Five-Year Review Report

Fourth Five-Year Review Report
for
Coal Creek AKA Ross Electric
WAD980726061

Chehalis
Lewis County, Washington

August 2015

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Fourth Five-Year Review Report
for
Coal Creek AKA Ross Electric
214 Coal Creek Road
Chehalis
Lewis County, Washington

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List of Acronyms

2,3,7,8-TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
ARAR	Applicable or Relevant and Appropriate Requirement
AWQC	Ambient Water Quality Criteria
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
COC	Contaminant of Concern
EPA	United States Environmental Protection Agency
FYR	Five-Year Review
HI	Hazard Index
IC	Institutional Control
LCPUD	Lewis County Public Utility District No. 1
µg/L	Microgram per Liter
MCL	Maximum Cleanup Level
MCLG	Maximum Contaminant Level Goal
mg/kg	Milligram per Kilogram
MTCA	Model Toxics Control Act
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PCB	Polychlorinated Biphenyl
PCDD	Polychlorinated Dibenzodioxins
PCDF	Polychlorinated Dibenzofurans
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
RfD	Reference Dose
ROD	Record of Decision
RPM	Remedial Project Manager
RSL	Regional Screening Level
SMCL	Secondary Maximum Contaminant Level
TBC	To-Be-Considered
TCLP	Toxic Characteristic Leaching Procedure
TEE	Terrestrial Ecological Evaluation
TEQ	Toxicity Equivalence
TEF	Toxicity Equivalency Factors
TSCA	Toxic Substances Control Act

Executive Summary

The 8-acre Coal Creek AKA Ross Electric site (the Site) is a former transformer salvage facility located northeast of Chehalis, Washington. Owners and operators at the Site handled polychlorinated biphenyls (PCBs), heavy metals and other hazardous substances. The remedy for the Site, selected in the 1990 Record of Decision (ROD), included stabilization and capping of contaminated soils on site, institutional controls, and a groundwater monitoring plan for long-term surveillance of the surficial aquifer and evaluation of the performance of the containment system. The triggering action for this five-year review (FYR) was the signing of the previous FYR on March 18, 2010.

The remedy is functioning as intended by the Site's 1990 ROD. Contaminated soils were capped on site and groundwater and surface water cleanup levels had been met for a four-year period ending in 1998. Institutional controls are in place to prevent inappropriate use at the Site. Fencing around the Site deters trespassing. O&M reporting was recently re-established in January 2015; quarterly site inspections and reporting should continue.

The remedy at the Site is currently protective of human health and the environment because the landfill cap, fence and institutional controls are effective in preventing exposure to contaminants that remain on site. However, in order for the remedy to be protective in the long term, the Site requires an updated site health and safety plan.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Coal Creek AKA Ross Electric		
EPA ID: WAD980726061		
Region: 10	**State:** WA	**City/County:** Chehalis/Lewis

SITE STATUS	
NPL Status: Non-NPL	
Multiple OUs? No	**Has the site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA
Author name: Claire Hong (EPA) and Johnny Zimmerman-Ward (Skeo Solutions)
Author affiliation: EPA and Skeo Solutions
Review period: January 2015 – August 2015
Date of site inspection: March 4, 2015
Type of review: Statutory
Review number: 4
Triggering action date: March 18, 2010
Due date *(five years after triggering action date)*: March 18, 2015

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
None

Issues and Recommendations Identified in the Five-Year Review:

OU(s): OU1	**Issue Category: Operations and Maintenance**
	Issue: The health and safety plan for the Site is outdated.
	Recommendation: Update the health and safety plan for the Site.

Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	Yes	PRP	EPA	9/1/2016

Sitewide Protectiveness Statement	
Protectiveness Determination: Short-term Protective	*Addendum Due Date (if applicable):* Click here to enter date.
Protectiveness Statement: The remedy at the Site is currently protective of human health and the environment because the landfill cap, fence and institutional controls are effective in preventing exposure to contaminants that remain on site. However, in order for the remedy to be protective in the long term, the Site requires an updated site health and safety plan.	

Fourth Five-Year Review Report
for
Coal Creek AKA Ross Electric Superfund Site

1.0 Introduction

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. FYR reports document FYR methods, findings and conclusions. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The United States Environmental Protection Agency prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121 states:

> If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

EPA interpreted this requirement further in the NCP, 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

> If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.

EPA conducted the FYR from January 2015 to August 2015. Skeo Solutions, an EPA Region 10 contractor, compiled this report regarding the remedy implemented at the Coal Creek AKA Ross Electric site[1] (the Site) in Chehalis, Lewis County, Washington. EPA is the lead agency for developing and implementing the remedy for the potentially responsible party (PRP)-financed cleanup at the Site. The Washington Department of Ecology, as the support agency representing the State of Washington, has reviewed all supporting documentation and provided input to EPA during the FYR process.

[1] Although the Site was not formally proposed or listed on the National Priorities List, it was still remediated under Superfund authority.

This is the fourth FYR for the Site. The triggering action for this statutory review is the previous FYR. The FYR is required due to the fact that hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. The Site consists of one operable unit.

2.0 Site Chronology

Table 1 lists the dates of important events for the Site.

Table 1: Chronology of Site Events

Event	Date
Property acquired by Lewis County Public Utility District No. 1 (LCPUD)	1948
Site use associated with manufacturing, repairing and scrapping electrical equipment	1949 to 1983
Transformer salvage activities ceased	1983
Washington Department of Ecology issued a compliance order under State Water Quality Regulations requiring Ross Electric and LCPUD to initiate certain site response/cleanup actions	February 1983
Ross Electric terminated its lease for the Site; LCPUD assumed responsibility for the Site	September 1983
EPA and LCPUD signed an agreement to initiate certain site response/cleanup actions and stabilize the Site	April 1984
PRPs took actions to stabilize the Site	1983 to 1984
Site inspection	May 30, 1985
EPA notified LCPUD of the need for a removal site assessment	1985
PRPs formed the Coal Creek Steering Committee	1986
EPA issued CERCLA Administrative Order on Consent for remedial investigation and feasibility study (RI/FS) with 66 PRPs	February 19, 1988
RI/FS completed	August 15, 1989
EPA-generated Supplemental Risk Assessment completed	April 1990
EPA notified PRPs of the need to conduct additional investigations to assess impacts from a 100-year flood event and gather additional information on leaching characteristics of heavy metals found on site	January 1990 and May 1990
Record of Decision (ROD) issued	October 17, 1990
Consent decrees with de minimis parties and major parties	November 13, 1991
Restrictive Covenant filed with County Auditor	March 10, 1992
Phase I remedial design approved by EPA	December 15, 1992
Phase I remedial action	March 1993 to May 1993
Phase II remedial design approved by EPA	November 4, 1993
Phase II remedial action	September 1993 to October 1994
Final site inspection	November 4, 1994
Consent Decree with de minimis parties terminated	August 11, 1994
Remedial Action Report approved by EPA	February 2, 1995
O&M Plan approved by EPA	March 8, 1995
Final Close Out Report	June 5, 1995
Final Closure Report	July 15, 1999
First FYR	February 4, 2000
Consent decree with major parties terminated	December 22, 2000
Monitoring wells abandoned in accordance with state regulations	July 9, 2001
Second FYR	March 23, 2005
Third FYR	March 23, 2010

3.0 Background

3.1 Physical Characteristics

The Site, which consists of about 8 acres, is located at the head of an alluvial valley about one mile northeast of Chehalis, Washington (Figure 1). The Site's address is 214 Coal Creek Road. Lewis County Public Utility District No. 1 (LCPUD) currently owns the site property. It is bounded by Coal Creek to the southwest and by Coal Creek Road to the east (Figure 2). An eight-foot chain-link fence encloses the Site.

A fill mound in the northeast corner of the Site was a prominent feature prior to cleanup. This mound covered about a quarter of the site area. It was composed of 2 to 8 feet of fill material, including native site and clay soils, ash, coal remains, and mixed debris from transformer scrapping operations. A 1-to-2-foot-thick sand and gravel cover was placed over the fill as a working surface for vehicle access when the facility was operating. Currently, the landfill cell cover is covered by grasses.

The Site is located in a floodplain bounded by bedrock hills to the northeast and southwest. Coal Creek receives all local surface water drainage, including that from the Site. A surface water drainage ditch extends from the southwest corner of the former fill mound and meanders through the wetlands to the west, where it discharges to Coal Creek.

The Site is located within a regional groundwater discharge zone, where hydraulic gradients direct groundwater flow toward the surface. Regional topography suggests that groundwater flows from the highlands northeast of the Site toward the center of the valley where it discharges to Coal Creek or flows down the axis of the Coal Creek Valley.

In the last 20 years, four 100-year floods have occurred in the Chehalis River Basin, in January and November 1990, February 1996 and December 2007.

3.2 Land and Resource Use

The Site is located in a rural residential area. Electric utilities have primarily owned the site property since the early 1900s. The Coal Creek Valley is largely undeveloped with few people living in the immediate vicinity of the Site. During the site inspection on September 21, 2009, four homes were identified within a quarter-mile mile of the Site, along Coal Creek Road.

People do not use surface water resources near the Site for drinking water. Small quantities of surface water may be used for watering livestock or crop irrigation. Coal Creek has been extensively altered by development; it now provides relatively poor fishery habitat. Stream water quality is characterized by high turbidity, temperatures and nitrate levels, and low flows.

City water service extends from the base of Coal Creek Valley to a point a half-mile upstream from the Site. All homes without city water service are upgradient from the Site.

Wildlife is expected to be typical of wet lowland conditions in the region. Currently, deer and birds occupy the Site during at least part of the year.

3.3 History of Contamination

Utility companies have been the primary owners of the site property since the early 1900s. Documented use of the property for industrial purposes dates back to 1935. Property records indicate site use associated with the manufacturing, repairing and scrapping of electrical equipment. Its present owner, LCPUD, acquired the property in 1948. Transformer salvage operations ceased in 1983.

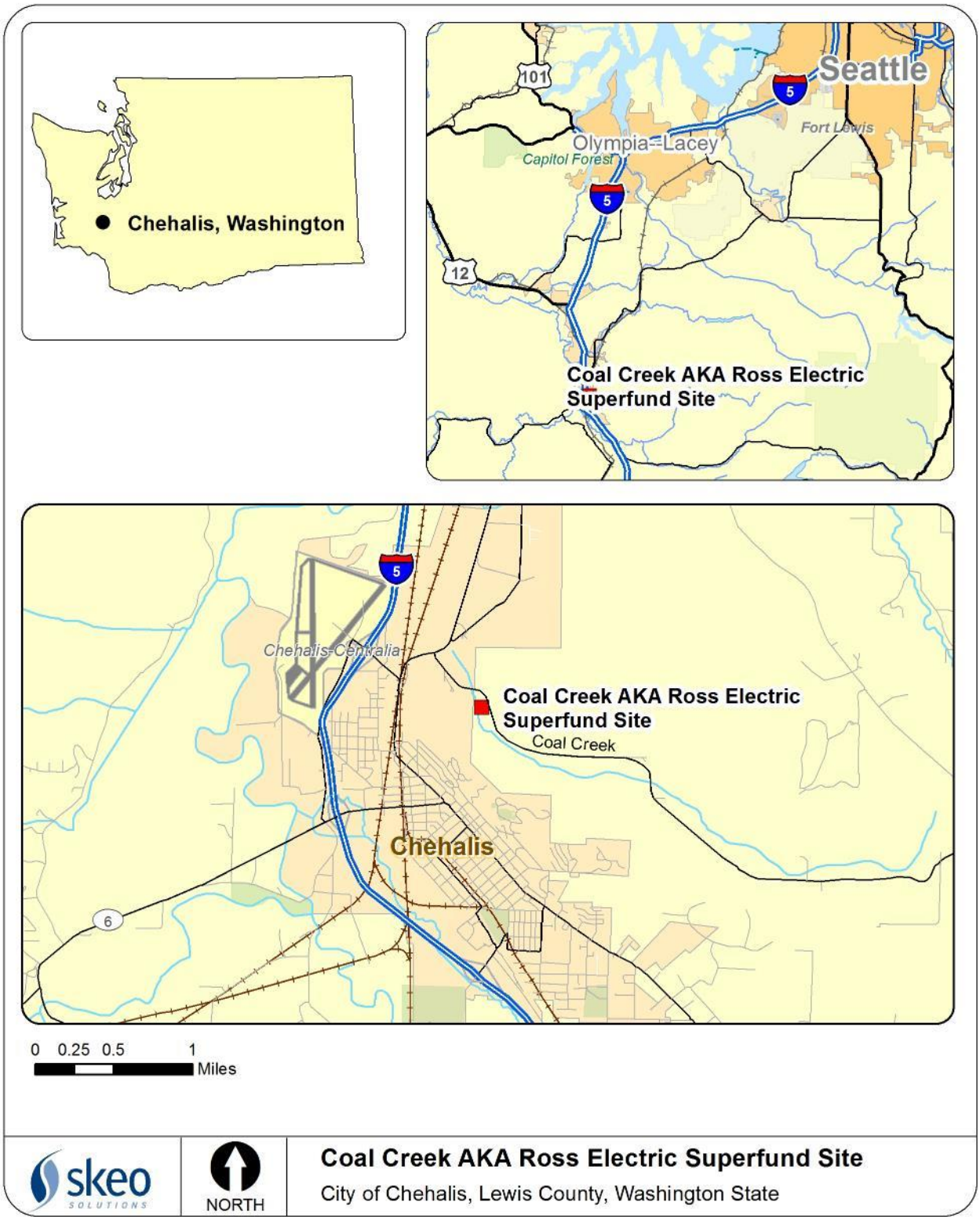
Owners and operators engaged in activities involving hazardous substances including, but not limited to, polychlorinated biphenyls (PCBs) and heavy metals. During this time, transformer fluid containing PCBs and chlorobenzenes was dumped or spilled on the ground. Metals such as arsenic, barium, copper, lead, mercury and zinc have also been introduced as a result of the disposal of scrap electrical equipment. The presence of a coal burning steam generating plant on the Site prior to 1949 was also a source of many trace metals.

Pathways of contamination included surface water runoff, groundwater discharging from the former fill mound, sediment migration down a former drainage ditch that connected the fill mound with Coal Creek, and emissions in the form of volatile gases and fugitive dusts. The drainage ditch served as a mechanism for the transport of site contaminants to surrounding wetlands. This pathway was especially significant in light of flood events and their ability to scour ditch sediments. Due to the relative immobility of site contaminants (especially PCBs) and to environmental factors such as absorbent clay soils and the upward component of the groundwater flow, contamination on site did not migrate far beyond the edge of the former fill mound except for the drainage channel and subsurface conduits. In addition to contaminated fill mound soils, other potential sources of contamination included subsurface pipes and flumes as well as underground storage tanks.

3.4 Initial Response

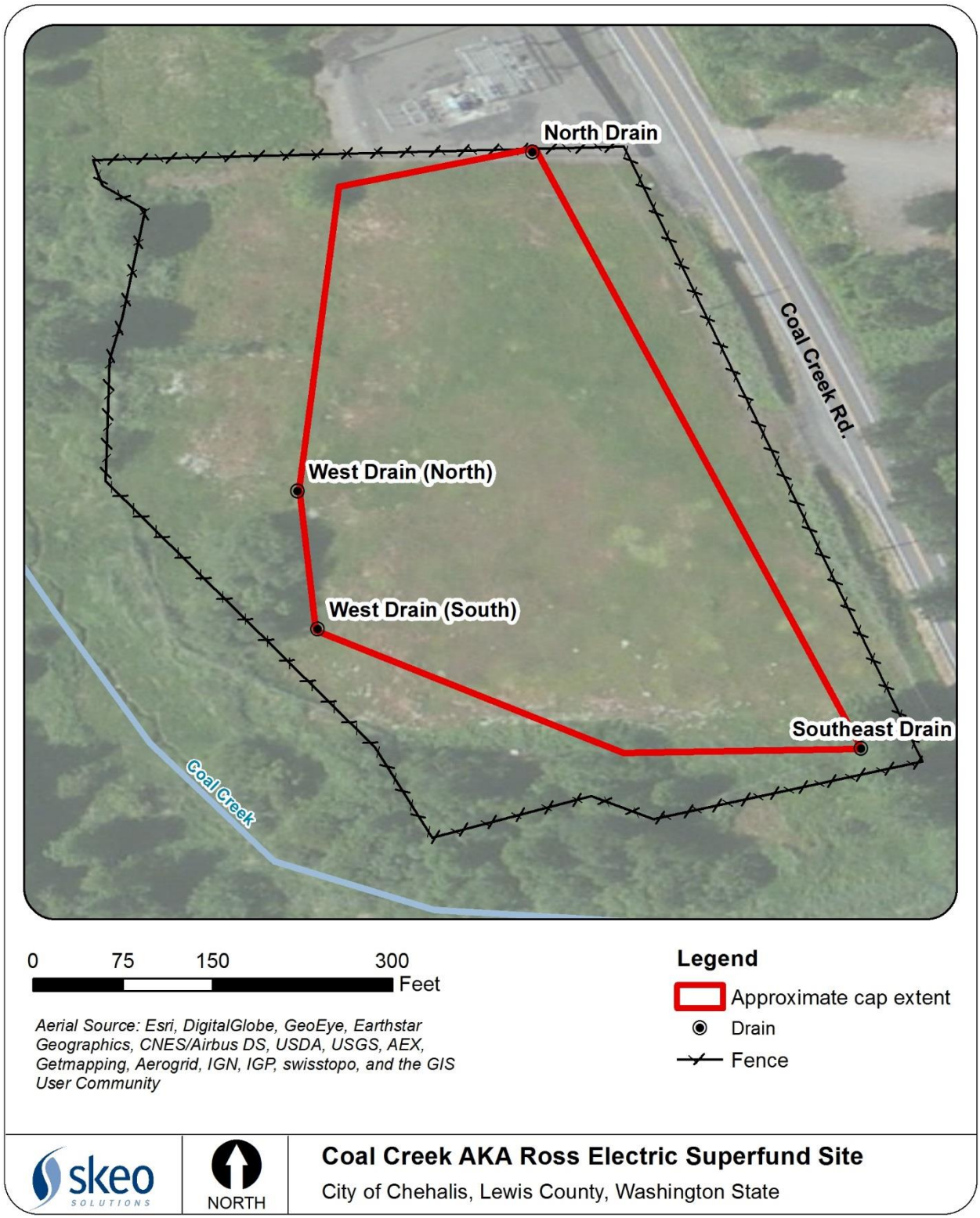
In 1983 and 1984, the PRPs took actions to stabilize the Site. These response actions included covering portions of the former fill mound with plastic to control air emissions and prevent rainfall from percolating through contaminated soils, installing plywood dams in the drainage ditch to retard migration of contaminated sediments, installing monitoring wells to assess the extent of contamination in the groundwater, and erecting a perimeter fence to secure the Site.

Figure 1: Site Location Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Figure 2: Detailed Site Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

3.5 Basis for Taking Action

On February 19, 1988, EPA issued a Consent Order on the Site requiring Coal Creek Steering Committee representatives to conduct a remedial investigation and feasibility study (RI/FS). The Coal Creek Steering Committee was composed of approximately 86 PRPs; most were electric utility companies that shipped used electrical equipment to the Site for disposal. The PRPs completed the RI/FS on August 15, 1989. EPA-generated risk assessment documents supplemented the RI/FS in April 1990.

The RI identified soils (direct contact or ingestion by humans) and air (volatilization or dust generation) as the exposure media of greatest concern at the Site. The principal contaminants of concern (COCs) include PCBs, copper, lead, zinc, 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) and chlorobenzenes. PCBs account for the overwhelming majority of carcinogenic risk effects from organic COCs. Lead accounts for greatest carcinogenic and non-carcinogenic risk effects from metal COCs.

4.0 Remedial Actions

4.1 Remedy Selection

EPA selected the Site's long-term remedy in the Site's October 17, 1990 ROD; Washington Department of Ecology concurred with the selected remedy. The remedial action objectives (RAOs) developed from the RI/FS were to provide a "cost-effective remedial alternative that effectively mitigates and minimizes threats and provides adequate protection of public health and welfare and the environment." Specific RAOs included:

- Prevent human exposure to PCBs and other carcinogenic indicator chemicals that could result in exceeding a cumulative lifetime cancer risk of $1x10^{-7}$ to $1x10^{-4}$.
- Prevent human exposure to non-carcinogenic indicator chemicals that could cause the Hazard Index (HI) to exceed 1.0.
- Prevent soil with concentrations exceeding the PCBs action level from migrating off the former fill mound, from being directly contacted or ingested by humans, from exposure to volatilization or dust generation, or from serving as a medium for vegetable gardening (residential only).
- Prevent groundwater, in contact with soil exceeding the PCBs action level, from migrating out of the fill mound to either surface water or to a deeper aquifer.
- Prevent surface water from contacting soil exceeding the PCBs action level.
- Prevent human contact with all identified special features above or below ground surface, and prevent any special features or their contents containing PCBs in excess of the PCBs action level from migrating off the mound.

The selected remedy for the Site included:

- Removal of asbestos from the on-site building.
- Demolition of on-site structures, including UST removal.

- Excavation, testing and segregation of contaminated soils, sediments and mixed debris into batches containing: 1) greater than 50 milligram per kilogram (mg/kg) PCBs; and 2) 1 to 50 mg/kg PCBs.
- On-site incineration of soils, sediments and mixed debris containing greater than 50 mg/kg PCBs.
- On-site incineration or off-site treatment of contaminated fluids (perched groundwater, containerized liquids and sludge).
- Containment, under an engineered cap, of incinerator ash, soils containing from 1 to 50 mg/kg PCBs and soils containing greater than 500 mg/kg lead in a location above the maximum seasonal groundwater table and outside the 100-year floodplain.
- Perimeter drainage systems to control surface water run-on/run-off on the final site cover. These drainage systems require routine inspection and maintenance.
- Institutional controls to protect the cap and limit land and groundwater use.
- Monitor site conditions for a minimum of five years to assess the potential for contaminant migration.

Soil, sediment and debris action levels established in the ROD are shown in Table 2. Ground water and surface water action levels were defined in the 1995 Operation and Maintenance (O&M) (Tables 3 and 4).

Table 2: 1990 ROD COC Action Levels for Soil, Sediments and Debris

COC	Cleanup Level (mg/kg)	Basis for Cleanup Level
PCBs	1.0 1 to 50	Carcinogenic risk level of $1x10^{-5}$ for residential scenario Capped Soils: Toxic Substances Control Act (TSCA)
Lead	500	Capped Soils: Toxic Characteristic Leaching Procedure (TCLP) standards; Agency of Toxic Substances and Disease Registry
Copper	NA	Capped Soils: TCLP standards
Zinc	NA	Capped Soils: TCLP standards
2,3,7,8-TCDD	0.001	Carcinogenic risk level of $1x10^{-5}$ for residential scenario

Notes:
Soils containing 1 to 50 mg/kg PCBs and greater than 500 mg/kg lead are contained in a landfill on site.
NA = Not applicable

4.2 Remedy Implementation

EPA filed two consent decrees requiring implementation of the ROD in November 1991. The major PRPs signed one Consent Decree and the de minimis PRPs signed the other. The site remedial action took place in two phases. EPA approved the Phase I remedial design in December 1992 and the Phase II remedial design in November 1993.

Phase I (March 1993 to May 1993): Demolition of a two-story concrete building and foundation; asbestos abatement; demolition of the site drainage system; debris disposal; and UST removal and decontamination.

Phase II (September 1993 to August 1994): Excavation of contaminated soil; thermal treatment of contaminated soil; containment cell construction; debris disposal; and wetlands restoration. Containment cell cap seeding and wetlands seeding took place during October 1994.

Excavation operations divided the contaminated soils into 15-foot-by-15-foot grids. Soils with greater than 1 mg/kg PCBs or 500 mg/kg lead were excavated and placed in two stockpiles. The following parameters were the basis for excavation and stockpile determination:

- If less than 1 mg/kg PCBs and 500 mg/kg lead, then no further excavation.
- If 1 to 50 mg/kg PCBs and greater than 500 mg/kg lead, then excavate (1-3 feet) and place into stockpile #1.
- If greater than 50 mg/kg PCBs and 500 mg/kg lead, then excavate (1-3 feet) and place into stockpile #2 for thermal treatment.

Composite soil samples from each grid were analyzed for PCBs and lead. Samples from each grid were analyzed and excavation repeated until all grids were below 1 mg/kg PCBs and 500 mg/kg lead.

Soils with 1 to 50 mg/kg PCBs and greater than 500 mg/kg lead (stockpile #1) were placed in a containment cell on site. Soils with greater than 50 mg/kg PCBs were thermally treated on site. Debris containing greater than 50 mg/kg PCBs was disposed of in Idaho. Larger pieces of debris containing less than 50 mg/kg PCBs that were unsuitable for placement in the cell were also disposed of off site.

The incinerator was mobilized to the Site in the fall of 1993. The incinerator processed 9,715 tons of material from January 1994 to May 1994. Incinerator demobilization and removal from the Site took place in May and June 1994. Remedial activities included restoring the wetland area to its original condition.

Construction of a 22,000-cubic-yard engineered containment cell for thermally treated soils took place on site in July and August 1994. A 92,000-square-foot multi-layer synthetic cap constructed over the cell included a geosynthetic clay liner, a 30-mil PVC liner, a geonet drainage layer, a 12-ounce geotextile fabric, a 12-inch biotic barrier, a second geotextile layer (16 ounce), and a 1-foot layer of top soil with a covering of selected rye grasses.

Following cleanup, EPA required that site PRPs sample and analyze upgradient and downgradient groundwater and surface water at the Site to determine any potential impact of the completed remedy on downgradient waters. The 1995 Operation and Maintenance (O&M) Plan required analysis of site COCs and established action levels for groundwater and surface water. Tables 3 and 4 summarize this information.

Table 3: 1995 O&M Plan COC Action Levels for Groundwater

COC	Action Level (µg/L)
PCBs	0.5
Total lead	5

Total arsenic	50
Total barium	1,000
Total cadmium	10
Total chromium	50
Total silver	50
Total mercury	2
Total copper	1,000
Total selenium	10
Chlorobenzenes	5

Notes:
µg/L=microgram per liter
According to the 1990 ROD, groundwater ARARs were based on the more stringent of either Washington state's Model Toxics Control Act (MTCA) Method B Groundwater Cleanup Standards based on a human health carcinogenic risk level of 1 x 10^{-6} and a noncancer threshold of 1.0 or the EPA's maximum contaminant levels (MCLs) and non-zero Maximum Contaminant Level Goals (MCLGs).

Table 4: 1995 O&M Plan COC Action Levels for Surface Water

COC	Action Level (µg/L)
PCBs	0.014
Total Lead	3.2
Total Copper	12

Notes:
µg/L=microgram per liter
According to the 1990 ROD, Federal Water Quality Criteria (40 CFR Part 131) and State Water Quality Standards (WAC 173-2 01) were identified as chemical-specific ARARs for site runoff to surface water.

Groundwater and surface water samples had consistently met action levels for four years as of 1998. The existing monitoring wells were abandoned in July 2001, in accordance with the Washington State Well Construction Act and implementing regulations.

In December 1994, PRP contractors CH2M Hill and Roy F. Weston, Inc. prepared a Remedial Action Report documenting the completion of construction activities. EPA approved the Remedial Action Report in February 1995. The final inspection took place on January 20 and 21, 1998. The Coal Creek Steering Committee determined that the remedial action had been successfully executed.

4.3 Operation and Maintenance (O&M)

The Site's O&M Plan, approved by EPA on March 8, 1995, established inspection, sampling and maintenance requirements. In September 2014, LCPUD removed trees and brush from the cap area and repaired and cleared the fence. Since the 2010 FYR, LCPUD provided one site inspection report in January 2015, as reporting was temporarily suspended after the 2010 FYR. The site inspection found the fence to be in good repair and there were no signs of trespassing,

although a few strands of barbed wire were broken. LCPUD plans to remove blackberry vines in the spring/summer of 2015. Drains are cleaned and drained as needed. There was little evidence of mole activity.

The ROD estimated annual O&M costs at $50,000. O&M costs since the 2010 FYR totaled about $8,000. The 2014 costs were a bit higher than average due to the removal of trees and brush from the cap and fence clearing and repair. The PRPs estimate future O&M costs to be approximately $1,000 per year.

Potential site impacts from climate change have been assessed, and the performance of the remedy may be impacted by the following climate change effects in the region and near the Site: risk of floods. The O&M Plan addresses these impacts by requiring additional site visits after a 25-year, 24-hour storm event or during potential flood conditions. In addition, a 1991 and 2006 flood map are available in Appendix I. In the 1991 map, Coal Creek Road is outside of the 100-year flood zone and a small portion of the Site may be within the 100-year flood zone delineated on the 2006 map. No flooding was observed on the Site during the 100-year storm events in February 1996 and December 2007.

5.0 Progress Since the Last Five-Year Review

The protectiveness statement from the 2010 FYR for the Site stated:

The remedy at the Coal Creek Site is protective of human health and the environment. The landfill cap appears to be in good shape (i.e. no subsidence or erosion) and the fence and institutional controls are effective in limiting access to the site. Restrictive covenants, recorded in the Property Restrictions and Conveyance of Interest, as implemented will eliminate inappropriate land use and human exposure at this site.

The 2010 FYR included three issues and recommendations. This report summarizes each recommendation and its current status below.

Table 5: Progress on Recommendations from the 2010 FYR

Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
In general, inspect cap and ensure that cap is maintained and protected from invasive vegetation. The landfill cap has a biotic barrier layer that prevents intrusion of burrowing animals into the low permeability layer, so the burrow hills are not a current threat to the contained waste. However, EPA recommends LCPUD monitor mole activity to ensure that cap is not threatened in the future.	LCPUD	Annually submitted on August 1. Inspections will be conducted quarterly and submitted to EPA annually. LCPUD will decide with each inspection whether additional work to protect the cap is needed.	In September 2014, LCPUD removed trees and brush from the cap area. LCPUD provided one site inspection report since the previous FYR. Very little mole activity was observed.	1/15/2015

Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
Locate the outlet and drain by cutting back the vegetation in these areas.	LCPUD	10/31/2010	LCPUD located the southeast interceptor trench and the southern diversion drain and cleared vegetation around them.	2/4/2015
After new PRGs [preliminary remediation goals] are determined and the dioxin reassessment is done, this site should be among those evaluated for potential further assessment and action.	EPA	3/31/2011	EPA has determined that the remedy is protective in light of the dioxin reassessment; see Section 7.2 for more details.	3/20/2015

6.0 Five-Year Review Process

6.1 Administrative Components

EPA Region 10 initiated the FYR in January 2015 and scheduled its completion for August 2015. EPA remedial project manager (RPM) Claire Hong led the EPA site review team, which also included the EPA site attorney Joan Shirley, the EPA toxicologist Julius Nwosu and contractor support provided to EPA by Skeo Solutions. The review schedule established consisted of the following activities:

- Community notification.
- Document review.
- Data collection and review.
- Site inspection.
- Local interviews.
- FYR Report development and review.

6.2 Community Involvement

In February 2015, EPA published a public notice in the *Chronicle* newspaper announcing the commencement of the FYR process for the Site, providing contact information for Claire Hong and inviting community participation. The press notice is available in Appendix B. No one contacted EPA as a result of the advertisement.

EPA will make the final FYR Report available to the public. EPA will place copies of the document in the designated site repository: Timberland Regional Library located at 400 N. Market Boulevard, Chehalis, Washington.

6.3 Document Review

This FYR included a review of relevant, site-related documents, including the ROD and the final close out report. A complete list of the documents reviewed can be found in Appendix A.

ARARs Review

Remedial actions are required to comply with the ARARs identified in the ROD. When reviewing the ARARs during this FYR, only those ARARs that address the protectiveness of the remedy were reviewed.

Groundwater ARARs
According to the 1990 ROD, groundwater emanating from the fill mound after remediation shall neither exceed the MCL for PCBs or lead nor exceed the Secondary Maximum Contaminant Level (SMCL) for copper. The 1990 ROD identified the Model Toxics Control Act (MTCA) regulations as TBC values because regulations had not yet been finalized. MTCAs are promulgated and now considered ARARs for the Site. Groundwater ARARs were based on the more stringent of either Washington state's MTCA Method B Groundwater Cleanup Standards based on a human health carcinogenic risk level of 1×10^{-6} and a noncancer threshold of 1.0 or the EPA's MCLs and non-zero Maximum Contaminant Level Goals (MCLGs).

Table 6 compares groundwater action levels from the 1995 O&M Plan with the current MCLs/MCLGs and current Method B groundwater levels. As shown, the 1995 O&M Plan action levels for arsenic and cadmium are less stringent than the current MCLs. The protectiveness evaluation of the more stringent MCLs are further reviewed in Section 7.2.

Table 6: ARAR Review for Groundwater COCs

COC	1995 O&M Plan Action Level[a] (µg/L)	Current MCL (µg/L)[b]	Current MTCA Method B Cleanup Level (µg/L)[c]	Is the Current ARAR More Stringent than the 1995 O&M Plan Action Level?
PCBs (total)	0.5	0.5	0.5	No
Total lead	5	15	15	No
Total arsenic	50	10	10	Yes
Total barium	1,000	2,000	2,000	No
Total cadmium	10	5	5	Yes
Total chromium	50	100	100	No
Total silver	50	100	80	No
Total mercury	2	2	2	No
Total copper	1,000	1,300	1,300	No
Total selenium	10	50	50	No

COC	1995 O&M Plan Action Level[a] (µg/L)	Current MCL (µg/L)[b]	Current MTCA Method B Cleanup Level (µg/L)[c]	Is the Current ARAR More Stringent than the 1995 O&M Plan Action Level?
Chlorobenzenes	5	100	100	No

Notes:

a. The ROD identified the chemical-specific ARAR regulations but did not specify the values; the values were included in the 1995 O&M Plan.
b. Current MCLs were obtained at http://water.epa.gov/drink/contaminants/index.cfm (accessed 4/6/2015). The current non-zero MCLGs were not more stringent than the current MCLs.
c. MTCA Method B cleanup levels are available at https://fortress.wa.gov/ecy/clarc/FocusSheets/Groundwater%20Methods%20B%20and%20A%20and%20ARARs.pdf (accessed 4/6/2015).

Surface Water ARARs

According to the 1990 ROD, Federal Water Quality Criteria (40 CFR Part 131) and State Water Quality Standards (WAC 173-2 01) were identified as chemical-specific ARARs for site runoff to surface water. Table 7 compares surface water action levels from the 1995 O&M Plan against the current federal Ambient Water Quality Criteria (AWQC) for the protection of freshwater aquatic life. Values for lead and copper are hardness dependent. As shown, the current state and federal ARAR for lead is slightly more stringent than the 1995 O&M Plan action level. For copper, the state ARAR is slightly more stringent than the O&M Plan action level. To determine the protectiveness of the remedy, surface water results from the final sampling, completed in 1998 and summarized in the Final Closure Report, were compared to current surface water quality criteria. The maximum concentration of total copper (5.3 µg/L) is less than the most stringent standard of 11.3 µg/L. The maximum concentration of total lead (0.36 µg/L) is below the current standard of 2.5 µg/L. PCBs were non-detect in all samples from 1994 to 1998, so the remedy remains protective based on current surface water standards.

Table 7: ARAR Review for Surface Water COCs

COC	1995 O&M Plan Action Level[a] (µg/L)	Current Federal AWQC (µg/L)[b]	Current Method B Cleanup Level (µg/L)[c]	Is the Current ARAR More Stringent than the 1995 O&M Plan Action Level?
PCBs (total)	0.014	0.014	0.014	No/No
Total lead	3.2	2.5[d]	2.5	Yes/Yes
Total copper	12	13.4[d]	11.4	No/Yes

Notes:

a. The ROD identified the chemical-specific ARAR regulations but did not specify the values; the values were included in the 1995 O&M plan.
b. Current AWQCs were obtained at http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#altable (accessed 4/6/2015). Value is based on a hardness of 100 mg/L.
c. State water quality criteria obtained at http://apps.leg.wa.gov/WAC/default.aspx?cite=173-201A-240 (accessed 4/6/15).
A four-day average concentration not to be exceeded more than once every three years on the average:
≤ (0.960)(e(0.8545[ln(hardness)] - 1.465)) copper
≤ (0.791)(e(1.273[ln(hardness)] - 4.705)) lead

Soil ARARs
PCB is the only soil COC with a chemical-specific ARAR. EPA has established PCB soil cleanup levels of 1 mg/kg for high occupancy (e.g., unrestricted exposure) in the self-implementing portion of the Toxic Substances Control Act (TSCA) regulations for PCB remediation waste at 40 CFR 761.61(a)(4). The cleanup level range of PCBs greater than 1 mg/kg to 50 mg/kg has not changed according to EPA's TSCA PCBs disposal regulations (40 CFR 761.60), which requires placement of PCBs in this range under a cap. The protectiveness evaluation of the remaining soil COC cleanup levels are further reviewed in Section 7.2.

Institutional Control Review
On March 10, 1992, in accordance with the requirements in the Consent Decree, site owner LCPUD recorded the form of the Property Restrictions and Conveyance of Interest for the Site with the Lewis County Recorder's Office (Appendix G). The document binds any and all persons who acquire interest in the site property in the future. The document places the following restrictive covenants on the future use of the property:

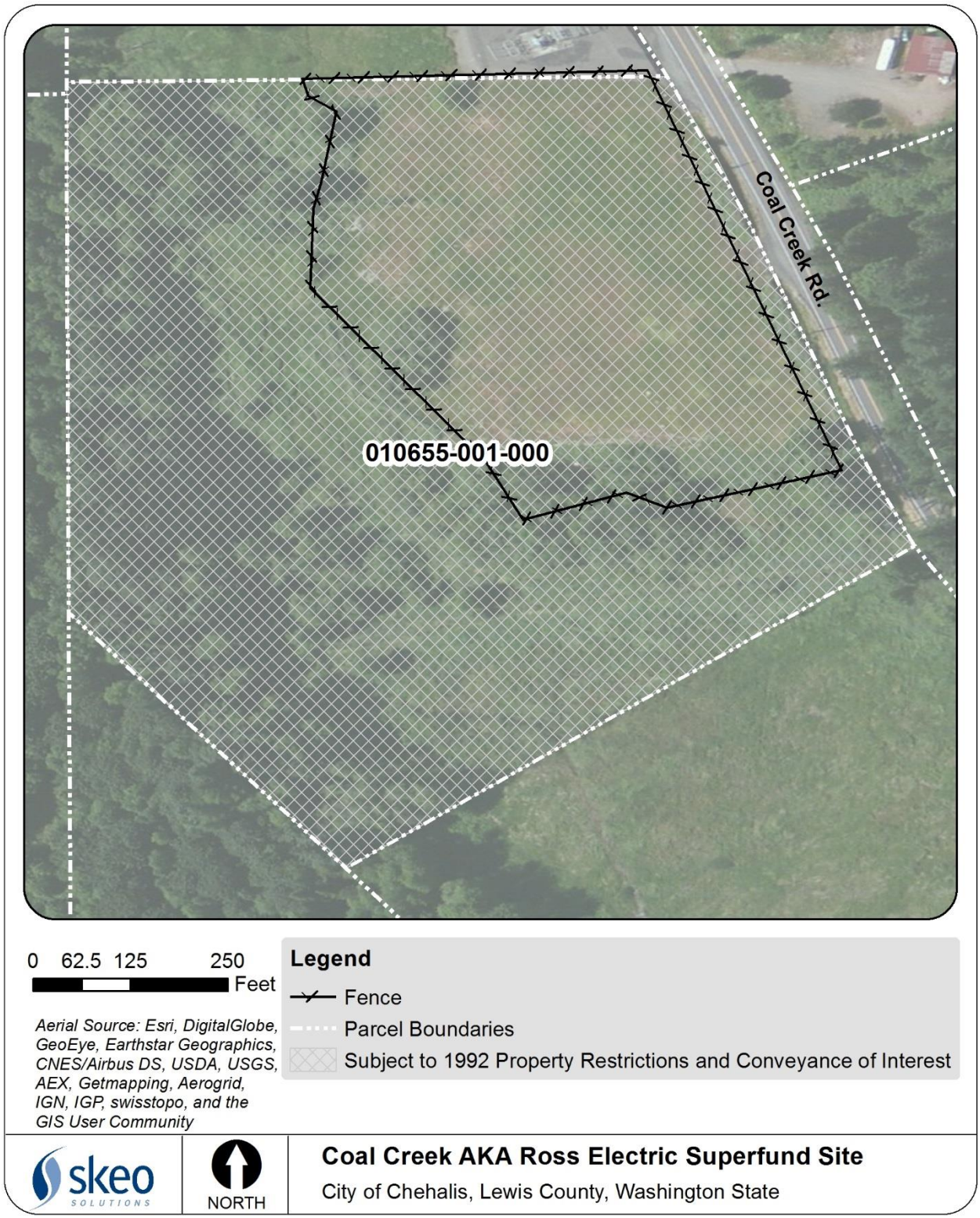
- The property shall not be used for residential or agricultural purpose.
- Construction, installation, maintenance or use of any wells on the property for human drinking water purposes or for irrigation of feed or food crops is prohibited.
- Construction activities that would violate the integrity of the containment structure are prohibited.
- Maintenance of diversion ditches, flood barriers and other special features of the remedy shall be maintained.

The institutional controls will help ensure that the integrity of the remedy will not be violated and that the Site will remain protective of human health and the environment in the future. Institutional controls are also listed by media in Table 8 and shown in Figure 3.

Table 8: Institutional Control (IC) Summary Table

Medium	ICs Needed?	ICs Called for in the Decision Documents?	Impacted Parcels	IC Objective	Instrument in Place
Soil	Yes	Yes	010655-001-000	Prevent exposure to contaminated soils and protect integrity of remedy.	1992 Property Restrictions and Conveyance of Interest
Groundwater	Yes	Yes	010655-001-000	Prevent installation of wells on site.	1992 Property Restrictions and Conveyance of Interest

Figure 3: Institutional Control Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

6.4 Data Review

No new data were available for this FYR period. Sampling was discontinued in 1998 after groundwater and surface water cleanup levels were reached.

6.5 Site Inspection

EPA RPM Claire Hong and EPA toxicologist Julius Nwosu performed the site inspection on March 4, 2015. They walked the cap and fence line. The landfill cap provides waste containment and prevents exposure to contaminants. The landfill cap appears to be in good condition. Past issues associated with moles and vegetation encroachment have been addressed. No molehills were observed on the cap during the visit. Trees and blackberry bushes have been removed. Fences and gates are in good condition and there were no signs of trespassing.

Previous FYRs have noted that the monitoring wells were abandoned in accordance with Washington state regulations. During the site inspection, two monitoring well monuments were found lying on the ground surface. Subsequent investigation by LCPUD showed bentonite in former well casings near these monuments, indicating that they were properly abandoned.

For a full list of site inspection activities, see the Site Inspection Checklist in Appendix D. For photographs of the Site, see Appendix E.

6.6 Interviews

The FYR process included interviews with parties affected by the Site, including the current landowners, nearby residents and regulatory agencies involved in site activities or aware of the Site. The purpose was to document the perceived status of the Site and any perceived problems or successes with the phases of the remedy implemented to date. All of the interviews took place during the site inspection in March 2015. The interviews are summarized below. Appendix C provides the complete interviews.

- *LCPUD:* staff are aware of the Site and comfortable with the cleanup. They have received no comments from the public regarding the Site. LCPUD staff inquired about using herbicides to prevent vegetation such as blackberries from encroaching on the landfill. EPA responded that herbicides could be used if label requirements were followed.

- *Resident 1 and 2:* the residents indicated they had not seen any flooding on the site property in the last five years.

- *Lewis County Fire District 6 Chief:* The local fire chief stated that all cleanup and maintenance at the Site has been satisfactory.

- *Property owner:* The property owner stated that project activities were acceptable and that an exceptional job has been done at the Site.

7.0 Technical Assessment

7.1 Question A: Is the remedy functioning as intended by the decision documents?

Yes. The review of documents, ARARs, risk assumptions, institutional controls and the site inspection indicate that the remedy is functioning as intended by the Site's 1990 ROD. Contaminated soils were capped on site and groundwater and surface water cleanup levels were met for a four-year period ending in 1998, after which monitoring was discontinued. Institutional controls are in place to prevent inappropriate use at the Site. Fencing around the Site deters trespassing.

O&M reporting was recently re-established in January 2015; therefore, only one report has been submitted since EPA issued the 2010 FYR. Quarterly site inspections and reporting should continue and LCPUD should write a Health and Safety Plan for the Site.

7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels and remedial action objectives (RAOs) used at the time of remedy selection still valid?

The ROD identified chemical-specific ARARs for groundwater and surface water and action levels were established in the 1995 O&M Plan. The 1995 O&M Plan action levels for arsenic and cadmium are less stringent than current ARARs for arsenic and cadmium in groundwater; however, institutional controls prohibit construction, installation, maintenance or use of any wells on the property for human drinking water purposes or for irrigation of feed or food crops. Surface water quality criteria for copper and lead are slightly more stringent than 1995 O&M Plan action levels. Review of surface water data in the 1999 Final Closure Report indicates that surface water concentrations for copper, lead and PCBs were lower than the current ARARs. Therefore, the remedy is protective for surface water.

The validity of soil ROD cleanup levels for the five soil COCs was reviewed due to the toxicity value changes that have occurred for several COCs since the ROD was issued. The evaluation indicates that current screening level for lead has become more stringent and the toxicity values for 2,3,7,8-TCDD have become more stringent. However, the remedy remains protective because elevated concentrations of lead or 2,3,7,8-TCDD are no longer available for human exposure. A review of RI/FS data indicates the maximum total 2,3,7,8-TCDD toxicity equivalence (TEQ) concentrations outside the fill mound were located at MW9-S where the TEQ concentration was calculated to be 0.42 µg/kg (Table F-3). The highest TEQ concentration in the fill mound was at sample location TR1-S3 of 0.41 µg/kg. However, these locations were addressed by the excavation portion of the remedy since the two locations are currently under the capped area. Therefore, the remedy remains protective despite more stringent toxicity values for 2,3,7,8-TCDD. Further, the cap is surrounded by a fence to prevent exposure and the land use is restricted by a deed restriction to industrial/commercial use.

Detailed analysis to support these conclusions is presented in Appendix F and the approximate extent of excavation for the Site are presented in Appendix H.

EPA's dioxin reassessment has been developed and undergone review for many years, with the participation of scientific experts in EPA and other federal agencies, as well as scientific experts in the private sector and academia. The Agency followed current guidelines and incorporated the latest data and physiological/biochemical research into the reassessment. On February 17, 2012, EPA released the final human health non-cancer dioxin reassessment, publishing an oral non-cancer toxicity value, or reference dose (RfD), of $7x10^{-10}$ mg/kg-day for 2,3,7,8-TCDD in EPA's Integrated Risk Information System (IRIS). The dioxin cancer reassessment will follow thereafter. The dioxin RfD was approved for immediate use at Superfund sites to ensure protection of human health.

A simplified Terrestrial Ecological Evaluation (TEE) was conducted for the drainage ditch based on the exposure analysis procedure under WAC 173-340-7492(2)(a)(iii). Based on the TEE in the 2010 FYR, there is no substantial potential for a threat of significant adverse effects to terrestrial ecological receptors. In addition, exposure pathways and land uses have not changed since the previous FYR and the RAOs remain valid.

7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No. No other information has come to light that could call into question the protectiveness of the remedy.

7.4 Technical Assessment Summary

The remedy is functioning as intended by the Site's 1990 ROD. Contaminated soils were capped on site and groundwater and surface water cleanup levels had been met for a four-year period ending in 1998. Institutional controls are in place to prevent inappropriate use at the Site. Fencing around the Site deters trespassing. O&M reporting was recently re-established in January 2015; quarterly site inspections and reporting should continue and LCPUD should update the health and safety plan for the Site.

8.0 Issue

Table 9 summarizes the current site issue.

Table 9: Current Site Issue

Issue	Affects Current Protectiveness?	Affects Future Protectiveness?
The health and safety plan for the Site is outdated.	No	Yes

9.0 Recommendation and Follow-up Action

Table 10 provides a recommendation to address the current site issue.

Table 10: Recommendation to Address Current Site Issue

Issue	Recommendation / Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
The health and safety plan for the Site is outdated.	Update the health and safety plan for the Site.	LCPUD	EPA	09/01/2016	No	Yes

The following additional items, though not expected to affect protectiveness, warrant additional follow up:

- LCPUD should continue to submit quarterly monitoring reports.

10.0 Protectiveness Statement

The remedy at the Site is currently protective of human health and the environment because the landfill cap, fence and institutional controls are effective in preventing exposure to contaminants that remain on site. However, in order for the remedy to be protective in the long term, the Site requires an updated site health and safety plan.

11.0 Next Review

The next FYR will be due within five years of the signature/approval date of this FYR.

Appendix A: List of Documents Reviewed

Coal Creek Site, Phase II Remedial Action, Thermal Treatment and Containment Cell. Weston. Prepared for the Coal Creek Remedial Action Steering Committee. March 1993.

Coal Creek Superfund Site. Chehalis, Washington. Five-Year Review Report. United States Environmental Protection Agency. January 2000.

Coal Creek Superfund Site. Chehalis, Washington. Five-Year Review Report. United States Environmental Protection Agency. March 2005.

EPA Superfund Record of Decision: Coal Creek AKA Ross Electric. EPA ID: WAD980726061 OU 01. Chehalis, WA. October 17, 1990.

Final Closure Report. Coal Creek Site. Prepared for Coal Creek Remedial Action Steering Committee. Portland Oregon. July 15, 1999.

Flood Warning Map for Centralia, Chehalis and Vicinity. 1991. Available online at: http://lewiscountywa.gov/attachment/895/floodwarn.pdf

Operation and Maintenance Plan. Coal Creek Remedial Action. Chehalis, WA. Prepared for The Coal Creek Remedial Action Steering Committee. February 1995.

Property Restrictions and Conveyance of Interests. Coal Creek Site. Lewis County Washington. March 10, 1992.

Remedial Investigation/Feasibility Study, Volumes 1-2. Coal Creek Site. Chehalis Washington. Prepared for Coal Creek Committee. February 21, 1989.

Third Five-Year Review for Coal Creek Site, Chehalis, Washington. Prepared by: United States Environmental Protection Agency, Region 10. March 17, 2010.

Appendix B: Press Notice

EPA United States Environmental Protection Agency

Cleanup Measures Reviewed for Coal Creek Superfund Site

Fourth Five-Year Site Review

The U.S. Environmental Protection Agency is doing the fourth Five-Year Review for the Coal Creek Superfund Site. The eight acre site is approximately one mile northeast of Chehalis, Washington at 346 Coal Creek Road. Five-year reviews are routine assessments to ensure that the cleanup measures completed for the site continue to be protective of human health and the environment.

Site Background

The Coal Creek site has been primarily owned by electric utilities since the early 1900s. Operations included a coal fired steam generation plant in the 1930s and 1940s, and transformer scrapping and repair from 1948 to 1983. Work activities involved the use of hazardous substances such as polychlorinated biphenyls (PCBs), and metals such as arsenic, barium, copper, lead, mercury, and zinc. These contaminants were detected in soils, sediments, ground water and surface water.

Cleanup Actions

The 1993 and 1994 site cleanup by the EPA:

- ✓ demolished on-site structures and removed an underground storage tank;
- ✓ removed, incinerated, treated, or contained contaminated materials;
- ✓ covered (capped) a landfill area to seal in contaminated materials;
- ✓ installed perimeter drainage systems with set maintenance and monitoring; and
- ✓ placed property restrictions on wells to make sure that well water is not used for drinking or for crop irrigation.

To date, the cleanup measures remain in place and function as intended to prevent human exposure to chemicals; prevent human contact to and use of contaminated soils and water; and prevent the spread of contaminated soils, sediments, surface and ground water.

EPA Welcomes Your Input

We want to keep you informed. Also, as someone living close to the site, you may have information helpful to the review team. If you have anything you would like us to consider during our review, please contact ***Claire Hong****, EPA Project Manager, at* ***hong.claire@epa.gov*** ***or 206-553-1813****, between now and June 1, 2015.*

More information is also online at the EPA website: **http://go.usa.gov/ww8J**

CH1536582cr.sw

TDD and/or TTY users please call the Federal Relay Service at 1-800-877-8339.
Give the operator Claire Hong's phone number: 206-553-1813.

Appendix C: Interview Forms

Site Name:	**Coal Creek AKA Ross Electric**	**EPA ID No.:**	**WAD980726061**
Interviewer Name:	**Claire Hong**	**Affiliation:**	**EPA Region 10**
Subject Name:	**Steve Young & Dan Kay**	**Affiliation:**	**LCPUD**
Subject Contact Information:	**LCPUD, 321 NW Pacific Avenue, Chehalis, WA 98532**		
Time:	**11:15 a.m.**	**Date:**	**March 4, 2015**
Interview Location:	**LCPUD offices**		

Interview Format (circle one): **In Person** **Phone** **Mail** **Other:**

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

   Yes. Recently reviewed a number of documents on the cleanup. Read the last FYR.

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

   Satisfactory. The cleanup is fine. LCPUD chopped down trees and repaired fencing.

3. What have been the effects of the Site on the surrounding community, if any?

   Not much interest. No one has called to complain. No questions from the public.

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?

   No. There has been no vandalism or unauthorized entry since the last FYR.

5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?

   There has not been much activity at the Site except for the recent removal of vegetation. LCPUD will be providing quarterly O&M reports. No specific suggestions for further EPA outreach.

6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used?

   No.

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project?

   LCPUD inquired whether certain herbicides could be used to prevent vegetation like blackberries from encroaching on the landfill cap. EPA responded that herbicides could be used if label requirements were met.

Coal Creek Site **Five-Year Review Interview Form**

Site Name: Coal Creek **EPA ID No.:** WAD980726061
Interviewer Name: GARY DURYEA JR **Affiliation:** LCPUD EMPLOYEE
Subject Name: TIM KINDER **Affiliation:** LC FIRE DISTRICT 6 CHIEF
Subject Contact Information: 360-748-6019 TKINDER@LCFD6.ORG
Time: 11:00 AM **Date:** 2/26/15
Interview Location: LCPUD CHEHALIS OFFICE

Interview Format (circle one): In Person Phone Mail Other:

Interview Category: ~~State Agency~~ LOCAL AGENCY

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)? ALL CLEANUP AND MAINTENANCE IS SATISFACTORY

2. What is your assessment of the current performance of the remedy in place at the Site? SATISFACTORY

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years? NO

4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities. NO

5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy? NOT AWARE

6. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues? YES

7. Are you aware of any changes in projected land use(s) at the Site? NO

8. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

   SATISFIED WITH MANAGEMENT BY LEWIS COUNTY PUBLIC UTILITY DISTRICT NO. 1

Coal Creek Site **Five-Year Review Interview Form**

Site Name: Coal Creek **EPA ID No.:** WAD980726061
Interviewer Name: GARY DURYEA JR **Affiliation:** LC PUD EMPLOYEE
Subject Name: GAIL KOSTICK **Affiliation:** PROPERTY OWNER
Subject Contact Information: 360-748-7590
Time: 8:45 AM **Date:** 3/2/15
Interview Location: LCPUD CHEHALIS OFFICE

Interview Format (circle one): **In Person** **Phone** **Mail** **Other:**

Interview Category: **Residents**

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date? YES

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)? GOOD JOB. ACCEPTABLE

3. What have been the effects of this Site on the surrounding community, if any? NONE

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing? NO

5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?
IN THE PAST BUT NOT RECENTLY. BY MAIL

6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used? NO - USE CITY WATER

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project?
NO. HAVE DONE AN EXCEPTABLE JOB WITH SITE.

Appendix D: Site Inspection Checklist

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST	
I. SITE INFORMATION	
Site Name: Coal Creek	**Date of Inspection: March 4, 2015**
Location and Region: Lewis, WA Region10	**EPA ID: WAD980726061**
Agency, Office or Company Leading the Five-Year Review: EPA Region 10	**Weather/Temperature: Sunny; mid 60's F**
Remedy Includes: (Check all that apply) ☒ Landfill cover/containment ☒ Access controls ☒ Institutional controls ☐ Ground water pump and treatment ☐ Surface water collection and treatment ☐ Other: _____	☐ Monitored natural attenuation ☐ Ground water containment ☐ Vertical barrier walls
Attachments: ☒ Inspection team roster attached	☐ Site map attached
II. INTERVIEWS (check all that apply)	
1. **O&M Site Manager** Dan Kay (Name) Chief Engineer, LCPUD (Title) 03/04/2015 (Date) Interviewed ☐ at site ☒ at office ☐ by phone Phone: 360.740.2435 Problems, suggestions ☐ Report attached:	
2. **O&M Staff** Steve Young (Name) Fleet/Facilities Manager (Title) 03/04/2015 (Date) Interviewed ☐ at site ☒ at office ☐ by phone Phone: 360.496.6100 Problems/suggestions ☐ Report attached: _____	

3. **Local Regulatory Authorities and Response Agencies** (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.

Agency Lewis County Fire District 6
Contact Tim Kinder (Name) | Chief (Title) | 2/26/2015 (Date) | 360.748.6019 (Phone No.)
Problems/suggestions ☒ Report attached: _____

Agency _____
Contact _____Name | _____ (Title) | _____ (Date) | _____ (Phone No.)
Problems/suggestions ☐ Report attached:_____

Agency _____
Contact _____ (Name) | _____ (Title) | _____ (Date) | _____ (Phone No.)
Problems/suggestions ☐ Report attached:_____

Agency _____
Contact _____ (Name) | _____ (Title) | _____ (Date) | _____ (Phone No.)
Problems/suggestions ☐ Report attached: _____

Agency _____
Contact _____ (Name) | _____ (Title) | _____ (Date) | _____ (Phone No.)
Problems/suggestions ☐ Report attached:_____

4. **Other Interviews** (optional) ☒ Report attached: Mrs. Kostick, Resident near Site

III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)

1. **O&M Documents**

☒ O&M manual	☒ Readily available	☐ Up to date	☐ N/A
☒ As-built drawings	☒ Readily available	☐ Up to date	☐ N/A
☒ Maintenance logs	☐ Readily available	☒ Up to date	☐ N/A

Remarks: Quarterly reports re-instituted in January 2015.

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date ☐ N/A

☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☐ N/A

Remarks: There is currently no Health and Safety Plan in place.

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date ☐ N/A

Remarks: _____

4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
	☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
7.	**Ground Water Monitoring Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	☒ N/A
	☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			

IV. O&M COSTS

1.	**O&M Organization**		
	☐ State in-house	☐ Contractor for state	
	☒ PRP in-house	☐ Contractor for PRP	
	☐ Federal facility in-house	☐ Contractor for Federal facility	
	☐ _____		
2.	**O&M Cost Records**		
	☒ Readily available	☒ Up to date	
	☐ Funding mechanism/agreement in place	☐ Unavailable	
	Original O&M cost estimate: $50,000/year ☐ Breakdown attached		
	Total annual cost by year for review period if available		
	From: 01/01/2010 (Date)	To: 12/31/014 (Date)	$8,204.78 (Total cost) ☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs during Review Period**

Describe costs and reasons: Extensive cap and fence clearing efforts made in September 2014.

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing Damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A

Remarks: _____

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☐ Location shown on site map ☒ N/A

Remarks: _____

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by): LCPUD

Frequency: Four times per year

Responsible party/agency: LCPUD

Contact	Steve Young	Fleet/Facilities Manager	03/04/2015	360.740.2452
	Name	Title	Date	Phone no.

Reporting is up to date ☒ Yes ☐ No ☐ N/A

Reports are verified by the lead agency Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☒ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks: _____

D. General

1. **Vandalism/Trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks: _____

2. **Land Use Changes On Site** ☐ N/A

Remarks: There are no land use changes recorded since last Five Year Review

3. **Land Use Changes Off Site** ☐ N/A

Remarks: During site inspection, there did not appear to be any land use changes at surrounding properties.

VI. GENERAL SITE CONDITIONS

A. Roads	☐ Applicable	☒ N/A	
1. **Roads Damaged**	☐ Location shown on site map	☐ Roads adequate	☐ N/A
Remarks: _____			
B. Other Site Conditions			
Remarks: _____			
VII. LANDFILL COVERS	☒ Applicable	☐ N/A	
A. Landfill Surface			
1. **Settlement** (low spots)	☐ Location shown on site map	☒ Settlement not evident	
Arial extent: _____		Depth: _____	
Remarks: _____			
2. **Cracks**	☐ Location shown on site map	☒ Cracking not evident	
Lengths: _____	Widths: _____	Depths: _____	
Remarks: _____			
3. **Erosion**	☐ Location shown on site map	☐ Erosion not evident	
Arial extent: _____		Depth: _____	
Remarks: _____			
4. **Holes**	☐ Location shown on site map	☒ Holes not evident	
Arial extent: _____		Depth: _____	
Remarks: Multiple molehills observed during 2010 FYR are gone.			
5. **Vegetative Cover**	☐ Grass	☒ Cover properly established	
☐ No signs of stress	☐ Trees/shrubs (indicate size and locations on a diagram)		
Remarks: Previous vegetation encroachment (trees and shrubs have been removed).			
6. **Alternative Cover** (e.g., armored rock, concrete)		☒ N/A	
Remarks: _____			
7. **Bulges**	☐ Location shown on site map	☒ Bulges not evident	
Arial extent: _____		Height: _____	
Remarks: _____			
8. **Wet Areas/Water Damage**	☒ Wet areas/water damage not evident		
☐ Wet areas	☐ Location shown on site map	Arial extent: _____	
☐ Ponding	☐ Location shown on site map	Arial extent: _____	
☐ Seeps	☐ Location shown on site map	Arial extent: _____	
☐ Soft subgrade	☐ Location shown on site map	Arial extent: _____	
Remarks: _____			

9.	**Slope Instability**	☐ Slides	☐ Location shown on site map
	☒ No evidence of slope instability		
	Arial extent: _____		
	Remarks: _____		
B. Benches	☐ Applicable	☒ N/A	
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench**	☐ Location shown on site map	☒ N/A or okay
	Remarks: _____		
2.	**Bench Breached**	☐ Location shown on site map	☒ N/A or okay
	Remarks: _____		
3.	**Bench Overtopped**	☐ Location shown on site map	☒ N/A or okay
	Remarks: _____		
C. Letdown Channels	☐ Applicable	☒ N/A	
	(Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
1.	**Settlement** (Low spots)	☐ Location shown on site map	☒ No evidence of settlement
	Arial extent: _____		Depth: _____
	Remarks: _____		
2.	**Material Degradation**	☐ Location shown on site map	☒ No evidence of degradation
	Material type:_____		Arial extent: _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☒ No evidence of erosion
	Arial extent: _____		Depth: _____
	Remarks: _____		
4.	**Undercutting**	☐ Location shown on site map	☒ No evidence of undercutting
	Arial extent: _____		Depth: _____
	Remarks: _____		
5.	**Obstructions**	Type: _____	☒ No obstructions
	☐ Location shown on site map	Arial extent: _____	
	Size: _____		
	Remarks: _____		

6. **Excessive Vegetative Growth** Type: _____

☒ No evidence of excessive growth

☐ Vegetation in channels does not obstruct flow

☐ Location shown on site map Arial extent: _____

Remarks: _____

D. Cover Penetrations ☐ Applicable ☒ N/A

1. **Gas Vents** ☐ Active ☐ Passive

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☒ N/A

Remarks: _____

2. **Gas Monitoring Probes**

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☒ N/A

Remarks: _____

3. **Monitoring Wells** (within surface area of landfill)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☒ N/A

Remarks: Previous FYRs have noted that the monitoring wells were abandoned in accordance with Washington state regulations. During the site visit on March 4, 2015, two monitoring well monuments were found lying on the ground surface. Photos are attached. Subsequent investigation by LCPUD showed bentonite in former well casings near these monuments. The bentonite fill prevents water from finding a preferential pathway to the aquifer. Despite being knocked over, the monuments do not affect well closure. In the future, these monuments may act as a reminder that abandoned wells are in close proximity. No further action identified for LCPUD.

4. **Extraction Wells Leachate**

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☒ N/A

Remarks: _____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☒ N/A

Remarks: _____

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

1. **Gas Treatment Facilities**

☐ Flaring ☐ Thermal destruction ☐ Collection for reuse

☐ Good condition ☐ Needs maintenance

Remarks: _____

2.	**Gas Collection Wells, Manifolds and Piping** ☐ Good condition ☐ Needs maintenance Remarks: _____
3.	**Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings) ☐ Good condition ☐ Needs maintenance ☐ N/A Remarks: _____
F. Cover Drainage Layer	☒ Applicable ☐ N/A
1.	**Outlet Pipes Inspected** ☒ Functioning ☐ N/A Remarks: _____
2.	**Outlet Rock Inspected** ☐ Functioning ☒ N/A Remarks: _____
G. Detention/Sedimentation Ponds	☐ Applicable ☒ N/A
1.	**Siltation** Area extent: _____ Depth: _____ ☒ N/A ☐ Siltation not evident Remarks: _____
2.	**Erosion** Area extent: _____ Depth: _____ ☒ Erosion not evident Remarks: _____
3.	**Outlet Works** ☒ Functioning ☐ N/A Remarks: _____
4.	**Dam** ☐ Functioning ☒ N/A Remarks: _____
H. Retaining Walls	☐ Applicable ☒ N/A
1.	**Deformations** ☐ Location shown on site map ☐ Deformation not evident Horizontal displacement: _____ Vertical displacement: _____ Rotational displacement: _____ Remarks: _____
2.	**Degradation** ☐ Location shown on site map ☐ Degradation not evident Remarks: _____
I. Perimeter Ditches/Off-Site Discharge	☐ Applicable ☒ N/A
1.	**Siltation** ☐ Location shown on site map ☐ Siltation not evident Area extent: _____ Depth: _____ Remarks: _____

2.	**Vegetative Growth**	☐ Location shown on site map	☐ N/A
	☐ Vegetation does not impede flow		
	Area extent: _____		Type: _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☐ Erosion not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
4.	**Discharge Structure**	☐ Functioning	☐ N/A
	Remarks: _____		
VIII. VERTICAL BARRIER WALLS		☐ Applicable	☒ N/A
1.	**Settlement**	☐ Location shown on site map	☐ Settlement not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
2.	**Performance Monitoring**	Type of monitoring: _____	
	☐ Performance not monitored		
	Frequency: _____		☐ Evidence of breaching
	Head differential: _____		
	Remarks: _____		
IX. GROUND WATER/SURFACE WATER REMEDIES		☐ Applicable	☒ N/A
A. Ground Water Extraction Wells, Pumps and Pipelines		☐ Applicable	☒ N/A
1.	**Pumps, Wellhead Plumbing and Electrical**		
	☐ Good condition	☐ All required wells properly operating	☐ Needs maintenance ☐ N/A
	Remarks: _____		
2.	**Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances**		
	☐ Good condition	☐ Needs maintenance	
	Remarks: _____		
3.	**Spare Parts and Equipment**		
	☐ Readily available	☐ Good condition	☐ Requires upgrade ☐ Needs to be provided
	Remarks: _____		
B. Surface Water Collection Structures, Pumps and Pipelines		☐ Applicable	☒ N/A
1.	**Collection Structures, Pumps and Electrical**		
	☐ Good condition	☐ Needs maintenance	
	Remarks: _____		

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

C. Treatment System ☐ Applicable ☒ N/A

1. **Treatment Train** (check components that apply)

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

☐ Air stripping ☐ Carbon adsorbers

☐ Filters: _____

☐ Additive (e.g., chelation agent, flocculent): _____

☐ Others: _____

☐ Good condition ☐ Needs maintenance

☐ Sampling ports properly marked and functional

☐ Sampling/maintenance log displayed and up to date

☐ Equipment properly identified

☐ Quantity of ground water treated annually: _____

☐ Quantity of surface water treated annually: _____

Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Tanks, Vaults, Storage Vessels**

☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs maintenance

Remarks: _____

4. **Discharge Structure and Appurtenances**

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

5. **Treatment Building(s)**

☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair

☐ Chemicals and equipment properly stored

Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

D. Monitoring Data

1. **Monitoring Data**

☐ Is routinely submitted on time ☐ Is of acceptable quality

2. **Monitoring Data Suggests:**

☐ Ground water plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☒ N/A

Remarks: _____

X. OTHER REMEDIES

If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions).

Landfill cap provides waste containment and prevents exposure to contaminants. The landfill cap appears to be in good condition. Past issues associated with moles and vegetation encroachment have been addressed. No molehills were observed on the cap during this visit. Trees and blackberry bushes have been removed. Fences and gates are in good condition.

Previous FYRs have noted that the monitoring wells were abandoned in accordance with Washington state regulations. During the site visit on March 4, 2015, two monitoring well monuments were found lying on the ground surface. Photos are included in Appendix E. Subsequent investigation by LCPUD showed bentonite in former well casings near these monuments. The bentonite fill prevents water from finding a preferential pathway to the aquifer. Despite being knocked over, the monuments do not affect well closure. In the future, these monuments may act as a reminder that abandoned wells are in close proximity. No further action identified for LCPUD.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.
Quarterly reporting re-instituted.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.
N/A

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. N/A

Inspection Team:

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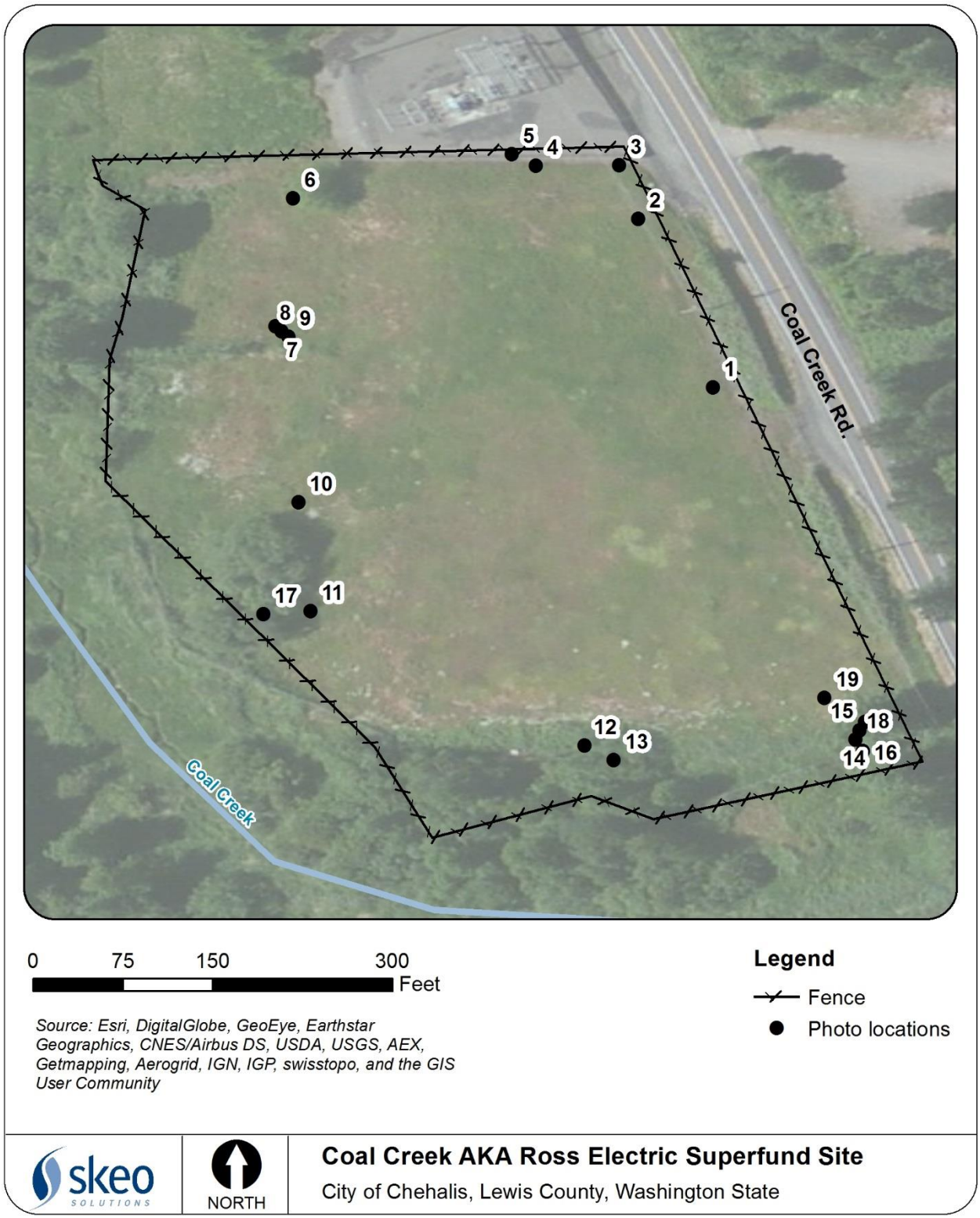
Follow up photographs from LCPUD received March 6, 2015; bentonite clay at sealed wells.

Appendix E: Photographs from Site Inspection Visit



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Photograph 1: Looking north towards substation along the eastern fence.

1

Photograph 2: Looking north from the northeast corner of the property.

Photograph 3: Looking west along the northern fence. Red marker is northern drain.

Photograph 4: Northern drain.

Photograph 5: Substation that sits on adjacent property to the north of the Site.

Photograph 6: Northern edge of landfill -- looking east. Cone sits above the northwest interceptor drain.

Photograph 7: West side of landfill – looking to north east. Compare with Figure 16 from 2010 FYR. Note tree and vegetation have been removed.

Photograph 8: West side of landfill -- looking north. Shows landfill slope and general topography.

Photograph 9: West side of landfill – looking north. Shows nearest neighbor, who owns property due north of the substation.

Photograph 10: West side of landfill -- looking east. Diversion drain on the west side of landfill.

Photograph 11: Another diversion drain on west side of landfill.

Photograph 12: Southwestern part of site. Photograph of well monument that was lying on its side.

Photograph 13: Southwestern part of site. Photograph of the underside of the well monument.

Photograph 14: Southeastern part of site. Photograph of two diversion drains, each marked by red pole.

Photograph 15: Southeastern part of site. Photograph of second diversion drain pictured in previous photograph.

Photograph 16: Southern fence. Vegetation had been growing through the fence.

Photograph 17: Western part of the Site. Photograph of second well monument that was lying on its side.

Photograph 18: Diversion drains in southeastern portion of the Site.

Photograph 19: Location of previously existing mole infestation. Compare with Figure 24 from the 2010 FYR.

Appendix F: Risk Assessment Support for Question B

To evaluate the validity of soil ROD cleanup levels for the five soil COCs, the goals were compared to the EPA's Regional Screening Levels (RSLs) and the state's MTCA Method B levels based on a standard default residential exposure and current toxicity values (Tables F-1 and F-2, respectively). Based on this analysis, the lead cleanup level is less stringent than the EPA RSL or the Method B residential screening levels. Similarly, the cleanup level for 2,3,7,8-TCDD may not be protective for unrestricted exposure because the equivalent risk level is slightly above EPA's upperbound or the risk management range of 1×10^{-6} to 1×10^{-4}; in addition, the equivalent noncancer hazard index (HI) is greater than EPA's threshold of 1.0. However, the remedy remains protective because there is no human exposure to soils excavated from the Site and drainage ditch; these soils are contained in the landfill.

Table F-1: Evaluating Protectiveness of ROD Cleanup Levels based on EPA Toxicity Values

COC	ROD Soil Cleanup Levels (mg/kg)	Residential RSL[a] (mg/kg)		Screening Level Risk Evaluation[c]	
		Risk-based (1×10^{-6})	HI-based (HI=1)	Risk	HI
PCBs	1.0	0.23	1.2[d]	4×10^{-6}	1
Copper	NA				
Lead	500	400[b]		1.3[e]	
Zinc	NA				
2,3,7,8-TCDD	0.001	4.8×10^{-6}	5.1×10^{-5}	**2×10^{-4}**	**20**

Notes:
a. Values obtained from EPA's June 2015 RSL table: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm.
b. RSL based on the EPA's blood lead model
c. Screening risk evaluation:
Risk = (cleanup goal/RSL) x 1×10^{-6}
Non-cancer HI = cleanup goal/RSL
d. Assumed the PCBs are representative of the most toxic noncarcinogenic PCB mixture, Aroclor 1254.
e. Cancer and noncancer-based toxicity values have not been established, therefore, the analysis compared the cleanup level directly to the RSL
NE = toxicity value not established.
NA = not applicable because 1990 cleanup levels based on TCLP standards.
Bold – cancer risk exceeds 1×10^{-4} or noncancer HI exceeds 1.0.

Table F-2: Evaluating Protectiveness of ROD Cleanup Levels based on MTCA Toxicity Values

COC	ROD Soil Cleanup Levels (mg/kg)	Residential Method B Value[a] (mg/kg)		Screening Level Risk Evaluation[c]	
		Risk-based (1×10^{-6})	HI-based (HI=1)	Risk	HI
PCBs	1.0	0.5	NE	2×10^{-6}	NE
Copper	NA				
Lead	500	250[b]		2.0	
Zinc	NA				
2,3,7,8-TCDD	0.001	1.28×10^{-5}	9.3×10^{-5}	8×10^{-5}	**11**

COC	ROD Soil Cleanup Levels (mg/kg)	Residential Method B Value[a] (mg/kg)		Screening Level Risk Evaluation[c]	
		Risk-based (1×10^{-6})	HI-based (HI=1)	Risk	HI

Notes:
a. MTCA Method B levels obtained at: https://fortress.wa.gov/ecy/clarc/FocusSheets/Soil%20Methods%20B%20and%20A%20unrestricted.pdf (accessed 4/6/15).
b. Cancer and noncancer-based toxicity values have not been established, therefore, the analysis compared the level goal directly to the MTCA B value.
c. Screening risk evaluation:
Risk = (cleanup goal/RSL) x 1×10^{-6}
Noncancer HI = cleanup goal/MTCA Method B
NE = toxicity value not established.
NA = Not applicable because 1990 cleanup levels based on TCLP standards.
Bold – Cancer risk exceeds 1×10^{-4} or noncancer HI exceeds 1.0.

Due to the possibility that some soil inside the mound as well as outside the mound area but still located within the fenced area, could contain residual dioxin-like compounds above levels that would allow for unlimited use and unrestricted exposure, the historical concentrations were evaluated further using EPA's most current cancer and noncancer toxicity values. Dioxin is the most potent of a series of related polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs), with each member of these chemical classes exhibiting similar toxicological effects but differing only in the degree of toxicity. As a result, each dioxin-like chemical is expressed as toxic equivalents of TCDD by using toxicity equivalency factors (TEFs) to convert the different dioxin-like compounds into an estimate of the total dioxin equivalent concentration expressed as dioxin TEQs. In other words, the TEQ is the concentration of TCDD that is predicted to be of equal toxicity to the sum of the toxicity of all the different PCDDs and PCDFs present at the Site. The most current TEFs developed by the World Health Organization in 2006 were used to determine the TEQ concentrations.[2] Each dioxin-like chemical detected, as well as the detection limits, was multiplied by the corresponding TEF and then summed to obtain the updated total dioxin TEQ concentration. The dioxin TEQ concentration was then compared to both the residential and industrial cancer-based RSLs and noncancer-based RSLs to evaluate the validity of the remedy.

A review of RI/FS data indicates that three samples were analyzed for dioxins which were located outside the toe of the fill area (Samples MW7-S, MW8-S and MW9-S) and four samples were collected within the mound area (Samples TRI-S3, TR1-S4, TR1-S4A, and TR1-S5). All samples are located within the fenced area. The maximum total 2,3,7,8-TCDD TEQ concentrations outside the fill mound were located at MW9-S where the TEQ concentration was calculated to be 0.42 µg/kg (Table F-3). The highest TEQ concentration in the fill mound is at sample location TR1-S3 of 0.41 µg/kg. Both TEQ concentrations result in noncancer HIs greater than 1.0 based on an unrestricted land use (Table F-4) and industrial land use (Table F-5). However, these locations were addressed by the excavation portion of the remedy since the on-fill location, TR1-S3, is already under the cap and the off-fill location, MW-9-S, was included in the off-fill excavation area for PCBs exceeding 1 mg/kg. Both locations are currently under the

[2] Van den Berg, et al., 2006. *World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds*, Toxicological Sciences 93(2):223-241, 2006.

cap. Therefore, the remedy remains protective despite more stringent toxicity values for 2,3,7,8-TCDD. Further, the cap is surrounded by a fence to prevent exposure.

A simplified TEE was conducted for the drainage ditch based on the exposure analysis procedure under WAC 173-340-7492(2)(a)(iii). Based on the TEE in the 2010 FYR, and concluded here, there is no substantial potential for a threat of significant adverse effects to terrestrial ecological receptors.

Table F-3: Summary of On-fill and Off-fill 2,3,7,8-TCDD Concentrations

Dioxin Congener	EPA TEF[a]	MW-9S Off-fill Maximum[b] (µg/kg)	TEQ Conc. (µg/kg)	TRI-S3 On-fill Maximum[b] (µg/kg)	TEQ Conc. (µg/kg)
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	1	0.048	0.048	0.14	0.14
Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	1	0.25	0.25	0.14	0.144
Hexachlorodibenzo-p-dioxin, 1,2,3,4,7,8-	0.1	0.64	0.064	0.32	0.032
Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	0.1	NA	NA	NA	NA
Hexachlorodibenzo-p-dioxin, 1,2,3,7,8,9-	0.1	NA	NA	NA	NA
Heptachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8-	0.01	1.3	0.013	1.6	0.016
Heptachlorodibenzo-p-dioxin, 1,2,3,4,7,8,9-	0.01	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	0.0003	2.7	0.00081	11.3	0.00339
Tetrachlorodibenzofuran, 2,3,7,8-	0.1	0.019	0.0019	0.16	0.016
Pentachlorodibenzofuran, 1,2,3,7,8-	0.03	NA	NA	NA	NA
Pentachlorodibenzofuran, 2,3,4,7,8-	0.3	0.051	0.0153	0.078	0.0234
Hexachlorodibenzofuran, 1,2,3,4,7,8-	0.1	0.2	0.02	0.28	0.028
Hexachlorodibenzofuran, 1,2,3,6,7,8-	0.1	NA	NA	NA	NA
Hexachlorodibenzofuran, 1,2,3,7,8,9-	0.1	NA	NA	NA	NA
Hexachlorodibenzofuran, 2,3,4,6,7,8-	0.1	NA	NA	NA	NA
Heptachlorodibenzofuran, 1,2,3,4,6,7,8-	0.01	0.23	0.0023	1.2	0.012
Heptachlorodibenzofuran, 1,2,3,4,7,8,9-	0.01	NA	NA	NA	NA
Octachlorodibenzofuran	0.0003	0.31	0.000093	2.9	0.00087
		Total Sum	0.42		0.41

Notes:
a. Van den Berg, et al., 2006. *World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds*, Toxicological Sciences 93(2):223-241, 2006.
TEFs obtained from concentrations listed in Table C-1 of the Site's RI/FS. TEQ = total dioxin equivalent concentration.

Table F-4: Residential Risk Evaluation of On-fill and Off-fill 2,3,7,8-TCDD Concentrations

COC	Sample Location	Maximum Soil Concentration (mg/kg)	Residential RSL[a] (mg/kg)		Screening Level Risk Evaluation[b]	
			Risk-based (1×10^{-6})	HI-based (HI=1)	Risk	HI
2,3,7,8-TCDD TEQ	off-fill (MW9-S)	0.00042	4.8×10^{-6}	5.1×10^{-5}	8.8×10^{-5}	**8.2**
2,3,7,8-TCDD TEQ	on-fill (TR1-S3)	0.00041	4.8×10^{-6}	5.1×10^{-5}	8.5×10^{-5}	**8**

Notes:
a. Values obtained from EPA's June 2015 RSL table: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm.

b. Screening risk evaluation:
Risk = (maximum concentration/RSL) x 1 x 10^{-6} Noncancer HI = maximum concentration/RSL
Bold – Cancer risk exceeds 1 x 10^{-4} or noncancer HI exceeds 1.0

Table F-5: Industrial Risk Evaluation of On-fill and Off-fill 2,3,7,8-TCDD Concentrations

COC	Sample Location	Maximum Soil Concentration (mg/kg)	Industrial RSL[a] (mg/kg)		Screening Level Risk Evaluation[b]	
			Risk-based (1 x 10^{-6})	HI-based (HI=1)	Risk	HI
2,3,7,8-TCDD TEQ	off-fill (MW9-S)	0.00042	2.2 x 10^{-5}	7.2 x 10^{-4}	1.9 x 10^{-5}	**1.7**
2,3,7,8-TCDD TEQ	on-fill (TR1-S3)	0.00041	2.2 x 10^{-5}	7.2 x 10^{-4}	1.9 x 10^{-5}	**1.8**

Notes:
c. Values obtained from EPA's June 2015 RSL table: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm.
d. Screening risk evaluation:
Risk = (maximum concentration/RSL) x 1 x 10^{-6} Noncancer HI = maximum concentration/RSL
Bold – Cancer risk exceeds 1 x 10^{-4} or noncancer HI exceeds 1.0

Appendix G: Coal Creek Property Restrictions and Deed

9202697

PROPERTY RESTRICTIONS AND CONVEYANCE OF INTEREST

Public Utility District No. 1 of Lewis County (the "District"), as legal owner of property described in Exhibit "A", pursuant to a Consent Decree entered in the United States District Court for the Western District of Washington, in the cast titled United States of America, Plaintiff, vs. Ross Electric of Washington, Inc., et al., Defendants, Civil Action No. C91-5470B, places the following restrictive covenants on future uses of the property.

a) The property shall not be used for residential or agricultural purposes.

b) Construction, installation, maintenance or use of any wells on the property for human drinking purposes or for irrigation of feed or food crops is prohibited.

c) Construction activities that would violate the integrity of the contaminated structure are prohibited.

d) Maintenance of diversion ditches, flood barriers, and other special features of the remedy shall be maintained.

The District has granted the United States, the State, and their authorized representatives, including the EPA and its contractors, access at all times to the property to which access is required for implementation of the Consent Decree, to the extent access to the property is controlled by the District, for the purposes of conducting any activity to the Consent Decree and as further set forth in the Consent Decree.

These restrictive covenants and access requirements are binding on any and all persons who acquire any interest in the property.

DATED this 10th day of March, 1992.

COPY AT REQUEST OF
PUD
PO Box 330
Chehalis, Wa 98532
92 MAR 10 PM 2:52
GARY E. ZANDELL, AUDITOR
LEWIS COUNTY, WA.

Public Utility District No. 1
of Lewis County

By: Gary H Kalish

Title: its Manager

STATE OF WASHINGTON)
) ss.
County of Lewis)

I certify that I know or have satisfactory evidence that Gary H Kalish is the person who appeared before me, and said person acknowledged that he/~~she~~ signed this instrument, on oath stated that he/~~she~~ was authorized to sign this instrument and acknowledged it as the Manager of Public Utility District No. 1 of Lewis County, a Washington corporation, to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

DATED: 3-10-92

NOTARY PUBLIC
STATE OF WASHINGTON
AUG. 17, 1995

Catherine R Bloomfield
Notary Public for Washington
My appointment expires: 8-17-95

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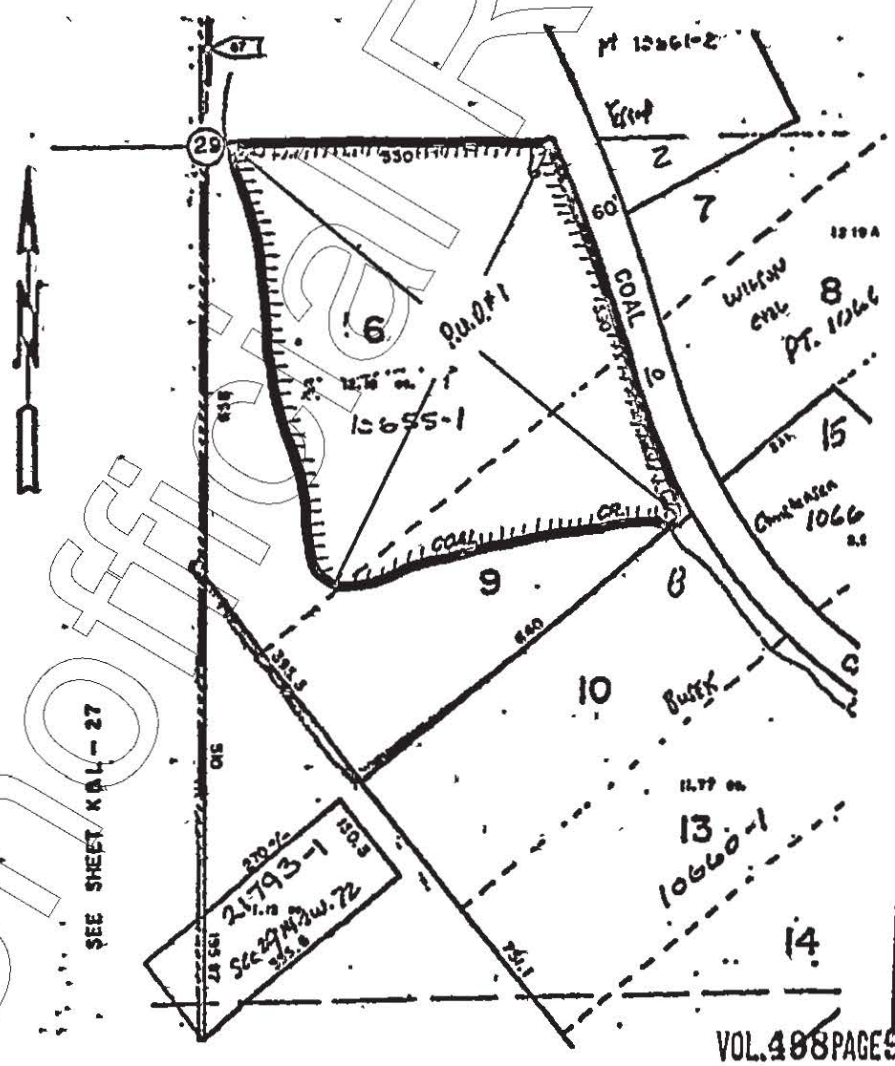
EXHIBIT A

DESCRIPTION OF COAL CREEK PROPERTY

That part of Lots Six (6) and Nine (9), CHEHALIS LAND AND TIMBER COMPANY'S COAL CREEK SUBDIVISION, lying North and East of and including Coal Creek; EXCEPTING THEREFROM the Coal Creek County Road.



Unofficial Record

DEED AND BILL OF SALE

The Grantor, PUGET SOUND POWER & LIGHT COMPANY, a corporation created under the laws of Massachusetts, for and in consideration of the sum of $10.00 and other valuable considerations to it in hand paid, receipt of which is hereby acknowledged, hereby grants, bargains, sells, conveys, transfers, assigns and delivers to Public Utility District No. 1 of Lewis County, Washington, Grantee, the following real and personal property located in Lewis County, Washington, subject, however, to the reservations and conditions hereinbelow stated and excepting the property described below under the general heading "EXCLUSIONS", the property hereby conveyed being a part of the electric generating and distribution properties of Puget Sound Power & Light Company:

unofficial record

Lewis County Property

1. Chehalis Steam-Electric Generating Plant and Chehalis Substation

Lots 6 and 9 in Chehalis Land and Timber Company's Coal Creek subdivision to the City of Chehalis, Lewis County, Washington.

Subject, however, to the following:

(a) Rights to a strip of land about 20 feet wide extending eastorly and westerly along the southerly boundary of said Lot nine (9), arising out of lease to Coal Creek Lumber Company, recorded in Book 4 Leases, page 167.

(b) The right created by a certain instrument executed by Washington-Oregon Corporation and George Snyder recorded in Volume 5 of Leases, page 94, records of Lewis County, Washington.

(c) A right of way for a logging road conveyed by Ludwig Stuppa and wife to Coal Creek Lumber Company by deed dated December 19, 1905, and recorded in Volume 69 of Deeds, page 76, records of Lewis County, Washington.

(d) A right of way conveyed by Barnard Heinz and wife to Harn and Brown Lumber Company by deed dated July 23, 1910, and recorded in Volume 108 of Deeds, page 416, records of Lewis County, Washington.

(e) A right of way conveyed by Barnard Heinz and wife to Harn and Brown Lumber Company by deed dated November 7, 1910, and recorded in Volume 110 of Deeds, page 249, records of Lewis County, Washington.

(f) Easement for county road dated January 29, 1937.

2. Napavine Substation

Lots 2, 3, 7 and 8 in Block 5 of the plat of the Town of Napavine, Lewis County, Washington.

3. Pe Ell Substation

That part of Lot 19 of Dobson & Donahoe's Third Addition to Pe Ell described as follows:

That certain tract of land bounded by a line commencing at a point 330 feet west of the northeast corner of Lot 19 of Dobson & Donahoe's Third Addition to the Town of Pe Ell, Lewis County,

Unofficial Record

Washington, and running thence at right angles to 4th Avenue a distance of 125 feet; thence East at right angles a distance of 50 feet; thence South at right angles a distance of 455 feet; thence West to the Chehalis River; thence along the East bank of the Chehalis River to its intersection with the South line of said 4th Avenue; thence along said South line of said 4th Avenue East 110 feet, more or less, to the point of beginning, excepting therefrom State Highway No. 12, (Ocean Beach Highway).

4. William Avenue Substation (Chehalis)

Lots 12 and 13 in Block 30 of W. M. Urquhart Addition to the City of Chehalis, Lewis County, Washington.

5. New Winlock Substation

Lots 1 and 2 in Block 14 of Kerron's Addition to the Town of Winlock, Lewis County, Washington.

Also that part of Lots 7 and 8 in Block 14 of Kerron's Addition to the Town of Winlock lying east of the Olequa Creek.

6. Chehalis Warehouse on National Avenue:

A tract of land situated in the N 1/2 of the SW 1/4 of Section 29 and in the SE 1/4 of the SW 1/4 of Section 20 in Township 14 North, Range 2 West, W. M., described as follows:

Beginning at a point on the center line of the Old Cowlitz and Olympia road which bears north 64° east 3.3 chains (218') from the easterly line of the logging road operated by Harm and Brown Lumber Company, which last named point bears south 60° 54' east 19.23 chains (1265') from the northwest corner of Section 29, Township 14 North, Range 2 West, W.M.; running thence south 35° 42' east, 6.88 chains (454') to the southeast corner of the tract of land belonging to Harm and Brown Lumber Company; thence north 64° east to the right of way of the Coal Creek spur of the Washington-Oregon Corporation; thence northwesterly and northerly curving to the right along the southwesterly boundary of said right of way of the Coal Creek spur of the Washington-Oregon Corporation, to a point of intersection with the northerly boundary, curving to the left, of the right of way of the former Chehalis-Centralia Railroad of the Puget Sound Power and Light Company as described in Exhibit "A" Item 8(b) of a certain deed to W. E. Brown recorded in Vol. 200 page 359, deed records, of Lewis County, which is the true point of beginning; thence continuing northerly along the southwesterly boundary of the said right of way of the Coal Creek Spur, to the land deeded by Margaret E. Somerville to Fred Emerson by deed dated March 6, 1906 and recorded in Book 81 at page 416 deed records of Lewis County; thence north 60° 36' west to the center

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line of the Somerville Consent Road, same being the most traveled county road east of the main line of the Northern Pacific Railroad; thence south 15° 27' west to the center line of the Cowlitz and Olympia Road; thence south 64° west along the center line of said road to a point of intersection with the northerly boundary of the said right of way of the former Chehalis-Centralia Railroad; thence easterly along said boundary to the point of beginning, less State and County Roads containing 1 acre more or less.

7. Also all appurtenances to and all structures or other improvements located upon the real property above described and every part and parcel thereof, including all electrical equipment thereon.

8. Also all distribution lines, substations and electrical facilities of Puget Sound Power & Light Company located in Lewis County, Washington, and used for distribution of electricity to the public, except those distribution lines, substations and facilities hereinafter expressly excluded under the designation of "Exclusions."

9. Franchises and other rights

Also all franchises, easements, permits, licenses, contracts, water rights, flumes, canals and rights of every kind heretofore acquired or reserved and now held, owned and used by Puget Sound Power & Light Company in the operation of the above described electric generating plant, distribution lines, substations and facilities, but only to the extent that said franchises, easements, permits, licenses, contracts and rights are transferable and only insofar as they are applicable to the operation of said electric properties.

Without limiting the generality of the foregoing, the following is a detailed list of franchises included herein:

City Franchises

Ordinance Number	City	Date Granted
Ordinance #757	City of Chehalis	3-27-11
Ordinance #50	City of Vader (Little Falls)	5-7-12
Ordinance #125	City of Winlock	10-1-12
Ordinance #18	City of Toledo	7-5-13
Ordinance #112	City of Pe Ell	1-20-25
Ordinance #143	City of Toledo	11-4-40

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1008 HOGE BUILDING
SEATTLE 4, WASHINGTON

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State Franchises

Franchise Number	Date Granted	
State #32	7-11-22	(also in Thurston County)
State #15	8-28-22	
State #55	10-3-22	
State #102	9-11-23	Amended 4-4-48
State #224	2-16-26	
State #271	9-14-26	
State #274	11-4-26	
State #311	4-17-28	
State #357	5-22-28	
State #476	10-22-29	
State #566	1-20-31	
State #672	5-10-32	
State #1870	1-27-48	
State #335	11-1-27	(also in Thurston County)
State #235	5-4-26	(also in Pacific County)

Lewis County Franchises

Granted	Granted	Granted
4-18-22	1-19-27	3-4-30
9-23-22	1-18-27	8-9-30
9-23-22	4-4-27	2-2-31
9-23-22	4-4-27	2-2-31
9-23-22	4-4-27	5-4-31
11-6-23	4-4-27	5-21-31
12-16-24	4-4-27	8-17-31
4-7-25	4-18-27	12-22-31
4-7-25	4-18-27	5-16-32
4-7-25	5-17-27	12-19-32
11-3-25	5-17-27	1-8-34
11-3-25	6-6-27	11-30-34
11-17-25	6-6-27	4-22-35
12-21-25	6-20-27	7-22-35
1-20-26	10-18-27	4-13-36
3-15-26	11-21-27	6-22-36
4-5-26	12-20-27	10-8-36
4-5-26	12-20-27	1-7-37
4-5-26	12-20-27	1-11-37
4-20-26	2-20-28	7-15-37
4-20-26	4-4-28	7-18-38
4-20-26	5-7-28	11-30-39
6-8-26	6-20-28	7-29-40
7-20-26	7-2-28	11-16-42
9-7-26	7-17-28	2-2-42

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Lewis County Franchises (Contd.)

Granted	Granted	Granted
10-7-26	9-17-28	10-21-43
10-19-26	10-17-28	12-18-44
11-17-26	12-28-28	1-20-47
1-18-27	3-4-29	3-30-28
1-18-27	3-4-29	3-30-28
1-18-27	5-7-29	

10. Automotive Equipment

Puget Car No.	Year-Make-Type	Title Number	Motor Number	Serial Number
229	46 Ford 1/2 ton pickup	1400415	923119	--
435	38 Ford 1/2 ton pickup (60 hp)	760345	54-357693	--
579	42 Dodge 1/2 ton Std. Serv.	1100476	T112-55897	9215929
580	42 Ford 1/2 ton pickup	1100475	I60-67775	--
584	42 Chev. 1/2 ton Std. Serv.	1100478	EBT-223856	6BK11-3932
659	39 Intern. 1-1/2 ton Line	871710	HD-23275800	D30-63845
725	38 Dodge 2 ton Line	761191	142-6201	9274728
829	39 White 2 ton Line	838339	2143208	213697
989	38 Standard 5 ton pole trlr.	799667	--	478
996	38 Standard 3 ton pole trlr.	805802	--	514
525	41 Chev. 3/4 ton Std. Serv.	1031334	AAF817375	6AM05-10549

11. Merchandise, Materials and Supplies

Also all merchandise, materials and supplies of Puget Sound Power & Light Company now on hand in Lewis County, Washington, and held for use in the operation of the aforesaid electric properties.

EXCLUSIONS

Excepting and excluding from the foregoing the following:

(a) All electric distribution lines, substations and facilities of Puget Sound Power & Light Company used for distribution of electricity to the public in the following portion of Lewis County, Washington, to-wit:

That portion of Township 15 North, Range 5 West W.M., included within Sections 15, 16, 21 and 22 in said township and range, presently served by means of a 7200 volt

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1008 HOYT BUILDING

line from a distribution line of Puget Sound Power & Light Company from the Cosville substation in Grays Harbor County, Washington.

(b) Also all franchises, easements, permits, licenses, contracts and rights of every kind heretofore acquired or reserved and now held, owned and used by Puget Sound Power & Light Company in the operation of the excluded distribution lines, substations and facilities described in the foregoing paragraph (a).

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All of the real property described above is hereby conveyed subject to all exceptions, reservations and conditions of record and subject to the exceptions, reservations and conditions above set forth.

The Grantor covenants only that except as hereinbefore expressly stated said property is free and clear of all liens and encumbrances placed thereon by or arising by, through or under the Grantor.

It is further understood that all of the obligations imposed upon the Grantor under and by virtue of the franchises, easements, permits, licenses and contracts assigned and transferred pursuant to this conveyance are assumed by the Grantee, and by the acceptance hereof the Grantee does hereby assume and agree to perform the same and to indemnify and save harmless the Grantor from any loss on account thereof.

Dated September 22, 1948.

PUGET SOUND POWER & LIGHT COMPANY

By [illegible]
President

Attest:

[illegible]
Assistant Secretary

HOLMAN & SPRAGUE
1006 HOGE BUILDING
SEATTLE 4, WASHINGTON

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STATE OF WASHINGTON)
(ss.
COUNTY OF K I N G)

On this 22nd day of September, 1948, before me personally appeared FRANK McLAUGHLIN and D. J. TORRANCE, to me known to be the President and Assistant Secretary, respectively, of Puget Sound Power & Light Company, the corporation that executed the within and foregoing instrument, and acknowledged said instrument to be the free and voluntary act and deed of said corporation for the uses and purposes therein mentioned, and each on oath stated that he was authorized to execute said instrument and that the seal affixed is the corporate seal of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

Wendell N Black
Notary Public in and for the State of Washington, residing at Seattle

HOLMAN & SPRAGUE
1006 HOGE BUILDING
SEATTLE 4, WASHINGTON

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440782

DEED AND BILL OF SALE

Puget Sound Power & Light Co.

to

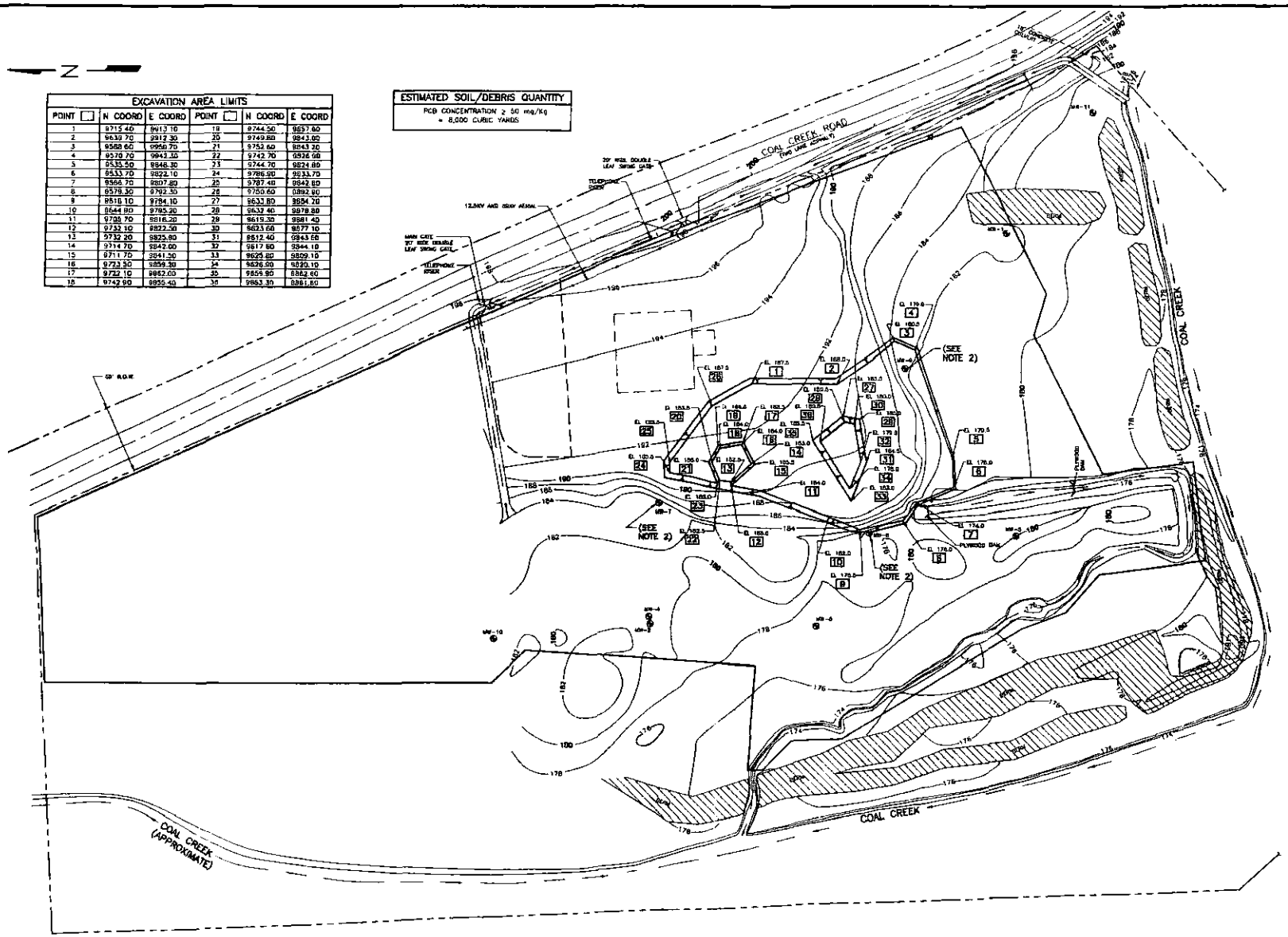
Public Utility District #1

Unofficial Copy

Appendix H: 1992 Coal Creek Excavation Plans

EXCAVATION AREA LIMITS					
POINT	N COORD	E COORD	POINT	N COORD	E COORD
1	9715.40	9913.10	18	9744.50	9857.60
2	9639.70	9912.30	20	9749.80	9843.00
3	9568.60	9956.70	21	9753.60	9843.30
4	9570.70	9943.20	22	9742.70	9826.60
5	9535.50	9846.30	23	9744.70	9824.80
6	9533.70	9822.10	24	9786.90	9833.70
7	9566.70	9807.80	25	9787.40	9842.80
8	9578.30	9792.30	26	9750.60	9892.90
9	9610.10	9784.10	27	9632.80	9884.70
10	9644.80	9785.20	28	9633.40	9878.80
11	9705.70	9816.20	29	9615.30	9881.40
12	9732.10	9822.50	30	9623.60	9877.10
13	9732.20	9825.80	31	9612.40	9843.68
14	9714.70	9842.60	32	9617.80	9844.10
15	9711.70	9841.30	33	9625.80	9859.10
16	9723.50	9859.30	34	9626.00	9020.10
17	9722.10	9862.00	35	9654.90	9862.60
18	9742.90	9855.40	36	9653.30	9861.60

ESTIMATED SOIL/DEBRIS QUANTITY
PCB CONCENTRATION ≥ 50 mg/Kg = 8,000 CUBIC YARDS



NOTES:

1. COORDINATE BOUNDARIES SHOWN IDENTIFY INITIAL LIMITS OF EXCAVATION. CONFIRMATORY TESTING SHALL BE USED TO IDENTIFY FINAL EXTENT OF EXCAVATION.
2. DECOMMISSION MONITORING WELLS MW-7, MW-8 AND MW-9 PER SPECIFICATION 02090.

MONITORING WELL	DEPTH	DIAMETER	MATERIAL
MW-7	20'	2"	PVC
MW-8	20'	2"	PVC
MW-9	20'	2"	PVC

3. SURFACE WATER CONTROL MUST BE MAINTAINED DURING CONSTRUCTION TO MINIMIZE THE FLOW OF STORMWATER INTO OPEN EXCAVATIONS. CLEAN SOIL CAN BE USED FOR TEMPORARY BERMS ON THE UPHILL SIDE OF OPEN EXCAVATIONS. STORMWATER, WHICH CONTACTS CONTAMINATED MATERIAL OR COLLECTS WITHIN AN OPEN MATERIAL HANDLING AREA SHALL BE COLLECTED, STORED, AND TESTED. IF TEST RESULTS INDICATE THE WATER IS NON-CONTAMINATED, DISCHARGE OR USE ON-SITE. IF TEST RESULTS INDICATE THE WATER IS CONTAMINATED, TREAT AND DISPOSE OF PROPERLY.
4. MISCELLANEOUS DEBRIS WILL BE ENCOUNTERED DURING EXCAVATION ACTIVITIES. THE CONTRACTOR SHALL INCINERATE, OR DECONTAMINATE THIS MATERIAL.
5. TEMPORARY DECONTAMINATION FACILITIES WILL BE CONSTRUCTED AS NECESSARY TO LIMIT CONTAMINATION OF CLEAN AREAS. THE LOCATION AND SPECIFIC DESIGN OF THESE FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR. SEDIMENTS AND LIQUIDS GENERATED FROM THESE FACILITIES MUST BE HANDLED AS SPECIFIED IN SECTION 02227.
6. ALL CONTAMINATED WATER RESULTING FROM CONSTRUCTION ACTIVITIES INCLUDING DECONTAMINATION PROCEDURES MUST BE COLLECTED AND STORED, AND TREATED.
7. ALL EQUIPMENT AND PERSONNEL WHICH COME IN CONTACT WITH CONTAMINATED MATERIALS MUST UNDERGO A DECONTAMINATION PROCESS BEFORE LEAVING THE CONSTRUCTION AREA. LIQUIDS GENERATED DURING DECONTAMINATION MUST BE HANDLED AS SPECIFIED IN SECTION 02227.

LEGEND

- 188 — CONTOUR LINE
- ⊗ MONITORING WELL
- POWER POLE & OVERHEAD LINE
- CENTERLINE OF DRAINAGE DITCH
- PROPERTY LINE
- CUT LINE
- LIMITS OF WORK SPACE

0 40 80
SCALE IN FEET

COAL CREEK SITE
CHEHALIS, WASHINGTON

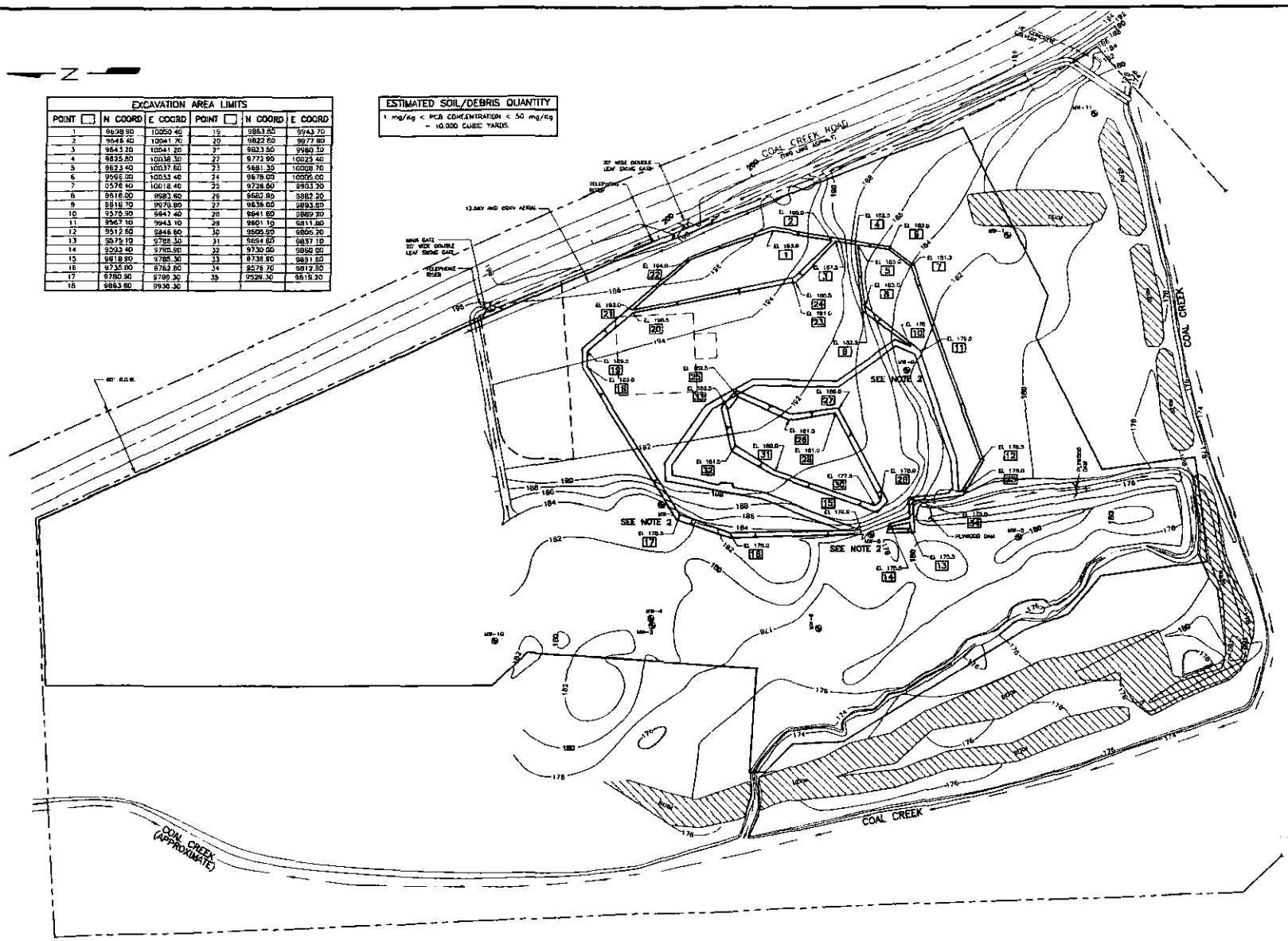
WESTON
MANAGERS DESIGNERS/BUILDERS

CONTAMINATED MATERIAL EXCAVATION PLAN
PCB ≥ 50 mg/Kg

DRAWN DWM	DATE OCTOBER 1992	DWG. NO. CCS-02-006	REV. NO. 0
SCALE AS NOTED	W.O. NO. 5265-02-03	SHEET 5 OF 11	

EXCAVATION AREA LIMITS					
POINT	N COORD	E COORD	POINT	N COORD	E COORD
1	9698.80	10050.40	19	9883.85	9943.70
2	9646.40	10041.70	20	9822.60	9977.80
3	9643.20	10041.20	21	9823.50	9980.10
4	9825.80	10038.30	22	9772.90	10025.40
5	9823.40	10037.80	23	9681.30	10008.70
6	9696.00	10033.40	24	9678.00	10005.00
7	9576.40	10018.40	25	9726.60	9903.20
8	9618.00	9983.60	26	9882.90	9862.20
9	9816.70	9979.80	27	9838.00	9893.80
10	9576.90	9947.40	28	9941.60	9869.20
11	9567.10	9943.10	29	9901.10	9811.80
12	9512.80	9846.60	30	9905.50	9806.20
13	9575.10	9785.30	31	9864.60	9857.10
14	9293.40	9785.90	32	9730.00	9858.80
15	9819.90	9785.30	33	9738.90	9891.60
16	9735.80	9782.80	34	9576.70	9812.80
17	9780.90	9780.30	35	9529.30	9819.20
18	9883.80	9930.30			

ESTIMATED SOIL/DEBRIS QUANTITY
1 mg/Kg < PCB CONCENTRATION < 50 mg/Kg = 10,000 CUBIC YARDS.



NOTES:

1. COORDINATE BOUNDARIES SHOWN IDENTIFY INITIAL LIMITS OF EXCAVATION. CONFIRMATORY TESTING SHALL BE USED TO IDENTIFY FINAL EXTENT OF EXCAVATION.
2. DECOMMISSION MONITORING WELLS MW-7, MW-8 AND MW-9 PER SPECIFICATION 02090.

MONITORING WELL	DEPTH	DIAMETER	MATERIAL
MW-7	20'	2"	PVC
MW-8	20'	2"	PVC
MW-9	20'	2"	PVC

3. SURFACE WATER CONTROL MUST BE MAINTAINED DURING CONSTRUCTION TO MINIMIZE THE FLOW OF STORMWATER INTO OPEN EXCAVATIONS. CLEAN SOIL CAN BE USED FOR TEMPORARY BERMS ON THE UPHILL SIDE OF OPEN EXCAVATIONS. STORMWATER, WHICH CONTACTS CONTAMINATED MATERIAL OR COLLECTS WITHIN AN OPEN MATERIAL HANDLING AREA, SHALL BE COLLECTED, STORED, AND TESTED. IF TEST RESULTS INDICATE THE WATER IS NONCONTAMINATED, DISCHARGE OR USE ON SITE. IF TEST RESULTS INDICATE THE WATER IS CONTAMINATED, TREAT AND DISPOSE OF PROPERLY.
4. MISCELLANEOUS DEBRIS WILL BE ENCOUNTERED DURING EXCAVATION ACTIVITIES. THE CONTRACTOR SHALL INCINERATE, OR DECONTAMINATE THIS MATERIAL.
5. TEMPORARY DECONTAMINATION FACILITIES WILL BE CONSTRUCTED AS NECESSARY TO LIMIT CONTAMINATION OF CLEAN AREAS. THE LOCATION AND SPECIFIC DESIGN OF THESE FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR. SEDIMENTS AND LIQUIDS GENERATED FROM THESE FACILITIES SHALL BE DISPOSED OF AS SPECIFIED IN SECTION 02227.
6. ALL CONTAMINATED WATER RESULTING FROM CONSTRUCTION ACTIVITIES INCLUDING DECONTAMINATION PROCEDURES MUST BE COLLECTED, STORED AND TREATED.
7. ALL EQUIPMENT AND PERSONNEL WHICH COME IN CONTACT WITH CONTAMINATED MATERIALS MUST UNDERGO A DECONTAMINATION PROCESS BEFORE LEAVING THE CONSTRUCTION AREA. LIQUIDS GENERATED DURING DECONTAMINATION SHALL BE DISPOSED OF AS SPECIFIED IN SECTION 02227.

LEGEND

- 188 — CONTOUR LINE
- MONITORING WELL
- POWER POLE & OVERHEAD LINE
- CENTERLINE OF DRAINAGE DITCH
- PROPERTY LINE
- CUT LINE
- LIMITS OF WORK SPACE

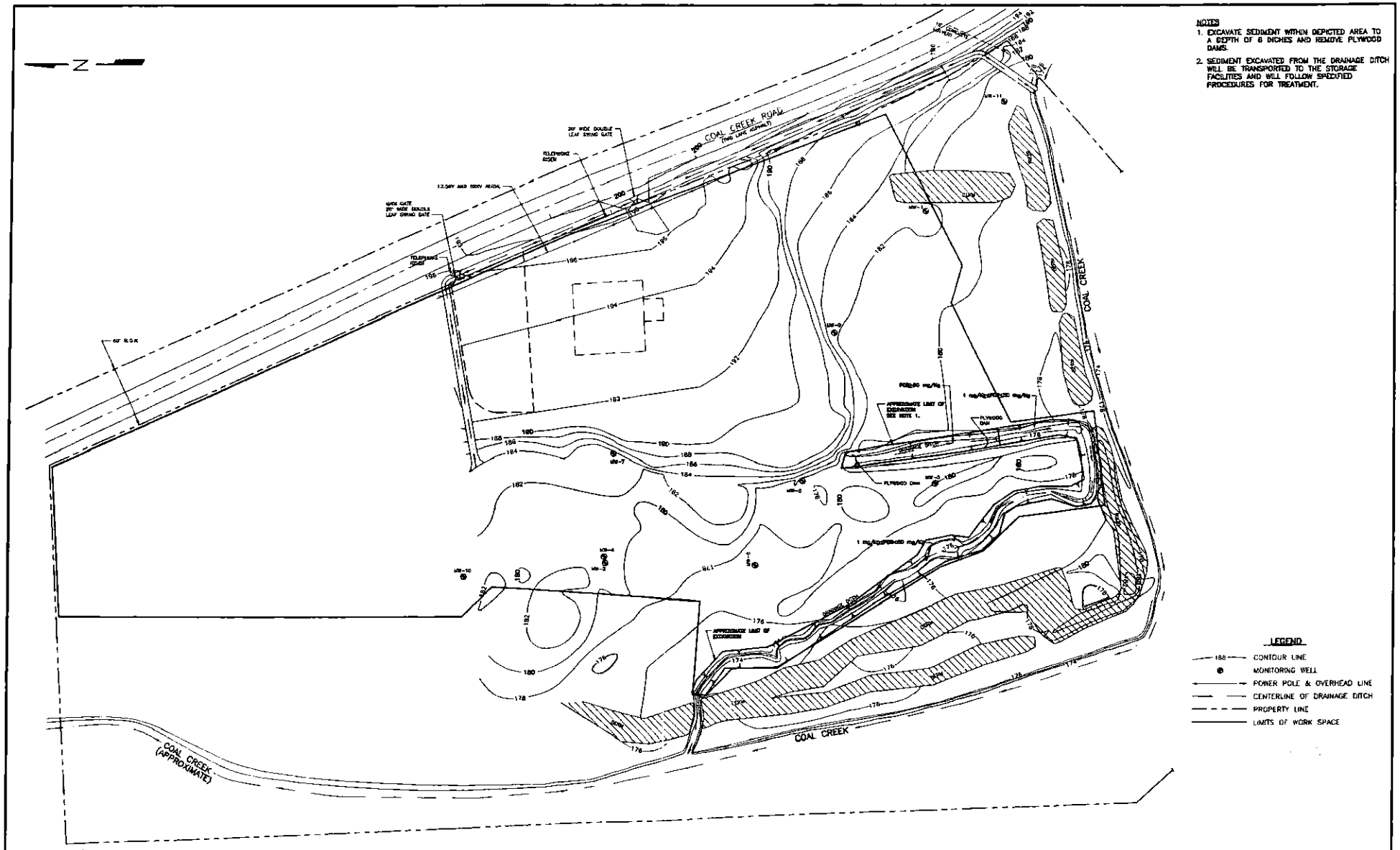
0 40 80
SCALE IN FEET

COAL CREEK SITE
CHEHALIS, WASHINGTON

WESTON

CONTAMINATED MATERIAL EXCAVATION PLAN
1 mg/Kg ≤ PCB < 50 mg/Kg

DRAWN	OCTOBER 1992		0
AS NOTED	5266-02-03	005-02-007	



NOTES

1. EXCAVATE SEDIMENT WITHIN DEPICTED AREA TO A DEPTH OF 6 INCHES AND REMOVE PLYWOOD DAMS.
2. SEDIMENT EXCAVATED FROM THE DRAINAGE DITCH WILL BE TRANSPORTED TO THE STORAGE FACILITIES AND WILL FOLLOW SPECIFIED PROCEDURES FOR TREATMENT.

0 40 80
SCALE IN FEET

COAL CREEK SITE
CHEHALIS, WASHINGTON

WESTON
MANAGERS DESIGNERS/CONSULTANTS

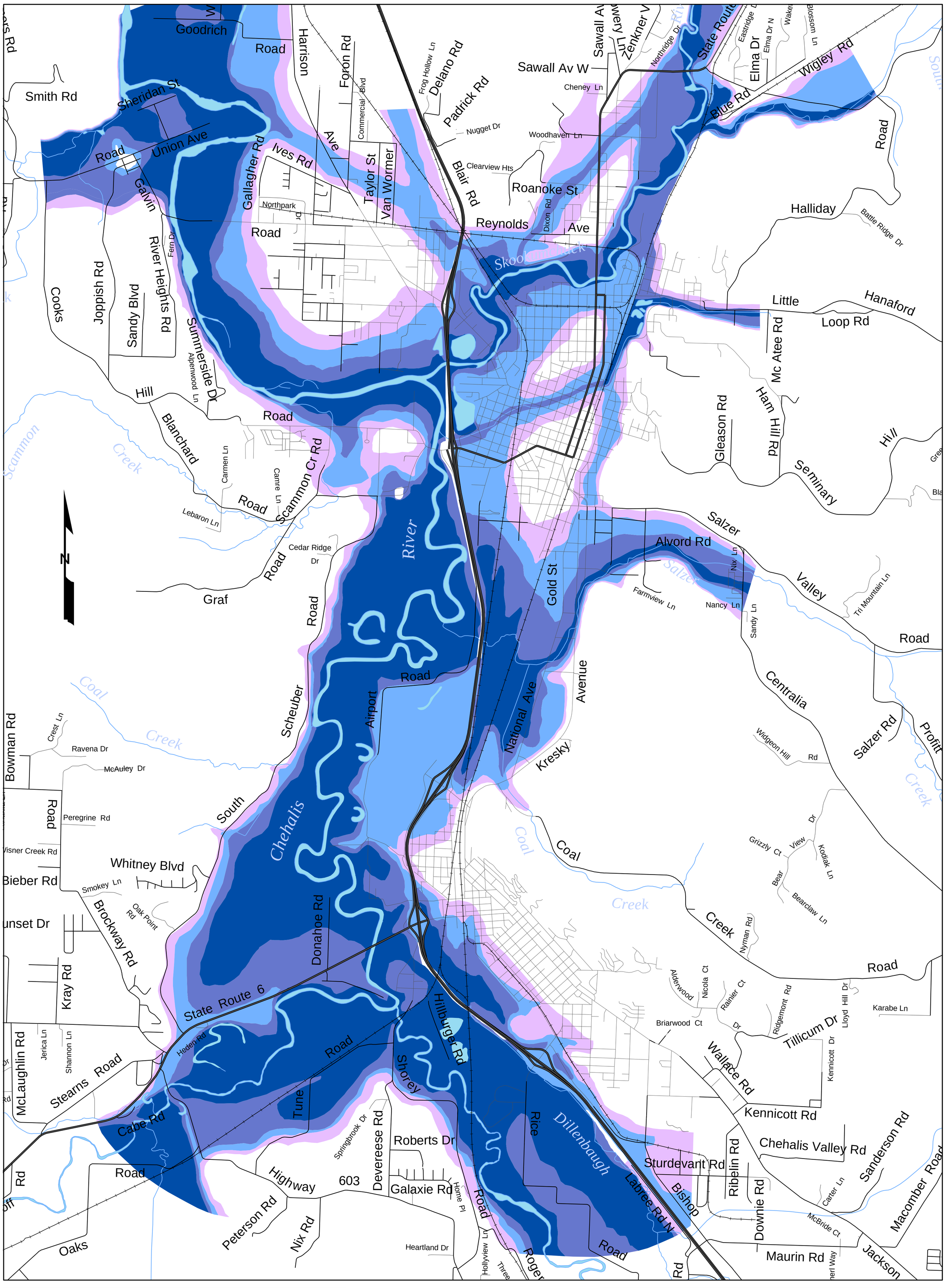
SEDIMENT MATERIAL EXCAVATION PLAN

DRAWN DRM	DATE OCTOBER 1992	REF. TO CCS-02-008	REV. NO. 0
SCALE AS NOTED	W.O. NO. 5286-02-03	SHT. 8 OF 11	

Appendix I: 1991 and 2006 Chehalis Area Flood Maps

Flood Warning Map
for Centralia, Chehalis and Vicinity

LEWIS COUNTY G.I.S.



Flood Warning Phases

- Phase 1
- Phase 2
- Phase 3
- Phase 4

The phase descriptions and flood limits on this map were developed by the U.S. Army Corps of Engineers with assistance from the city of Centralia, the city of Chehalis and Lewis County in 1991.

Map produced by Lewis County GIS - May 23, 2002

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevation** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevation (BFEs) shown on this map apply only landward of 0.0' National Geodetic Vertical Datum (NGVD). Users of this FIRM should be aware that coastal flood elevations may also be provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this community. Elevations shown in the Summary of Stillwater Elevations table should be used for construction, and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map is Universal Tranverse Mercator (UTM) zone 10. The **horizontal datum** is NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the National Geodetic Vertical Datum of 1929. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242,** or visit their website at www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by the Lewis County Department of Public Works.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

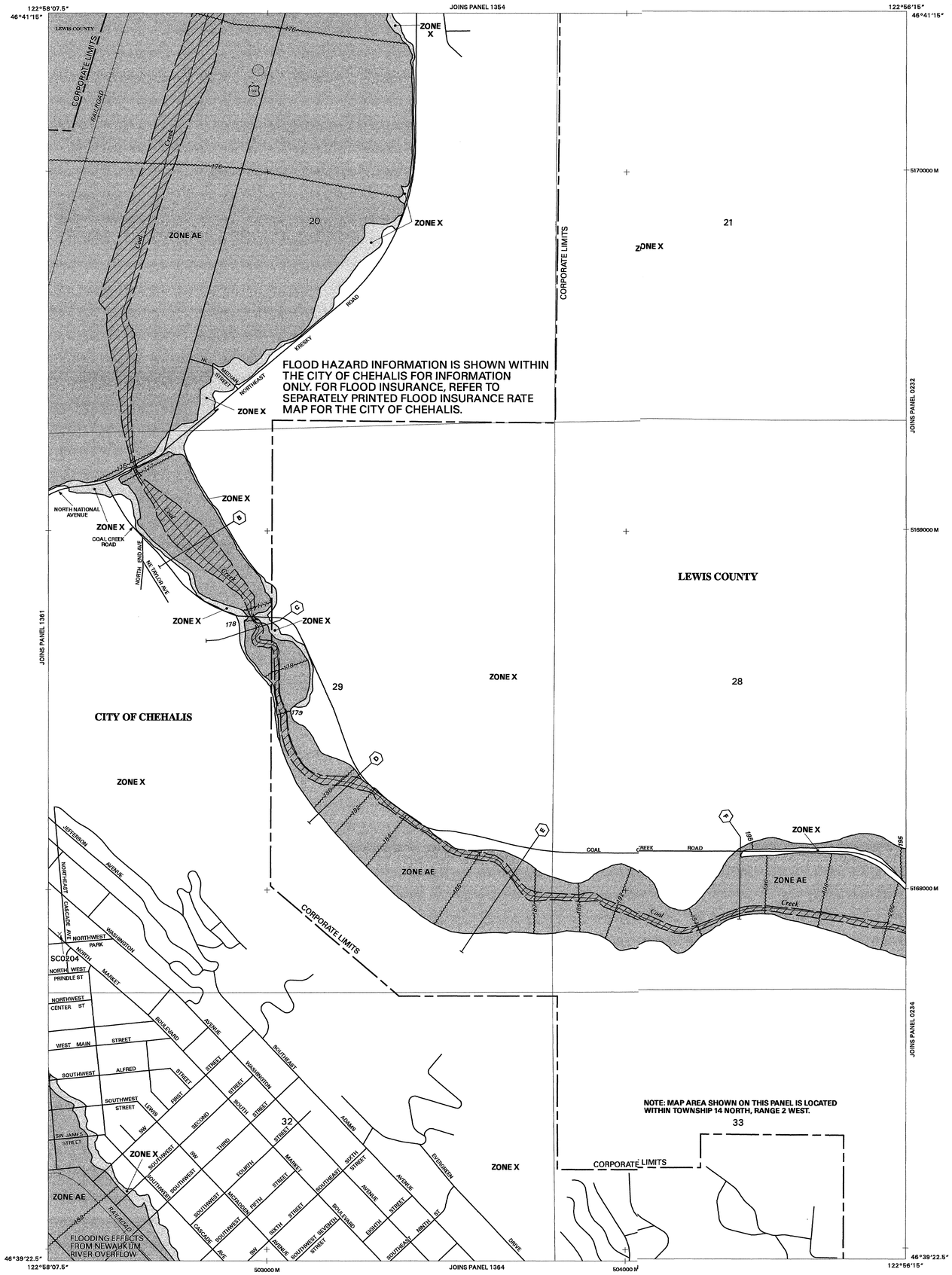
Please refer to the separately printed **Map Index** for an overview map showing the layout of map panels for this jurisdiction.

An accompanying Flood Insurance Study report, Letters of Map Revision or Letters of Map Amendment revising portions of this panel, and digital versions of this PANEL may be available. Contact the **FEMA Map Service Center** at the following phone numbers and Internet address for infomation on all related products available from FEMA;

Phone: 800-358-9616
FAX: 800-358-9620
www.fema.gov/msc

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at www.fema.gov.

This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on this map.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

ZONE A	No base flood elevations determined.
ZONE AE	Base flood elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood event.
ZONE A99	Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no base flood elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no base flood elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	Floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the National Geodetic Vertical Datum of 1929

(A)———(A)	Cross Section Line
(23)- - - - -(23)	Transect Line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4276000M	1000-meter Universal Transverse Mercator grid values, zone 10
600000 FT	5000-foot grid ticks
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel).
• M1.5	River Mile

MAP REPOSITORY
Division of Public Services, 350 North Market Boulevard, Chehalis, WA 98532-2626
(Maps available for reference only, not for distribution.)

INITIAL IDENTIFICATION
NOVEMBER 29, 1974
FLOOD HAZARD BOUNDARY MAP REVISIONS
NOVEMBER 29, 1977
FLOOD INSURANCE RATE MAP EFFECTIVE
DECEMBER 15, 1981
FLOOD INSURANCE RATE MAP REVISIONS
July 17, 2006: to change base flood elevations, to change zone designations, to update map format, to add roads and road names, to reflect updated topographic information, and to change floodway.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1362C

FIRM
FLOOD INSURANCE RATE MAP
LEWIS COUNTY, WASHINGTON (UNINCORPORATED AREAS)

PANEL 1362 OF 2500

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LEWIS COUNTY, UNINCORPORATED AREAS	530102	1362	C

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 5301021362C

MAP REVISED: JULY 17, 2006

Federal Emergency Management Agency