PUGET SOUND ENERGY
The Energy To Do Great Things

Baker River Hydroelectric Project
FERC Project No. 2150

Final
Water Quality Protection Plan

Prepared By:

Puget Sound Energy
Bellevue, Washington

In association with GeoEngineers, Inc.

GeoEngineers

August 14, 2009

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Definitions

Best Management Practice - Schedules of activities, prohibitions of practices, maintenance procedures, and other recommended physical, structural, and/or managerial practices to prevent or reduce the likelihood of stormwater adversely affecting a waterbody (modified from Ecology, 2004).

Material - For the purpose of this plan, material (for example, non-oil “material” discussed in the plan) includes any solid or liquid material that, if released, could potentially impact the water quality of an adjacent waterbody.

Oil - Oil of any kind or in any form, including, but not limited to: vegetable oils; and, other oils and greases, including petroleum, fuel oil, synthetic oils, mineral oils, oil refuse, or oil mixed with wastes (modified from EPA, Code of Federal Regulations 112.2).

Release - For the purposes of this plan, any intentional or unintentional entry of oil or material into the environment other than permitted releases (modified from Ecology, 2007).

Stormwater - Water resulting from precipitation, including rain and snow, that runs off roofs, roads, unpaved areas, and other upland surfaces. Stormwater often discharges to a waterbody, although it may infiltrate into soil before it enters a waterbody.

Waterbody - For the purposes of this plan, a waterbody may include lakes, rivers (including tailraces), streams (including intermittent streams), wetlands, sloughs, or natural ponds.

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Acronyms

AST	Aboveground Storage Tank
BMP	Best Management Practice
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
gpm	gallons per minute
PSE	Puget Sound Energy
SPCC	Spill Prevention, Control and Countermeasures
SWPPP	Stormwater Pollution Prevention Plan
UST	Underground Storage Tank
WQC	Water Quality Certification
WQPP	Water Quality Protection Plan

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1.0 INTRODUCTION

1.1 Background

Puget Sound Energy (PSE) owns and operates the Baker River Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC) No. 2150. The Project is located on the Baker River near the town of Concrete, Washington (**Figure 1**).

On October 17, 2008, FERC issued a new license (License) to PSE to operate the Project. The License incorporates the Project's water quality certification (WQC), Ecology Order No. 2525. Section 5.1 of the Project's WQC requires PSE to prepare a Water Quality Protection Plan (WQPP). The WQPP must be approved by the Washington State Department of Ecology (Ecology) before it can be implemented.

1.2 Purpose of this WQPP

This WQPP describes the measures and procedures PSE will implement to protect the water quality of the Baker River and other potentially affected water bodies during operation[1] of the Project. Specifically, this document describes the activities, pollution prevention measures, inspection/monitoring, and reporting that will be implemented by PSE staff during operation and maintenance at the Project.

1.3 Format of this WQPP

Several PSE documents currently address the management of water quality and oil and/or non-oil materials at the Project. These include:

- Baker Lake Fish Hatchery O&M Manual (PSE, 2009)
- Operation, Maintenance and Monitoring Manual for Water Treatment System, Lower Baker Power House (GeoEngineers, 2008)
- SPCC Plan Baker Lake Resort (PSE, 2007)
- SPCC Plan Lower Baker Generation Plant (GeoEngineers, 2008b)
- SPCC Plan Upper Baker Generation Plant (GeoEngineers, 2008a)

[1] This WQPP does not address measures to take during construction. Separate WQPPs are prepared for the major construction projects, which require approval from Ecology and FERC.

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This WQPP is similar to the Project's Spill Prevention, Control and Countermeasures (SPCC) plans for the Upper and Lower Baker Generation Plants (GeoEngineers, 2008a and 2008b). The main differences between the SPCC plans and this WQPP are summarized below:

- **Materials -** The Project's SPCC plans specifically address the management and control of oil (including mineral oil, hydraulic oil, turbine oil, fuel oil, and other petroleum based oil) and are required by federal regulations to prevent the release of oil into the Project's waterbodies[2]. This WQPP addresses the management and control of oil and materials used at the Project that could potentially degrade the Project's waterbodies. Some of these materials include sodium hypochlorite, sodium bisulfite, and sanitizers (used at the Baker Lake Fish Hatchery), stored equipment (i.e., in the boneyard), non-hazardous waste (i.e., at solid waste dumpster areas) and herbicides.

- **Project Area -** The Project's SPCC plans address the two powerhouses and the Baker Lake Resort. This WQPP addresses the powerhouses and the additional areas within the Project area that use oil or other materials, such as the Baker Lake Hatchery and the Lower Baker offices. It should be noted that several facilities on PSE property are open to the public. These include the campground, lodge and boat ramp at Upper Baker, and the boat ramp at Lake Shannon (not shown on figures).

- **Format -** The Project's SPCC plans include specific elements set by federal regulations. A specific format for this WQPP is not required; instead this WQPP is designed to be used as the principal resource guide for PSE staff to prevent potentially harmful materials from reaching the Project's waterbodies and what to do in the event oil or materials enter the Project's waterbodies. The focus of this WQPP is the protection of water quality in the Baker River and other potentially affected waterbodies.

- **Implementation Reporting Requirements -** Specific reporting for implementation of the SPCC plans is not required. In contrast, PSE is required to submit a report that documents implementation of this WQPP by June 30th of each year. This documentation will be included in our Annual Water Quality Report to Ecology.

- **Updates -** The Project's SPCC plans must be updated every 5 years. This WQPP may be modified as requested by Ecology, if there are major changes to the Project's

[2] Title 40, Code of Federal Regulations, Part 112, dated July 17, 2002 FR, Part 112 (40 CFR, Part 112), as amended as of the current date.

facilities, or as needed to make it most useful and effective to PSE staff. Revisions to this WQPP require Ecology approval.

To avoid duplication and the potential for conflicting information, this WQPP references applicable sections of the Project's SPCC plans. The management of oil and spill notification requirements are included in the Project's SPCC Plans.

1.4 Organization of this WQPP

- Section 2 – EXISTING OIL AND NON-OIL MATERIALS. This section lists the existing oil and non-oil materials stored at the Project and the locations of these materials.
- Section 3 – PROJECT DRAINAGE. This section describes the drainage features and stormwater pathways at select Project areas.
- Section 4 – BEST MANAGEMENT PRACTICES. This section identifies the best management practices (BMPs) to protect the Baker River and other potentially affected waterbodies.
- Section 5 – NOTIFICATION AND REPORTING REQUIREMENTS. This section summarizes what to do in the event of a spill, the annual WQPP reporting requirements, and procedures for updating this WQPP.
- Section 6 – INSPECTION AND MONITORING. This section describes the required inspection and water quality monitoring associated with this WQPP.

2.0 EXISTING OIL AND NON-OIL MATERIALS

This WQPP divides the Project into Upper and Lower Baker. Upper Baker includes the following facilities or areas (shown on **Figures 2 through 4**):

- Upper Baker Dam
- Upper Baker Powerhouse
- Upper Baker Shop Area
- Upper Baker Floating Surface Collector
- Baker Lake Fish Hatchery
- Depression Lake Pump Station

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Lower Baker includes the following facilities or areas (shown on **Figures 5 through 7**):

- Lower Baker Dam
- Lower Baker Powerhouse
- Lower Baker Office and Warehouse Area

Relevant stormwater-related features, as well as an inventory of materials stored and used at Upper and Lower Baker are listed in **Tables 1 and 2**. Refer to **Figures 2 through 7** for general locations of these features and materials.

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Table 1. Inventory of Features and Materials at Upper Baker

Reference Number	Description	Material	Estimated Maximum Quantity (gallons)
Dam (Figure 2)			
1	Dam	Concrete	Not Applicable
2	Catch Basin "A"	Stormwater	Not Applicable
3	Drain	Stormwater	Not Applicable
Powerhouse (Figure 3)			
4	Aboveground Storage Tank (AST) For Emergency Generator	Diesel Fuel	100
5	Governor Oil Tanks	Governor Oil	1,256
6	Turbine Oil Tanks	Turbine Oil	2,000
7	Miscellaneous Oil Storage Room	Oils, Greases and Solvents	200
8	Four Step-Up Transformers	Mineral Oil	13,900
9	Grounding Transformers	Mineral Oil	40
10	Upper Baker Sump	Water	2,500
Shop Area (Figure 2)			
11	Fuel Island with two Underground Storage Tanks (USTs)	Diesel and Gasoline	2,000
12	Shop	Misc Equipment	Not Applicable
13	Two Pad Transformers	Mineral Oil	100
14	Warehouse	Misc Equipment	Not Applicable
15	Dumpsters / Scrap Bins	Non-hazardous Waste	Not Applicable
16	Hazardous Materials Storage Trailer	Petroleum Products	125
17	AST	Diesel	1,000
Floating Surface Collector (Figure 2)			
18	Floating Surface Collector (materials used in various pieces of equipment on collector)	Various food-grade oils and grease	35
Baker Lake Fish Hatchery (Figure 2)			
19	Baker Lake Hatchery	Sodium Hypochlorite	300
19	Baker Lake Hatchery	Sodium Bisulfite	300
19	Baker Lake Hatchery	Iodophore	55

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Table 1. Inventory of Features and Materials at Upper Baker (Continued)

Reference Number	Description	Material	Estimated Maximum Quantity (gallons)
19	Baker Lake Hatchery	Formalin	250
Depression Lake Pump Station (Figure 4)			
20	Capacitor	Mineral Oil	35
21	Three 1,000 KVA Transformers	Mineral Oil	1,035
22	Three Step-down Transformers	Mineral Oil	100
23	Actuator Valve	Hydraulic Oil	130

Table 2. Inventory of Features and Materials at Lower Baker

Reference Number	Description	Material	Estimated Maximum Quantity (gallons)
Dam (Figure 5)			
24	Dam	Concrete	Not Applicable
25	Hydraulic Gate Car	Hydraulic Oil	65
26	Hydraulic Ram in Gatehouse	Hydraulic Oil	1,200
27	Emergency Generator	Diesel	100
Powerhouse (Figure 6)			
28	Butterfly Valve	Hydraulic Oil	250
29	Turbine Hydraulic Governor	Turbine Oil	465
30	Turbine Thrust/Guide Bearings	Turbine Oil	745
31	Lower Baker Sump	Water	4,800
32	Step-Up Transformer	Mineral Oil	7,890
33	Emergency Diesel Generator	Diesel	100
34	Catch Basin “B”	Stormwater	Not Applicable
Office and Warehouse Area (Figure 7)			
35	Catch Basin “C”	Stormwater	Not Applicable
36	Oil Storage Area	Used Oil	160
37	Maintenance Shop	Used Equipment Including Batteries and Fluorescent Light Bulbs	Not Applicable
38	Garage AST	Diesel	100
39	Emergency Generator	Diesel	475
40	Dumpster / Scrap Bins	Non-hazardous waste	Not Applicable

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Table 2. Inventory of Features and Materials at Lower Baker (Continued)

Reference Number	Description	Material	Estimated Maximum Quantity (gallons)
41	Boneyard	Wire Spools, Truck Canopies, Ball Buoys, Empty Drums, Chain Link Fence Rolls, Corrugated Plastic Pipe	Not Applicable
42	Storage Trailers	Oil, Solvents, Kerosene	1,500
42	Storage Trailers	Herbicides	100
43	Fueling Station with USTs	Diesel and Gasoline	5,000

3.0 PROJECT DRAINAGE

3.1 Upper Baker

- Dam

The Upper Baker Dam is shown on **Figure 2**. Stormwater falling on the top of the dam flows across concrete surfaces and drains into Baker Lake. Stormwater on the face of the dam flows across concrete surfaces to the Upper Baker tailrace. Additionally, Catch Basin "A" collects stormwater drainage from a gravel access road and conveys water via an underground pipe to the Upper Baker tailrace (see **Figure 2** and Photo 1). A drain is also located at the end of the parking area near the Powerhouse (**Figure 2** and Photo 2). The drain collects stormwater from a small concrete pad and conveys it to the Upper Baker tailrace via buried piping. A capped, abandoned governor-oil fill port is located approximately 2 feet southwest of the drain (Photo 2). In the past, the fill port was used to deliver oil to equipment inside the dam, however, the port is no longer used and oil is brought in using bulk containers.

- Powerhouse

The Powerhouse is shown on **Figures 2 and 3**. Drainage at the top level of the Powerhouse is directed via a piping system to the Powerhouse sump, which discharges to the Upper Baker tailrace.

- Shop Area

The Shop Area is shown on **Figure 2**. The area is generally flat and mostly unpaved with the exception of the fuel island area and concrete surfaces around the Shop and Hazardous Materials Storage Trailer. The nearest drainage feature is a vegetated ditch on the west side of the access road leading down to the Powerhouse. Surface water flows from the top of the access road, approximately 1/4 mile to Catch Basin "A." Catch Basin A drains via underground pipe to the Upper Baker tailrace.

- Upper Baker Floating Surface Collector

The Floating Surface Collector is located east of the Upper Baker Dam (**Figure 2**). Stormwater from the collector drains into the lake.

- Depression Lake Pump Station

The area around the Depression Lake Pump Station is generally flat and unpaved, except for a curbed concrete containment area for the three 1,000 KVA transformers (**Figure 4**). Stormwater from inside the curbed concrete containment area drains via underground piping to a vault and then to Baker Lake. The vault contains an oil stop valve. Drainage from outside the curbed area flows across gravel surfaces to Baker Lake.

- Baker Lake Fish Hatchery

The location of the Baker Lake Fish Hatchery is shown on **Figure 2**. Soils at the Hatchery are recent alluvium including sand and gravel, and surface water runoff is minimal. See Part 2 of the Baker Lake Fish Hatchery O&M Manual (PSE 2009), which contains very detailed descriptions of processes at the Hatchery.

3.2 Lower Baker

- Lower Baker Dam

The Lower Baker Dam is shown on **Figure 5**. Stormwater from the top of the dam flows across concrete surfaces into Lake Shannon. Stormwater from the face of the dam flows across concrete surfaces to the Baker River. Stormwater from the facilities on the east side of the dam generally flows to the northwest across unpaved surfaces to Lake Shannon.

- Lower Baker Powerhouse

A sump in the bottom of the Lower Baker Powerhouse collects seepage from inside the powerhouse and discharges the sump water via sump pumps to the Lower Baker tailrace.

Stormwater from the area around the Lower Baker Powerhouse (Figure 6) flows to the Baker River. A paved access road leads to the Powerhouse from the southwest. Catch Basin "B" collects stormwater from an area of the road in the vicinity of the catch basin (**Figure 6** and Photo 3). This catch basin conveys stormwater via a buried pipe to the Baker River. The remaining areas near the Powerhouse generally drain west to the Baker River.

- Lower Baker Offices/Shop/Warehouse

The Lower Baker Office Area is shown on **Figure 7**. The area around the Lower Baker Office, Maintenance Shop and Warehouse Garage is paved. Catch Basin "C" collects stormwater from the paved area and discharges drainage to the Baker River via a buried pipe. The area around the Fueling Station is also paved; however, there are no catch basins or drainage features in the vicinity of the Fueling Station. Surface runoff is to the west or southwest to gravel and/or vegetated surfaces. A soil berm impedes runoff from reaching the Baker River; water infiltrates in the vicinity of the two storage trailers shown on Figure 7. The remaining areas between the Maintenance Shop and Fueling Station are unpaved. Surface flow is generally to the west or southwest towards the Baker River.

4.0 BEST MANAGEMENT PRACTICES

This section describes the BMPs that are being implemented to minimize the impacts of operation and maintenance on the Baker River and other potentially affected waterbodies. The BMPs were based primarily on the review of existing PSE documents and Ecology's guidelines for the preparation of Stormwater Pollution Prevention Plans (SWPPP) at Industrial Facilities (Ecology, 2004)[3]. The BMPs for the Project are divided into BMPs that apply to the entire Project and BMPs that apply to specific areas. Schematics and/or text of BMPs from Ecology's manuals are included at the end of this plan.

4.1 BMPs That Apply to the Entire Project

The following BMPs apply to the entire Project:

- **BMP-1**: Promptly clean spills: Promptly contain and clean up solid and liquid leaks and spills on any soil, vegetation or paved area. PSE has a 24-hour spill response program in which spill responders are available to assess and respond to spills quickly and

[3] Ecology does not classify the Project as an Industrial Site and the requirements of an Industrial Stormwater General Permit are not applicable to the Project, however, this guidance document was used because it provides best management practices for the control of stormwater from single sites.

effectively. The 24-hour phone number (***206-994-3186***) is posted throughout PSE facilities and updated and redistributed as needed.

- **BMP-2**: Promptly repair damaged secondary containment: Promptly repair or replace substantially damaged paved secondary containment areas subject to leaks or spills.

- **BMP-3**: Promptly repair leaks: Promptly repair or replace all leaking connections, pipes, hoses and valves with the potential to contaminate stormwater.

- **BMP-4**: Prevent unpermitted waste discharges: Illicit connections are unpermitted discharges to storm drains or surface waters. Identify and eliminate unpermitted discharges within 30 days of their discovery.

- **BMP-5**: Use appropriate storage containers: Use containers that are in good condition and constructed of materials appropriate for the materials being stored.

- **BMP-6**: Document drainage features. Prepare a scaled site map that shows the locations of drainage features.

- **BMP-7**: Remain updated on effective spill prevention and response procedures. Remain updated on inspection and maintenance requirements, regulations and spill response procedures with employee**.**

4.2 BMPs That Apply to Specific Project Areas

Table 3 (at end of report) summarizes the BMPs that are applied to specific areas of the Project listed in **Tables 1 and 2**. Table 3 also contains several BMPs that are not currently in use, but are potentially applicable. These BMPs are described below.

- **BMP-8**: Inspect and clean catch basins. Inspect Catch Basins A, B and C twice a year and clean annually or as necessary (see Section 6).

- **BMP-9**: Do not wash vehicles on paved surfaces if storm drainage features are present: Wash vehicles on unpaved surfaces where wash water can soak into the ground or evaporate.

- **BMP-10**: Use drip pans during product transfers: Use drip pans underneath hose connections during product transfers (e.g., fuel or oil) or when making or breaking any

hose connections. Promptly empty drip pans into a suitable container for recycling/ disposal.

- **BMP-11**: Drain fuel and oil from filters before disposal: Drain fuel and oil from filters into appropriate containers for recycling/disposal.

- **BMP-12**: Properly dispose of drained filters: Dispose of used filters in appropriately closed and properly labeled containers.

- **BMP-13**: Personnel present during fuel transfers: The person conducting a fuel transfer must be present at the pump during the transfer.

- **BMP-14**: Inspect vehicles frequently for leaks: It is PSE policy to maintain vehicles in good working order. Leaks and drips are reported immediately, and vehicles are repaired as soon as is practicable.

- **BMP-15**: Provide Spill Cleanup Kits in appropriate areas: Maintain a spill cleanup kit at critical areas at the Project such as fueling stations and loading/unloading areas (refer to **Table 3**). Ensure that opened kits are inspected and replenished as necessary.

- **BMP-16**: "Dump No Waste" signs or equivalent posted: Use signs or paint next to Catch Basins A, B and C: "Dump No Waste, Drains to Stream" or equivalent (refer to **Figures 2, 6 and 7**).

- **BMP-17**: Containers have tight fitting lids: Use tight fitting lids on containers that contain oil or other potentially hazardous substances (e.g., storage containers stored outside and dumpsters).

- **BMP-18**: Unauthorized access to drums (i.e., 55-gallon drums for oil, etc.) prevented: Use fences and locked gates to prevent unauthorized access to drums.

- **BMP-19**: Use correct impervious materials: Construct containment areas using materials appropriate for containing spills of the material stored or used.

- **BMP-20**: Cover areas: Cover storage areas to prevent exposure to stormwater.

- **BMP-21**: Pave Fuel Island areas with Portland cement: Do not pave Fuel Island areas with asphalt because gasoline degrades asphalt. Instead, pave Fuel Islands with Portland cement.

- **BMP-22**: Overflow protection during fuel transfers: Provide automatic shutoff systems at fueling stations to prevent overfills.

- **BMP-23**: Operations Plan for liquid transfers at ASTs and USTs: Prepare a written document that trains personnel using a standard set of procedures during loading/ unloading activities. An "Operations Plan for Liquid Transfers at ASTs and USTs" is included as Appendix A.

5.0 NOTIFICATION AND REPORTING REQUIREMENTS

5.1 Spill Response Protocols

Spill response protocols that apply to oil are also applicable to the non-oil materials at the Project. These protocols are provided in Section 6 of the Upper and Lower Baker SPCC plans. Ecology will be notified within 24 hours of a spill event at the Baker River Project. The 24-hour Ecology spill reporting phone number is (425) 649-7000.

5.2 WQPP REPORTING AND AMENDING

PSE will report implementation of this WQPP in the Annual Water Quality Monitoring report, which is submitted to Ecology by June 30th of each year. The report will note any spills which occur at the Project and PSE's response. The report will also address the status of implementation of maintenance and inspection required by this plan.

PSE will submit plan amendments to Ecology as necessary to reflect major changes in the project's facilities.

6.0 SITE INSPECTION, MAINTENANCE AND MONITORING

6.1 Site Inspection and Maintenance

Refer to Section 4.3 of the Upper and Lower Baker SPCC plans for required inspection of oil-containing equipment at the Project. Additional visual inspections and maintenance required for

this WQPP include inspection of the sumps at the Upper and Lower Baker powerhouses and inspection and maintenance of Catch Basins A, B and C, as described below.

6.1.1 Upper and Lower Baker Sumps

Saddle taps will be installed on the sump pump discharge pipes in the sump rooms at each powerhouse to permit inspection of sump discharge water and water sample collection. Quarterly inspection of the Upper and Lower Baker sumps shall include observation of water in the sumps and water from the saddle taps for visible sheen (see forms in Appendix B).

6.1.2 Upper and Lower Baker Catch Basins

Catch Basins A, B and C should be inspected twice each year and cleaned as necessary (typically yearly). The forms in Appendix B describe catch basin inspection and maintenance procedures.

Measure the depth of sediment in each catch basin once each year during the third quarter (July to September). Clean the catch basins if they are more than half-full of sediment. Cleaning can be performed using a shovel or vactor truck. If a shovel is used, bag the catch basin waste and place in a solid waste dumpster for disposal. Note that the cover may be difficult to remove from Catch Basin "A," and that it may be necessary to clean the catch basin using a vactor truck with a suction line that has been modified to fit through the cover (see Photo 1).

Observe each catch basin once each year during the fourth quarter (October to December) during a rain event. Document whether petroleum sheen is visible in each catch basin using the forms in Appendix B. If a sheen is present, attempt to determine the source of the sheen. If there is no apparent source near the catch basin, the sheen may be due to the presence of oily material in the catch basin. If this is the case, the catch basin should be cleaned.

6.2 Sump Sampling

The Upper and Lower Baker sumps will be sampled quarterly for oil and grease (EPA Method 1664) for one year. Samples will be collected from the saddle taps installed on the sump pump discharge pipes in the sump rooms at each dam. If results indicate that oil and grease concentrations are less than 10 mg/L for four consecutive quarters, sampling will be discontinued. However, quarterly visual inspections will continue as described in Section 6.1 above. This quarterly sampling scheme will be repeated every five years.

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7.0 REFERENCES CITED

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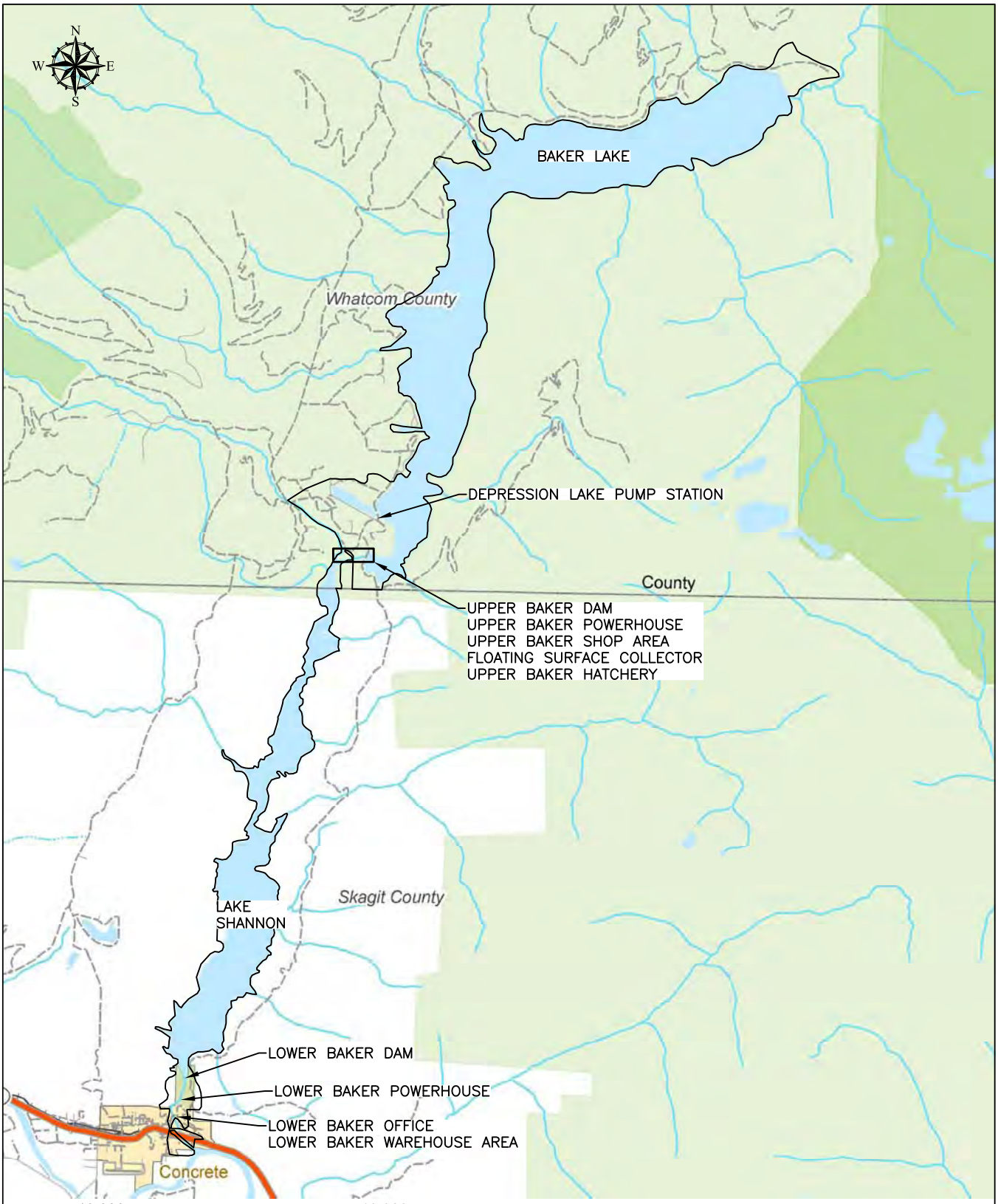

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Raster image are from ESRI street GIS data.

Vicinity Map

Baker River Project
Concrete, Washington

PSE GeoEngineers

Figure 1

TACO:TCM : SCY

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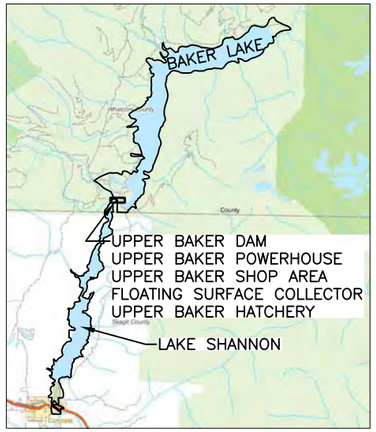

Vicinity Map

30,000 0 30,000

Feet

TACO:TCM : SCY

SULFUR CREEK

BAKER LAKE HATCHERY (19)

SHOP AREA

DUMPSTERS / SCRAP BIN (15)

THIS AREA GENERALLY FLAT

PAVED

FUEL ISLAND WITH TWO USTs (11)

SHOP (12)

2 PAD TRANSFORMERS (13)

WAREHOUSE (14)

HAZARDOUS MATERIALS STORAGE TRAILER (16)

COVERED CANOPY STORAGE

1,000 GALLON AST (17)

GARAGE

OFFICE BUILDING

ACCESS ROAD WITH DITCH

FORESTED SLOPE

SUBSTATION

CATCH BASIN "A" (2) (DRAINS TO BAKER RIVER)

POWERHOUSE (SEE FIGURE 3)

DRAIN (3)

UPPER BAKER DAM (1)

BAKER LAKE

UPPER BAKER TAILRACE

FLOATING SURFACE COLLECTOR (18)

N

W E

S

Legend

- Surface drainage path
- Access road (paved)
- Access road (gravel)
- Fence
- Stormwater pipe

200 0 200

Approximate Scale in Feet

Notes:
1. Numbers in parenthesis cross reference features shown in Tables 1-3.
2. The locations of all features shown are approximate.
3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Drawing provided by Puget Sound Energy.

Site Plan - Upper Baker Dam, Powerhouse, Shop Area, and Hatchery

Baker River Project
Concrete, Washington

PSE GeoEngineers

Figure 2

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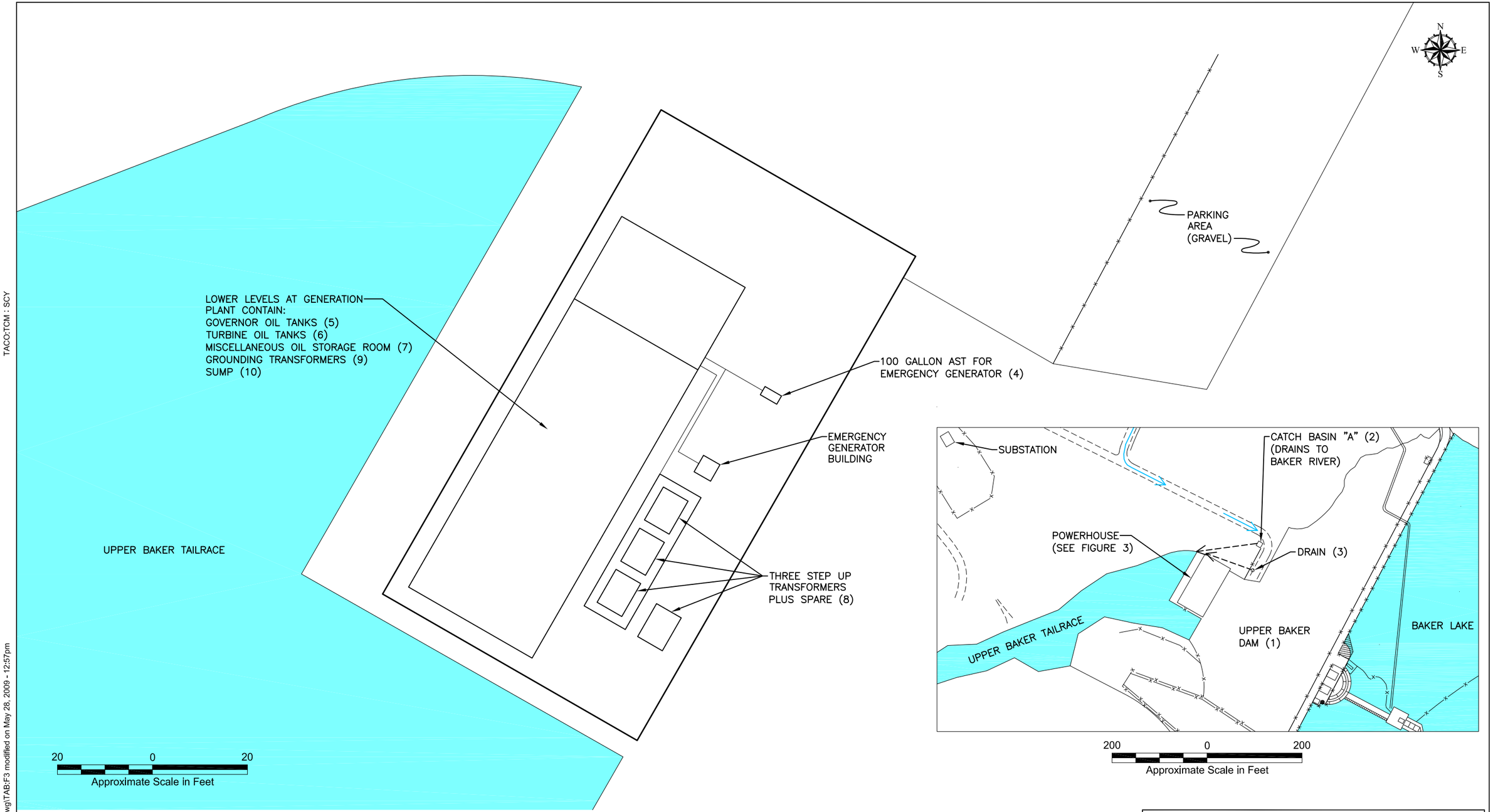

Legend

——x—— Fence

Notes:
1. Numbers in parenthesis cross reference features shown in Tables 1-3.
2. The locations of all features shown are approximate.
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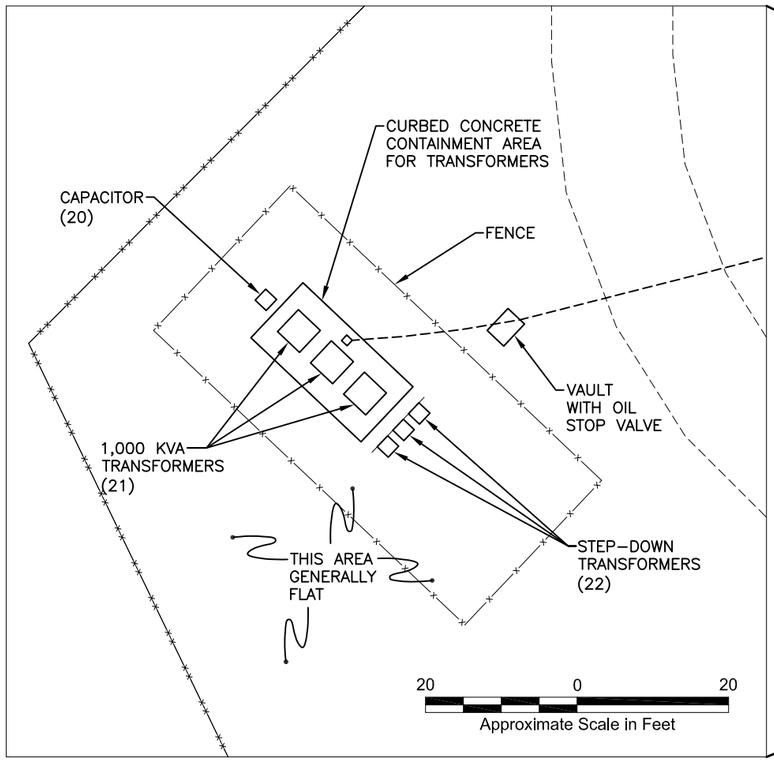
Reference: Drawing provided by Puget Sound Energy.

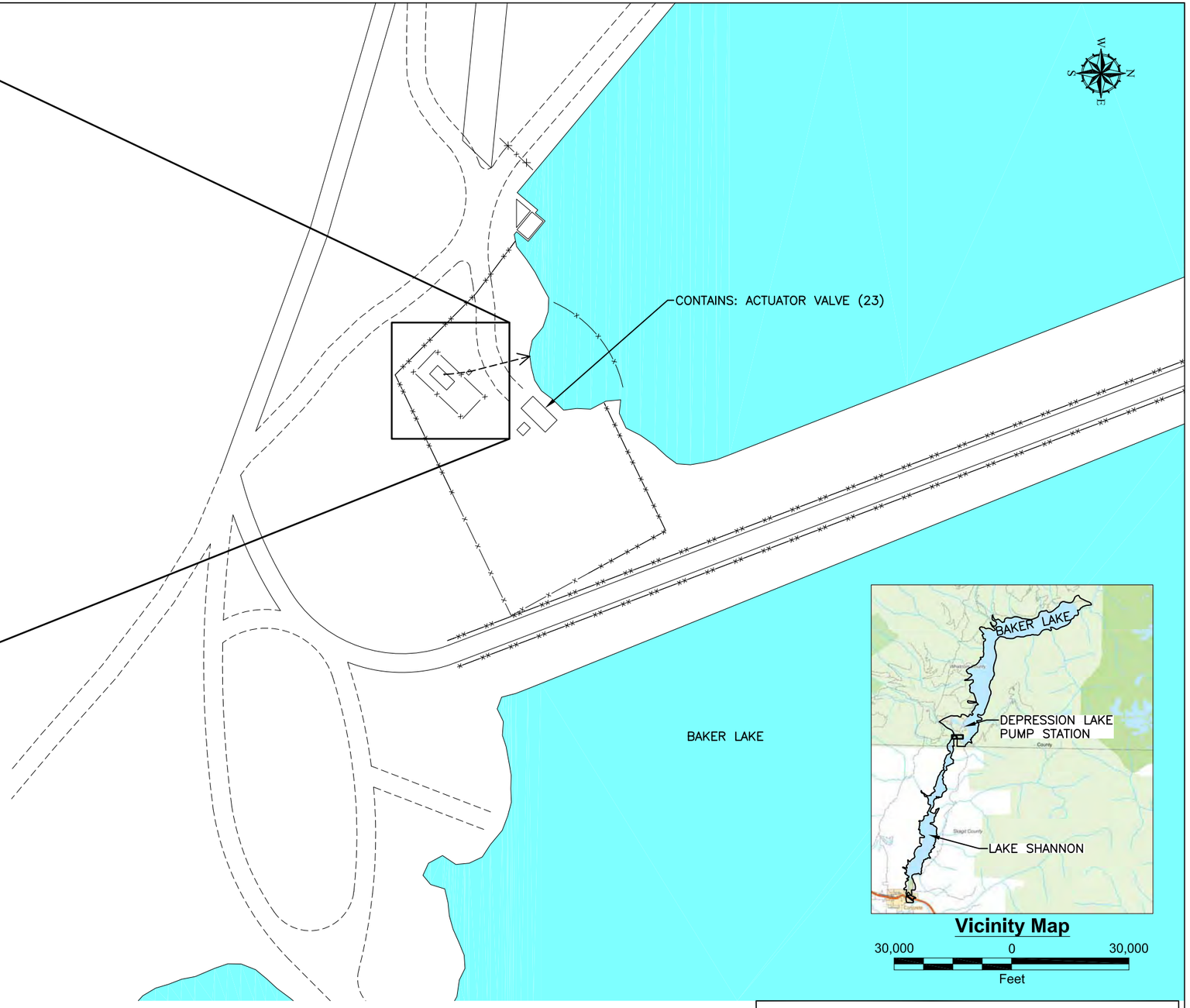
Site Plan - Upper Baker Powerhouse

Baker River Project
Concrete, Washington

PSE GeoEngineers

Figure 3





Legend

- Fence
- Access road (paved)
- Access road (gravel)
- Stormwater pipe

100 0 100
Approximate Scale in Feet

Notes:
1. Numbers in parenthesis cross reference features shown in Tables 1-3.
2. The locations of all features shown are approximate.
3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Drawing provided by Puget Sound Energy.

Site Plan - Depression Lake

Baker River Project
Concrete, Washington

PSE GeoEngineers

Figure 4

TACO:TCM : SCY

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LOWER BAKER TAILRACE

LOWER BAKER DAM (24)

HYDRAULIC GATE CAR MOVES ON RAILS TO VARIOUS GATES (25)

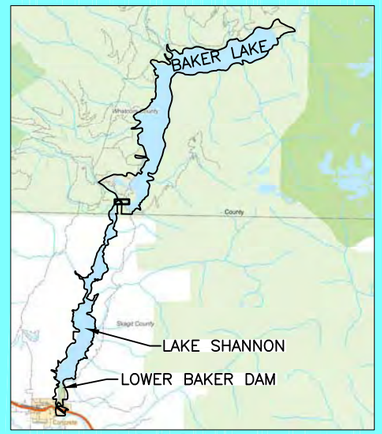
LAKE SHANNON

GATEHOUSE CONTAINS 1,200 GALLON HYDRAULIC RAM OIL AST (26)

WATER INTAKE

MAIN PRESSURE TUNNEL TO POWERHOUSE

EMERGENCY GENERATOR HOUSE (27)



Vicinity Map

30,000 0 30,000

Feet

Legend

- Surface drainage path
- Fence
- Access road (paved)
- Access road (gravel)

100 0 100

Approximate Scale in Feet

Notes:
1. Numbers in parenthesis cross reference features shown in Tables 1-3.
2. The locations of all features shown are approximate.
3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Drawing provided by Puget Sound Energy.

Site Plan - Lower Baker Dam

Baker River Project
Concrete, Washington

PSE GeoEngineers

Figure 5

TACO:TCM : SCY

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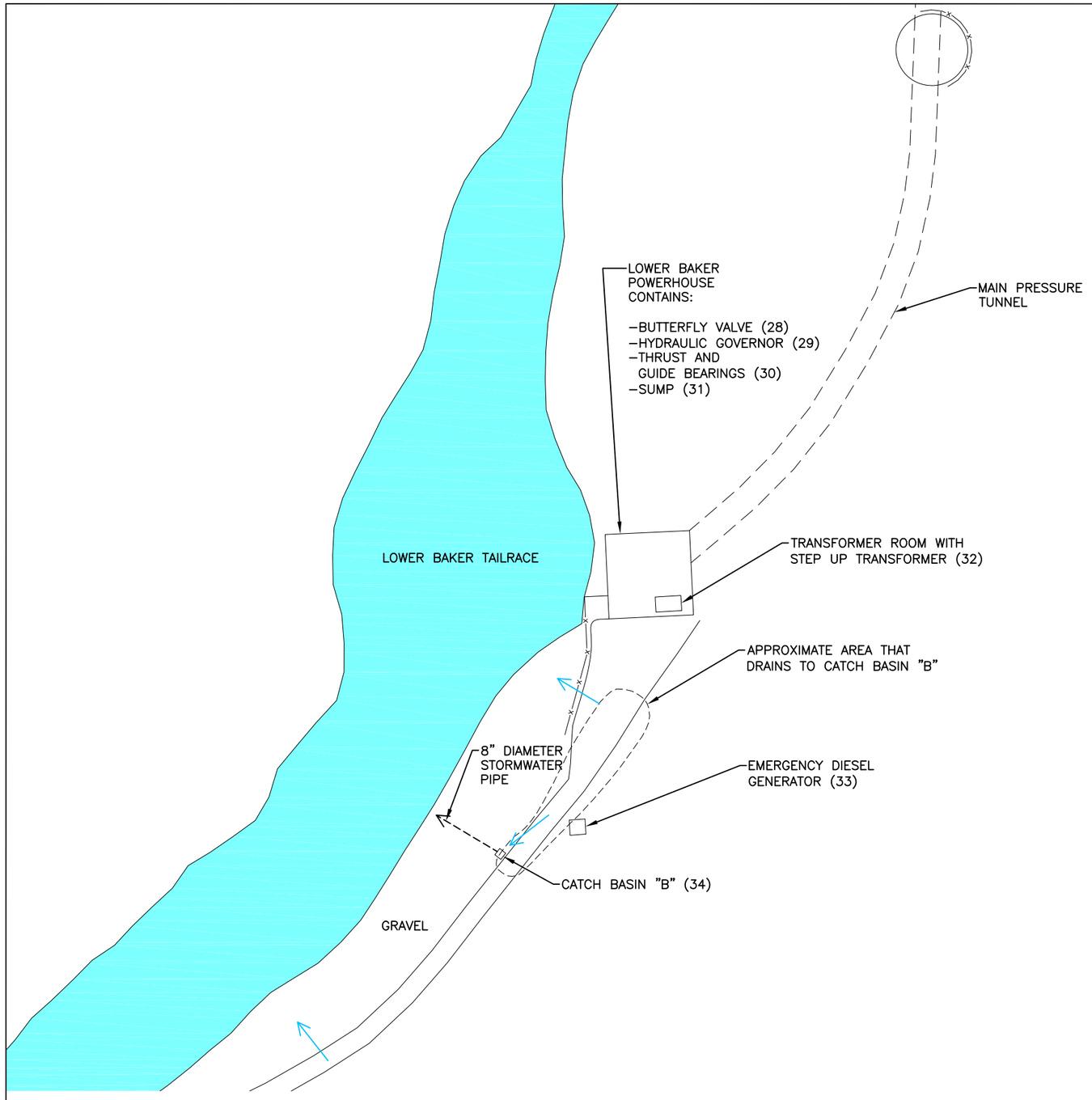

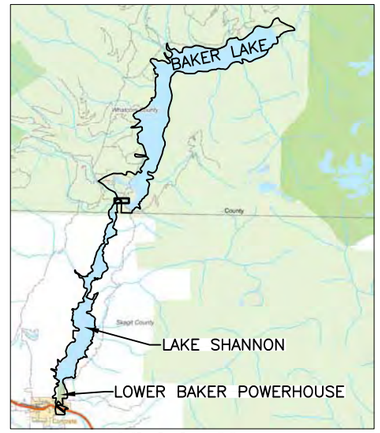

Vicinity Map

30,000 0 30,000

Feet

N W E S

Legend

- Surface drainage path
- Access road (paved)
- Fence
- Stormwater pipe

100 0 100

Approximate Scale in Feet

Notes:
1. Numbers in parenthesis cross reference features shown in Tables 1-3.
2. The locations of all features shown are approximate.
3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Drawing provided by Puget Sound Energy.

Site Plan - Lower Baker Powerhouse

Baker River Project
Concrete, Washington

PSE GeoEngineers

Figure 6

TACO:TCM : SCY

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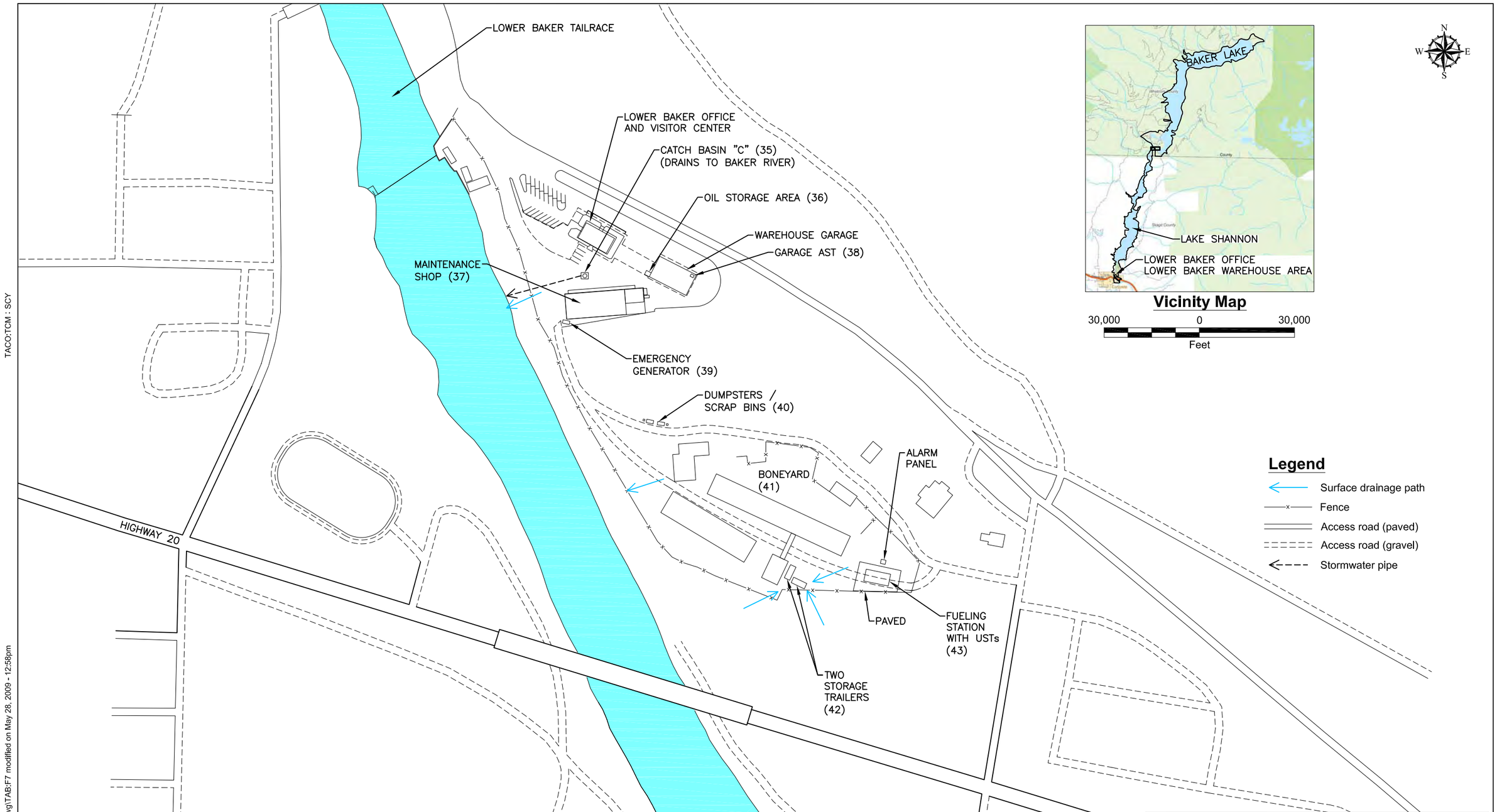

Vicinity Map

30,000 0 30,000
Feet

N
W E
S

Notes:
1. Numbers in parenthesis cross reference features shown in Tables 1-3.
2. The locations of all features shown are approximate.
3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Drawing provided by Puget Sound Energy.

Site Plan - Lower Baker Office Area

Baker River Project
Concrete, Washington

PSE GeoEngineers

Figure 7

TACO:TCM : SCY

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TABLE 3
BEST MANAGEMENT PRACTICES
BAKER RIVER PROJECT, PROJECT NO. 2150
CONCRETE, WASHINGTON

Location	Reference Number	Inspect and Clean Catch Basins (BMP-8)	Wash vehicles on unpaved surfaces (BMP-9)	Use Drip Pans during Product Transfers (BMP-10)	Drain Oil from Filters Before Disposal (BMP-11)	Properly Dispose of Drained Filters (BMP-12)	Personnel Present During Fuel Transfers (BMP-13)	Inspect Vehicles Frequently for Leaks (BMP-14)	Provide Spill Cleanup Kits (BMP-15)	"Dump no Waste" Signs or Equivalent Posted (BMP-16)	Containers Have Tight Fitting Lids (BMP-17)	Unauthorized Access to Drums Prevented (BMP-18)	Use Correct Impervious Materials (BMP-19)	Cover Areas (BMP-20)	Pave Fuel Island Areas with Portland Cement (BMP-21)	Overflow Protection During Fuel Transfers (BMP-22)	"Operations Plan for Liquid Transfers" (BMP-23)
Upper Baker			X					X									
Dam (Figure 2)																	
Dam	1								X								
Catch Basin "A"	2	O								O							
Drain	3									O							
Powerhouse (Figure 3)									X								
Generating Plant 100-Gallon AST	4													X			
Governor Oil Tanks	5													X			
Turbine Oil Tanks	6													X			
Miscellaneous Oil Storage	7										X		X	X			
Step-up Transformers	8																
Grounding Transformers	9													X			
Upper Baker Sump	10													X			
Shop Area (Figure 2)																	
Fuel Island	11			O			X		X				X	X	X	X	
Shop	12				X				X	O			X	X			X
Two Pad Transformers	13												X				
Warehouse	14				X				X				X	X			X
Dumpster/Scrap Bin	15				X	X					O						X
Hazmat Storage Trailer	16				X						X		X	X			X
1,000-Gallon Diesel AST	17			O			X							O			
Floating Surface Collector (Figure 2)									X								
Oils/Grease	18												X	X			
Hatchery (Figure 2)																	
Acids, Bases, Disinfectants	19																X
Depression Lake Area (Figure 4)																	
Capacitor	20																
1,000 KVA Transformers	21												X				
Step-down Transformers	22																
Actuator Valve	23													X			
Lower Baker			X					X									
Lower Baker Dam (Figure 5)									X								
Dam	24																
Hydraulic Gate Car	25													X			
Hydraulic Ram AST	26													X			
Diesel Generator	27						X						X	X			
Powerhouse (Figure 6)									X								
Butterfly Valve	28													X			
Turbine Hydraulic Governor	29													X			
Turbine Thrust/Guide Bearings	30													X			
Lower Baker Sump	31													X			
Step-up Transformer	32												X	X			
Emergency Diesel Generator	33			O									X	X			
Catch Basin "B"	34	O								O							
Office Area (Figure 7)																	
Catch Basin "C"	35	O								O							
Oil Storage Area	36				X		X				X	X	X	X			
Maintenance Shop	37				X				X		X		X	X			X
Garage AST	38			O			X						X	X			
Diesel Generator	39			O			X						X	X			
Dumpster/Scrap Bin	40				X	X					O			O			X
Boneyard	41																X
Storage Trailers	42				X		X		X		X	X	X	X			
Fueling Station	43			O			X		X				X	X	X	X	

Notes:
X = BMP in place at the Site
O = BMP not in place but potentially applicable

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PUGET SOUND ENERGY
The Energy To Do Great Things

APPENDIX A

OPERATIONS PLAN FOR LIQUID TRANSFERS AT ASTS AND USTS

PURPOSE

To prevent spills from contaminating stormwater.

APPLICABILITY

The general procedures and best practices apply to transfers of product into or out of all ASTs or USTs at the Facility.

BEFORE TRANSFER

Check to make sure a spill kit is available at the transfer area before beginning procedure.

If applicable, block the wheels of vehicles or tanker trucks to ensure there is no movement during product transfer.

If applicable, perform the transfer in areas that are not exposed to rainfall.

Place drip pans beneath hose connections that could potentially leak during transfer. Use drip pans while making and breaking any connection and during product transfer. Stop the transfer and empty drip pans into appropriate disposal containers immediately after any spills or drips.

Double check the amount to be transferred.

DURING TRANSFER

Personnel must always be present during any product transfer.

Watch for leaks and spills during transfer. In the event of a leak or spill, stop the transfer and clean up the spill. Repair or replace any leaking equipment before continuing the transfer.

AFTER TRANSFER

Check that transfer process is complete before disconnecting hoses.

Check the area for leaks or spills and clean up as appropriate.

Report any faulty equipment to Maintenance Supervisor for correction before the next transfer.

If applicable, remove blocks from vehicle wheels.

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APPENDIX B

INSPECTION FORMS

Baker River Project WQPP Inspection Form (Lower Baker)

Instructions: This form is to be used for one year and covers 4 quarters of Lower Baker Sump inspection and 2 semi-annual inspections of Catch Basins "B" and "C" (see Figures 6 and 7 of WQPP)

	Sump Instructions: *Observe sump water for sheen. Wait until pump(s) starts. Open the saddle tap and allow water to run for approximately 15 seconds. Collect one to two cups of water into a clean black plastic "sheen pan" or equivalent container. Observe the water for signs of petroleum sheen, excessive turbidity, or other observations (unusual odor or color, etc.)*			***Catch Basin Instructions:*** *Measure the depth of sediment in Catch Basins B and C once during the third quarter (July to September). Clean the catch basin if it is more than 1/2 full of sediment. Observe Catch Basins B and C once during a rain event in the fourth quarter (Oct to Dec), preferably within the first hour of rainfall. Use a flashlight and look into the catch basins and observe for petroleum sheen*		
1st Quarter						
(Jan - March)	Sheen on sump water?	Y	N			
	Sheen on tap water?	Y	N			
Inspector Initials:	Excessive Turbidity?	Y	N			
	Unusual Color?	Y	N			
	Unusual Odor?	Y	N			
Date:	Comments:					
2nd Quarter						
(Apr - June)	Sheen on sump water?	Y	N			
	Sheen on tap water?	Y	N			
Inspector Initials:	Excessive Turbidity?	Y	N			
	Unusual Color?	Y	N			
	Unusual Odor?	Y	N			
Date:	Comments:					
3rd Quarter					CB "B"	CB "C"
(Jul - Sept)	Sheen on sump water?	Y	N	Date:		
	Sheen on tap water?	Y	N	Sediment Depth:		
Inspector Initials:	Excessive Turbidity?	Y	N	Cleaning Required:	Y N	Y N
	Unusual Color?	Y	N	Cleaning Performed:	Y N	Y N
	Unusual Odor?	Y	N	Approx. Lbs Removed:		
Date:	Comments:			Disposal (circle one below):		
				Vactor Truck		
				Dumpster		
4th Quarter					CB "B"	CB "C"
(Oct - Dec)	Sheen on sump water?	Y	N	Date:		
	Sheen on tap water?	Y	N	Visible Sheen?	Y N	Y N
Inspector Initials:	Excessive Turbidity?	Y	N	If yes, what is/are source(s) of sheen:		
	Unusual Color?	Y	N			
	Unusual Odor?	Y	N			
Date:	Comments:			Corrective Action:		

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Baker River Project WQPP Inspection Form (Upper Baker)

Instructions: This form is to be used for one year and covers 4 quarters of Upper Baker Sump inspection and 2 semi-annual inspections of Catch Basin "A" (see Figure 2 of WQPP)

	Sump Instructions: *Observe sump water for sheen. Wait until pump(s) starts. Open the saddle tap and allow water to run for approximately 15 seconds. Collect one to two cups of water into a clean black plastic "sheen pan" or equivalent container. Observe the water for signs of petroleum sheen, excessive turbidity, or other observations (unusual odor or color, etc.)*			***Catch Basin Instructions:*** *Measure the depth of sediment in Catch Basin A once during the third quarter (July to September). Clean the catch basin if it is more than 1/2 full of sediment. Observe Catch Basin A once during a rain event in the fourth quarter (Oct to Dec), preferably within the first hour of rainfall. Use a flashlight and look into the catch basin and observe for petroleum sheen*	
1st Quarter (Jan - March)	Sheen on sump water?	Y	N		
	Sheen on tap water?	Y	N		
Inspector Initials:	Excessive Turbidity?	Y	N		
	Unusual Color?	Y	N		
	Unusual Odor?	Y	N		
Date:	Comments:				
2nd Quarter (Apr - June)	Sheen on sump water?	Y	N		
	Sheen on tap water?	Y	N		
Inspector Initials:	Excessive Turbidity?	Y	N		
	Unusual Color?	Y	N		
	Unusual Odor?	Y	N		
Date:	Comments:				
3rd Quarter (Jul - Sept)	Sheen on sump water?	Y	N	CB "A" Date:	
	Sheen on tap water?	Y	N	Sediment Depth:	
Inspector Initials:	Excessive Turbidity?	Y	N	Cleaning Required:	Y N
	Unusual Color?	Y	N	Cleaning Performed:	Y N
	Unusual Odor?	Y	N	Approx. Lbs Removed:	
Date:	Comments:			Disposal (circle one below): *Vactor Truck* *Dumpster*	
4th Quarter (Oct - Dec)	Sheen on sump water?	Y	N	Date:	
	Sheen on tap water?	Y	N	Visible Sheen?	Y N
Inspector Initials:	Excessive Turbidity?	Y	N	If yes, what is source of sheen:	
	Unusual Color?	Y	N		
	Unusual Odor?	Y	N		
Date:	Comments:			Corrective Action:	

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APPENDIX C

BMP CUT SHEETS

- **Good Housekeeping.** Good housekeeping is an ongoing approach to improve and maintain a clean and orderly work environment and includes the following BMPs:

    - Promptly contain and clean up solid and liquid pollutant leaks and spills including oils, solvents, fuels, and dust from manufacturing operations on any soil, vegetation, or paved area exposed to stormwater.

    - Sweep paved material handling and storage areas regularly as needed to collect and dispose of dust and debris that could contaminate stormwater. Do not hose down pollutants from any area to the ground, storm drain, conveyance ditch, or receiving water unless necessary for dust control purposes to meet air quality regulations and unless the pollutants are conveyed to a treatment system approved by the local jurisdiction. Contact Ecology's regional office for a wastewater discharge permit, if required.

    - Clean oils, debris, sludge, etc. from all BMP systems regularly, including catch basins, sedimentation basins, oil/water separators, boomed areas, and conveyance systems, to prevent the contamination of stormwater. (Appendix D.3. – dangerous wastes.)

    - Promptly repair or replace all substantially cracked or otherwise damaged paved secondary containment, high-intensity parking, and any other drainage areas, which are subjected to pollutant material leaks or spills.

    - Promptly repair or replace all leaking connections, pipes, hoses, valves, etc., which can contaminate stormwater.

    - Use solid absorbents, e.g., clay and peat absorbents and rags for cleanup of liquid spills/leaks, where practicable.

- **Preventive Maintenance.** A preventive maintenance program includes inspection and maintenance of stormwater management devices (BMPs) and drainage systems, and routine inspections of industrial facility operations including vehicle maintenance. Equipment such as tanks, containers (drums), and outside piping, pumps, and process equipment should be checked regularly for signs of deterioration. The following are additional preventive BMPs applicable at industrial sites:

    - Prevent the discharge of unpermitted liquid or solid wastes, process wastewater, and sewage to ground or surface water or to storm drains, which discharge, to surface water or to the ground. Floor drains in potential pollutant source areas shall not be connected to storm drains, surface water, or to the ground. Eliminate illicit non-stormwater discharges within 30 days of discovery.

    - Conduct all oily parts cleaning, steam cleaning, or pressure washing of equipment or containers inside a building and/or on an impervious contained area such as a

concrete pad. Direct contaminated stormwater from such an area to a sanitary sewer where allowed by local sewer authority, or to a storm drain after implementing BMP #17 (see Appendix A–BMPs for washing and steam cleaning.

- Do not pave over contaminated soil unless it has been determined that ground water has not been and will not be contaminated by the soil. Call Ecology for assistance.

- Construct impervious areas that are compatible with the materials handled. Portland cement concrete, asphalt, or equivalent material may be considered.

- Use drip pans to collect leaks and spills from equipment such as cranes at ship/boat building and repair facilities, log stackers, industrial parts, trucks, and other vehicles that are stored outside. Empty drip pans immediately after a spill or leak is collected in an uncovered area.

- Drain oil from fuel filters before disposal. Discard empty oil and fuel filters, oily rags, and other oily solid waste into appropriately closed and properly labeled containers and in compliance with the Uniform Fire Code.

- For the storage of liquids use containers, such as steel and plastic drums, that are rigid and durable, corrosion resistant to the weather and fluid content, non-absorbent, water tight, rodent-proof, and equipped with a close fitting cover.

- For the temporary storage of solid wastes contaminated with liquids or other potential pollutant materials use dumpsters, garbage cans, drums and comparable containers that are durable, corrosion resistant, non-absorbent, non-leaking, and equipped with either a solid cover or screen cover to prevent littering. If covered with a screen, the container must be stored under a lean-to or equivalent structure.

- Where exposed to stormwater, use containers, piping, tubing, pumps, fittings, and valves that are appropriate for their intended use and for the contained liquid.

3. BMPs for Non-stormwater Illicit Connections to Storm Drains

Description of Pollutant Sources. Illicit connections are unpermitted sanitary or process wastewater discharges to a storm drain or to a surface water, rather than to a sanitary sewer, industrial process wastewater or other appropriate treatment. Examples of non-stormwater discharges include any water used directly in the manufacturing process (process water), air conditioner condensate, non-contact cooling water, vehicle wash water, and sanitary wastewater.

Pollutant Control Approach. Identify and eliminate unpermitted discharges within 30 days, or obtain an NPDES permit, where necessary.

Operational BMPs

- Identify and eliminate unpermitted non-stormwater discharges to storm drains, ground water, or surface water; and, convey unpermitted discharges to a sanitary sewer if allowed by the local sewer authority, or to other approved treatment; and, obtain appropriate permits for these discharges. Call the appropriate Ecology regional office if you discover a discharge of non-stormwater discharging to a surface water. ***The discharge must be eliminated within 30 days,*** or you may need to apply for Ecology's individual NPDES or State Waste Discharge Permit. Unless the discharge is eliminated or application is made for permit coverage, you are subject to enforcement action by Ecology or third party lawsuits.

- Conduct a survey of sanitary and industrial wastewater, condensate, cooling water, and any other contaminant discharge connections to storm drains and to surface water as follows:

  - Conduct a field survey of buildings, particularly older buildings, and other industrial areas to locate storm drains from buildings and paved surfaces. Note where these join the public storm drain(s).

  - During non-stormwater conditions inspect each storm drain for non-stormwater discharges. Record the locations of all non-stormwater discharges. Include all permitted discharges.

  - If useful, prepare a map of each area as it is to be surveyed. Show on the map the known location of storm drains, sanitary sewers, and permitted and unpermitted discharges. Aerial photos may be useful. Check records such as piping schematics to identify known side sewer connections and show these on the map. Consider using smoke, dye, or chemical analysis tests to detect connections between two conveyance systems (e.g., process water and stormwater). If desirable, conduct TV inspections of the storm drains and record the footage on videotape. Compare the observed locations of connections with the information on the map and revise the map accordingly. Note suspect connections that are inconsistent with the field survey. Several of the common dry weather inspection methods are described below.

Common Dry Weather Methods for Locating Non-stormwater Discharges

- Review a sewer map or plant schematic (a map of pipes and drainage systems used to carry process wastewater, non-contact cooling water, air conditioner condensate, and sanitary wastes (bathrooms, sinks, etc.). It is not uncommon to find that accurate and current information is not available. If you have an accurate and current map, simply examine the pathways of the different water circuits cited above. Determine where interior floor drains discharge. The drain(s) may be connected to the stormwater drainage system. If so, they ***must*** be disconnected and redirected to the sanitary sewer. Contact your local sewage utility before redirecting flow to the sanitary sewer.
- Observe all discharge points during dry weather for odors, discolorations, abnormal flows or conditions. As a rule, the discharge point should be dry during a period of extended dry weather since a stormwater collection system should only collect stormwater.
- Smoke testing of wastewater and stormwater collection and conveyance is used to detect connections between the two systems. During dry weather, the stormwater collection system is filled with smoke and then traced to sources. The appearance of smoke at the base of a toilet, sink, floor drain, wastewater conveyance, etc., indicates that there may be a connection with the stormwater system. If so, they must be disconnected and redirected to the sanitary sewer. Contact your local sewage utility before redirecting flow to the sanitary sewer.
- A dye test can be performed by simply releasing a dye into floor drains, sinks, basins, or other potential contaminant sources that may discharge to a surface water or storm sewer system. Examine discharge points in the stormwater collection system or surface water for discoloration.

5. BMPs for Loading and Unloading Areas for Liquid or Solid Material

Description of Pollutant Sources. Loading and unloading of liquid and solid materials are typically conducted at shipping and receiving, outside storage, fueling areas, etc. Materials transferred can include products, raw materials, intermediate products, waste materials, fuels, and scrap metals. Leaks and spills of fuels, oils, powders, organics, heavy metals, salts, acids, alkalis, etc., during transfer are potential causes of stormwater contamination. Spills from hydraulic line breaks are a common problem at loading docks.

Pollutant Control Approach. Cover and contain the loading/ unloading area where necessary to prevent run-on of stormwater and run-off of contaminated stormwater.

Operational BMPs

At All Loading/ Unloading Areas

- *A* significant amount of debris can accumulate at outside, uncovered loading/unloading areas. Sweep these surfaces frequently to remove material that could otherwise be washed off by stormwater. Sweep outside areas that are covered for a period of time by containers, logs, or other material after the areas are cleared.

- Place drip pans, or other appropriate temporary containment device, at locations where leaks or spills may occur such as hose connections, hose reels, and filler nozzles. Drip pans shall always be used when making and breaking connections (see Figure 2.2). Check loading/unloading equipment such as valves, pumps, flanges, and connections regularly for leaks and repair as needed.

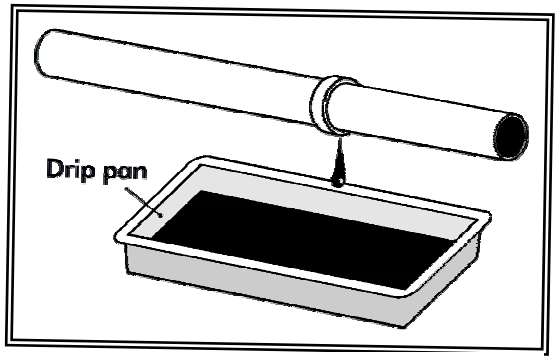

Figure 2.2 – Drip Pan

At Tanker Truck and Rail Transfer Areas to Above/Below-ground Storage Tanks

- To minimize the risk of accidental spillage, prepare an operations plan that describes procedures for loading/unloading. Train the employees, especially fork lift operators, in its execution and post it or otherwise have it readily available to employees.

- Prepare and implement an emergency spill cleanup plan for the facility (See BMP Spills of Oil and Hazardous Substances) which includes the following BMPs:

  - Ensure the cleanup of liquid/solid spills in the loading/unloading area immediately, if a significant spill occurs, and, upon completion of the loading/unloading activity, or, at the end of the working day.

  - Retain and maintain an appropriate oil spill cleanup kit on-site for rapid cleanup of material spills. .

- Ensure that an employee trained in spill containment and cleanup is present during loading/unloading.
- Report spills as required in BMP on spills

At Rail Transfer Areas to Above/Below-Ground Storage Tanks. Install a drip pan system as illustrated (see Figure 2.3) within the rails to collect spills/leaks from tank cars and hose connections, hose reels, and filler nozzles.

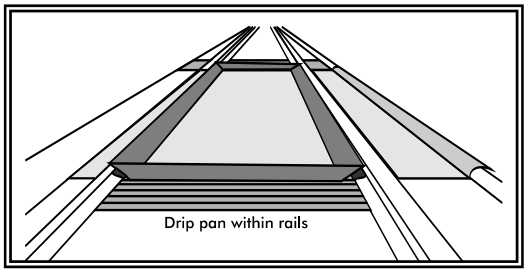

Figure 2.3 – Drip Pan Within Rails

Loading/Unloading from/to Marine Vessels. Facilities and procedures for the loading or unloading of petroleum products must comply with Coast Guard requirements specified in Appendix D.5.

Transfer of Small Quantities from Tanks and Containers. Refer to BMPs Storage of Liquids in Permanent Above-ground Tanks, and Storage of Liquid, Food Waste, or Dangerous Waste Containers, for requirements on the transfer of small quantities from tanks and containers, respectively.

Structural Source Control BMPs

At All Loading/Unloading Areas

- Consistent with Uniform Fire Code requirements (Appendix D.2) and to the extent practicable, conduct unloading or loading of solids and liquids in a manufacturing building, under a roof, or lean-to, or other appropriate cover.
- Berm, dike, and/or slope the loading/unloading area to prevent run-on of stormwater and to prevent the run-off or loss of any spilled material from the area.
- Large loading areas frequently are not curbed along the shoreline. As a result, stormwater passes directly off the paved surface into surface water. Place curbs along the edge or slope the edge such that the stormwater can flow to an internal storm drain system that leads to an approved treatment BMP.
- Pave and slope loading/unloading areas to prevent the pooling of water. The use of catch basins and drain lines within the interior of the paved area must be minimized as they will frequently be covered by material, or they should be placed in designated "alleyways" that are not covered by material, containers, or equipment.
- For the transfer of pollutant liquids in areas that cannot contain a catastrophic spill, consider installing an automatic shutoff system in case of unanticipated off-loading interruption (e.g., coupling break, hose rupture, overfill, etc.).

At Loading and Unloading Docks

- Install/maintain overhangs or door skirts that enclose the trailer end (see Figures 2.4 and 2.5) to prevent contact with rainwater.
- Design the loading/unloading area with berms, sloping, etc., to prevent the run-on of stormwater.
- Retain on-site the necessary materials for rapid cleanup of spills.

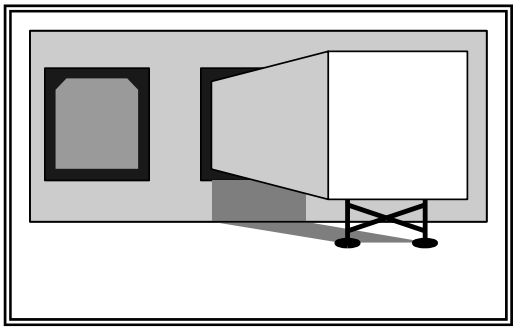

Figure 2.4 – Loading Dock with Door Skirt

At Tanker Truck Transfer Areas to Above/Below-ground Storage Tanks

- Pave the area on which the transfer takes place. If any transferred liquid, such as gasoline, is reactive with asphalt, pave the area with Portland cement concrete.
- Slope, berm, or dike the transfer area to a dead-end sump, spill containment sump, a spill control (SC) oil/water separator, or other spill control device. The minimum spill retention time should be 15 minutes at the greater flow rate of the highest fuel dispenser nozzle through-put rate, or the peak flow rate of the 6-month, 24-hour storm event over the surface of the containment pad, whichever is greater. The volume of the spill containment sump should be a minimum of 50 gallons with an adequate grit sedimentation volume.

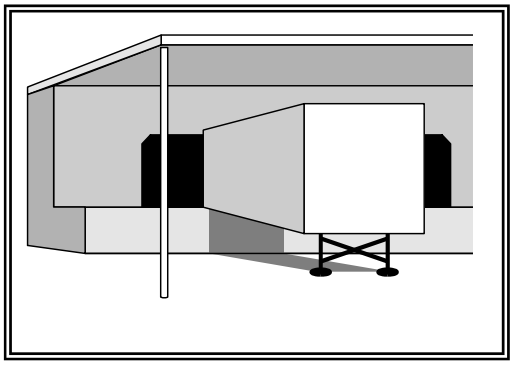

Figure 2.5 – Loading Dock with Overhang

6. BMPs for Maintenance and Repair of Vehicles and Equipment

Description of Pollutant Sources. Pollutant sources include parts/vehicle cleaning, spills/leaks of fuel and other liquids, replacement of liquids, outdoor storage of batteries/liquids/parts, and vehicle parking.

Pollutant Control Approach. Control of leaks and spills of fluids using good housekeeping and cover and containment BMPs.

Operational BMPs

- Inspect for leaks all incoming vehicles, parts, and equipment stored temporarily outside.
- Use drip pans or containers under parts or vehicles that drip or that are likely to drip liquids, such as during dismantling of liquid containing parts or removal or transfer of liquids.
- Remove batteries and liquids from vehicles and equipment in designated areas designed to prevent stormwater contamination. Store cracked batteries in a covered non-leaking secondary containment system.
- Empty oil and fuel filters before disposal. Provide for proper disposal of waste oil and fuel.

- Do not pour/convey washwater, liquid waste, or other pollutant into storm drains or to surface water. Do not hose down work areas to storm drains. Use dry methods for cleaning leaked fluids. Check with the local sanitary sewer authority for approval to convey to a sanitary sewer.
- Do not connect maintenance and repair shop floor drains to storm drains or to surface water. To allow for snowmelt during the winter, a drainage trench with a sump for particulate collection can be installed and used only for draining the snowmelt and not for discharging any vehicular or shop pollutants.
- Consider storing damaged vehicles inside a building or other covered containment until all liquids are removed. Remove liquids from vehicles retired for scrap.
- Consider cleaning parts with aqueous detergent based solutions or non-chlorinated solvents such as kerosene or high flash mineral spirits, and/or use wire brushing or sand blasting whenever practicable. Avoid using toxic liquid cleaners such as methylene chloride, 1,1,1-trichloroethane, trichloroethylene, or similar chlorinated solvents. Choose cleaning agents that can be recycled.
- Inspect all BMPs regularly, particularly after a significant storm. Identify and correct deficiencies to ensure that the BMPs are functioning as intended.

Structural Source Control BMPs

- Conduct all maintenance and repair of vehicles and equipment in a building, or other covered impervious containment area that is sloped to prevent run-on of uncontaminated stormwater and run-off of contaminated stormwater.
- Park large mobile equipment, such as log stackers, in a designated contained area.

Treatment BMPs, if required (See Section E. 10.). Contaminated stormwater run-off from vehicle staging and maintenance areas may be conveyed to a sanitary sewer, if allowed by the local sewer authority, or to an API or CP oil and water separator followed by a basic treatment BMP, media filtration systems, or other equivalent oil treatment system (3, 4).

7. BMPs for Maintenance of Stormwater Drainage and Treatment Systems

Description of Pollutant Sources. Facilities include roadside catch basins, conveyance systems, detention facilities such as ponds and vaults, oil and water separators, biofilters, settling basins, infiltration systems, and all other types of stormwater treatment systems presented in Volume V of SWMM (3). Oil and grease, hydrocarbons, debris, heavy metals, sediments, and contaminated water are found in catch basins, oil and water separators, settling basins, etc.

Pollutant Control Approach. Provide maintenance and cleaning of debris, sediments, and oil from stormwater collection, conveyance, and treatment systems to obtain proper operation.

Operational BMPs. Maintain stormwater treatment facilities according to the O&M procedures presented in Section 4.6 of Volume V (3) in addition to the following BMPs:

- Inspect and clean treatment BMPs, conveyance systems, and catch basins as needed, and determine whether improvements in O&M are needed.

- Promptly repair any deterioration threatening the structural integrity of the facilities. These include replacement of clean-out gates, catch basin lids, and rock in emergency spillways.
- Ensure that storm sewer capacities are not exceeded and that heavy sediment discharges to the sewer system are prevented.
- Regularly remove debris and sludge from BMPs used for peak-rate control, treatment, etc., and discharge to a sanitary sewer if approved by the sewer authority or truck to a local or state government approved disposal site.
- Post warning signs; "Dump No Waste - Drains to Ground Water," "Streams," "Lakes," or emboss on or adjacent to all storm drain inlets *where practical*.

8. BMPs for Outside Manufacturing Activities

Description of Pollutant Sources. Manufacturing pollutant sources include outside process areas, stack emissions, and areas where manufacturing activity has taken place in the past and significant pollutant materials remain and are exposed to stormwater.

Pollution Control Approach. Cover and contain outside manufacturing and prevent stormwater run-on and contamination, where feasible.

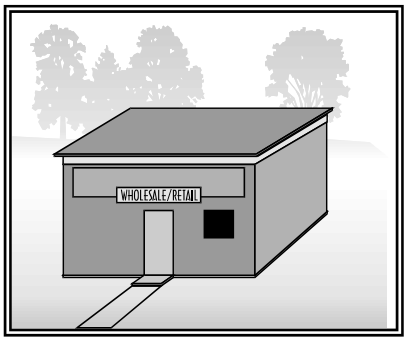

Figure 2.6 – Enclose the Activity

Operational BMP

Sweep paved areas regularly, as needed, to prevent contamination of stormwater.

Structural Source Control BMPs

- Alter the activity by eliminating or minimizing the contamination of stormwater.
- Enclose the activity (see Figure 2.6). If possible, enclose the manufacturing activity in a building.
- Cover the activity and connect floor drains to a sanitary sewer, if approved by the local sewer authority. Berm or slope the floor as needed to prevent drainage of pollutants to outside areas. (Figure 2.7)
- Isolate and segregate pollutants as feasible. Convey the segregated pollutants to a sanitary sewer, process treatment or a dead-end sump depending on available methods and applicable permit requirements.

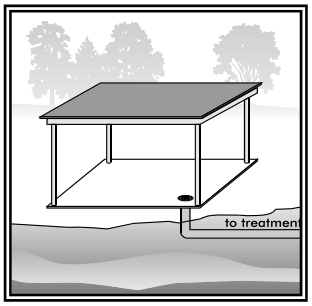

Figure 2.7 – Cover the Activity

9. BMPs for Mobile Fueling of Vehicles and Heavy Equipment

Description of Pollutant Sources. Mobile fueling, also known as fleet fueling, wet fueling, or wet hosing, is the practice of filling fuel tanks of vehicles by tank trucks that are driven to the yards or sites where the vehicles to be fueled are located. Diesel fuel is considered as a Class II Combustible Liquid, whereas gasoline is considered as a Flammable Liquid.

Small Dischargers

Small dischargers are defined as those where washing is carried out infrequently:

- Involving 1 or 2 pieces of equipment and/or vehicles per day, not exceeding eight during any week; and/or
- Discharging less than 100 gallons of washwater each day; and
- Washing of the vehicle/equipment is not the primary business activity of the discharges. For example, mobile washers are not small dischargers. Recommendations in this manual for "Mobile washers" should be followed.

Do

- ❖ Discharge to a sanitary sewerage system when possible. If you are not sure the nearby drain is a sanitary sewer, contact your local sewer utility.
- ❖ If a sanitary sewerage system is not available, discharge to a landscaped, grassy ground surface, or dirt area where the washwater can soak into the ground or evaporate. Note: soapy washwater may adversely affect landscaping. Discuss this option with the building owner.
- ❖ Keep a distance of at least 100 feet from a well head if discharging to ground.
- ❖ Minimize the amount of soaps and detergents used.

Don't

- ❖ Do not discharge to a surface water or a storm sewer.
- ❖ Do not clean engines or do any cleaning involving strong acids, caustics, or other metal brighteners.

2. BMPs for Fueling At Dedicated Stations

Description of Pollutant Sources. Typically, stormwater contamination at fueling stations is caused by leaks/spills of fuels, lube oils, radiator coolants, and vehicle washwater.

Pollutant Control Approach. Cover with roof or canopy and conduct the fueling in an impervious containment area.

Operational BMPs

- Prepare an emergency spill response and cleanup plan (see applicable spill control BMPs) and have designated trained person(s) available either on site or on call at all times to promptly and properly implement that plan and immediately cleanup all spills. Keep suitable cleanup materials, such as dry adsorbent materials, on site to allow prompt cleanup of a spill.
- Train employees on the proper use of fuel dispensers. Post signs in accordance with the Uniform Fire Code (UFC). Post "No Topping Off" signs (topping off gas tanks causes spillage and vents gas fumes to the air). Make sure that the automatic shutoff on the fuel nozzle is functioning properly.
- The person conducting the fuel transfer must be present at the fueling pump during fuel transfer, particularly at unattended or self-serve stations.
- Keep drained oil filters in a suitable container or drum.

Structural Source Control BMPs

- Design the fueling island to control spills (dead-end sump or spill control separator in compliance with the UFC) and to treat collected stormwater and/or wastewater to required levels. Slope the concrete containment pad around the fueling island toward drains—either trench drains, catch basins, and/or a dead-end sump. The slope of the drains shall not be less than 1 percent (Section 7901.8 of the UFC). Drains to treatment shall have a shutoff valve, which must be closed in the event of a spill. The spill control sump must be sized in compliance with Section 7901.8 of the UFC; or
- Design the spill containment pad of the fueling island with a sill or berm raised to a minimum of four inches (Section 7901.8 of the UFC) to prevent the runoff of spilled liquids and to prevent run-on of stormwater from the surrounding area. Raised sills are not required at the open-grate trenches that connect to an approved drainage-control system.
- The fueling pad must be paved with Portland cement concrete, or equivalent. Asphalt is not considered an equivalent material.
- The fueling island must have a roof or canopy to prevent the direct entry of precipitation onto the spill containment pad (see Figure 2.1). The roof or canopy should, at a minimum, cover the spill containment pad (within the grade break or

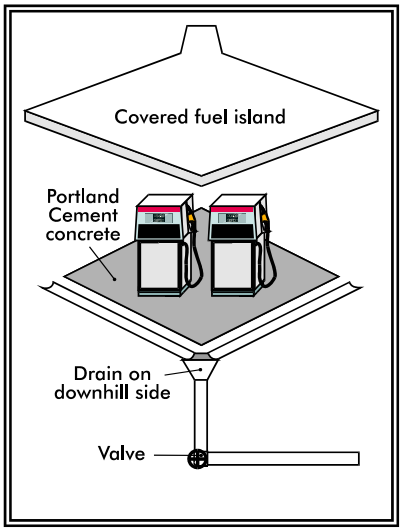

Figure 2.1 – Covered Fuel Island

fuel dispensing area) and preferably extend several additional feet to reduce the introduction of windblown rain. Convey all roof drains to storm drains outside the fueling containment area.

- If treatment of the runoff is required (see section E.10.) stormwater collected on the fuel island containment pad must be conveyed to a sanitary sewer system, if approved by the sanitary authority; or to an appropriate treatment system such as an oil/water separator, media filter, biofilter, or equivalent treatment. Discharges from treatment systems to storm drains or surface water or to the ground must not display ongoing or recurring visible sheen and must not contain greater than a benchmark value of oil and grease-petroleum.

- Alternatively, stormwater collected on the fuel island containment pad may be collected and held for proper off-site disposal.

- Conveyance of any fuel-contaminated stormwater to a sanitary sewer must be approved by the local sewer authority and must comply with pretreatment regulations (WAC 173-216-060). These regulations prohibit discharges that could cause fire or explosion. An explosive or flammable mixture is defined under state and federal pretreatment regulations, based on a flash point determination of the mixture. If contaminated stormwater is determined not to be explosive, then it could be conveyed to a sanitary sewer system.

- Transfer the fuel from the delivery tank trucks to the fuel storage tank in impervious contained areas and ensure that appropriate overflow protection is used. Alternatively, cover nearby storm drains during the filling process and use drip pans under all hose connections.

Additional BMPs for vehicles ten feet in height or greater

A roof or canopy may not be practicable at fueling stations that regularly fuel vehicles that are ten feet in height or greater. At those types of fueling facilities, the following BMPs apply, as well as the applicable BMPs and fire prevention (UFC requirements) of this BMP for fueling stations.

- If a roof or canopy is impractical the concrete fueling pad must be equipped with emergency spill control, which includes a shutoff valve for the drainage from the fueling area. The valve must be closed in the event of a spill. An electronically actuated valve is preferred to minimize the time lapse between spill and containment. Spills must be cleaned up and disposed off site in accordance with BMPs for Spills of Oil and Hazardous Substances.

- If treatment is required (see Section E.10.) the valve may be opened to convey contaminated stormwater to a sanitary sewer, if approved by the sewer authority, or to oil/water separator, media filter, biofilter, or equivalent treatment. Discharges from treatment systems to storm drains or surface water or to the ground must not display ongoing or recurring visible sheen and must not contain greater than a benchmark value of oil and grease.

6. BMPs for Maintenance and Repair of Vehicles and Equipment

Description of Pollutant Sources. Pollutant sources include parts/vehicle cleaning, spills/leaks of fuel and other liquids, replacement of liquids, outdoor storage of batteries/liquids/parts, and vehicle parking.

Pollutant Control Approach. Control of leaks and spills of fluids using good housekeeping and cover and containment BMPs.

Operational BMPs

- Inspect for leaks all incoming vehicles, parts, and equipment stored temporarily outside.
- Use drip pans or containers under parts or vehicles that drip or that are likely to drip liquids, such as during dismantling of liquid containing parts or removal or transfer of liquids.
- Remove batteries and liquids from vehicles and equipment in designated areas designed to prevent stormwater contamination. Store cracked batteries in a covered non-leaking secondary containment system.
- Empty oil and fuel filters before disposal. Provide for proper disposal of waste oil and fuel.

- Do not pour/convey washwater, liquid waste, or other pollutant into storm drains or to surface water. Do not hose down work areas to storm drains. Use dry methods for cleaning leaked fluids. Check with the local sanitary sewer authority for approval to convey to a sanitary sewer.
- Do not connect maintenance and repair shop floor drains to storm drains or to surface water. To allow for snowmelt during the winter, a drainage trench with a sump for particulate collection can be installed and used only for draining the snowmelt and not for discharging any vehicular or shop pollutants.
- Consider storing damaged vehicles inside a building or other covered containment until all liquids are removed. Remove liquids from vehicles retired for scrap.
- Consider cleaning parts with aqueous detergent based solutions or non-chlorinated solvents such as kerosene or high flash mineral spirits, and/or use wire brushing or sand blasting whenever practicable. Avoid using toxic liquid cleaners such as methylene chloride, 1,1,1-trichloroethane, trichloroethylene, or similar chlorinated solvents. Choose cleaning agents that can be recycled.
- Inspect all BMPs regularly, particularly after a significant storm. Identify and correct deficiencies to ensure that the BMPs are functioning as intended.

Structural Source Control BMPs

- Conduct all maintenance and repair of vehicles and equipment in a building, or other covered impervious containment area that is sloped to prevent run-on of uncontaminated stormwater and run-off of contaminated stormwater.
- Park large mobile equipment, such as log stackers, in a designated contained area.

Treatment BMPs, if required (See Section E. 10.). Contaminated stormwater run-off from vehicle staging and maintenance areas may be conveyed to a sanitary sewer, if allowed by the local sewer authority, or to an API or CP oil and water separator followed by a basic treatment BMP, media filtration systems, or other equivalent oil treatment system (3, 4).

14. BMPs for Storage of Liquid, Food Waste, or Dangerous Wastes in Containers

Description of Pollutant Sources. Steel and plastic drums with volumetric capacities of 55 gallons or less are typically used at industrial facilities for container storage of liquids and powders. The BMPs specified below apply to container(s) located outside a building used for temporary storage of accumulated food wastes, vegetable or animal grease, used oil, liquid feedstock or cleaning chemical, or Dangerous Wastes (liquid or solid) unless the business is permitted by Ecology to store the wastes (Appendix D.4). Leaks and spills of pollutant materials during handling and storage are the primary sources of pollutants. Oil and grease, acid/alkali pH, BOD, COD are potential pollutant constituents.

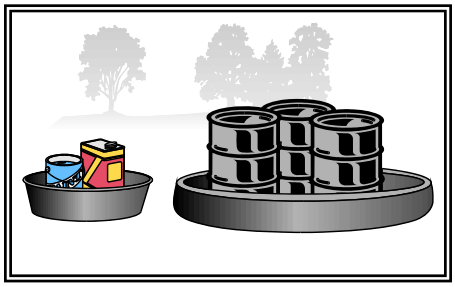

Figure 2.8
Secondary Containment System

Pollutant Control Approach. Store containers in impervious containment under a roof or other appropriate cover, or in a building. For roll-containers (for example, dumpsters) that are picked up directly by the collection truck, a filet can be placed on both sides of the curb to facilitate moving the dumpster. If a storage area is to be used on site for less than 30 days, a portable temporary secondary system like that shown in Figure 2.8 can be used in lieu of a permanent system as described above.

Operational BMPs

- Place tight-fitting lids on all containers.
- Place drip pans beneath all mounted container taps and at all potential drip and spill locations during filling and unloading of containers.
- Inspect container storage areas regularly for corrosion, structural failure, spills, leaks, overfills, and failure of piping systems. Check containers daily for leaks/spills. Replace containers and replace and tighten bungs in drums as needed.
- Businesses accumulating dangerous wastes that do not contain free liquids need only to store these wastes in a sloped designated area with the containers elevated or otherwise protected from storm water run-on.
- Drums stored in an area where unauthorized persons may gain access must be secured in a manner that prevents accidental spillage, pilferage, or any unauthorized use (see Figure 2.9).

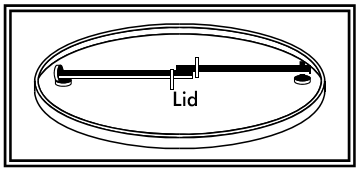

Figure 2.9
Locking System for Drum

- If the material is a dangerous waste, the business owner must comply with any additional Ecology requirements. (Appendix D.3)
- Storage of reactive, ignitable, or flammable liquids must comply with the Uniform Fire Code (Appendix D.2).
- Cover dumpsters, or keep them under cover such as a lean-to, to prevent the entry of stormwater. Replace or repair leaking garbage dumpsters.
- Drain dumpsters and/or dumpster pads to sanitary sewer. Keep dumpster lids closed. Install waterproof liners.

Structural Source Control BMPs

- Keep containers with dangerous waste, food waste, or other potential pollutant liquids inside a building unless this is impracticable due to site constraints or Uniform Fire Code requirements.
- Store containers in a designated area, which is covered, bermed or diked, paved and impervious in order to contain leaks and spills (see Figure 2.10). The secondary containment shall be sloped to drain into a dead-end sump for the collection of leaks and small spills.

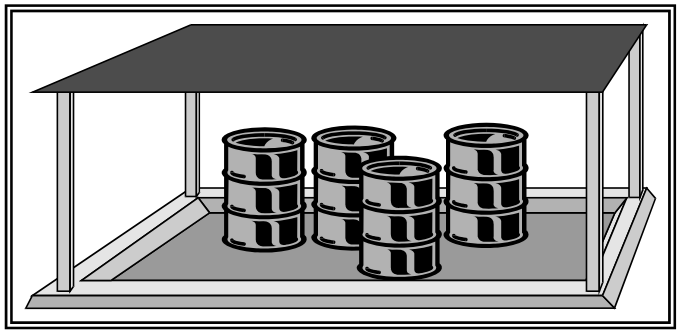

Figure 2.10 – Covered and Bermed Containment Area

- For liquid wastes, surround the containers with a dike as illustrated in Figure 2.10. The dike must be of sufficient height to provide a volume of either 10 percent of the total enclosed container volume or 110 percent of the volume contained in the largest container, whichever is greater, or, if a single container, 110 percent of the volume of that container.

Where material is temporarily stored in drums, a containment system can be used as illustrated, in lieu of the above system (see Figure 2.8).

- Place containers mounted for direct removal of a liquid chemical for use by employees inside a containment area as described above. Use a drip pan during liquid transfer

Treatment BMP, if required (See Section E.10.)

- For contaminated stormwater in the containment area, connect the sump outlet to a sanitary sewer, if approved by the local Sewer Authority, or to appropriate treatment such as an API or CP oil/water separator, catch basin filter, or other appropriate system (3, 4). Equip the sump outlet with a normally closed valve to prevent the release of spilled or leaked liquids, especially flammables (compliance with fire codes), and dangerous liquids. This valve may be opened only for the conveyance of contaminated stormwater to treatment.

- Another option for discharge of contaminated stormwater is to pump it from a dead-end sump or catchment to a tank truck or other appropriate vehicle for off-site treatment and/or disposal.

PUGET SOUND ENERGY
The Energy To Do Great Things

Photo 1. View looking southwest at Catch Basin "A" (right arrow). A small drain is located in the background (left arrow, see photo 2). The drain discharges to the Upper Baker Tailrace (Baker River).

Photo 2. The drain at the Upper Baker Powerhouse. The drain collects runoff from a small concrete pad at the entrance to the Powerhouse and discharges to the Upper Baker Tailrace (Baker.River). A permanently capped, unused fill port is located to the left of the drain.

PUGET SOUND ENERGY
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Photo 3. View looking northeast at Catch Basin "B". Catch Basin B collects surface runoff from a portion of the roadway and adjacent gravel area northeast of the catch basin (see Figure 6). The outfall for Catch Basin B drains to the Lower Baker Tailrace (Baker River).