FIVE-YEAR REVIEW REPORT FOR GOULD SUPERFUND SITE MULTNOMAH COUNTY, OREGON

Prepared by

U.S. Environmental Protection Agency
Region 10
Seattle, Washington

Cami Grandinetti

Cami Grandinetti, Program Manager
Remedial Cleanup Program
Office of Environmental Cleanup

9/17/12

Date

TABLE OF CONTENTS

List of Acronyms	3
Executive Summary	4
Five-Year Review Summary Form	5
I. Introduction	7
II. Site Chronology	8
III. Background	9
Physical Characteristics	9
Land and Resource Use	9
History of Contamination	10
Initial Investigation	10
Basis for Taking Action	10
IV. Remedial Actions	11
Remedy Selection	11
Remedy Implementation	11
Amended Remedy	11
Amended Remedy Implementation	13
System Operations/Operation and Maintenance (O&M)	14
V. Progress Since the Last Five-Year Review	16
VI. Five-Year Review Process	17
Administrative Components	17
Community Involvement	17
Document Review	17
Data Review	17
Site Inspection	18
VII. Technical Assessment	18
Question A: Is the remedy functioning as intended by the decision documents?	19
Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy still valid?	21
Question C: Has any other information come to light that could call into question the protectiveness of the remedy?	21
Technical Assessment Summary	21
III. Issues	22
IX. Recommendations and Follow-up Actions	22
X. Protectiveness Statement(s)	23
XI. Next Review	23
Attachment 1 - Site Location Map	
Attachment 2 - Site Plan View Map	
Attachment 3 - List of Documents Reviewed	

LIST OF ABBREVIATIONS

ARAR	Applicable or Relevant and Appropriate Requirement
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	United States Environmental Protection Agency
CFR	Code of Federal Regulations
DEQ	Oregon Department of Environmental Quality
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PRP	Potentially Responsible Party
RA	Remedial Action
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SDWA	Safe Drinking Water Act

EXECUTIVE SUMMARY

The remedy for the Gould Superfund Site in Portland, Oregon included construction of an on-site containment facility, stabilization and consolidation of contaminated waste, soils and sediments on-site, institutional controls, and groundwater monitoring. The original Record of Decision (ROD) for the soils operable unit was signed on March 31, 1988, an Amended ROD for the soils operable unit was signed in June 3, 1997, and a No Action ROD for the groundwater operable unit was signed on September 28, 2000. The Site achieved construction completion with the signing of the Preliminary Close-Out Report on September 28, 2000. The trigger for this five-year review was the completion of the third five-year report in September 2007.

This review included the following components:

- Public notification
- Review of key project documents
- Review of groundwater monitoring data
- Assessment of effectiveness and protectiveness of institutional controls
- On-site inspection
- Five-year Review Report Development and Review

As a result of this five-year review, EPA concludes: (1) the remedy was constructed and completed in accordance with the requirements of the Amended ROD, (2) the remedy is functioning as designed, and (3) the operation, maintenance and monitoring at the Site is being performed in accordance with the approved Operation and Maintenance Plan and protects the integrity of the remedy. The institutional controls are in place and effective and current land use is consistent with the controls and the Amended ROD and Consent Decree. Because the remedial actions at the site are protective, the remedy is protective of human health and the environment.

The Superfund Sitewide Human Exposure Environmental Indicator Status for the Site remains "Human Health Exposures Under Control and Long-Term Human Health Protection Achieved". The site is capped and fenced, the containment remedy is functioning as intended, and Institutional Controls are in place to ensure no unacceptable exposures occur.

The Groundwater Migration Environmental Indicator Status for the Site remains "Under Control" because EPA concluded there was no Site-impacted groundwater that warranted action. Groundwater in the vicinity of the Site is being investigated due to concerns about contamination from neighboring industrial sites.

Cross Program Revitalization Measure Status: The Site was determined to be "Ready for Anticipated Use" in September 2008 and there is no reason to reconsider that determination based on this review.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Gould		
EPA ID: ORD090003678		
Region: 10	**State:** OR	**City/County:** Multnomah

SITE STATUS	
NPL Status: Deleted	
Multiple OUs? Yes	**Has the site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA **If "Other Federal Agency" was selected above, enter Agency name:** Click here to enter text.
Author name (Federal or State Project Manager): Chip Humphrey
Author affiliation: EPA Region 10
Review period: 5/30/2012 – 9/27/2012
Date of site inspection: 6/19/2012
Type of review: Statutory
Review number: 4
Triggering action date: 9/27/2007
Due date *(five years after triggering action date)*: 9/27/2012

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
Sitewide (Soils Operable Unit, Groundwater Operable Unit)

Issues and Recommendations Identified in the Five-Year Review:

OU(s): N/A	**Issue Category:** Choose an item.			
	Issue: Click here to enter text.			
	Recommendation: Click here to enter text.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
Choose an item.	Choose an item.	Choose an item.	Choose an item.	Enter date.

Protectiveness Statement(s)

Include each individual OU protectiveness determination and statement. If you need to add more protectiveness determinations and statements for additional OUs, copy and paste the table below as many times as necessary to complete for each OU evaluated in the FYR report.

Operable Unit: N/A	*Protectiveness Determination:* Choose an item.	*Addendum Due Date (if applicable):* Click here to enter date.
Protectiveness Statement: Click here to enter text.		

Sitewide Protectiveness Statement (if applicable)

For sites that have achieved construction completion, enter a sitewide protectiveness determination and statement.

Protectiveness Determination: Protective	*Addendum Due Date (if applicable):* Click here to enter date.

Protectiveness Statement:

Because the remedial actions at the site are protective, the remedy is protective of human health and the environment. Exposure pathways that could result in unacceptable risks have been controlled. All threats at the Site have been addressed through stabilization, consolidation and placement of contaminated waste, soil and debris in the on-site containment facility, the installation of fencing and warning signs and the implementation of institutional controls. No issues that affect or may affect protectiveness were identified in the Review. Long-term protectiveness of the remedial action will continue to be verified by on-site inspections, operation and maintenance of the containment facility and groundwater monitoring.

Gould Superfund Site
Portland, OR
Fourth Five-Year Review Report

I. Introduction

The purpose of the five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and identify recommendations to address them.

The Agency is preparing this Five-Year Review report pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

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

The Agency interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) states:

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

The United States Environmental Protection Agency (EPA), Region 10, conducted this statutory five-year review of the remedy implemented at the Gould Superfund Site ("Gould Site" or "Site") in Portland, Oregon. A statutory review is required because the implemented remedy resulted in hazardous substances, pollutants or contaminants being left at the Gould Site. This review was conducted by the Remedial Project Manager (RPM) for the Site from May 2012 through September 2012. This report documents the results of the review.

This is the fourth five-year review for the Gould Site and addresses the entire site. The triggering action for this statutory review is the completion of the third five-year review in September 2007. The five-year review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

II. Site Chronology

Table 1: Chronology of Site Events

Event	Date
EPA and DEQ investigations documenting lead contamination	1982, 1983
NPL listing	Sept 1983
RI/FS Consent Order signed	August 1985
RI/FS completed	March 1988
ROD for Soils Operable Unit signed	March 1988
Remedial Design Completed	Sept 1991
Unilateral Order issued for Remedial Action	Jan 1992
Contractor mobilized to start site preparation	July 1992
Cleanup operation suspended	May 1994
ROD Amendment signed	June 1997
Unilateral Order for Remedial Design and Early Remedial Action	July 1997
First five-year review completed	Sept 1997
Consent Decree for Remedial Action	Feb 1998
Remedial action construction excavation and stockpiling East Doane Lake sediments	June - Oct 1998
On-site Containment Facility construction begins	May 1999
No-action ROD for Groundwater Operable Unit signed	Sept 2000
Construction completion	Sept 2000
Preliminary Closeout Report	Sept 2000
Operation and Maintenance begins	Jan 2001

Final Operation and Maintenance Plan approved	May 2002
Final Closeout Report Completed	August 2002
Second Five Year Review Completed	Sept 2002
Third Five Year Review Completed	Sept 2007
RAU Determination	Sept 2008

III. Background

Physical Characteristics

The Gould Site is located in Portland, Oregon in a heavily industrialized area northwest of downtown Portland between NW St. Helen's Road and NW Front Avenue known as the Doane Lake area. The Site includes a 9.2 acre property currently owned by Gould Inc. Gould and its predecessor-in-interest formerly operated a secondary lead smelter and battery recycle facility on the property. Battery casings and other residues from operations on the Gould property were disposed on properties owned by Gould as well as areas not owned by Gould.

The Gould Site is adjacent to the former Rhone-Poulenc Ag Company (Rhone-Poulenc) facility. Rhone-Poulenc is conducting an investigation with State oversight under a 1999 Consent Order with Oregon DEQ to address on-site and off-site contamination associated with their former pesticide and herbicide manufacturing facility. A shallow groundwater extraction and treatment system has been in operation on a portion of the facility since the mid-1980s. Rhone Poulenc has implemented several interim remedial action measures, including soil capping in the insecticide dust plant area soils, capping of herbicide area soil, lining City Outfall 22B to control groundwater infiltration, and in-situ stabilization and solidification of West Doane Lake sediments. A draft RI and Source Control Evaluation Report was submitted to DEQ in November, 2010. Final versions of these documents along with the On-Site Baseline Human Health Risk Assessment, Off-Site Baseline Human Health Risk Assessment are expected in late 2012.

The Gould Site is approximately 1,000 feet southwest of the Willamette River. The Lower Willamette River, known as the Portland Harbor area, was added to the National Priorities List because of sediment contamination in December, 2000. A remedial investigation and feasibility study (RI/FS) of the lower Willamette River is being conducted by a group of Potentially Responsible Parties (PRPs) under a Consent Order signed by EPA and the PRPs in September 2001. The revised draft RI and baseline risk assessment reports were submitted to EPA in May 2011. The draft Feasibility Study was submitted to EPA March 2012. The Gould Site is also adjacent to several contaminated properties, including the former Rhone Poulenc and Arkema facilities that are being evaluated under State Environmental Cleanup Program authority.

Land and Resource Use

The historic land use of the Site has been industrial since at least 1940. From 1949 until operations ceased in 1981, activities at the Site included secondary lead smelting. The current land use for the surrounding area is a mix of industrial and commercial uses. The Willamette River supports a variety of uses, including boating and fishing, with park and boat launch located approximately 1 mile downstream and across the river. It is anticipated that a mix of land uses similar to that described will continue for these areas in the future. In establishing cleanup requirements for the Site, EPA assumed that the Gould Site would remain industrial. The Site itself is currently fenced and the treated, stabilized soils and sediments are contained within the fenced area in the containment facility that was constructed with a double bottom liner and an impermeable cap.

The groundwater aquifer underlying the Site is currently not used as a drinking water source. The dominant groundwater flow direction is to the northwest toward the Willamette River.

History of Contamination

Secondary lead smelting operations began at the Gould Site in 1949 under the ownership of Morris P. Kirk and Sons, a subsidiary of NL Industries, Inc. (NL). Facility operations included lead-acid battery recycling, lead smelting and refining, and lead oxide production. Gould purchased the property in 1979 and closed the facility in 1981. During facility operations, discarded battery casing materials and other lead smelter wastes were used as fill on the Gould Site and an adjacent property. Acid from batteries was drained to Doane Lake during several years of operation.

Initial Investigation

In 1981 and 1982, a joint investigation of contamination at the Site was conducted by EPA and the Oregon Department of Environmental Quality (DEQ). Based on the results of the joint investigation, EPA included the Site on the NPL in 1983 because of documented lead contamination. In 1985 NL and Gould signed an Order on Consent with EPA under which the two companies conducted a RI/FS. The RI/FS was completed in February 1988.

Basis for Taking Action

The RI/FS showed there were high levels of lead contamination in soil, waste and debris and in East Doane Lake sediments at the Site. Exposures to lead-contaminated waste, soils and East Doane lake sediments were associated with significant human health risks.

IV. Remedial Actions

Remedy Selection

Soils Operable Unit

EPA signed a ROD for the Soils Operable Unit on March 31, 1988. The selected remedy included excavating and treating battery casings, recovering lead and casing materials for recycle, excavation of contaminated soil and East Doane Lake sediments followed by stabilization of excavated soil, matte (smelter waste), and sediment that exceeded RCRA characteristic hazardous waste levels, and monitoring air, ground water and surface water quality. Stabilized material would then be backfilled on-site. The 1988 ROD also included additional study of groundwater to determine whether action was needed because there was insufficient hydrogeologic information available to make a decision on groundwater.

The selected remedy was expected to control the migration of contaminants from the Site by minimizing releases to the air and groundwater. The surface soil (0 to 1ft depth) cleanup level of 1000 mg/kg was selected to be protective for human industrial exposures, including direct contact, inhalation and ingestion. A primary objective of the selected remedy was to recycle materials that could potentially be recycled (lead and casing materials).

Remedy Implementation

Excavation and treatment of contaminated surface soils, battery casing piles, buried battery casings, matte and other debris began in the summer of 1993. Excavated battery casings were processed through a battery treatment plant to separate materials (lead fines, metallic lead, clean plastic, and clean ebonite) for recycle. Contaminated soil and matte were stabilized to bind contaminants for backfilling on-site.

An estimated 24,000 tons of contaminated battery casings were treated through the treatment/separation process, with 244 tons of plastic and 88 tons of coarse lead recycled. An estimated 20,000 blocks (each measuring one cubic yard) of stabilized material were produced. Several hundred tons of contaminated debris were shipped off-site for disposal. Approximately 15,000 cubic yards of contaminated material were stockpiled on-site.

The treatment/recycle process was suspended in 1994 because of operational problems, inconsistent results, and significantly increased costs. EPA subsequently determined that the selected remedy was no longer appropriate based on operating experience and conditions at the Site.

Amended Remedy

In June 1997 EPA issued a ROD Amendment for the Soils Operable Unit that changed the cleanup remedy previously selected at the Site. The selected remedy included the following:

* Excavation and dewatering of contaminated East Doane Lake remnant (EDLR) sediments

followed by backfilling the EDLR with clean imported backfill;

* Excavation of the remaining battery casings on the Gould property;

* Treatment (stabilization or fixation) of the lead fines stockpile, the screened Gould excavation stockpile and other lead contaminated material identified as principal threat waste;

* Construction of a lined and capped on-site containment facility (OCF), with leachate collection and treatment, on the Gould property;

* Consolidation of contaminated material, including sediments, treated and untreated stockpiled materials, casings, soil and debris in the lined and capped OCF;

* Institutional controls, such as deed restrictions or environmental protection easements, which (1) provide EPA access for the purpose of evaluating the remedial action, and (2) limit future use of properties within the Site to industrial operations or other uses compatible with the protective level of cleanup achieved after implementation of the selected remedial action, and to uses which do not damage the OCF cap and liner system or cause releases of buried materials;

* Performing groundwater monitoring to ensure the effectiveness of the cleanup and that contaminants were not mobilized during its implementation; and

* Long-term operation and maintenance requirements and reviews conducted no less often than every five (5) years to ensure the remedy continues to provide adequate protection of human health and the environment.

The 1997 ROD Amendment also required off-site mitigation/restoration to comply with CWA Section 404 and implementing regulations as compensation for the loss of the estimated 3.1 acres of EDLR open water habitat.

The ROD Amendment retained the surface soil cleanup level for lead at 1,000 mg/kg (the cleanup level selected in the 1988 ROD). Lead contamination was the principal threat addressed in the ROD and the primary contaminant of concern addressed in the 1997 ROD Amendment. The ROD Amendment modified the contaminated subsurface material that would be excavated as part of the remedial action. Instead of requiring all subsurface material contaminated above EP Toxicity levels to be excavated, it allowed some subsurface materials in excess of those levels to remain in place based on types of materials, depth, location and updated information about groundwater contamination.

In the 1997 ROD Amendment, EPA determined that results of previous groundwater monitoring had not confirmed lead contamination in area groundwater. Data collected in 1995 and 1996 indicated that lead contamination was not widespread or significant in groundwater near the Site. The ROD Amendment further concluded that although it did not appear there was a need for

treatment of groundwater for lead, monitoring would be continued to further evaluate Site conditions and provide a basis for future cleanup or no-action decisions for groundwater. EPA issued a no-action ROD for the Groundwater Operable Unit in September 2000.

State Removal Action of East Doane Lake Sediments

DEQ issued a Removal Action Decision Memorandum under State law in May 1998 that evaluated removal alternatives for organic contamination in portions of the East Doane lake remnant that could be performed in conjunction with the sediment removal action described in EPA's ROD Amendment for the Gould Site. DEQ's evaluation was based on additional sampling in the East Doane Lake remnant which indicated that sediments were also contaminated with organic chemicals that appeared to be related to past waste management practices at the Rhone-Poulenc facility that was located adjacent to the Gould property. DEQ determined that removal of additional sediments in portions of East Doane Lake was warranted to address the organic chemical contamination and that the removal should occur in conjunction with sediment removal under the Gould Site remedial action. Rhone-Poulenc did not agree to perform the removal action and DEQ funded the removal of additional contaminated sediments.

Amended Remedy Implementation

Nine Gould Site PRPs signed a Consent Decree with EPA that was lodged in US District Court in Portland in March 1998. The PRPs began work in the summer of 1998 with the excavation, dewatering and stockpiling of contaminated sediments from EDLR. Construction of the on-site containment facility, excavation and treatment of other contaminated materials, placement of the waste in the containment facility, and other cleanup actions required by the ROD Amendment have been completed as described below:

* East Doane Lake contaminated sediments - Dredging, mechanical dewatering and stockpiling an estimated 8700 cubic yards of contaminated EDLR sediment (including sediment removed as part of the DEQ removal action) and debris was completed in November 1999. In addition, 55 compressed gas cylinders that were buried in the east portion of EDLR were recovered, overpacked, and transported to an off-site facility for treatment and disposal.

* Gould property battery casings - An estimated 3590 cubic yards of battery casings and other waste material were excavated from the south shoreline of EDLR.

* Treatment of principle threat/stockpiled material - An estimated 7850 cubic yards of stockpiled material, including the lead fines stockpile, were treated by stabilization to pass RCRA characteristic waste levels.

* On-site containment facility - Construction of the 4.5 acre containment facility on the Gould property was completed in 1999. The OCF includes a double bottom liner, leachate collection and treatment, and a multi-media cap. The leachate collection and treatment system are operational. Leachate is pre-treated for metals prior to transport to the Rhone-Poulenc wastewater treatment facility for additional treatment prior to

discharge to the Willamette River in accordance with Rhone-Poulenc's NPDES permit.

* Consolidating contaminated material in the OCF - An estimated 77,700 cubic yards of contaminated material have been placed in the OCF. Material that was shipped off-site included the recycled lead and plastic and the contaminated debris from the original treatment process, and compressed gas cylinders previously described. The OCF was capped with a multimedia cap following materials placement. The final topsoil cover and seeding were completed in August 2000.

* East Doane Lake remnant and the open excavation in the Lake Area of the Rhone-Poulenc property - backfilling the East Doane Lake remnant and the open excavation in the Lake Area of Rhone-Poulenc with clean material was completed in 1998 following excavation of the contaminated sediments.

* Institutional controls - Future use of the property is limited to industrial or other uses compatible with the cleanup under the terms of the Environmental Protection Restrictive Covenant and Easements that were granted by the four affected property owners to meet the requirements of the Consent Decree. The covenants and easements, which were recorded in Multnomah County in 2001, included the following restrictions on use: the property shall not be used for residential or agricultural use; no actions may be undertaken that may disturb or damage or otherwise interfere with the structural integrity of the OCF, the cap, liner and leachate collection system, and detection monitoring system; granted right of access to EPA and the State to conduct monitoring, investigations, inspections and assessing the need for additional response actions. EPA has and will continue to evaluate the institutional controls at least every 5 years as part of the 5 year reviews that will be conducted at the Site.

* Groundwater monitoring - groundwater monitoring was carried out during remedial action to ensure the effectiveness of the cleanup and that contaminants were not mobilized during its implementation; and to gather additional information for the groundwater evaluation. Long-term groundwater monitoring will continue as part of the remedial action requirements for the Soils Operable Unit and the operation and maintenance plan for the OCF.

* Long-term operation and maintenance requirements and reviews conducted no less often than every five (5) years to ensure the remedy continues to provide adequate protection of human health and the environment.

Other cleanup activities performed as part of the remedial action included demolition of on-site structures, asbestos abatement and PCB light ballast removal and disposal, and excavation of surface soils contaminated above the 1,000 ppm lead cleanup level established by the ROD Amendment. Extensive air monitoring of lead and particulate levels was conducted to ensure that fugitive dust from construction activities were adequately controlled. Perimeter security fencing was installed to restrict access to the OCF.

The Site achieved construction completion status when the Preliminary Closeout Report was signed on September 28, 2000. EPA and the State have determined that all RA construction activities, including the implementation of institutional controls, were performed according to specifications.

System Operation/Operation and Maintenance

The Gould Site PRPs are conducting long-term monitoring and maintenance activities according to the approved operation and maintenance (O&M) plan to protect the integrity of the remedy. Operation and maintenance activities began in January 2000 in accordance with the Final Remedial Design Report and Draft Operation and Maintenance Plan.

The Final Operation and Maintenance Plan was completed November 6, 2001. It addresses activities, responsibilities and schedules for the following Site components: OCF cover condition and stability; erosion and sedimentation controls, access roads; security fencing, stormwater systems; leachate collection and treatment, and groundwater monitoring. The Gould Site PRPs are conducting inspection, monitoring and maintenance activities according to the O&M plan.

The primary activities associated with O&M include the following:

- Inspection of Site security including fences, gates and signage.
- Visual inspection of the cap and side slopes with regard to vegetative cover, animal burrows, settlement, stability, and any need for corrective action. In addition, the cap is to be mowed as necessary to approximately 6 inches to allow establishment of grass, evaluation of cover conditions and inhibit woody vegetation.
- Inspection of the stormwater drainage system for blockage (debris and sediment), erosion and instability, and any need for corrective action and condition of groundwater monitoring wells.
- Environmental monitoring including annual monitoring of groundwater.
- Inspection of the leachate collection system (manholes, leak detection pipes) and leachate pre-treatment system. Leachate is to be pumped to the frac tanks prior to 1 foot of water collecting in the bottom of the leachate collection system manholes. When the frac tank is approximately 75% full, leachate is to be pre-treated via the additive/mixing and filtration system and transferred to Rhone Poulenc for final treatment and discharge.

The inspection frequency established in the final O&M Plan was once per month for the first year after construction completion, with quarterly inspections after the first year. Groundwater sampling was conducted semi-annually for the first 5 years following completion of construction, and annually after the first 5 years.

The leachate pre-treatment system that was installed to treat leachate from the OCF prior to transporting it to the Rhone-Poulenc site treatment system was modified based on initial tests which determined that filtration was not sufficient as the sole means of treatment. An additive was used to make the filtration process more effective and meet pretreatment requirements, although this system has not been needed for the past several years because of lack of leachate.

O&M costs include OCF cover and drainage structure maintenance, leachate collection system inspections (including manholes and leak detection sumps), Site security and annual groundwater monitoring. First year costs were higher due the need to establish the vegetative cover on the cap and to treat leachate. The O&M costs for the Site have been reasonably consistent with the originally estimated annual costs.

Groundwater Operable Unit ROD

EPA issued a Record of Decision for the Groundwater Operable Unit on September 28, 2000. The Selected Remedy is no further action for the Gould Site Groundwater Operable Unit. Groundwater monitoring carried out as part of the cleanup of the Soils Operable Unit has not shown a need for additional cleanup of Gould Site contaminants in groundwater. Long-term groundwater monitoring will continue at the site as required by the 1997 ROD Amendment for the Soils Operable Unit to ensure that the remedy remains protective.

V. Progress Since the Last Five-Year Review

The following issues were raised in the last five-year review:

1) Maintentance issues – some minor reseeding, replacement of channel rock for the stormwater drainage system, repair of animal burrows and other minor maintenance issues were noted in the previous five year review inspection.

Status: the repairs noted in the last five-year review report have been completed. Some additional animal burrows were noted in the June 19, 2012 inspection and scheduled for repair in July 2012

2) Stormwater drainage system – repairs to the stormwater drainage system had recently been completed at the time of the last five year review. It was noted that the adequacy of the repairs needed to be evaluated in follow up inspections.

Status: follow-up inspections confirmed that the repairs were effective in reducing groundwater infiltration

3) Wetlands mitigation - Acquisition of off-site property to satisfy wetland mitigation requirements was being pursued through the Trust for Public Lands and US Fish and Wildlife Service.

Status: The specific property transaction reference in the previous review was not

completed and is no longer an option. EPA is working directly with the Gould Site PRPs on other options to satisfy the wetland mitigation requirements.

Operation and maintenance activities at the Site are continuing in accordance with the O&M Plan. The leachate collection system has not collected water and no water has been pumped from the system for several years.

SLLI, PRP for the adjacent Rhone Poulenc Site, is conducting an investigation of groundwater contamination associated with the releases from the facility under Oregon DEQ oversight and authority. Rhone Poulenc recently completed long-term pilot testing for a potential pump and treat source control measure. Source control work under DEQ oversight and authority is underway at the adjacent (directly across Front Avenue from Gould) Arkema facility to address stormwater and contaminated groundwater.

VI. Five-Year Review Process

Administrative Components

Representatives of the Gould Site PRP Group and the DEQ were notified of the initiation of the five-year review in May 2012. Natural resource trustee representatives were notified on June 6, 2012. The Gould five-year review was conducted by Chip Humphrey of EPA, Remedial Project Manager (RPM) for the Gould Site.

Community Notification

Activities to involve the community in the five-year review process were initiated in July 2012. A notice describing the five-year review process and soliciting information about the Site was published in the Oregonian newspaper on August 20, 2012. In addition, a notice was sent to the Gould and Portland Harbor mailing list, an extensive list of parties that are interested in information related to the Portland Harbor Superfund Site.

EPA will be issuing another notice to announce the availability of this five-year review. The results of the review and the report will be available to the public at the EPA Oregon Operations Office and the EPA Region 10 website.

Document Review

This five-year review consisted of a review of relevant documents including the ROD Amendment, O&M plan, quarterly inspection reports and annual groundwater monitoring reports, and the easements and protective covenants for the individual properties.

Data Review

Groundwater monitoring has been conducted at the Gould Site since the late 1980s. In general, most contaminants were detected at their highest levels in the mid 1980s. Contaminant levels

associated with the Gould Site dropped in the 1990s, which may have been the result of remedial activities eliminating significant source material. A review of quarterly inspection reports and annual groundwater monitoring results was conducted as part of the no-action ROD for the groundwater operable unit.

Lead levels in groundwater samples collected from monitoring wells located directly downgradient from the Site have been below 15 ug/l, the current action level for lead established by the Safe Drinking Water Act (SDWA) for the past ten years, with many of the measurements non-detect for lead. The highest concentration in the most recent sampling results that were collected on June 19, 2012 was 7.8 ug/l total lead reported for monitoring well ASW-06. Dissolved lead was not detected above the method detection limit of 0.5 ug/l in any of the monitoring wells. The SDWA action level for lead was the standard that was evaluated as a basis for EPA's no-action ROD for groundwater.

The area surrounding the Site is currently served by a municipal water supply system that provides potable water. There are no drinking water supply wells on or down gradient of the Gould Site. There are deep wells located near the Gould Site that have been used to supply water for industrial uses (non-drinking water) purposes.

The leak detection sumps are inspected on a quarterly basis and sampled if water is present. The leak detection sumps were dry at the time of the June 19, 2012 site inspection and the previous quarterly inspection. The highest level detected in the 2007 - 2012 five year review period was 5.4 ug/l total lead that was measured during the 3rd quarter inspection in 2008.

Contamination associated with the former pesticide/herbicide facility adjacent to the Gould Site is being investigated by SLLI (formerly Rhone-Poulenc) under DEQ oversight and authority. Extensive groundwater monitoring for organic contamination is being conducted as part of the investigation. DEQ is also working with SLLI on Interim Actions to address contaminated groundwater as a potential source of contamination to the Willamette River. EPA will assess whether source control efforts are adequate as part of its oversight role under the Memorandum of Agreement for the Portland Harbor Superfund Site.

Site Inspection

A site inspection was conducted on June 19, 2012 by the EPA RPM and representatives from Oregon DEQ and the Gould Site PRP Group (AMEC Environment and Infrastructure , consultants for StarLink Logistics). The purpose of the inspections were to assess the protectiveness of the remedy, including the integrity of the on-site containment facility, condition of the cover, leachate collection and treatment system, stormwater system, and security fencing.

No significant issues were identified regarding the OCF, the cover, or drainage structures. The OCF cover was in good condition and no significant settlement or subsidence was observed. The top surface and side slopes have a well-established grass cover. Some animal burrows were noted and subsequently scheduled for repair by the landscaping contactor concurrent with the next mowing event. Fencing and access controls were in good condition. Post-closure inspection reports are submitted to EPA and DEQ following each quarterly inspection by the

Gould Site PRPs.

It was noted the onsite maintenance trailer was in disrepair and unsecured. AMEC representatives stated that equipment and supplies are no longer kept in the on-site trailer, but are stored at AMECs office and transported to the site as needed. The trailer is a safety hazard based on its current condition and obvious signs of rodent infestation. EPA has advised the Gould PRP representatives that the condition of the trailer is unacceptable and requested that it either be cleaned and repaired, or removed from the site and demolished and adequately disposed.

The institutional controls that are in place include prohibitions on the use or disturbance of containment facility and any other activities or actions that might interfere with the implemented remedy. No activities were observed that would have violated the institutional controls, and the controls were determined to be effective in preventing unacceptable exposures. The containment facility property and the surrounding area uses were consistent with land use assumptions and restrictions identified in the Amended ROD, and no new uses of groundwater were observed.

VII. Technical Assessment

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

Yes. The results of the Site inspection and review of documents, ARARs and risk assumptions indicate that the remedy is functioning as intended by the Amended ROD. The excavation, stabilization and consolidation of the contaminated waste, soils, debris and sediments in the OCF have achieved the remedial objectives to prevent direct contact with or ingestion of contaminants.

1. Direct contact exposures: Prevent direct contact exposures to battery casings, waste material and contaminated soils.

The waste excavation and consolidation in the lined and capped OCF prevents direct contact with the contamination. Sampling verified that surface soils above 1,000 mg/kg cleanup level specified in the ROD were excavated and placed in the OCF. The OCF cover system and clean imported backfill that was placed over the excavation areas also provide additional protection from direct contact exposures. Institutional controls limit future use of the Gould Site properties to uses compatible with the industrial cleanup levels selected and achieved for this Site. Observed uses of the Site during the five-year review were compatible with the cleanup levels selected and achieved, and no additional anticipated uses of the property were identified.

2. Inhalation exposures: Prevent releases and inhalation of lead exceeding ambient air standards.

Previous violations of the ambient air standard for lead were attributed to releases from piles of battery casings and other waste material at the Site prior to completion of the cleanup. Waste material and contaminated surface soils above 1000 mg/kg lead have been consolidated and contained in the OCF. Air monitoring was conducted and protective measures were used throughout the remedial action to ensure that the remedial construction activities did not cause

unacceptable releases of lead. Average quarterly lead concentrations for the Site did not exceed the Federal and State of Oregon standard of 1.5 ug/cubic meter (quarterly average).

3. Groundwater: Minimize migration of contamination from waste materials to groundwater.

Sources of potential groundwater contamination from Gould Site operations were addressed in the remedial action for the Soils Operable Unit. EPA issued a no-action ROD for groundwater in September 2000 which documented the results of groundwater monitoring for Gould Site constituents. There have been no exceedences of the 15 ug/l action level for lead established under the Safe Drinking Water Act at the monitoring wells located on or directly downgradient of the Site for at least the past thirteen years. DEQ is continuing an investigation of organic contamination in groundwater associated with the adjacent Rhone-Poulenc property and may require future cleanup of Rhone-Poulenc contaminants at Rhone-Poulenc and the Gould Site under state authority. Pilot testing of a pump and treat system was recently completed to evaluate its use a potential source control measure.

4. Wetlands: Provide mitigation for loss of wetland and open-water habitat.

EPA approved the wetlands mitigation plan which provides funding and requires acquisition of an off-site property as mitigation for the loss of East Doane lake wetland and open-water habitat. At the time of the previous 5 year review, work was progressing on a proposal for acquisition of a specific property adjacent to the Tualatin Wildlife Refuge in consultation with US Fish and Wildlife Service. The property acquisition was not completed and is no longer being pursued as an option for mitigation. The mitigation requirement has still not been completed, and EPA is pursuing other options for fulfilling this obligation with the Gould PRPs.

5. Future land use: 1) Provide EPA access for the purpose of evaluating the remedial action, and 2) limit future use of properties within the Site to industrial operations or other uses compatible with the protective level of cleanup achieved after implementation of the selected remedial action, and to uses which do not damage the OCF cap and liner system or cause releases of buried materials.

Access is provided and future use of the property is limited to industrial or other uses compatible with the cleanup under the terms of the Environmental Protection Restrictive Covenant and Easements that were granted by property owners. The Restrictive Covenants and Easements were finalized and recorded with Multnomah County for each of the Gould Site properties. Current land use is consistent with the assumptions used and restrictions required by the Amended ROD. As part of this five-year review EPA also verified through the Multnomah County Records office that the Restrictive Covenants and Easements are still in place for the affected properties.

Operation and maintenance of the on-site containment facility, leachate collection and treatment system, and stormwater runoff system has been effective. The Gould PRP Group is maintaining the remedy in accordance with the Amended ROD and O&M Plan. O&M annual costs are reasonably consistent with original estimates and there are no indications of any significant problems with the remedy. EPA is working to ensure that the Gould Site PRPs complete the

acquisition of off-site mitigation property or other approved mitigation. The delay in meeting the wetlands mitigation requirements for the Site does not affect the potential for release of contaminants and does not affect protectiveness for the Site.

There were no opportunities for system optimization observed during this review. Work to address groundwater infiltration in the stormwater system has been completed. EPA will continue to assess groundwater data and the adequacy of the monitoring well network to ensure that it provides sufficient data to evaluate the effectiveness of the remedy.

The institutional controls that are in place include prohibitions on the disturbance of the cap, and any other activities or actions that might interfere with the implemented remedy and are adequately meeting the RAOs. The ICs were implemented in 2001 by means of an Environmental Protection Easement and Declaration of Restrictive Covenant on the four affected properties in accordance with Oregon law. EPA has copies of the Restrictive Covenants that were filed with the Recorders Office in Multnomah County. No activities were observed during this review that would have violated the institutional controls or result in unacceptable exposures. The cap and the surrounding area land uses were consistent with the requirements of the covenants and easements, and no new uses of groundwater were observed. There are also engineering controls in the form of a fence around the Site with locked gates to control access. The security fence and gates are intact and in good repair.

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

Yes, the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection are still valid. No significant changes to the remedial action objectives or cleanup levels are necessary based on the results of the five-year review. The following describes the objectives, cleanup levels and monitoring results:

There have been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy. As required by the soils remedy, annual groundwater monitoring is being conducted to evaluate groundwater quality relative to the action level for lead established under the Safe Drinking Water Act. Lead levels in groundwater samples collected from wells located directly downgradient from the Site have been below 0.015mg/l, the action level for lead established by the Safe Drinking Water Act, and most of the results have been non-detect for lead. This data and conditions at the Site continue to show that there is no need to reconsider the selected No Action remedy for groundwater. There have been no significant changes in ARARs and no new standards affecting the protectiveness of the remedy.

There have been numerous changes to the standardized risk assessment methodology since the completion of the endangerment assessment that was performed under the 1988 RI/FS. EPA reviewed information and evaluated changes that could affect the protectiveness of the remedy in the 1997 Amended ROD and the 2000 No Action ROD. No significant changes in lead exposure pathways or toxicity that could affect the protectiveness of the remedy were identified during the five-year review.

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

No other information that calls into question the protectiveness of the remedy was identified during the five-year review.

Technical Assessment Summary

According to the Site inspection and documents and data reviewed, the remedy has been completed and is functioning as intended by the Amended ROD. There have been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy and ICs continue to effectively prevent exposure to contaminated materials remaining on Site. ARARs for soil contamination cited in the Amended ROD have been met. No changes in the toxicity factors for the contaminants of concern were identified since the Amended ROD was issued. No other information was identified during the five-year review that calls into question the protectiveness of the remedy.

VIII. Issues

No issues that affect or may affect protectiveness were identified in this review. The review did identify the following three issues which warrant follow-up as part of O&M activities and wetlands mitigation requirements at the Site.

- Repair of animal burrows - Some animal burrows were observed during the onsite inspection and were previously described in quarterly inspection reports. Repairs to the containment facility soil cover are scheduled to be completed by the landscaping contractor concurrent with the mowing event schedule for July 2012 as noted in AMEC's August 7, 2012 post-closure inspection report.

- Maintenance trailer - The existing trailer located onsite is in disrepair and unsecured. AMEC representatives stated that equipment and supplies are no longer kept in the on-site trailer, but are stored at AMECs office and transported to the site as needed. The trailer is a safety hazard based on its current condition and signs of rodent infestation. EPA has advised the Gould PRP representatives of the condition of the trailer and requested that it either be cleaned and repaired, or removed from the site and properly addressed.

- Wetlands mitigation - The off-site wetlands mitigation property acquisition has not been completed. The Gould Site PRPs are no longer actively pursuing the purchase of property through the Trust for Public Lands and a revised mitigation proposal needs to be submitted, approved and completed.

IX. Recommendations and Follow-Up Actions

Since no issues that affect or may affect protectiveness were identified in this review, there are no recommendations or follow-up actions required to ensure protectiveness. However, as noted above three O&M issues were identified and the following recommendations and follow-up actions are warranted as part of the O&M at the Site.

- Repair of animal burrows - The repairs were scheduled to be completed by the landscaping contractor concurrent with the mowing event schedule for July 2012 as noted in AMEC's August 7, 2012 post-closure inspection report. Completion of the repairs will verified during the next quarterly inspection scheduled for October, 2012.

- Maintenance trailer - EPA has advised the Gould PRP representatives of the condition of the trailer and requested that it either be cleaned and repaired, or removed from the site and properly addressed.

- Wetland mitigation – EPA will continue to monitor progress and ensure that acquisition of off-site property or alternate approved mitigation is completed. The mitigation requirement is enforceable under the Consent Decree for Remedial Action.

X. Protectiveness Statement

Because the remedial actions at the site are protective, the remedy is protective of human health and the environment. Exposure pathways that could result in unacceptable risks have been controlled. All threats at the Site have been addressed through stabilization, consolidation and placement of contaminated waste, soil and debris in the on-site containment facility, the installation of fencing and warning signs and the implementation of institutional controls. No issues that affect or may affect protectiveness were identified in the Review. Long-term protectiveness of the remedial action will continue to be verified by on-site inspections, operation and maintenance of the containment facility and groundwater monitoring.

XI. Next Review

The next five-year review for the Gould Superfund Site is required by September 2017, five years from the date of this review.

ATTACHMENTS

Site Location Map
Site Plan
List of Documents Reviewed

GOULD SUPERFUND SITE LOCATION

GOULD SUPERFUND SITE

ATTACHMENT 3

List of Documents Reviewed

Record of Decision, Gould Site Soils Operable Unit, US Environmental Protection Agency, March 1988.

Amended Record of Decision, Gould Site Soils Operable Unit, US Environmental Protection Agency, June 1997.

Record of Decision, Groundwater Operable Unit, US Environmental Protection Agency, September 2000.

Final Report for Early Remedial Action and Remedial Action, Prepared for the Gould Site Respondents by Advanced GeoServices, March 2001.

Operation and Maintenance Plan, Gould Superfund Site, Prepared for the Gould Site Respondents by Advanced GeoServices, November 2001.

Gould Superfund Site Post-Closure Inspection Reports (AMEC Earth & Environment Inc.)

Environmental Protection Easements and Declaration of Restrictive Covenants

Third Five Year Review Report, US Environmental Protection Agency, September 2007

Milestone Report for Upland Source Control at the Portland Harbor Superfund Site, Oregon Department of Environmental Quality, January 2012