EPA SUPERFUND
EXPLANATION OF SIGNIFICANT DIFFERENCES:

NORTH RIDGE ESTATES SITE
OPERABLE UNIT NUMBER 1
EPA ID: ORN001002476

KLAMATH FALLS, OREGON
February 22, 2019

Approved by: Date:

Sheryl Bilbrey 2/28/19

Sheryl Bilbrey, Director
Office of Environmental Cleanup
U. S. Environmental Protection Agency Region 10

INTRODUCTION

The purpose of this Explanation of Significant Differences (ESD) is to modify the September 22, 2011 U.S. Environmental Protection Agency (EPA) Record of Decision (ROD) for the North Ridge Estates (NRE) Site, Operable Unit Number 1 (OU1), based on information gained during implementation of the remedy. This ESD revises the arsenic background level based on recent sampling and analysis of off-site soils.

The EPA is publishing this ESD pursuant to Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9617(c), and Section 300.435(c)(2)(i) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. § 300.435(c)(2)(i).

SUMMARY OF SITE BACKGROUND, HISTORY, CONTAMINATION, AND SELECTED REMEDY

Background and History:

The NRE Site (EPA ID number ORN001002476) is located approximately 3 miles north of the City of Klamath Falls, in Klamath County, Oregon, on Old Fort Road and North Ridge Drive. The NRE Site is named after the North Ridge Estates residential subdivision built on a portion of the property that is now included within the Site boundary. The NRE Site is largely comprised of privately owned parcels and parcels managed by a court-appointed Receiver.

The NRE Site has been divided into two operable units (OUs):

- ***OU1*** encompasses the footprint of a former Marine Recuperation Barracks and includes all areas where asbestos-containing material (ACM) and/or asbestos have been observed and/or detected with the exception of the former firing range. Parcels included in OU1 are contiguous with the exceptions of Parcels BQ and BM which are located ¼ mile to the south (see Figure 3). When established, OU1 was estimated to include approximately 125 acres. An additional 8.5 acres of asbestos contaminated areas has been added to OU1 over the course of remedial design and remedial action (see Figures 1 and 2 for added areas).
- ***OU2*** includes the area of the former firing range and is estimated to include approximately 46 acres. OU2 is not affected by this ESD.

The remedy selected in the September 22, 2011 ROD is intended to be the final remedial action for OU1 of the NRE Site. The OU1 remedial action builds on the numerous removal actions already implemented at the Site. The specific remedial actions that are being taken at OU1 because of the ROD are discretely separate from OU2. OU2 is geographically distinct from OU1 and may have additional contaminants of concern that require additional investigation at a later time.

EPA is the lead agency for the remedial actions at OU1, and the Oregon Department of Environmental Quality (ODEQ) will provide long-term operation and maintenance (O&M) of the remedy implemented by EPA.

The NRE site was listed on the National Priorities List September 16, 2011. The remedial investigation (RI) and feasibility study (FS) for OU1 were completed in January 2010. The Proposed Plan for NRE OU1 was released in April 2010. The ROD for OU1 was signed on September 22, 2011, and the Remedial Design for OU1 was approved in December 2015. Remedial Action was conducted over three field seasons between 2016 and 2018. Construction is expected to be final in November 2019 after vegetation is established and all warranty items are addressed to EPA's satisfaction.

Contamination:

The main contaminant of concern at OU1 is asbestos. The main source of asbestos is ACM that was used in the original construction of the marine recuperation barracks in the 1940s. As was common in the 1940s, a variety of different types of ACM was used in the construction of the barracks, including cement asbestos board (CAB) on exterior and interior walls, asphalt-asbestos roofing material, vinyl asbestos tile (VAT), floor tile mastic, and several types of asbestos steam pipe insulation. When buildings containing ACM were demolished, some of the ACM debris was consolidated into waste piles or burial pits and the rest of the ACM was dispersed in surface and subsurface soil in the vicinity of the demolition. During development of the NRE residential subdivision, most of this ACM was covered or buried with soil, but some was left exposed. Over time pieces of ACM in the shallow subsurface soil have appeared at the surface. This is believed to be due to repeated cycles of frost heave, surface soil erosion, and/or transport by water runoff. Once at the surface, the ACM can release asbestos fibers to surface soil and/or air, especially when the ACM and soil is disturbed by human or mechanical forces.

The only other contaminant of concern at OU1 is the arsenic found in soils in the location of the former power plant. The data set for arsenic in the area of the former power plant was limited and the exposure point concentration is elevated as compared with typical background soil levels for Oregon. The lifetime excess cancer risks to residents from arsenic at the former power plant have been calculated at a level of 4E-05 (4 in one hundred thousand). These risks are within EPA's acceptable cancer risk range of 1E-06 (1 in 1 million) to 1E-04 (1 in 10,000) but exceed ODEQ's cancer risk threshold of 1E-06. The arsenic in soils in the former power plant area is co-located with ACM and/or asbestos contamination; therefore, the OU1 FS assumed the arsenic contamination found in these areas would be addressed by the ACM/asbestos remediation.

Description of Selected Remedy:

A large portion of OU1 has undergone removal actions that have reduced the volume of contaminated materials such as ACM and asbestos-containing soils exposed at the Site but have not eliminated the pathways for receptors to be exposed to asbestos. The selected remedy for OU1 addresses the remaining threats to human health and the environment posed by exposure to asbestos and arsenic contamination within this OU. The selected remedy for OU1 includes the following components:

- Excavation of most of the contaminated surface and subsurface soils to a minimum depth of 2 feet, and maximum depth of 4 feet below ground surface. Excavation may be less

than 2 feet and more than 4 feet under certain conditions, discussed in Section 12.3.1.3 of the ROD.

- Installation of a visible marker layer in areas where material is still present at a 4-foot depth to denote the vertical extent of contaminated material after excavation on each parcel.
- Capping of remaining soils on the parcels with clean cover soils of sufficient thickness to break the soil-to-air exposure pathway associated with residual ACM or asbestos fibers left in the soils. The caps also keep ACM from migrating to the surface through natural processes such as frost heave or erosion. Caps on OU1 will include 1) onsite repositories, 2) soil caps on parcels, and 3) existing structures, such as buildings, driveways, and existing roads.
- Consolidation and placement of excavated contaminated material in two onsite ACM repositories.
- Capping of the onsite repositories with a barrier of clean cover soil of sufficient thickness to break the soil-to-air exposure pathway and keep contaminated materials from migrating to the surface through natural processes such as frost heave and erosion. Access controls (signs and fencing) will be used as necessary to prevent access to the repositories.
- Institutional controls at the entire site to prevent disruption of residual contamination within parcels and consolidated material in the onsite repositories.
- Maintenance with ongoing monitoring (inspections and sampling) to ensure that capped areas are maintained and not damaged, exposure does not occur, and caps remain protective.
- Contingency: Current sampling data indicate that indoor air in OU1 residences is protective of human health. Therefore, EPA has no reason to remediate indoor living spaces at this time. After excavation and capping are completed on each parcel, sampling will be conducted in indoor living spaces (residences). If sampling shows a risk of greater than 1E-04 in any home, EPA will invoke a post–ROD change (such as an ESD), to reflect this determination, to indicate which living spaces will need to be cleaned, and to share information with the public about how indoor cleaning will be conducted.

BASIS FOR THIS ESD

Arsenic Background:

Section 8.2 of the OU1 ROD stated that a site-specific arsenic background study would be performed in late 2011 on properties near OU1. If the study demonstrated that natural background was higher than 0.425 mg/kg, EPA would publish an ESD to change the allowable arsenic level to a site-specific background level.

DESCRIPTION OF THE SIGNIFICANT DIFFERENCES

This ESD modifies the natural background levels of arsenic in soils at the NRE Site.

Arsenic Background:

The arsenic concentrations in soil at the former power plant ranged between 0.5 mg/kg and 27.2 mg/kg. Using an exposure point concentration of 17 mg/kg, the excess lifetime cancer risk was determined to be 4E-05. In the ROD, EPA calculated the arsenic concentration in soil that would equate to a human health cancer risk level of 1E-06 using residential exposure assumptions as 0.425mg/kg. However, arsenic is a metalloid that also occurs naturally in soils developed over volcanic rocks, such as those that underlie and outcrop near the NRE Site. Pursuant to EPA guidance, Role of Background in the CERCLA Cleanup Program, Office of Solid Waste and Emergency Response (OSWER) 9285.6-07P, acceptable exposure levels are not set below background levels.

A site-specific background study was performed in September 2011 in soils off-site but in close proximity to OU1. Additional investigation and analysis of soil near the Site to be used as backfill material at the Site found that arsenic levels varied due to naturally occurring geochemical variability. The results of the investigation are documented in a December 2, 2013 ODEQ memorandum, which recommends that the site-specific natural background level for the NRE Site be set at 12 mg/kg.

As discussed in Section 8.2 of the OU1 ROD, arsenic contamination was found in soils on and near the former power plant and is co-located with asbestos-contaminated soils. Cleanup of asbestos in soils on and near the former power plant location required EPA to excavate deeper than where arsenic contamination of concern had been found. Therefore, the remedial action objective for arsenic contaminated soils near the former power plant was achieved by excavation and placement in a capped onsite repository as part of the site final remedy. The EPA used the presence of asbestos rather than an arsenic cleanup level as a guide for how much soil required excavation.

At the time the remedy was selected it was not certain that all soils within the OU1 boundary were planned to be excavated so the ROD stated that a ROD Amendment or ESD would be necessary to select final arsenic clean-up levels. Although no additional sampling for arsenic is anticipated at this time, if arsenic sampling is conducted in the future, results will be compared to the 12 mg/kg background level selected in this ESD, which supersedes the 0.425 mg/kg risk-based level in the 2011 ROD.

COST

There is no cost associated with the change in the selection of regional arsenic concentration for use as the background level.

SUPPORT AGENCY COMMENTS

The State of Oregon concurs with this Explanation of Significant Differences.

AFFIRMATION OF THE STATUTORY DETERMINATIONS

When implemented, the remedy, as modified by this ESD, will be protective of human health and the environment, will comply with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, will be cost effective, and will utilize permanent solutions and alternative treatment technologies to the maximum extent practicable.

Because the remedy will result in hazardous substances, pollutants or contaminants remaining on site above levels that allow for unlimited use or unrestricted exposure, in accordance with 40 CFR § 300.430(f)(4)(ii), the remedy for the Site must be reviewed no less often than every five years to ensure the continued protectiveness of the selected remedy.

PUBLIC PARTICIPATION ACTIVITIES

As required by Section 300.825(a)(2) of the NCP, 40 C.F.R. § 300.825(a)(2), this ESD is supported by the Administrative Record which is available for review at the following locations:

EPA Region 10, Records Center
1200 Sixth Avenue, Suite 155, ECL-076
Seattle, Washington 98101
Phone number (206) 553-4494 or toll-free at 1-800-424-4372

The information used in EPA's assessment, including an interpretation of analytical results from background, is currently available in the administrative record and on the NRE Site website at: http://www.epa.gov/superfund/north-ridge-estates. This ESD will be placed in the Administrative Record upon signature.

With the publication of this ESD, the public participation requirements set out in 40 CFR § 300.435(c)(2)(i) of the NCP have been met.

Routing and Concurrence

Proposed Plan, ROD, RODA, ESD, NTCRA Action Memo under $50M*

Author:	Linda Meyer	Date submitted for signature:	2/22/19
Site:	North Ridge Estates		
File Location/Name:	G/Denali/North Ridge Estates/ESD 2019		

PROGRAM OFFICE CONCURRENCE:

Name:	RPM	Site Attorney	ORC UM	RCP UM	RCP PM	ECL OD (Signature)
Initials/Date:	lm 2/22	attached 2/22	DBF 2/22/19	SDB 2/25/19	CS 2/25/19	SB 2/25/19

Decision Document checklist- Proposed Plan, ROD, RODA, ESD, NTCRA (Action Memo) under $50M

Review/Coordination	Completed (Y/N, N/A)	Notes
Followed detailed Decision Document checklist	y	
AR complete and ready for publishing	y	
Fact sheet/communications plan developed	n	
State/Tribal input on ARARs	y	
RCP Policy Advisor input & review/comment	y	
(ACTION MEMO ONLY) EMP Action Memo review input & review/comment		
HQ Regional Coordinator review/comment	y	
State/Tribal coordination (PP, ESD, and Action Memo)	y	
State/Tribal coordination & concurrence (ROD, RODA)		

- **For Proposed Plans, brief ECL OD, obtain RCP PM concurrence. All other decision documents are signed by ECL OD**

From:	Leefers, Kristin
To:	Meyer, Linda; Blocker, Shawn; Grandinetti, Cami
Cc:	Tan, Robert
Subject:	RE: NRE ESD for Arsenic for your concurrence
Date:	Friday, February 22, 2019 9:19:19 AM

Looks great Linda. I concur.

Kris

Kris Leefers
206-553-1532

From: Meyer, Linda
Sent: Thursday, February 21, 2019 7:19 PM
To: Leefers, Kristin <Leefers.Kristin@epa.gov>; Blocker, Shawn <Blocker.Shawn@epa.gov>; Grandinetti, Cami <Grandinetti.Cami@epa.gov>
Cc: Tan, Robert <Tan.Robert@epa.gov>
Subject: NRE ESD for Arsenic for your concurrence

Kris - here is the final ESD. I attached the redline as well so you can see your comments - I addressed all of your comments. The admin record is in place and I will also send to DEQ for a concurrence email. Thanks!

Linda Meyer | Superfund Project Manager
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March 4, 2019

Sheryl Bilbrey, Director
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1200 Sixth Ave, Suite 900
Seattle, WA 98101

Re: State Concurrence, Explanation of Significant Differences Document, North Ridge Estates Superfund Site (NRE), Operable Unit 1 (OU1), Klamath Falls, Oregon. ORN001002476, ECSI #2335

Dear Ms. Bilbrey:

Thank you for the opportunity for the Oregon Department of Environmental Quality to review and comment on the US Environmental Protection Agency's Explanation of Significant Differences (ESD) document dated February 22, 2019.

DEQ concurs with the use of the site-specific background level of 12 milligrams per kilograms (mg/kg) for arsenic in lieu of the 0.425 mg/kg risk-based level referenced in the 2011 Record of Decision.

If you have any questions or comments, please contact me at 541-633-2012 or via email at anderson.david@deq.state.or.us.

Sincerely,

David Anderson
Eastern Region Manager
Cleanup, Emergency Response, and Hydrogeology Programs

ecc: Katie Daugherty, DEQ
Linda Meyer, EPA