FINAL CLEANUP ACTION PLAN
CASCADE TIMBER NO. 3 LOG SORT YARD
SEPTEMBER 1993

EXHIBIT C

PT017015

CONTENTS

1.0 INTRODUCTION

This cleanup action plan (CAP) is provided to describe the proposed remedial action for the Cascade Timber No. 3 log sort yard site (hereafter referred to as "the Site") located along Maxwell Way between Port of Tacoma Road and Thorne Road in Tacoma, Washington (Figure 1). This CAP has been prepared to satisfy the requirements of the Model Toxics Control Act (MTCA). The purposes of this CAP are to: 1) describe the Site, including a summary of its history and extent of contamination as presented in the Remedial Investigation/Feasibility Study (RI/FS); 2) identify the site-specific cleanup standards; 3) summarize the remedial alternatives presented in the FS; and 4) identify and describe the selected alternative for Site remediation. Thorough descriptions of the Site and the remedial alternatives set forth are found in the RI/FS (Harding Lawson Associates, 1993). The RI/FS was performed pursuant to Agreed Order No. DE 91-S198.

2.0 SITE DESCRIPTION

The Site (formerly known as the Cascade Timber No. 3 log yard), located on the southeast side of Maxwell Way, is an 18.57 acre industrially zoned parcel of land owned by the Port of Tacoma (Port). The property is divided into two parcels: a 7.84-acre parcel to the northeast and a 10.73-acre parcel to the southwest. The Site was operated as a log sort yard by the Cascade Timber Company from 1978 through 1984. In 1982, approximately 500 tons of slag generated by Asarco Inc. of Tacoma, Washington, was placed on the southwest parcel for use as road bed or "ballast" material. According to court records, there is no documented evidence of slag being placed on the northeast parcel.

During normal log sort yard operations, wood waste (principally bark) was produced by loading, unloading and movement of logs within the yard. This wood waste accumulated on top of the

natural soil, dredged fill material, and ballast. As a result of heavy vehicular traffic, wood wastes have been mixed with surficial soils and slag ballast.

In the early 1980s, the Department of Ecology (Ecology) initiated preliminary investigations of water and sediment quality in Commencement Bay and its tributaries, including the Sitcum Waterway. Surface water samples collected by Ecology at the Site and other similar log sort yards in the Commencement Bay area were found to contain elevated concentrations of metals. Ecology believes that the metals are leached out of the slag. The mechanical grinding of the slag by heavy vehicular traffic pulverized it and created smaller particles which increased the surface area of the slag available to leach metals.

2.1 Commencement Bay Superfund Site Considerations

In 1983, the Commencement Bay area was identified as a federal Superfund site. Sitcum Waterway marine sediments were found to be contaminated with metals (Tetra Tech, 1985, 1988). The Record of Decision for the Commencement Bay Nearshore/Tideflats Superfund site issued in 1989 (USEPA, 1989) identifies the Cascade Timber No. 3 Site as a source of problem chemicals (arsenic, copper, zinc, lead) to the Sitcum Waterway problem area.

3.0 SITE CHARACTERIZATION

In February 1985, Ecology issued a report entitled, "Assessment of Log Sort Yards as Metals Sources to Commencement Bay Waterways, November 1983 - June 1984" (Norton and Johnson, 1985). This report contained storm water runoff data for numerous log sort yards, including the Cascade Timber No. 3 Site. This report concluded that metals in excess of state water quality standards were leaving the site via stormwater.

On October 8, 1991, Ecology and the Port entered into an Agreed Order to complete a Remedial Investigation/Feasibility Study (RI/FS). The mutual objectives of the Agreed Order were to provide a framework for the investigation of the extent of metals contamination at the site and the

evaluation of alternatives available to provide a permanent site remedy in accordance with the Model Toxics Control Act. The RI/FS was submitted to Ecology in June 1993.

Specific findings of the investigative work conducted at the Site include the following:

3.1 Soil Quality

The surface of the northern portion of the site consists of imported gravel and fill material. The surface of the southern portion of the site is covered by areas of bark, other wood debris, gravel, and slag. Bark on the southern portion of the site ranges in thickness from 0 to approximately 2 feet.

Estimates of the percentage of slag on the surface of the Site were made at 172 locations across the site during the RI process. The majority of slag identified during this mapping ranged from sand sized particles to 3 inches long in the greatest dimension.

Based on the results of the surface slag mapping, 25 surface soil samples were analyzed. The maximum detected concentrations of the metals of concern were arsenic - 2,650 mg/kg, copper - 2,760 mg/kg, lead - 1,180 mg/kg, and zinc - 3,870 mg/kg. These maximum concentrations were all detected in one sample collected from the southwest portion of the site. Concentrations of metals in soil samples collected from the northeast portion of the site were generally 1 to 2 orders of magnitude lower than the elevated concentrations detected on the southwest portion of the site. These relatively low metals concentrations combined with the absence of slag in this area indicates that the northeast portion of the site does not appear to be a concern with respect to the presence of metals. Moreover, Ecology is addressing the cleanup of the northwest portion of the site (known as the Cascade Timber #3 - U.S. Oil site) under a separate regulatory action.

Subsurface soil samples were taken at 14 locations across the site at depths of between 1.0 and 2.0 feet below ground surface. The maximum detected concentrations in subsurface materials were arsenic - 1,180 mg/kg, copper - 2,760 mg/kg, lead - 1,180 mg/kg, and zinc - 3,870 mg/kg.

These maximum values occurred within the same sample and at the same location as the maximum concentrations detected in the surface samples. In general, in areas where slag was observed, concentrations of these metals at the 3-foot depth were 1 or 2 orders of magnitude less than those detected at the surface. In no case did any of the samples from depths greater than 3.0 feet exceed 20 mg/kg of arsenic.

Total Petroleum Hydrocarbon (TPH) concentrations detected in soil outside the U.S. Oil spill area ranged from 50 to 39,000 mg/kg in near surface soils and 46 to 350 mg/kg at depths between 3.0 and 5.0 feet, with a mean concentration of approximately 3,200 mg/kg in near surface soils and 270 mg/kg at depth. Petroleum hydrocarbons detected in soil samples from the southwest parcel can be distinguished from the petroleum hydrocarbons in the U.S. Oil spill area in the northeast portion of the property based on a comparison of chromatograms. Petroleum in the U.S. Oil spill area contains high levels of benzene, and a significantly greater percentage of lighter fraction hydrocarbons. The type of hydrocarbons found on the southern portion of the site consist of higher molecular weight petroleum fractions which are of very low solubility and tend to strongly sorb to soils.

3.3 Ground Water Quality

The first water-bearing zone beneath the site occurs under unconfined conditions in a poorly sorted sand and silty sand fill layer. This fill layer is underlain by a clayey layer which is laterally extensive beneath the site. The clayey layer is underlain by sand deposits which contain the second water-bearing zone beneath the site. Water quality data indicates that the two different water-bearing zones are not hydraulically interconnected.

Groundwater at the Site is not a current or potential future source of drinking water due to the fact that the water-bearing zones beneath the site are expected to produce small quantities of relatively poor quality water. Because of this, groundwater quality will be evaluated with respect

to its ability to discharge to the closest surface water body and will be compared with federal and state marine chronic water quality criteria.

Three rounds of groundwater samples were taken from eight monitoring wells during the RI process. Seven of the wells were sampled from the shallow fill unit and one well was sampled from the lower sand unit. The ranges in concentrations of dissolved arsenic, copper, lead, and zinc from these wells and the Marine Chronic Water Quality Criteria are shown in Table 1. No wells screened in the shallow fill unit exceeded the Marine Chronic criteria, with the exception of copper which was detected at a concentration of 3 ug/L. However, copper was also detected in the laboratory method blank associated with this sample.

Chromium, copper, and lead were detected in the one well screened in the lower sand water-bearing zone at levels up to 191 ug/L, 105 ug/L, and 8 ug/L, respectively. No other metals exceeded the Marine Chronic criteria.

Table 1. Measured Levels of Contaminants of Concern at the Cascade Timber No. 3 Site and Marine Ambient Water Quality Criteria

Contaminant	Surface Water Maximum Measured (a) ug/l	Ground Water Range Measured/Avg. (b) ug/l	Marine Acute (c) ug/l	Marine Chronic (c) ug/l
arsenic	435	<1 to 10/3	69	36
copper	567	<2 to 105/12	2.9	2.9
lead	231	<1 to 8/1	220	8.5
zinc	21,300	<4 to 47/13	95	86

Key: (a) Total metals

(b) Dissolved metals

(c) U.S. EPA Water Quality Criteria

Petroleum hydrocarbons were not detected in any monitoring wells sampled during the remedial investigation.

Based on the information provided above, shallow or intermediate aquifer groundwater does not appear to be a pathway for migration of contaminants from the Site. The deep aquifer chromium emanates from a source other than the surficial woodwaste fill. Ecology is considering whether the presence of this chromium merits attention as a separate site.

3.2 Surface Water Quality

Surface water occurs on-site as a result of precipitation and discharges off-site to City of Tacoma storm drains along Thorne Road. These storm drains eventually discharge to the Sitcum Waterway. Stormwater samples collected by Ecology in 1983 and 1984 contained concentrations of arsenic, copper, lead, and zinc up to 1,750, 138, 69, and 293 ug/l (ppb), respectively. Stormwater sampling conducted during the RI showed lower levels of arsenic and slightly higher levels of copper, lead, and zinc in water discharging from the site. Maximum concentrations measured during the RI in surface water runoff and the marine chronic and acute water quality criteria are shown for comparison in Table 1. The maximum concentration of TPH measured in runoff from the southern portion of the site was 2.7 ug/L.

Based on the results of the environmental investigations conducted at the Site, it appears that surface water runoff is the primary pathway by which metals and TPH are transported from the Site.

4.0 CLEANUP STANDARDS

Cleanup standards were developed for this Site based on Chapter 173-340 WAC. The use of Method A industrial soil cleanup standards per WAC 173-340-745 is justified for the following

reasons: the Site cleanup may be defined as a routine cleanup per WAC 173-340-130; the Site is located in a heavy industrial area, adjacent to other industrial properties; the site is zoned for industrial use; and, deed restrictions will limit the use of the Site to industrial activities in the future.

Soil cleanup levels have been determined for arsenic and lead. Copper and zinc were evaluated and determined not to be present on-site at concentrations which would present a human health (direct contact) hazard. Groundwater cleanup standards were set for arsenic, copper, lead, and zinc. The cleanup standards for soil and groundwater are presented in Table 2.

In addition to protection of human health from the direct contact exposure pathway, contaminant concentrations remaining in soil after the cleanup is completed must also support maintenance of acceptable water quality (see standards in Table 2).

The aquifer underlying the Site cannot be used for drinking water due to low yield and poor water quality. The closest receptor of groundwater is the Blair Waterway, approximately 1/4 mile from the Site. Groundwater discharge must be of a quality which will maintain acceptable sediment and water column quality. Waterway sediment cleanup objectives are set forth in the Commencement Bay Nearshore/Tideflats Record of Decision (USEPA, 1989). It is expected that discharge of groundwater contaminant concentrations below marine chronic ambient water quality criteria will result in sediment and surface water concentrations at or below acceptable levels as discussed above. Therefore, groundwater standards for this Site are the federal marine chronic ambient water quality criteria.

Petroleum hydrocarbons measured on the southern portion of the site appear to be extremely weathered, heavy-end hydrocarbons. Data from studies performed on the site indicate that these hydrocarbons are not migrating from near surface soils to groundwater. The primary migration pathway for these hydrocarbons is through stormwater runoff. Therefore, remedial alternatives

for mitigating petroleum hydrocarbon migration are consistent with remedial alternatives for mitigating metals migration.

Table 2. Cleanup Standards

Site Cleanup Standards			
Contaminant	Ground Water (ug/l)(a),(f)	Soil (mg/kg)(d)	Surface Water(e)
Arsenic	36	200(c)	*
Copper	2.9 (10(b))		*
Lead	8.5 (10(b))	1000(c)	*
Zinc	86		*

Key: (a) U.S. EPA Water Quality Criteria - Marine Chronic Criteria

(b) Practical Quantification Limit (PQL). Ecology recognizes that the PQL may be higher than the cleanup standard for a given parameter. In these cases, the cleanup standard may be considered to be attained if the parameter is undetected at the PQL and the conditions outlined in WAC 173-340-707 are met.

(c) MTCA Method A Cleanup Levels - Industrial Soil per WAC 173-340-745

(d) Soil cleanup standards are not based on 100 X groundwater cleanup level due to the low groundwater concentrations (below cleanup standards) of the compounds listed below.

(e) No surface water cleanup standards have been set for this site since the proposed remedial action should eliminate surface water as a contaminant pathway;

however, surface water will be monitored for the same parameters as groundwater, as indicated by the symbol *, to ensure the efficacy of the cleanup.

(f) Natural background values may be substituted as cleanup objectives by Ecology if the requirements of WAC 173-340-708 (11) are satisfied.

The points of compliance and compliance monitoring requirements are discussed in section 6.2.

5.0 SUMMARY OF REMEDIAL ALTERNATIVES

The MTCA requires at a minimum that all cleanup actions protect human health and the environment, comply with cleanup standards, comply with applicable state and federal laws, and provide for compliance monitoring. In addition, all cleanup actions must consider implementation time, cost effectiveness, permanent solutions, and resource recovery technologies to the maximum extent practicable.

A number of potential remediation alternatives were screened in the FS process to select the most effective, implementable, and cost-effective alternatives for more detailed evaluation. The FS developed six remedial alternatives to address potential human health and environmental risks associated with the metals present in slag and soil at the site. One of the alternatives (Alternative 2) did not meet the MTCA threshold criteria and was screened out. A detailed evaluation was performed on the remaining five alternatives. Each alternative is briefly described below:

Alternative 1 No action/Institutional Controls.

Semiannual groundwater and surface water monitoring would be performed and a deed restriction would be placed on the property.

Alternative 2 Surface Water and Institutional Controls.

Stormwater runoff would be collected from the site and treated prior to discharge to the storm drain. Access to the site would be restricted, groundwater would be monitored, and a deed restriction would be placed on the property.

Alternative 3 Asphalt Cap.

The southern portion of the site would be graded and the soil and slag would be capped with asphalt meeting permeability and strength requirements. The cap would cover the entire southwestern parcel, comprising approximately 10.7 acres. The cap would include an 8- to 12-inch layer of crushed aggregated base over the rough grade, topped with a 4- to 8-inch layer of asphaltic pavement. Groundwater would be monitored, the cap would be inspected annually, and deed restrictions would be placed on the property.

Alternative 4 Excavation, Ex-Situ Stabilization, and Replacement

Soil, slag, and wood debris above the target cleanup levels would be excavated, screened to remove large debris, stabilized ex-situ with a cement-based agent, and replaced on site. Screened debris would be disposed at a hazardous waste landfill. The stabilized soil would then be covered with a cover of nine inches of soil and three inches of gravel. Groundwater and stormwater would be monitored semi-annually and a deed restriction would be imposed.

Alternative 5 Excavation and Consolidation in Onsite Lined Cell

Soil, slag, and wood debris above target cleanup levels would be excavated and consolidated into an on site lined waste management unit which would comprise the entire southwest parcel. This would include a cell liner and cap. A passive venting system would be installed due to the high organic content of the soil. Groundwater monitoring, annual cell inspection, and deed restrictions would be imposed.

Alternative 6 Excavation and Offsite Disposal

Soil, slag and wood debris exceeding the cleanup standards would be excavated and disposed of off-site in a permitted hazardous waste landfill. Excavated areas would be backfilled with clean soil. This alternative would include regrading of site surface and stormwater monitoring and groundwater monitoring.

6.0 SELECTED CLEANUP ACTION

While several of the alternatives examined in the FS should positively impact the quality of surface water runoff, groundwater, and soil conditions on the site, it is Ecology's opinion that Alternative 3, previously outlined and described in detail below, will provide the greatest protection for human health and the environment.

On-site containment, rather than waste treatment, was selected as the cleanup action because literature review and bench scale studies for similar sites have not demonstrated the existence of a feasible treatment system (biological or chemical) for this waste type.

6.1 Detailed Description of the Selected Cleanup Action

The alternative selected involves capping of the Site with asphalt. The cap system will serve to isolate contaminated materials from surface water, prevent infiltration through contaminated soils, and eliminate the potential for worker exposure to the contaminated material. While the actual cap design will be determined as part of the remedial design, the cap is expected to require placement of an 8- to 12-inch layer of crushed aggregate base over the rough grade which has been smoothed by grading. Above that a 4- to 8-inch layer of asphalt will be placed. The asphalt(s) used for the cap will be designed for high durability and low permeability. Seams and edges of the cap will be engineered to reduce effective permeability and potential for cracking of the cap.

The activities anticipated for the construction of the containment cap are as follows:

- Abandon existing monitoring wells.
- Prepare site by removing vegetation, mixing the bark/soil to create a layer of uniform thickness and composition, and regrading the southern 10.7 acres of the site.
- If the moisture content of the soil and wood is above the optimum moisture content for compaction, it will be aerated before cap placement.
- Install catch basins and drain lines.
- Compact base soil with a sheepsfoot roller to 95 percent of maximum dry density.
- Place crushed aggregate base rock over the compacted soil, followed by asphalt pavement.
- Install 3 new monitoring wells to monitor shallow groundwater quality.

A key component of the selected cleanup action is a schedule of inspection and maintenance of the cap. An Operation and Maintenance Plan will be prepared as part of the remedial design phase. This plan will specify regular cap inspections and maintenance to ensure that the cap is functioning as intended.

Institutional controls prohibiting the disruption of the cap system without Ecology approval will be placed on the site. Since industrial soil cleanup standards will be used on the site, a restrictive covenant limiting use on the southern portion of the site to industrial activities will be placed on the property deed. Future industrial uses of the southern portion of the site will only be permitted if it can be shown that the cap is of suitable strength to support the proposed activities.

6.2 Points of Compliance/Compliance Monitoring

The selected cleanup alternative involves containment of hazardous substances on-site; therefore requirements of WAC 173-340-740(6)(d) must be met, including compliance monitoring to ensure the long-term integrity of the containment system, and other requirements for containment technologies in WAC 173-340-360(8).

Groundwater will be monitored by wells located on the perimeter of the cap system near the property boundary; these wells shall represent the points of compliance for groundwater cleanup standards. All wells will sample the uppermost aquifer system. Specific well placements, designs, and monitoring methodologies will be developed during the remedial design phase.

7.0 JUSTIFICATIONS/DETERMINATIONS

The MTCA requires that any alternative selected for site remediation must, as a minimum, meet four threshold requirements as follows: protect human health and the environment; comply with cleanup standards; comply with applicable state and federal laws; and, provide for compliance monitoring.

7.1 Protection of Human Health and the Environment

The risks identified during the RI/FS process are: 1) potential human health impacts from ingestion and inhalation of on-site wood waste and soil/slag deposits which contain elevated concentrations of metals; 2) potential water quality impacts in the Sitcum Waterway attributable to surface water runoff containing elevated concentrations of metals; and, 3) potential impacts to marine sediments.

The selected cleanup action eliminates the human health risks from ingestion and inhalation of metals in the slag/soil mixture by capping of the wood waste, contaminated soil, and slag deposits. The metal concentration in surface water runoff attributable to these soils/wastes will be minimized by preventing surface water contact with the soil/slag.

As noted in Section 2.1 above, Ecology believes that the site is a potential source, along with other sources, of metals to the Sitcum Waterway sediments. Remediation of the Sitcum Waterway sediments will be addressed in other activities pursuant to the Commencement Bay Nearshore/Tideflats Record of Decision. The selected cleanup action for the Cascade Timber No. 3 Logyard site will eliminate the possibility of metals migration from the site soils to the Sitcum Waterway.

7.2 Compliance with Cleanup Standards

The selected alternative is designed to comply with the remedial action objectives listed in Section 5.0 above.

7.3 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

This evaluation criterion is used to determine the degree to which the selected cleanup action complies with federal and state standards and regulations. The following ARARs apply to the site:

STATE LAWS AND REGULATIONS

a. Model Toxics Control Act Cleanup Regulation, Chapter 173-340 WAC

b. Hazardous Waste Cleanup - Model Toxics Control Act, Chapter 70.105D RCW

c. State Environmental Policy Act, Chapter 197-11 WAC

d. Minimum Standards for Construction and Maintenance of Water Wells, Chapter 173-160 WAC

e. Water Pollution Control, Chapter 90.48 RCW

f. NPDES Permit Program, Chapter 173-220 WAC

g. Water Quality Standards for Surface Waters of the State of Washington, Chapter 173-201A WAC

h. Dangerous Waste Regulations, Chapter 173-303 WAC

i. Washington Clean Air Act, Chapter 70.94 RCW

j. Washington Industrial Safety and Health Act (WISHA)

FEDERAL LAWS AND REGULATIONS

k. Occupational Safety and Health Act (OSHA), 29 CFR subpart 1910.120

l. Federal Water Pollution Control Act of 1972 (Clean Water Act)

m. Water Quality Act of 1987:

1) Section 308. Establishes water quality criteria for toxic pollutants.

2) Section 402. Establishes the NPDES permit process for discharges to surface water bodies.

The selected cleanup action achieves all ARARs listed above. Other ARARs such as air quality regulations will be complied with as an integral part of the remedial design and implementation steps.

7.4 Compliance Monitoring

Compliance monitoring as specified in WAC 173-340-410 will be provided to determine compliance with the cleanup standards listed in Section 5.0. Groundwater will be monitored to evaluate compliance with cleanup standards. A compliance monitoring plan will be prepared and submitted to Ecology for approval during the remedial design phase.

7.5 Short-Term Effectiveness

Short-term effectiveness considers how each alternative would impact the human health and the environment during the implementation (construction) phase and prior to attainment of cleanup standards.

The implementation of the selected cleanup action involves various earth moving activities. The earth work may have an impact the community from exposure to airborne dust. This potential impact will be mitigated through use of control measures such as watering to reduce dust generation.

Capping should result in immediate improvements in the quality of storm water runoff. The cap should effectively isolate contaminated materials from surface water runoff. Capping should eliminate the human health concerns associated with ingestion of contaminated material.

7.6 Long-Term Effectiveness

Long-term effectiveness is evaluated in terms of the magnitude of residual risk and the adequacy and reliability of the cleanup action.

Implementation of the selected alternative will prevent contact between precipitation/surface water runoff and contaminated soil/slag materials. Long-term reliability will be dependent on the ultimate capping system design, on maintenance of the engineering controls and continued monitoring since residuals will remain on site. The isolation and containment measures should be effective in controlling mobility of metals when coupled with appropriate long-term operation, maintenance and monitoring to remedy any potential damage to the cap system due to settlement, erosion, or other causes. The selected alternative provides, in addition to monitoring, periodic routine inspections and maintenance of the cap system to ensure its integrity and effectiveness. Institutional controls, including restrictive covenants, will limit the use of the southern portion of the site to industrial uses for the long-term.

7.7 Reduction of Toxicity, Mobility, or Volume

This evaluation criterion addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility, and volume of the hazardous substances present. As stated in section 6.0 above, physical or chemical treatment was not chosen as the preferred cleanup alternative because the existence of a feasible treatment system for this waste is not known.

The human health and environmental risks identified at the Site are a direct result of on-site slag deposits containing metals. The implementation of this alternative will not use treatment technologies to reduce toxicity, or volume of the contamination present on the site. The cleanup action will greatly reduce contaminant mobility by eliminating the contact of storm water with contaminated soil/slag through the use of a physical barrier (cap system).

7.8 Implementability/Technical Feasibility

This alternative employs conventional technologies and, therefore, should be readily implemented. Capping has been performed at other log sort yards in the Tacoma area. Maintenance requirements for the cap system should not pose any technical difficulties.

7.9 Cost

The relative costs of the alternatives determined in the FS are given in Table 3.

7.10 Elimination of Other Alternatives

Alternatives 1 and 2 were not selected because they would not adequately protect human health and the environment. Alternatives 4 and 5 could provide increased protection over capping by immobilizing or encapsulating slag and metal-bearing soil. However, since surface water is the primary transport mechanism for chemicals at the site, immobilization and encapsulation would provide only minimal increased protection at a substantially greater cost. Alternative 6 could meet the target cleanup levels for soil at the site; however, the additional cost for excavation and disposal is excessive considering the minimal degree of protection it achieves over the selected alternative.

Table 3. Remedial Alternative Cost Comparison

ALTERNATIVE	COST
Alternative 1. No Action	341,000(1)
Alternative 2. Grading/surface water collection/water treatment	NA(2)
Alternative 3. Asphalt Cap	1,893,000(1) 1,893,000(1)
Alternative 4. Excavation, Ex-Situ Stabilization, and Replacement	3,136,000(1)
Alternative 5. Excavation and Consolidation in Onsite Lined Cell	3,343,000(1)
Alternative 6. Excavation and Offsite Disposal	3,381,000(3)

(1) Cost includes net present value for 30 years of operation and maintenance.

(2) Not applicable. Alternative 2 did not meet the preliminary threshold evaluation criteria described in the Feasibility Study, therefore a cost analysis was not performed.

(3) Cost includes net present value for three years of groundwater and surface water monitoring.

8.0 STATE AND COMMUNITY ACCEPTANCE

State and community acceptance have been evaluated based on the comments received during the public comment period. Based on the information gathered from the public, Ecology has modified the draft CAP to arrive at this final CAP.

9.0 CLEANUP ACTION REQUIREMENTS

The cleanup action as selected is designed to accomplish the following requirements:

1. Protect human health and the environment.

2. Comply with cleanup standards per WAC 173-340-700 through 760.

3. Comply with applicable state and federal laws per WAC 173-340-710.

4. Provide compliance monitoring per WAC 173-340-410.

5. Use permanent solutions to the maximum extent practicable per WAC 173-340-360(4), (5), (7), and (8).

6. Provide a reasonable restoration time frame per WAC 173-340-360(6).

7. Consider public concerns, if any, raised during public comment on the draft cleanup action plan per WAC 173-340-360(10) through (13).

10.0 SCHEDULE FOR IMPLEMENTATION/UPCOMING ACTIVITIES

Ecology will begin negotiations on a Consent Decree per MTCA with the Port of Tacoma to cover the remedial design, remedial construction, and all other work phases. The time line for implementation of all project phases will be defined in the Consent Decree. Full public participation, including a 30-day public comment period and public meeting, will accompany the MTCA Consent Decree.

REFERENCES

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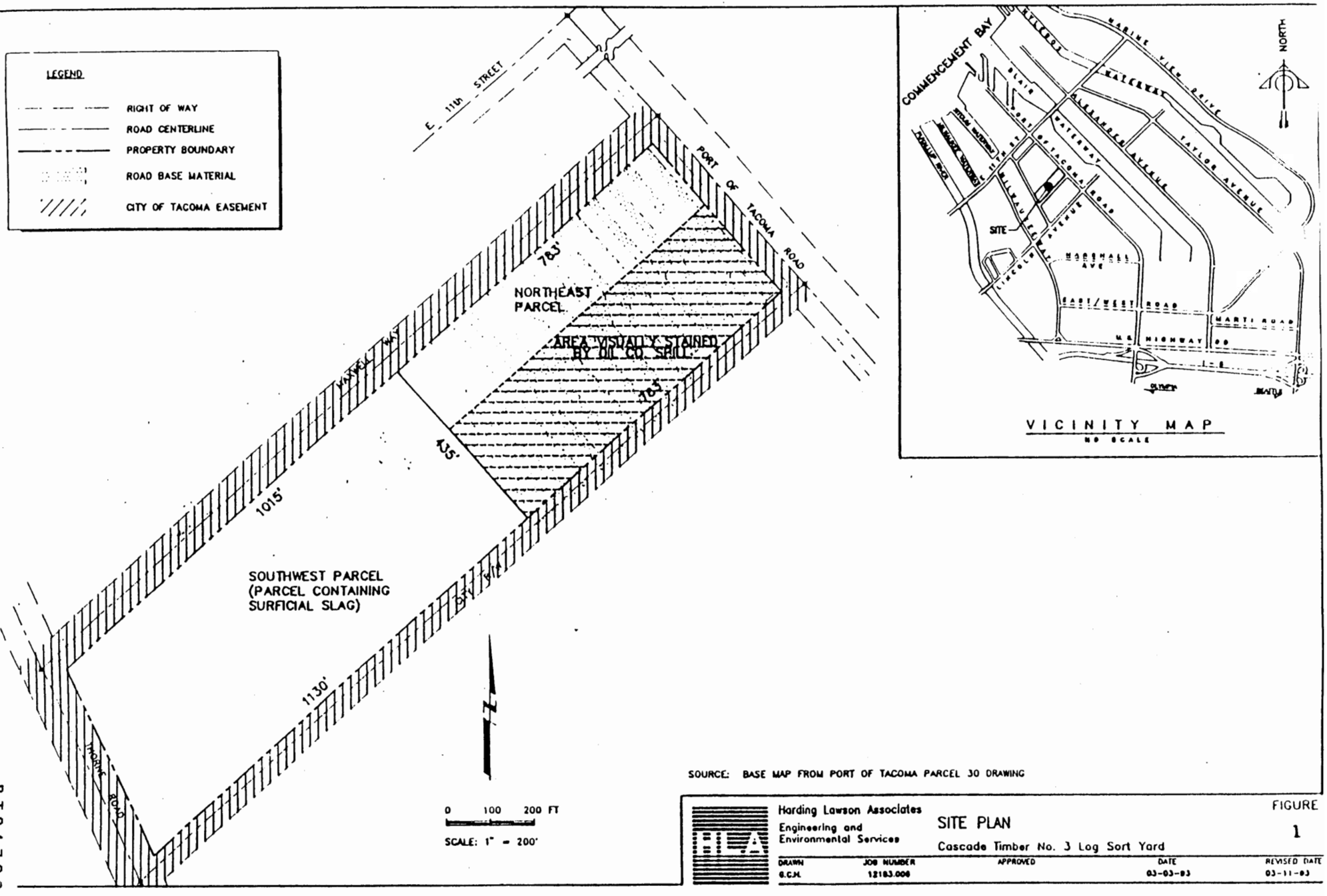

SOURCE: BASE MAP FROM PORT OF TACOMA PARCEL 30 DRAWING

Harding Lawson Associates
Engineering and Environmental Services

SITE PLAN
Cascade Timber No. 3 Log Sort Yard

FIGURE 1

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
G.C.M.	12183.006		03-03-93	03-11-93

EXHIBIT C - FIGURE 1

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