



PERIODIC REVIEW

**Intalco Aluminum Corporation
Facility Site ID#: 16**

**4050 Mountain View Road
Ferndale, WA**

**Industrial Section
Waste 2 Resources Program**

October 2015

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1.0 Introduction

This document is a review by the Washington State Department of Ecology (Ecology) of post-cleanup site conditions and monitoring data to ensure that human health and the environment are being protected at the Intalco Aluminum Corporation Ferndale facility (Site). Remedial action was undertaken at the landfills under Consent Decree No. 07-2-00181-2 between Ecology and Intalco Aluminum Corporation. Cleanup of the Beach I (BI) and Beach II (BII) Landfills, and the Closed Construction Debris Landfill (CCDL) at this Site was implemented under the Model Toxic Control Act (MTCA) regulations, Chapter 173-340 Washington Administrative Code (WAC). Closure of a solid waste landfill, known as the Double-Lined Landfill (DLL), was also performed under the Consent Decree. A periodic review of Intalco's Triple-Lined Landfill (TLL) is not included in this report as the review is not due until March 26, 2017.

BI cleanup activities were started June 16, 2005 and completed November 29, 2005. BII cleanup activities were started July 6, 2005 and completed November 25, 2005. Closure of the CCDL was started May 15, 2006 and completed October 4, 2006. DLL closure began March 16, 2007 and was completed September 14, 2007. The cleanup actions resulted in concentrations of fluoride, PAHs and polychlorinated biphenyls (PCBs) less than MTCA cleanup levels remaining in the soils at the BI and BII landfills.

The MTCA cleanup levels for soil are established under WAC 173-340-740. The MTCA cleanup levels for groundwater are established under WAC 173-340-720. WAC 173-340-420 (2) requires that Ecology conduct a periodic review of a Site every five years under the following conditions:

- (a) Whenever Ecology conducts a cleanup action.
- (b) Whenever Ecology approves a cleanup action under an order, agreed order, or consent decree.
- (c) Or, as resources permit, whenever Ecology issues a no further action opinion, and one of the following conditions exists:
 - 1. Institutional controls or financial assurance are required as part of the cleanup.
 - 2. Where the cleanup level is based on a practical quantitation limit.
 - 3. Where, in Ecology's judgment, modifications to the default equations or assumptions using Site-specific information would significantly increase the concentrations of hazardous substances remaining at the Site after cleanup or the uncertainty in the ecological evaluation or the reliability of the cleanup action is such that additional review is necessary to assure long-term protection of human health and the environment.

When evaluating whether human health and the environment are being protected, the factors Ecology shall consider include [WAC 173-340-420(4)]:

- (a) The effectiveness of ongoing or completed cleanup actions, including the effectiveness of engineered controls and institutional controls in limiting exposure to hazardous substances remaining at the Site.
- (b) New scientific information for individual hazardous substances or mixtures present at the Site.
- (c) New applicable state and federal laws for hazardous substances present at the Site.
- (d) Current and projected Site use.
- (e) Availability and practicability of higher preference technologies.

- (f) The availability of improved analytical techniques to evaluate compliance with cleanup levels.

Ecology shall publish a notice of all periodic review in the Site Register and provide an opportunity for public comment.

2.0 Summary of Site Conditions

2.1 Site Description and History

Intalco is located at 4050 Mountain View Road in Ferndale, Washington, in Whatcom County. A vicinity map is shown in Figure 6.1. The aluminum production facility consists of approximately 320 acres on a 1,200-acre upland tract. The Intalco site location map is shown in Figure 6.2. The Intalco plant has operated continuously at the Ferndale location from May 8, 1966 to the present, with the exception of a temporary curtailment from June to December 2001. The production process involves the electrochemical reduction of aluminum oxide (alumina) to aluminum metal. Intalco was built with three pot lines, each consisting of approximately 240 pots, but only 2 ½ lines are currently in operation. Supporting operations include a casting house, a carbon plant for anode production, two wastewater-treatment facilities, and several material storage, maintenance and administrative facilities.

During the construction and early operation of the plant, solid waste and construction debris was disposed of on the property in three historic landfills: BI, BII, and the CCDL (Figure 6.3). All three landfills were located on the western portion of the property. A steep, 180-foot bluff adjacent to the Strait of Georgia forms the western boundary of the smelter property. BI, BII, and the CCDL, were created by filling or partially filling three natural ravines that cut and drained into the bluff and the Strait.

Use of these landfills slowed during the late 1970's and early 1980's, after which waste landfilling at these locations was permanently terminated. BI opened in 1966 by filling a ravine and was closed in 1972 with a volume of approximately 9,000 cubic yards. BII opened in 1971 by filling the head of a ravine and was closed in 1976 after receiving approximately 56,000 cubic yards of material. The CCDL opened in 1966 for disposal of debris and was closed in 1975.

A closed landfill disposal area, referred to as the Waste Site Impoundment Area (WSIA) operated from 1970 until 1986 when it was closed under Minimal Functional Standards for Solid Waste Handling, Chapter 173-304 WAC. In preparation for WSIA closure, Intalco constructed the DLL and the first cell of the TLL in 1986. The DLL was to be used for limited purpose landfilling of plant-generated solid waste and the first cell of the TLL was to be used primarily for disposal of spent potliner (SPL). In 1992, a second cell of the TLL was constructed. The closed solid waste (DLL) and dangerous waste (TLL) landfills are located away from the bluff on the upland plain just north of the main facility.

The DLL was developed to provide disposal for a large variety of solid wastes from the aluminum smelting process that were not classified as dangerous waste. After closure of the DLL in 2007, general solid wastes generated by Intalco were also disposed of in the TLL in accordance with the supplemental operations plan. Intalco resumed disposal of SPL into the TLL in 2007 as well as non-dangerous solid waste that would have otherwise been disposed of in the DLL. In June 2011, capacity was reached at the TLL and closure was completed on November 28, 2012.

2.2 Site Investigations and Sample Results

Upland investigations of the BI, BII, and CCDL began December 27, 2000 and were completed February 6, 2001. CCDL activities included excavation of test pits, collection of waste materials for analysis, and collection of surface water samples in the ravine on the south east sides of the landfill. Samples were also collected from the toe of the BI and BII Landfills for environmental analysis. Sampling of the near shore sediments adjacent to all three landfills was completed February 8, 2001. Near shore sediment sampling consisted of collecting surface sediment samples at locations perpendicular to seeps located at the base of the BI and BII Landfills (Figures 6.4 and 6.5), and perpendicular to the discharge area of the surface water drainage feature that runs along the western side of the CCDL.

Pursuant to Agreed Order No. DE 01 TCPIS 2949 dated July 9, 2001, the three industrial solid waste landfills (BI, BII, and CCDL) were required to undergo separate remedial investigations and feasibility studies. The field investigations at the BI and BII landfills were performed in May 2000, December 2000, and September/October 2001. A total of 30 test pits were dug and samples of waste were obtained, and subsequently analyzed. Seep and surface water samples were also obtained on three occasions (April, July, and October 2000) and analyzed for total and dissolved solids, dissolved metals, fluoride, total and amenable cyanide, total organic carbon, total petroleum hydrocarbons, semi-volatile organic compounds, and total and dissolved PCBs. Waste samples contained multiple contaminants of concern including fluoride, aluminum, chromium, copper, lead, zinc, PCBs, and PAHs. Surface water contained fluoride and aluminum. PCB arochlor 1248 and PAHs were found in soil samples from the vicinity of BI and BII.

Field investigations at the CCDL were performed from December 27, 2000 to February 8, 2001. Eleven test pits were dug and waste samples were analyzed for fluoride, cyanide, ignitability, corrosivity, reactive cyanide and sulfide, metals, polychlorinated biphenyls, gasoline and diesel range total petroleum hydrocarbons, semi-volatile organic compounds, toxicity characteristic leaching procedure (TCLP) metals, volatile organic compounds, pesticides, and herbicides. Sediment, surface water, seeps, groundwater and soil were also sampled and analyzed for similar chemicals of concern at the CCDL, even though the only required groundwater analyte was fluoride. The primary chemicals of concern detected in the waste materials were PAHs, PCBs, and fluoride. Concentrations of the same chemicals of concern were found to be several orders of magnitude lower in the underlying soil compared to the waste materials. Water samples collected from the ravine next to the CCDL had elevated fluoride concentrations. Sediment sampling adjacent to the BI, BII, and CCDL indicated no exceedances of the Sediment Management Standards (SMS) or Lower Apparent Effects Threshold (LAET) criteria. Therefore, adverse effects are not anticipated in the sediments near the landfills.

2.3 Cleanup Actions

Consent Decree #07-2-00181-2 between Ecology and Intalco was effective on February 2, 2007 and required Intalco to implement the Cleanup Action Plan. The consent decree (CD) called for the remediation of BI, BII, and CCDL by excavating material from BI and BII and placing it in either the DLL or TLL, re-grading and re-vegetating the remaining BI and BII slopes, stabilizing the CCDL and closing the DLL once it was filled to capacity. Long term monitoring of seeps from the BI, BII, and CCDL for fluoride, weak acid dissociable (WAD) cyanide, and total PCBs on a semi-annual basis was also required for three years – 2007, 2009, and 2011.

From June 2005 through September 2007 remedial action was performed at the three landfills. The remedial action for BI included removal of approximately 29,600 cubic yards (42,017 tons) of waste material. Waste from the landfill was excavated, hauled to, and disposed of in the DLL. Approximately 5,800 tons of the excavated material consisting of concrete, brick, and clean soil that was in compliance with the Model Toxics Control Act (MTCA) industrial cleanup standards was reused as subgrade material in the closure of the DLL.

BI confirmation samples were collected following the excavation to confirm that MTCA cleanup levels were met (Table 7.1). After erosion and drainage control measures were installed, signage was placed at the base of the BI with the warning “Former landfill. Do not drink water.”

The remedial action for the BII Landfill included removal of approximately 110,500 cubic yards (154,718 tons) of waste material. Approximately 17,000 tons of materials including concrete, brick, and clean soil that met MTCA industrial cleanup levels was used as grading fill in the closure of the CCDL and DLL. Solid waste removed from BII was first placed in the DLL and then the TLL when additional capacity was required. After confirmation samples were analyzed and found to be in compliance with the MTCA cleanup levels (Table 7.2), the former BII was vegetated, erosion control and drainage control measures were installed, and slope surface treatments were applied in an effort to return the natural ravine to an approximation of its pre-landfill conditions. Signage similar to BI was placed along the base of BII.

The cleanup of the CCDL included stabilizing the existing slopes through grading and installation of a buttress wall on the exposed face of the landfill. Rock and select fill were placed above a subsurface shear key and along the former CCDL slope to form the stabilizing buttress. Excavated material was either placed in low areas at the top of the landfill or disposed of in the DLL or TLL. Bake oven brick from the former stockpile areas was reused in the capped portion of the buttress fill and in low areas under the closure cap. An engineered, multi-component, low-permeability cap was installed over the landfill. Erosion and drainage measures were installed and a sign similar to BI was placed at the base of the CCDL.

Beginning March 16, 2007, closure activities at the DLL included filling the landfill to final grades and installing an engineered, multi-component, low-permeability cap over the landfill footprint to minimize infiltration of surface water through the in-place waste materials. Erosion and drainage control measures were installed to further enhance the stability of the closure cap. Closure activities were performed in accordance with the Solid Waste Regulation, Chapter 173-350 WAC.

Because the TLL was not filled to capacity during the remediation of the BI, BII, and CCDL, the TLL landfill was not closed at the same time. The TLL was filled to capacity and closed November 28, 2012, and an environmental covenant was recorded March 26, 2012. A periodic review of the TLL is not required until March 26, 2017.

Per Consent Decree #07-2-00181-2 and the cleanup action plan, semi-annual surface water sampling of seeps was required in 2007, 2009, and 2011 at BI, BII, and the CCDL. No exceedances of cleanup or remediation levels were identified during the seep sampling and the remedial and closure requirements of the Decree were met on April 27, 2011. The results of the rainy season and dry season surface water monitoring of seeps are found in Table 7.3.

Groundwater within the vicinity of the historic landfills was found to be non-potable and was not considered a current or future source of drinking water. According to the consent decree,

groundwater is to be monitored at only the DLL and TLL in accordance with the facility landfill post-closure plan.

2.4 Cleanup Levels

The chemicals of concern, cleanup levels and surface water remediation levels at the BI, BII, and CCDL are shown in Table 7.4.

The soil point of compliance for the BI and BII Landfills was the native soil/waste boundary. The point of compliance for marine surface water at BI, BII, and the CCDL is the Strait of Georgia below the Mean Lower Low Water (MLLW) level adjacent to each landfill.

2.5 Restrictive Covenant

Because contamination remains on site, two Restrictive Covenants were recorded for the property to prohibit activities that may interfere with the cleanup action or monitoring, and to describe other measures necessary to assure the integrity of the cleanup action and continued protection of human health and the environment. Restrictive Covenants were recorded for BI, BII, DLL and CCDL on February 25, 2008, imposing limitations as shown in Section 8.0.

3.0 Periodic Review

3.1 Effectiveness of Completed Cleanup Actions

Cleanup activities for BI and BII were completed and the CCDL was successfully capped. The DLL was properly closed and groundwater is monitored per the closure plan. Two Restrictive Covenants for the Site were recorded and are in place. The Restrictive Covenants prohibit activities that will result in the release of contaminants at the Site without Ecology's approval, and prohibits any use of the property that is inconsistent with the covenants. The Restrictive Covenants serve to ensure the long term integrity of the remedy.

Based upon the Site visit conducted on September 1, 2015, the landfill cap on the DLL and TLL continue to eliminate exposure to waste and contaminated soils through ingestion and direct contact. The landfill caps appear to be in satisfactory condition and no repair, maintenance, or contingency actions have been required. Seep monitoring results demonstrate compliance with surface water cleanup levels. A photo log is presented in Section 9.0. These photos were taken on September 1, 2015.

3.2 New Scientific Information for Individual Hazardous Substances for Mixtures Present at the Site

There is no new scientific information for the contaminants related to the Site.

3.3 New Applicable State and Federal Laws for Hazardous Substances Present at the Site

The cleanup at the Site was governed by WAC 173-340-702(12)(c)[2001 ed.]. This regulation states that:

“A release cleaned up under the cleanup levels determined in (a) or (b) of this subsection shall not be subject to further cleanup action due solely to subsequent amendments to the provision in this chapter on cleanup levels, unless Ecology determines, on a case-by-case basis, that the

previous cleanup action is no longer sufficiently protective of human health and the environment.”

Although cleanup levels for fluoride in groundwater and surface water have changed as a result of modifications to MTCA, the contamination remaining at the Site above the new MTCA Method A and B cleanup levels does not pose a threat to human health or the environment. The cleanup action is still considered protective of human health and the environment. Cleanup levels required by the CD and 2015 MTCA values are compared below.

Analyte	CD Soil Cleanup Levels (mg/kg)	2015 MTCA Method A/B/C Soil Cleanup Level (mg/kg)	CD Groundwater Cleanup Level (mg/L)	2015 MTCA Method A Groundwater Cleanup Level (mg/L)	CD Surface Water Cleanup Level (ug/L)	2015 MTCA Method A/B Marine Surface Water Cleanup Level (ug/L)
PAHs	2 (Method A Industrial)	2 (Method A Industrial)	N/A	N/A	N/A	N/A
PCBs	10 (Method A Industrial)	10 (Method A Industrial)	N/A	N/A	10	10
Fluoride	5,950 (Method B - protection of groundwater and surface water)	140,000 (Method C – direct contact only)	100 (Site-specific non-potable water)	4 (Potable water)	1500	4
WAD Cyanide	N/A	N/A	N/A	N/A	9.1	1

N/A = Not Applicable

3.4 Current and Projected Site Use

The Site is currently used for industrial purposes. There have been no changes in current or projected future Site or resource uses.

3.5 Availability and Practicability of Higher Preference Technologies

The remedy implemented at this Site included removal and containment of hazardous substances, and it continues to be protective of human health and the environment. While higher preference cleanup technologies may be available, they are still not considered practicable at this Site.

3.6 Availability of Improved Analytical Techniques to Evaluate Compliance with Cleanup Levels

The analytical methods used at the time of the remedial action were capable of detection below selected Site cleanup levels. The presence of improved analytical techniques would not affect decisions or recommendations made for this Site.

4.0 Conclusions

The following conclusions have been made as a result of this periodic review:

- The cleanup actions completed at the Site still appear to be protective of human health and the environment.
- Site cleanup levels have been met at the standard point of compliance for BI and BII, and the CCDL and DLL were capped. The cleanup actions have been determined to comply with cleanup standards since the long-term integrity of the containment systems are ensured, and the requirements for containment technologies are being met.
- Groundwater is monitored on a quarterly basis once every 5 years under an approved groundwater monitoring program at the CCDL, the closed DLL, and the TLL in compliance with the facility post closure monitoring plans. The groundwater monitoring program is composed of eleven monitoring wells and requires testing for eleven analytes as defined in the post closure plan.
- Seep sampling was performed as required by Consent Decree #07-2-00181-2 and the Cleanup Action Plan. All detected concentrations of fluoride, WAD cyanide, and total PCBs at BI, BII and the CCDL were below cleanup levels.
- The Restrictive Covenants for the property are in place and continue to be effective in protecting public health and the environment from exposure to hazardous substances and in protecting the integrity of the cleanup action.

Based on this periodic review, Ecology has determined that the requirements of the Restrictive Covenants continue to be met. No additional cleanup actions are required by the property owner. It is the property owner's responsibility to continue to inspect and monitor groundwater at the Site to ensure that the integrity of the remedy is maintained.

4.1 Next Review

The next review of the cleanup actions for BI, BII, CCDL, and DLL will be scheduled five years from the date of this periodic review. A periodic review for the Triple-Lined Landfill (TLL) is scheduled to occur March 26, 2017. In the event that additional cleanup actions or institutional controls are required at this Site, the next periodic review will be scheduled five years from the completion of those activities.

5.0 References

Sampling and Analysis Plan, Beach I & II Landfills, Intalco Aluminum, MFG, Inc., March 2000
Field Investigation Data Report, Closed Construction Debris Landfill and Beach I and Beach II Landfills, MFG, Inc., April 2001
Draft Remedial Investigation/Feasibility Study Report, Closed Construction Debris Landfill, MFG, Inc., January 2002

Final Project Completion Report, Intalco Landfill Closure Program, Anchor QEA, LLC, October 2009.

Intalco Landfill Closure Program – Year 5 Annual Monitoring Report, Anchor QEA, December 14, 2011

Site Visit, Ecology, September 2015

Agreed Order No. DE 01 TCPIS 2949, July 9, 2001

Consent Decree No. 07-2-00181-2, February 2, 2007

6.0 Figures

6.1 Vicinity Map

Source: Anchor, October 2009

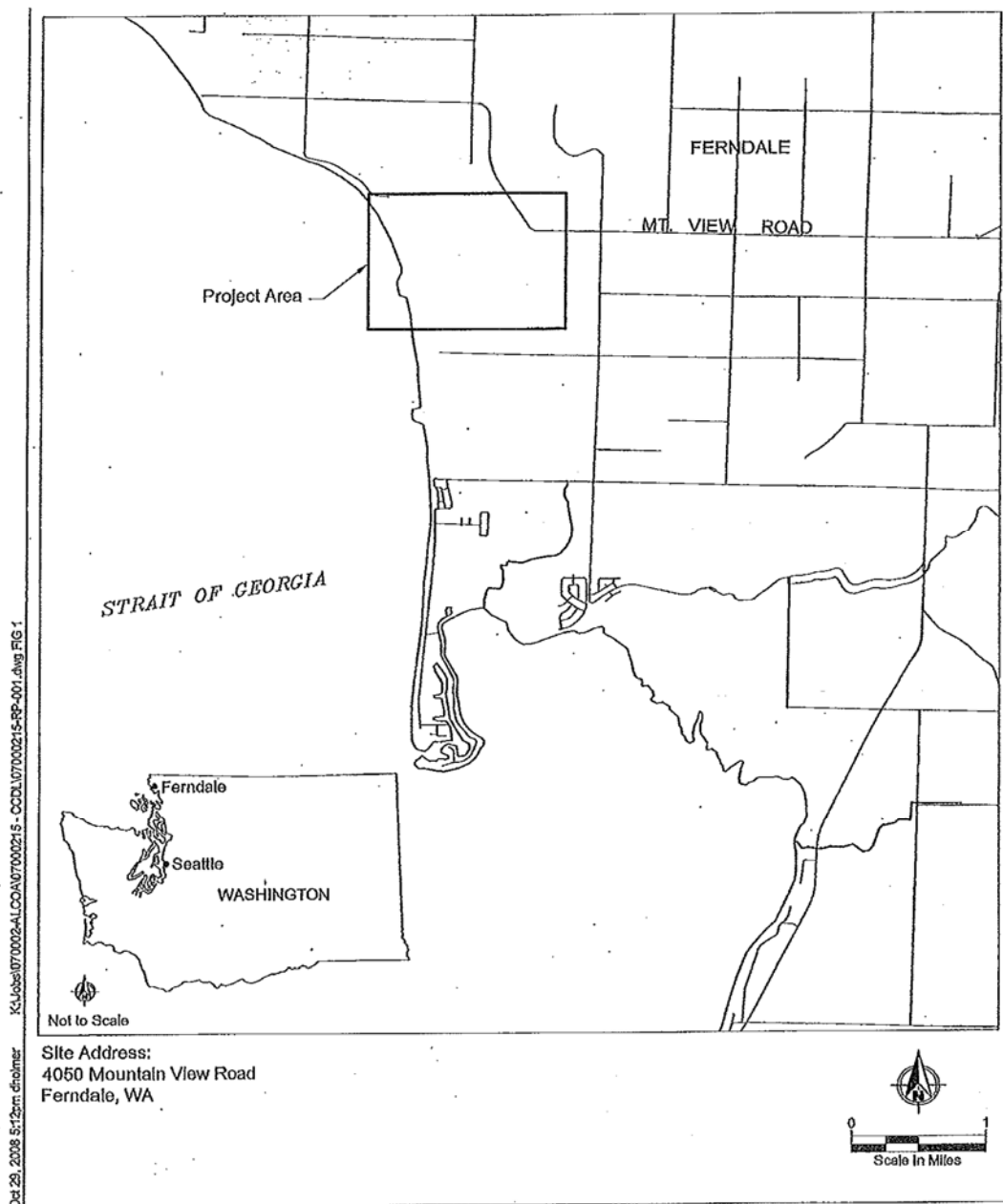


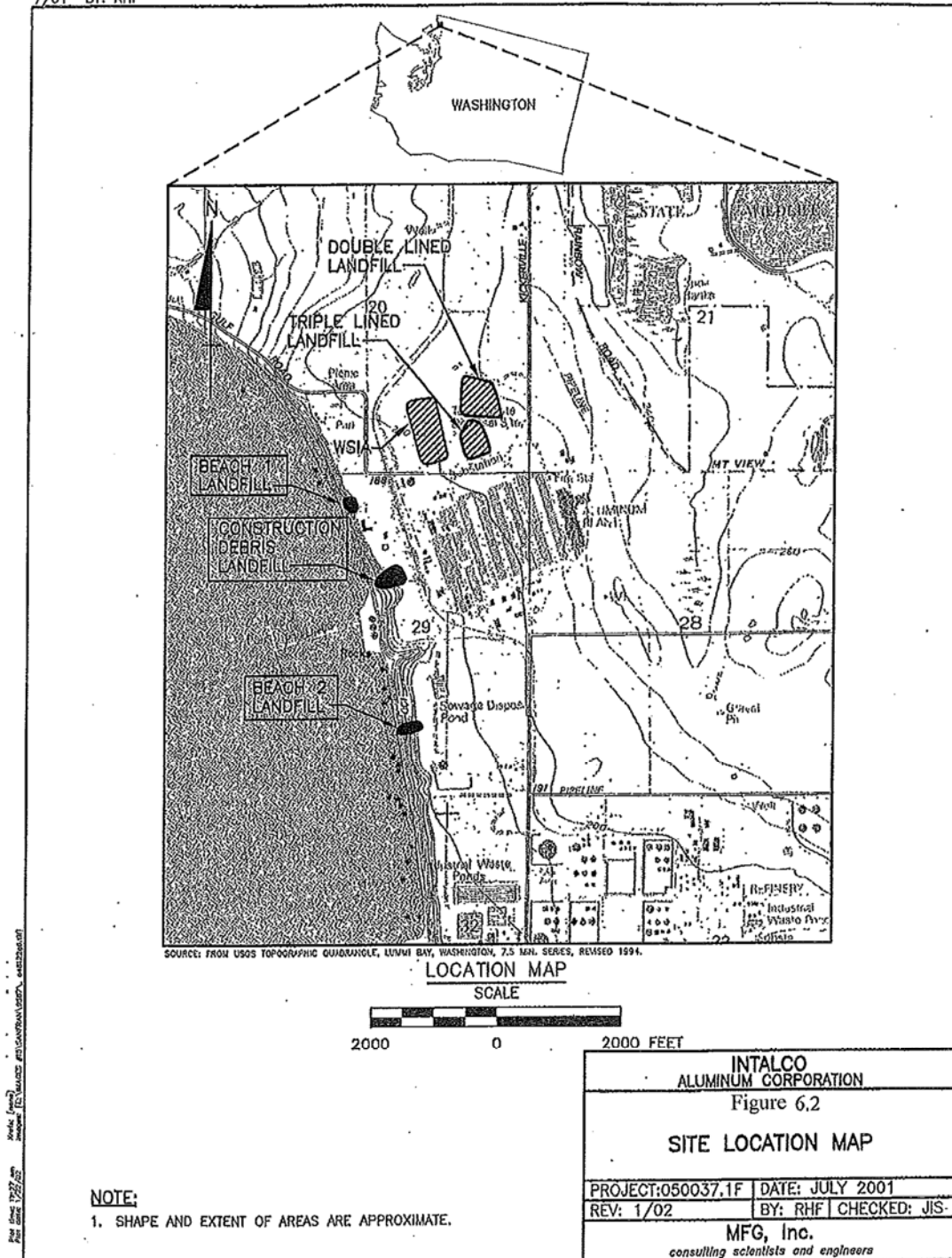
Figure 6.1
Vicinity Map
Project Completion Report
Intalco Landfill Closure Program
Ferndale, Washington



6.2 Site Map

Source: MFG, July 2001

7/01 BY: RHF



6.3 Intalco Facility Map

Source: Anchor, October 2009

6.3 Intalco Facility Map

Source: Anchor, October 2009

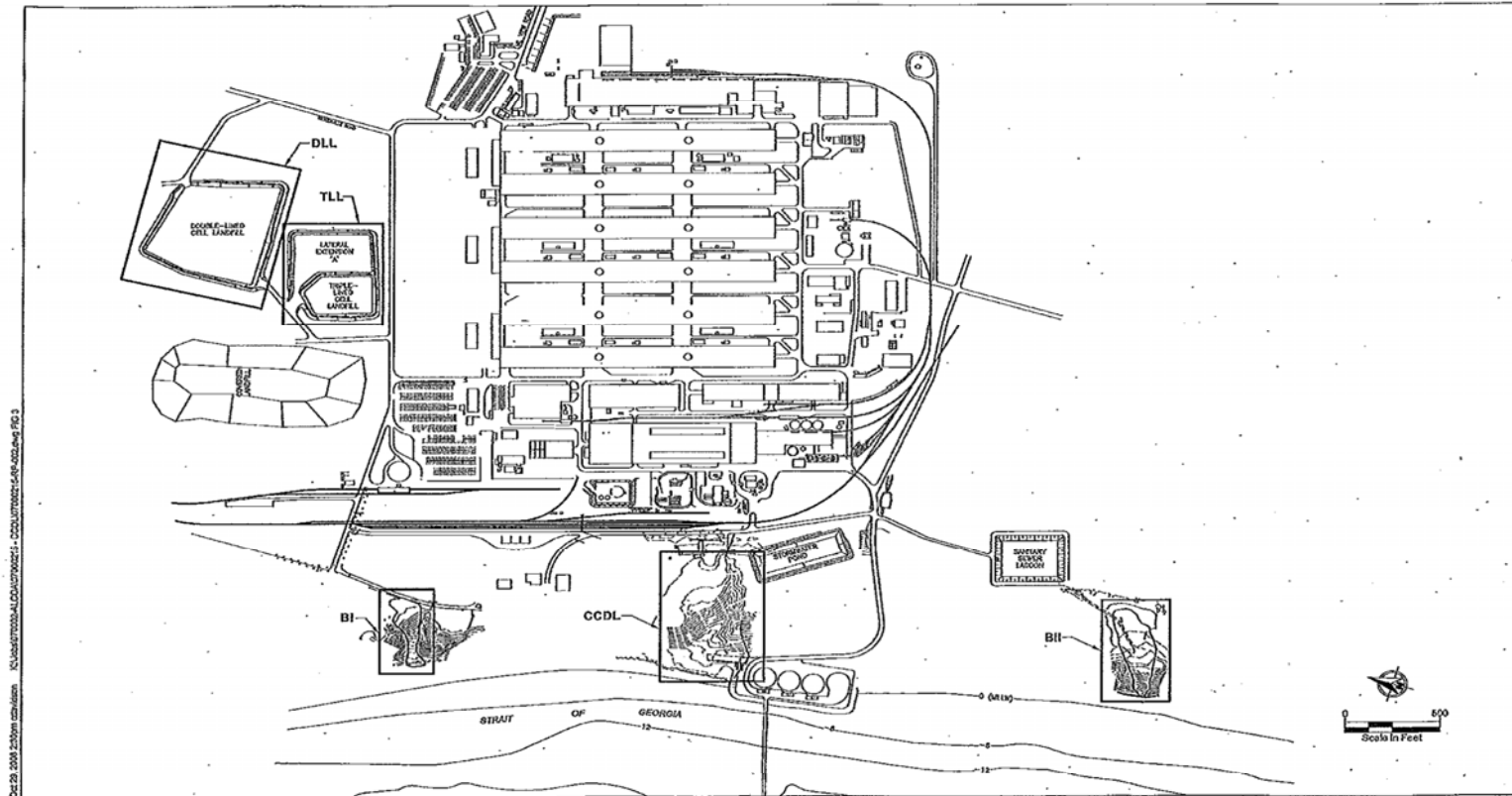
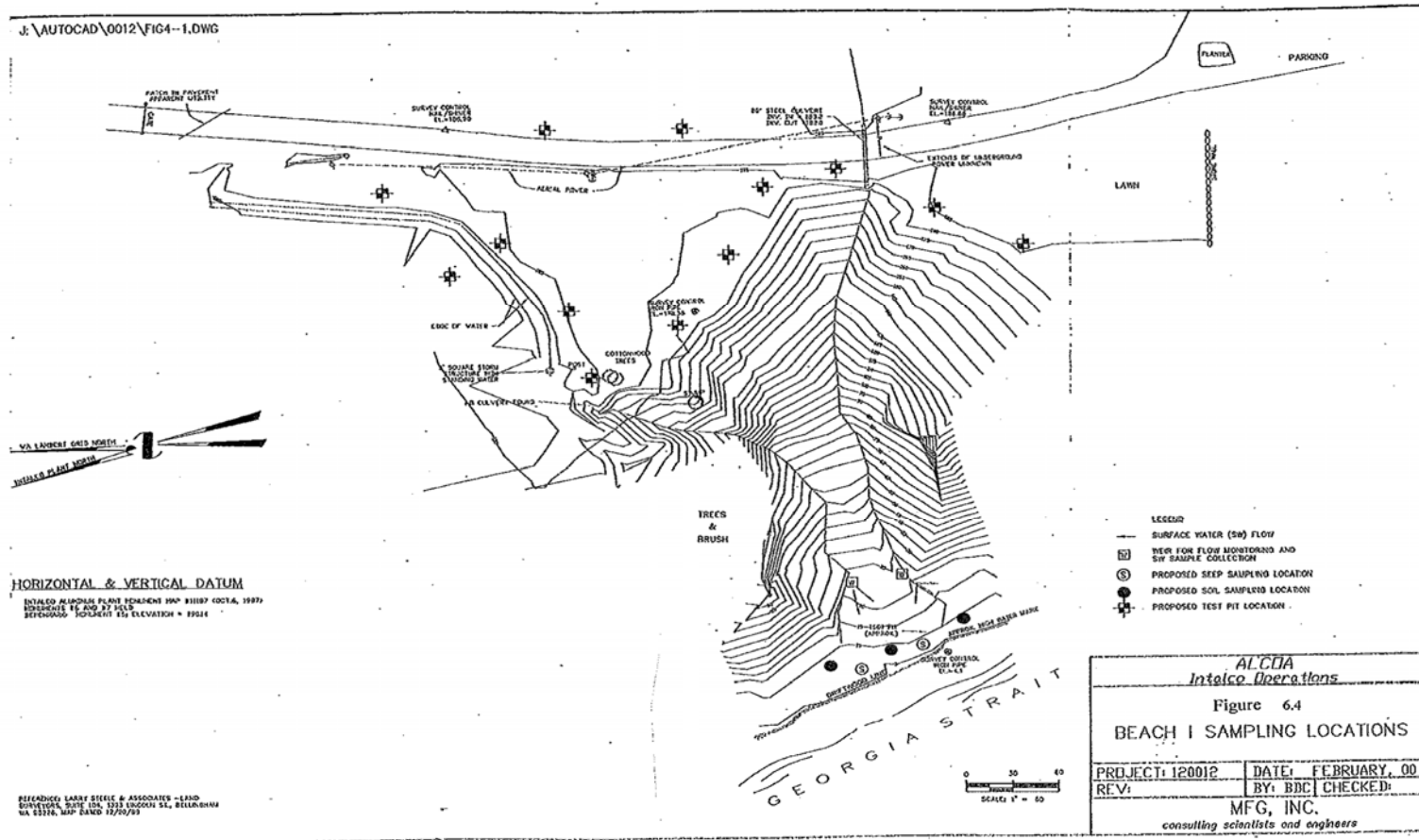


Figure 6.3
 Intalco Facility Map
 Project Completion Report
 Intalco Landfill Closure Program
 Ferndale, Washington

6.4 Beach I Sampling Locations

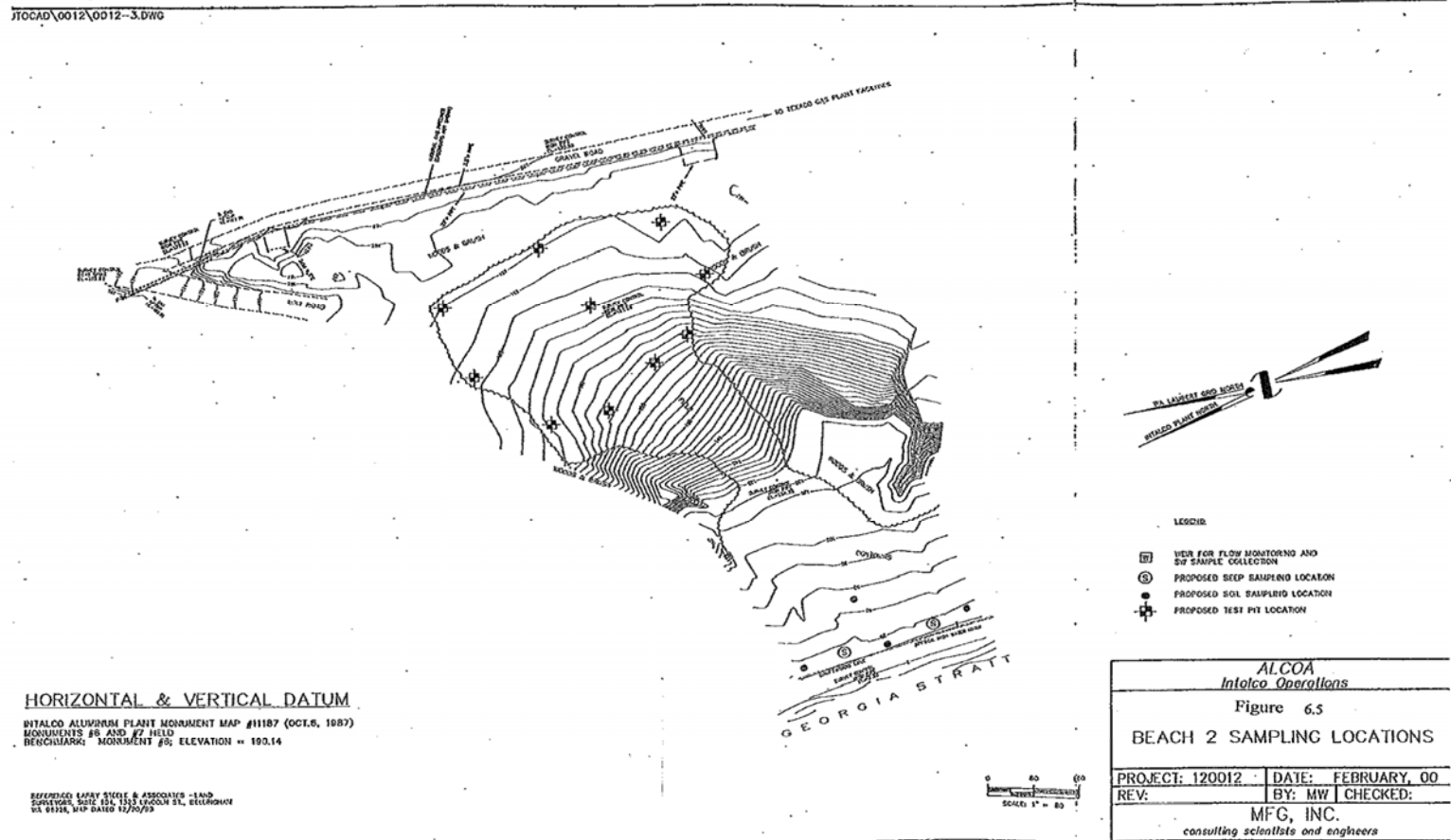
Source: MFG, February 2000



6.5 Beach II Sampling Locations

Source: MGF, February 2000

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7.0 Tables

7.1 BI Landfill Soil Sampling Results

Source: Anchor QEA, October 2009

Table 7.1
Beach I Landfill Confirmatory Soil Sampling Results

Sample I.D.	Date	PAHs ¹ (mg/kg)	Fluoride ² (mg/kg)	PCBs (mg/kg)	Comments
ILCPBIC170	9/22/2005	0.015	334	0.13	
ILCPBIC180A	10/8/2005	0.013	396	ND	
ILCPBIC180B	11/7/2005	ND	221	ND	Resample of ILCPBIC180A
ILCPBIC190	9/22/2005	ND	219	ND	
ILCPBIC200	9/22/2005	0.0001	151	0.09	
ILCPBIC210	9/22/2005	0.004	661	ND	
ILCPBIC210A	10/8/2005	ND	3660	ND	Resample of ILCPBIC210
ILCPBIC210B	11/7/2005	NT	1420	ND	Resample of ILCPBIC210A
ILCPBIC220	10/8/2005	ND	524	ND	
ILCPBIC220A	11/7/2005	NT	5130	ND	Resample of ILCPBIC220
ILCPBIC240	10/8/2005	ND	1080	ND	
ILCPBIC240A	11/7/2005	NT	5810	ND	Resample of ILCPBIC240
ILCPBIC250	10/8/2005	ND	2910	ND	
ILCPBIC250A	11/7/2005	NT	835	ND	Resample of ILCPBIC250
ILCPBIC260	10/13/2005	ND	134	ND	Remote area -- old building foundation

Notes:

NT = testing not required

ND = non-detect

(1) Sum of carcinogenic PAHs using MTCA toxicity equivalency factors

(2) Total fluoride as measured by Bellack method.

Required cleanup levels: PAHs = 2 mg/kg; fluoride = 5,950 mg/kg; PCBs = 10 mg/kg

7.2 BII Soil Sampling Results

Source: Anchor QEA, October 2009

Beach I and Beach II Landfill Remedial Activities

Table 7.2
Beach II Landfill Confirmatory Soil Sampling Results

Sample I.D.	Date	PAHs ¹ (mg/kg)	Fluoride ² (mg/kg)	PCBs (mg/kg)	Comments
ILCPBIIC010	8/24/2005	ND	324	ND	
ILCPBIIC010D	8/24/2005	0.008	272	ND	DUPLICATE SAMPLE
ILCPBIIC020	8/24/2005	0.09	185	0.12	
ILCPBIIC040	9/3/2005	0.027	159	0.04	
ILCPBIIC60	9/3/2005	0.001	370	ND	
ILCPBIIC70	9/3/2005	ND	275	ND	
ILCPBIIC80	9/3/2005	ND	154	ND	
ILCPBIIC90	9/3/2005	ND	248	ND	
ILCPBIIC100	9/3/2005	ND	159	ND	
ILCPBIIC110	9/3/2005	ND	187	ND	
ILCPBIIC120	9/16/2005	ND	226	ND	
ILCPBIIC130	9/16/2005	ND	100	ND	
ILCPBIIC140	9/16/2005	ND	171	ND	
ILCPBIIC30A	10/3/2005	ND	110	ND	
ILCPBIIC50A	10/3/2005	ND	146	ND	

Notes:

ND = non-detect

(1) Sum of carcinogenic PAHs using MTCA toxicity equivalency factors

(2) Total fluoride as measured by Bellack method.

Required cleanup levels: PAHs = 2 mg/kg; fluoride = 5,950 mg/kg; PCBs = 10 mg/kg

7.3 Long Term Monitoring Results

Source: Anchor QEA, October 2009 and December 2011

Table 7.3

Long-term Monitoring Results: Year 1 Rainy Season

Sample ID (AIN-) Sample Date	B1-SW-070223 02/23/2007	B51-SW-070223 02/23/2007	B2-SW-070223 02/23/2007	CCDL-SW-070223 ¹ 02/23/2007	Cleanup Level ²
Fluoride (mg/L)	15.9 J	14.1	11.1	20.2	100
WAD Cyanide (mg/L)	0.01	0.01 UJ	0.01 U	-	0.0091
Total PCBs (µg/L) ³	0.097	0.091	5.4 D	-	10
Aroclor 1016	0.023 UJ	0.02 UJ	0.2 UJ	-	-
Aroclor 1221	0.045 U	0.039 U	0.39 U	-	-
Aroclor 1232	0.023 U	0.02 U	0.2 U	-	-
Aroclor 1242	0.097	0.091	5.4 D	-	-
Aroclor 1248	0.023 U	0.02 U	0.2 U	-	-
Aroclor 1254	0.023 U	0.02 U	0.2 U	-	-
Aroclor 1260	0.023 UJ	0.02 UJ	0.2 UJ	-	-

Notes:

Detected values are shown in bold.

J = the result is an estimated concentration

U = not detected above the laboratory reporting limit indicated

UJ = the result is an estimated concentration that is less than the laboratory reporting limit indicated

D = reported result is from a dilution

(1) Fluoride is the only required analyte for CCDL long-term monitoring.

(2) A remediation level is listed for fluoride; cleanup levels are listed for WAD cyanide and Total PCBs

(3) Total PCBs were calculated by summing all detected Aroclors.

Long-term Monitoring Results: Year 1 Dry Season

Sample ID (AIN-) Sample Date	B1-SW-070829 08/29/2007	B51-SW-070829 08/29/2007	CCDL-SW-070829 ¹ 08/29/2007	Cleanup Level ²
Fluoride (mg/L)	9.7	11.5	11.2	100
Total Cyanide (mg/L) ³	0.01	0.03	-	-
WAD Cyanide (mg/L)	0.005 U	0.005 U	-	0.0091
Total PCBs (µg/L) ⁴	0.029	0.031	-	10
Aroclor 1016	0.0049 U	0.0049 U	-	-
Aroclor 1221	0.0097 U	0.0097 U	-	-
Aroclor 1232	0.0049 U	0.0049 U	-	-
Aroclor 1242	0.0049 U	0.0049 U	-	-
Aroclor 1248	0.029	0.031	-	-
Aroclor 1254	0.0049 U	0.0049 U	-	-
Aroclor 1260	0.0049 U	0.0049 U	-	-

Notes:

Detected values are shown in bold.

U = not detected above the laboratory reporting limit indicated

(1) Fluoride is the only required analyte for CCDL long-term monitoring.

(2) A remediation level is listed for fluoride; cleanup levels are listed for WAD cyanide and total PCBs

(3) Total cyanide was added during the 'dry season' sampling event, but is not required by the CAP.

(4) Total PCBs were calculated by summing all detected Aroclors.

(5) No water was observed at BII during the 'dry season' sampling event; therefore, no sample was collected.

BI, BII and CCDL Long-term Monitoring Results: Year 5 Wet Season

Sample ID (AIN-) Sample Date	BI-SW-110126 1/26/2011	B51-SW-110126 1/26/2011	BII-SW-110126 1/26/2011	CCDL-SW-110126 ¹ 1/26/2011	Cleanup Level ²
Fluoride (mg/L)	11.6 J	11.7 J	9.44 J	20.8 J	100
Total Cyanide (mg/L) ³	0.028 J	0.03 J	0.01 UJ	--	--
WAD Cyanide (mg/L)	0.0037 J	0.0047 UJ	0.0047 UJ	--	0.0091
Total PCBs (µg/L) ⁴	0.16	0.16	0.28	--	10
Aroclor 1016	0.0049 U	0.005 U	0.005 U	--	--
Aroclor 1221	0.0097 U	0.01 U	0.0099 U	--	--
Aroclor 1232	0.0049 U	0.005 U	0.005 U	--	--
Aroclor 1242	0.0049 U	0.005 U	0.005 U	--	--
Aroclor 1248	0.16	0.16	0.28	--	--
Aroclor 1254	0.0049 U	0.005 U	0.005 U	--	--
Aroclor 1260	0.0049 U	0.005 U	0.005 U	--	--

Notes:

Detected values are shown in bold

J = Estimated Value

U = Not detected above the laboratory reporting limit indicated

UJ = Compound analyzed, but not detected above detection limit

Level II data validation applied

(1) Fluoride is the only required analyte for CCDL long-term monitoring.

(2) A remediation level is listed for fluoride; cleanup levels are listed for WAD cyanide and total PCBs. The cleanup level for fluoride is 4 mg/L.

(3) Total cyanide is not required by the Cleanup Action Plan, but was added for quality control purposes.

(4) Total PCBs were calculated by summing all detected Aroclors.

Sample ID (AIN-) Sample Date	BI-SW-110728 7/28/2011	BID-SW-110728 7/28/2011	CCDL-SW-110728 ¹ 7/28/2011	Cleanup Level ²
Fluoride (mg/L)	7.64	8.53	13.7	100
Total Cyanide (mg/L) ³	0.017	0.016	--	--
WAD Cyanide (mg/L)	0.005	0.0047 U	--	0.0091
Total PCBs (µg/L) ⁴	0.071	0.08	--	10
Aroclor 1016	0.0053 U	0.005 U	--	--
Aroclor 1221	0.011 U	0.0099 U	--	--
Aroclor 1232	0.0053 U	0.005 U	--	--
Aroclor 1242	0.0053 U	0.005 U	--	--
Aroclor 1248	0.071	0.08	--	--
Aroclor 1254	0.0053 U	0.005 U	--	--
Aroclor 1260	0.0053 U	0.005 U	--	--

Notes:

No water was observed at BII during the 'dry season' sampling event; therefore, no sample was collected.

Detected values are shown in bold

J = Estimated value

U = Not detected above the laboratory reporting limit indicated

UJ = Compound analyzed, but not detected above estimated detection limit

Level II data validation applied

(1) Fluoride is the only required analyte for CCDL long-term monitoring.

(2) A remediation level is listed for fluoride; cleanup levels are listed for WAD cyanide and total PCBs. The cleanup level for fluoride is 4 mg/L.

(3) Total cyanide is not required by the Cleanup Action Plan, but was added for quality control purposes.

(4) Total PCBs were calculated by summing all detected Aroclors.

7.4 Cleanup Levels

Source: Consent Decree No. 07-2-00181-2

Table 7.4
Beach I and Beach II Landfills
Soil Cleanup Standards

Parameter	Cleanup Standard	Protection Basis
PAHs	2.0 mg/Kg	MTCA A Industrial WAC 173-340-745
PCBs	10.0 mg/Kg	MTCA A Industrial WAC 173-340-745
Fluoride	5,950.0 mg/kg	MTCA B WAC 173-340-747 (Using 100 mg/L F, Kd 26.5, dilution 2.23) Protection of non-potable groundwater and surface water

CONSENT DECREE

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ATTORNEY GENERAL OF WASHINGTON
Ecology Division
PO Box 40117
Olympia, WA 98504-0117
FAX (360) 586-6760

**Beach I and Beach II Landfills
Marine Surface Water Cleanup Standards**

Parameter	Cleanup Standard	Protection Basis
PCBs	10 ug/L	WAC 173-201A Marine
Metal cyanide complex	9.1 ug/L	WAC 173-201A Marine
Fluoride	1.5 mg/L	Ministry of Environment British Columbia, Canada Recommended Marine Criteria

Note: The point of compliance where the Marine Surface Water Cleanup Standards are attained is the Strait of Georgia below the mean lower, low water (MLLW) datum adjacent to each individual historic landfill.

**Closed Construction Debris Landfill
Marine Surface Water Cleanup Standard**

Parameter	Cleanup Standard	Protection Basis
Fluoride	1.5 mg/L	Ministry of Environment British Columbia, Canada Recommended Marine Criteria

Note: The point of compliance where the Marine Surface Water Cleanup Standard is attained is the Strait of Georgia below the MLLW datum adjacent to each individual historic landfill.

**Beach I, Beach II, and Closed Construction Debris Landfills
Surface Water Remediation Levels**

Parameter	Remediation Level	Protection Basis
Fluoride	100.0 mg/L	WAC 173-340-730(3)(c)(v) WAC 173-340-747

Notes: The point of measurement to achieve compliance with the Surface Water Remediation Level is the seep at the Beach I Landfill and the intermittent stream at the Closed Construction Debris Landfill. The data from the Beach I Landfill will be used to demonstrate compliance with the Surface Water Remediation Level for the Beach II Landfill.

**Beach I, Beach II, and Closed Construction Debris Landfills
Groundwater Standard**

Parameter	Cleanup Standard	Protection Basis
Fluoride	100.0 mg/L	MTCA 173-340-720(6) Non-potable Groundwater

8.0 Environmental Covenant

Restrictive Covenant Historic “Beach I” and “Beach II” Intalco Landfills

This Declaration of Restrictive Covenant is made under the Uniform Environmental Covenant Act (2007 Wash. Laws Ch. 104), RCW 70.105D.030(1)(f), RCW 70.105D.030(1)(g), and WAC 173-340-440 by Intalco Aluminum Corporation (hereafter “Intalco”), its successors and assigns, and the State of Washington and the Department of Ecology, its successors and assigns (hereafter “Ecology”)

Recitals

A remedial action (hereafter “Remedial Action”) occurred at the property that is the subject of this Restrictive Covenant. The Remedial Action conducted at the property is described in the Consent Decree entered in the State of Washington Department of Ecology v. Intalco, Whatcom County Superior Court No. 07-2-00181-2, and in attachments to the Decree and in documents referenced in the Decree.

Declaration of Restrictions and Covenants

Intalco makes the following declaration as to limitation, restrictions, and uses to which the Restricted Sites may be put and specifies that such declarations shall constitute covenant to run with the land, as provided by law and shall be binding on all parties and all persons claiming under them, including all current and future owners of any portion of or interest in the Restricted Sites (hereafter “Owner”). Within the Property and located the two parcels that are the subject of this Restrictive Covenant (the “Restricted Sites”).

Section 1. The Restricted Sites shall be used only for traditional industrial uses, as described in RCW 70.105D.020(23) and defined in and allowed under Whatcom County Code 20.68.054(7) as of the date of this Restrictive Covenant.

Section 2. Withdrawal of groundwater at the Restricted Sites is prohibited.

Section 3. Any Activity on the Restricted Sites that may interfere with the integrity of the remedial action and continued protection of human health and the environment is prohibited.

Section 4. Any activity on the Restricted Sites that may result in the release or exposure to the environment of a hazardous substance that remains on the Property as part of the Remedial Action, or create a new exposure pathway, is prohibited without prior written approval from Ecology.

Section 5. The Owner of the Restricted Sites must give fifteen (15) day advance written notice to Ecology of the Owner’s interest to convey any interest in the Restricted Sites. No conveyance of title, easement, lease, or other interest in the Restricted Sites shall be consummated by the Owner without adequate and complete provision for continued monitoring, operation, and maintenance of the Remedial Action.

Section 6. The Owner must restrict leases to uses and activities consistent with the Restrictive Covenant and notify all leases of the restrictions on the use of the Restricted Sites.

Section 7. The Owner must notify and obtain approval from Ecology prior to any use for the Restricted Sites that is inconsistent with the terms of the Restrictive Covenant. Ecology may

approve any inconsistent use only after public notice and comment. If Ecology approved an inconsistent use, the Restrictive Covenant must be amended to reflect the change.

Section 8. The Owner shall allow authorized representatives of Ecology the right to enter the Restricted Sites at reasonable times for the purpose of evaluating the Remedial Action, to take samples, to inspect remedial actions conducted at the Restricted Sites, and to inspect records that are related to the Remedial Action.

Section 9. If the conditions at the Restricted Sites which require a restrictive covenant no longer exist, the Owner may submit a request to Ecology that this Restrictive Covenant be removed. This Restrictive Covenant shall be removed only if Ecology, after public notice and comment, concurs.

Restrictive Covenant

Capped and/or Lined Intalco Landfills

This Declaration of Restrictive Covenant is made under the Uniform Environmental Covenant Act (2007 Wash. Laws Ch. 104), RCW 70.105D.030(1)(f), RCW 70.105D.030(1)(g), and WAC 173-340-440 by Intalco Aluminum Corporation (Hereafter "Intalco"), its successors and assigns, and the State of Washington Department of Ecology, its successors and assigns (hereafter "Ecology")

Declaration of Restriction and Covenants

Intalco makes the following declaration as to limitation, restrictions, and uses to which the Restricted Sites may be put and specifies that such declarations shall constitute covenant to run with the land, as provided by law and shall be binding on all parties and all persons claiming under them, including all current and future owners of any portion of or interest in the Restricted Sites (hereafter "Owner"). Within the Property are located the two parcels that are the subject of this Restrictive Covenant (the "Restricted Sites"). The Restricted Sites are known as the Double-Lined Solid Waste Landfill and Closed Construction Debris Landfill.

Section 1. The Restricted Sites contains PAHs of PCB contaminated soils. The Restricted Sites are being capped as part of the Remedial Action to prevent human, plant, or wildlife exposure to the contaminated soils. The Owner shall not alter, modify, or remove the existing stricter in any manner that may result in the release or exposure to the environment of that contaminated soil or create a new exposure pathway without prior written approval from Ecology. Any activity on the Restricted Sites that may result in the release or exposure to the environment of the contaminated soil that was contained as part of the Remedial Action, or create a new exposure pathway, is prohibited. Some examples of activities that are prohibited in the Restricted Sites include: drilling, digging, placement of any objects, or use of any equipment which deforms or stresses the surface beyond its load bearing capability, piercing the surface with a rod, spike or similar item, bulldozing or earthwork.

Section 2. Withdrawal of groundwater at the Restricted Sites is prohibited.

Section 3. Any activity on the Restricted Sites that may interfere with the integrity of the Remedial Action and continued protection of human health and the environment is prohibited.

Section 4. Any activity on the Restricted Sites that may result in the release or exposure to the environment of a hazardous substance that remains on the Restricted Sites as part of the

Remedial Action, or create a new exposure pathway, is prohibited without prior written approval from Ecology.

Section 5. The Owner of the Restricted Sites must give fifteen (15) day advance written notice to Ecology of the Owner's interest to convey any interest in the Restricted Sites. No conveyance of title, easement, lease, or other interest in the Restricted Sites shall be consummated by the Owner without adequate and complete provision for continued monitoring, operation, and maintenance of the Remedial Action.

Section 6. The Owner must restrict leases to uses and activities consistent with the Restrictive Covenant and notify all leases of the restrictions on the use of the Restricted Sites.

Section 7. The Owner must notify and obtain approval from Ecology prior to any use of the Restricted Sites that is inconsistent with the terms of this Restrictive Covenant. Ecology may approve any inconsistent use only after public notice and comment. If Ecology approves an inconsistent use, the Restrictive Covenant must be amended to reflect the change.

Section 8. The Owner shall allow authorized representatives of Ecology the right to enter the Restricted Sites at reasonable times for the purpose of evaluating the Remedial Action, to take samples, to inspect remedial actions conducted at the Restricted Sites, and to inspect records that are related to the Remedial Action.

Section 9. If the conditions at the Restricted Sites which require a restrictive covenant no longer exist, the Owner may submit a request to Ecology that this Restrictive Covenant be removed. This Restrictive Covenant shall be removed only if Ecology, after public notice and comment, concurs.

9.0 Photo Log

Photo 1: Beach I Landfill



Photo 2: Beach I Landfill



Photo 3: Beach II Landfill



Photo 4: Beach II Landfill



Photo 5: Closed Construction Debris Landfill



Photo 6: Closed Construction Debris Landfill



Photo 7: Double-Lined Landfill



Photo 8: Waste Surface Impoundment Area

