

Construction is expected to begin with site preparation in fall 2002 and be completed by fall/winter 2004. The generation plant will be constructed generally following the sequence indicated below:

- The site will be cleared and grubbed in the areas of permanent structures and in other areas required outside the loop road.
- Temporary site security fencing will be installed.
- Excavation and boulder removal will be completed. Unsuitable material and boulders will be spoiled onsite as nonstructural fill. The stormwater retention basin will be excavated and surrounding embankments installed.
- Structural fill will be installed, the site will be graded to rough grade elevation, and the underground portion of the stormwater drainage system will be constructed.
- The tile field and septic tank for sanitary wastewater will be installed.
- The roadway base will be constructed.
- The major foundations for the equipment and structures will be constructed.
- The underground utilities and process wastewater infiltration basin will be constructed.

- The equipment will be installed and structures will be erected.
- The finish road surfaces will be constructed.
- The site will be graded to finish grade elevation.
- The final stabilization (seeding and erosion control) of the site will be installed.

(x) A Statement Regarding Compliance with the State Environmental Policy Act (SEPA) and the National Environmental Policy Act (NEPA), if Applicable

The Applicant is working with EFSEC and its consultant, Jones & Stokes, to prepare a joint National Environmental Policy Act (NEPA)/SEPA environmental impact statement (EIS) for the generation plant, which includes the construction of a generation plant and installation of the proposed 500-kV transmission line. The EIS will be reviewed by EFSEC and BPA.

(y) Additional Items to be Included in an Engineering Report for a Solid waste Leachate Treatment System Are:

The elements of this section are not applicable to this report.

ATTACHMENT 1

Application for a Wastewater Discharge Permit for Discharge of Industrial Wastewater to Groundwater

APPLICATION FOR A WASTEWATER DISCHARGE PERMIT FOR DISCHARGE OF INDUSTRIAL WASTEWATER TO GROUND WATER

FOR OFFICE USE ONLY	Check One	New/Renewal ☐	Modification ☐
Date Application Received		Application/Permit No.	
Date Application Accepted		Date Fee Paid	

This application is for a wastewater discharge permit as required in accordance with provisions of Chapter 90.48 RCW and Chapter 173-216 WAC. Permit applications provide the Department with information on pollutants in the waste stream, materials which may enter the waste stream, the flow characteristics of the discharge, and the site characteristics at the point of discharge.

The Department may request additional information at a later date to clarify the conditions of this discharge. Information previously submitted to the Department and which is applicable to this application should be referenced in the appropriate section.

SECTION A. GENERAL INFORMATION

1. Applicant Name: Starbuck Power Company, LLC

2. Facility Name: Starbuck Power Project
(if different from Applicant)

3. Applicant Address: 10500 NE 8th Street, Suite 1100
Street

Bellevue, WA 98004
City/State Zip

4. Facility Address: Highway 261
Street

Columbia County, WA
City/State Zip

5. Latitude/longitude of mechanical portion of the wastewater treatment plant:

46° 34' 30" N 118° 12' 0" W

6. Person to contact who is familiar with the information contained in this application:

Mr. Michael Elmer
Name

Starbuck Power Plant Project Manager
Title

(425) 454-5664
Telephone Number

(425) 455-3977
Fax Number

7. Check One:

☐ **Permit Renewal** (including renewal of temporary permits authorized by RCW 90.48.200)

Does this application request a greater amount of wastewater discharge, a greater amount of pollutant discharge, or a discharge of different pollutants than specified in the last permit application for this facility? ☐Yes ☐No

For permit renewals, the current permit is an attachment, by reference, to this application.

☐ **Permit Modification**

☐ **Existing Unpermitted Discharge**

☒ **Proposed Discharge**

Anticipated date of discharge: Fall 2004

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and/or imprisonment for knowing violations.

Signature*	Date	Title

Printed Name

*Applications must be signed as follows: Corporations, by a principal executive officer of at least the level of vice-president; partnership, by a general partner; sole proprietorship, by the proprietor. If these titles do not apply to your organization, the application is to be signed by the person who makes budget decisions for this facility.

The Department of Ecology is an equal opportunity agency and does not discriminate on the basis of race, creed, color, disability, age, religion, national origin, sex, marital status, disabled veteran's status, Vietnam Era veteran's status or sexual orientation.

If you have special accommodation needs or require this document in alternative format, please contact Ecology at (360) 407-6401 (voice). Ecology's telecommunications devise for the deaf (TDD) is (360) 407-6006.

SECTION B. PRODUCT INFORMATION

1. Briefly describe all manufacturing processes and products, and/or commercial activities at this facility. Provide the applicable Standard Industrial Classification (SIC) Code(s) for each activity (see *Standard Industrial Classification Manual,* 1987 ed.).

Description:

The Starbuck Power plant will be a 1200-megawatt (MW), natural gas-fueled, combustion turbine power plant. The facility will consist of a generation plant, a step-up switchyard, and auxiliary support units. The generation plant will contain gas turbines, steam generators, steam turbines, and air-cooled condensers. The step-up switchyard will allow for the transfer of the electrical power to the Bonneville Power Administration (BPA) transmission corridor. The support units at the facility will be a fire pump building, an ammonia transfer system, a mobile water treatment unit, and a service water system. Fire water will be pumped to the process area during an emergency event by either an electrical or diesel pump (in the case of a power outage). The primary function of the ammonia system is to provide the scrubbing media for the NOx scrubbers. The mobile water treatment unit will serve to demineralize the supply water prior to use in the generation plant. Service water will be the source of water for sanitary purposes and clean-up in the generation plant.

2. List raw materials and products:

Type	RAW MATERIALS	Quantity
Water		300 gallons per minute (gpm); 14,400 gallons per day (gpd)
Natural Gas		8.4 million standard cubic feet per hour (mmscfh)

Type	PRODUCTS	Quantity
Electrical Power		1,200-MW

SECTION C. PLANT OPERATIONAL CHARACTERISTICS

1. For each process listed in B.1. that generates wastewater, list the process, assign the waste stream a name and an ID # and describe whether it is a batch or continuous flow.

Process	Waste Stream Name	Waste Stream ID#	Batch or Continuous Process
Plant Drains	Process Wastewater	001	Batch
Sanitary System	Sanitary Wastewater	002	Batch
Oil/Water Separator	Wastewater	003	Continuous

2. On a separate sheet, produce a schematic drawing showing production processes, water flow through the facility and wastewater treatment devices. The drawing should indicate the source of intake water and the operations contributing wastewater to the effluent. The treatment units should be labeled. Construct the water balance by showing average flows between intakes, operations, treatment units, and points of discharge to land. If a water balance cannot be determined *(e.g., for certain mining activities)*, provide a description of the nature and amount of any sources of water and any collection or treatment measures. (Attachment C.2)

3. What is the maximum daily discharge flow 14,400 gallons/day

   What is the maximum average monthly
   discharge flow (daily flows averaged over a month) 14,400 gallons/day

4. Describe any planned wastewater treatment improvements or changes in wastewater disposal methods and the schedule for the improvements or changes. *(Use additional sheets, if necessary and label as attachment C4.)*

   Facility is new construction; no improvements, changes, or expansions are scheduled at this time.

5. If production processes are subject to seasonal variations, provide the following information. List discharge for each wastestream in gallons per day (GPD). The combined value for each month should equal the estimated total monthly flow. NO SEASONAL VARIATIONS.

Waste Stream ID#	MONTHS											
	J	F	M	A	M	J	J	A	S	O	N	D
Estimated Total Monthly Flow (GPD)												

6. How many hours a day does this facility typically operate? 24
How many days a week does this facility typically operate? 7
How many weeks per year does this facility typically operate? 52

7. List all incidental materials like oil, paint, grease, solvents, and cleaners that are used or stored on site (List only those with quantities greater than 10 gallons for liquids and 50 pound quantities for solids.) For solvents and solvent-based cleaners include a copy of the material safety data sheet for each material and estimate the quantity used. *Use additional sheets, if necessary and label as attachment C.7.)*

Materials/Quantity Stored: Lube oil (total amount inside turbines and transformers) - 96,500 gal; Diesel (fuel) - 500 gal.; Aqueous Ammonia - 60,000 gal.; Hydrazine - 55 gal.; Tri-sodium Phosphate - 500 lbs.

8. Some types of facilities are required to have spill or waste control plans. Does this facility have:

a. A Spill Prevention, Control, and Countermeasure Plan (40 CFR 112)? ☒ Yes ☐ No
b. An Emergency Response Plan (per WAC 173-303-350)? ☒ Yes ☐ No
c. A Runoff, spillage, or leak control plan (per WAC 173-216-110(f))? ☒ Yes ☐ No
d. Any spill or pollution prevention plan required by local, State or Federal authorities?
☒ Yes ☐ No If yes specify: Spill Pollution Prevention Plan--WAC 173-220
e. A Solid Waste Management Plan? ☐ Yes ☒ No

SECTION D. WATER CONSUMPTION AND WATER LOSS

1. Water source(s):

☐ Public System (Specify)_____
☒ Private Well ☐ Surface Water

a. Water Right Permit Number: Pending; Application No. G3-29568

b. Legal Description:

___ ¼S, ___ ¼S, ___, Section, ___ TWN, ___ R

2. a. Indicate total water use: Gallons per day (average) 300 gpd
Gallons per day (maximum) 300 gpd

b. Is water metered? ☒ Yes ☐ No

SECTION E. WASTEWATER INFORMATION

1. How are the water intake and effluent flow measured?

   Intake Flowmeter with Totalizer

   Effluent Flowmeter

2. Provide measurements for treated wastewater prior to land application for the parameters with an "X" in the left column. Use the analytical methods given in the table unless an alternate method is approved by Ecology. All analyses (except pH) must be conducted by a laboratory registered or accredited by the Department of Ecology (WAC 173-216-125). If this is an application for permit renewal, provide data for the last year for those parameters that are routinely measured. For parameters measured only for this application, place values under maximum.

X	Parameter	Concentrations Measured			Number of Analyses	Analytical Method Std. Methods 19th edition	Detection Limit
		Minimum	Maximum	Average			
	BOD (5 day)					5210	2 mg/l
	COD					5220 B, C, or D	5 mg/l
	Total Suspended Solids					2540D	1 mg/l
	Total Dissolved Solids			340		2540 C	
	Conductivity					2510 B	
	Ammonia-N					4500-NH_3 C	20 µg/l
	pH	6.5	9	7.5		4500-H	0.1 units
	Total Residual Chlorine			ND		4500-Cl E	1 mg/l
	Fecal Coliform			ND		9222 D	
	Total Coliform			ND		9221 B or 9222 B	
	Dissolved Oxygen					4500-O C or 4500-O G	
	Nitrate + Nitrite-N			1.0		4500-NO_3 E	0.5 mg/l
	Total Kjeldahl N					4500-N_{org}	20 µg/l
	Ortho-phosphate-P					4500-P E or 4500-P F	1 µg/l
	Total-phosphate-P					4500-P B.4.	1 µg/l
	Total Oil & Grease					5520 C	0.2 mg/l

	Parameter	Concentrations Measured			Number of Analyses	Analytical Method Std. Methods 19th edition	Detection Limit
		Minimum	Maximum	Average			
	Total Petroleum Hydrocarbon					5520 C, F	0.2 mg/l
	Calcium					3500-Ca B	3 µg/l
	Chloride			1.0		4500-Cl C	0.15 µg/l
	Fluoride			1.0		4500-F D	0.1 mg/l
	Magnesium					3500-Mg B	0.5 µg/l
	Potassium					3500-K B	5 µg/l
	Sodium					3500-Na B	2 µg/l
	Sulfate			5.0		4500-SO_4 E	1 mg/l
	Barium (total)					3500-Ba B	30 µg/l
	Cadmium (total)					3500-Cd B	5 µg/l
	Chromium (total)					3500-Cr B	50 µg/l
	Copper (total)					3500-Cu B	20 µg/l
	Iron (total)					3500-Fe B	20 µg/l
	Lead (total)					3500-Pb B	100 µg/l
	Manganese (total)					3500-Mn B	10 µg/l
	Mercury					3500-Hg B	0.2 µg/l
	Selenium (total)					3500-Se C	2 µg/l
	Silver (total)					3500-Ag B	10 µg/l
	Zinc (total)					3500-Zn B	5 µg/l

3. Describe the collection method for the samples which were analyzed above (ie. grab, 24 hour composite).

No samples were taken for wastewater because the facility has not yet been constructed. These values are based upon the average concentrations of the parameters found in the supply water and the expected dilutions that will occur in the sanitary system and oil/water separator prior to discharge to the drain field and infiltration/evaporation pond, respectively.

4. Has the effluent been analyzed for any other parameters than those identified in question E.2.?
☐ Yes ☒ No If yes, when? Attach results and label attachment E.4. *(Note: Ecology may require additional testing.)*

5. Does this facility use any of the following chemicals as raw materials in production, produce them as part of the manufacturing process, or are they present in the wastewater? (*The number following the chemical name is the Chemical Abstract Service (CAS) reference number to aid in identifying the compound.*) ☐Yes ☒No

If yes, specify how the chemical is used and the quantity used or produced:_____

Acrylamide/79-06-1
Acrylonitrile/107-13-1
Aldrin/309-00-2
Aniline/62-53-3
Aramite/140-57-8
Arsenic/7440-38-2
Azobenzene/103-33-3
Benzene/71-43-2
Benzidine/92-87-5
Benzo(a)pyrene/50-32-8
Benzotrichloride/98-07-7
Benzyl chloride/100-44-7
Bis(chloroethyl)ether/111-44-4
Bis(chloromethyl)ether/542-88-1
Bis(2-ethylhexyl) phthalate/ 117-81-7
Bromodichloromethane/75-27-4
Bromoform/75-25-2
Carbazole/86-74-8
Carbon tetrachloride/56-23-5
Chlordane/57-74-9
Chlorodibromomethane/124-48-1
Chloroform/67-66-3
Chlorthalonil/1897-45-6
2,4-D/94-75-7
DDT/50-29-3
Diallate/2303-16-4
1,2 Dibromoethane/106-93-4
1,4 Dichlorobenzene/106-46-7
3,3' Dichlorobenzidine/91-94-1
1,1 Dichloroethane/75-34-3
1,2 Dichloroethane/107-06-2
Nitrofurazone/59-87-0
N-nitrosodiethanolamine/ 1116-54-7
N-nitrosodiethylamine/55-18-5
N-nitrosodimethylamine/62-75-9
N-nitrosodiphenylamine/86-30-6
N-nitroso-di-n-propylamine/ 621-64-7
N-nitrosopyrrolidine/930-55-2
N-nitroso-di-n-butylamine/ 924-16-3
N-nitroso-n-methylethylamine/ 10595-95-6
PAH/NA
PBBs/NA
PCBs/1336-36-3
1,2 Dichloropropane/78-87-5
1,3 Dichloropropene/542-75-6
Dichlorvos/62-73-7
Dieldrin/60-57-1
3,3' Dimethoxybenzidine/119-90-4
3,3 Dimethylbenzidine/119-93-7
1,2 Dimethylhydrazine/540-73-8
2,4 Dinitrotoluene/121-14-2
2,6 Dinitrotoluene/606-20-2
1,4 Dioxane/123-91-1
1,2 Diphenylhydrazine/122-66-7
Endrin/72-20-8
Epichlorohydrin/106-89-8
Ethyl acrylate/140-88-5
Ethylene dibromide/106-93-4
Ethylene thioureae/96-45-7
Folpet/133-07-3
Furmecyclox/60568-05-0
Heptachlor/76-44-8
Heptachlor epoxide/1024-57-3
Hexachlorobenzene/118-74-1
Hexachlorocyclohexane (alpha)/ 319-84-6
Hexachlorocyclohexane (tech.)/ 608-73-1
Hexachlorodibenzo-p-dioxin, mix/19408-74-3
Hydrazine/hydrazine sulfate/ 302-01-2
Lindane/58-89-9
2 Methylaniline/100-61-8
2 Methylaniline hydrochloride/ 636-21-5
4,4' Methylene bis(N,N-dimethyl)aniline/101-61-1
Methylene chloride (dichloromethane)/75-09-2
Mirex/2385-85-5
O-phenylenediamine/106-50-3
Propylene oxide/75-56-9
2,3,7,8-Tetrachlorodibenzo-p-dioxin/ 1746-01-6
Tetrachloroethylene/127-18-4
2,4 Toluenediamine/95-80-7
o-Toluidine/95-53-4
Toxaphene/8001-35-2
Trichloroethylene/79-01-6
2,4,6-Trichlorophenol/88-06-2
Trimethyl phosphate/512-56-1
Vinyl chloride/75-01-4

6. Are any other pesticides, herbicides or fungicides used at this facility? ☐Yes ☒No

If yes, specify the material and quantity used:_____

7. Are there other pollutants that you know of or believe to be present?

☐ Yes ☒ No

If yes, specify the pollutants and their concentration if known (attach laboratory analyses if available).

SECTION F. GROUND WATER INFORMATION

Provide available data measurements or range of measurements from monitoring wells or supply wells in the area of discharge. Provide the analytical method and detection limit, if known. Provide the location of each well on the map required in G.3 below. Attach well logs and well I.D. # when available. Copy this page as necessary for each well.

Well ID # BARZ

Parameter	Range of Measurements	Number of Analyses	Analytical Method	Detection Limit
BOD (5 day)				
COD				
Total Organic Carbon				
Ammonia-N	ND		SM4500NH3G	
pH				
Total Dissolved Solids	28 mg/l		EPA 160.1	500 mg/l
Conductivity	208 µmhos/cm		EPA 120.1	700 mg/l
Total Hardness	107 mg/l		EPA 200.8	
Fecal Coliform	ND			
Total Coliform	ND			
Dissolved Oxygen				
Nitrate + Nitrite-N, Nitrate	1.3 mg/l		EPA 300.0	10 mg/l
Total Kjeldahl N				
Ortho-phosphate-P	ND		SM4500PF	
Total-phosphate-P				
Total Petroleum Hydrocarbon				
Calcium	29.2 mg/l		EPA 200.8	
Chloride	ND		EPA 300.0	250 mg/l
Fluoride	ND		EPA 300.0	4 mg/l
Magnesium	7.7 mg/l		EPA 200.8	
Potassium	3.14 mg/l		EPA 200.8	
Sodium	11.0 mg/l		SM3111B	
Sulfate	22.0 mg/l		EPA 300.0	250 mg/l
Barium	ND		EPA 200.8	2
Cadmium	ND		EPA 200.8	0.005
Chromium	ND		EPA 200.8	0.1
Copper	ND		EPA 200.8	
Iron	ND		EPA 200.8	0.3
Lead	ND		EPA 200.8	
Manganese	ND		EPA 200.8	0.05
Mercury	ND		EPA 200.8	0.002
Selenium	ND		EPA 200.8	0.05
Silver	ND		EPA 200.8	0.05
Zinc	0.02 mg/l		EPA 200.8	5
Water Level				

SECTION F. GROUND WATER INFORMATION

Provide available data measurements or range of measurements from monitoring wells or supply wells in the area of discharge. Provide the analytical method and detection limit, if known. Provide the location of each well on the map required in G.3 below. Attach well logs and well I.D. # when available. Copy this page as necessary for each well.

Well ID # CCGG

Parameter	Range of Measurements	Number of Analyses	Analytical Method	Detection Limit
BOD (5 day)				
COD				
Total Organic Carbon				
Ammonia-N	ND		SM4500NH3G	
pH				
Total Dissolved Solids	88 mg/l		EPA 160.1	500
Conductivity	281 µmhos/cm		EPA 120.1	700
Total Hardness	146 mg/l		EPA 200.8	
Fecal Coliform	ND			
Total Coliform	ND			
Dissolved Oxygen				
Nitrate + Nitrite-N, Nitrate	2.0 mg/l		EPA 300.0	10
Total Kjeldahl N				
Ortho-phosphate-P	ND		SM4500PF	
Total-phosphate-P				
Total Petroleum Hydrocarbon				
Calcium	38.6 mg/l		EPA 200.8	
Chloride	ND		EPA 300.0	250
Fluoride	ND		EPA 300.0	4
Magnesium	11.3 mg/l		EPA 200.8	
Potassium	4.86 mg/l		EPA 200.8	
Sodium	18.0 mg/l		SM3111B	
Sulfate	29.0 mg/l		EPA 300.0	250
Barium	ND		EPA 200.8	2
Cadmium	0.003 mg/l		EPA 200.8	0.005
Chromium	ND		EPA 200.8	0.1
Copper	ND		EPA 200.8	
Iron	ND		EPA 200.8	0.3
Lead	ND		EPA 200.8	
Manganese	ND		EPA 200.8	0.05
Mercury	ND		EPA 200.8	0.002
Selenium	ND		EPA 200.8	0.05
Silver	ND		EPA 200.8	0.05
Zinc	0.02 mg/l		EPA 200.8	5
Water Level				

SECTION G. SITE ASSESSMENT

The local library and local city or county planning offices may be helpful in providing the information required in this section. The Department of Ecology Water Resources Section can be consulted for identifying wells within one mile of your site.

1. Give the legal description of the land treatment site(s) by section/township/range and latitude/longitude. Indicate owner for each site. Give the acreage of each land treatment site(s). Attach a copy of the contract(s) authorizing use of land for treatment.

   See Attachment G.1

2. If this is a new discharge, list all environmental control permits or approvals needed for this project; for example, SEPA review, septic tank permits, sludge application permits, or air emissions permits.

   See Attachment G.2

3. Attach an original United States Geological Survey (USGS) 7.5 minute topographic map. **USGS topographical maps are available from the Department of Natural Resources (360 902-1234), Metsker Maps (206 588-5222), some local bookstores and internet vendors.** Show the following on this map: (See Attachment G.3)

   a. Location and name of internal and adjacent streets.
   b. Surface water drainage systems within ¼ mile of the site.
   c. All wells within 1 mile of the site.
   d. Wastewater discharge points.
   e. Land uses and zoning adjacent to the wastewater application site.
   f. Ground water gradient.

4. Describe soils on the site using information from local soil survey reports. **Soils information is available from your local County Conservation District**. *(Submit on separate sheet and label as attachment G.4.)*

5. Describe the local geology and hydrogeology within one mile of the site. Include any ground water quality data. **The local library or local Soil Conservation Service may have this information**. *(Submit on separate sheet and label as attachment G.5.)*

6. List the names and addresses of contractors or consultants who provided information and cite sources of information by title and author.

   Mrs. Marlena Guhlke
   CH2M HILL, Inc.
   9 S. Washington, Suite 400
   Spokane, WA 99201-3709
   (509) 747-2000 / (509) 623-1622 [fax]

   Mr. Jay Nagori
   Black & Veatch, Corp.
   PO Box 8405
   Kansas City, MO 64114
   (913) 458-2000 / (913) 458-2934 [fax]

SECTION H. STORMWATER

1. Do you have a Washington State Stormwater Baseline General Permit? If yes, please list the permit number here. _____ ☐ Yes ☒ No

2. Have you applied for a Washington State Stormwater Baseline General Permit? ☒ Yes ☐ No

3. Do you have any stormwater quality or quantity data? ☐ Yes ☒ No

Note: If you answered "no" to questions 1 or 2 above, complete questions 4 through 8.

4. Describe the size of the stormwater collection area.

   a. Unpaved Area 832,000 sq.ft.
   b. Paved Area Paved Area 383,000 sq.ft.
   c. Other Collection Areas (Roofs) 133,630 sq.ft.

5. Does your facility's stormwater discharge to: *(Check all that apply)*

   ☐ Storm sewer system; name of storm sewer system *(operator):* _____
   ☐ Directly to surface waters of Washington State *(e.g., river, lake, creek, estuary, ocean).* Specify waterbody name _____
   ☐ Indirectly to surface waters of Washington State *(i.e., flows over adjacent properties first).*
   ☒ ~~Directly~~ to ground waters of Washington State: (indirectly)

      ☐ dry well
      ☐ drainfield
      ☒ other - Infiltration/Evaporation Ponds

   ☐ Sanitary Sewer

6. Areas with industrial activities at facility: *(check all that apply)*

   ☐ Manufacturing Building
   ☒ Material Handling
   ☒ Material Storage
   ☐ Hazardous Waste Treatment, Storage, or Disposal *(Refers to RCRA, Subtitle C Facilities Only)*
   ☒ Waste Treatment, Storage, or Disposal
   ☒ Application or Disposal of Wastewaters
   ☐ Storage and Maintenance of Material Handling Equipment
   ☐ Vehicle Maintenance
   ☐ Areas Where Significant Materials Remain
   ☒ Access Roads and Rail Lines for Shipping and Receiving
   ☐ Other _____

7. Material handling/management practices

a. Types of materials handled and/or stored outdoors: *(check all that apply)*

- ☐ Solvents
- ☐ Scrap Metal
- ☐ Petroleum or Petrochemical Products
- ☐ Plating Products
- ☐ Pesticides
- ☐ Hazardous Wastes
- ☐ Acids or Alkalies
- ☐ Paints/Coatings
- ☐ Woodtreating Products
- ☒ Other *(please list)*: Lube oil
  Aqueous Ammonia

b. Identify existing management practices employed to reduce pollutants in industrial storm water discharges: *(check all that apply)*

- ☐ Oil/Water Separator
- ☒ Containment
- ☒ Spill Prevention
- ☐ Surface Leachate Collection
- ☒ Overhead Coverage
- ☐ Detention Facilities
- ☒ Infiltration Basins
- ☒ Operational BMPs
- ☐ Vegetation Management
- ☐ Other *(please list)*:

8. Attach a map showing storm water drainage/collection areas, disposal areas and discharge points. This may be a hand drawn map if no other site map is available. Label this as attachment H.8.

SECTION I. OTHER INFORMATION

☐

1. Describe liquid wastes or sludges being generated that are not disposed of in the waste stream(s) and how they are being disposed. For each type of waste, provide type of waste, name, address, and phone number of hauler.

Septic Tank Sludge--Off site disposal - Contract hauler to be determined
Chemical Sump Waste--Off site disposal--Contract hauler to be determined
Skimmed Oil--Off site disposal--Contract hauler to be determined

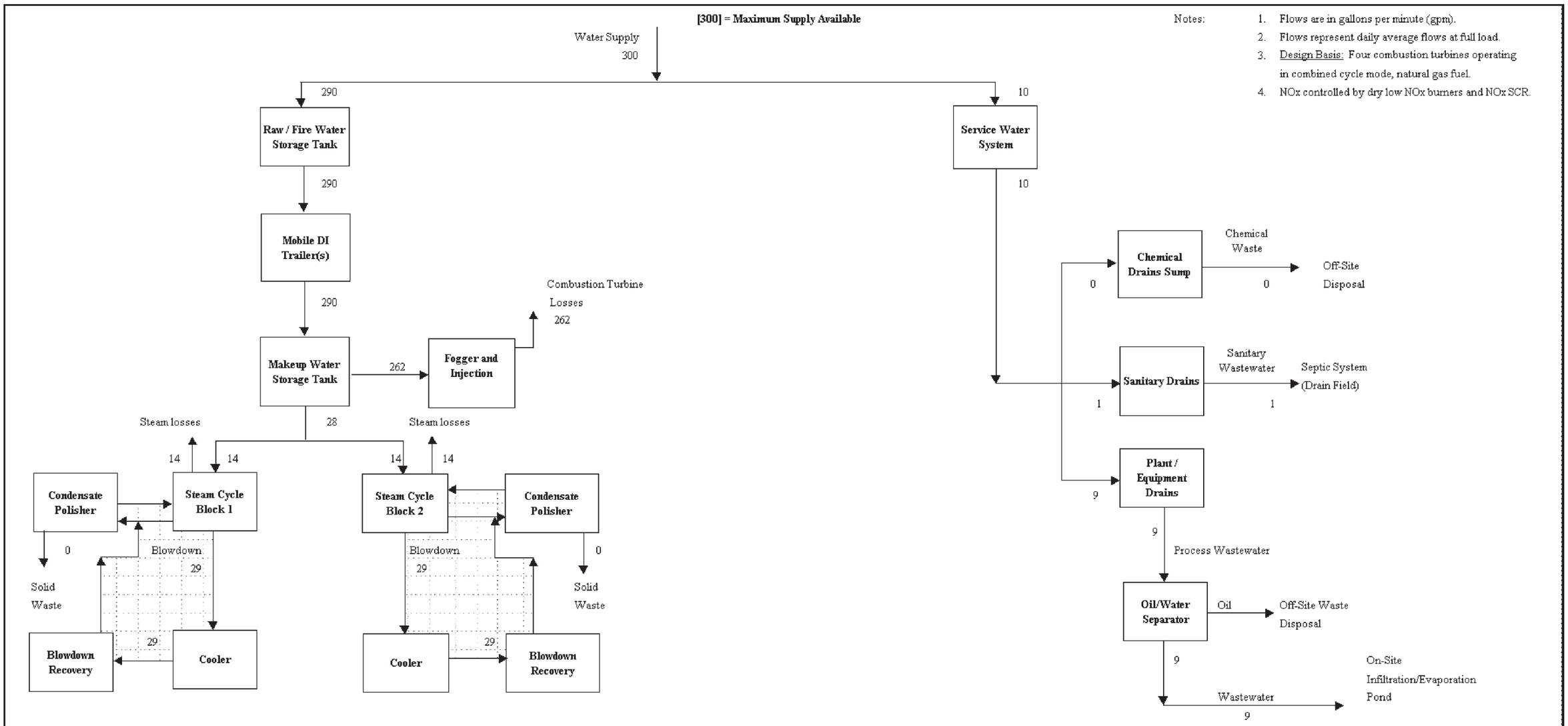
2. Describe storage areas for raw materials, products, and wastes.

Well Water Storage Tanks--Two 48 ft. (OD) x 40 ft. (horizontal tanks)
Septic Tank--1,000 gallon capacity
Oil/Water Separator--10,000 gallon capacity
Chemical Sump--1,000 gallon capacity

3. Have you designated the wastes described above according to the applicable procedures of Dangerous Waste Regulations, Chapter 173-303 WAC? ☐ Yes ☒ No

Summary of Attachments That May be Required for This Application:
(Please check those attachments which are included)

- ☒ C.2. Production schematic flow diagram and water balance
- ☐ C.4. Wastewater treatment improvements
- ☐ C.7. Additional incidental materials
- ☐ E.4. Additional results of effluent testing
- ☒ G.1. Copies of land use contracts
- ☒ G.3. USGS topographical map
- ☒ G.4. Soils description
- ☒ G.5. Local geology and hydrology
- ☒ H.8. Stormwater drainage map



Notes:

1. Flows are in gallons per minute (gpm).
2. Flows represent daily average flows at full load.
3. Design Basis: Four combustion turbines operating in combined cycle mode, natural gas fuel.
4. NOx controlled by dry low NOx burners and NOx SCR.

Rev	Date	Revision and Record of Issue	BY	CHK	APP
E	07-Jun-01	Revised steam flow	JLB		
D	22-May-01	Revised input variables	JLB		
C	14-May-01	Changed to 300 gpm max supply	JLB		
B	01-May-01	Increased air cooling to 8 hours	JLB		
A	11-Apr-01	Preliminary Issue to Client	JLB		

COMBUSTION TURBINE FUEL	Natural Gas	CYCLE MAKEUP EFF.	100%
NOMINAL PLANT OUTPUT (MW)	1200	STEAM LOSSES	0.5%
AV ANNUAL TEMP (F)	51	COOLING TOWER CYCLES	N/A
DUCT BURNERS	FIRED	COMBUSTION TURBINE	SWPC 501F
TURBINE CONFIGURATION	2 blk - 2 on 1	HEAT BALANCE	CASE 1
HEAT REJECTION SYSTEM	Air Cooled		

BLACK & VEATCH Corporation

Eng: JLB Dwg: JLB
Check: BAL Date: 02/11/01

Starbuck Power Company LLC
Starbuck Power Project

Maximum Use
Water Mass Balance

Drawing # 96344-DC-1004

Rev. E

ATTACHMENT C-2
Water Mass Balance Flow Diagram
Application for Site Certification
STARBUCK POWER PROJECT
STARBUCK, WASHINGTON

LEGAL DESCRIPTION

The following described property including any and all fixtures, buildings and appurtenances located thereon, in Columbia County, State of Washington.

All that part of the following described real property lying between the former Starbuck-Lyons Ferry Road and the south bank of the Snake River:

The south half of the Southwest Quarter; the Northwest Quarter of the Southwest Quarter and the Southwest Quarter of the Northwest Quarter of Section 29; the north half of the Northwest Quarter of Section 32; all in Township 13 North, Range 37, East of the Willamette Meridian.

SUBJECT to easement for electric power transmission line and access road as granted to the United States of America, as described in that Easement Deed recorded in Book 49 at page 486, records of Columbia County, Washington.

SAVE AND EXCEPT the following two tracts:

TRACT 1:

A tract of land lying in Government Lots 6 and 7 and the Southwest Quarter of the Southwest quarter of Section 29, the east half of the Southeast Quarter of Section 30, and the east half of the Northwest Quarter and the Northwest Quarter of the Northwest Quarter and the Northeast Quarter of the Southwest Quarter of Section 32, all in Township 13 North, Range 37, East of the Willamette Meridian, Columbia County, Washington, said tract of land being more particularly described as follows:

Beginning at the point of intersection with the north-south center line of said Section 32 and a line bearing North 55° 03' 20" West from a point lying South 41° 27' 11" East a distance of 4,653.64 feet from the Northwest corner of said Section 32; thence northerly along said north-south center line to a point lying 1,450.0 feet south of the north line of said Section 32; thence North 69° 30' West, a distance of 1,450.00 feet; thence northerly along a straight line to a point on the north line of said Section 32, said point lying 725.0 feet easterly of the northwest corner of said Section 32; thence northerly along a straight line to a point on the west line of said Section 29, said point lying 1,100.0 feet southerly of the quarter corner on the west line of said Section 29; thence northerly along said west line

of Section 29 a distance of 900.0 feet; thence southerly along a straight line to a point on the north-south center line of said Section 32, said point lying 400.0 feet southerly of the north line of said Section 32; thence northerly along said north-south center line, a distance of 400.0 feet to the north line of said Section 32; thence easterly along the north line of said Section 32 to the line of ordinary high water (south bank) of the Snake River; thence northwesterly along said line of ordinary high water to the west line of Section 29; thence southerly along said west line of Section 29 to the Quarter corner thereof; thence westerly along the north line of the east half of the Southeast Quarter of said Section 30, to the Northwest corner thereof; thence southerly along the west line of said east half of the Southeast Quarter to the existing center line of the Starbuck-Lyons Ferry County Road (Mullen Road); thence southeasterly along said center line to the west line of the east half of the Northwest Quarter of said Section 32; thence southerly along said west line of the east half of the Northwest Quarter to a point lying 400.0 feet southerly of the Southeast corner of the Northwest Quarter of the Northwest Quarter of said Section 32; thence South 52° 38' 00" East, a distance of 890.0 feet; thence South 34° 56' 40" West, a distance of 460.0 feet; thence southeasterly along a straight line to the point of beginning.

TRACT 2:

All that portion of the North half of the Northwest Quarter of Section 32, and the Southwest Quarter of the Southwest Quarter of Section 29, all in Township 13 North, Range 37, East of the Willamette Meridian, Columbia County, Washington, lying southwesterly of a line lying northeasterly, a distance of 50 feet, when measured at right angles and/or radially from the following described centerline survey:

Commencing at a point lying South 55° 43' 59" East, a distance of 2,251.01 feet, from the Northwest corner of said Section 32; thence South 65° 32' East, a distance of 630.74 feet, to Survey Station 97+09.18 P.T., and the TRUE POINT OF BEGINNING; thence northwesterly along a 2° 00' curve to the right, a distance of 1241.67 feet, to Survey Station 84+67.51 P.C.; thence North 40° 42' West, a distance of 1,400.00 feet, and point of terminus of the above described line.

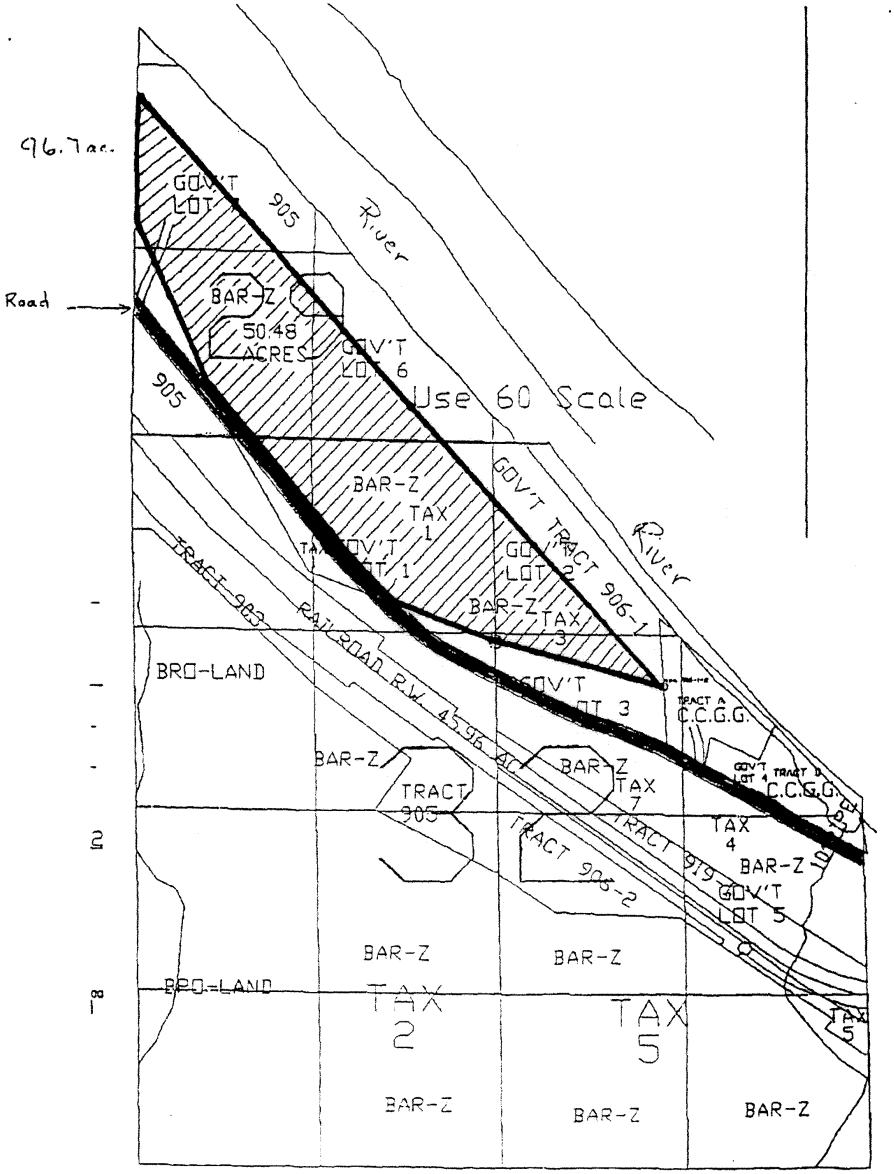
There is excepted therefrom all that portion lying southwesterly of the following described line:
Beginning at a point on the north-south centerline of said Section 32, said point lying south, a distance of 1,450.0 feet, from the north line thereof; thence North

69° 30' West, a distance of 1,450.0 feet; thence northwesterly along a straight line to a point on the north line of said Section 32, said point lying 725.0 feet easterly of the northwest corner of said Section 32; thence northwesterly along a straight line to a point on the west line of said Section 29, said point lying 1,100.00 feet southerly of the quarter corner thereof and the point of terminus of the above described line.

Government Lots 2 and 3 in Section 32, Township 13 North, Range 37, East of the Willamette Meridian.

SAVE AND EXCEPT the following tract:

Beginning at a point lying on the west line of said Government Lot 3, said point lying southerly 1,750.00 feet from the north line of said Section 32; thence South 71° 47' 00" East a distance of 1,420.0 feet; thence South 55° 08' 00" East to the East line of said Section 32; thence northerly along the east line of said Section 32 to the line of ordinary high water (south bank) of the Snake River; thence northwesterly along said line of ordinary high water to the north line of said Section 32; thence westerly along said north line of Section 32 to the northwest corner of said Government Lot 2; thence southerly along the west line of said Government Lot 2, a distance of 400 feet; thence South 41° 08' 00" East, a distance of 1,830.0 feet; thence North 74° 30' 00" West to the west line of said Government Lot 3; thence southerly along the west line of said Government Lot 3 to the place of beginning.


96.7ac.
Road
GOV'T LOT
905
River
BAR-Z
50.48 ACRES
GOV'T LOT 6
Use 60 Scale
905
BAR-Z
TAX 1
GOV'T LOT 1
GOV'T LOT 2
GOV'T TRACT 905-1
River
TRACT 903
RAILROAD R.W. 45.96 AC
BAR-Z
TAX 3
BRO-LAND
GOV'T LOT 3
TRACT A C.C.G.G.
BAR-Z
TRACT 905
BAR-Z
TAX 7
GOV'T LOT 4
TRACT B C.C.G.G.
TAX 4
BAR-Z
TRACT 905-2
TRACT 919
GOV'T LOT 5
BAR-Z
BAR-Z
BRO-LAND
TAX 2
TAX 5
BAR-Z
BAR-Z
BAR-Z

ATTACHMENT G.2

Applicable Environmental Control Permits or Approvals
Application for Wastewater Discharge Permit

Federal Permits:

National Environmental Policy Act (NEPA)
U.S. Army Corps of Engineers Dredge and Fill Section 404 Permit
U.S. Army Corps of Engineers Nationwide Permit Program
Threatened or Endangered Species Assessments
Historic Preservation/Landmark Review

State of Washington Permits:

State Environmental Policy Act (SEPA)
Notice of Construction (NOC) Approval (for Air Quality)
Air Contaminant Source Registration
Prevention of Significant Deterioration of Air Quality Permit
Air Operating Permit
Compliance with State Noise Regulations
Hydraulic Project Approval (HPA)
Public Water Supply Approval
Shorelines Permit
Aquatic Resources Use Authorization Notification
NPDES General Permit for Stormwater Associated with Construction Activities
NPDES General Permit for Stormwater Associated with Industrial Activities
State Waster Discharge Permit

Local Permits:

On-Site Sewage Disposal System Permit

Attachment G.3
USGS Topographic Map

Application for
Wastewater Discharge Permit
Starbuck Power Project
Starbuck, Washington

N

1000 0 1000 2000 Feet

Legend

- Proposed Site Property
- Proposed Facility
- Facility Buildings
- Stormwater and Wastewater Discharge Ponds
- Facility Roads
- Facility Fence
- 1 Mile Radius From Site
- Heavy Industrial Landuse
- Well
- State Route (SR)

Background Image:

USGS 7.5 Minute Quadrangle (Topographic)
Original Scale 1:24000
North American Datum 1983
Washington Zone - South
Contours and Elevations in Meters
Scanned at 300 dpi

CH2MHILL

ATTACHMENT G.4

Description of Soil(s) on Site Application for Wastewater Discharge Permit

The soil at the proposed site of the Starbuck generation plant is a gravel/cobble soil. It is delineated as Stratford Series soil, which consists of well-drained, very stony silt loams that are underlain by sand, gravel, cobblestones, and boulders at a depth of 20 to 40 inches. Test trenches excavated at the site show that the soil is well-drained and has stony to very stony silt loams. The soil profile consists of a surface layer of grayish brown, very stony silt loam to a depth of 13 inches. The substratum, to a depth of 24 inches, is pale brown gravelly loam. Below this loam, to a depth of 60 inches, is loose, coarse-sand gravel, cobblestones, and boulders.

The Stratford Series soils have a moderate permeability above the coarse gravels, cobble-stones, and boulders. Root penetration is restricted by the coarser layers. The available water-holding capacity is moderate to moderately high (4 to 6 inches of water). Runoff is slow to medium, and the erosion hazard is slight to moderate, depending on the slope of the ground surface.

ATTACHMENT G.5

Local Geology and Hydrogeology Application for Wastewater Discharge Permit

Geology

The proposed generation plant site is situated on a gravel bar that was deposited along the Snake River approximately 13,000 years ago. This bar was deposited by floodwaters that backed up into the Snake River valley from the confluence of the Palouse and Snake Rivers during the last of the catastrophic Lake Missoula floods. Borings conducted at the generation plant site indicate that subsurface conditions consist of two relatively thick layers of gravel, underlain by basalt bedrock. The upper layer extends to 150 feet below ground surface (bgs) in the northern portion of the generation plant site, to 115 feet bgs toward the southeast. This layer consists of poorly graded gravels, cobbles, and boulders with traces of sand and silt. The lower layer starts at the bottom of the upper layer and is assumed to extend down to basalt bedrock; this layer has a higher content of sand and silt when compared to the upper layer. A geologic log associated with a domestic water well drilled in the area indicates that at least 193 feet of coarse gravelly sediments overlie the basalt bedrock. The basaltic bedrock underlying the generation plant site and forming the walls of the Snake River canyon to the north and south consists of lava flows of the Grande Ronde Basalt. This basalt is the most abundant and widespread formation of the Columbia River Basalt Group. It consists of about 120 individual flow units and makes up about 90 percent of the total volume of the Columbia River Basalt Group. The thickness of the basalt below the site is not known but is likely on the order of 1,000 feet. The only other major geologic unit in the immediate site vicinity is a sand and gravel deposit that is exposed on the slope to the south of the site. As with the gravel bar deposit underlying the site, these sediments were also deposited during the Missoula Floods. They differ from the bar deposit in that they are typically finer grained and were deposited in protected places on the canyon walls.

Hydrogeology

The terrace that the generation plant site will be located upon is slightly to moderately sloped, generally from north to south. The highest elevations are located near the bank of the Snake River and near the north end of the site; the lowest elevations are near the south end of the site. Elevations within the generation plant property boundary vary from approximately 720 feet above mean sea level (msl) in the north to approximately 690 feet msl in the south. To the far southern and eastern regions of the terrace, outside of the generation plant site, elevations reach 600 feet msl. The horizontal distance between the nearest project facility (perimeter road) and the Snake River is approximately 41 feet, and the vertical drop from the site to the normal river water level is approximately 170 feet. The area to be developed for the generation plant slopes away from the river.

Precipitation on the site infiltrates through the soil or is directed by the sloping topography toward the south end of the site. Four small ravines in the southern portion of the site collect precipitation and direct it to the southeast, away from the Snake River and toward SR-261. This runoff is directed under SR-261 via a 24-inch-diameter culvert and allowed to disperse and percolate on the west side of SR-261. On the basis of site soil properties, runoff potential is classified as low to moderate. Because the generation plant site does not contain surface water bodies other than during periods immediately following rainfall or snowmelt, no surface water quality data are available. As a result of erosion and soil conditions at the site, runoff during the periods of rainfall or snowmelt does typically contain suspended solids. As previously discussed, this runoff is directed away from the Snake River, toward SR-261.

Two main aquifers surround the proposed generation plant site:

- **Flood Gravel Aquifer.** The aquifer in the flood gravels below the generation plant site is at a depth of 190 feet, based on a geologic log of a residential well drilled near the northwest end of the site. This groundwater elevation corresponds closely to the pool elevation of Lake Herbert G. West, about 1,000 feet north of the well, suggesting that groundwater in the flood gravel aquifer is hydraulically connected with the lake. This groundwater is likely to be restricted to the geographic extent of the terrace, although it could be in contact with a bedrock aquifer at essentially the same elevation. The groundwater is recharged by infiltration of precipitation through the terrace, seepage from the lake, and perhaps by discharge from the adjoining bedrock. The well log indicates that the aquifer is situated in highly permeable gravels; a pumping test in the well yielded 190 gallons per minute (gpm) with 70 feet of drawdown after 2 hours.

- **Columbia Plateau Aquifer System.** The Columbia Plateau aquifer system underlies about 50,600 square miles of Washington, Oregon, and Idaho. The thickest, most extensive, and most important geologic unit in the aquifer system is the Columbia River Basalt Group. In the vicinity of the generation plant site, the Grande Ronde Basalt formation (of the Columbia River Basalt Group) may be as much as 1,000 feet thick and serves as the primary regional aquifer; it is the area's only available source of large quantities of good-quality water. Within the Grande Ronde aquifer, groundwater occurs at numerous horizons within the thick sequence of lava flows and is derived mainly from relatively thin, permeable flow-contact zones between thicker, less permeable parts of the flows. Several water-bearing zones within the Grande Ronde basalt aquifer are used for water supply in the area, with most of the wells open to more than one water-bearing zone.

The regional basalt aquifers are recharged mainly by infiltration of precipitation, both at the basalt surface and in stormwater runoff channels crossing the basalt. Most of the precipitation falls during the cooler seasons, when loss of water to evaporation and plant growth is relatively small and the opportunity for infiltration is enhanced. Discharge from the aquifer systems is mainly to the river systems and, in lesser quantities, to springs and seeps along canyon and coulee walls. Groundwater flow direction in the vicinity of the generation plant site is toward the Snake River canyon to the north, generally indicating that the Snake River canyon is hydraulically connected to the regional aquifer. Although the basalt aquifers are capable of yielding large quantities of water to wells, they contain relatively small volumes of groundwater per unit volume of rock. Considerable effort has

been made in parts of the Columbia River basin to evaluate the impact of extraction on groundwater levels in the Columbia River Basalt Group. However, these studies have focused on areas to the north and west of the generation plant site, where there is considerably greater groundwater withdrawal. No published studies have evaluated long-term effects of groundwater withdrawal in Columbia County, and this project does not propose to withdraw water from the basalt aquifer system.

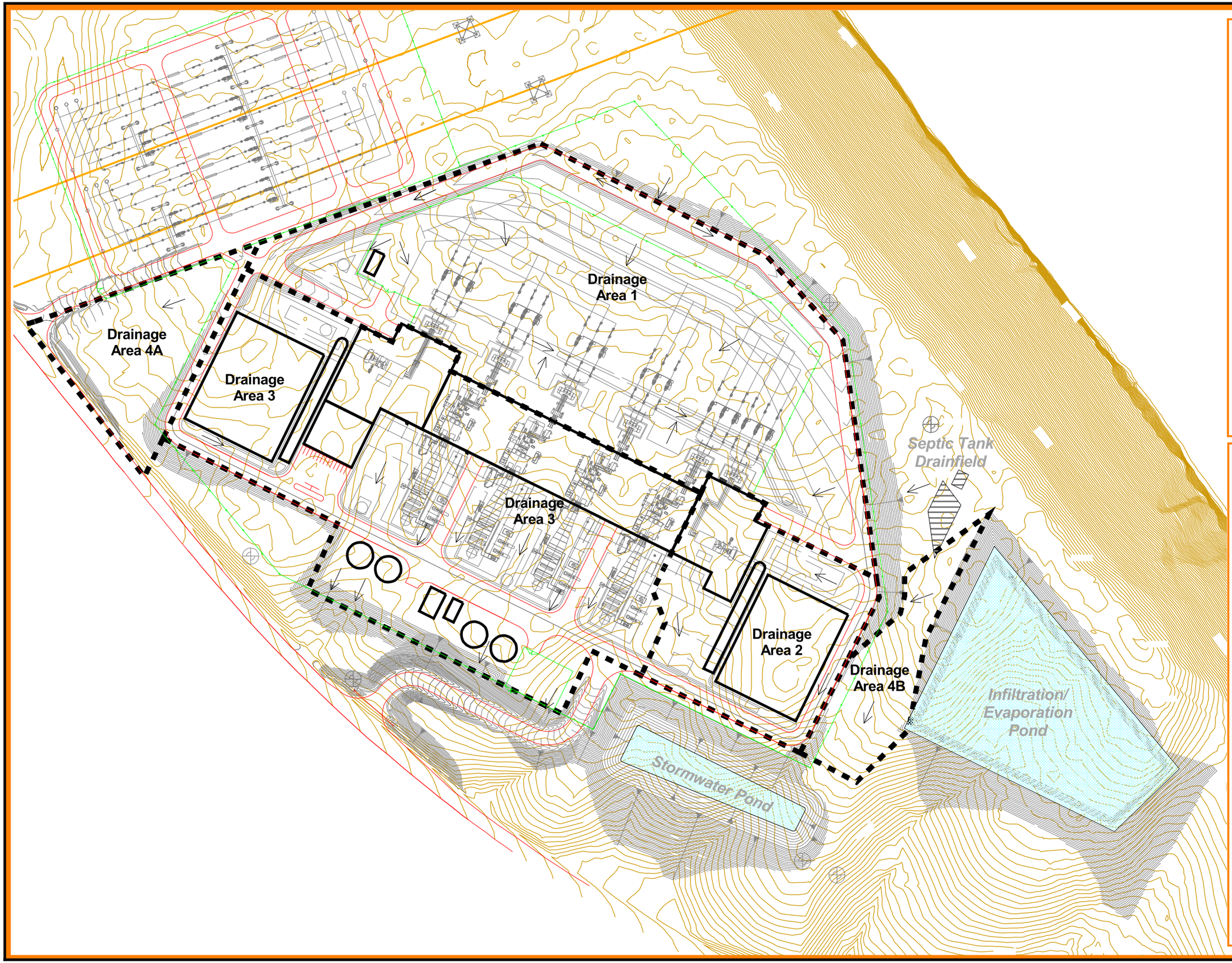
According to Federal Emergency Management Agency (FEMA) maps, the generation plant site is not within the 100- or 500-year floodplains. Several dams control the elevation of the river in the site vicinity; river elevation normally fluctuates between 537 and 540 feet msl (Black & Veatch, 2000). The lowest point within the generation plant property boundary is approximately 690 feet msl (approximately 150 feet above the normal river level). The onsite well at the generation plant site would be above the 100- and 500-year floodplain of the Snake River and would not be susceptible to flood impacts.

Water Quality Data

Water quality data from this area can be found in Section F, Groundwater Information, of this Applicant for a Wastewater Discharge Permit.

Attachment H.8
Stormwater Drainage/Collection and Wastewater Discharge Points

Application for Wastewater Discharge Permit
Starbuck Power Project
Starbuck, Washington



N

100 0 100 200 Feet

Legend

- Proposed Facility
- Facility Buildings
- Stormwater and Wastewater Discharge Ponds
- Septic Tank Drainfield
- Facility Roads
- Facility Fence
- Transmission Lines
- Contours - Existing
- Contours - Finished 1 Foot Interval
- Drainage Area Boundar
- Grade to Drain (Flow Arrow)

ATTACHMENT 2

Anatek Labs Reports

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

INORGANIC CHEMICAL (IOC) REPORT

System ID#:		System Name:	CH2M HILL-SPOKANE		
Lab/Sample Number:	125 01420	Collect Date:	3/22/2001	DOH Source #:	
Multiple Source Nos:		Sample Type:		Sample Purpose:	
Date Received:	3/23/2001	Date Reported:	13-Apr-01	Supervisor:	MTP
Date Digested		Date Analyzed	3/30/2001		
County:	COLUMBIA			Phone Number:	509-747-2000
Sample Location:	032201BARZ				
Report To:	Customer	MARK HENRY			
	Address:	9 S WASHINGTON STE 400			
	City, State, ZIP	SPOKANE WA 99201			

DOH_#	Analytes	Results	Units	SRL	Trigger	MCL	Method	Analyst
	EPA Regulated							
4	Arsenic	ND	mg/l	0.01	0.05	0.05	EPA 200.8	ETL
5	Barium	ND	mg/l	0.1	2	2	EPA 200.8	ETL
6	Cadmium	ND	mg/l	0.002	0.005	0.005	EPA 200.8	ETL
7	Chromium	ND	mg/l	0.01	0.1	0.1	EPA 200.8	ETL
11	Mercury	ND	mg/l	0.0005	0.002	0.002	EPA 200.8	ETL
12	Selenium	ND	mg/l	0.005	0.05	0.05	EPA 200.8	ETL
110	Beryllium	ND	mg/l	0.003	0.004	0.004	EPA 200.8	ETL
111	Nickel	ND	mg/l	0.04	0.1	0.1	EPA 200.8	ETL
112	Antimony	ND	mg/l	0.005	0.006	0.006	EPA 200.8	ETL
113	Thallium	ND	mg/l	0.002	0.002	0.002	EPA 200.8	ETL
116	Cyanide	ND	mg/l	0.05	0.2	0.2	SM4500-CN F	KS
19	Fluoride	ND	mg/l	0.5	2	4	EPA 300.0	KMH
114	Nitrite-N	ND	mg/l	0.1	0.5	0.5	EPA 300.0	KMH
20	Nitrate-N	1.3	mg/l	0.5	5	10	EPA 300.0	KMH
161	Total Nitrate/Nitrite-N	1.3	mg/l	0.5	5	10	EPA 300.0	KMH
	EPA Regulated (secondary)							
8	Iron	ND	mg/l	0.1	0.3	0.3	EPA 200.8	ETL
10	Manganese	ND	mg/l	0.01	0.05	0.05	EPA 200.8	ETL
13	Silver	ND	mg/l	0.01	0.05	0.05	EPA 200.8	ETL
21	Chloride	ND	mg/l	20	250	250	EPA 300.0	KMH
22	Sulfate	22	mg/l	10	250	250	EPA 300.0	KMH
24	Zinc	0.20	mg/l	0.02	5	5	EPA 200.8	ETL
	State Regulated							
14	Sodium	11	mg/l	5			SM3111B	ETL
15	Hardness(CaCO3)	107	mg/l	10			EPA 200.8	ETL
16	Conductivity	208	umhos/cm	10	700	700	EPA 120.1	SG
17	Turbidity	0.2	NTU	0.1	1	1	EPA 180.1	ETL
18	Color	ND	color units	5	15	15	EPA 110.2	ETL
26	Total Dissolved Solids	28	mg/l	150	500	500	EPA 160.1	KMH
	State Unregulated							
9	Lead	ND	mg/l	0.002	0.015		EPA 200.8	ETL
23	Copper	ND	mg/l	0.2	1.3		EPA 200.8	ETL
	Other							
171	Orthophosphate/P	ND	mg/l	0.1			SM4500PF	JWC
172	Silica	16	mg/l	1			EPA 200.8	ETL
402	Aluminum	ND	mg/l	0.05			EPA 200.8	ETL
403	Alkalinity as CaCO3	78	mg/l	10			EPA 310.1	SG
404	Magnesium	7.7	mg/l	0.1			EPA 200.8	ETL
405	Calcium	29.2	mg/l	0.5			EPA 200.8	ETL
406	Ammonia/N	ND	mg/l	1			SM4500NH3G	JWC
	Potassium	3.14	mg/l	0.5			EPA 200.8	ETL

ND = Not Detected within the sensitivity of the instrument
Numerical Entry = Detection at level indicated
SRL - Minimum reporting level for Washington DOH
MCL - EPA maximum contaminant level
Trigger - Washington DOH response level. If results exceed this level, contact the DOH

WATER BACTERIOLOGICAL ANALYSIS

www.anateklabs.com

DATE COLLECTED (MONTH DAY YEAR)	TIME COLLECTED	COUNTY NAME
3 / 22 / 01	2:30 ☐AM ☒PM	Columbia

TYPE OF SYSTEM: ☐ PUBLIC ☒ INDIVIDUAL (serves only 1 residence)

IF PUBLIC SYSTEM, COMPLETE: I.D. No. ____ CIRCLE GROUP A B

NAME OF SYSTEM: 032201 BART

SPECIFIC LOCATION WHERE SAMPLE COLLECTED	TELEPHONE NO.
outside hose bib	DAY ( )
	EVENING ( )
SAMPLE COLLECTED BY: (Name) Pyle	SYSTEM OWNER/MGR: (Name)

SOURCE TYPE: ☐ GROUND WATER UNDER SURFACE INFLUENCE ☐ SURFACE ☒ WELL or WELL FIELD ☐ SPRING ☐ PURCHASED or INTERTIE ☐ COMBINATION or OTHER

SEND REPORT TO: (Print Full Name, Address and Zip Code)

TYPE OF SAMPLE (check only one in this column)

- ☒ ROUTINE DRINKING WATER check treatment
  - ☐ Chlorinated (Residual: __Total __Free)
  - ☐ Filtered
  - ☒ Untreated or Other ____
- ☐ REPEAT SAMPLE previous Coliform presence — Lab# ____ Date ___/___/___
- ☐ RAW SOURCE WATER — Source # S ☐☐ — ☐ Total Coliform ☐ Fecal Coliform
- ☐ NEW CONSTRUCTION or REPAIRS
- ☐ OTHER (Specify) ____

Remarks:

(LAB USE ONLY) DRINKING WATER RESULTS

☐ UNSATISFACTORY, Coliforms present

REPEAT SAMPLES REQUIRED: ☐ Total Present ☐ Total Absent ☐ E. Coli Present ☐ E. Coli Absent

☒ SATISFACTORY, Coliforms absent — ZH

OTHER LABORATORY RESULTS

☐ TOTAL COLIFORM ____/100ml ☐ E. COLI ____/100ml

☐ FECAL COLIFORM ____/100ml ☐ PLATE COUNT ____/100ml

ANOTHER SAMPLE REQUIRED

SAMPLE NOT TESTED BECAUSE:	TEST UNSUITABLE BECAUSE:
☐ Sample too old	☐ Confluent Growth
☐ Wrong container	☐ TNTC
☐ Incomplete form	☐ Turbid Culture
☐ ____	☐ Excess Debris

LAB NO. (8 DIGITS)	DATE, TIME RECEIVED	
112-22040	3/23/01 ☒AM ☐PM 8:45	ZH RECEIVED BY
DATE REPORTED 3-24-01	LABORATORY: Anatek Labs, Inc. (509) 838-3999	

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

INORGANIC CHEMICAL (IOC) REPORT

System ID#:		System Name:	CH2M HILL-SPOKANE		
Lab/Sample Number:	125 01421	Collect Date:	3/22/2001	DOH Source #:	
Multiple Source Nos:		Sample Type:		Sample Purpose:	
Date Received:	3/23/2001	Date Reported:	16-Apr-01	Supervisor:	MTP
Date Digested		Date Analyzed	3/30/2001		
County:	COLUMBIA			Phone Number:	509-747-2000
Sample Location:	032201CCGG				
Report To:	Customer	MARK HENRY			
	Address:	9 S WASHINGTON STE 400			
	City, State, ZIP	SPOKANE WA 99201			

DOH_#	Analytes	Results	Units	SRL	Trigger	MCL	Method	Analyst
	EPA Regulated							
4	Arsenic	ND	mg/l	0.01	0.05	0.05	EPA 200.8	ETL
5	Barium	ND	mg/l	0.1	2	2	EPA 200.8	ETL
6	Cadmium	0.003	mg/l	0.002	0.005	0.005	EPA 200.8	ETL
7	Chromium	ND	mg/l	0.01	0.1	0.1	EPA 200.8	ETL
11	Mercury	ND	mg/l	0.0005	0.002	0.002	EPA 200.8	ETL
12	Selenium	ND	mg/l	0.005	0.05	0.05	EPA 200.8	ETL
110	Beryllium	ND	mg/l	0.003	0.004	0.004	EPA 200.8	ETL
111	Nickel	ND	mg/l	0.04	0.1	0.1	EPA 200.8	ETL
112	Antimony	ND	mg/l	0.005	0.006	0.006	EPA 200.8	ETL
113	Thallium	ND	mg/l	0.002	0.002	0.002	EPA 200.8	ETL
116	Cyanide	ND	mg/l	0.05	0.2	0.2	SM4500-CN F	KS
19	Fluoride	ND	mg/l	0.5	2	4	EPA 300.0	KMH
114	Nitrite-N	ND	mg/l	0.1	0.5	0.5	EPA 300.0	KMH
20	Nitrate-N	2.0	mg/l	0.5	5	10	EPA 300.0	KMH
161	Total Nitrate/Nitrite-N	2.0	mg/l	0.5	5	10	EPA 300.0	KMH
	EPA Regulated (secondary)							
8	Iron	ND	mg/l	0.1	0.3	0.3	EPA 200.8	ETL
10	Manganese	ND	mg/l	0.01	0.05	0.05	EPA 200.8	ETL
13	Silver	ND	mg/l	0.01	0.05	0.05	EPA 200.8	ETL
21	Chloride	ND	mg/l	20	250	250	EPA 300.0	KMH
22	Sulfate	29	mg/l	10	250	250	EPA 300.0	KMH
24	Zinc	0.02	mg/l	0.02	5	5	EPA 200.8	ETL
	State Regulated							
14	Sodium	18	mg/l	5			SM3111B	ETL
15	Hardness(CaCO3)	146	mg/l	10			EPA 200.8	ETL
16	Conductivity	281	umhos/cm	10	700	700	EPA 120.1	SAT
17	Turbidity	0.1	NTU	0.1	1	1	EPA 180.1	ETL
18	Color	ND	color units	5	15	15	EPA 110.2	ETL
26	Total Dissolved Solids	88	mg/l	150	500	500	EPA 160.1	KMH
	State Unregulated							
9	Lead	ND	mg/l	0.002	0.015		EPA 200.8	ETL
23	Copper	ND	mg/l	0.2	1.3		EPA 200.8	ETL
	Other							
171	Orthophosphate/P	ND	mg/l	0.1			SM4500PF	JWC
172	Silica	18	mg/l	1			EPA 200.8	ETL
402	Aluminum	ND	mg/l	0.05			EPA 200.8	ETL
403	Alkalinity as CaCO3	92	mg/l	10			EPA 310.1	SG
404	Magnesium	11.3	mg/l	0.1			EPA 200.8	ETL
405	Calcium	38.6	mg/l	0.5			EPA 200.8	ETL
406	Ammonia/N	ND	mg/l	1			SM4500NH3G	JWC
	Potassium	4.86	mg/l	0.5			EPA 200.8	ETL

ND = Not Detected within the sensitivity of the instrument
Numerical Entry = Detection at level indicated
SRL - Minimum reporting level for Washington DOH
MCL - EPA maximum contaminant level
Trigger - Washington DOH response level. If results exceed this level, contact the DOH

WATER BACTERIOLOGICAL ANALYSIS

www.anateklabs.com

DATE COLLECTED (MONTH DAY YEAR)	TIME COLLECTED	COUNTY NAME
3/22/01	12:05 ☐AM ☒PM	Columbia

TYPE OF SYSTEM: ☐ PUBLIC ☒ INDIVIDUAL (serves only 1 residence)

IF PUBLIC SYSTEM, COMPLETE: I.D. No. [ ] CIRCLE GROUP A B

NAME OF SYSTEM

032201 CC (-G

SPECIFIC LOCATION WHERE SAMPLE COLLECTED: Pump Tank Fixt

TELEPHONE NO. DAY ( ) EVENING ( )

SAMPLE COLLECTED BY: (Name) Rik

SYSTEM OWNER/MGR: (Name)

SOURCE TYPE ☐ GROUND WATER UNDER SURFACE INFLUENCE ☐ SURFACE ☒ WELL or WELL FIELD ☐ SRPING ☐ PURCHASED or INTERTIE ☐ COMBINATION or OTHER

SEND REPORT TO: (Print Full Name, Address and Zip Code)

TYPE OF SAMPLE (check only one in this column)

- ☒ ROUTINE DRINKING WATER check treatment
- ☐ REPEAT SAMPLE previous Coliform presence
- ☐ RAW SOURCE WATER
- ☐ NEW CONSTRUCTION or REPAIRS
- ☐ OTHER (Specify) _____

☐ Chlorinated (Residual: __Total __Free)
☐ Filtered
☒ Untreated or Other _____
Lab# _____
Date ___/___/___
Source # S [ ]
☐ Total Coliform
☐ Fecal Coliform

Remarks:

(LAB USE ONLY) DRINKING WATER RESULTS

☐ UNSATISFACTORY, Coliforms present
REPEAT SAMPLES REQUIRED: ☐ Total Present ☐ Total Absent ☐ E. Coli Present ☐ E. Coli Absent

☒ SATISFACTORY, Coliforms absent

OTHER LABORATORY RESULTS

☐ TOTAL COLIFORM _____/100ml ☐ E. COLI _____/100ml
☐ FECAL COLIFORM _____/100ml ☐ PLATE COUNT _____/100ml

ANOTHER SAMPLE REQUIRED

SAMPLE NOT TESTED BECAUSE:
- ☐ Sample too old
- ☐ Wrong container
- ☐ Incomplete form
- ☐ _____

TEST UNSUITABLE BECAUSE:
- ☐ Confluent Growth
- ☐ TNTC
- ☐ Turbid Culture
- ☐ Excess Debris

LAB NO. (8 DIGITS)	DATE, TIME RECEIVED		
112-22041	3/23/01	08:42 ☐AM ☐PM	RECEIVED BY

DATE REPORTED

LABORATORY: Anatek Labs, Inc. (509) 838-3999