Final Report

2004 Scrap Yard Removal Action

Reynolds Metals Company
TROUTDALE FACILITY

CH2MHILL

May 2005

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SECTION 1

Introduction

This report documents the removal of contaminated soil from the north and south scrap yard area at the Reynolds Metals Company/Alcoa (RMC/Alcoa) facility in Troutdale, Oregon, during late 2004. The work was conducted in accordance with *Memorandum WP No. 64: Soil Mixing Addendum to Memorandum WP No. 55: Company Lake Early Remedial Action Work Plan* (CH2M HILL, October 2004).

Removal activities were accomplished in the north scrap yard to reduce total polynuclear aromatic hydrocarbon (PAH) concentrations in the western 200 feet to meet occupational risk scenario cleanup requirements. Waste material removed from the north scrap yard was transported to Company Lake and mixed with process residue. Following excavation, confirmation samples were collected to document removal effectiveness.

Removal activities in the south scrap yard were accomplished as part of plant demolition actions to provide material for mixing with Company Lake process residue and to meet occupational risk scenario cleanup requirements. The removal action included excavation of contaminated soil from the south scrap yard, transporting material to Company Lake for mixing with process residue, transporting process residue from Company Lake to south scrap yard for drying and mixing, confirmation sampling, and offsite transport and disposal at Wasco County Landfill. Confirmation samples were collected in the south scrap yard following excavation to document removal effectiveness.

Site-specific cleanup goals identified for the 2004 scrap yard removal action included:

- Excavate and remove visual deposits of waste material currently present in the south portion of the scrap yard to a depth of 1 to 2 feet below ground surface (bgs).
- Excavate and remove additional soil from the western 200 feet of the north portion of the scrap yard to a depth of approximately 6 inches bgs.
- Achieve a mean total fluoride and total PAH concentration in soil of less than 4,000 milligrams per kilogram (mg/kg) and 36 mg/kg, respectively.

This report is organized into the following sections:

- Section 1: Introduction
- Section 2: Background
- Section 3: 2004 Scrap Yard Removal Action
- Section 4: Sampling and Analysis
- Section 6: Certification
- Section 5: Costs
- Appendixes

Appendix A, a photo log, appears at the end of this report. Appendixes B through G are presented on a compact disk (CD) at the end of this report.

SECTION 2

Background

2.1 Area Description

The scrap yard is a flat, sparsely vegetated area located in the eastern part of the RMC/Alcoa property, as illustrated in Figure 2-1. This report focuses on the removal and disposal of contaminated soil from the northern and southern portions of the scrap yard. Prior to this removal action, the area contained miscellaneous debris, including metal, refractory brick, and other site solid waste. The scrap yard area is bounded by undeveloped roads to the north and south.

2.2 Previous Investigations and Actions

Site investigations took place at the scrap yard site in 1994, 1995, 1997, 1998, 2001, and 2002. Investigation activities included collection of surface and subsurface soil samples from test pits, soil borings, and Geoprobes®, and soil removal actions. Constituents detected in samples collected from the scrap yard prior to implementation of the 2002 and 2004 removal actions included fluoride, metals, PAHs, cyanide, and polychlorinated biphenyls (PCBs). A summary of information obtained from these investigations can be found in the following CH2M HILL documents:

- *Memorandum WP No. 46: Scrap Yard Early Action Work Plan* (June 2001)
- *Final Report: Scrap Yard Removal Action* (April 2003)
- *Removal Site Assessment Report* (January 1995)
- *Draft Current Situation Summary* (April 5, 1996)
- *Technical Memorandum DS No. 16: Data Summary for the Soil and Debris Areas Addendum to the RI/FS Work Plan – 1997 Sampling at North Landfill, South Landfill, and Scrap Yard* (December 15, 1997)
- *Draft Groundwater Remedial Investigation Report* (June 1999)
- *Draft Nongroundwater Remedial Investigation Report* (August 1999)
- *Results of Industrial Hygiene Air Monitoring Conducted at the Alcoa/Reynolds Metals Facility, Troutdale, OR, January 22-23, 2002* (February 2002)
- *Cultural Resource Monitoring at the Reynolds Metals Company Facility, Troutdale, Oregon* (January 22, 2002)
- *Specifications for Excavation of Waste Material Present in the Northern Portion of Scrap Yard* (July 2002)
- *Specifications for Transportation and Disposal of Excavated Material from Scrap Yard* (July 2002)

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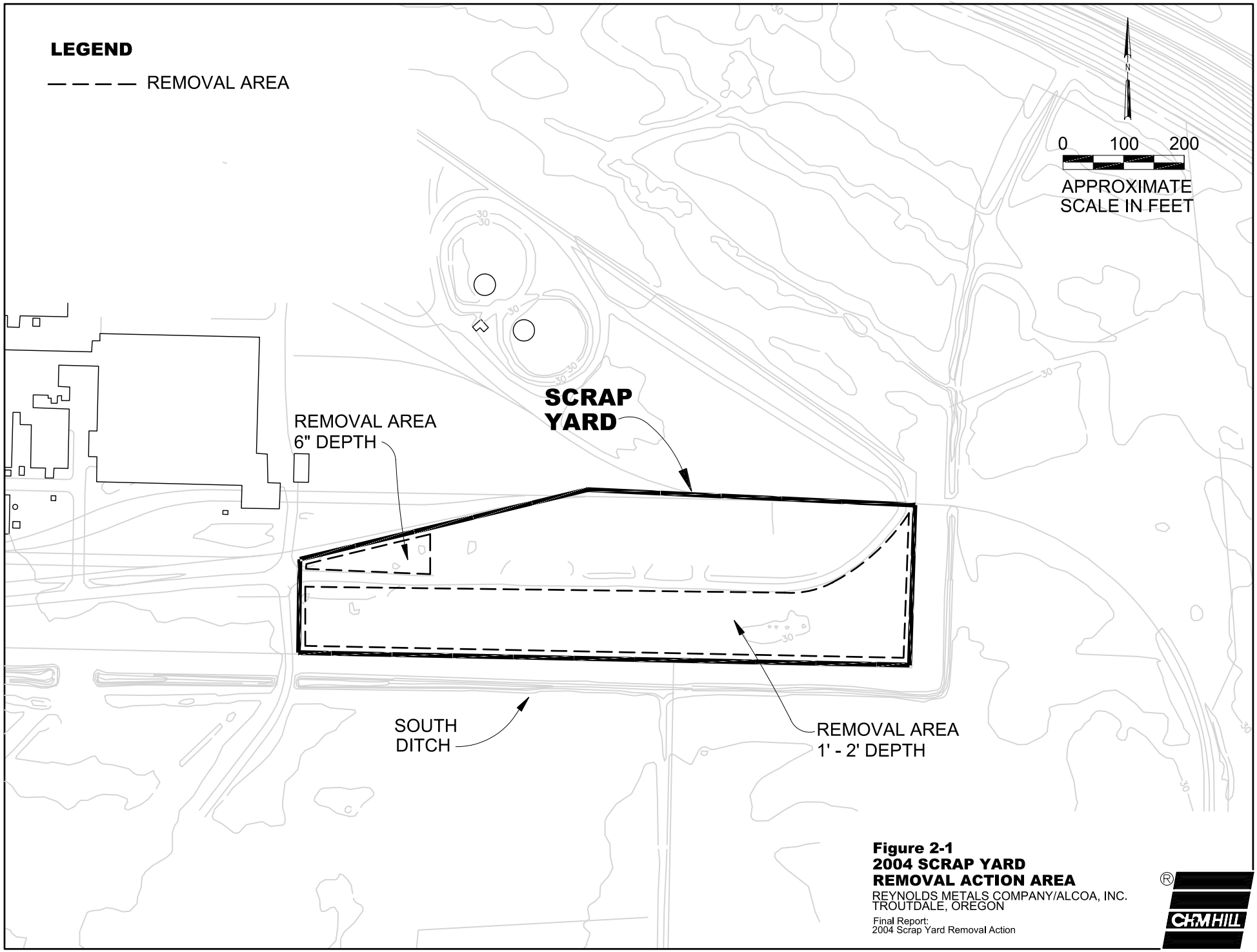

Figure 2-1
2004 SCRAP YARD
REMOVAL ACTION AREA
REYNOLDS METALS COMPANY/ALCOA, INC.
TROUTDALE, OREGON
Final Report:
2004 Scrap Yard Removal Action

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- *Memorandum WP No. 64: Soil Mixing Addendum to Memorandum WP No. 55: Company Lake Early Remedial Action Work Plan* (October 2004)

An early removal action at the north side of the scrap yard site was conducted between September 25 and October 21, 2002. Approximately 11,590 tons of material was excavated and disposed of offsite during this action. Confirmation soil samples were collected from 18 locations following site excavation activities. Site-specific cleanup goals identified in *Memorandum WP No. 46: Scrap Yard Early Action Work Plan* (CH2M HILL, June 2001) were achieved. More information on this early action can be found in *Final Report: Scrap Yard Removal Action* (CH2M HILL, April 2003).

SECTION 3

2004 Scrap Yard Removal Action

Approximately 11,328 tons of material was removed from the northern and southern portions of the scrap yard from September 9 to December 17, 2004. Of this amount, approximately 7,057 tons was hauled directly to Company Lake and mixed with process residue (PR) prior to offsite disposal. The remaining 4,271 tons of material was mixed with PR hauled from Company Lake to the western portion of south scrap yard and then hauled directly to Wasco County Landfill for disposal. All waste material was loaded into trucks and disposed of according to the specifications for the Company Lake removal action. Confirmation surface soil samples were collected from the area after excavation activities were completed. Photographs documenting the 2004 removal effort are shown in Appendix A.

CH2M HILL was responsible for preconstruction test pitting, design, confirmation sampling, analytical laboratory analysis, data quality evaluation, and reporting. BBL Environmental Services, Inc. (BBLES) was the prime contractor for remedial actions. ENTACT, Inc. (subcontracted to BBLES) provided excavation, waste loadout, and final grading services. Celorie Bros. (subcontracted to BBLES) transported waste materials to Wasco County Landfill for final disposal.

The following sections describe the major work components accomplished during the 2004 removal effort at the scrap yard area.

3.1 Site Preparation/Traffic Management

Site preparation work included constructing an earthen berm surrounding the western portion of the south scrap yard for drying of Company Lake PR in accordance with *Memorandum WP No. 64: Soil Mixing Addendum to Memorandum WP No. 55: Company Lake Early Remedial Action Work Plan* (CH2M HILL, October 2004). A crushed rock apron was also constructed on the northeast side of the western portion of south scrap yard for truck decontamination prior to leaving the work site.

Vehicular traffic was restricted to the designated routes shown on Figure 3-1.

3.2 Excavation

Excavation activities began on September 9, 2004. The depth of excavation ranged from 6 inches in the northern portion of scrap yard to between 1 and 2 feet bgs, depending on the thickness of waste material encountered in the southern portion of the site. The depth of cut was carefully controlled to minimize the amount of clean underlying soil removed with waste material. Trackhoe excavators were used to remove waste material from the site for direct loading into dump trucks.

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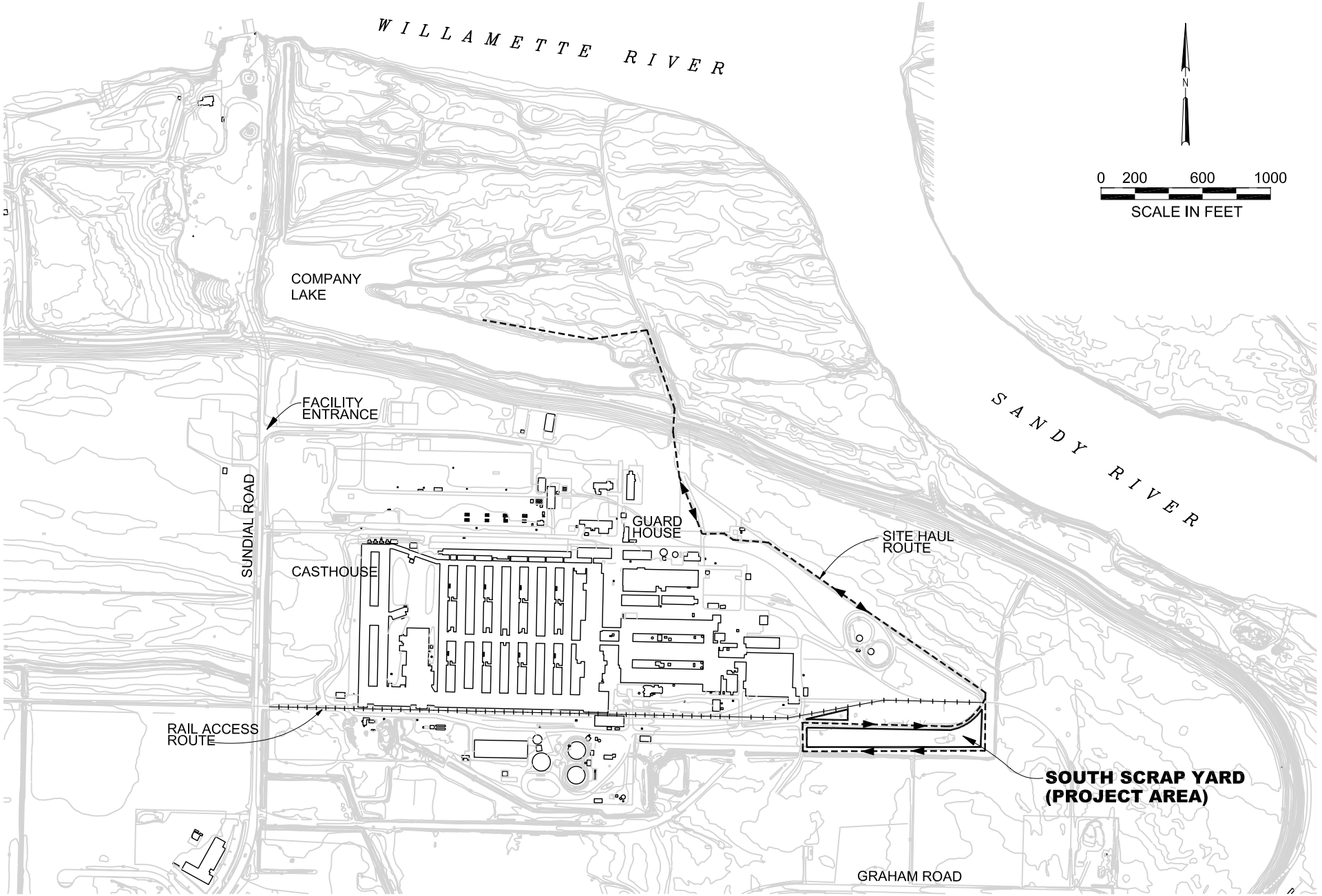
15-Apr-2002



LEGEND

— — HAUL ROUTE

Figure 3-1
SITE HAUL ROUTE
REYNOLDS METALS COMPANY/ALCOA, INC.
TROUTDALE, OREGON
Final Report:
2004 Scrap Yard Removal Action

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Waste material was initially excavated from the east side of the south scrap yard (approximately 600 by 110 feet). The remaining 400 feet on the west side was used as a drying area for Company Lake PR prior to removal and offsite disposal. A soil berm was installed surrounding the west side of the south scrap yard to contain the Company Lake PR in place.

A portion of the west side of north scrap yard (approximately 60 by 210 feet) was excavated on September 30 and October 1, 2004. Waste material was hauled to Company Lake and mixed with PR prior to removal and offsite disposal.

3.3 Offsite Transportation and Disposal

Waste material was loaded into trucks and hauled to Company Lake from September 9 to 23, 2004. From September 27 to December 22, Company Lake PR was transported to the west side of south scrap yard to dry out. The PR was then mixed with south scrap yard material and hauled directly to Wasco County Landfill by Celorie Bros. Table 3-1 lists the number of loads and approximate tonnage hauled each day. Daily truck disposal logs, landfill weight tickets, and nonhazardous waste manifests are presented in Appendix B. (NOTE: Daily truck disposal logs, landfill weight tickets, and nonhazardous waste manifests from September 9 to 23 will be reported with the Company Lake Final Report).

Table 3-1
Daily Tonnages Removed from the Scrap Yard Site in 2004

Date	No. of Loads	Daily Total (tons)	Cumulative Total (tons)
09/09/04	51	816*	816
09/10/04	56	896*	1,712
09/13/04	56	896*	2,608
09/15/04	60	960*	3,568
09/16/04	56	896*	4,464
09/17/04	42	673*	5,137
09/20/04	26	416*	5,553
09/22/04	52	832*	6,385
09/23/04	22	352*	6,737
9/30/04	11	176*	6,913
10/1/04	9	144*	7,057
10/15/04	1	19	7,076
10/16/04	5	159	7,235
10/18/04	25	821	8,056

Table 3-1
Daily Tonnages Removed from the Scrap Yard Site in 2004

Date	No. of Loads	Daily Total (tons)	Cumulative Total (tons)
10/19/04	31	988	9,044
10/20/04	1	20	9,064
10/21/04	27	887	9,951
11/02/04	12	395	10,346
11/03/04	20	657	11,003
11/04/04	8	259	11,262
12/15/04	7	224	11,486
12/16/04	16	509	11,995
12/17/04	17	545	12,540
Total	611	12,540	12,540
Total (Adjusted for PR Additions)			11,328

* Daily total based on average loading of 16 tons per truck.

3.4 Dust Control and Monitoring

Dust suppression activities were not necessary during rainy days or when the ground was wet. When dry conditions were encountered or dust was observed, a fire hose was used to wet the work areas.

CH2M HILL accomplished dust monitoring during excavation and hauling activities on September 16, 2004, to document compliance with the site health and safety plan. Dust monitoring on this date indicated that the dust suppression measures were appropriate for maintaining safe working conditions. The results of the September 16, 2004, dust monitoring effort are presented in Appendix G.

3.5 Site Restoration

Final grading of the excavated area occurred on December 21, 2004. All temporary fencing and supports were removed prior to project completion and final site acceptance.

3.6 EPA Oversight

The U.S. Environmental Protection Agency's (EPA) contractor, Mr. John Howland of Parametrix, provided oversight during removal activities.

SECTION 4

Sampling and Analysis

Sampling and analysis activities associated with the 2004 scrap yard removal action included collection of the following samples:

- Waste profile soil samples from five locations across the south scrap yard to profile waste material for disposal
- Confirmation samples to demonstrate the effectiveness of the removal effort

4.1 Waste Profile Sampling

Five grab samples were collected on August 27, 2004, from the south scrap yard before excavation activities began. The samples were sent to CH2M HILL's Applied Sciences Laboratory in Corvallis, Oregon, for waste profiling analyses. Analytical results are contained in Appendix C.

4.2 Confirmation Sampling

Confirmation samples were collected on October 5 and 15, 2004, from the north scrap yard portion of the site, and on October 14, November 4, and December 20, 2004, from the south scrap yard portion of the site. Samples collected in north scrap yard were analyzed for total fluoride and PAHs as outlined in *Memorandum WP No. 46: Scrap Yard Early Action Work Plan* (CH2M HILL, June 2001). Confirmation samples collected in the south scrap yard were analyzed for total fluoride, arsenic, PCBs, and PAHs based on historical site information. Samples were collected from a depth interval of 0 to 6 inches below final excavation limits (sample locations are shown on Figure 4-1). South scrap yard sampling activities were conducted in accordance with *Memorandum WP No. 64: Soil Mixing Addendum to Memorandum WP No. 55: Company Lake Early Remedial Action Work Plan* (CH2M HILL, October 2004).

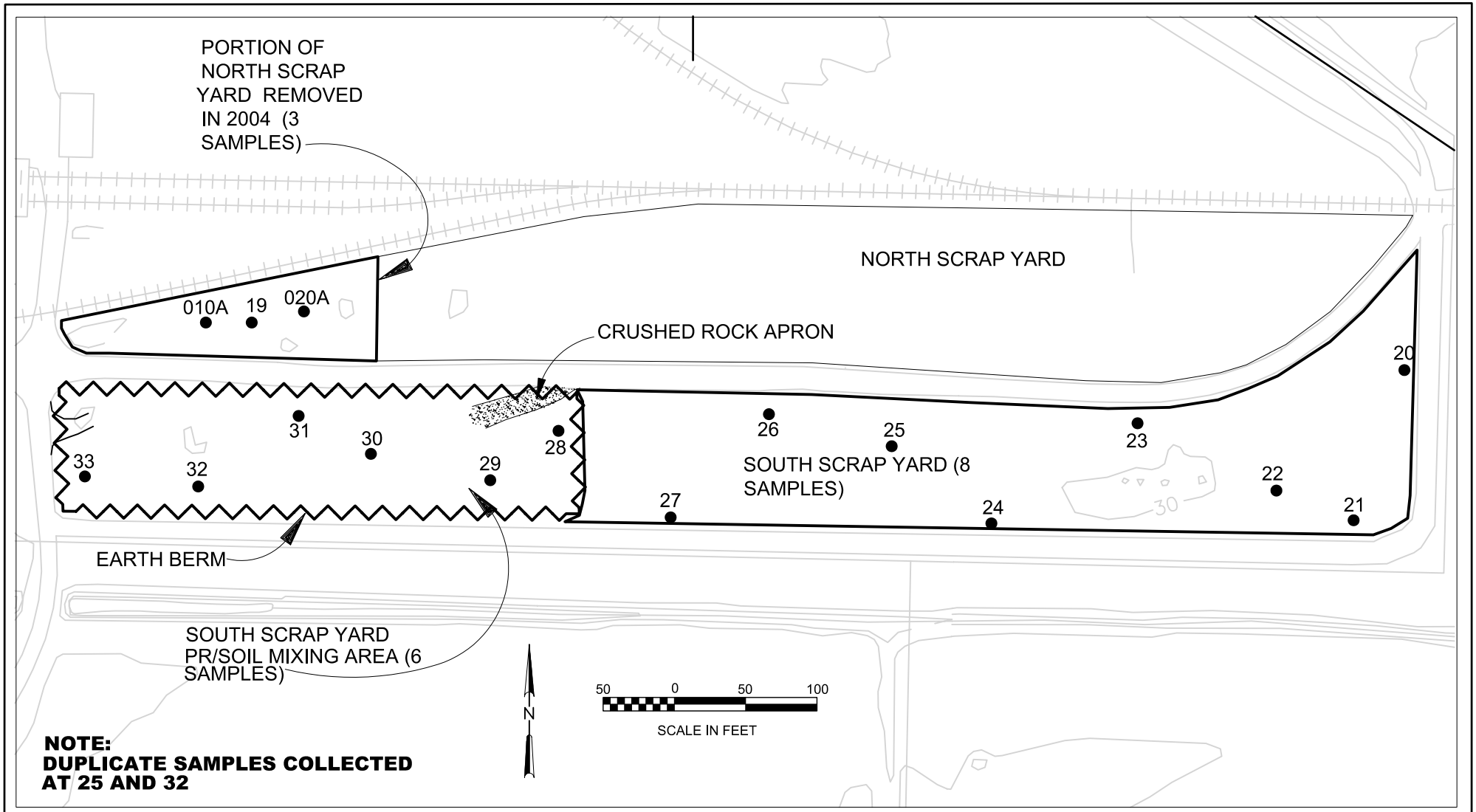
4.2.1 Quality Control

Two duplicate soil samples were collected from the scrap yard site (sample locations SY-CS25 and SY-CS32) in 2004. Data validation reports for analytical results accomplished during 2004 are included in Appendix D.

4.2.2 Analysis and Residual Risk

Confirmation soil samples were sent to CH2M HILL's Applied Sciences Laboratory in Corvallis, Oregon, for fluoride, arsenic, PCB, and PAH analysis. A summary of analytical results is shown in Table 4-1. Complete analytical results are included in Appendix E.

10/7/04



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● **VERIFICATION SAMPLE LOCATION**

Figure 4-1
2004 SCRAP YARD CONFIRMATION SAMPLING LOCATIONS
REYNOLDS METALS COMPANY/ALCOA, INC.
TROUTDALE, OREGON

Final Report:
2004 Scrap Yard Removal Action

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Table 4-1
2004 Confirmation Soil Samples at Scrap Yard
RMC/Alcoa - Troutdale

Class	Analyte	Units	SYCS-010A 10/15/04		SYCS-020A 10/15/04		SYSC-019 10/05/04		SYSC-020 10/14/04		SYSC-021 10/14/04		SYSC-022 10/14/04		SYSC-023 10/14/04		SYSC-024 10/14/04		SYSC-025 10/14/04		SYSC-025-1 10/14/04		SYSC-026 10/14/04	
PAHs	Acenaphthene	mg/kg	0.00323	U	0.00352	U	0.0028	U	0.0475		0.00328	U	0.00323	U	0.015		0.00311	U	0.00647		0.00324	U	0.00326	U
	Acenaphthylene	mg/kg	0.00323	U	0.00352	U	0.0028	U	0.00338	U	0.00328	U	0.00323	U	0.00326	U	0.00311	U	0.00321	U	0.00324	U	0.00326	U
	Anthracene	mg/kg	0.00323	U	0.00352	U	0.0028	U	0.0768		0.00328	U	0.00323	U	0.0228		0.00382		0.0102		0.00588		0.00326	U
	Benzo (a) anthracene	mg/kg	0.00512		0.00905		0.0028	U	0.739	D	0.0283		0.00323	U	0.204		0.029		0.0806		0.0279		0.0211	
	Benzo (a) pyrene	mg/kg	0.0097		0.0128		0.00293		1.13	D	0.0487		0.00323	U	0.334	D	0.0417		0.117		0.0376		0.0304	
	Benzo (b) fluoranthene	mg/kg	0.0104		0.0145		0.00322		0.949	D	0.0483		0.00323	U	0.319	D	0.0363		0.112		0.0311		0.0326	
	Benzo (g,h,i) perylene	mg/kg	0.00918		0.0125		0.00311		0.838	D	0.0415		0.00323	U	0.217		0.0307		0.0929		0.0283		0.0284	
	Benzo (k) fluoranthene	mg/kg	0.00755		0.0106		0.0028	U	0.805	D	0.0421		0.00323	U	0.258	D	0.0289		0.0903		0.0294		0.0266	
	Chrysene	mg/kg	0.00735		0.0125		0.00284		0.89	D	0.0366		0.00323	U	0.291	D	0.0343		0.104		0.032		0.0309	
	Dibenzo (a,h) anthracene	mg/kg	0.00323	U	0.00352	U	0.0028	U	0.164		0.00988		0.00323	U	0.0527		0.00702		0.0227		0.00588		0.00612	
	Fluoranthene	mg/kg	0.00468		0.0105		0.0029		0.874	D	0.0339		0.00323	U	0.305	D	0.043		0.114		0.048		0.0282	
	Fluorene	mg/kg	0.00323	U	0.00352	U	0.0028	U	0.0259		0.00328	U	0.00323	U	0.00717		0.00311	U	0.00321	U	0.00324	U	0.00326	U
	Indeno (1,2,3-cd) pyrene	mg/kg	0.00768		0.0102		0.0028	U	0.718	D	0.0353		0.00323	U	0.18		0.0259		0.0748		0.0227		0.0235	
	Naphthalene	mg/kg	0.00323	U	0.00352	U	0.0028	U	0.00338	U	0.00328	U	0.00323	U	0.00326	U	0.00311	U	0.00321	U	0.00324	U	0.00326	U
	Phenanthrene	mg/kg	0.00323	U	0.00352		0.0028	U	0.316	D	0.011		0.00323	U	0.0969		0.0161		0.048		0.0258		0.0106	
	Pyrene	mg/kg	0.00542		0.0112		0.00295		0.885	D	0.0356		0.00323	U	0.317	D	0.044		0.118		0.0477		0.0305	
	Total PAHs	mg/kg	0.07		0.11		0.02		8.5		0.37		0.0032	U	2.6		0.34		0.99		0.34		0.27	
Fluoride	Fluoride by 340_2 Mod	mg/kg	331		717		414		232		248		324		645		150	U	266		275		320	
Total Metals	Arsenic	mg/kg	-		-		-		0.895		0.58	U	0.555	U	0.702		0.533	U	0.545	U	0.556	U	0.996	
PCBs	Aroclor-1016	mg/kg	-		-		-		0.0502	U	0.0482	U	0.0487	U	0.505	U	0.0472	U	0.0497	U	0.0464	U	0.0497	U
	Aroclor-1221	mg/kg	-		-		-		0.0502	U	0.0482	U	0.0487	U	0.505	U	0.0472	U	0.0497	U	0.0464	U	0.0497	U
	Aroclor-1232	mg/kg	-		-		-		0.0502	U	0.0482	U	0.0487	U	0.505	U	0.0472	U	0.0497	U	0.0464	U	0.0497	U
	Aroclor-1242	mg/kg	-		-		-		0.0502	U	0.0482	U	0.0487	U	0.505	U	0.0472	U	0.0497	U	0.0464	U	0.0497	U
	Aroclor-1248	mg/kg	-		-		-		0.0502	U	0.0482	U	0.0487	U	2.06		0.0472	U	0.0497	U	0.0464	U	0.0497	U
	Aroclor-1254	mg/kg	-		-		-		0.0502	U	0.0482	U	0.0487	U	0.505	U	0.0472	U	0.0497	U	0.0464	U	0.0497	U
	Aroclor-1260	mg/kg	-		-		-		0.0502	U	0.0482	U	0.0487	U	0.505	U	0.0472	U	0.0497	U	0.0464	U	0.0497	U
	Aroclor-1262	mg/kg	-		-		-		0.0502	U	0.0482	U	0.0487	U	0.505	U	0.0472	U	0.0497	U	0.0464	U	0.0497	U
	Aroclor-1268	mg/kg	-		-		-		0.0502	U	0.0482	U	0.0487	U	0.505	U	0.0472	U	0.0497	U	0.0464	U	0.0497	U

D = Compounds identified in an analysis at a secondary dilution factor.
J = Compounds are estimated values.
U = Compounds analyzed for but not detected.
- = Compounds not analyzed for.

Table 4-1
2004 Confirmation Soil Samples at Scrap Yard
RMC/Alcoa - Troutdale

Class	Analyte	Units	SYSC-027 10/14/04		SYSC-028 12/20/04		SYSC-029 11/04/04		SYSC-030 11/04/04		SYSC-031 11/04/04		SYSC-032 11/04/04		SYSC-032-1 11/04/04		SYSC-033 12/20/04	
PAHs	Acenaphthene	mg/kg	0.00322	U	0.00588		0.00333	U	0.00338	U	0.00323	U	0.0039	U	0.00948		0.00293	U
	Acenaphthylene	mg/kg	0.00322	U	0.00321	U	0.00333	U	0.00338	U	0.00323	U	0.0039	U	0.00396	U	0.00293	U
	Anthracene	mg/kg	0.00349		0.0286		0.00333	U	0.00338	U	0.00323	U	0.00624		0.0146		0.00425	
	Benzo (a) anthracene	mg/kg	0.035		0.332	D	0.00333	U	0.00338	U	0.00323	U	0.0445		0.145		0.0353	
	Benzo (a) pyrene	mg/kg	0.0509		0.345	D	0.00333	U	0.00338	U	0.00323	U	0.0487		0.157		0.043	
	Benzo (b) fluoranthene	mg/kg	0.0531		0.54	D	0.00333	U	0.00338	U	0.00323	U	0.056		0.176		0.0435	
	Benzo (g,h,i) perylene	mg/kg	0.0393		0.168		0.00333	U	0.00338	U	0.00323	U	0.0363		0.117		0.0376	
	Benzo (k) fluoranthene	mg/kg	0.0394		0.297	D	0.00333	U	0.00338	U	0.00323	U	0.0443		0.13		0.0363	
	Chrysene	mg/kg	0.0499		0.801	D	0.00333	U	0.00338	U	0.00323	U	0.0738		0.232		0.0576	
	Dibenzo (a,h) anthracene	mg/kg	0.00916		0.0559		0.00333	U	0.00338	U	0.00323	U	0.0107		0.0359		0.0105	
	Fluoranthene	mg/kg	0.0532		0.162		0.00333	U	0.00338	U	0.00323	U	0.0474		0.151		0.0417	
	Fluorene	mg/kg	0.00322	U	0.00352		0.00333	U	0.00338	U	0.00323	U	0.0039	U	0.00418		0.00293	U
	Indeno (1,2,3-cd) pyrene	mg/kg	0.0317		0.147		0.00333	U	0.00338	U	0.00323	U	0.0311		0.102		0.0315	
	Naphthalene	mg/kg	0.00322	U	0.00321	U	0.00333	U	0.00338	U	0.00323	U	0.0039	U	0.00396	U	0.00293	U
	Phenanthrene	mg/kg	0.0194		0.0488		0.00333	U	0.00338	U	0.00323	U	0.0154		0.0611		0.017	
	Pyrene	mg/kg	0.0512		0.153		0.00333	U	0.00338	U	0.00323	U	0.0471		0.161		0.0431	
	Total PAHs	mg/kg	0.44		3.1		0.0033	U	0.0034	U	0.0032	U	0.46		1.5		0.4	
Fluoride	Fluoride by 340_2 Mod	mg/kg	1690		688		337		512		383		846		770		299	
Total Metals	Arsenic	mg/kg	1.4		-		0.556	U	0.595	U	0.575	U	1.75		1.78		-	
PCBs	Aroclor-1016	mg/kg	0.0553	U	-		0.0449	U	0.0504	U	0.0496	U	0.0583	U	0.0603	U	-	
	Aroclor-1221	mg/kg	0.0553	U	-		0.0449	U	0.0504	U	0.0496	U	0.0583	U	0.0603	U	-	
	Aroclor-1232	mg/kg	0.0553	U	-		0.0449	U	0.0504	U	0.0496	U	0.0583	U	0.0603	U	-	
	Aroclor-1242	mg/kg	0.0553	U	-		0.0449	U	0.0504	U	0.0496	U	0.0583	U	0.0603	U	-	
	Aroclor-1248	mg/kg	0.0553	U	-		0.0449	U	0.0504	U	0.0496	U	0.0583	U	0.0603	U	-	
	Aroclor-1254	mg/kg	0.0553	U	-		0.0449	U	0.0504	U	0.0496	U	0.0583	U	0.0603	U	-	
	Aroclor-1260	mg/kg	0.0553	U	-		0.0449	U	0.0504	U	0.0496	U	0.0583	U	0.0603	U	-	
	Aroclor-1262	mg/kg	0.0553	U	-		0.0449	U	0.0504	U	0.0496	U	0.0583	U	0.0603	U	-	
	Aroclor-1268	mg/kg	0.0553	U	-		0.0449	U	0.0504	U	0.0496	U	0.0377	J	0.0534	J	-	

D = Compounds identified in an analysis at a secondary dilution
J = Compounds are estimated values.
U = Compounds analyzed for but not detected.
- = Compounds not analyzed for.

Site-specific cleanup goals identified in *Memorandum WP No. 64: Soil Mixing Addendum to Memorandum WP No. 55: Company Lake Early Remedial Action Work Plan* (CH2M HILL, October 2004) included:

- Excavate and remove visual deposits of waste material currently present in the south portion of the scrap yard to a depth of 1 to 2 feet bgs.
- Excavate and remove additional soil from the western 200 feet of the north portion of the scrap yard to a depth of approximately 6 inches bgs.
- Achieve a mean total fluoride and total PAH concentration in soil of less than 4,000 and 36 mg/kg, respectively.

All site cleanup goals were achieved as a result of this removal action. Confirmation soil sample results indicate maximum total fluoride and total PAH concentrations of 1,690 and 8.5 mg/kg, respectively. Mean total fluoride and PAH concentrations following removal were 489 and 1.0 mg/kg, respectively.

Analytical results were also used to estimate the risk to human health receptors following the removal action. The estimated risk was calculated by using the exposure scenarios presented in the *Draft Baseline Risk Assessment, Part 1 – Nongroundwater Media* (CH2M HILL, May 1999). Appendix F summarizes risk calculations for both the intermittent maintenance worker and trench worker scenarios.

Table 4-2 provides a summary of pre- and post-removal action risk estimates for the scenarios identified above based on "reasonable maximum exposures" (RME). Estimated risks are below EPA's target risk levels of 1×10^{-4} excess cancer risk and hazard index of 1. In addition, estimated risks following the 2004 removal action are also below the Oregon Department of Environmental Quality's (DEQ) target risk level of 1×10^{-5} for cumulative contaminant exposure and 1×10^{-6} for all individual contaminants of potential concern. Risk reductions achieved at the scrap yard site following removal actions range from 92 to 99 percent.

Table 4-2
Human Health Risk Reduction Following 2004 Scrap Yard Removal Action

	Intermittent Maintenance Worker (RME)		**Trench Worker (RME)**	
	Excess Lifetime Cancer Risk	**Hazard Index**	**Excess Lifetime Cancer Risk**	**Hazard Index**
Prior to Excavation	9.94×10^{-5}	0.398	3.41×10^{-5}	0.359
After Excavation	9.23×10^{-7}	0.004	9.99×10^{-8}	0.028
Risk Reduction	99.7%	99%	99.7%	92.2%

SECTION 5

Costs

Costs for the removal action at the scrap yard site are summarized in Table 5-1. Included in the table are costs for CH2M HILL, the analytical laboratories, BBLES, and the transportation contractors. Costs incurred by EPA and RMC/Alcoa are not included.

Table 5-1
Summary of Costs for Removal Actions at Scrap Yard

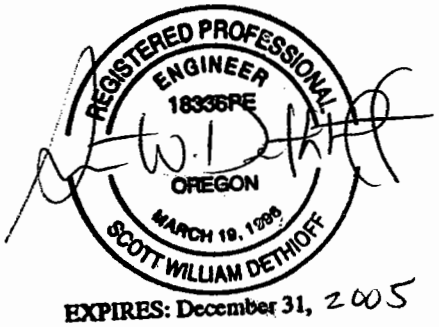
Description of Work	Cost*
Engineering design, construction oversight, laboratory analysis, confirmation sampling, waste profiling, and final report	$185,833
Excavation and site restoration	$104,716
Transportation and disposal	$566,942
Total	**$857,491**

* EPA oversight and RMC/Alcoa costs not included. Costs include both 2002 and 2004 removal actions.

SECTION 6

Certification

Under penalty of law, I certify that to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of the report, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



EXPIRES: December 31, 2005

W. Dethloff

May 12, 2005

Scott W. Dethloff, P.E.
Oregon Professional Engineer 18336 PE
CH2M HILL, Inc.

Date

Steven M. Shaw

May 9, 2005

Steven M. Shaw
Troutdale Superfund Project Coordinator
Reynolds Metals Company/Alcoa

Date

APPENDIX A

Photo Log of 2004 Scrap Yard Removal Effort


United Rentals
Link-Belt
4300


2004 10 4


2004 10 18

APPENDIX B

Daily Truck Logs, Landfill Weight Tickets, and Waste Manifests

APPENDIX C

Waste Profile Sample Analytical Results

APPENDIX D

Confirmation Sample Validation Reports

APPENDIX E

Confirmation Sample Analytical Results

APPENDIX F

Human Health Risk Calculation Tables

APPENDIX G

Dust Monitoring Results

Appendixes B through G are available upon request.

If you need access to these data, please contact Carol Plambeck, CH2M HILL, 503-736-4319.