
Post-Demolition Residual Risk Assessment



Reynolds Metals Company
TROUTDALE FACILITY

CH2MHILL

JUNE 2006



**Printed on
Recycled and
Recyclable
Paper**

Contents

Section	Page
Abbreviations and Acronyms	vii
Executive Summary.....	ES-1
1 Introduction	1-1
1.1 Background	1-1
1.2 Purpose of the Risk Assessment.....	1-3
2 Revised Conceptual Site Model.....	2-1
2.1 Projected Future Land Uses	2-1
2.2 Proposed Exposure Areas	2-1
2.2.1 Exposure Area 1: Fairview Farms.....	2-2
2.2.2 Exposure Area 2: Outside the Dike	2-2
2.2.3 Exposure Area 3: South Wetlands	2-2
2.2.4 Exposure Area 4: East Area, Comprising Former Plant Area East of Sundial Road.....	2-3
2.3 Conceptual Exposure Model.....	2-3
2.3.1 Human Receptors and Exposure Routes	2-3
3 Selection of Representative Data	3-1
4 Human Health Risk Assessment	4-1
4.1 Organization of This Section.....	4-1
4.2 Human Health Risk Assessment Guidance	4-1
4.3 Chemicals of Potential Concern and Data Evaluation	4-2
4.3.1 Identification of COPCs for Human Health.....	4-2
4.3.2 Calculation of Exposure Point Concentrations.....	4-3
4.4 Human Exposure Assessment.....	4-3
4.4.1 Trespasser Scenario.....	4-4
4.4.2 Recreational User Scenario	4-4
4.4.3 Construction Worker Scenario	4-4
4.4.4 Excavation/Trench Worker Scenario	4-4
4.4.5 Occupational Worker Scenario.....	4-4
4.5 Toxicity Assessment for Human Health	4-5
4.6 Human Health Risk Characterization	4-5
4.6.1 Target Risk Levels	4-6
4.6.2 Summary of Risk Estimates	4-6
4.6.3 Risk-Based Screening for Petroleum	4-9
5 Updated Ecological Risk Assessment for South Wetlands.....	5-1
5.1 Introduction.....	5-1
5.2 The Tiered Approach for the Ecological Risk Assessment	5-1
5.2.1 Tier 1 Approach.....	5-1

Section	Page
5.2.2 Tier 2 Approach	5-2
5.3 Ecological Risk Assessment Guidance	5-2
5.4 Ecological Risk Characterization for South Wetlands	5-3
5.4.1 Derivation of Ecological Hazard Quotients	5-3
5.4.2 Results of the Tier 1 Ecological Risk Assessment for South Wetlands.....	5-4
5.4.3 Results of the Tier 2 Ecological Risk Assessment for South Wetlands.....	5-4
5.4.4 ERA Conclusions	5-10
6 Identification of Major Uncertainties and Assumptions.....	6-1
6.1 Sampling, Analysis, and Data Evaluation	6-1
6.2 Chemical Fate and Transport	6-2
6.3 Exposure Estimation.....	6-2
6.4 Toxicological Data.....	6-2
7 Conclusions of the Post-Demolition RI/RA Process.....	7-1
8 References	8-1

Appendixes

- A Area-Specific Human Health Risk Calculation Data Sheets
- B Area-Specific Ecological Risk Calculation Data Sheets

Tables

- ES-1 Summary of Scope
- ES-2 Human Health Risk Assessment Results Summary
- ES-3 Comparison of Human Health Risk Results with Regulatory Risk Criteria

[All remaining tables, as well as all figures, are located at the end of this report]

- 2-1 Areas of Concern Addressed During the Post-Demolition RA
- 2-2 Post-Demolition Residual Risk Assessment Exposure Scenarios

- 3-1 Samples Used in the Fairview Farms Risk Assessment
- 3-2 Samples Used in the Outside the Dike Risk Assessment
- 3-3 Samples Used in the South Wetlands Risk Assessment
- 3-4 Samples Used in the East Area Risk Assessment

- 4-1 Chemicals of Potential Concern Identified for Each of the Exposure Areas
- 4-2 Fairview Farms Surface Soil Summary Statistics and Exposure Point Concentrations
- 4-3 Fairview Farms Subsurface Soil Summary Statistics and Exposure Point Concentrations
- 4-4 Outside the Dike Surface Soil and Sediment Summary Statistics and Exposure Point Concentrations

- 4-5 Outside the Dike Surface Soil Summary Statistics and Exposure Point Concentrations
- 4-6 South Wetlands Surface Soil Summary Statistics and Exposure Point Concentrations
- 4-7 South Wetlands Subsurface Soil Summary Statistics and Exposure Point Concentrations
- 4-8 East Area Surface Soil Summary Statistics and Exposure Point Concentrations
- 4-9 East Area Subsurface Soil Summary Statistics and Exposure Point Concentrations
- 4-10 Reasonable Maximum Exposure Assumptions
- 4-11 Central Tendency Exposure Assumptions
- 4-12 Toxicity Factors for the Oral Route
- 4-13 Toxicity Factors for the Inhalation Route
- 4-14 Summary of Risk Estimates for Fairview Farms
- 4-15 Summary of Risk Estimates for Outside the Dike
- 4-16 Summary of Risk Estimates for South Wetlands
- 4-17 Summary of Risk Estimates for East Area

- 5-1 Summary of Tier 1 Ecological Hazard Quotients for South Wetlands
- 5-2 Tier 2 Adjustments to Tier 1 Ecological Quotients for Open Water/Wetland Areas
- 5-3 Tier 2 Adjustments to Tier 1 Ecological Quotients for Upland Areas
- 5-4 Comparison of Open Water/Wetland Area Ecological Risk Estimates with Background Risk Estimates
- 5-5 Open Water/Wetland Area Contribution Estimates for COPECs
- 5-6 Comparison of Upland Area Ecological Risk Estimates with Background Risk Estimates
- 5-7 Upland Area Contribution Estimates for COPECs
- 5-8 Available LOAELs for Fluoride and PCBs

Figures

- 1-1 Vicinity Map
- 2-1 Site Map
- 2-2 Conceptual Exposure Model
- 3-1 Sample Locations

Abbreviations and Acronyms

ARARs	applicable or relevant and appropriate requirements
bgs	below the ground surface
BLRA	<i>Baseline Risk Assessment</i>
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COPC	chemical of potential concern
COPEC	chemical of potential ecological concern
CSM	conceptual site model
CTE	central tendency estimate
DEQ	Oregon Department of Environmental Quality
ELCR	excess lifetime cancer risk
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
ERA	ecological risk assessment
ft	foot [feet]
HEAST	Health Effects Assessment Summary Tables
HHRA	human health risk assessment
HI	hazard index
HQ	hazard quotient
ID	identification
IRIS	Integrated Risk Information System
kg	kilogram
km	kilometer(s)
LOAEL	lowest observed adverse effect level
mg/kg	milligrams per kilogram
mg/kg-day	milligrams of chemical contacting the body per kilogram body weight each per day
NCEA	EPA National Center for Environmental Assessment
NOAEL	no observed adverse effect level
NPL	National Priorities List
NRDA	Natural Resource Damage Assessment

OAR	Oregon Administrative Rule
ORS	Oregon Revised Statute
PAHs	polynuclear aromatic hydrocarbons
PCB	polychlorinated biphenyl
PDRI	post-demolition remedial investigation
PPRTVs	Provisional Peer Reviewed Toxicity Values
PRG	preliminary remediation goal
RA	post-demolition residual risk assessment
RCRA	Resource Conservation and Recovery Act
RI/RA	post-demolition remedial investigation/risk assessment
RMC	Reynolds Metals Company
RME	reasonable maximum exposure
ROD	Record of Decision
TRV	toxicity reference value
UCL	upper confidence limit
USFWS	U.S. Fish and Wildlife Service
WDOE	Washington Department of Ecology

Executive Summary

This report presents the results of a post-demolition residual risk assessment (RA) for the entire Reynolds Metals Company (RMC) facility, including Fairview Farms, in Troutdale, Oregon. This work was conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and *Memorandum WP No. 67: Post-Demolition Residual Risk Assessment Scoping Document for RMC-Troutdale* (CH2M HILL, 2005a).

Purpose of This Report

The post-demolition RA documents the final condition at the RMC-Troutdale site after completion of plant demolition and extensive remediation of the property. The site will be developed as a mixed-use general industrial complex consistent with the general industrial zoning currently designated for the property. This report addresses the reasonably anticipated future land uses at the site and considers exposure scenarios for direct contact pathways associated with soil for the most plausible future site users: site trespassers, recreational users, construction workers, excavation/trench workers, and standard occupational workers. An updated ecological risk assessment is also presented for the south wetlands area using current data representative of final conditions.

Background

The *Baseline Risk Assessment* (BLRA) (CH2M HILL, 2000) addressed potential human and ecological exposure pathways associated with soil, surface water, sediment, and biota for conditions existing before the extensive removal and remedial actions were conducted at the site. Since the preparation of the BLRA, removal and remedial actions and plant demolition have significantly reduced contaminated materials on the site, reduced potential sources of exposure, and eliminated certain exposure pathways. Removal of source material also has eliminated sources of contamination to groundwater. In addition, projected future land use changes required consideration of exposure scenarios different from those assumed in the BLRA.

This post-demolition RA builds on the previous BLRA work and evaluates residual risks now that removal and remedial actions are complete. Exposure to groundwater, surface water, sediment, and historical soil sources have been addressed by the BLRA and by the *Reynolds Metals Company Record of Decision for Interim Action* (U.S. Environmental Protection Agency [EPA], 2002) and are not addressed in this report.

Purpose of the Post-Demolition Risk Assessment

The purpose of this post-demolition RA is to estimate the realistic potential for risk to human health and ecological receptors posed by chemicals of potential concern present at the site following plant demolition and extensive remediation.

This post-demolition RA was conducted using standard EPA methodologies as well as additional approaches and assumptions agreed to by RMC, EPA, and the Oregon

Department of Environmental Quality (DEQ). The resulting risk estimates, along with other factors, serve as the basis of risk management decisions for the RMC-Troutdale site.

The main objective of the human health RA is to determine whether residual concentrations of chemicals in soil result in cancer or noncancer risks that exceed regulatory risk threshold levels. A consideration of reasonably anticipated future land uses provides identification of the most feasible human exposure pathways for future use of the RMC-Troutdale site.

The main objective of the ecological RA is to update the south wetlands ecological risk assessment that was presented in the BLRA, using characterization data representative of final site conditions and the most current regulatory guidance. The purpose is to document the effectiveness of a polychlorinated biphenyl (PCB) removal action in this area in September 1999, and to consider additional sampling data (since the BLRA) from the railroad embankment, south landfill, north landfill, and Company Lake. Ecological evaluations for other areas at the RMC-Troutdale site were documented in the BLRA.

Revised Conceptual Site Model

The physical setting of the site has changed since the BLRA because significant removal actions have been performed and plant buildings and structures have been demolished. In addition, a considerable amount of contamination has been removed, and projected land use conditions have been clarified.

Projected Future Land Uses

The RMC-Troutdale site will be developed as a mixed-use general industrial complex consistent with the general industrial zoning currently designated for the property. The site will be subdivided and built out over an extended period of time.

Proposed Exposure Areas

This post-demolition RA evaluates the entire RMC-Troutdale site, including Fairview Farms to the west and areas outside the dike to the north. The risk assessment was performed on four discrete exposure areas. These four areas are as follows:

1. Fairview Farms
2. Outside the dike
3. South wetlands
4. East Area (former plant area east of Sundial Road)

Human Receptors and Exposure Routes

The exposure scenarios appropriate for each of the identified areas are presented in Table ES-1.

Exposure Area	Human Health					Ecological
	Short-Term Trespasser	Recreational User	Construction Worker	Excavation/Trench Worker	Occupational Worker	
Outside the Dike	X	X				
Fairview Farms	X		X	X	X	
East Area	X		X	X	X	
South Wetlands	X		X	X		X

Human Health Risk Assessment Findings

Risk Quantification Results

The exposure assessment component of the risk assessment identifies the means by which individuals on or near the Troutdale site may contact chemicals in environmental media. The estimation of potential exposure requires specific assumptions to describe potential exposure situations. Upper-bound exposure assumptions are used to define reasonable maximum exposure (RME) conditions to provide a bounding estimate on exposure. In accordance with *Guidance for Conduct of Deterministic Human Health Risk Assessments* (DEQ, 2000a), deterministic risk assessments should also define central tendency estimates (CTEs) of exposure and risk. The results of the human health risk assessment are presented in Table ES-2.

Exposure Area	Exposure Scenario	Excess Lifetime Cancer Risk		Noncancer Hazard Index (RME and CTE)	Primary Excess Lifetime Cancer Risk Contributors (approximate percent contribution)
		CTE	RME		
Fairview Farms	Short-Term Trespasser	1×10^{-8}	2×10^{-7}	<1	None
	Construction Worker	3×10^{-8}	2×10^{-7}	<1	None
	Excavation/Trench Worker	1×10^{-9}	6×10^{-9}	<1	None
	Occupational Worker	2×10^{-7}	2×10^{-6}	<1	None
Outside the Dike	Short-Term Trespasser	1×10^{-7}	2×10^{-6}	<1	None
	Recreational User	1×10^{-7}	2×10^{-6}	<1	None
South Wetlands	Short-Term Trespasser	8×10^{-7}	1×10^{-5}	<1	Benzo(a)pyrene ELCR = 3×10^{-6} (32%) Dibenzo(a,h)anthracene ECLR = 2×10^{-6} (21%)
	Construction Worker	4×10^{-7}	3×10^{-6}	<1	None
	Excavation/Trench Worker	4×10^{-8}	3×10^{-7}	<1	None

Table ES-2 Human Health Risk Assessment Results Summary					
Exposure Area	Exposure Scenario	Excess Lifetime Cancer Risk		Noncancer Hazard Index (RME and CTE)	Primary Excess Lifetime Cancer Risk Contributors (approximate percent contribution)
		CTE	RME		
East Area	Short-Term Trespasser	9×10^{-8}	1×10^{-6}	<1	None
	Construction Worker	4×10^{-7}	2×10^{-6}	≤ 1	None
	Excavation/Trench Worker	1×10^{-8}	9×10^{-8}	<1	None
	Occupational Worker	1×10^{-6}	1×10^{-5}	<1	Benzo(a)pyrene ELCR = 5×10^{-6} (38%) Arsenic ELCR = 2×10^{-6} (17%)

This table provides the excess lifetime cancer risk and noncancer hazard index results for each exposure area and exposure scenario evaluated in this report. Also provided in Table ES-2 is a summary of the primary risk contributors and their respective contributions to the total area-specific risk estimate, when appropriate.

Comparison with Target Risk Levels

Risks for each exposure area are evaluated relative to goals established by DEQ that define acceptable risk for individual carcinogenic compounds to be set at one in one million (1×10^{-6}) excess risk for cancer and one in one hundred thousand (1×10^{-5}) for cumulative risks from carcinogenic compounds. Acceptable risk for noncarcinogenic constituents is set at a hazard index equal to 1. If calculated risks within an exposure area are below these target risk levels, risks are assumed to be acceptable and no further evaluation or action will be taken. This comparison is provided in Table ES-3.

Table ES-3 Comparison of Human Health Risk Results with Regulatory Risk Criteria					
Exposure Area	Exposure Scenario	DEQ Target Risk Exceedance—Is Total ELCR > 1×10^{-5} ?		Is Total HI for RME and CTE > 1.0?	Are Individual Chemical ELCRs > 1×10^{-6} ?
		CTE	RME		
Fairview Farms	Short-Term Trespasser	No	No	No	No
	Construction Worker	No	No	No	No
	Excavation/Trench Worker	No	No	No	No
	Occupational Worker	No	No	No	No
Outside the Dike	Short-Term Trespasser	No	No	No	No
	Recreational User	No	No	No	No
South Wetlands	Short-Term Trespasser	No	No	No	Yes. ^a Two polynuclear aromatic hydrocarbons (PAHs)
	Construction Worker	No	No	No	No
	Excavation/Trench Worker	No	No	No	No

Exposure Area	Exposure Scenario	DEQ Target Risk Exceedance—Is Total ELCR > 1×10^{-5} ?		Is Total HI for RME and CTE > 1.0?	Are Individual Chemical ELCRs > 1×10^{-6} ?
		CTE	RME		
East Area	Short-Term Trespasser	No	No	No	No
	Construction Worker	No	No	No	No
	Excavation/Trench Worker	No	No	No	No
	Occupational Worker	No	No	No	Yes. One PAH and arsenic. Arsenic concentrations are at background levels.

^a Individual chemical ELCRs do not exceed 1×10^{-6} when assuming a more realistic trespass frequency of less than 11 days per year at south wetlands, as described in Section 4.6.2 of the main report.

The Troutdale site meets DEQ's 1×10^{-5} cumulative target risk and total hazard index (less than 1.0) for the CTE case for all human health exposure scenarios. The site also meets the 1×10^{-6} individual target risk criterion for the CTE case for all human health exposure scenarios.

For the RME case, the Troutdale site meets DEQ's 1×10^{-5} cumulative target risk and total hazard index (less than 1.0) for all human health exposure scenarios. The site also meets the 1×10^{-6} individual target risk criterion, except for the RME site trespasser scenario at south wetlands and the RME occupational worker scenario at the East Area. However, the individual target risk criterion is not exceeded for these two areas under the CTE scenario. The slight exceedance of the 1×10^{-6} individual target risk for the RME site trespasser scenario at south wetlands is not considered significant in light of the results seen for the CTE case for this site. An additional calculation indicated that even if the trespass frequency were assumed to be 11 days per year, there would be no exceedances of the 1×10^{-6} individual target risk for this area. For trespass exposure at south wetlands, an exposure frequency of about 5 days per year (assumed under the CTE case) is more reasonable than the 26 days per year assumed under the RME case,¹ and results in acceptable risk. In addition, the thick vegetation and standing water would serve to minimize direct contact with soil at south wetlands.

In addition to the above risk estimates, all soil samples in the Fairview Farms area, outside the dike area, south wetlands, and East Area met the risk-based screening levels identified in DEQ's *Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites* (DEQ, 2003), except one sample in south wetlands.

South Wetlands Ecological Risk Assessment Findings

A post-demolition residual ecological RA was performed for south wetlands to document the effectiveness of a PCB removal action in this area in September 1999, and the addition of

¹ The exposure frequency of 26 days per year was used as a high-end default in the BLRA and was carried over here for consistency, but it does not reflect actual trespass observed at south wetlands.

sampling data (since the BLRA) from the railroad embankment. The ecological RA provides an assessment of the potential impacts on wildlife of residual concentrations at south wetlands, assuming that site development does not occur. If the area is developed in the future, then the ecological risk results will become invalid at that time. Additional areas at the RMC site where ecological exposures could occur were previously addressed during the BLRA.

This ecological RA for south wetlands was conducted using a tiered approach, structured to focus the ecological RA on the contaminants of potential ecological concern and receptors with the greatest potential for ecological exposure. Tier 1 consists of a screening-level ecological assessment that serves to narrow the field of chemicals detected in site media to those that are of most concern to ecological receptors. Tier 2 uses site-specific information to provide more realistic exposure estimates and to better characterize risk for south wetlands, but only for those chemicals and receptors that were not screened out during Tier 1.

The previous BLRA indicated that the contaminants of potential ecological concern with the highest potential for ecological exposure were PCBs, primarily in south wetlands, and fluoride and polynuclear aromatic hydrocarbons (PAHs), primarily within Company Lake. Since the BLRA, these constituents have been addressed by the remedial actions at Company Lake (as outlined in the interim Record of Decision [EPA, 2002]) and the PCB removal action in September 1999 at south wetlands.

The results of the Tier 2 ecological RA presented here indicate that these actions have been effective in further reducing ecological risk in south wetlands within acceptable levels. The removal action at south wetlands was effective at reducing the PCB exposure point concentration in surface soil by 65 percent.

Conclusion

Using the results of this post-demolition residual risk assessment, RMC has demonstrated that acceptable risk levels have been achieved for the property such that deed restrictions on soil are not required for the potential exposure scenarios evaluated, except as presupposed in the evaluation. These presuppositions include prohibiting residential use of the site and requiring that clean fill is placed over south wetlands prior to occupational use. RMC has accomplished this level of risk reduction by eliminating sources of contamination to the groundwater and to human and ecological receptors through soil removal, capping, offsite disposal, and grading. No further remedial action is anticipated.

SECTION 1

Introduction

This report presents the results of a post-demolition residual risk assessment (RA) for soil at the Reynolds Metals Company (RMC) facility in Troutdale, Oregon. This work was conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and *Memorandum WP No. 67: Post-Demolition Residual Risk Scoping Document for RMC-Troutdale* (Risk Scoping Document) (CH2M HILL, 2005a).

The post-demolition RA documents the final condition at the Troutdale site following plant demolition and extensive remediation, prior to the sale and development of the property. It addresses the reasonably anticipated future land uses at the site and considers exposure scenarios for direct contact pathways associated with soil for the most plausible future site users: site trespassers, recreational users, construction workers, excavation/trench workers, and standard occupational workers. An updated ecological risk assessment is also presented for the south wetlands area using current data representative of final conditions.

This report contains the following sections:

- Section 1 presents the background and overall purpose of the post-demolition RA
- Section 2 presents the revised conceptual site model
- Section 3 describes the process used to select representative data for use in the post-demolition RA
- Section 4 is the human health risk assessment (HHRA)
- Section 5 is the updated ecological risk assessment (ERA) for the south wetlands area
- Section 6 identifies major uncertainties and assumptions
- Section 7 presents the conclusions of the post-demolition remedial investigation/risk assessment (RI/RA) process
- Section 8 presents the references cited in this report

1.1 Background

The *Baseline Risk Assessment* (BLRA) (CH2M HILL, 2000) addressed potential human and ecological exposure pathways associated with soil, surface water, sediment, and biota for conditions existing before the extensive removal and remedial actions were conducted at the site over the past 6 years. Since the preparation of the BLRA, removal and remedial actions and plant demolition have significantly reduced contaminated materials on the site, as well as potential sources of exposure. Removal of source material also has eliminated sources of contamination to groundwater. In addition, projected future land use changes require consideration of exposure scenarios different from those assumed in the BLRA.

This post-demolition RA builds on the previous BLRA work and evaluates residual risks from soil now that removal and remedial actions are complete. Current soil conditions and a history of removal and remedial actions conducted at the site are provided in the *Post-Demolition Remedial Investigation Report* (Post-Demolition RI) (CH2M HILL, 2006). Groundwater risks have been addressed by the interim Record of Decision (ROD) (U.S. Environmental Protection Agency [EPA], 2002) and are not addressed in this report.

Removal and remedial actions resulted in removing sources of contamination for human and ecological exposure, as well as sources of contamination to groundwater. In total, soil removal and remedial actions removed more than 348,000 tons of material. This tonnage contained over 7,300 tons of fluoride that was disposed of offsite in approved landfills. Historical (pre-demolition) soil remedial actions and those removal actions undertaken as part of the interim ROD accounted for over 232,000 tons of material that were the major source of contamination to the intermediate and deep groundwater zones. Removal of this material significantly reduces the migration of fluoride to these zones. These historical actions (and dates of action) included:

- Carbon Bake Sumps (1997)
- Casthouse/PCB Spill Area (1995, 1998-1999)
- Company Lake (2001, 2003-2005)
- Cryolite Ponds (1995-1996)
- Diesel Spill Area (1994-1995)
- East Potliner (1995-1996)
- North Landfill (2003)
- Scrap Yard (2002, 2004)
- South Ditch (1995, 1998-1999)
- South Landfill (2003-2004)
- South Wetlands (1999)
- Wet Electrostatic Precipitator (1997)

These actions are identified in Section 7.1.1 of the Post-Demolition RI, with references provided in Table 7-2 and quantities provided in Table 7-4.

The most recent actions taken during the demolition phase of the project are described in Section 7.1.2 of the Post-Demolition RI, with references provided in Table 7-3, quantities in Table 7-4, and locations in Figure 7-2. Recent actions (and dates of action) have been taken at the following locations:

- Building 97, Building 98, and Building 34 (2005)
- Bunker C Area (2005)
- Cryolite Plant Area (2005)
- East of Building 52 (2006)
- East Plant Area at or near buildings and structures (2004-2005)
- Field West of Potline 5 (2005-2006)
- Rectifier Yard (2005)
- Sample Area 12 and ADD3 (2005)
- Scrap Yard Area Road (2005-2006)
- South Ditch and Banks (2005)

- Storage Areas 1 Through 7 (2005-2006)
- West Railroad Fill/Embankment (2006)

1.2 Purpose of the Risk Assessment

The purpose of this post-demolition RA is to estimate the realistic potential for risk to human health and ecological receptors posed by chemicals of potential concern (COPCs) present at the site following plant demolition and extensive remediation. This post-demolition RA was conducted using standard EPA methodologies, as well as additional approaches and assumptions agreed to by RMC, EPA, and the Oregon Department of Environmental Quality (DEQ) in a series of meetings in 2004 and 2005. The methodology and assumptions used in this post-demolition RA were documented in the Risk Scoping Document, which was accepted by EPA and DEQ.

The main objective of the HHRA is to determine whether residual concentrations of chemicals in soil result in cancer or noncancer risks that exceed regulatory risk threshold levels. A consideration of reasonably anticipated future land uses provides identification of the most feasible human exposure pathways for future use of the RMC-Troutdale site.

The main objective of the ERA is to update the south wetlands ecological risk assessment that was presented in the BLRA, using characterization data representative of final site conditions and the most current regulatory guidance. The purpose is to document the effectiveness of a polychlorinated biphenyl (PCB) removal action in this area in September 1999, and to consider additional sampling data (since the BLRA) from the railroad embankment, south landfill, north landfill, and Company Lake. Ecological evaluations for other areas at the RMC-Troutdale site were documented in the BLRA.

SECTION 2

Revised Conceptual Site Model

This section provides the revised conceptual site model (CSM) for the RMC-Troutdale site, considering changes that have taken place since the BLRA. The physical setting of the site has changed since the BLRA because significant removal and remedial actions have been performed and plant buildings and structures have been demolished. In addition, a considerable amount of contamination has been removed, and projected land use conditions have been clarified.

2.1 Projected Future Land Uses

The RMC-Troutdale site will be developed as a mixed-use general industrial complex consistent with the general industrial zoning currently designated for the property. The site will be subdivided and built out over an extended period of time. The planned development will likely cover virtually all of the current RMC-Troutdale property within the dike with buildings, asphalt, concrete, fill material, rail beds, and landscaping. The development plans consider that the RMC-Troutdale site will consist of the following types of land uses:

- Green Open Space (north of the dike)
- Mixed General Industrial (Fairview Farms, east plant areas, and the south wetlands area)

The potential exposure scenarios considered for the assessment of residual risk (described below) are consistent with the current and future land uses anticipated for the site.

2.2 Proposed Exposure Areas

This post-demolition RA evaluates the entire RMC-Troutdale site, including Fairview Farms to the west and areas outside the dike to the north. The risk assessment was performed on four discrete exposure areas (as outlined in the approved Risk Scoping Document), delineated on the basis of similar historical uses and associated contaminant releases. In addition, these exposure areas are anticipated to provide risk estimates that would adequately represent reasonably anticipated future uses of the site. These four areas are as follows:

- Fairview Farms
- Outside the dike
- South wetlands
- East Area (former plant area east of Sundial Road)

Table 2-1 summarizes the components of each of these categories. Table 2-1 also lists areas where early actions have been completed. The *Post-Demolition Remedial Investigation Report* (CH2M HILL, 2006) contains a summary of these actions and references for further

information. The boundaries of these four exposure areas are shown on Figure 2-1 and are described in the following subsections.

2.2.1 Exposure Area 1: Fairview Farms

The Fairview Farms area (essentially all areas west of Sundial Road, comprising approximately 277 acres) is planned for industrial development.² This area has not been previously used for industrial purposes, and verification sampling indicates very low levels of site constituents. On the basis of the projected future land use, the most plausible exposure scenarios at Fairview Farms are site trespasser (short term), construction worker (near term), and excavation/trench worker (long term). The trespasser exposure scenario would apply before development. The construction worker exposure scenario would apply during development, and the excavation/trench worker exposure scenario would apply after construction (assuming that, because of development, contact with site soil could occur only during excavation).

The conceptual development plans for the Troutdale site include development of the Fairview Farms area as part of a mixed-use general industrial complex. With this planned use, virtually all of the area would be covered with structural fill, railways, rail bed ballast (crushed rock), paved roadways and parking areas, structures, and landscaping. Because of the size of the complex and the potential spatial differences in historical releases, the western portion of the complex (the Fairview Farms area) is considered separately from the eastern portion. In addition to the site-specific scenarios mentioned above, an occupational worker exposure scenario is included to demonstrate whether controls may be necessary to ensure acceptable risk.

2.2.2 Exposure Area 2: Outside the Dike

The area outside the dike (approximately 177 acres) is located within a floodplain and could not be built upon unless it were rezoned and filled. If filled, the area would be considered capped, greatly reducing any existing risk. Additionally, source materials in Company Lake have been removed as a part of the interim ROD actions. Company Lake and portions of the area adjacent to Company Lake will be restored and set aside for open space under the Natural Resource Damage Assessment (NRDA) settlement with the natural resource trustees. Therefore, the trespasser exposure scenario would apply for areas outside the dike until the area becomes available for recreational use, and the recreational exposure scenario would apply thereafter.

2.2.3 Exposure Area 3: South Wetlands

The south wetlands area (approximately 28 acres) is considered separate and distinct from other areas because it is currently a wetland and would need to be covered by considerable fill material in order to develop the property. In addition, because of the presence of existing habitat, a residual risk evaluation for potential ecological pathways was conducted for this area to document the effectiveness of a PCB removal action that occurred in September 1999, and the addition of sampling data (since the BLRA) from the railroad embankment. Plausible human exposure scenarios include a site trespasser scenario under current conditions, a

² Although recent land use at the westernmost end of Fairview Farms has been agricultural, this area is to be incorporated into industrial property for redevelopment.

construction worker (modified) scenario for development and fill preparation, and a potential future excavation/trench worker scenario if a pipeline or utilities are laid through the area when (and if) the area is filled for development. An occupational worker scenario was not evaluated for this area because extensive filling of the south wetlands area would be required before traditional construction or industrial use could begin.

2.2.4 Exposure Area 4: East Area, Comprising Former Plant Area East of Sundial Road

The East Area (approximately 254 acres) includes the former plant area and areas to the east and south outside the current plant fence line. On the basis of the projected future land uses, the most plausible exposure scenarios are site trespasser (short term), construction worker (near term), and excavation/trench worker (long term). The trespasser exposure scenario would apply before development. The construction worker exposure scenario would apply during development, and the excavation/trench worker exposure scenario would apply after development since contact with site soil could occur only during an excavation. The conceptual development plans for the Troutdale site include development of the East Area as part of a mixed-use general industrial complex. These areas would be covered with structural fill, railways, rail bed ballast (crushed rock), roadways, parking areas, structures, and/or landscaping as part of development. In addition to the site-specific scenarios mentioned above, an occupational worker exposure scenario is included to demonstrate whether controls may be necessary to ensure acceptable risk.

2.3 Conceptual Exposure Model

The conceptual exposure model for the RMC-Troutdale site is shown in Figure 2-2. The model indicates that the following three general pathways of exposure to residual constituents in soil are potentially complete:

- Direct contact with contaminant in surface soil (before and during development)
- Direct contact with contaminant in subsurface soil (during and after development)
- Dust generated from wind (before and during development)

All other pathways are addressed in the BLRA and the interim ROD, including those associated with exposure to groundwater, surface water, and sediment, or soil sources that have been remediated as a part of the interim ROD. This post-demolition RA addresses existing soil under current conditions.

2.3.1 Human Receptors and Exposure Routes

On the basis of current and potential future land uses at the site, potentially complete human exposure pathways for each of the exposure areas exist for the following receptors and exposure routes:

- Incidental ingestion of and dermal contact with surface soil by trespassers, recreational users, and/or construction workers (depending on exposure area)
- Incidental ingestion of and dermal contact with subsurface soil by excavation and construction workers (depending on exposure area)

- Inhalation of dust in ambient air by trespassers, recreational users, and/or excavation and construction workers (depending on exposure area)

Once the area inside the dike is developed, direct contact pathways for surface soil are anticipated to be incomplete, therefore minimizing the potential for future exposure under the standard occupational worker scenario. However, an occupational scenario is evaluated to demonstrate the potential need for institutional controls on soil to ensure acceptable risk. The exposure scenarios appropriate for each of the identified exposure areas are summarized in Table 2-2. The locations where these exposure scenarios apply are shown in Figure 2-1. The exposure assumptions associated with each exposure scenario are described in Section 4.

The ecological risk assessment has already been performed in the BLRA for all appropriate areas at the site. Ecological evaluations are not appropriate where the land is disturbed, such as at the former plant site or where the land will be developed in the future (for example, the Fairview Farms area).³ The south wetlands area requires an ecological evaluation update because remediation and additional data collection have occurred in this area since the BLRA, and the residual risk remaining at the site has decreased as a result of that removal action. The ecological conceptual exposure model provided in Figure 2-4 of the BLRA still applies to south wetlands.

³ At the request of EPA and DEQ, a comparison of submerged Company Lake verification sediment samples to applicable sediment regulatory benchmarks will document current, post-remediation conditions.

SECTION 3

Selection of Representative Data

The analysis of health risks uses chemical data generated during the post-demolition remedial investigation (PDRI), as well as from previous investigations and removal and remedial actions. These data were evaluated to determine the degree to which they represent current conditions at the site, and whether they are usable for assessing the residual risk remaining at the Troutdale facility. Soil analytical data were obtained from the vast number of references provided in the *Post-Demolition Remedial Investigation Report* (CH2M HILL, 2006).

The data were reviewed for completeness and representativeness. The available soil sample data collected at the site since 1994 initially were sorted according to the four exposure areas identified. The data for each exposure area were then evaluated for exclusion from the post-demolition RA for the following reasons:

- Sample was not soil⁴
- Sample was not on RMC property or along the adjacent shoreline and was not considered representative of site releases
- Sample was in an area where excavation has occurred to remove the contaminated soil
- Sample is currently more than 10 feet below ground surface, and therefore not subject to direct contact exposure
- Sample is beneath a cap placed over the contaminated material, making it inaccessible to a receptor

In cases where excavation or soil capping had occurred, the original sample depth was adjusted to reflect the current depth. This may have resulted in the inclusion or exclusion of some samples as their depths changed. Duplicate samples were processed in accordance with the procedure described in Section 4.3. On the basis of this sample selection process, the number of samples found usable for the risk assessment are as follows:

- Fairview Farms – 49 samples
- Outside the dike – 104 samples
- South wetlands – 142 samples
- East plant – 875 samples

Tables 3-1 through 3-4 list the station identifications (IDs), sampling dates, and depths for soil samples considered representative of final site conditions and that were used in the post-demolition RA. Figure 3-1 shows the locations of these samples.

⁴ Samples for waste characterization analyses were excluded from the risk assessment data set.

Human Health Risk Assessment

4.1 Organization of This Section

The human health risk assessment for the Troutdale facility is composed of the following components:

- **Human Health Risk Assessment Guidance.** Lists the guidance documents used for the risk assessment.
- **Chemicals of Potential Concern and Data Evaluation.** Identifies the constituents considered to be most important to the human health risk quantification process.
- **Human Exposure Assessment.** Identifies the pathways by which potential human exposures could occur, describes how they are evaluated, and evaluates the magnitude, frequency, and duration of these exposures.
- **Toxicity Assessment for Human Health.** Summarizes the toxicity of the selected chemicals and the relationship between magnitude of exposure and the occurrence of adverse health effects.
- **Human Health Risk Characterization.** Integrates information from the exposure and toxicity assessments to characterize the risks to human health from potential exposure to chemicals in environmental media.

4.2 Human Health Risk Assessment Guidance

The procedures used for the human health risk assessment are consistent with those described in the following guidance documents:

- *Guidance for Conduct of Deterministic Human Health Risk Assessments* (DEQ, 2000a)
- *Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites* (DEQ, 2003)
- *Risk Assessment Guidance for Superfund – Volume I: Human Health Evaluation Manual, Part A (Interim Final) (RAGS), EPA/540-1-89/002* (EPA, 1989)
- *Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors* (EPA, 1991)
- *Exposure Factors Handbook* (EPA, 1997a)
- *Risk Assessment Guidance for Superfund – Volume I: Human Health Evaluation Manual, Part E Supplemental Guidance for Dermal Risk Assessment (Final)* (EPA, 2004a)
- *Guidelines for Carcinogen Risk Assessment* (EPA, 2005a)

The first two guidance documents were released by DEQ after the BLRA was completed. Pertinent exposure assumptions for the construction worker, excavation/trench worker, and occupational worker scenarios are used from these sources.

4.3 Chemicals of Potential Concern and Data Evaluation

COPCs are those chemicals that should be carried through the human health risk quantification process. Data sources, identification of usable laboratory data, and methodology of identification of COPCs are consistent with methods used in the BLRA (CH2M HILL, 2000).

Soil to a depth of approximately 10 feet (ft) below ground surface (bgs) was considered for the excavation/trench worker and construction worker scenarios, in accordance with DEQ guidance (DEQ, 2003). Soil to a depth of approximately 1 ft bgs was considered for the trespasser, recreational user, and occupational worker scenarios.

Laboratory analytical data were reviewed to determine their reliability for use in the risk assessment. The data review consisted of the following checks to identify usable data:

- Estimated values flagged with a “J” qualifier were treated as qualified detected concentrations.
- Data for detected constituents that were also detected in method blanks were not used in the risk assessment, in accordance with EPA guidance.
- For duplicate samples, the following procedure was applied: (a) if there were two detections, the average detection value was used; (b) if there was one detection and one nondetection, the detected value was used; (c) if there were two nondetections, the lowest detection limit was used.
- Data qualified with an “R” (rejected) were not used in the risk assessment and were not included in the total count of samples analyzed for a constituent.

4.3.1 Identification of COPCs for Human Health

Soil samples collected during the life of the RMC-Troutdale project have been analyzed for constituents based on knowledge of plant processes and RMC’s long history of site investigation and remediation at this and other aluminum reduction plants around the world. The confirmation sampling conducted as part of the PDRI focused on those constituents that were anticipated to be historically used or released at that specific location that could have resulted in localized releases to soil. To supplement this focused sampling, a full suite of laboratory analysis was performed on 5 percent of the samples to document the absence or presence of other COPCs. This effort proved that the COPCs identified below are the correct subset of compounds for the site.

The COPCs for the human health risk assessment were identified for each exposure area using three main criteria:

- The chemical was detected in at least 5 percent of the samples
- Concentrations exceeded background values for inorganics
- Agency-derived toxicity values exist for the chemical

Concentrations of each metal detected were compared with background levels for the same soil types. Background levels were obtained from the BLRA. Inorganic chemical concentrations detected at or below background levels are excluded as COPCs. Table 4-1 summarizes the COPCs identified for each of the exposure areas, for both surface soil (0 to 1 ft bgs) and subsurface soil (0 to 10 ft bgs). The reason for elimination of a chemical as a COPC is provided for chemicals not retained for further evaluation.

Petroleum compounds were not evaluated in the same manner as other COPCs in this risk assessment. Rather, for each exposure area where they occurred, gasoline, diesel, and total petroleum hydrocarbon (TPH) concentrations were compared with the risk-based screening levels in DEQ's *Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites* (DEQ, 2003).

4.3.2 Calculation of Exposure Point Concentrations

For each exposure area, exposure point concentrations (EPCs) for COPCs in surface soil and subsurface soil were calculated as the lesser of either the maximum value or the 95th percentile upper confidence limit (UCL) of all results, in accordance with EPA guidance. Summary statistics were calculated for each chemical and each exposure area. The EPA statistical tool, ProUCL, was used to calculate the EPCs and identify the statistical distribution type for each analyte including normal, lognormal, or nonparametric distribution types. For cases where risk estimates only slightly exceed DEQ's regulatory target risk thresholds using the 95th percentile UCL, the EPCs for the major contributing chemicals were recalculated to determine the 90th percentile, in accordance with DEQ guidance (DEQ, 2000a). The summary statistics and EPCs for each of the exposure areas are provided in Tables 4-2 through 4-9.

4.4 Human Exposure Assessment

The exposure assessment component of the risk assessment identifies the means by which individuals on or near the Troutdale site may contact chemicals in environmental media. It addresses exposures that may result under current site conditions and from reasonably anticipated potential uses of the site and the surrounding areas in the future. The exposure assessment also identifies the populations that may be exposed, the routes by which these individuals may become exposed, and the magnitude, frequency, and duration of potential exposures.

The estimation of potential exposure requires specific assumptions to describe potential exposure situations. Upper-bound exposure assumptions are used to define reasonable maximum exposure (RME) conditions to provide a bounding estimate on exposure. In accordance with DEQ guidance (DEQ, 2000a), deterministic risk assessments should also define central tendency estimates (CTEs) of exposure and risk. The exposure parameters used for generating RME and CTE risk estimates are as listed in Tables 4-10 and 4-11, respectively, and are described in the following subsections. The equations used to calculate direct contact exposures to contaminants in site soil are the same as those provided in Sections 3.4.2 and 3.4.3 of the BLRA (CH2M HILL, 2000).

4.4.1 Trespasser Scenario

For the trespasser scenario, it is assumed that this person would be exposed to site contaminants for 5 days per year for 5 years under the CTE scenario and for 26 days per year for 5 years under the RME scenario (CH2M HILL, 2000). It is assumed that this person is a 35-kilogram [kg] adolescent and could be exposed to chemicals in surface soil via dermal contact, incidental ingestion, and inhalation of particulates.

4.4.2 Recreational User Scenario

For the recreational user scenario, it is assumed that this person would be exposed to site contaminants for 5 days per year for 5 years under the CTE scenario and for 26 days per year for 5 years under the RME scenario. It is assumed that this person is a 35-kg adolescent and could be exposed to chemicals in surface soil via dermal contact, incidental ingestion, and inhalation of particulates.

4.4.3 Construction Worker Scenario

For the construction worker scenario, it is assumed that this worker would be exposed to site contaminants for 250 days per year for 0.5 year under the CTE scenario and for 250 days per year for 1 year under the RME scenario. These assumptions are consistent with *Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites* (DEQ, 2003). However, the DEQ default exposure frequency for a construction worker scenario (250 days per year) was modified for south wetlands to a site-specific value of 90 days per year to reflect a 3- to 4-month working timeframe of July through October.⁵ It is assumed that this worker is a 70-kg adult that could be exposed to chemicals in soil via dermal contact, incidental ingestion, and inhalation of particulates.

4.4.4 Excavation/Trench Worker Scenario

For the excavation/trench worker scenario, it is assumed that this worker would be exposed to site contaminants for 9 days per year for 0.5 year under the CTE scenario and for 9 days per year for 1 year under the RME scenario, following *Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites* (DEQ, 2003). It is assumed that this worker is a 70-kg adult that could be exposed to chemicals in subsurface soil via dermal contact, incidental ingestion, and inhalation of particulates.

4.4.5 Occupational Worker Scenario

As previously noted, use of any portion of the site for industrial purposes would require extensive development of infrastructure, including railways, roadways, parking areas, buildings, or associated landscaping. Actual post-development exposures will be significantly reduced by the placement of these infrastructure materials. Because of the limited access to surface soil after development, standard occupational exposures are not anticipated. However, an occupational worker scenario is evaluated for the Fairview Farms area and East Area under a worst-case assumption that workers would occupy the site before placement of infrastructure and be potentially exposed to the entire exposure area

⁵ The south wetlands area is below the seasonal water table, supports dense hydrophytic vegetation, and has standing water for a significant portion of the year.

without any barrier materials. It is assumed that an occupational worker would be exposed to site contaminants for 250 days per year for 6 years under the CTE scenario and for 250 days per year for 25 years under the RME scenario, following *Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites* (DEQ, 2003).

4.5 Toxicity Assessment for Human Health

This toxicity assessment evaluates the relationship between the magnitude of exposure to a chemical at the former site and the likelihood of adverse health effects to potentially exposed human populations. This assessment provides, where possible, a numerical estimate of the increased likelihood of adverse effects associated with chemical exposure (EPA, 1989). In accordance with EPA guidance, toxicity values (cancer slope factors and noncancer reference doses) to be used were obtained from the following sources (EPA, 2003):

- Integrated Risk Information System (IRIS), an electronic database available through the EPA National Center for Environmental Assessment (NCEA) in Cincinnati, Ohio (EPA, 2005b). The IRIS database is prepared and maintained by EPA and contains of health risk and EPA regulatory information on specific chemicals.
- Provisional Peer Reviewed Toxicity Values (PPRTVs), provided by the EPA Superfund Health Risk Technical Support Center. The PPRTVs are developed on a chemical-specific basis when requested under EPA's Superfund program.
- Health Effects Assessment Summary Tables (HEAST), provided by the EPA Office of Solid Waste and Emergency Response. HEAST is a compilation of toxicity values published in health effects documents issued by EPA and is intended for use in Superfund and Resource Conservation and Recovery Act (RCRA) programs.
- U.S. EPA Region IX Preliminary Remediation Goal (PRG) Table (EPA, 2004b) available at <http://www.epa.gov/region09/waste/sfund/prg/index.htm>.

The primary source of toxicity values is the EPA IRIS database. If a toxicity value is not available from IRIS, then the latest available values from the other sources are used. Toxicity values for COPCs present at the Troutdale facility are shown in Tables 4-12 and 4-13, for the oral and inhalation routes, respectively.

4.6 Human Health Risk Characterization

The risk characterization for each exposure area provides estimates of risk to human health based on the identified COPCs, the exposure scenarios, and toxicity information. The assessment includes excess lifetime cancer risk (ELCR) estimates and noncancer hazard index (HI) calculations (a comparison of intake of noncarcinogenic compounds with acceptable intake rates). Risk characterization considers the nature and weight of evidence supporting these estimates, as well as the magnitude of uncertainty surrounding such estimates. The human health risk posed by each exposure area is calculated using a two-step process as described in Section 3.5 of the BLRA (CH2M HILL, 2000): (1) calculate chemical-specific risk (either ELCR or hazard quotient [HQ]) from the EPCs for each contaminant, and (2) sum the risk

estimates from all contaminants to estimate the aggregate ELCR or HI for each exposure area.

4.6.1 Target Risk Levels

Risks for each exposure area are evaluated relative to goals established by DEQ in Oregon Administrative Rule (OAR) 340-122-0115(1) and Oregon Revised Statute (ORS) 465.315 (1)(b) A and B in recognition of state regulations as applicable or relevant and appropriate requirements (ARARs). Oregon law defines that acceptable risk for individual carcinogenic compounds be set at one in one million (1×10^{-6}) excess risk for cancer and one in one hundred thousand (1×10^{-5}) for cumulative risks from carcinogenic compounds. Acceptable risk for noncarcinogenic constituents is set at an HI equal to 1. If calculated risks within an exposure area are below these target risk levels, risks are assumed to be acceptable and no further evaluation or action will be taken.

4.6.2 Summary of Risk Estimates

This section summarizes the risk estimates for soil at each of the four exposure areas identified for the Troutdale facility. The risk calculation data sheets used to develop the risk summary tables for the area-specific evaluations described below are provided by area of concern in Appendix A.

Fairview Farms

Fairview Farms includes essentially all areas west of Sundial Road and comprises approximately 277 acres (Figure 2-1). The exposure media evaluated for Fairview Farms are surface and subsurface soil containing site-related constituents. In accordance with the CSM, the exposure scenarios evaluated for Fairview Farms are site trespasser (short-term exposure), construction worker (near-term exposure), and excavation/trench worker (long-term exposure). In addition to these site-specific scenarios, an occupational worker exposure scenario is included to demonstrate whether controls may be necessary to ensure acceptable risk. The exposure assumptions are summarized in Tables 4-10 and 4-11. The ELCR and HI estimates for these exposure scenarios at Fairview Farms are summarized in Table 4-14. The risk calculation data tables are provided in Appendix A, Tables A-1 through A-16.

Trespasser Scenario. The ELCR estimates for the trespasser scenario are 2×10^{-7} for the RME case and 1×10^{-8} for the CTE case. The HI estimates for the trespasser scenario are 0.02 for the RME case and 0.002 for the CTE case.

Construction Worker Scenario. The ELCR estimates for the construction worker scenario are 2×10^{-7} for the RME case and 3×10^{-8} for the CTE case. The HI estimates for the construction worker scenario are 0.1 for the RME case and 0.02 for the CTE case.

Excavation/Trench Worker Scenario. The ELCR estimates for the excavation/trench worker scenario are 6×10^{-9} for the RME case and 1×10^{-9} for the CTE case. The HI estimates for the excavation/trench worker scenario are 0.005 for the RME case and 0.0008 for the CTE case.

Occupational Scenario. The ELCR estimates for the occupational worker scenario are 2×10^{-6} for the RME case and 2×10^{-7} for the CTE case. The HI estimates for the occupational worker scenario are 0.05 for the RME case and 0.03 for the CTE case.

The risk estimates for all four exposure scenarios evaluated for Fairview Farms do not exceed the DEQ acceptable risk target ELCR of 1×10^{-5} for cumulative contaminant exposure or an HI of 1. Also, no carcinogens exceed the DEQ target risk level for single carcinogens of 1×10^{-6} . The maximum detection of lead in soil in this exposure area is 34.3 milligrams per kilogram (mg/kg), well below the EPA Region IX PRGs (EPA, 2004b).

Outside the Dike

The exposure medium evaluated for the area outside the dike (Figure 2-1) is surface soil containing site-related constituents. This approximately 177-acre area is located within a floodplain and could not be built upon unless it were rezoned and filled. In accordance with the CSM, the exposure scenarios evaluated for the area outside the dike are short-term exposures, including the site trespasser and recreational user scenarios. The trespasser scenario assumes exposure to surface soil (0 to 1 ft bgs), whereas the recreational user scenario assumes exposure to both surface soil and surface sediments where surface water is typically less than 6 feet deep in areas of Company Lake, East Lake, and along the Sandy and Columbia rivers. The exposure assumptions are summarized in Tables 4-10 and 4-11. The ELCR and HI estimates for these exposure scenarios at the area outside the dike are summarized in Table 4-15. The risk calculation data tables are provided in Appendix A, Tables A-17 through A-24.

Trespasser Scenario. The ELCR estimates for the trespasser user scenario are 2×10^{-6} for the RME case and 1×10^{-7} for the CTE case. The HI estimates for this scenario are 0.3 for the RME case and 0.02 for the CTE case.

Recreational User Scenario. The ELCR estimates for the recreational user scenario are 2×10^{-6} for the RME case and 1×10^{-7} for the CTE case. The HI estimates for this scenario are 0.3 for the RME case and 0.02 for the CTE case.

The risk estimates for the area outside the dike do not exceed the DEQ acceptable risk target ELCR of 1×10^{-5} for cumulative contaminant exposure or an HI of 1. Also, no carcinogens exceed the DEQ target risk level for single carcinogens of 1×10^{-6} . The maximum detection of lead in surface soil in this exposure area is 123 mg/kg, well below the EPA Region IX PRGs (EPA, 2004b).

South Wetlands

The exposure media evaluated in the south wetlands area (comprising approximately 28 acres) are surface and subsurface soil containing site-related constituents (Figure 2-1). The purpose of assessing risk in this area is to determine the effectiveness of a PCB removal action in this area in September 1999, and to include additional sampling data from the railroad embankment since the BLRA. In accordance with the CSM, the exposure scenarios evaluated for the south wetlands area are site trespasser (short term), construction worker (near term), and excavation/trench worker (long term). The exposure assumptions are summarized in Tables 4-10 and 4-11. The ELCR and HI estimates for these exposure scenarios at the south wetlands area are summarized in Table 4-16. The risk calculation data tables are provided in Appendix A, Tables A-25 through A-36.

Trespasser Scenario. The ELCR estimates for the trespasser scenario are 1×10^{-5} for the RME case and 8×10^{-7} for the CTE case. The HI estimates for the trespasser scenario are 0.5 for the

RME case and 0.04 for the CTE case. These risk estimates are based on EPCs calculated as the 90 percent UCL for the primary contributing constituent (benzo(a)pyrene), in accordance with DEQ guidance, and as outlined in Section 4.3 of the Risk Scoping Document.

Construction Worker Scenario. The ELCR estimates for the construction worker scenario are 3×10^{-6} for the RME case and 4×10^{-7} for the CTE case. The HI estimates for the construction worker scenario are 0.7 for the RME case and 0.1 for the CTE case. These risk estimates are based on EPCs calculated as the 90 percent UCL for the primary contributing constituents (benzo(a)pyrene, dibenzo(a,h)anthracene, PCBs, fluoride, and vanadium), in accordance with DEQ guidance, and as outlined in Section 4.3 of the Risk Scoping Document.

Excavation/Trench Worker Scenario. The ELCR estimates for the excavation/trench worker scenario are 3×10^{-7} for the RME case and 4×10^{-8} for the CTE case. The HI estimates for the excavation/trench worker scenario are 0.09 for the RME case and 0.01 for the CTE case. These risk estimates are based on EPCs calculated as the 90 percent UCL for the primary contributing constituents (benzo(a)pyrene, dibenzo(a,h)anthracene, PCBs, fluoride, and vanadium), in accordance with DEQ guidance, and as outlined in Section 4.3 of the Risk Scoping Document.

The risk estimates for all three exposure scenarios evaluated for the south wetlands area do not exceed the DEQ acceptable risk target ELCR of 1×10^{-5} for cumulative contaminant exposure, or an HI of 1. Also, no carcinogens exceed the DEQ target risk level for single carcinogens of 1×10^{-6} for the construction worker and excavation/trench worker exposure scenarios. The maximum detection of lead in soil in this exposure area is 259 mg/kg, which is below the EPA Region IX PRGs (EPA, 2004b).

For the trespasser scenario, RME risk estimates slightly exceed the DEQ acceptable risk target ELCR of 1×10^{-6} for individual contaminant exposure for the south wetlands area. Under this scenario, benzo(a)pyrene (3×10^{-6}) and dibenzo(a,h)anthracene (2×10^{-6}) are above the DEQ target risk level for a single carcinogen of 1×10^{-6} .

It should be noted that the trespass exposure frequency of 26 days per year was used as a high-end default in the BLRA and was carried over to this risk assessment for consistency, as requested by EPA during scoping meetings. This exposure frequency does not reflect actual trespass observed at south wetlands. To provide further clarification of this issue, an additional calculation was conducted to identify what trespass frequency would result in acceptable risk for individual carcinogens (that is, the "critical exposure frequency") at south wetlands. This evaluation indicated that if the trespass frequency were assumed to be 11 days per year, there would be no exceedances of the 1×10^{-6} individual target risk for this area. For trespass exposure at south wetlands, an exposure frequency of less than 11 days per year (probably about 5 days per year, as assumed under the CTE case) is more reasonable than the 26 days per year assumed under the RME case, and results in acceptable risk under DEQ statutory rules.

East Area, Comprising Former Plant Area East of Sundial Road

The exposure media evaluated for the East Area (comprising approximately 254 acres) are surface and subsurface soil containing site-related constituents (Figure 2-1). In accordance with the CSM, the exposure scenarios evaluated for the East Area are site trespasser (short term), construction worker (near term), and excavation/trench worker (long term). In

addition to these site-specific scenarios, an occupational worker exposure scenario is included to demonstrate whether controls may be necessary to ensure acceptable risk. The exposure assumptions are summarized in Tables 4-10 and 4-11. The ELCR and HI estimates for these exposure scenarios at Fairview Farms are summarized in Table 4-17. The risk calculation data tables are provided in Appendix A, Tables A-37 through A-52.

Trespasser Scenario. The ELCR estimates for the trespasser scenario are 1×10^{-6} for the RME case and 9×10^{-8} for the CTE case. The HI estimates for the trespasser scenario are 0.1 for the RME case and 0.007 for the CTE case. These risk estimates are based on EPCs calculated as the 90 percent UCL for the primary contributing constituents (benzo(a)pyrene, arsenic, benzo(k)fluoranthene, and dibenzo(a,h)anthracene), in accordance with DEQ guidance, and as outlined in Section 4.3 of the Risk Scoping Document.

Construction Worker Scenario. The ELCR estimates for the construction worker scenario are 2×10^{-6} for the RME case and 4×10^{-7} for the CTE case. The HI estimates for the construction worker scenario are 1 for the RME case and 0.2 for the CTE case. These risk estimates are based on EPCs calculated as the 90 percent UCL for the primary contributing constituents (PCBs), in accordance with DEQ guidance, and as outlined in Section 4.3 of the Risk Scoping Document.

Excavation/Trench Worker Scenario. The ELCR estimates for the excavation/trench worker scenario are 9×10^{-8} for the RME case and 1×10^{-8} for the CTE case. The HI estimates for the excavation/trench worker scenario are 0.04 for the RME case and 0.01 for the CTE case. These risk estimates are based on EPCs calculated as the 90 percent UCL for the primary contributing constituents (PCBs), in accordance with DEQ guidance, and as outlined in Section 4.3 of the Risk Scoping Document.

Occupational Scenario. The ELCR estimates for the occupational worker scenario are 1×10^{-5} for the RME case and 1×10^{-6} for the CTE case. These risk estimates are based on EPCs calculated as the 90 percent UCL for the primary contributing constituents (benzo(a)pyrene, arsenic, benzo(k)fluoranthene, and dibenzo(a,h)anthracene), in accordance with DEQ guidance, and as outlined in Section 4.3 of the Risk Scoping Document. The HI estimates for the occupational worker scenario are 0.2 for the RME case and 0.09 for the CTE case.

The risk estimates for all four exposure scenarios evaluated for the East Area do not exceed the DEQ acceptable risk target ELCR of 1×10^{-5} for cumulative contaminant exposure or an HI of 1. Also, no carcinogens exceed the DEQ target risk level for single carcinogens of 1×10^{-6} for the trespasser, construction worker, and excavation/trench worker scenarios.

For the RME occupational worker scenario, only benzo(a)pyrene (5×10^{-6}) and arsenic (2×10^{-6}) are above the DEQ target risk level for a single carcinogen of 1×10^{-6} . The EPC for arsenic, however, is 3.8 mg/kg, well within the range anticipated for natural background (less than 11.9 mg/kg). The maximum detection of lead in soil in this exposure area is 338 mg/kg, well below the EPA Region IX PRGs (EPA, 2004b).

4.6.3 Risk-Based Screening for Petroleum

Petroleum hydrocarbon values from each area were compared with risk-based screening levels in DEQ's *Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites* (DEQ, 2003), for gasoline, diesel, heavy oil, and mineral oil, on a sample-by-sample basis for

each exposure scenario. When a detection was reported generically as TPH, the most conservative risk-based concentration for gasoline, diesel, or oil was used for that sample.

Fairview Farms

Gasoline, diesel, and TPH by 418_1 were compared with DEQ screening levels for the occupational worker, construction worker, and excavation worker scenarios. No TPH values exceeded the screening levels.

Outside the Dike

In order to evaluate TPH values from this area, residential scenario screening levels were used in the comparison, since no screening levels exist for recreational or trespasser scenarios. None of the gasoline, diesel, heavy oil, and TPH by 418_1 values exceeded the residential screening levels.

South Wetlands

Gasoline, diesel, heavy oil, and TPH by 418_1 were compared with DEQ screening levels for the construction and excavation worker scenarios. Only one sample (SW-SB29) had a TPH by 418_1 value that exceeded the diesel screening levels (most conservative) under the construction worker scenario.

East Area, Comprising Former Plant Area East of Sundial Road

Gasoline, diesel, heavy oil, motor oil, and oil were compared with DEQ screening levels for the occupational worker, construction worker, and excavation worker scenarios. No TPH values exceeded the screening levels.

SECTION 5

Updated Ecological Risk Assessment for South Wetlands

5.1 Introduction

A post-demolition residual ERA was performed for south wetlands to document the effectiveness of a PCB removal action in this area in September 1999, and the addition of sampling data (since the BLRA) from the railroad embankment. This ERA provides an assessment of the potential impacts on wildlife of residual concentrations at south wetlands, assuming that site development does not occur. If the area is developed in the future, then the ecological risk results will become invalid at that time.

Specifically, this ERA includes the following updates to the BLRA (CH2M HILL, 2000):

- Revision of PCB data from the former high concentration area where excavation at south wetlands occurred, substituting data from the post-excavation confirmation samples
- Inclusion of new sampling data from railroad embankment areas
- Consideration of the remedial actions at Company Lake, north landfill, and south landfill during the Tier 2 ERA⁶

Additional areas at the RMC site where ecological exposures could occur were previously addressed during the BLRA.

5.2 The Tiered Approach for the Ecological Risk Assessment

The BLRA and ERA were conducted in accordance with approaches described in EPA (EPA, 1992, 1997a, 1998) and DEQ guidance (DEQ, 2000b) and the tiered framework described below was used.

5.2.1 Tier 1 Approach

Tier 1 consists of a screening-level ecological assessment that serves to narrow the field of chemicals detected in site media to those that are of most concern to ecological receptors. These identified chemicals are called chemicals of potential ecological concern, or COPECs. Tier 1 conservatively assumes that completely suitable habitat is provided, and that representative wildlife receptors exclusively use the south wetlands area for their food source (that is, regional home range use is not considered). These assumptions are intended to provide a conservative identification of COPECs, which are carried forward into Tier 2

⁶ The purpose of considering the remedial actions at Company Lake is specifically to allow for a sitewide (that is, Tier 2) risk estimate for south wetlands, and not to provide post-remedial risks for Company Lake, since the remedial actions there occurred as part of the interim ROD for the site. The potential ecological risk at Company Lake was evaluated in *Memorandum No. 36: RMC-Troutdale Company Lake: Post-Remediation Data Evaluation Relative to Sediment Benchmarks* (CH2M HILL, 2005b).

where more realistic, site-specific assumptions are applied. Following Tier 1, chemicals with ecological HQs exceeding the background ecological HQ by 1.0 or more were designated COPECs, and were carried forward to Tier 2. The results of the south wetlands Tier 1 ERA are provided in Section 5.4.2 of this report.⁷ Chemicals screened out during Tier 1 were discussed in the risk characterization step, but no further risk assessment is needed because they pose minimal (if any) risk and are excluded from further consideration.

5.2.2 Tier 2 Approach

Tier 2 uses site-specific information to provide more realistic exposure estimates and to better characterize risk for south wetlands, but only for those chemicals and receptors that were not screened out during Tier 1. The Tier 2 ERA provides additional evaluation of four primary considerations, as follows:

- **Exposure from multiple areas:** The possibility that receptors using the Troutdale site could use and potentially be exposed at multiple areas at the site is accounted for.
- **Habitat quality:** The quality of the available habitat within and surrounding each evaluated area of concern is weighted in order to identify its relative suitability for wildlife use. This evaluation is conducted for each selected receptor carried forward from Tier 1 for each area of concern.
- **Species home range:** A consideration is made of the availability of more suitable foraging or feeding habitat in areas surrounding the site but within each selected receptor's documented home range or foraging area.
- **Toxicological uncertainty:** For COPECs exceeding an ecological HQ of 1.0, the Tier 2 ERA provides a more detailed evaluation of the toxicity of COPECs to site receptors. Because the actual chemical-specific toxicity falls between the no observed adverse effect level (NOAEL) and lowest observed adverse effect level (LOAEL), a consideration is made on the range between the NOAEL and LOAEL.

These four considerations serve to ground-truth the risk assessment results from Tier 1. The methods employed to conduct these additional Tier 2 refinements, and the results of the south wetlands Tier 2 ERA, are discussed in Section 5.4.3.⁸

5.3 Ecological Risk Assessment Guidance

The procedures used for this ERA are consistent with those described in the following EPA and DEQ guidance documents:

- *Guidelines for Ecological Risk Assessment* (EPA, 1998)
- *Framework for Ecological Risk Assessment* (EPA, 1992)

⁷ Tier 1 BLRA risk results were provided in Section 4.6.2 of the *Baseline Risk Assessment, Part 1—Nongroundwater Media* (CH2M HILL, 2000).

⁸ Tier 2 BLRA risk results were provided in Section 4.6.3 of the *Baseline Risk Assessment, Part 1—Nongroundwater Media* (CH2M HILL, 2000).

- *Supplemental Ecological Risk Assessment Guidance for Superfund: EPA Region 10* (EPA, 1997b)
- *Wildlife Exposure Factors Handbook* (EPA, 1993)
- *ECO Updates, Volumes 1 through 3* (EPA, 1991-96)
- *Guidance for Ecological Risk Assessment – Level III Baseline* (DEQ, 2000b)

In addition to these published agency guidance documents, monthly meetings of RMC and EPA, DEQ, and the U.S. Fish and Wildlife Service (USFWS) were held from May through August 1998 to develop consensus on ERA methodologies, endpoints, assumptions, and sampling needs. This ERA uses approaches and assumptions consistent with the agreements made at that time.

5.4 Ecological Risk Characterization for South Wetlands

The problem formulation components related to south wetlands are the same as those presented in Section 4.4 of the BLRA. The methods, receptors of potential concern, exposure parameters, toxicity reference values (TRVs), and equations used to compute potential exposure and risk to wildlife are also the same as those used in the BLRA. Exposure point concentrations that serve as input to the intake equations are developed using the same approaches described for the HHRA in Section 4.3.2 of this report. Summary statistics and EPCs for south wetlands are provided in Appendix B. The numerical results of exposure quantification at south wetlands are provided in the ecological risk calculation data sheets (Appendix B).⁹

On the basis of the habitat and potential species present at the Troutdale facility, two general food web types were distinguished during the BLRA for the purpose of intake calculation, and both types occur at south wetlands. The general habitat types considered are upland and open water/wetland areas. Appropriate avian and mammalian endpoint species for food chain uptake, as identified in Section 4.4.5.3 of the BLRA, are considered. Figures 4-4 and 4-5 of the BLRA schematically present the food webs for both upland and open water/wetland habitats, respectively.

5.4.1 Derivation of Ecological Hazard Quotients

The primary means for quantifying ecological risk is to determine the ratio of the estimated chemical intake level for the endpoint species of concern (per the equations described in the BLRA) with the chemical-specific TRV.

$$\text{Ecological HQ} = I/\text{TRV}$$

⁹ As a result of remedial and restoration activities at Company Lake, revised risk estimates for Company Lake are also included in Appendix A and used as part of the Tier 2 ERA.

where:

Ecological HQ	= Ecological hazard quotient (unitless)
I	= Medium-specific intake level (mg/kg-day ¹⁰)
TRV	=Toxicity reference value (mg/kg-day)

When this ratio (that is, the ecological HQ) exceeds unity ($HQ > 1$), there is a potential for ecological risk. Conversely, if $HQ \leq 1$, it is assumed that ecological risks are not present. The TRV and intake estimates for Tier 1 are intentionally conservative (reasonable worst case), whereas Tier 2 uses more realistic, site-specific assumptions. Following Tier 1, chemicals with ecological HQs exceeding the background ecological HQ by 1.0 or more were designated COPECs, and are carried forward to Tier 2.

5.4.2 Results of the Tier 1 Ecological Risk Assessment for South Wetlands

Table 5-1 provides a summary of the Tier 1 ecological risk characterization for south wetlands. A total of 59 surface soil samples and 24 surface water samples collected in this area were used in the evaluation. Because south wetlands is largely identified as a wetland area (CH2M HILL, 1997), selected ecological receptors of concern included the robin, mink, great blue heron, mallard, coyote, red-tailed hawk, and deer. Of the 36 detected chemicals that were evaluated for ecological risk, aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, fluoride, lead, mercury, nickel, selenium, vanadium, zinc, polynuclear aromatic hydrocarbons (PAHs), and PCBs occur at concentrations resulting in an ecological HQ that exceeds 1.0 for one or more of the selected endpoint species.

Also provided in Table 5-1 are the ecological HQ estimates for the corresponding background soil samples (as calculated during the BLRA). A comparison of the south wetlands and background ecological HQ estimates indicates that all chemicals that resulted in an ecological HQ exceeding 1.0 (with the exceptions of antimony, arsenic, and beryllium) also exceeded the background ecological HQ¹¹ by 1.0 or more (highlighted by boldface type in Table 5-1). Aluminum, barium, cadmium, chromium, cobalt, copper, fluoride, lead, mercury, nickel, selenium, vanadium, zinc, PAHs, and PCBs are therefore identified as COPECs and are carried forward to be addressed in the Tier 2 ERA.

5.4.3 Results of the Tier 2 Ecological Risk Assessment for South Wetlands

Tier 2 uses site-specific information and more realistic exposure estimates to better characterize risk for those chemicals and receptors of highest priority (those identified as COPECs during Tier 1). Tier 2 provides additional evaluation of four primary considerations described in Section 5.2.2 (exposure from multiple areas, habitat quality, species home range, and toxicological uncertainty) to help ground-truth the risk assessment results from Tier 1. The methods used to conduct these additional Tier 2 refinements, and the results of the Tier 2 ERA for south wetlands, are provided in this section.

¹⁰ Milligrams of chemical contacting the body per kilogram body weight per day.

¹¹ Background ecological HQ results were as provided in Appendix G of the *Baseline Risk Assessment, Part 1—Nongroundwater Media* (CH2M HILL, 2000).

Consideration of Additive Exposure from Areas Outside of South Wetlands

During Tier 1, to select COPECs for south wetlands, the endpoint species were conservatively assumed to obtain 100 percent of their diet specifically from the south wetlands area. For Tier 2, it is assumed that endpoint species obtain their forage from all of the same areas of concern at RMC-Troutdale that were previously considered in the BLRA.¹² The fraction of total dietary intake is assumed proportional to the areal size (in acres) of each area of concern, relative to the total acreage of all areas of concern.¹³ This approach allows for a more realistic accounting for multiple site exposures at the Troutdale facility.

The specific areas at the Troutdale facility considered collectively are grouped on the basis of habitat and receptor types, as follows:

- Open water/wetland habitats where the heron, mallard, and mink could occur. In addition to south wetlands, these areas include Company Lake, the depression east of the outfall ditch, East Lake, east South Ditch, Salmon Creek/West Drainage, and river shoreline areas along the RMC-Troutdale property.
- In addition to south wetlands, upland areas where upland species could occur include the north landfill, south landfill, Fairview Farms, and east potliner areas. Receptors considered for these areas include the red-tailed hawk, American robin, mule deer, and coyote.

It should be noted that this aggregate intake approach still assumes that foraging occurs only within the RMC areas of concern, and thus is still considered conservative for ecological receptors with home ranges larger than the property. This factor is further addressed in the section below on endpoint species home range.

Consideration of Area-Specific Habitat Suitability

In addition to consideration of intake from multiple areas of concern, Tier 2 provides consideration of the general degree to which habitat at each area of concern is suitable for attracting wildlife use and providing food for foraging. These judgments were based on knowledge of the site obtained during reconnaissance visits and field surveys.

During the BLRA, each area of concern was rated on a five-step scale according to whether the area is believed to provide excellent, good, average, poor, or unsuitable foraging habitat for the endpoint species selected for that area. These ratings correspond to assigned weighting factors, expressed as a fraction, with which the Tier 1 ecological HQs are multiplied to provide an adjustment based on habitat suitability. The ecological rationale for these habitat suitability ratings, based on preferences for each endpoint species, was provided in Appendix I of the BLRA. The habitat suitability ratings assigned for each area of concern are listed in Section 4.6.3 of the BLRA. Habitat restoration at Company Lake following the remedial action activities has resulted in a higher quality habitat. As a result, the habitat suitability weighting factor at Company Lake has been increased from 0.75 to 1.0 for the Tier 2 ERA for south wetlands.

¹² These are areas determined to have habitat suitable for ecological use, and therefore exclude the east plant area.

¹³ For example, the area of south wetlands is 44.2 percent of the total area of open water/wetland areas, and therefore has an areal weighting factor of 0.442.

Tier 2 Ecological Hazard Quotients

The consideration of both multiple area exposures and habitat suitability results in interim numerical adjustments to the risk estimates. Tables 5-2 and 5-3 provide summaries of these Tier 2 adjustments to the Tier 1 ecological HQs for open water/wetland and upland habitat types, respectively.¹⁴ Each table lists by area the Tier 1 ecological HQs, the habitat suitability weighting, the area weighting, and the calculated Tier 2 ecological HQs. The areal size weightings are calculated at the bottom of each table. The Tier 2 ecological HQs for all areas are summed in the last column to estimate the sitewide Tier 2 ecological HQ for each COPEC.

Open Water/Wetland Areas. For open water/wetland areas, the list of south wetlands COPECs with total Tier 2 ecological HQs exceeding 1.0 is reduced to aluminum, fluoride, selenium, vanadium, and PCBs. It is still possible, however, that a substantial portion of this calculated risk is the result of background levels of naturally occurring chemicals. To evaluate this possibility, Table 5-4 provides a comparison of the total Tier 2 ecological HQs with ecological HQs calculated for background areas with similar habitats sampled for the RI. This comparison indicates that, for the open water/wetland areas, the total Tier 2 ecological HQs for only fluoride (for heron) and PCBs (for heron and mink) exceed corresponding background values by at least 1.0. Table 5-5 summarizes the area-specific contribution to the total sitewide Tier 2 HQ for fluoride and PCBs. These results indicate that south wetlands is the highest risk-contributing area of concern for fluoride and PCBs, contributing 88 percent and more than 100 percent, respectively, of the sitewide risk for these COPECs. These COPECs are therefore carried forward for further evaluation by considering the home ranges of these endpoint species of concern and the toxicological uncertainty of these COPECs to birds and mammals.

Upland Areas. For upland areas, the list of south wetlands COPECs with total Tier 2 ecological HQs exceeding 1.0 is reduced to aluminum, chromium, fluoride, zinc, and PCBs. Table 5-6 provides a comparison of the sitewide Tier 2 ecological HQs with ecological HQs calculated for the similar habitat background area. This comparison reveals that, for the upland areas, only aluminum (for the robin), fluoride (for the robin), and PCBs (for the red-tailed hawk) have a total Tier 2 ecological HQ that exceeds the corresponding background value by at least 1.0. Table 5-7 summarizes the area-specific contribution to the total sitewide Tier 2 HQ for fluoride and PCBs. These results indicate that south wetlands is the highest risk-contributing area of concern for fluoride and PCBs, contributing 58 percent and 89 percent, respectively, of the sitewide risk for these COPECs. These COPECs are therefore carried forward for further evaluation by considering the home ranges of these endpoint species of concern and the toxicological uncertainty of these COPECs to birds.

For aluminum, more than 90 percent of the sitewide risk for upland areas is contributed by the Fairview Farms area (see Table 4-29 of the BLRA), primarily because of its large areal weighting. Because releases of aluminum across Fairview Farms have not occurred, these results suggest that the aluminum risk estimate for Fairview Farms is being contributed largely by naturally occurring concentrations. The maximum background aluminum concentration (14,600 mg/kg) measured in 14 samples during the RI is about 73 percent of

¹⁴ It should be noted that the Tier 1 and Tier 2 HQs for upland areas are likely lower than reported in Table 5-3 due to the remedial actions that have taken place at north and south landfills since the BLRA.

the level measured in Fairview Farms (19,900 mg/kg as lognormal UCL of 35 samples). A more thorough regional background evaluation conducted by the Washington Department of Ecology (WDOE, 1994) for Clark County, Washington (just across the Columbia River from RMC) reported background aluminum concentrations ranging from 13,740 to 54,550 mg/kg, with a 90th percentile 52,276 mg/kg. The geologic conditions just across the river would not intuitively be expected to differ from those found on the Oregon side. The Washington statewide median concentration is reported to be 21,956 mg/kg (versus 31,192 mg/kg for Clark County). In light of this information, the aluminum risk estimates for the robin are not interpreted to be the result of a release or to indicate unacceptable risk, and this constituent is not identified as a COPEC.

Consideration of Endpoint Species Home Range

As stated earlier, Tier 2 evaluations to this point in the ERA conservatively assume that all foraging of endpoint species occurs only at the areas of concern within or along the property boundaries. However, it is known that for most of the endpoint species, the home range and foraging areas extend well beyond the areas of concern and property boundaries. The available foraging areas and home ranges for the endpoint species, as documented in literature sources, were summarized in Table 4-30 of the BLRA.

In the vicinity of the Troutdale property, it is unknown exactly how much suitable habitat actually exists within each species' documented home range. Without extensive habitat identification in areas surrounding the facility, the exact acreage of suitable habitat for each species remains uncertain. In addition, the potential for exposure to COPECs from offsite sources and their contribution to total exposure is uncertain.

In lieu of specific knowledge of the amount of offsite foraging habitat and potential offsite exposures, an alternative evaluation approach was used. By knowing the magnitude of the estimated total Tier 2 ecological HQs for site COPECs (from Tables 5-4 and 5-6) and the total size of the open water/wetland (about 60 acres) and upland (about 259 acres) areas of concern, it is possible to back-calculate the minimum amount of needed suitable offsite habitat (with zero exposure) that would result, when combined with areas of concern, in site exposures posing acceptable risk (ecological HQ = 1). The resulting acreage estimates can be compared with general knowledge of surrounding habitat areas in order to give a rough idea of the likelihood that unacceptable risk exists. If the calculated amount of required offsite suitable habitat is (1) within the total home range of the species of concern and (2) believed to be locally available, then it is postulated that ecological risks for that COPEC at the Troutdale facility are acceptable. This approach is used for each remaining COPEC (fluoride and PCBs, but not aluminum, which was eliminated as a COPEC) and endpoint species identified in Tables 5-4 and 5-6 as exceeding corresponding background risk levels. Each of these potentially affected endpoint species (mink, great blue heron, and red-tailed hawk)¹⁵ is discussed in the following subsections.

Mink. Mink are closely associated with aquatic and wetland habitats, including the banks of rivers, streams, lakes, and ditches, as well as wooded swamps, freshwater marshes, coastlines, and backwater areas. Their home range includes both their foraging areas around

¹⁵ Because of the relatively small home range for the American robin, no discussion of a home range refinement to the risk estimates for this species is provided in this section. Rather, this species is addressed further in the consideration of toxicological data in the following subsection.

these waterways and their dens. Most mink activity occurs within a few meters of water and mink rarely stray more than several hundred meters from water. Den sites are within 100 meters of open water, typically closer (Allen, 1986; EPA, 1993). However, more than one den may be used by an individual mink. Home range shape depends on habitat type, with riverine home ranges being basically linear.

For the mink, the documented home range from seven studies (see Table 4-30 of the BLRA) ranges from 19.2 to 4,520 acres, with an average of 1,270 acres and a median of 790 acres. The sitewide Tier 2 ecological HQ for this species is calculated to be 5.8 for PCBs (Table 5-2). The total acreage of the open water/wetland areas of concern considered for the mink is about 60 acres. Therefore, within the median documented home range for the mink of about 790 acres, if approximately 288 additional acres $[(5.8 \times 60) - 60 = 288]$ of offsite habitat exists that is suitable for foraging by mink, then it can be concluded that the RMC-related exposures to PCBs are not high enough to pose unacceptable risk (ecological HQ > 1). The availability of actual suitable surrounding habitat is sufficient, as discussed below.

Great Blue Heron. For the great blue heron, the documented home range from literature sources is generally expressed in terms of linear foraging distance from the colony. Great blue herons will forage relatively far from nesting colonies, averaging several kilometers (km), but they may go as far as 30 km on occasion (EPA, 1993; Table 1). Maximum distances of between 15 and 20 km are the farthest great blue herons will regularly travel between foraging areas and colonies (Gibbs et al., 1987). The principal determinant of adequate foraging habitat is the availability of shallow water with available small fish (Henning et al., 1999).

The documented foraging distance for the great blue heron, from seven studies (see Table 4-30 of the BLRA), ranges from 1.8 to 29 km, with an average of 9.5 km and a median of 7.5 km. For the purposes of converting linear distance to area, it was assumed that the heron uses a zone of approximately 100 meters wide along its documented foraging distance, consistent with that documented for the mink. For the median reported foraging distance of 7.5 km, this results in an estimated home range size of about 185 acres.

The sitewide Tier 2 ecological HQs for this species are calculated to be 2.2 for fluoride and 4.5 for PCBs (Table 5-2). The total acreage of the open water/wetland areas of concern considered for the heron is about 60 acres. Therefore, if approximately 210 additional acres $[(4.5 \times 60) - 60 = 210]$ of nearby offsite habitat exists that is suitable for foraging by piscivorous birds, then it can be concluded that the RMC-related exposures to fluoride and PCBs are not high enough to pose unacceptable risk (ecological HQ > 1). The availability of actual suitable surrounding habitat is sufficient, as discussed below.

Red-tailed Hawk. The size of the red-tailed hawk home range depends on the type of habitat and availability of forage. Hawks inhabit large open or semi-open areas, often near woodlands. Trees or other elevated sites are a requirement for nesting and perching. This species occupies large territory areas and defends its area throughout the year. Hawks are primarily sit-and-wait predators and are opportunistic feeders.

For the red-tailed hawk, the documented home range from eight studies (see Table 4-30 of the BLRA) ranges from 210 to 964 acres, with an average of 408 acres and a median of 346 acres. The sitewide Tier 2 ecological HQ for PCBs is calculated to be 1.1 (Table 5-3) for this species. The total acreage of the upland areas of concern considered for the red-tailed

hawk is about 259 acres. Therefore, within the documented home range for the red-tailed hawk of about 346 acres, if approximately 26 additional acres $[(1.1 \times 259) - 259 = 26]$ of nearby offsite habitat exists that is suitable for foraging by upland raptors, then it can be concluded that the RMC-related exposures to PCBs are not high enough to pose unacceptable risk (ecological HQ > 1). The availability of actual suitable surrounding habitat is sufficient, as discussed below.

Surrounding Habitat. Because the property is located at the confluence of two of Oregon's largest rivers, and because of regional climatological conditions, an abundance of suitable nearby habitat exists for the types of endpoint receptors evaluated for this post-demolition ERA. Areas directly across the Sandy River (including the U.S. Forest Service Sandy River Delta Restoration Project), and on Lady Island within the Columbia River near RMC, provide several thousand acres of high-quality habitat and foraging for great blue herons, mink, and red-tailed hawks. Also, adjacent properties provide usable habitat, such as those along the shorelines of the two rivers and within the unused areas of RMC property north of the dike. The availability of abundant habitat in these nearby areas makes sole use of the areas of concern by wildlife unlikely.

Consideration of Toxicity Data

The Tier 1 risk estimates use NOAELs to develop TRVs (the highest tested dose shown to be without adverse effects). For south wetlands COPECs, the lowest observed adverse effect levels (LOAELs, the lowest tested dose shown to produce adverse effects) is considered, in order to provide a perspective on the uncertainty associated with the NOAEL-based HQs. In addition, the LOAEL is considered more relevant than the NOAEL for identifying acceptable risk to animal populations under DEQ statutory rules.¹⁶

Fluoride. Fluoride is identified as a COPEC for the great blue heron (wetland/open water areas) and robin (upland areas), each with an NOAEL-based Tier 2 HQ of about 2. The LOAEL for fluoride was identified from the same study from which the NOAEL was derived (Pattee et al., 1988). The difference between the reported LOAEL and NOAEL for the selected avian toxicity study is about four-fold. The LOAEL and NOAEL from this study are 32 and 7.8 mg/kg-day, respectively. This study was considered very relevant for this risk assessment because it tested effects in a wildlife species, screech owls. Another available avian study (Guenter and Hahn, 1986) reported a LOAEL of >49 mg/kg-day in chickens. Given the range of available avian LOAELs reported for fluoride (Table 5-8), the LOAEL from the Pattee et al., 1988 study is considered adequately protective.

The LOAEL-based HQs for fluoride in birds are provided in Tables 5-5 and 5-7 for the heron (HQ = 0.5) and robin (HQ = 0.5), respectively. Considering collectively the foraging areas for these species (discussed above), the availability of nearby suitable habitat, and the uncertainties in the toxicity data, fluoride levels at RMC-Troutdale are not high enough to pose meaningful risk to any of the endpoint species evaluated.

Total PCBs. Total PCBs are identified as a COPEC for the great blue heron (wetland/open water areas), red-tailed hawk (upland areas), and mink (wetland/open water areas). The NOAEL-based Tier 2 HQs are 4.5, 1.1, and 5.8 for the heron, hawk, and mink, respectively

¹⁶ Because DEQ guidance specifies that the median lethal dose should be used as an ecological benchmark value to assess population risk (OAR340-122-0115(21)), the LOAEL is still considered very conservative.

(Tables 4-5 and 4-7). The avian LOAEL for PCBs was identified from the same study from which the NOAEL was derived (Dahlgren et al., 1972). The difference between the reported LOAEL and adjusted NOAEL for the selected avian toxicity study is five-fold. The LOAEL and NOAEL from this study are 1.8 and 0.36 mg/kg-day, respectively. This study was considered very relevant for this risk assessment because it tested effects in a wildlife species, pheasants. Another available avian study (Bird et al., 1983, as cited in Eisler, 1986) reported an LOAEL of 9 to 10 mg/kg-day in American kestrels. Given the range of available avian LOAELs reported for PCBs (Table 5-8), the LOAEL from the Dahlgren et al., 1972 study is considered adequately protective.

The mammalian LOAEL for PCBs was identified from the same study from which the NOAEL was derived (Aulerich and Ringer, 1977). The difference between the reported LOAEL and adjusted NOAEL for the selected mammalian toxicity study is also approximately five-fold. The LOAEL and NOAEL from this study (are 0.69 and 0.14 mg/kg-day, respectively). This study was considered very relevant for this risk assessment because it tested effects in mink, a wildlife species known to be very sensitive to PCBs. Other available mink studies reported LOAELs of 0.69 mg/kg-day (McCoy et al., 1995) and 3.43 mg/kg-day (Aulerich and Ringer, 1980). Given the range of available mink LOAELs reported for PCBs (Table 5-8), the LOAEL from the Aulerich and Ringer, 1977 study is considered adequately protective.

The LOAEL-based HQs for PCBs are provided in Tables 5-5 and 5-7 for the heron (HQ = 0.9), hawk (HQ = 0.2), and mink (HQ = 1), respectively. Considering collectively the foraging areas for these species (discussed above), the availability of nearby suitable habitat, and the uncertainties in the toxicity data, total PCB levels at RMC-Troutdale are not high enough to pose meaningful risk to any of the endpoint species evaluated.

5.4.4 ERA Conclusions

This ERA for south wetlands was conducted using a tiered approach, structured to focus the ERA on the COPECs and receptors with the greatest potential for ecological exposure. The previous BLRA indicated that the COPECs with the highest potential for ecological exposure were PCBs, primarily in south wetlands, and fluoride and PAHs, primarily within Company Lake. Since the BLRA, these constituents have been addressed by the remedial actions at Company Lake (as outlined in the interim ROD) and the PCB removal action in September 1999 at south wetlands. The results of the Tier 2 ERA presented here indicate that these actions have been effective in further reducing ecological risk in south wetlands within acceptable levels. The removal action at south wetlands was effective at reducing the EPC for PCBs in surface soil by 65 percent.

SECTION 6

Identification of Major Uncertainties and Assumptions

Several sources of uncertainty affect the overall estimates of human health and ecological risk presented in this RA. The sources are generally associated with the following:

- Sampling, analysis, and data evaluation
- Chemical fate and transport
- Exposure estimation
- Toxicological data

These sources of uncertainty are discussed in the following subsections.

6.1 Sampling, Analysis, and Data Evaluation

Uncertainty associated with sampling and analysis includes the inherent variability (standard error) in the analysis, representativeness of the samples, sampling errors, and heterogeneity of the sample matrix. The quality assurance/quality control (QA/QC) program used during the Post-Demolition RI serves to maintain acceptable precision and accuracy in measurement of chemical concentrations, but it cannot eliminate all sampling and analysis errors. The degree to which sample collection and analyses reflect real exposure point concentrations will influence the reliability of the risk estimates. Many of the sample data used for this RA were generated from samples collected at known or suspected areas of concern, rather than randomly. Because exposure is not likely to be limited solely to higher concentration areas, risk estimates for these areas may be conservatively high.

A key uncertainty for this RA is that many of the sample data used were generated from samples collected at known or suspected areas of concern, rather than randomly. Because exposure is not likely to be limited solely to higher concentration areas, risk estimates for these areas are likely conservatively high.

In addition, the statistical methods used to identify potential EPCs have inherent uncertainty. The 95 percent UCL (or, in a few cases, the 90 percent UCL) was selected to project the high end of potential exposure, and could in some instances overestimate exposure. In some cases, exposure estimates defaulted to maximum detected concentrations, also adding to conservatism.

In some cases, the reported detection limits for chemicals in environmental media were higher than concentrations of concern derived from TRVs, resulting in possible undetected risk. This occurred either because the required laboratory program detection limits exceeded concentrations of concern, or because a particular sample was diluted due to the presence of high concentrations of other constituents (usually PAHs). In the former case, the detection limits were unavoidable, because of the limitations of the instruments, the methods used, or both. The latter case generally occurred when another risk-contributing chemical was

present, reducing the impact of any undetected risk. However, the risk estimates in these situations are less certain and may be underestimated as a result of the higher detection limits.

6.2 Chemical Fate and Transport

This RA makes simplifying assumptions about environmental fate and transport of COPCs in order to estimate exposure; specifically, that no chemical loss or transformation will occur. It is assumed that the chemical concentrations detected in site media remain constant during the assessed exposure duration. In cases where natural attenuation processes are high, the analytical data chosen to represent exposure point concentrations may overstate actual long-term exposure levels. This uncertainty is likely to be more relevant for organic constituents that biodegrade (for example, PAHs) than for inorganic constituents (for example, fluoride).

6.3 Exposure Estimation

Uncertainties introduced into risk characterization during exposure assessment include assumptions made about future land and water use and chemical intake. Since the BLRA, projected land use conditions have been clarified. The RMC-Troutdale site will be developed as a mixed-use general industrial complex consistent with the general industrial zoning currently designated for the property. The estimation of intake requires many assumptions to describe potential exposure situations. There are uncertainties about the frequency and extent of contact with contaminated media, the concentration of constituents at exposure points, and the total duration of exposure. To address these, the estimation of exposure requires numerous assumptions to describe potential exposure situations. The use of upper bound exposure assumptions to estimate RME exposures provides a bounding estimate on exposure. The use of CTE parameters in estimation of exposure provides a perspective on some of the uncertainties due to use of RME assumptions. The uncertainties regarding the trespass exposure frequency at south wetlands are described in Section 4.6.2. Based on past observations, an exposure frequency of less than 11 days per year (probably about 5 days per year, as assumed under the CTE case) is more reasonable than the 26 days per year assumed under the RME case, and results in acceptable risk under DEQ statutory rules.

For the Tier 1 ERA, the assumption was made during risk characterization that the selected endpoint species (and their representative functional groups) use only onsite areas of concern, and are potentially exposed to the chemical concentrations in media directly onsite. A discussion of the potential for offsite habitat use is provided in Section 5.4.3. The fact that many of the Tier 1 risk estimates presented are below regulatory concern in the face of these conservative assumptions provides an added level of confidence in the conclusions for COPECs.

6.4 Toxicological Data

Uncertainties in toxicological data can influence the reliability of risk management decisions. The toxicity values used for quantifying risk in this HHRA and ERA have varying

levels of uncertainty that may affect the confidence in the resulting risk estimates. The sources of uncertainty include the following:

- Extrapolation from high to low doses, from species to species, and from short to long exposure durations
- Gender, age, and strain differences in uptake, metabolism, organ distribution, and target site susceptibility
- Variability with respect to diet, environment, activity patterns, and ecosystem factors

The use of uncertainty factors in the derivation of human and ecological toxicity factors, while striving for protectiveness, may result in an overestimate of risk. However, by using health-conservative estimates throughout this process, a margin of safety is allowed to account for uncertainty in this assessment, giving a margin of safety to the conclusions drawn.

For the HHRA, the levels of uncertainty for RfDs, judged by EPA on the basis of uncertainty factors and modifying factors, are listed in Tables 4-12 and 4-13 for the COPCs at RMC. For COPCs suspected of resulting in human cancer effects, uncertainty is in part expressed in terms of EPA's weight-of-evidence classification, also listed in Tables 4-12 and 4-13. For the ERA, similar use of uncertainty factors was made in the derivation of ecological TRVs, as listed in the table in Appendix B. Only a few of the TRVs for terrestrial/avian species were based on toxicity studies using the actual endpoint species (for example, mink for PCBs). For many chemicals, data on toxicity to wildlife are limited. Most wildlife toxicity information is generated by laboratory studies evaluating inbred animals under controlled laboratory conditions. This requires that the toxicity information be extrapolated to native species in the wild. For the most important COPECs identified (fluoride and PCBs), the toxicity information came from studies using actual wildlife species, increasing confidence in the results.

The following bullets describe some of the other sources of toxicological uncertainties that need to be considered when interpreting the results of this RA:

- One primary source of uncertainty in the ERA is the use of default inter-taxa uncertainty factors to extrapolate between species, per EPA Region 10 guidance (EPA, 1997a). An alternative scientifically sound approach is the use of a physiological scaling factor based on body weight. In some instances (for example, extrapolation between bird species), the use of the EPA default uncertainty factors for interspecies extrapolation could result in risk estimates higher than when using the body-weight scaling approach.
- Another major uncertainty for this RA is the bioavailability of the forms of metals that occur in soil at the site. Because the toxicity of many elements is greatly influenced by the chemical state in which they occur in an animal's food or water, total concentrations of these elements in water or soil are not generally accurate indicators of potentially toxic exposure. For most chemicals, however, site-specific bioavailability data were unavailable. The HHRA and ERA conservatively assume that bioavailability from soil is the same as that in the toxicological studies from which the toxicity values were derived, with the exception of aluminum, copper, fluoride, and vanadium. The uncertainty in bioavailability for these four elements is reduced through use of the adjustment (ERA

only) described in Section 4.5.1.1 of the BLRA. If the chemical form occurring in soil at the site is less bioavailable than assumed, actual risk would be proportionately lower.

- The use of the NOAEL to derive human and ecological toxicity factors also provides a margin of conservatism for the HHRA and ERA. If toxicity factors were based on exposure levels where actual adverse effects would occur (that is, at the LOAEL), risk estimates could be up to four times lower than when calculated using the NOAEL. To address this uncertainty, LOAEL-based ecological HQs were computed for the primary risk contributors, fluoride and PCBs (see Section 5.4.3).
- Because some of the constituents detected at the Troutdale facility did not have available human or wildlife toxicity information on which to quantify risks, these constituents could not be evaluated. However, most of the constituents that have no available toxicity data are generally considered less toxic, because most of the toxicological literature focuses on those constituents considered more toxic to human and ecological receptors. In some cases where adequate toxicity data were unavailable, structurally similar surrogates were used. The use of surrogates for these chemicals may lead to overestimates or underestimates of risk to ecological receptors. Because surrogates considered to have greater toxicity were chosen (for example, benzo(a)pyrene for high-molecular-weight PAHs in the ERA), the risk estimates for these chemicals are likely to be conservatively high.

In the HHRA risk characterization phase, the assumption is made that the total risk of developing an adverse effect from aggregate exposure to site constituents is the sum of the hazard quotients or cancer risks estimated for exposure to each individual constituent. This approach does not account for the possibility that chemicals act synergistically or antagonistically.

Conclusions of the Post-Demolition RI/RA Process

Currently, the RMC-Troutdale site is on the National Priorities List (NPL) and has been remediated as a Superfund site under CERCLA since 1995. RMC has conducted a significant number of owner-initiated removal actions and CERCLA removal and remedial actions, independent of and during the plant demolition process. These actions have removed structures and contaminated materials from the site, resulting in the removal of sources of contamination for human and ecological exposure and to groundwater. Soil removal and remedial actions have resulted in the offsite disposal of over 348,000 tons of material that contained more than 7,300 tons of fluoride.

The Troutdale site meets DEQ's 1×10^{-5} cumulative target risk and total hazard index (less than 1.0) for both the RME and CTE case for all human health exposure scenarios. The site also meets the 1×10^{-6} individual target risk criterion, except for the RME site trespasser scenario at the south wetlands and the RME occupational worker scenario at the East Area. However, the individual target risk criterion is not exceeded for these two areas under the CTE scenario. The slight exceedance of the 1×10^{-6} individual target risk for the RME site trespasser scenario at south wetlands is not considered significant in light of the results seen for the CTE case for this site. An additional calculation indicated that even if the trespass frequency were assumed to be 11 days per year, there would be no exceedances of the 1×10^{-6} individual target risk for this area. For trespasser exposure at south wetlands, an exposure frequency of about 5 days per year (assumed under the CTE case) is more reasonable than the 26 days per year assumed under the RME case¹⁷, and results in acceptable risk. In addition, the thick vegetation and standing water would serve to minimize direct contact with soil at south wetlands. For occupational exposure at the East Area, the exceedance of the individual target risk for a single PAH is not anticipated to be meaningful once site development occurs. The site is expected to be covered with buildings, parking lots, or landscaping prior to occupational use.

The results of the ERA indicate that the removal action in south wetlands was effective in further reducing ecological risk within acceptable levels.

Using the results of this post-demolition residual risk assessment, RMC has demonstrated that acceptable risk levels have been achieved for the property such that deed restrictions on soil are not required for the potential exposure scenarios evaluated, except as presupposed in the evaluation. These presuppositions include prohibiting residential use of the site and requiring that clean fill is placed over south wetlands prior to occupational use. RMC has accomplished this level of risk reduction by eliminating sources of contamination to the groundwater and to human and ecological receptors through soil removal, capping, offsite disposal, and grading. No further remedial action is anticipated.

¹⁷ The exposure frequency of 26 days per year was used as a high-end default in the BLRA and was carried over here for consistency, but it does not reflect actual trespass observed at south wetlands.

Deed restrictions on future activities at the site have been drafted in consultation with EPA and DEQ and will be finalized and included in the upcoming final Record of Decision (ROD). RMC has the goal of obtaining a final ROD and Consent Decree from EPA by September 30, 2006. This post-demolition residual risk assessment, ROD, and Consent Decree serve as the foundation for removing the Troutdale site from the NPL.

SECTION 8

References

- Allen, A.W. 1986. "Habitat Suitability Index Models: Mink." *U.S. Fish and Wildlife Service Biological Report* 82(10.127). 23 pp.
- Aulerich, R.J. and R.K. Ringer. 1977. "Current Status of PCB Toxicity, Including Reproduction in Mink." *Arch. Environ. Contam. Toxicol.* 6: 279.
- _____. 1980. *Toxicity of the Polychlorinated Biphenyl Aroclor 1016 to Mink*. Environmental Research Laboratory, Office of Research and Development.
- Bird, D.M., P.H. Tucker, G.A. Fox, and P.C. Lague. 1983. "Synergistic Effects of Aroclor® 1254 and Mirex on the Semen Characteristics of American Kestrels." *Arch. Environ. Contam. Toxicol.* 12:633-640.
- CH2M HILL. 1997. *Technical Memorandum No. 3: Terrestrial Habitat Characterization*. Prepared for Reynolds Metals Company, Troutdale Facility. March 31, 1997.
- _____. 2000. *Draft-Final Baseline Risk Assessment, Part 1 – Nongroundwater Media*. Prepared for Reynolds Metals Company, Troutdale Facility. August 2000.
- _____. 2005a. *Memorandum WP No. 67: Post-Demolition Residual Risk Assessment Scoping Document for RMC-Troutdale*. Prepared for Reynolds Metals Company, Troutdale Facility. September 2005.
- _____. 2005b. *Memorandum No. 36: RMC-Troutdale Company Lake: Post-Remediation Data Evaluation Relative to Sediment Benchmarks*. July 14, 2005.
- _____. 2006. *Post-Demolition Remedial Investigation Report*. Prepared for Reynolds Metals Company, Troutdale Facility. March 2006.
- Dahlgren, R.B., R.L. Linder, and C.W. Carlson. 1972. "Polychlorinated Biphenyls: Their Effects on Pened Pheasants." *Environ. Health Perspect.* 1: 89-101.
- Eisler, R. 1986. "Polychlorinated Biphenyls Hazards to Fish, Wildlife, and Invertebrates: A Synoptic Review." *U.S. Fish and Wildlife Service Biological Report* 85(1.7), Contaminant Hazard Reviews Report No. 7. April.
- Gibbs, J.P., S. Woodward, M.L. Hunter, and A.E. Hutchinson. 1987. "Determinants of Great Blue Heron Colony Distribution in Coastal Maine." *Auk* 104:38-47.
- Guenter, W. and P.H. Hahn. "1986 Fluorine Toxicity and Laying Hen Performance." *Poultry Science*, 65(4):769-78.
- Henning, M.H., N.M. Shear, N.D. Wilson, and T.J. Iannuzzi. 1999. "Distributions for Key Exposure Factors Controlling the Uptake of Xenobiotic Chemicals by Great Blue Herons (*Ardea herodias*) through Ingestion of Fish." *Human and Ecological Risk Assessment* (5):(1)125-144.

McCoy, G., M.F. Finlay, A. Rhone, K. James, and G.P. Cobb. 1995. "Chronic Polychlorinated Biphenyls Exposure on Three Generations of Oldfield Mice (*Peromyscus polionotus*): Effects on Reproduction, Growth, and Body Residues." *Arch. Environ. Contam. Toxicol.* 28: 431-435.

Oregon Department of Environmental Quality (2000a). *Guidance for Conduct of Deterministic Human Health Risk Assessments*.

_____. 2000b. *Guidance for Ecological Risk Assessment – Level III Baseline*.

_____. 2003. *Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites*.

Pattee, O.H., S.N. Wiemeyer, and D.M. Swineford. 1988. "Effects of Dietary Fluoride on Reproduction in Eastern Screech-Owls." *Arch. Environ. Contam. Toxicol.* 17: 213-218.

U.S. Environmental Protection Agency (EPA). 1989. *Risk Assessment Guidance for Superfund – Volume I: Human Health Evaluation Manual, Part A (Interim Final) (RAGS)*. EPA/540-1-89/002. December 1989.

_____. 1991. *Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors*. Office of Emergency and Remedial Response. OERR Publication 9285.6-03. March 25, 1991.

_____. 1991-96. *ECO Updates*. Office of Solid Waste and Emergency Response. September 1991 through January 1996.

_____. 1992. *Framework for Ecological Risk Assessment*. EPA/630/R-92/001. February 1992.

_____. 1993. *Wildlife Exposure Factors Handbook*. Office of Research and Development. EPA/600/R-93/187. December 1993.

_____. 1997a. *Exposure Factors Handbook*. Office of Research and Development. EPA/600/P-05/002Fa. August 1997.

_____. 1997b. *Supplemental Ecological Risk Assessment Guidance for Superfund: EPA Region 10*. June 1997.

_____. 1998. *Guidelines for Ecological Risk Assessment*. EPA/630/R-95/002F. April 1998.

_____. 2003. *Memorandum – Human Health Toxicity Values in Superfund Risk Assessments*. OSWER Directive 9285.7-53. December 5, 2003.

_____. 2004a. *Risk Assessment Guidance for Superfund – Volume I: Human Health Evaluation Manual, Part E Supplemental Guidance for Dermal Risk Assessment (Final)*.

_____. 2004b. U.S. EPA Region IX Preliminary Remediation Goal (PRG) Table available at <http://www.epa.gov/region09/waste/sfund/prg/index.htm>.

_____. 2005a. *Guidelines for Carcinogen Risk Assessment*.

_____. 2005b. Integrated Risk Information System (IRIS), an electronic database available through the EPA National Center for Environmental Assessment (NCEA) in Cincinnati, Ohio.

Washington Department of Ecology (WDOE). 1994. *Natural Background Soil Metals Concentrations in Washington State*. Publication #94-115. October 1994.

Tables

**Table 2-1
Areas of Concern Addressed During the Post-Demolition RA**

Category	Area
Fairview Farms	Fairview Farms Drainage District Forebay
Outside the Dike	Company Lake North Landfill East Lake
South Wetlands	South Wetlands Railroad Fill/Embankment ^a
East Plant Area	Buildings 30, 32, 32A, 32C, 34, 36, 37A, 41A, 52/52B, 52A, 54, 54A, 54A-62 Trench, 55, 58, 60, 55A/58C/66A Basements, 56, 60, 62, 62A, 64, 66, 71, 83 Complex, 97 Subarea, 98 Area, 44, 46, 53 Cryolite Ponds Diesel Spill East Field East Parking Lot East Potliner Former Cryolite Plant Mineral Oil Spill North Field North Parking Lot North Property Old West Ditch and Forebay Potline 1-5 & Courtyard Railroad Fill/Embankment (West) ^a Railroad (Center, East, West) Rectifier Building – Filter Room Rectifier Yard Scrap Yard and Road South Landfill South Property Storage Areas 1, 2, 3, 4, 5, 6, 7 West of Potline 5 West South Ditch

^a Includes central and eastern portion of railroad embankment within the south wetlands boundary. The western portion of the railroad embankment is within the East Area.

**Table 2-2
Post-Demolition Residual Risk Assessment Exposure Scenarios**

Exposure Area	Human Health					Ecological
	Short-Term Trespasser	Recreational User	Construction Worker	Excavation/Trench Worker	Occupational Worker	
Outside the Dike	X	X			a	b
Fairview Farms	X		X	X	X ^c	d
East Area	X		X	X	X ^c	
South Wetlands	X		X ^e	X	e	X

Notes:

- ^a The area outside the dike is located within a floodplain and could not support occupational uses unless it were filled. Therefore, present and future occupational uses in this area are highly unlikely.
- ^b As part of the interim Record of Decision (ROD), remedial actions for Company Lake and the north landfill area removed significant source materials, reducing terrestrial ecological risk for the area outside the dike. At the request of the U.S. Environmental Protection Agency (EPA) and the Oregon Department of Environmental Quality (DEQ), a comparison of submerged Company Lake verification sediment samples with applicable sediment regulatory benchmarks served to document current, post-remediation conditions. This evaluation is provided in *Memorandum No. 36: RMC-Troutdale Company Lake: Post-Remediation Data Evaluation Relative to Sediment Benchmarks* (CH2M HILL, 2005b).
- ^c Development of areas for planned industrial use will require placement of railways, roadways, buildings, fill, or landscaping, significantly reducing the potential for exposure to surface soil at the site (without excavation). However, an occupational scenario is evaluated to demonstrate whether controls may be necessary to ensure acceptable risk. Specification of barriers may be included in deed restrictions that would ensure placement of such barriers as part of development before occupational use could ensue.
- ^d The Fairview Farms area was evaluated for ecological risk in the *Baseline Risk Assessment, Part 1—Nongroundwater Media* (CH2M HILL, 2000) (BLRA), and risk was found to be acceptable. In the event that some localized areas of Fairview Farms remain to be used for green or open space, it is anticipated that these baseline ecological risk estimates would still apply.
- ^e The south wetlands area is below the seasonal water table, supports dense hydrophytic vegetation, and has standing water for a significant portion of the year. An occupational worker scenario was not evaluated for this area because extensive filling of the south wetlands area would be required before traditional construction or industrial use could begin. Potential exposures associated with future occupational use would need to assume direct contact with fill material, not the material currently in place, because placement of fill will preclude direct contact with south wetlands soil. A construction worker exposure scenario is evaluated to assess potential risks to construction workers, specifically survey crews or other workers who might conduct tasks in advance of filling. The exposure assumptions for this task may be modified to reflect the limited working season in the wetland. The excavation/trench worker scenario evaluates potential exposures resulting from penetration of the fill material for building foundations or from placing utility lines in existing soil. RMC will prepare a deed restriction that will be filed for this area, to be recorded with the property title, prohibiting future moving or altering of the current soil elevations, or any filling within the south wetlands area, without DEQ approval. This will effectively involve DEQ in any future plans that could conceivably result in human exposures. Draft language for a deed restriction was submitted to EPA for approval as part of the post-demolition project in support of a final Record of Decision.

**Table 3-1
Samples Used in the Fairview Farms Risk Assessment**

Station ID	Date Sampled	Current Depth^a
DDFSC-01	28-Feb-05	0
DDFSC-02	28-Feb-05	0
DDFSC-03	28-Feb-05	0
DDFSC-04	28-Feb-05	0
FF-DG21	26-Jun-95	0
FF-DG21	26-Jun-95	3
FF-DG21	26-Jun-95	4
FF-DG22	26-Jun-95	0
FF-DG22	26-Jun-95	1.5
FF-DG22	26-Jun-95	3.5
FF-DG27	26-Jun-95	0
FF-DG27	26-Jun-95	2
FF-DG27	26-Jun-95	5
FF-SB01	26-Jun-95	0
FF-SB02	26-Jun-95	0
FF-SB02	26-Jun-95	0.5
FF-SB02	26-Jun-95	1
FF-SB03	26-Jun-95	0
FF-SB04	26-Jun-95	0
FF-SB04	26-Jun-95	0.5
FF-SB04	26-Jun-95	1
FF-SB05	26-Jun-95	0
FF-SB06	26-Jun-95	0
FF-SB06	26-Jun-95	0.5
FF-SB06	26-Jun-95	1
FF-SB07	26-Jun-95	0
FF-SB08	26-Jun-95	0
FF-SB08	26-Jun-95	0.5
FF-SB08	26-Jun-95	1
FF-SB09	26-Jun-95	0
FF-SB10	26-Jun-95	0
FF-SB10	26-Jun-95	0.5
FF-SB10	26-Jun-95	1
FF-SB11	26-Jun-95	0
FF-SB12	26-Jun-95	0
FF-SB13	26-Jun-95	0
FF-SB14	27-Jun-95	0
FF-SB15	27-Jun-95	0
FF-SB16	27-Jun-95	0
FF-SB17	27-Jun-95	0
FF-SB18	27-Jun-95	0
FF-SB19	27-Jun-95	0
FF-SB20	27-Jun-95	0
FF-SD28	27-Jun-95	0
FF-SD29	27-Jun-95	0
FF-SD30	27-Jun-95	0
MW31-034	26-Nov-96	10
RM-S15	18-Aug-94	0.1
RM-S16	18-Aug-94	0.1

^a Current depth after any removal action, regrading, or capping.

**Table 3-2
Samples Used in the Outside the Dike Risk Assessment**

Station ID	Date Sampled	Current Depth ^a	Station ID	Date Sampled	Current Depth ^a	Station ID	Date Sampled	Current Depth ^a
01	09-Oct-01	0	CLSC-017	08-Oct-03	0.5	NLCS-08	03-Nov-03	0.5
02	09-Oct-01	0	CLSC-018	13-Dec-04	0.5	NLCS-09	03-Nov-03	1
03	09-Oct-01	0	CLSC-020	13-Dec-04	0.5	NLCS-10	03-Nov-03	1
05	09-Oct-01	0	CLSC-021	13-Dec-04	0.5	NLCS-11	03-Nov-03	0.5
06	09-Oct-01	0	CLSC-022	14-Dec-04	0.5	NLCS-12	03-Nov-03	0.5
07	09-Oct-01	0	CLSC-023	21-Dec-04	0.5	NLCS-13	03-Nov-03	1
08	09-Oct-01	0	CL-SD002	15-Oct-96	1.5	NLCS-14	03-Nov-03	0.5
09	09-Oct-01	0	CLSS-004	16-Feb-05	0.5	NLCS-15	03-Nov-03	0.5
10	09-Oct-01	0	CR-SB006	05-Sep-96	0	NLCS-16	03-Nov-03	0.5
11	09-Oct-01	0	CR-SB007	05-Sep-96	0	NLCS-17	03-Nov-03	0.5
12	09-Oct-01	0	EHW1	20-Jul-94	0.6	NLCS-18	03-Nov-03	0.5
13	09-Oct-01	0	EHW1	20-Jul-94	2.5	NL-SB012	18-Jun-97	0
14	09-Oct-01	0	EHW1	20-Jul-94	5.5	NL-SB018	18-Jun-97	0
15	09-Oct-01	0	EHW2	20-Jul-94	0.6	NL-SB024	18-Jun-97	0
16	09-Oct-01	0	EHW2	20-Jul-94	2.5	NL-SB030	18-Jun-97	0
17	09-Oct-01	0	EHW2	20-Jul-94	5.5	NLTP	29-Aug-97	0
18	09-Oct-01	0	EHW2	20-Jul-94	6	OR-1	04-Aug-94	0.1
19	09-Oct-01	0	EL-SD001	29-Jan-98	0	OR-SS-01	15-Apr-96	0
20	09-Oct-01	0	EL-SD002	29-Jan-98	0	OR-SS-02	15-Apr-96	0
21	09-Oct-01	0	LDSC-001	20-Dec-04	0	OR-SS-03	15-Apr-96	0
22	09-Oct-01	0	LDSC-002	20-Dec-04	0	RM-SD18	19-Aug-94	0.1
23	09-Oct-01	0	LDSC-003	20-Dec-04	0	SHN1	20-Jul-94	1.5
CL-SB041	09-Sep-97	0	LDSC-004	20-Dec-04	0	SHN2	20-Jul-94	1.5
CLSC-001	12-Aug-03	0.5	LDSC-005	21-Dec-04	0	SHN3	20-Jul-94	3.5
CLSC-002	20-Dec-04	0.5	MW08-027	07-Jul-94	0.1	SHN4	19-Jul-94	4.5
CLSC-003	12-Aug-03	0.5	MW08-027	07-Jul-94	2.5	SR-SB001	06-Sep-96	0
CLSC-005	20-Dec-04	0.5	MW08-127	20-Jun-96	10	SR-SB002	06-Sep-96	0
CLSC-006	12-Aug-03	0.5	MW09-030	04-Aug-94	0.1	SR-SB003	06-Sep-96	0
CLSC-007	02-Oct-03	0.5	MW09-030	04-Aug-94	2.5	SR-SB004	06-Sep-96	0
CLSC-008	12-Aug-03	0.5	ND-1	04-Aug-94	0.6	SR-SD038	06-Sep-96	0
CLSC-009	20-Dec-04	0.5	ND-2	04-Aug-94	0.6	SR-SD039	06-Sep-96	0
CLSC-010	22-Sep-04	0.5	NLCS-04	03-Nov-03	1	SR-SD041	06-Sep-96	0
CLSC-011	13-Dec-04	0.5	NLCS-05	03-Nov-03	1	SR-SD20	21-Feb-95	0.1
CLSC-013	13-Dec-04	0.5	NLCS-06	03-Nov-03	1	SR-SD21	21-Feb-95	0.1
CLSC-016	20-Dec-04	0.5	NLCS-07	03-Nov-03	1			

^a Current depth after any removal action, regrading, or capping.

**Table 3-3
Samples Used in the South Wetlands Risk Assessment**

Station ID	Date Sampled	Current Depth ^a	Station ID	Date Sampled	Current Depth ^a	Station ID	Date Sampled	Current Depth ^a
MW36-006	22-Oct-96	3.5	SW-SB10	24-Jul-95	3.2	SW-SB24	22-Jul-96	1
MW36-006	22-Oct-96	6	SW-SB11	24-Jul-95	0.5	SW-SB24	22-Jul-96	1.4
MW36-006	22-Oct-96	8	SW-SB11	24-Jul-95	1.5	SW-SB24	22-Jul-96	3
MW37-012	23-Oct-96	4	SW-SB11	24-Jul-95	2.2	SW-SB25	22-Jul-96	0.8
MW37-012	23-Oct-96	5.5	SW-SB12	24-Jul-95	0.5	SW-SB25	22-Jul-96	1.7
MW37-012	23-Oct-96	7.5	SW-SB12	24-Jul-95	1.5	SW-SB25	22-Jul-96	2.8
MW37-012	23-Oct-96	10	SW-SB12	24-Jul-95	2.2	SW-SB26	22-Jul-96	1.2
RRTP-001	17-Sep-04	0	SW-SB13	24-Jul-95	0.4	SW-SB26	22-Jul-96	1.9
RRTP-001	17-Sep-04	4	SW-SB13	24-Jul-95	1.6	SW-SB26	22-Jul-96	3.5
RRTP-001	17-Sep-04	6	SW-SB13	24-Jul-95	2.1	SW-SB27	23-Jul-96	0.7
RRTP-002	17-Sep-04	0	SW-SB14	04-Aug-95	0.3	SW-SB28	23-Jul-96	0.4
RRTP-002	17-Sep-04	4	SW-SB14	04-Aug-95	0.8	SW-SB29	23-Jul-96	0.4
RRTP-002	17-Sep-04	6	SW-SB14	04-Aug-95	1.5	SW-SB29	23-Jul-96	0.8
RRTP-003	17-Sep-04	0	SW-SB14	04-Aug-95	2.1	SW-SB30	23-Jul-96	0.6
RRTP-003	17-Sep-04	4	SW-SB15	04-Aug-95	0.2	SW-SB31	23-Jul-96	0.4
RRTP-003	17-Sep-04	6	SW-SB15	04-Aug-95	0.7	SW-SB32	23-Jul-96	0.3
RRTP-004	17-Sep-04	0	SW-SB15	04-Aug-95	1.6	SW-SB33	23-Jul-96	0.3
RRTP-004	17-Sep-04	4	SW-SB15	04-Aug-95	2.1	SW-SB34	23-Jul-96	0.5
RRTP-004	17-Sep-04	6	SW-SB16	04-Aug-95	0.3	SW-SB35	23-Jul-96	0.3
SA1	26-Jul-94	3	SW-SB16	04-Aug-95	0.8	SW-SB36	23-Jul-96	0.4
SA2	26-Jul-94	3	SW-SB16	04-Aug-95	1.3	SW-SB37	24-Jul-96	1
SD28	23-Feb-95	0.1	SW-SB16	04-Aug-95	1.9	SW-SB37	24-Jul-96	2
SW2	26-Jul-94	3	SW-SB17	04-Aug-95	0.3	SW-SB37	24-Jul-96	3.2
SW3	26-Jul-94	3	SW-SB17	04-Aug-95	0.8	SW-SB38	24-Jul-96	1.1
SW4	26-Jul-94	3	SW-SB17	04-Aug-95	1.3	SW-SB38	24-Jul-96	2.2
SW5	26-Jul-94	3	SW-SB17	04-Aug-95	1.7	SW-SB38	24-Jul-96	3
SW-6	04-Aug-94	0.1	SW-SB17	04-Aug-95	2.1	SW-SB39	26-Aug-96	2.3
SW-SB03	24-Jul-95	0.5	SW-SB18	04-Aug-95	0.4	SW-SB39	26-Aug-96	3.3
SW-SB03	24-Jul-95	1.2	SW-SB18	04-Aug-95	0.6	SW-SB40	26-Aug-96	2
SW-SB03	24-Jul-95	2.2	SW-SB18	04-Aug-95	1.1	SW-SB40	26-Aug-96	4.3
SW-SB05	24-Jul-95	0.5	SW-SB18	04-Aug-95	1.6	SW-SB41	26-Aug-96	0.5
SW-SB05	24-Jul-95	1.6	SW-SB18	04-Aug-95	2	SW-SB42	26-Aug-96	0.7
SW-SB05	24-Jul-95	2.2	SW-SB19	22-Jul-96	0.9	SW-SB49	19-Nov-97	0
SW-SB06	24-Jul-95	0.5	SW-SB19	22-Jul-96	2.2	SW-SB50	19-Nov-97	0
SW-SB06	24-Jul-95	1.7	SW-SB19	22-Jul-96	3.2	SW-SB51	19-Nov-97	0
SW-SB06	24-Jul-95	2.2	SW-SB20	22-Jul-96	0.7	SW-SB52	19-Nov-97	0
SW-SB07	24-Jul-95	0.5	SW-SB20	22-Jul-96	1.2	SW-SB53	19-Nov-97	0
SW-SB07	24-Jul-95	1.6	SW-SB20	22-Jul-96	3.2	SW-SB54	19-Nov-97	0
SW-SB07	24-Jul-95	2.2	SW-SB21	22-Jul-96	0.7	SW-SB55	19-Nov-97	0
SW-SB08	24-Jul-95	0.5	SW-SB21	22-Jul-96	2.2	SW-SB56	19-Nov-97	0
SW-SB08	24-Jul-95	1.5	SW-SB21	22-Jul-96	3.2	SW-SB57	19-Nov-97	0
SW-SB08	24-Jul-95	2.2	SW-SB22	22-Jul-96	0.7	SW-SB58	19-Nov-97	0
SW-SB09	24-Jul-95	0.6	SW-SB22	22-Jul-96	1.5	SW-SC01	20-Sep-99	2
SW-SB09	24-Jul-95	2.2	SW-SB22	22-Jul-96	2.6	SW-SC02	20-Sep-99	1
SW-SB09	24-Jul-95	3	SW-SB23	22-Jul-96	0.9	SW-SC03	20-Sep-99	1
SW-SB10	24-Jul-95	0.5	SW-SB23	22-Jul-96	2.2	SW-SC04	20-Sep-99	2
SW-SB10	24-Jul-95	2.2	SW-SB23	22-Jul-96	3.2	SW-SC05	20-Sep-99	2
						SW-SC06	20-Sep-99	2

^a Current depth after any removal action, regrading, or capping.

**Table 3-4
Samples Used in the East Area Risk Assessment**

Station ID	Date Sampled	Current Depth ^a	Station ID	Date Sampled	Current Depth ^a	Station ID	Date Sampled	Current Depth ^a
183E-10N	29-Jan-02	0	ADD-CS-7	17-Aug-04	8	B34-I-10	7-Mar-05	6
225E-35N	29-Jan-02	0.5	B04-001	14-Oct-04	1	B34-K	22-Jun-05	10
470E-24N	29-Jan-02	1	B04-001	14-Oct-04	10	B34-L	22-Jun-05	10
511E-117N	29-Jan-02	1	B06-001	20-Jul-04	0	B34-M	22-Jun-05	10
54AT-1	22-Feb-05	6	B06-002	14-Oct-04	10	B34-S	22-Jun-05	10
54AT-2	22-Feb-05	8	B08-001	21-Jul-04	0	B-34W	22-Jun-05	10
54AT-3	22-Feb-05	6	B08-002	21-Jul-04	0	B34-X	22-Jun-05	10
54AT-3	22-Feb-05	8	B08-002	21-Jul-04	8.5	B34-Z	22-Jun-05	9
54AT-6	22-Feb-05	6	B10-001	20-Jul-04	0	B46DW	22-Feb-05	6
54AT-7	22-Feb-05	6	B12-001	21-Jul-04	0	B46DW	22-Feb-05	10
550E-114N	29-Jan-02	1	B12-002	21-Jul-04	0	B52SA4TP1	18-Nov-05	0
589E-21N	29-Jan-02	0.5	B14-001	20-Jul-04	0	B52SA4TP1	18-Nov-05	1.5
670E-106N	29-Jan-02	1.5	B16-001	20-Jul-04	0	B52SA4TP2	18-Nov-05	0
792E-110N	29-Jan-02	1	B16-001	20-Jul-04	10	B54T-A	03-Nov-04	5
79E-38N	29-Jan-02	0.5	B18-001	21-Jul-04	0	B54T-A2	08-Dec-04	6
903E-14N	29-Jan-02	0.5	B18-002	21-Jul-04	0	B54T-B	03-Nov-04	5
903E-55N	29-Jan-02	1	B1FR-1	07-Dec-04	0	B54T-B2	08-Dec-04	6
A1TP-001	16-Sep-04	0	B1FR-2	07-Dec-04	0	B54T-C2	08-Dec-04	6
A1TP-001	16-Sep-04	1	B2	13-Sep-94	2	B54T-C3	13-Jan-05	6
A1TP-002	16-Sep-04	0	B20-001	14-Oct-04	1	B54T-D3	13-Jan-05	6
A1TP-002	16-Sep-04	1.5	B20-001	14-Oct-04	8	B54T-D3A	13-Jan-05	6
A1TP-003	16-Sep-04	0	B21-001	14-Oct-04	1	B54T-EB1	03-Nov-04	6
A1TP-003	16-Sep-04	1.5	B21-001	14-Oct-04	9	B54T-EB2	03-Nov-04	6
A1TP-004	16-Sep-04	0	B22-001	14-Oct-04	1	B60-001	10-Jun-04	2
A1TP-004	16-Sep-04	1.5	B22-002	14-Oct-04	1	B60-002	10-Jun-04	2
A1TP-005	16-Sep-04	0	B30-N1	24-Mar-05	4.2	B97-001	28-Oct-05	0.5
A1TP-005	16-Sep-04	2	B30-N2	11-Apr-05	4.2	B97-002	28-Oct-05	0.5
A2TP-001A	16-Sep-04	0	B30-N3	11-Apr-05	4.2	B97-003	28-Oct-05	0.5
A2TP-001A	16-Sep-04	1	B30-S1	24-Mar-05	8.1	B98-001	10-Jun-04	3
A2TP-002A	16-Sep-04	0	B30-W1	20-Apr-05	2	B98-002	10-Jun-04	1
A2TP-002A	16-Sep-04	1.5	B30-W1	20-Apr-05	5.5	B98-002	10-Jun-04	6
A2TP-003A	16-Sep-04	1	B32-001	09-Jun-04	1	B98-003	10-Jun-04	6
A2TP-004A	16-Sep-04	1.5	B32-001	09-Jun-04	9	B98-CS1	09-Mar-05	0.5
A2TP-005A	16-Sep-04	0.5	B32-002	09-Jun-04	1	B98-CS2	30-Mar-05	3
A2TP-006A	16-Sep-04	0.5	B32-002	09-Jun-04	9	B98-CS3	30-Mar-05	3
A3TP-001	17-Sep-04	0.5	B32-003	20-Jul-04	0	B98-TP02	18-Oct-05	4
A3TP-002	17-Sep-04	0	B32-003	20-Jul-04	9	BC-SB001	21-May-97	5
A3TP-004	17-Sep-04	0.5	B32-004	20-Jul-04	9	BC-SB001	21-May-97	10
A3TP-005	17-Sep-04	0	B32-T02	23-Feb-05	4	BC-SB002	21-May-97	5
A3TP-006	17-Sep-04	0	B34-AA	22-Jun-05	9	BC-SB002	21-May-97	10
A5TP-002A	16-Sep-04	0.5	B34-BB	22-Jun-05	9	BC-SB003	21-May-97	5
A5TP-003A	16-Sep-04	0.5	B34-CC	22-Jun-05	9	BC-SB003	21-May-97	10
A5TP-004A	16-Sep-04	0	B34-1	28-Apr-05	0.5	BLD971	25-Jul-95	2.5
A5TP-004A	16-Sep-04	1	B34-2	28-Apr-05	0.5	BLD971	25-Jul-95	8
A6TP-001	25-Jul-05	1	B34-3	28-Apr-05	0.5	BLD971	25-Jul-95	10
A6TP-004	25-Jul-05	0	B34-4	28-Apr-05	0.5	BLD972	25-Jul-95	6.5
A6TP-004	25-Jul-05	2.5	B34-5	28-Apr-05	0.5	BLD972	25-Jul-95	8.5
A6TP-004	25-Jul-05	3.5	B34-6	28-Apr-05	0.5	C13A-001	14-Oct-04	0
A6TP-004A	25-Jul-05	2.5	B34-7	28-Apr-05	0.5	C13A-002	20-Jul-04	0
A7TP-001	25-Jul-05	0.5	B34-8	05-May-05	0.5	C17A-001	21-Jul-04	0
A7TP-002	25-Jul-05	0.5	B34-9	05-May-05	0.5	C5A-001	14-Oct-04	1
A7TP-003	25-Jul-05	0	B34-I-1	07-Mar-05	3.5	C5A-001	14-Oct-04	10
A7TP-003	25-Jul-05	1.5	B34-I-2	07-Mar-05	8.5	C5A-002	20-Jul-04	0
A7TP-004	25-Jul-05	0	B34-I-3	07-Mar-05	3.5	C9A-001	14-Oct-04	1
A7TP-004	25-Jul-05	0.7	B34-I-4	07-Mar-05	3.5	C9A-001	14-Oct-04	9
A7TP-004	25-Jul-05	1.5	B34-I-5	07-Mar-05	3.5	CB2	13-Oct-04	8
A7TP-005	25-Jul-05	0	B34-I-6	07-Mar-05	8.5	CB3	24-Aug-04	7
A7TP-005	25-Jul-05	1.5	B34-I-7	07-Mar-05	7.5	CB4	24-Aug-04	7
ADD-ACS-7	17-Aug-04	8	B34-I-8	07-Mar-05	7.5	CB5	24-Aug-04	7
ADD-CS2	17-Aug-04	8	B34-I-9	07-Mar-05	6.5			

^a Current depth after any removal action, regrading, or capping.

**Table 3-4
Samples Used in the East Area Risk Assessment**

Station ID	Date Sampled	Current Depth ^a	Station ID	Date Sampled	Current Depth ^a	Station ID	Date Sampled	Current Depth ^a
CB6	24-Aug-04	9	CP-CS043	18-Oct-95	3	CS-ADD-5	30-Aug-05	0.5
CB7	27-Sep-04	6	CP-CS044A	25-Jan-96	3	CS-ADD-6	30-Aug-05	0.5
CB8	27-Sep-04	6	CP-CS045	18-Oct-95	3	CS-ADD-8	30-Aug-05	0.5
CB9	11-Oct-04	8.5	CP-CS046	18-Oct-95	3	CS-ADD-9	1-Sep-05	0.5
CB10	27-Sep-04	6	CP-TP01	25-Jul-05	7	CS-ADD10	01-Sep-05	0.5
CB11	11-Oct-04	8.5	CP-TP02	25-Jul-05	0.9	CS-RS-ADD3	30-Nov-05	0.5
CB13	11-Oct-04	10	CP-TP02	25-Jul-05	4.5	D4	13-Sep-94	4
CB16	12-Oct-04	8	CP-TP03	25-Jul-05	0	DS-SC01	23-Aug-95	6.5
CB17	27-Sep-04	4.5	CP-TP03	25-Jul-05	2	DS-SC02	23-Aug-95	6.5
CB24	20-Oct-04	8	CP-TP04	25-Jul-05	2	DS-SC03	23-Aug-95	6.5
CB25	27-Sep-04	4.5	CP-TP05	25-Jul-05	2	DS-SC05	24-Aug-95	7
CB26	27-Sep-04	4.5	CP-TP06	25-Jul-05	1.5	DS-SC06	24-Aug-95	7
CB28	13-Oct-04	8	CREM-1	29-Jan-95	4	DS-SC07	24-Aug-95	10
CB29	27-Sep-04	4.5	CREM1-1	25-Jan-95	0.1	DS-SC08	25-Aug-95	4
CB30	27-Sep-04	4.5	CREM2-1	27-Jan-95	0.1	DS-SC09	25-Aug-95	4
CB33	27-Sep-04	4.5	CREM2-2	27-Jan-95	0.1	DS-SC10	25-Aug-95	5
CB34	13-Oct-04	8	CRY-007	3-Nov-05	5	DS-SC12	25-Aug-95	5
CB35	27-Sep-04	4.5	CRY-008	3-Nov-05	2.5	DS-SC13	25-Aug-95	7
CB37	22-Jun-04	6.5	CRY-009	03-Nov-05	2	DS-SC14	25-Aug-95	7
CB38	22-Jun-04	6.5	CS-032	30-Nov-05	0.5	DS-SC105	15-Nov-96	6
CB39	22-Jun-04	6.5	CS-033	30-Nov-05	0.5	DS-SC106	15-Nov-96	6
CP5	28-Jul-94	3	CS1	30-Aug-05	0.5	DS-SC107	15-Nov-96	6
CP6	28-Jul-94	3	CS2	30-Aug-05	0.5	EP-BLUE	09-Oct-95	2
CP-CS001	21-Sep-95	3	CS3	30-Aug-05	0.5	EP-CS0D1	20-Mar-96	2
CP-CS002A	25-Jan-96	3	CS4	30-Aug-05	0.5	EP-CS0D1	20-Mar-96	4
CP-CS003	21-Sep-95	3	CS5	30-Aug-05	0.5	EP-CS0F1	20-Mar-96	0
CP-CS004	21-Sep-95	3	CS6	30-Aug-05	0.5	EP-CS0F1	20-Mar-96	2
CP-CS005	21-Sep-95	3	CS7-RS2	19-Jan-06	0.5	EP-CSDITCH	09-Jan-96	0
CP-CS006	21-Sep-95	3	CS8	23-Aug-05	0.5	EP-GRAY	09-Oct-95	2.5
CP-CS007A	25-Jan-96	3	CS9-RS	28-Oct-05	0.5	EP-GRAY	09-Oct-95	3
CP-CS008	21-Sep-95	3	CS10	30-Aug-05	0.5	EP-PIPE1	21-Sep-95	1
CP-CS009	21-Sep-95	3	CS11-RS	28-Oct-05	0.5	EP-PIPE2	21-Sep-95	1
CP-CS011	21-Sep-95	3	CS12-RS	03-Oct-05	0.5	EP-PIPE3	21-Sep-95	1
CP-CS012	21-Sep-95	3	CS13	30-Aug-05	0.5	EP-SB01	23-Jun-98	6
CP-CS013	21-Sep-95	3	CS14	30-Aug-05	0.5	EP-SC0A3	08-Jan-96	1
CP-CS014	21-Sep-95	3	CS15	01-Sep-05	1.5	EP-SC0A3	09-Jan-96	3
CP-CS015A	25-Jan-96	3	CS16	30-Aug-05	0.5	EP-SC0B2	08-Jan-96	1
CP-CS019A	25-Jan-96	3	CS17-RS	04-Oct-05	0.5	EP-SC0B2	09-Jan-96	3
CP-CS020	21-Sep-95	3	CS18	23-Aug-05	0.5	EP-SC0B3	08-Jan-96	1
CP-CS021A	25-Jan-96	3	CS19	30-Aug-05	0.5	EP-SC0B3	09-Jan-96	3
CP-CS022	21-Sep-95	3	CS20	30-Aug-05	0.5	EP-SC0B4	08-Jan-96	1
CP-CS023A	25-Jan-96	3	CS21	30-Aug-05	0.5	EP-SC0B4	09-Jan-96	3
CP-CS024	21-Sep-95	3	CS22	23-Aug-05	0.5	EP-SC0C2	08-Jan-96	1
CP-CS025	21-Sep-95	3	CS23-RS	28-Oct-05	0.5	EP-SC0C2	09-Jan-96	3
CP-CS027	21-Sep-95	3	CS24-RS	28-Oct-05	0.5	EP-SC0C3	08-Jan-96	1
CP-CS028	21-Sep-95	3	CS25	30-Aug-05	0.5	EP-SC0C3	09-Jan-96	3
CP-CS029	21-Sep-95	3	CS26	30-Aug-05	0.5	EP-SC0C4	08-Jan-96	1
CP-CS030	21-Sep-95	3	CS27	30-Aug-05	0.5	EP-SC0C4	9-Jan-96	3
CP-CS031	21-Sep-95	3	CS28	30-Aug-05	0.5	EP-SC0D2	8-Jan-96	1
CP-CS032	21-Sep-95	3	CS29	23-Aug-05	0.5	EP-SC0D2	9-Jan-96	3
CP-CS033	21-Sep-95	3	CS30	23-Aug-05	0.5	EP-SC0D3	8-Jan-96	1
CP-CS035	21-Sep-95	3	CS31	23-Aug-05	0.5	EP-SC0D3	9-Jan-96	3
CP-CS036	21-Sep-95	3	CS34	23-Aug-05	0.5	EP-SC0D4	8-Jan-96	1
CP-CS037	21-Sep-95	3	CS35	23-Aug-05	0.5	EP-SC0D4	09-Jan-96	3
CP-CS038	21-Sep-95	3	CS36	23-Aug-05	0.5	EP-SC0D5	08-Jan-96	1
CP-CS039	21-Sep-95	3	CSA14	30-Aug-05	0.5	EP-SC0D5	09-Jan-96	3
CP-CS040	21-Sep-95	3	CSA29	23-Aug-05	0.5	EP-SC0D5	09-Jan-96	5.5
CP-CS041	21-Sep-95	3	CSA-ADD-9	01-Sep-05	0.5	EP-SC0E1	08-Jan-96	1
CP-CS042	18-Oct-95	3	CS-ADD-1	30-Aug-05	0.5	EP-SC0E1	09-Jan-96	3
CP-CS042A	25-Jan-96	3	CS-ADD-4	30-Aug-05	0.5	EP-SC0E2	08-Jan-96	1

^a Current depth after any removal action, regrading, or capping.

**Table 3-4
Samples Used in the East Area Risk Assessment**

Station ID	Date Sampled	Current Depth ^a	Station ID	Date Sampled	Current Depth ^a	Station ID	Date Sampled	Current Depth ^a
EP-SC0E2	09-Jan-96	3	GP63	05-Jun-98	2.5	MO-SB09	28-Jul-95	2
EP-SC0E3	08-Jan-96	1	GP63	05-Jun-98	7.5	MO-SB09	28-Jul-95	4
EP-SC0E3	09-Jan-96	3	GP64	08-Jun-98	0	MO-SB09	28-Jul-95	6
EP-SC0E4	09-Jan-96	1	GP64	08-Jun-98	5	MO-SB10	28-Jul-95	2
EP-SC0E4	09-Jan-96	3	GP64	08-Jun-98	10	MO-SB10	28-Jul-95	4
EP-SC0E5	08-Jan-96	1	GP65	09-Jun-98	0	MO-SB10	28-Jul-95	6
EP-SC0E5	09-Jan-96	3	GP65	09-Jun-98	5	MW01-019	12-Jul-94	0
EP-SC0F3	08-Jan-96	1	GP65	09-Jun-98	10	MW01-019	12-Jul-94	2.5
EP-SC0F3	09-Jan-96	3	GP66	08-Jun-98	0	MW01-019	12-Jul-94	7.5
EP-SC0F4	08-Jan-96	1	GP66	08-Jun-98	5	MW01-019	12-Jul-94	10
EP-SC0F4	09-Jan-96	3	GP66	08-Jun-98	10	MW02-012	11-Jul-94	1
EP-SC0F5	08-Jan-96	1	GP67	09-Jun-98	0	MW02-012	11-Jul-94	6
EP-SC0F5	09-Jan-96	3	GP67	09-Jun-98	5	MW03-017	9-Jul-94	0
EP-SC0F6	08-Jan-96	1	GP67	09-Jun-98	10	MW04-019	12-Jul-94	5
EP-SC0F6	09-Jan-96	3	GP72	14-Aug-00	4	MW04-019	12-Jul-94	7.5
EP-SC0G5	08-Jan-96	1	GP72	14-Aug-00	8	MW05-025	08-Jul-94	2.5
EP-SC0G5	09-Jan-96	3	GP73	10-Aug-00	8	MW06-024	08-Jul-94	0.1
EP-SC0G6	08-Jan-96	1	GP76	10-Aug-00	4	MW06-024	08-Jul-94	2.5
EP-SC0G6	09-Jan-96	3	GP76	10-Aug-00	8	MW06-024	08-Jul-94	7.5
EP-SC0G7	08-Jan-96	1	GP77	11-Aug-00	5.5	MW07-024	09-Jul-94	0.1
EP-SC0G7	09-Jan-96	3	GP77	11-Aug-00	9.5	MW07-024	09-Jul-94	2.5
EP-SC0H6	08-Jan-96	1	GP78	11-Aug-00	5.5	MW07-024	09-Jul-94	7.5
EP-SC0H6	09-Jan-96	3	GP78	11-Aug-00	9.5	MW07-024	09-Jul-94	10
EP-SC0H7	08-Jan-96	1	MA30-001	28-Feb-05	1	MW10-023	05-Aug-94	0.1
EP-SC0H7	09-Jan-96	3	MA30-001	28-Feb-05	8	MW10-023	05-Aug-94	2.5
FCT1-A	29-Sep-04	2	MA37A-001	15-Oct-04	1	MW10-023	05-Aug-94	7.5
FCT1-A-A	29-Sep-04	2	MA37A-001	15-Oct-04	8	MW10-023	05-Aug-94	10
FCT1-B	29-Sep-04	2	MA37A-002	15-Oct-04	1	MW11-017	04-Aug-94	3
FCT1-EB1	24-Sep-04	4	MA37A-002	15-Oct-04	8	MW11-017	05-Aug-94	5.5
FCT1-EB2	24-Sep-04	4	MA41A-001	15-Oct-04	1	MW12-021	04-Aug-94	0.1
FCT2-A	29-Sep-04	4	MA41A-001	15-Oct-04	9	MW12-021	04-Aug-94	7.5
FCT2-B	29-Sep-04	4	MA44-001	15-Oct-04	1	MW26-012	24-Jul-95	2
FCT2-EB1	24-Sep-04	9	MA44-001	15-Oct-04	6	MW28-160	03-Oct-96	5
FCT2-EB2	24-Sep-04	9	MA44-002	14-Oct-04	1	MW28-160	03-Oct-96	10
FCT2-EB3	24-Sep-04	9	MA44-002	14-Oct-04	8	MW28-SC	08-Dec-05	0
FCT2-EB4	24-Sep-04	9	MA46-001	15-Oct-04	2	MW32-165	20-Nov-96	10
FCT3-A	29-Sep-04	4	MA46-001	15-Oct-04	8.5	MW33-165	21-Oct-96	5
FCT3-B	29-Sep-04	4	MA56-001	15-Oct-04	9	MW34-038	27-Nov-96	10
FCT3-EB1	29-Sep-04	5	MA62-001	28-Feb-05	1	MW35-038	02-Dec-96	10
FCT3-EB2	29-Sep-04	5	MA62-002	28-Feb-05	1	MW40-030	11-Jun-97	5
GP51	01-Jun-98	4	MA62A-001	14-Oct-04	0	MW41-033	12-Jun-97	5
GP51	01-Jun-98	9	MA64-001	28-Feb-05	2	MW42-027	11-Jun-97	5
GP52	02-Jun-98	5	MA64-001	28-Feb-05	9	MW42-027	11-Jun-97	10
GP52	02-Jun-98	10	MA64-002	28-Feb-05	1	MW43-027	13-Jun-97	5
GP53	02-Jun-98	4	MA64-003	28-Feb-05	1	NBD-002	18-Oct-05	0
GP53	02-Jun-98	9	MO-SB01	28-Jul-95	7	NBD-RS-003	28-Oct-05	0
GP54	02-Jun-98	4	MO-SB02	28-Jul-95	7	NBD-RS-003	28-Oct-05	1
GP54	02-Jun-98	9	MO-SB03	28-Jul-95	7.5	NBD-RS01	04-Oct-05	0
GP55	01-Jun-98	4	MO-SB05	28-Jul-95	2	NF-005	02-Nov-05	4
GP55	01-Jun-98	9	MO-SB05	28-Jul-95	4	NF-007	02-Nov-05	3
GP58	03-Jun-98	2.5	MO-SB05	28-Jul-95	6	NF-008	02-Nov-05	0
GP58	03-Jun-98	7.5	MO-SB06	28-Jul-95	2	NF-009	04-Nov-05	0
GP59	03-Jun-98	3	MO-SB06	28-Jul-95	4	NF-010	04-Nov-05	0
GP59	03-Jun-98	8	MO-SB06	28-Jul-95	6	NF-RS-TP05	28-Oct-05	0
GP60	04-Jun-98	3	MO-SB07	28-Jul-95	2	NF-RS-TP06	28-Oct-05	0
GP60	04-Jun-98	8	MO-SB07	28-Jul-95	4	NF-TP01	4-Mar-05	3
GP61	04-Jun-98	1	MO-SB07	28-Jul-95	6	NF-TP02	4-Mar-05	2
GP61	04-Jun-98	6	MO-SB08	28-Jul-95	2	NF-TP03	4-Mar-05	0
GP62	05-Jun-98	2.5	MO-SB08	28-Jul-95	4	NF-TP03	4-Mar-05	6.5
GP62	05-Jun-98	7.5	MO-SB08	28-Jul-95	6	NF-TP04	4-Mar-05	0

^a Current depth after any removal action, regrading, or capping.

**Table 3-4
Samples Used in the East Area Risk Assessment**

Station ID	Date Sampled	Current Depth ^a	Station ID	Date Sampled	Current Depth ^a	Station ID	Date Sampled	Current Depth ^a
NF-TP04	04-Mar-05	5	PC-SB010	17-Jul-95	4.5	PC-SC024A	05-Nov-96	2.8
OWD1	14-Oct-04	0	PC-SB010	17-Jul-95	6.5	PC-SC025A	05-Nov-96	7
P1	25-Jul-94	3	PC-SB021	27-Jul-95	3	PC-SC026A	05-Nov-96	7
P1	25-Jul-94	5	PC-SB021	27-Jul-95	5	PC-SC030A	07-Nov-96	7
P1	25-Jul-94	7	PC-SB022	27-Jul-95	5	PC-SC031	01-Nov-96	4
P2	25-Jul-94	3	PC-SB025	27-Jul-95	5	PC-SC032	01-Nov-96	4
P2	25-Jul-94	5	PC-SB027	27-Jul-95	5	PC-SC033	01-Nov-96	4
P2	25-Jul-94	7	PC-SB028	28-Jul-95	5	PC-SC034	01-Nov-96	4
P3	25-Jul-94	3	PC-SB028	28-Jul-95	7	PC-SC035	07-Nov-96	6
P3	25-Jul-94	5	PC-SB031	28-Jul-95	5	PC-SC036	07-Nov-96	6
P3	25-Jul-94	7	PC-SB031	28-Jul-95	7	PC-SC037	01-Nov-96	6
P4	25-Jul-94	3	PC-SB033	28-Jul-95	6	PC-SC038	01-Nov-96	6
P4	25-Jul-94	5	PC-SB033	28-Jul-95	8	PC-SC039	01-Nov-96	6
P4	25-Jul-94	8	PC-SB034	28-Jul-95	3	PC-SC040	01-Nov-96	6
PCBCS1	24-Mar-05	0.5	PC-SB034	28-Jul-95	7	PC-SC041A	12-Nov-96	4.8
PCBCS2	24-Mar-05	5.6	PC-SB036	28-Jul-95	6	PC-SC042A	12-Nov-96	3.8
PCBCS2-8	20-Oct-04	2	PC-SB036	28-Jul-95	8	PC-SC071A	07-Nov-96	3.8
PCBCS3	03-Aug-05	0.5	PC-SB037	28-Jul-95	6	PC-SC072A	07-Nov-96	3.8
PCBCS5	16-Feb-05	0.5	PC-SB037	28-Jul-95	8	PC-SC073	20-Nov-96	2.8
PCBCS6	16-Feb-05	0.5	PC-SB123	05-Sep-95	5	PC-SC074	20-Nov-96	3.8
PCBCS9	30-Mar-05	0.5	PC-SB123	05-Sep-95	7	RM-S17	18-Aug-94	0.1
PCBCS10	07-Apr-05	0.5	PC-SB124	05-Sep-95	5	RM-SD12	18-Aug-94	0.1
PCBCS11	07-Apr-05	0.5	PC-SB124	05-Sep-95	7	RRE-006	10-Jan-06	0
PCBCS12	07-Apr-05	0.5	PC-SB125	05-Sep-95	5	RRTP-005	17-Sep-04	2
PCBCS13	07-Apr-05	0.5	PC-SB125	05-Sep-95	7	RRTP-005	17-Sep-04	6
PCBCS15	03-Aug-05	0.5	PC-SB126	05-Sep-95	4	RY14-1-1	12-Nov-04	1.5
PCBCS16	23-Feb-05	0.5	PC-SB126	05-Sep-95	6	RY14-1-2	12-Nov-04	1.5
PCBCS17W	11-Aug-05	0.5	PC-SB127	05-Sep-95	4	RY14-1-3	12-Nov-04	3.5
PCBCS18W	08-Dec-04	0.5	PC-SB127	05-Sep-95	6	RY14-2-1	12-Nov-04	2
PCBCS19W	08-Dec-04	0.5	PC-SB128	05-Sep-95	5	RY14-2-2	12-Nov-04	2
PCBCS20	08-Dec-04	0.5	PC-SB128	05-Sep-95	7	RY14-3-1	12-Nov-04	1
PCBCS20W	08-Dec-04	0.5	PC-SB129	05-Sep-95	5	RY14-4-1	12-Nov-04	3
PCBCS23	28-Apr-05	6.5	PC-SB129	05-Sep-95	7	RY14-4-2	12-Nov-04	2
PCBCS28	28-Apr-05	7.5	PC-SB131	05-Sep-95	3	RY14-5-1	16-Nov-04	3.5
PCBCS30	28-Apr-05	7.5	PC-SB131	05-Sep-95	5	RY14-6-1	16-Nov-04	3.5
PCBCS31	28-Apr-05	7.5	PC-SB132	05-Sep-95	5	RY14-7-1	16-Nov-04	1.5
PCBCS32	28-Apr-05	7.5	PC-SB132	05-Sep-95	7	RY14-7-2	16-Nov-04	2.5
PCBCS33	28-Apr-05	7.5	PC-SB133	05-Sep-95	5	RY14-8-1	16-Nov-04	1.5
PCBCS34	28-Apr-05	7.5	PC-SB133	05-Sep-95	7	RY14-9-1	16-Nov-04	1.5
PCBCS35	05-May-05	9.5	PC-SB134	05-Sep-95	4	RY14-9-2	16-Nov-04	3.5
PCBCS38	11-May-05	7	PC-SB134	05-Sep-95	6	RY14-10-1	16-Nov-04	3.5
PCBCS39	11-May-05	7	PC-SB135	05-Sep-95	4	RY14-11-1	16-Nov-04	3.5
PCBCS40	11-May-05	7	PC-SB135	05-Sep-95	6	RY14-11-2	16-Nov-04	3.5
PCBCS41	11-May-05	7	PC-SB141	05-Sep-95	4	RY14-12-1	16-Nov-04	4.5
PCBCS42	11-May-05	7	PC-SB141	05-Sep-95	6	RY14-12-2	16-Nov-04	4.5
PCBCS43	11-May-05	7	PC-SB141	05-Sep-95	8.5	RY14-15-1	17-Nov-04	7.5
PCBCS44	11-May-05	7	PC-SC001	01-Nov-96	2.8	RY14-15-2	17-Nov-04	6.5
PCBCS45	11-May-05	9	PC-SC003A	05-Nov-96	3.8	RY14-15-3	17-Nov-04	3.5
PCBCS46	11-May-05	9	PC-SC004	01-Nov-96	2.8	RY14-15-4	16-Nov-04	3.5
PCBCS47	11-May-05	10	PC-SC005	01-Nov-96	2.8	RY14-16-1	16-Nov-04	1.5
PCBCS49	11-May-05	9	PC-SC006	01-Nov-96	2.8	RY14-16-2	16-Nov-04	3.5
PC-SB001	18-Jul-95	5	PC-SC007A	05-Nov-96	2.8	RY14-17-1	16-Nov-04	2.5
PC-SB001	18-Jul-95	7	PC-SC008	01-Nov-96	1.8	RY14-17-2	16-Nov-04	3.5
PC-SB002	18-Jul-95	7	PC-SC011	01-Nov-96	1.8	RY14-17-3	17-Nov-04	3.5
PC-SB004	17-Jul-95	4	PC-SC012	01-Nov-96	1.8	RY14-18-1	16-Nov-04	3.5
PC-SB004	17-Jul-95	6	PC-SC015A	05-Nov-96	6	RY14-19-1	16-Nov-04	3.5
PC-SB004	17-Jul-95	8	PC-SC016A	07-Nov-96	2.8	RY14-19-2	17-Nov-04	4
PC-SB006	17-Jul-95	6	PC-SC017	01-Nov-96	6	RY14-20-1	17-Nov-04	1.5
PC-SB007	17-Jul-95	0	PC-SC018A	05-Nov-96	7	RY14-20-2	17-Nov-04	2.5
PC-SB007	17-Jul-95	4	PC-SC019B	12-Nov-96	3.8	RY14-21-1	17-Nov-04	3.5
PC-SB007	17-Jul-95	6	PC-SC020	01-Nov-96	1.8	RY14-21-2	17-Nov-04	7.5
PC-SB008	18-Jul-95	5	PC-SC023A	05-Nov-96	2.8			

^a Current depth after any removal action, regrading, or capping.

**Table 3-4
Samples Used in the East Area Risk Assessment**

Station ID	Date Sampled	Current Depth ^a	Station ID	Date Sampled	Current Depth ^a	Station ID	Date Sampled	Current Depth ^a
RY14-22-1	17-Nov-04	7	SLSC-006	24-Nov-03	3.5	SY-CS16	21-Oct-02	0
RY14-22-2	17-Nov-04	6	SLSC-007	13-Sep-04	3	SY-CS17	21-Oct-02	0
RY14-22-3	17-Nov-04	7	SLSC-008	30-Aug-04	0	SY-CS18	21-Oct-02	0
RY14-23-1	17-Nov-04	1.5	SLSC-009	02-Oct-03	2.5	SY-SB10	24-Jun-98	3
RY14-24-1	17-Nov-04	1.5	SLSC-010	28-Oct-03	2.5	SY-SB10	24-Jun-98	8
RY14-24-2	17-Nov-04	2.5	SLSC-011	10-Nov-03	3.5	SY-SB11	24-Jun-98	4
RY14-24-3	17-Nov-04	3.5	SLSC-012	24-Nov-03	3.5	SY-SB11	24-Jun-98	9
RY14-25-1	17-Nov-04	3.5	SLSC-013	30-Aug-04	2	SYSC-019	05-Oct-04	0
RY14-25-2	17-Nov-04	2.5	SLSC-015	06-Nov-03	0.5	SYSC-020	14-Oct-04	0
RY14-25-3	17-Nov-04	2.5	SLSC-016	02-Oct-03	2.5	SYSC-021	14-Oct-04	0
RY14-26-1	17-Nov-04	3.5	SLSC-017	13-Oct-03	2.5	SYSC-022	14-Oct-04	0
RY14-26-2	17-Nov-04	2.5	SLSC-018	13-Oct-03	1.5	SYSC-023	14-Oct-04	0
RY14-27-1	17-Nov-04	3.5	SLSC-019	10-Nov-03	0.5	SYSC-024	14-Oct-04	0
RY14-27-2	17-Nov-04	3.5	SLSC-020	30-Aug-04	0	SYSC-025	14-Oct-04	0
RY14-27-3	17-Nov-04	3.5	SLSC-021	06-Nov-03	0.5	SYSC-026	14-Oct-04	0
RY14-27-4	17-Nov-04	1.5	SLSC-023	30-Oct-03	2.5	SYSC-027	14-Oct-04	0
RY14-28-1	17-Nov-04	3.5	SLSC-024	30-Oct-03	2.5	SYSC-028	20-Dec-04	0
RY1-A-02	3-Mar-05	7.5	SLSC-025	10-Nov-03	0.5	SYSC-029	04-Nov-04	0
RY1-A-05	03-Mar-05	7	SLSC-026	06-Nov-03	0.5	SYSC-030	04-Nov-04	0
RY1-A-06	03-Mar-05	7	SLSC-027	02-Oct-03	0.5	SYSC-031	04-Nov-04	0
RY1-A-07	03-Mar-05	7	SLSC-028	24-Nov-03	0.5	SYSC-032	04-Nov-04	0
RY1-A-10	03-Mar-05	5	SLSC-030	13-Sep-04	2	SYSC-033	20-Dec-04	0
RY1-A-12	03-Mar-05	4.5	SLSC-031	05-Oct-04	0	TPIT-2	25-Jan-95	4
RY1-A-15	04-Mar-05	4.5	SLSC-032	05-Oct-04	8	WF-003	30-Nov-05	0
RY2-CS-002	12-Oct-05	9.5	SP02	21-Jul-94	2.5	WF-004	30-Nov-05	0
RY2-CS-003	12-Oct-05	9.5	SP05	21-Jul-94	2	WF-010	3-Jan-06	0
RY2-CS-004	12-Oct-05	9.5	SP06	21-Jul-94	2	WF-011	3-Jan-06	0
RY2-CS-005	12-Oct-05	9.5	SP07	21-Jul-94	1.5	WF-012	3-Jan-06	0
RYCS2	29-Jun-05	4	SP08	21-Jul-94	1.5	WF-013	10-Jan-06	0
SA2-007	30-Nov-05	1	SP09	21-Jul-94	1	WF1	23-Sep-94	2
SA3-007	08-Dec-05	0	SS01	14-Mar-95	1.5	WF2	23-Sep-94	2
SA3-TP003	30-Nov-05	0	SY1	25-Jul-94	1	WF3	23-Sep-94	2
SA4-001	03-Jan-06	0	SY1	25-Jul-94	3	WF-TP01	17-Sep-04	0
SA4-001	03-Jan-06	1.5	SY14	25-Jul-94	2	WF-TP01	17-Sep-04	1
SA4-002	03-Jan-06	0	SY2	25-Jul-94	1	WF-TP01	17-Sep-04	7
SA5-005	30-Nov-05	0	SY2	25-Jul-94	3	WF-TP02	17-Sep-04	0
SA5-BC1	02-Nov-05	2	SYCS-01A	15-Oct-04	0	WF-TP02	17-Sep-04	7
SA5-BC2-RS	30-Nov-05	0	SYCS-02A	15-Oct-04	0	WF-TP05	17-Sep-04	0
SA6-TP01	19-Jan-06	0	SY-CS03	27-Sep-02	0	WF-TP05	17-Sep-04	4
SA6-TP02	19-Jan-06	0	SY-CS03A	4-Oct-02	0	WF-TP05	17-Sep-04	7
SA6-TP03	19-Jan-06	0	SY-CS03A	21-Oct-02	0	WP06	20-Feb-95	7
SA7-RS-006	12-Oct-05	0	SY-CS04	04-Oct-02	0	WP07	20-Feb-95	7
SB-001	10-Jun-04	8	SY-CS04	21-Oct-02	0	WP08	20-Feb-95	8
SB75	16-Aug-00	6.5	SY-CS05	04-Oct-02	0	WSD-003	18-Oct-05	1
SD22	22-Feb-95	0.1	SY-CS05	21-Oct-02	0	WSD-RS-001	10-Oct-05	0
SD25	22-Feb-95	0.1	SY-CS06	04-Oct-02	0	WSD-RS04	03-Oct-05	5
SD26	22-Feb-95	0.1	SY-CS06	21-Oct-02	0	WSD-SC02	26-Jul-05	0
SD27	23-Feb-95	0.1	SY-CS07	04-Oct-02	0			
SD-SD03	9-May-97	0	SY-CS07	21-Oct-02	0			
SD-SD04	9-May-97	0	SY-CS08	04-Oct-02	0			
SD-SD05	9-May-97	0	SY-CS08	21-Oct-02	0			
SL-SB61	23-Jun-98	2.5	SY-CS09	21-Oct-02	0			
SL-SB61	23-Jun-98	7.5	SY-CS10	04-Oct-02	0			
SLSC-001	13-Oct-03	0.5	SY-CS10	21-Oct-02	0			
SLSC-002	28-Oct-03	0.5	SY-CS11	21-Oct-02	0			
SLSC-003	28-Oct-03	0.5	SY-CS12	21-Oct-02	0			
SLSC-004	28-Oct-03	2.5	SY-CS13	21-Oct-02	0			
SLSC-005	10-Nov-03	2.5	SY-CS14	21-Oct-02	0			
SLSC-006	24-Nov-03	2.5	SY-CS15	21-Oct-02	0			

^a Current depth after any removal action, regrading, or capping.

**Table 4-1
Chemicals of Potential Concern Identified for Each of the Exposure Areas**

Analyte	Fairview Farms		Outside the Dike	South Wetlands		East Area	
	Surface Soil	Subsurface Soil	Surface Soil	Surface Soil	Subsurface Soil	Surface Soil	Subsurface Soil
4,4-DDD	NT	NT	NT	NT	✓	NT	NT
4,4-DDE	NT	NT	NT	NT	✓	NT	NT
4,4-DDT	NT	NT	NT	NT	✓	NT	NT
4,4-Methoxychlor	NT	NT	NT	NT	ND	NT	NT
Acenaphthene	1	1	✓	✓	✓	✓	✓
Acenaphthylene	ND	ND	1	1	4	4	1
Aldrin	NT	NT	NT	NT	ND	NT	NT
Alpha-BHC	NT	NT	NT	NT	ND	NT	NT
Aluminum	✓	✓	✓	✓	✓	✓	✓
Aniline	ND	ND	NT	NT	NT	ND	ND
Anthracene	✓	✓	✓	✓	✓	✓	✓
Antimony	ND	ND	NT	✓	✓	1	1
Aroclor-1016	ND	ND	NT	ND	ND	ND	ND
Aroclor-1221	ND	ND	NT	ND	ND	ND	ND
Aroclor-1232	ND	ND	NT	ND	ND	ND	1
Aroclor-1242	ND	ND	NT	ND	ND	1	1
Aroclor-1248	ND	ND	NT	✓	✓	✓	✓
Aroclor-1254	ND	ND	NT	✓	✓	1	1
Aroclor-1260	✓	✓	✓	ND	ND	✓	✓
Aroclor-1262	NT	NT	NT	NT	ND	1	✓
Aroclor-1268	ND	ND	✓	NT	ND	✓	✓
Arsenic	3	3	✓	✓	✓	✓	✓
Barium	✓	✓	✓	✓	✓	✓	✓
Benzene	ND	ND	NT	NT	NT	ND	ND
Benzo (a) anthracene	✓	✓	✓	✓	✓	✓	✓
Benzo (a) pyrene	✓	✓	✓	✓	✓	✓	✓
Benzo (b) fluoranthene	✓	✓	✓	✓	✓	✓	✓
Benzo (g,h,i) perylene	4	4	4	4	4	4	4
Benzo (k) fluoranthene	✓	✓	✓	✓	✓	✓	✓
Benzoic Acid	ND	ND	NT	NT	NT	ND	ND
Benzyl Alcohol	ND	ND	NT	NT	NT	ND	ND
Beryllium	✓	✓	✓	✓	✓	✓	✓
beta-BHC	NT	NT	NT	NT	ND	NT	NT
Bis(2-Chloroisopropyl) Ether	ND	ND	ND	NT	NT	ND	ND
Bis(2-Ethylhexyl) Phthalate	ND	ND	ND	NT	NT	1	1
Bromobenzene	ND	ND	NT	NT	NT	ND	ND
Bromochloromethane	ND	ND	NT	NT	NT	ND	ND
Bromodichloromethane	ND	ND	NT	NT	NT	ND	ND
Bromoform	ND	ND	NT	NT	NT	ND	ND
Bromomethane	✓	✓	NT	NT	NT	✓	✓
Butyl Benzyl Phthalate	ND	ND	ND	NT	NT	ND	ND
Cadmium	✓	✓	✓	✓	✓	✓	✓
Calcium	2	2	2	2	2	2	2
Carbazole	NT	NT	ND	NT	NT	ND	ND
Carbon Tetrachloride	ND	ND	NT	NT	NT	ND	ND
Chlordane	NT	NT	NT	NT	ND	NT	NT
Chlorobenzene	ND	ND	NT	NT	NT	ND	ND
Chlorodibromomethane	ND	ND	NT	NT	NT	ND	ND
Chloroethane	ND	ND	NT	NT	NT	ND	ND
Chloroform	ND	ND	NT	NT	NT	ND	ND
Chloromethane	ND	ND	NT	NT	NT	ND	ND
Chromium	✓	✓	✓	✓	✓	✓	✓
Chrysene	✓	✓	✓	✓	✓	✓	✓
Cis-1,2-Dichloroethene	ND	ND	NT	NT	NT	ND	ND
Cis-1,3-Dichloropropene	ND	ND	NT	NT	NT	ND	ND
Cobalt	✓	✓	✓	✓	✓	✓	✓
Copper	✓	✓	✓	✓	✓	✓	✓
Cyanide, Total	✓	✓	✓	✓	✓	✓	✓
delta-BHC	NT	NT	NT	NT	ND	NT	NT
Dibenzo (a,h) anthracene	1	1	✓	✓	✓	✓	✓
Dibenzofuran	ND	ND	ND	NT	NT	✓	✓
Dibromomethane	ND	ND	NT	NT	NT	ND	ND
Dieldrin	NT	NT	NT	NT	ND	NT	NT

**Table 4-1
Chemicals of Potential Concern Identified for Each of the Exposure Areas**

Analyte	Fairview Farms		Outside the Dike	South Wetlands		East Area	
	Surface Soil	Subsurface Soil	Surface Soil	Surface Soil	Subsurface Soil	Surface Soil	Subsurface Soil
Diesel by 8015	4	4	4	NT	NT	NT	NT
Diesel by HCID	NT	NT	ND	ND	ND	NT	NT
Diethyl Phthalate	ND	ND	ND	NT	NT	ND	ND
Dimethyl Phthalate	ND	ND	ND	NT	NT	ND	ND
Di-n-Butyl Phthalate	ND	ND	ND	NT	NT	ND	ND
Di-n-Octyl Phthalate	ND	ND	ND	NT	NT	ND	ND
Endosulfan I	NT	NT	NT	NT	ND	NT	NT
Endosulfan II	NT	NT	NT	NT	4	NT	NT
Endosulfan Sulfate	NT	NT	NT	NT	ND	NT	NT
Endrin	NT	NT	NT	NT	ND	NT	NT
Endrin Aldehyde	NT	NT	NT	NT	ND	NT	NT
Ethylbenzene	ND	ND	NT	NT	NT	ND	ND
Fluoranthene	✓	✓	✓	✓	✓	✓	✓
Fluorene	1	1	✓	✓	✓	✓	✓
Fluoride	✓	✓	✓	✓	✓	✓	✓
Gas by HCID	NT	NT	ND	ND	ND	NT	NT
Gasoline by 8015	ND	ND	ND	NT	NT	NT	NT
Heavy Oil by HCID	NT	NT	ND	ND	4	NT	NT
Heptachlor	NT	NT	NT	NT	ND	NT	NT
Heptachlor Epoxide	NT	NT	NT	NT	ND	NT	NT
Hexachlorobenzene	ND	ND	ND	NT	NT	ND	ND
Hexachlorobutadiene	ND	ND	ND	NT	NT	ND	ND
Hexachlorocyclopentadiene	ND	ND	ND	NT	NT	ND	ND
Hexachloroethane	ND	ND	ND	NT	NT	ND	ND
Indeno (1,2,3-cd) pyrene	✓	✓	✓	✓	✓	✓	✓
Iron	3	3	3	3	3	3	3
Isophorone	ND	ND	ND	NT	NT	ND	ND
Isopropylbenzene	ND	ND	NT	NT	NT	ND	1
Lead	✓	✓	✓	✓	✓	✓	✓
Lindane	NT	NT	NT	NT	ND	NT	NT
m+p-Xylenes	ND	ND	NT	NT	NT	ND	ND
Magnesium	2	2	2	2	2	2	2
Manganese	✓	✓	✓	3	3	✓	✓
Mercury	3	3	✓	✓	✓	✓	✓
Methylene Chloride	ND	ND	NT	NT	NT	✓	✓
Naphthalene	ND	ND	✓	✓	✓	✓	✓
n-Butylbenzene	ND	ND	NT	NT	NT	ND	1
Nickel	✓	✓	✓	✓	✓	✓	✓
Nitrobenzene	ND	ND	ND	NT	NT	ND	ND
n-Nitrosodi-n-Propylamine	ND	ND	ND	NT	NT	ND	ND
n-Nitrosodiphenylamine	ND	ND	ND	NT	NT	ND	ND
n-Propylbenzene	ND	ND	NT	NT	NT	ND	1
o-Xylene	ND	ND	NT	NT	NT	ND	ND
Pentachlorophenol	ND	ND	ND	NT	NT	ND	ND
Phenanthrene	4	4	4	4	4	4	4
Phenol	ND	ND	ND	NT	NT	ND	ND
p-Isopropyltoluene	ND	ND	NT	NT	NT	ND	ND
Polychlorinated Biphenyls (PCBs)	1	1	✓	✓	✓	1	✓
Potassium	2	2	2	2	2	2	2
Pyrene	✓	✓	✓	✓	✓	✓	✓
Sec-Butylbenzene	ND	ND	NT	NT	NT	ND	1
Selenium	✓	1	ND	✓	✓	1	1
Silver	ND	ND	ND	✓	✓	1	1
Sodium	2	2	2	2	2	2	2
Styrene	ND	ND	NT	NT	NT	ND	ND
Tert-Butylbenzene	ND	ND	NT	NT	NT	ND	ND
Tetrachloroethene	ND	ND	NT	NT	NT	ND	1
Thallium	ND	ND	ND	✓	1	ND	ND
Toluene	ND	ND	NT	NT	NT	ND	ND
Total Organic Carbon	4	3	4	3	4	3	3
Total PAH	NT	NT	4	4	4	4	4
Toxaphene	NT	NT	NT	NT	ND	NT	NT
TPH by 418_1	4	4	4	4	4	4	4

**Table 4-1
Chemicals of Potential Concern Identified for Each of the Exposure Areas**

Analyte	Fairview Farms		Outside the Dike	South Wetlands		East Area	
	Surface Soil	Subsurface Soil	Surface Soil	Surface Soil	Subsurface Soil	Surface Soil	Subsurface Soil
Trans-1,2-Dichloroethene	ND	ND	NT	NT	NT	ND	ND
Trans-1,3-Dichloropropene	ND	ND	NT	NT	NT	ND	ND
Trichloroethene	ND	ND	NT	NT	NT	ND	ND
Trichlorofluoromethane	ND	ND	NT	NT	NT	ND	ND
Vanadium	3	3	✓	✓	✓	✓	✓
Vinyl Chloride	ND	ND	NT	NT	NT	ND	ND
Zinc	✓	✓	✓	✓	✓	✓	✓

✓ = Constituent was selected as a chemical of potential concern and used in the risk assessment.

1. Frequency of detection is less than 5%.
 2. Chemical is an essential nutrient.
 3. Exposure point concentration (EPC) does not exceed background levels.
 4. No toxicity factor exists for chemical.
- NT = Analyte was not tested for at this exposure area.
 ND = Analyte was not detected at site.

**Table 4-2
Fairview Farms Surface Soil Summary Statistics and Exposure Point Concentrations (EPCs)**

Analyte	Number of Detects	Number of Samples	Frequency of Detection	Minimum Nondetect Value	Maximum Nondetect Value	Minimum Detected Value	Maximum Detected Value	Arithmetic Mean	Calculated EPC	Basis	EPC > MAXDET	Final EPC	Basis	Background ^a	Retain as COPC?	Reason
Acenaphthene	2	44	4.5%	1.20E-01	3.00E-01	1.10E-01	1.60E-01	1.40E-01	1.46E-01	Non-parametric	FALSE	1.46E-01	Non-parametric	-	No	1
Aluminum	36	36	100%	-	-	1.17E+04	2.83E+04	1.89E+04	1.98E+04	Normal	FALSE	1.98E+04	Normal	14600	Yes	-
Anthracene	7	44	16%	1.70E-01	3.00E-01	1.00E-02	2.60E-01	1.36E-01	1.68E-01	Non-parametric	FALSE	1.68E-01	Non-parametric	-	Yes	-
Aroclor-1260	2	6	33%	8.00E-02	1.20E-01	1.20E-01	1.70E-01	8.17E-02	1.25E-01	Normal	FALSE	1.25E-01	Normal	-	Yes	-
Arsenic	42	42	100%	-	-	1.93E+00	9.01E+00	5.14E+00	5.64E+00	Non-parametric	FALSE	5.64E+00	Non-parametric	11.9	No	3
Barium	39	39	100%	-	-	5.97E+01	2.15E+02	1.42E+02	1.49E+02	Non-parametric	FALSE	1.49E+02	Non-parametric	107	Yes	-
Benzo (a) anthracene	20	42	48%	3.00E-01	3.00E-01	3.00E-02	6.00E-01	2.17E-01	3.07E-01	Non-parametric	FALSE	3.07E-01	Non-parametric	-	Yes	-
Benzo (a) pyrene	13	42	31%	3.00E-01	3.00E-01	4.00E-02	7.00E-01	2.00E-01	2.99E-01	Non-parametric	FALSE	2.99E-01	Non-parametric	-	Yes	-
Benzo (b) fluoranthene	19	42	45%	3.00E-01	3.00E-01	5.00E-02	1.10E+00	2.76E-01	4.43E-01	Non-parametric	FALSE	4.43E-01	Non-parametric	-	Yes	-
Benzo (g,h,i) perylene	13	44	30%	3.00E-01	3.00E-01	3.00E-02	1.80E+00	2.49E-01	4.60E-01	Non-parametric	FALSE	4.60E-01	Non-parametric	-	No	4
Benzo (k) fluoranthene	16	44	36%	3.00E-01	3.00E-01	2.00E-02	1.20E+00	2.04E-01	3.31E-01	Non-parametric	FALSE	3.31E-01	Non-parametric	-	Yes	-
Beryllium	36	42	86%	5.00E-01	1.00E+00	5.40E-01	1.20E+00	6.76E-01	7.24E-01	Non-parametric	FALSE	7.24E-01	Non-parametric	0.72	Yes	-
Bromomethane	1	1	100%	-	-	5.00E-03	5.00E-03	5.00E-03	5.00E-03	MAXDET	FALSE	5.00E-03	MAXDET	-	Yes	-
Cadmium	3	39	8%	5.00E-01	3.00E+00	5.40E-01	1.12E+00	3.33E-01	4.04E-01	Non-parametric	FALSE	4.04E-01	Non-parametric	0.77	Yes	-
Calcium	36	36	100%	-	-	3.58E+03	8.12E+03	5.60E+03	5.86E+03	Normal	FALSE	5.86E+03	Normal	2860	No	2
Chromium	39	39	100%	-	-	1.35E+01	3.14E+01	2.30E+01	2.41E+01	Non-parametric	FALSE	2.41E+01	Non-parametric	19.3	Yes	-
Chrysene	22	43	51%	3.00E-01	3.00E-01	4.00E-02	2.20E+00	3.00E-01	5.32E-01	Non-parametric	FALSE	5.32E-01	Non-parametric	-	Yes	-
Cobalt	38	38	100%	-	-	6.10E+00	1.55E+01	9.72E+00	1.03E+01	Non-parametric	FALSE	1.03E+01	Non-parametric	7.21	Yes	-
Copper	38	38	100%	-	-	2.46E+01	4.02E+01	3.25E+01	3.36E+01	Normal	FALSE	3.36E+01	Normal	28.5	Yes	-
Cyanide, Total	2	28	7%	1.80E-01	1.00E+00	5.20E-01	2.10E+00	5.03E-01	7.84E-01	Non-parametric	FALSE	7.84E-01	Non-parametric	0.027	Yes	-
Dibenzo (a,h) anthracene	2	44	4.5%	1.20E-01	3.00E-01	3.60E-01	5.20E-01	1.54E-01	1.72E-01	Non-parametric	FALSE	1.72E-01	Non-parametric	-	No	1
Diesel by 8015	2	2	100%	-	-	3.30E+01	3.60E+01	3.45E+01	3.60E+01	MAXDET	FALSE	3.60E+01	MAXDET	-	No	4
Fluoranthene	12	42	29%	3.00E-01	3.00E-01	5.00E-02	7.00E-01	2.01E-01	2.41E-01	Non-parametric	FALSE	2.41E-01	Non-parametric	-	Yes	-
Fluorene	1	44	2%	3.00E-02	3.00E-01	6.00E-02	6.00E-02	1.35E-01	1.43E-01	Non-parametric	TRUE	6.00E-02	MAXDET	-	No	1
Fluoride	42	42	100%	-	-	1.10E+01	6.20E+02	3.07E+02	3.83E+02	Non-parametric	FALSE	3.83E+02	Non-parametric	250	Yes	-
Indeno (1,2,3-cd) pyrene	10	44	23%	1.20E-01	3.00E-01	8.00E-02	1.50E+00	2.18E-01	3.87E-01	Non-parametric	FALSE	3.87E-01	Non-parametric	-	Yes	-
Iron	36	36	100%	-	-	1.42E+04	3.55E+04	2.35E+04	2.49E+04	Normal	FALSE	2.49E+04	Normal	122000	No	3
Lead	42	42	100%	-	-	8.50E+00	3.43E+01	1.94E+01	2.11E+01	Non-parametric	FALSE	2.11E+01	Non-parametric	28	Yes	-
Magnesium	36	36	100%	-	-	1.70E+03	7.78E+03	5.06E+03	5.42E+03	Normal	FALSE	5.42E+03	Normal	3950	No	2
Manganese	38	38	100%	-	-	1.10E+02	7.58E+02	3.46E+02	3.88E+02	Normal	FALSE	3.88E+02	Normal	252	Yes	-
Mercury	3	42	7%	2.00E-01	2.30E-01	2.00E-02	8.00E-02	9.70E-02	1.00E-01	Non-parametric	TRUE	8.00E-02	MAXDET	0.08	No	3
Nickel	38	38	100%	-	-	1.18E+01	2.80E+01	1.97E+01	2.07E+01	Normal	FALSE	2.07E+01	Normal	15.5	Yes	-
Phenanthrene	12	44	27%	3.00E-01	3.00E-01	2.00E-02	1.00E+00	1.90E-01	3.02E-01	Normal	FALSE	3.02E-01	Normal	-	No	4
Polychlorinated Biphenyls (PCBs)	1	23	4%	3.00E-01	3.00E-01	4.30E-01	4.30E-01	1.62E-01	1.85E-01	Non-parametric	FALSE	1.85E-01	Non-parametric	-	No	1
Potassium	37	37	100%	-	-	4.30E+02	2.90E+03	1.38E+03	1.57E+03	Non-parametric	FALSE	1.57E+03	Non-parametric	1900	No	2
Pyrene	16	42	38%	3.00E-01	3.00E-01	5.00E-02	8.00E-01	2.30E-01	3.50E-01	Non-parametric	FALSE	3.50E-01	Non-parametric	-	Yes	-
Selenium	2	39	5%	9.00E-01	1.00E+00	1.00E+00	1.10E+00	5.27E-01	5.63E-01	Non-parametric	FALSE	5.63E-01	Non-parametric	0.35	Yes	-
Sodium	38	38	100%	-	-	3.80E+02	1.39E+03	8.19E+02	8.81E+02	Normal	FALSE	8.81E+02	Normal	670	No	2
Total Organic Carbon	5	5	100%	-	-	3.50E+02	4.05E+04	1.38E+04	3.19E+04	Normal	FALSE	3.19E+04	Normal	58100	No	4
TPH by 418_1	1	1	100%	-	-	6.40E+01	6.40E+01	6.40E+01	6.40E+01	MAXDET	FALSE	6.40E+01	MAXDET	-	No	4
Vanadium	38	38	100%	-	-	4.48E+01	9.47E+01	6.33E+01	6.59E+01	Normal	FALSE	6.59E+01	Normal	125	No	3
Zinc	38	38	100%	-	-	3.79E+01	1.89E+02	7.81E+01	8.43E+01	Lognormal	FALSE	8.43E+01	Lognormal	140	Yes	-

^a Background values from *Technical Memorandum DS No. 12: Background Data Summary for RMC-Troutdale* (CH2M HILL, December 3, 1996).

Reasons:

1. Frequency of detection is less than 5 percent.
2. Chemical is an essential nutrient.
3. Maximum detected volume does not exceed background levels.
4. No toxicity factor exists for chemical.

**Table 4-3
Fairview Farms Subsurface Soil Summary Statistics and Exposure Point Concentrations (EPCs)**

Analyte	Number of Detects	Number of Samples	Frequency of Detection	Minimum Nondetect Value	Maximum Nondetect Value	Minimum Detected Value	Maximum Detected Value	Arithmetic Mean	Calculated EPC	Basis	EPC > MAXDET	Final EPC	Basis	Background ^a	Retain as COPC?	Reason
Acenaphthene	2	50	4%	1.20E-01	3.00E-01	1.10E-01	1.60E-01	1.41E-01	1.46E-01	Non-parametric	FALSE	1.46E-01	Non-parametric	-	No	1
Aluminum	42	42	100%	-	-	6.52E+03	2.83E+04	1.83E+04	1.92E+04	Non-parametric	FALSE	1.92E+04	Non-parametric	1.46E+04	Yes	-
Anthracene	7	50	14%	1.70E-01	3.00E-01	1.00E-02	2.60E-01	1.38E-01	1.66E-01	Non-parametric	FALSE	1.66E-01	Non-parametric	-	Yes	-
Aroclor-1260	2	6	33%	8.00E-02	1.20E-01	1.20E-01	1.70E-01	8.17E-02	1.25E-01	Normal	FALSE	1.25E-01	Normal	-	Yes	-
Arsenic	48	48	100%	-	-	6.20E-01	9.01E+00	4.83E+00	5.28E+00	Normal	FALSE	5.28E+00	Normal	1.19E+01	No	3
Barium	45	45	100%	-	-	2.47E+01	2.15E+02	1.35E+02	1.43E+02	Non-parametric	FALSE	1.43E+02	Non-parametric	1.07E+02	Yes	-
Benzo (a) anthracene	20	48	42%	3.00E-01	3.00E-01	3.00E-02	6.00E-01	2.09E-01	2.89E-01	Non-parametric	FALSE	2.89E-01	Non-parametric	-	Yes	-
Benzo (a) pyrene	13	48	27%	3.00E-01	3.00E-01	4.00E-02	7.00E-01	1.94E-01	2.29E-01	Non-parametric	FALSE	2.29E-01	Non-parametric	-	Yes	-
Benzo (b) fluoranthene	19	48	40%	3.00E-01	3.00E-01	5.00E-02	1.10E+00	2.60E-01	4.08E-01	Non-parametric	FALSE	4.08E-01	Non-parametric	-	Yes	-
Benzo (g,h,i) perylene	13	50	26%	3.00E-01	3.00E-01	3.00E-02	1.80E+00	2.37E-01	4.23E-01	Non-parametric	FALSE	4.23E-01	Non-parametric	-	No	4
Benzo (k) fluoranthene	16	50	32%	3.00E-01	3.00E-01	2.00E-02	1.20E+00	1.97E-01	3.10E-01	Non-parametric	FALSE	3.10E-01	Non-parametric	-	Yes	-
Beryllium	39	48	81%	5.00E-01	1.00E+00	5.40E-01	1.20E+00	6.45E-01	6.94E-01	Non-parametric	FALSE	6.94E-01	Non-parametric	7.20E-01	Yes	-
Bromomethane	1	1	100%	-	-	5.00E-03	5.00E-03	5.00E-03	5.00E-03	MAXDET	FALSE	5.00E-03	MAXDET	-	Yes	-
Cadmium	3	45	7%	5.00E-01	3.00E+00	5.40E-01	1.12E+00	3.22E-01	3.84E-01	Non-parametric	FALSE	3.84E-01	Non-parametric	7.70E-01	Yes	-
Calcium	42	42	100%	-	-	3.28E+03	8.12E+03	5.42E+03	5.68E+03	Non-parametric	FALSE	5.68E+03	Non-parametric	2.86E+03	No	2
Chromium	45	45	100%	-	-	7.97E+00	3.14E+01	2.20E+01	2.33E+01	Non-parametric	FALSE	2.33E+01	Non-parametric	1.93E+01	Yes	-
Chrysene	22	49	45%	3.00E-01	3.00E-01	4.00E-02	2.20E+00	2.82E-01	4.87E-01	Non-parametric	FALSE	4.87E-01	Non-parametric	-	Yes	-
Cobalt	44	44	100%	-	-	3.10E+00	1.55E+01	9.31E+00	9.88E+00	Normal	FALSE	9.88E+00	Normal	7.21E+00	Yes	-
Copper	44	44	100%	-	-	1.44E+01	4.30E+01	3.20E+01	3.33E+01	Normal	FALSE	3.33E+01	Normal	2.85E+01	Yes	-
Cyanide, Total	2	34	6%	1.80E-01	1.00E+00	5.20E-01	2.10E+00	5.02E-01	7.33E-01	Non-parametric	FALSE	7.33E-01	Non-parametric	2.70E-02	Yes	-
Dibenzo (a,h) anthracene	2	50	4%	1.20E-01	3.00E-01	3.60E-01	5.20E-01	1.53E-01	1.70E-01	Non-parametric	FALSE	1.70E-01	Non-parametric	-	No	1
Diesel by 8015	2	2	100%	-	-	3.30E+01	3.60E+01	3.45E+01	3.60E+01	MAXDET	FALSE	3.60E+01	MAXDET	-	No	4
Fluoranthene	12	48	25%	3.00E-01	3.00E-01	5.00E-02	7.00E-01	1.95E-01	2.29E-01	Non-parametric	FALSE	2.29E-01	Non-parametric	-	Yes	-
Fluorene	1	50	2%	3.00E-02	3.00E-01	6.00E-02	6.00E-02	1.37E-01	1.44E-01	Non-parametric	TRUE	6.00E-02	MAXDET	-	No	1
Fluoride	48	48	100%	-	-	1.10E+01	6.20E+02	3.01E+02	3.27E+02	Normal	FALSE	3.27E+02	Normal	2.50E+02	Yes	-
Indeno (1,2,3-cd) pyrene	10	50	20%	1.20E-01	3.00E-01	8.00E-02	1.50E+00	2.10E-01	3.59E-01	Non-parametric	FALSE	3.59E-01	Non-parametric	-	Yes	-
Iron	42	42	100%	-	-	9.50E+03	3.55E+04	2.23E+04	2.39E+04	Non-parametric	FALSE	2.39E+04	Non-parametric	1.22E+05	No	3
Lead	46	48	96%	5.00E+00	5.00E+00	6.80E+00	3.43E+01	1.80E+01	1.97E+01	Normal	FALSE	1.97E+01	Normal	2.80E+01	Yes	-
Magnesium	42	42	100%	-	-	5.47E+02	7.78E+03	4.71E+03	5.10E+03	Non-parametric	FALSE	5.10E+03	Non-parametric	3.95E+03	No	2
Manganese	44	44	100%	-	-	6.89E+01	7.58E+02	3.18E+02	3.64E+02	Non-parametric	FALSE	3.64E+02	Non-parametric	2.52E+02	Yes	-
Mercury	3	48	6%	2.00E-01	2.30E-01	2.00E-02	8.00E-02	9.74E-02	1.00E-01	Non-parametric	TRUE	8.00E-02	MAXDET	8.00E-02	No	3
Nickel	44	44	100%	-	-	5.87E+00	2.80E+01	1.88E+01	1.99E+01	Normal	FALSE	1.99E+01	Normal	1.55E+01	Yes	-
Phenanthrene	12	50	24%	3.00E-01	3.00E-01	2.00E-02	1.00E+00	1.85E-01	2.84E-01	Non-parametric	FALSE	2.84E-01	Non-parametric	-	No	4
Polychlorinated Biphenyls (PCBs)	1	23	4%	3.00E-01	3.00E-01	4.30E-01	4.30E-01	1.62E-01	1.85E-01	Non-parametric	FALSE	1.85E-01	Non-parametric	-	No	1
Potassium	43	43	100%	-	-	1.60E+02	2.90E+03	1.27E+03	1.46E+03	Non-parametric	FALSE	1.46E+03	Non-parametric	1.90E+03	No	2
Pyrene	16	48	33%	3.00E-01	3.00E-01	5.00E-02	8.00E-01	2.20E-01	3.26E-01	Non-parametric	FALSE	3.26E-01	Non-parametric	-	Yes	-
Selenium	2	45	4%	9.00E-01	1.00E+00	1.00E+00	1.10E+00	5.23E-01	5.54E-01	Non-parametric	FALSE	5.54E-01	Non-parametric	3.50E-01	No	1
Sodium	44	44	100%	-	-	3.80E+02	1.39E+03	8.45E+02	9.03E+02	Normal	FALSE	9.03E+02	Normal	6.70E+02	No	2
Total Organic Carbon	6	6	100%	-	-	3.50E+02	4.05E+04	1.21E+04	1.47E+05	Non-parametric	TRUE	4.05E+04	MAXDET	5.81E+04	No	3
TPH by 418_1	1	1	100%	-	-	6.40E+01	6.40E+01	6.40E+01	6.40E+01	MAXDET	FALSE	6.40E+01	MAXDET	-	No	4
Vanadium	44	44	100%	-	-	3.68E+01	9.47E+01	6.21E+01	6.48E+01	Normal	FALSE	6.48E+01	Normal	1.25E+02	No	3
Zinc	44	44	100%	-	-	1.58E+01	1.89E+02	7.29E+01	8.04E+01	Non-parametric	FALSE	8.04E+01	Non-parametric	1.40E+02	Yes	-

^a Background values from *Technical Memorandum DS No. 12: Background Data Summary for RMC-Troutdale* (CH2M HILL, December 3, 1996).

Reasons:

1. Frequency of detection is less than 5 percent.
2. Chemical is an essential nutrient.
3. EPC does not exceed background levels.
4. No toxicity factor exists for chemical.

**Table 4-4
Outside the Dike Surface Soil Summary Statistics and Exposure Point Concentrations (EPCs)**

Analyte	Number of Detects	Number of Samples	Frequency of Detection	Minimum Nondetect Value	Maximum Nondetect Value	Minimum Detected Value	Maximum Detected Value	Arithmetic Mean	EPC	Basis	EPC > Max	Final EPC	Basis	Background ^a	Retain as COPC?	Reason
Acenaphthene	20	83	24%	3.02E-03	8.70E-01	1.90E-03	6.30E-01	6.06E-02	1.32E-01	Non-Parametric	FALSE	1.32E-01	Non-Parametric	-	Yes	-
Acenaphthylene	1	85	1%	2.68E-03	1.50E+00	4.70E-03	4.70E-03	6.61E-02	1.50E-01	Non-Parametric	TRUE	4.70E-03	MAXDET	-	No	1
Aluminum	17	17	100%	-	-	9.26E+03	1.05E+05	2.04E+04	4.44E+04	Non-Parametric	FALSE	4.44E+04	Non-Parametric	1.46E+04	Yes	-
Anthracene	39	85	46%	3.02E-03	5.00E-01	8.50E-04	9.20E-01	7.54E-02	1.70E-01	Lognormal	FALSE	1.70E-01	Lognormal	-	Yes	-
Aroclor-1260	1	10	10%	5.00E-02	3.70E+00	8.90E-01	8.90E-01	4.43E-01	1.02E+00	Non-Parametric	TRUE	8.90E-01	MAXDET	-	Yes	-
Aroclor-1268	2	8	25%	7.00E-02	3.70E+00	1.20E+00	1.95E+00	7.62E-01	1.29E+00	Normal	FALSE	1.29E+00	Normal	-	Yes	-
Arsenic	20	22	91%	3.20E+00	5.40E+00	9.00E-01	2.12E+01	3.47E+00	7.51E+00	Non-Parametric	FALSE	7.51E+00	Non-Parametric	1.19E+01	Yes	-
Barium	19	19	100%	-	-	3.68E+01	1.56E+02	7.37E+01	8.56E+01	Non-Parametric	FALSE	8.56E+01	Non-Parametric	1.07E+02	Yes	-
Benzo (a) anthracene	58	84	69%	3.41E-03	5.00E-01	1.60E-03	7.30E+00	4.25E-01	1.44E+00	Non-Parametric	FALSE	1.44E+00	Non-Parametric	-	Yes	-
Benzo (a) pyrene	49	84	58%	3.41E-03	5.00E-01	3.89E-03	9.80E+00	5.47E-01	2.02E+00	Non-Parametric	FALSE	2.02E+00	Non-Parametric	-	Yes	-
Benzo (b) fluoranthene	53	84	63%	3.41E-03	5.00E-01	1.40E-03	1.00E+01	7.35E-01	2.53E+00	Non-Parametric	FALSE	2.53E+00	Non-Parametric	-	Yes	-
Benzo (g,h,i) perylene	47	84	56%	3.02E-03	5.00E-01	1.50E-03	6.50E+00	3.60E-01	9.03E-01	Lognormal	FALSE	9.03E-01	Lognormal	-	No	4
Benzo (k) fluoranthene	48	84	57%	3.41E-03	5.00E-01	1.30E-03	5.10E+00	3.80E-01	1.01E+00	Non-Parametric	FALSE	1.01E+00	Non-Parametric	-	Yes	-
Benzoic Acid	2	2	100%	-	-	4.80E+00	5.30E+00	5.05E+00	5.30E+00	MAXDET	FALSE	5.30E+00	MAXDET	-	Yes	-
Beryllium	3	22	14%	2.00E-01	1.40E+00	1.40E+00	9.20E+00	8.23E-01	2.60E+00	Non-Parametric	FALSE	2.60E+00	Non-Parametric	7.20E-01	Yes	-
Cadmium	8	22	36%	5.00E-01	1.10E+00	7.20E-01	2.10E+00	6.96E-01	1.27E+00	Non-Parametric	FALSE	1.27E+00	Non-Parametric	7.70E-01	Yes	-
Calcium	11	11	100%	-	-	3.52E+03	7.91E+03	4.39E+03	5.04E+03	Non-Parametric	FALSE	5.04E+03	Non-Parametric	2.86E+03	No	2
Chromium	22	22	100%	-	-	8.44E+00	5.19E+01	2.02E+01	2.39E+01	Non-Parametric	FALSE	2.39E+01	Non-Parametric	1.93E+01	Yes	-
Chrysene	61	84	73%	3.59E-03	5.00E-01	5.94E-04	7.40E+00	6.08E-01	2.38E+00	Non-Parametric	FALSE	2.38E+00	Non-Parametric	-	Yes	-
Cobalt	14	14	100%	-	-	6.43E+00	1.68E+01	1.01E+01	1.15E+01	Normal	FALSE	1.15E+01	Normal	7.21E+00	Yes	-
Copper	22	22	100%	-	-	1.65E+01	1.18E+03	1.11E+02	6.44E+02	Non-Parametric	FALSE	6.44E+02	Non-Parametric	2.85E+01	Yes	-
Cyanide, Total	7	28	25%	4.00E-02	1.42E+00	1.90E-01	1.37E+01	1.05E+00	5.83E+00	Non-Parametric	FALSE	5.83E+00	Non-Parametric	2.70E-02	Yes	-
Dibenzo (a,h) anthracene	41	85	48%	3.02E-03	5.00E-01	1.10E-03	1.50E+00	1.34E-01	3.05E-01	Non-Parametric	FALSE	3.05E-01	Non-Parametric	-	Yes	-
Diesel by 8015	1	2	50%	2.50E+01	2.50E+01	3.30E+01	3.30E+01	2.28E+01	3.30E+01	MAXDET	FALSE	3.30E+01	MAXDET	-	No	4
Fluoranthene	63	84	75%	3.59E-03	5.00E-01	1.90E-03	8.30E+00	5.16E-01	1.53E+00	Non-Parametric	FALSE	1.53E+00	Non-Parametric	-	Yes	-
Fluorene	19	85	22%	2.97E-03	1.50E+00	1.30E-03	3.60E-01	6.48E-02	1.43E-01	Non-Parametric	FALSE	1.43E-01	Non-Parametric	-	Yes	-
Fluoride	80	87	92%	2.50E+00	1.50E+02	5.90E+00	9.50E+03	5.37E+02	1.21E+03	Non-Parametric	FALSE	1.21E+03	Non-Parametric	2.50E+02	Yes	-
Indeno (1,2,3-cd) pyrene	47	84	56%	3.02E-03	5.00E-01	1.40E-03	8.00E+00	3.94E-01	1.09E+00	Non-Parametric	FALSE	1.09E+00	Non-Parametric	-	Yes	-
Iron	12	12	100%	-	-	1.34E+04	4.15E+04	2.00E+04	2.40E+04	Non-Parametric	FALSE	2.40E+04	Non-Parametric	1.22E+05	No	3
Lead	21	22	95%	5.00E+00	5.00E+00	5.40E+00	1.23E+02	2.00E+01	3.04E+01	Lognormal	FALSE	3.04E+01	Lognormal	2.80E+01	Yes	-
Magnesium	11	11	100%	-	-	2.13E+03	6.96E+03	3.41E+03	4.12E+03	Non-Parametric	FALSE	4.12E+03	Non-Parametric	3.95E+03	No	2
Manganese	13	13	100%	-	-	1.40E+02	4.47E+02	2.52E+02	2.94E+02	Normal	FALSE	2.94E+02	Normal	2.52E+02	Yes	-
Mercury	4	22	18%	4.00E-02	5.70E-01	1.00E-01	3.00E-01	1.26E-01	1.99E-01	Non-Parametric	FALSE	1.99E-01	Non-Parametric	8.00E-02	Yes	-
Naphthalene	39	85	46%	2.97E-03	1.50E+00	3.50E-04	1.20E-01	6.08E-02	1.40E-01	Non-Parametric	TRUE	1.20E-01	MAXDET	-	Yes	-
Nickel	22	22	100%	-	-	1.12E+01	3.64E+02	3.96E+01	1.09E+02	Non-Parametric	FALSE	1.09E+02	Non-Parametric	1.55E+01	Yes	-
Phenanthrene	46	85	54%	3.02E-03	5.00E-01	1.80E-03	3.20E+00	2.15E-01	5.12E-01	Non-Parametric	FALSE	5.12E-01	Non-Parametric	-	No	4
Polychlorinated Biphenyls (PCBs)	2	16	13%	2.00E-01	3.00E-01	1.30E+00	5.10E+00	5.25E-01	3.64E+00	Non-Parametric	FALSE	3.64E+00	Non-Parametric	-	Yes	-
Potassium	12	12	100%	-	-	3.38E+02	1.60E+03	6.11E+02	8.01E+02	Non-Parametric	FALSE	8.01E+02	Non-Parametric	1.90E+03	No	2
Pyrene	66	82	80%	3.37E-03	5.00E-01	1.51E-03	7.90E+00	4.70E-01	1.77E+00	Lognormal	FALSE	1.77E+00	Lognormal	-	Yes	-
Sodium	12	12	100%	-	-	4.80E+02	1.69E+03	7.22E+02	8.88E+02	Normal	FALSE	8.88E+02	Normal	6.70E+02	No	2
Total Organic Carbon	12	12	100%	-	-	5.74E+03	1.01E+05	2.44E+04	3.89E+04	Non-Parametric	FALSE	3.89E+04	Non-Parametric	5.81E+04	No	4
Total PAH	3	5	60%	2.00E-01	2.00E-01	4.20E+00	5.00E+02	1.02E+02	2.92E+03	Non-Parametric	TRUE	5.00E+02	MAXDET	-	No	4
TPH by 418_1	1	1	100%	-	-	3.50E+01	3.50E+01	3.50E+01	3.50E+01	MAXDET	FALSE	3.50E+01	MAXDET	-	No	4
Vanadium	19	19	100%	-	-	4.16E+01	2.47E+02	6.56E+01	8.41E+01	Normal	FALSE	8.41E+01	Normal	1.25E+02	Yes	-
Zinc	21	21	100%	-	-	2.94E+01	2.02E+02	6.59E+01	1.08E+02	Non-Parametric	FALSE	1.08E+02	Non-Parametric	1.40E+02	Yes	-

^a Background values from *Technical Memorandum DS No. 12: Background Data Summary for RMC-Troutdale* (CH2M HILL, December 3, 1996).

Reasons:

1. Frequency of detection is less than 5 percent.
2. Chemical is an essential nutrient.
3. EPC does not exceed background levels.
4. No toxicity factor exists for chemical.

**Table 4-5
Outside the Dike Subsurface Soil Summary Statistics and Exposure Point Concentrations (EPCs)**

Analyte	Number of Detects	Number of Samples	Frequency of Detection	Minimum Nondetect Value	Maximum Nondetect Value	Minimum Detected Value	Maximum Detected Value	Arithmetic Mean	EPC	Basis	EPC > Max	Final EPC	Basis	Background ^a	Retain as COPC?	Reason
Acenaphthene	20	75	27%	3.02E-03	8.70E-01	1.90E-03	6.30E-01	5.21E-02	1.26E-01	Non-Parametric	FALSE	1.26E-01	Non-Parametric	-	Yes	-
Acenaphthylene	1	77	1%	2.68E-03	1.50E+00	4.70E-03	4.70E-03	5.83E-02	1.47E-01	Non-Parametric	TRUE	4.70E-03	MAXDET	-	No	1
Aluminum	12	12	100%	-	-	9.26E+03	1.05E+05	2.13E+04	5.50E+04	Non-Parametric	FALSE	5.50E+04	Non-Parametric	1.46E+04	Yes	-
Anthracene	39	77	51%	3.02E-03	3.30E-01	8.50E-04	9.20E-01	6.86E-02	1.50E-01	Lognormal	FALSE	1.50E-01	Lognormal	-	Yes	-
Aroclor-1260	1	7	14%	2.00E-01	3.70E+00	8.90E-01	8.90E-01	6.17E-01	1.37E+00	Non-Parametric	TRUE	8.90E-01	MAXDET	-	Yes	-
Aroclor-1268	2	6	33%	3.30E-01	3.70E+00	1.20E+00	1.95E+00	1.00E+00	1.64E+00	Normal	FALSE	1.64E+00	Normal	-	Yes	-
Arsenic	16	16	100%	-	-	9.00E-01	2.12E+01	3.91E+00	6.33E+00	Lognormal	FALSE	6.33E+00	Lognormal	1.19E+01	Yes	-
Barium	13	13	100%	-	-	3.68E+01	1.20E+02	6.69E+01	7.86E+01	Normal	FALSE	7.86E+01	Normal	1.07E+02	Yes	-
Benzo (a) anthracene	55	76	72%	3.41E-03	3.30E-01	1.60E-03	7.30E+00	4.39E-01	1.58E+00	Lognormal	FALSE	1.58E+00	Lognormal	-	Yes	-
Benzo (a) pyrene	46	76	61%	3.41E-03	3.30E-01	3.89E-03	9.80E+00	5.70E-01	2.19E+00	Non-Parametric	FALSE	2.19E+00	Non-Parametric	-	Yes	-
Benzo (b) fluoranthene	50	76	66%	3.41E-03	3.30E-01	1.40E-03	1.00E+01	7.70E-01	2.74E+00	Non-Parametric	FALSE	2.74E+00	Non-Parametric	-	Yes	-
Benzo (g,h,i) perylene	44	76	58%	3.02E-03	3.30E-01	1.50E-03	6.50E+00	3.68E-01	9.41E-01	Lognormal	FALSE	9.41E-01	Lognormal	-	No	4
Benzo (k) fluoranthene	46	76	61%	3.41E-03	3.30E-01	1.30E-03	5.10E+00	3.99E-01	1.51E+00	Non-Parametric	FALSE	1.51E+00	Non-Parametric	-	Yes	-
Beryllium	3	16	19%	5.00E-01	1.00E+00	1.40E+00	9.20E+00	1.00E+00	6.53E+00	Non-Parametric	FALSE	6.53E+00	Non-Parametric	7.20E-01	Yes	-
Cadmium	6	16	38%	5.00E-01	1.00E+00	7.20E-01	2.10E+00	7.08E-01	1.42E+00	Non-Parametric	FALSE	1.42E+00	Non-Parametric	7.70E-01	Yes	-
Calcium	6	6	100%	-	-	3.52E+03	4.14E+03	3.78E+03	3.98E+03	Normal	FALSE	3.98E+03	Normal	2.86E+03	No	2
Chromium	16	16	100%	-	-	8.44E+00	5.19E+01	1.97E+01	2.46E+01	Non-Parametric	FALSE	2.46E+01	Non-Parametric	1.93E+01	Yes	-
Chrysene	58	76	76%	3.59E-03	3.30E-01	5.94E-04	7.40E+00	6.36E-01	2.82E+00	Lognormal	FALSE	2.82E+00	Lognormal	-	Yes	-
Cobalt	8	8	100%	-	-	6.43E+00	1.17E+01	8.80E+00	1.02E+01	Normal	FALSE	1.02E+01	Normal	7.21E+00	Yes	-
Copper	16	16	100%	-	-	1.65E+01	1.18E+03	1.40E+02	8.65E+02	Non-Parametric	FALSE	8.65E+02	Non-Parametric	2.85E+01	Yes	-
Cyanide, Total	7	20	35%	1.00E-01	1.01E+00	1.90E-01	1.37E+01	1.32E+00	7.95E+00	Non-Parametric	FALSE	7.95E+00	Non-Parametric	2.70E-02	Yes	-
Dibenzo (a,h) anthracene	39	77	51%	3.02E-03	3.30E-01	1.10E-03	1.50E+00	1.32E-01	3.20E-01	Non-Parametric	FALSE	3.20E-01	Non-Parametric	-	Yes	-
Diesel by 8015	1	1	100%	-	-	3.30E+01	3.30E+01	3.30E+01	3.30E+01	MAXDET	FALSE	3.30E+01	MAXDET	-	No	4
Fluoranthene	60	76	79%	3.59E-03	3.30E-01	1.90E-03	8.30E+00	5.34E-01	1.65E+00	Lognormal	FALSE	1.65E+00	Lognormal	-	Yes	-
Fluorene	19	77	25%	2.97E-03	1.50E+00	1.30E-03	3.60E-01	5.69E-02	1.39E-01	Non-Parametric	FALSE	1.39E-01	Non-Parametric	-	Yes	-
Fluoride	75	79	95%	2.50E+00	1.50E+02	5.90E+00	9.50E+03	5.66E+02	1.30E+03	Non-Parametric	FALSE	1.30E+03	Non-Parametric	2.50E+02	Yes	-
Indeno (1,2,3-cd) pyrene	44	76	58%	3.02E-03	3.30E-01	1.40E-03	8.00E+00	4.06E-01	1.18E+00	Non-Parametric	FALSE	1.18E+00	Non-Parametric	-	Yes	-
Iron	7	7	100%	-	-	1.34E+04	2.45E+04	1.70E+04	2.00E+04	Normal	FALSE	2.00E+04	Normal	1.22E+05	No	3
Lead	15	16	94%	5.00E+00	5.00E+00	5.40E+00	1.23E+02	2.21E+01	3.62E+01	Non-Parametric	FALSE	3.62E+01	Non-Parametric	2.80E+01	Yes	-
Magnesium	6	6	100%	-	-	2.13E+03	3.39E+03	2.73E+03	3.10E+03	Normal	FALSE	3.10E+03	Normal	3.95E+03	No	2
Manganese	8	8	100%	-	-	1.40E+02	3.22E+02	2.18E+02	2.68E+02	Normal	FALSE	2.68E+02	Normal	2.52E+02	Yes	-
Mercury	4	16	25%	8.00E-02	2.50E-01	1.00E-01	3.00E-01	1.21E-01	1.54E-01	Non-Parametric	FALSE	1.54E-01	Non-Parametric	8.00E-02	Yes	-
Naphthalene	39	77	51%	2.97E-03	1.50E+00	3.50E-04	1.20E-01	5.25E-02	1.36E-01	Non-Parametric	TRUE	1.20E-01	MAXDET	-	Yes	-
Nickel	16	16	100%	-	-	1.12E+01	3.64E+02	4.52E+01	1.40E+02	Non-Parametric	FALSE	1.40E+02	Non-Parametric	1.55E+01	Yes	-
Phenanthrene	45	77	58%	3.02E-03	3.30E-01	1.80E-03	3.20E+00	2.18E-01	5.09E-01	Lognormal	FALSE	5.09E-01	Lognormal	-	No	4
Polychlorinated Biphenyls (PCBs)	2	13	15%	2.00E-01	3.00E-01	1.30E+00	5.10E+00	6.12E-01	4.44E+00	Non-Parametric	FALSE	4.44E+00	Non-Parametric	-	Yes	-
Potassium	7	7	100%	-	-	3.38E+02	9.10E+02	4.75E+02	6.38E+02	Non-Parametric	FALSE	6.38E+02	Non-Parametric	1.90E+03	No	2
Pyrene	63	74	85%	3.37E-03	3.30E-01	1.51E-03	7.90E+00	4.83E-01	1.87E+00	Non-Parametric	FALSE	1.87E+00	Non-Parametric	-	Yes	-
Sodium	7	7	100%	-	-	4.80E+02	7.80E+02	6.28E+02	7.00E+02	Normal	FALSE	7.00E+02	Normal	6.70E+02	No	2
Total Organic Carbon	7	7	100%	-	-	5.74E+03	1.01E+05	2.68E+04	6.78E+04	Non-Parametric	FALSE	6.78E+04	Non-Parametric	5.81E+04	No	4
Total PAH	3	5	60%	2.00E-01	2.00E-01	4.20E+00	5.00E+02	1.02E+02	2.92E+03	Non-Parametric	TRUE	5.00E+02	MAXDET	-	No	4
TPH by 418_1	1	1	100%	-	-	3.50E+01	3.50E+01	3.50E+01	3.50E+01	MAXDET	FALSE	3.50E+01	MAXDET	-	No	4
Vanadium	13	13	100%	-	-	4.16E+01	2.47E+02	6.67E+01	9.62E+01	Non-Parametric	FALSE	9.62E+01	Non-Parametric	1.25E+02	Yes	-
Zinc	16	16	100%	-	-	2.94E+01	2.02E+02	6.43E+01	1.15E+02	Non-Parametric	FALSE	1.15E+02	Non-Parametric	1.40E+02	Yes	-

^a Background values from *Technical Memorandum DS No. 12: Background Data Summary for RMC-Troutdale* (CH2M HILL, December 3, 1996).

Reasons:

1. Frequency of detection is less than 5 percent.
2. Chemical is an essential nutrient.
3. EPC does not exceed background levels.
4. No toxicity factor exists for chemical.

**Table 4-6
South Wetlands Surface Soil Summary Statistics and Exposure Point Concentrations (EPCs)**

Analyte	Units	Number of Detects	Number of Samples	Frequency of Detection	Minimum Nondetect Value	Maximum Nondetect Value	Minimum Detected Value	Maximum Detected Value	Arithmetic Mean	EPC	Basis	EPC > Max	Final EPC	Basis	Background ^b	Retain as COPC?	Reason
Acenaphthene	mg/kg	6	27	22%	3.00E-01	3.00E+00	1.00E-02	8.00E-01	2.24E-01	4.69E-01	Non-Parametric	FALSE	4.69E-01	Non-Parametric	-	Yes	-
Acenaphthylene	mg/kg	1	27	4%	5.30E-03	3.00E+00	4.00E-01	4.00E-01	1.85E-01	7.08E-01	Non-Parametric	TRUE	4.00E-01	MAXDET	-	No	1
Aluminum	mg/kg	30	30	100%	-	-	9.34E+03	1.79E+05	4.87E+04	6.28E+04	Non-Parametric	FALSE	6.28E+04	Non-Parametric	1.46E+04	Yes	-
Anthracene	mg/kg	6	27	22%	5.00E-02	3.00E+00	2.00E-02	1.40E+00	2.66E-01	5.66E-01	Non-Parametric	FALSE	5.66E-01	Non-Parametric	-	Yes	-
Antimony	mg/kg	2	11	18%	1.30E+00	2.50E+00	4.00E+00	4.00E+00	1.70E+00	3.21E+00	Non-Parametric	FALSE	3.21E+00	Non-Parametric	2.50E+00	Yes	-
Aroclor-1248	mg/kg	1	3	33%	4.00E-02	5.00E-02	3.00E-02	3.00E-02	2.50E-02	3.60E-02	MAXDET	TRUE	3.00E-02	MAXDET	-	Yes	-
Aroclor-1254	mg/kg	1	3	33%	4.00E-02	4.00E-02	4.40E-01	4.40E-01	1.60E-01	4.45E-01	MAXDET	TRUE	4.40E-01	MAXDET	-	Yes	-
Arsenic	mg/kg	23	23	100%	-	-	4.70E-01	3.18E+01	1.06E+01	1.53E+01	Non-Parametric	FALSE	1.53E+01	Non-Parametric	1.19E+01	Yes	-
Barium	mg/kg	21	21	100%	-	-	3.14E+01	1.67E+02	9.20E+01	1.03E+02	Normal	FALSE	1.03E+02	Normal	1.07E+02	Yes	-
Benzo(a)anthracene	mg/kg	18	26	69%	3.00E-01	3.00E-01	1.20E-01	6.10E+01	3.46E+00	2.67E+01	Non-Parametric	FALSE	2.67E+01	Non-Parametric	-	Yes	-
Benzo(a)pyrene ^a	mg/kg	12	26	46%	3.00E-01	3.00E-01	1.50E-01	5.80E+01	3.36E+00	1.02E+01	Non-Parametric	FALSE	1.02E+01	Non-Parametric	-	Yes	-
Benzo(b)fluoranthene	mg/kg	20	26	77%	3.00E-01	3.00E-01	1.90E-01	1.40E+02	7.99E+00	6.16E+01	Non-Parametric	FALSE	6.16E+01	Non-Parametric	-	Yes	-
Benzo(g,h,i)perylene	mg/kg	12	26	46%	3.00E-01	3.00E-01	1.30E-01	6.70E+01	4.08E+00	3.13E+01	Non-Parametric	FALSE	3.13E+01	Non-Parametric	-	No	4
Benzo(k)fluoranthene	mg/kg	15	26	58%	3.00E-01	3.00E-01	7.00E-02	2.60E+01	1.62E+00	1.16E+01	Non-Parametric	FALSE	1.16E+01	Non-Parametric	-	Yes	-
Beryllium	mg/kg	12	23	52%	1.10E-01	1.00E+00	5.20E-01	5.77E+00	1.32E+00	3.51E+00	Lognormal	FALSE	3.51E+00	Lognormal	7.20E-01	Yes	-
Cadmium	mg/kg	5	21	24%	5.00E-01	1.00E+00	5.30E-01	1.06E+01	8.31E-01	2.97E+00	Non-Parametric	FALSE	2.97E+00	Non-Parametric	7.70E-01	Yes	-
Calcium	mg/kg	20	20	100%	-	-	3.67E+03	2.37E+04	8.08E+03	1.37E+04	Non-Parametric	FALSE	1.37E+04	Non-Parametric	2.86E+03	No	2
Chromium	mg/kg	21	21	100%	-	-	1.29E+01	1.73E+02	5.79E+01	8.03E+01	Non-Parametric	FALSE	8.03E+01	Non-Parametric	1.93E+01	Yes	-
Chrysene	mg/kg	20	26	77%	3.00E-01	3.00E-01	1.40E-01	1.80E+02	9.95E+00	7.80E+01	Non-Parametric	FALSE	7.80E+01	Non-Parametric	-	Yes	-
Cobalt	mg/kg	21	21	100%	-	-	3.40E+00	6.97E+01	2.46E+01	3.59E+01	Non-Parametric	FALSE	3.59E+01	Non-Parametric	7.21E+00	Yes	-
Copper	mg/kg	41	41	100%	-	-	2.46E+01	1.01E+03	3.43E+02	4.43E+02	Non-Parametric	FALSE	4.43E+02	Non-Parametric	2.85E+01	Yes	-
Cyanide, Total	mg/kg	17	22	77%	1.00E+00	1.00E+00	1.00E-01	5.50E+01	8.50E+00	2.65E+01	Lognormal	FALSE	2.65E+01	Lognormal	2.70E-02	Yes	-
Dibenzo(a,h)anthracene	mg/kg	8	27	30%	3.00E-01	3.00E-01	4.00E-02	1.50E+01	9.61E-01	6.62E+00	Non-Parametric	FALSE	6.62E+00	Non-Parametric	-	Yes	-
Fluoranthene	mg/kg	20	26	77%	3.00E-01	3.00E-01	1.90E-01	4.40E+02	1.99E+01	1.87E+02	Non-Parametric	FALSE	1.87E+02	Non-Parametric	-	Yes	-
Fluorene	mg/kg	6	27	22%	3.00E-01	3.00E+00	7.30E-03	5.00E-01	1.98E-01	4.28E-01	Non-Parametric	FALSE	4.28E-01	Non-Parametric	-	Yes	-
Fluoride	mg/kg	43	47	91%	1.50E+02	1.50E+02	3.20E+02	3.50E+04	7.65E+03	2.04E+04	Non-Parametric	FALSE	2.04E+04	Non-Parametric	2.50E+02	Yes	-
Indeno(1,2,3-cd)pyrene	mg/kg	10	26	38%	3.00E-01	3.00E-01	1.60E-01	4.20E+01	2.66E+00	1.96E+01	Non-Parametric	FALSE	1.96E+01	Non-Parametric	-	Yes	-
Iron	mg/kg	20	20	100%	-	-	3.29E+03	1.56E+04	9.87E+03	1.10E+04	Normal	FALSE	1.10E+04	Normal	1.22E+05	No	3
Lead	mg/kg	23	23	100%	-	-	2.10E+00	2.59E+02	4.65E+01	6.88E+01	Non-Parametric	FALSE	6.88E+01	Non-Parametric	2.80E+01	Yes	-
Magnesium	mg/kg	21	21	100%	-	-	2.14E+02	3.78E+03	1.58E+03	2.00E+03	Normal	FALSE	2.00E+03	Normal	3.95E+03	No	2
Manganese	mg/kg	21	21	100%	-	-	2.75E+01	1.52E+02	9.51E+01	1.08E+02	Normal	FALSE	1.08E+02	Normal	2.52E+02	No	3
Mercury	mg/kg	19	34	56%	2.00E-02	2.00E-01	2.10E-01	3.16E+00	6.37E-01	1.92E+00	Non-Parametric	FALSE	1.92E+00	Non-Parametric	8.00E-02	Yes	-
Naphthalene	mg/kg	4	27	15%	3.00E-02	3.00E+00	6.10E-03	4.00E-01	1.86E-01	7.08E-01	Non-Parametric	TRUE	4.00E-01	MAXDET	-	Yes	-
Nickel	mg/kg	21	21	100%	-	-	1.52E+01	3.24E+03	9.47E+02	1.65E+03	Non-Parametric	FALSE	1.65E+03	Non-Parametric	1.55E+01	Yes	-
Phenanthrene	mg/kg	19	26	73%	3.00E-01	3.00E-01	8.00E-02	9.80E+00	1.22E+00	1.90E+00	Non-Parametric	FALSE	1.90E+00	Non-Parametric	-	No	4
Polychlorinated Biphenyls (PCBs)	mg/kg	33	41	80%	3.00E-01	3.00E-01	3.00E-01	1.10E+01	3.07E+00	4.19E+00	Non-Parametric	FALSE	4.19E+00	Non-Parametric	-	Yes	-
Potassium	mg/kg	20	20	100%	-	-	8.70E+01	8.28E+02	3.75E+02	4.54E+02	Normal	FALSE	4.54E+02	Normal	1.90E+03	No	2
Pyrene	mg/kg	19	26	73%	3.00E-01	3.00E-01	1.30E-01	4.00E+02	1.76E+01	1.70E+02	Non-Parametric	FALSE	1.70E+02	Non-Parametric	-	Yes	-
Selenium	mg/kg	8	21	38%	1.00E+00	1.00E+00	1.20E+00	1.22E+01	2.44E+00	9.85E+00	Non-Parametric	FALSE	9.85E+00	Non-Parametric	3.50E-01	Yes	-
Silver	mg/kg	8	21	38%	1.00E+00	1.00E+00	1.00E+00	3.79E+00	9.80E-01	1.75E+00	Non-Parametric	FALSE	1.75E+00	Non-Parametric	-	Yes	-
Sodium	mg/kg	21	21	100%	-	-	6.70E+02	1.95E+03	1.07E+03	1.19E+03	Non-Parametric	FALSE	1.19E+03	Non-Parametric	6.70E+02	No	2
Thallium	mg/kg	1	21	5%	1.00E+00	1.00E+00	1.30E+00	1.30E+00	5.38E-01	6.10E-01	Non-Parametric	FALSE	6.10E-01	Non-Parametric	-	Yes	-
Total Organic Carbon	mg/kg	10	20	50%	5.00E+01	5.00E+01	6.30E+01	2.70E+02	7.48E+01	1.42E+02	Non-Parametric	FALSE	1.42E+02	Non-Parametric	5.81E+04	No	3
Total PAH	mg/kg	1	1	100%	-	-	1.90E+01	1.90E+01	1.90E+01	1.90E+01	MAXDET	FALSE	1.90E+01	MAXDET	-	No	4
TPH by 418_1	mg/kg	11	16	69%	5.00E+01	5.00E+01	6.80E+01	9.30E+04	6.96E+03	6.48E+04	Non-Parametric	FALSE	6.48E+04	Non-Parametric	-	No	4
Vanadium	mg/kg	42	42	100%	-	-	4.32E+01	2.26E+03	5.49E+02	7.39E+02	Non-Parametric	FALSE	7.39E+02	Non-Parametric	1.25E+02	Yes	-
Zinc	mg/kg	21	21	100%	-	-	3.64E+01	2.74E+02	7.63E+01	9.38E+01	Non-Parametric	FALSE	9.38E+01	Non-Parametric	1.40E+02	Yes	-

^a These risk estimates are based on EPCs calculated as the 90 percent upper confidence limit (UCL) for the primary contributing constituent (benzo(a)pyrene), in accordance with DEQ guidance, and as outlined in Section 4.3 of *Memorandum WP No. 67: Post-Demolition Residual Risk Assessment Scoping Document for RMC-Troutdale* (CH2M HILL, 2005a).

^b Background values from *Technical Memorandum DS No. 12: Background Data Summary for RMC-Troutdale* (CH2M HILL, December 3, 1996).

Reasons:

1. Frequency of detection is less than 5 percent.
2. Chemical is an essential nutrient.
3. EPC does not exceed background levels.
4. No toxicity factor exists for chemical.

**Table 4-7
South Wetlands Subsurface Soil Summary Statistics and Exposure Point Concentrations (EPCs)**

Analyte	Units	Number of Detects	Number of Samples	Frequency of Detection	Minimum Nondetect Value	Maximum Nondetect Value	Minimum Detected Value	Maximum Detected Value	Arithmetic Mean	EPC	Basis	EPC > Max	Final EPC	Basis	Background ^b	Retain as COPC?	Reason
4,4-DDD	mg/kg	3	6	50%	5.00E-03	5.00E-03	3.00E-02	8.00E-02	3.13E-02	1.36E-01	Non-Parametric	TRUE	8.00E-02	MAXDET	-	Yes	-
4,4-DDE	mg/kg	2	6	33%	5.00E-03	5.00E-02	1.00E-02	5.00E-02	1.54E-02	3.15E-02	Normal	FALSE	3.15E-02	Normal	-	Yes	-
4,4-DDT	mg/kg	1	6	17%	5.00E-03	5.00E-02	2.80E-01	2.80E-01	5.25E-02	5.07E-01	Non-Parametric	TRUE	2.80E-01	MAXDET	-	Yes	-
Acenaphthene	mg/kg	14	67	21%	3.00E-01	3.00E+00	2.90E-03	5.50E+00	3.73E-01	1.06E+00	Non-Parametric	FALSE	1.06E+00	Non-Parametric	-	Yes	-
Acenaphthylene	mg/kg	4	67	6%	5.30E-03	3.00E+00	3.00E-02	4.00E-01	1.52E-01	2.46E-01	Non-Parametric	FALSE	2.46E-01	Non-Parametric	-	No	4
Aluminum	mg/kg	62	62	100%	-	-	7.82E+03	1.79E+05	3.16E+04	4.96E+04	Non-Parametric	FALSE	4.96E+04	Non-Parametric	1.46E+04	Yes	-
Anthracene	mg/kg	13	67	19%	5.00E-02	5.70E+00	2.80E-03	8.20E+00	4.39E-01	1.27E+00	Non-Parametric	FALSE	1.27E+00	Non-Parametric	-	Yes	-
Antimony	mg/kg	3	39	8%	1.30E+00	2.50E+00	2.50E+00	4.00E+00	1.41E+00	1.59E+00	Non-Parametric	FALSE	1.59E+00	Non-Parametric	2.50E+00	Yes	-
Aroclor-1248	mg/kg	1	10	10%	4.00E-02	6.00E-02	3.00E-02	3.00E-02	2.30E-02	2.75E-02	Non-Parametric	FALSE	2.75E-02	Non-Parametric	-	Yes	-
Aroclor-1254	mg/kg	1	10	10%	4.00E-02	6.00E-02	4.40E-01	4.40E-01	6.35E-02	2.49E-01	Non-Parametric	FALSE	2.49E-01	Non-Parametric	-	Yes	-
Arsenic	mg/kg	66	67	99%	1.00E+00	1.00E+00	4.70E-01	3.18E+01	6.80E+00	1.05E+01	Non-Parametric	FALSE	1.05E+01	Non-Parametric	1.19E+01	Yes	-
Barium	mg/kg	53	53	100%	-	-	2.30E+01	1.67E+02	9.69E+01	1.03E+02	Normal	FALSE	1.03E+02	Normal	1.07E+02	Yes	-
Benzo(a)anthracene	mg/kg	26	66	39%	3.00E-01	3.00E-01	1.00E-02	6.10E+01	2.98E+00	1.03E+01	Non-Parametric	FALSE	1.03E+01	Non-Parametric	-	Yes	-
Benzo(a)pyrene ^a	mg/kg	20	66	30%	3.00E-01	3.00E-01	2.00E-02	5.80E+01	3.17E+00	6.93E+00	Non-Parametric	FALSE	6.93E+00	Non-Parametric	-	Yes	-
Benzo(b)fluoranthene	mg/kg	28	66	42%	3.00E-01	3.00E-01	2.00E-02	1.40E+02	5.35E+00	2.00E+01	Non-Parametric	FALSE	2.00E+01	Non-Parametric	-	Yes	-
Benzo(g,h,i)perylene	mg/kg	20	66	30%	3.00E-01	3.00E-01	1.00E-02	6.70E+01	2.86E+00	1.05E+01	Non-Parametric	FALSE	1.05E+01	Non-Parametric	-	No	4
Benzo(k)fluoranthene	mg/kg	23	66	35%	3.00E-01	3.00E-01	8.50E-03	2.60E+01	1.55E+00	5.08E+00	Non-Parametric	FALSE	5.08E+00	Non-Parametric	-	Yes	-
Beryllium	mg/kg	34	67	51%	1.10E-01	1.00E+00	5.20E-01	6.30E+00	1.10E+00	2.17E+00	Non-Parametric	FALSE	2.17E+00	Non-Parametric	7.20E-01	Yes	-
Cadmium	mg/kg	6	59	10%	5.00E-01	1.00E+00	5.30E-01	1.06E+01	4.96E-01	1.26E+00	Non-Parametric	FALSE	1.26E+00	Non-Parametric	7.70E-01	Yes	-
Calcium	mg/kg	52	52	100%	-	-	2.23E+03	2.37E+04	6.26E+03	7.21E+03	Non-Parametric	FALSE	7.21E+03	Non-Parametric	2.86E+03	No	2
Chromium	mg/kg	59	59	100%	-	-	6.08E+00	1.73E+02	3.15E+01	5.12E+01	Non-Parametric	FALSE	5.12E+01	Non-Parametric	1.93E+01	Yes	-
Chrysene	mg/kg	28	66	42%	3.00E-01	3.00E-01	1.00E-02	1.80E+02	5.73E+00	2.33E+01	Non-Parametric	FALSE	2.33E+01	Non-Parametric	-	Yes	-
Cobalt	mg/kg	52	53	98%	2.50E+00	2.50E+00	2.80E+00	6.97E+01	1.33E+01	2.34E+01	Non-Parametric	FALSE	2.34E+01	Non-Parametric	7.21E+00	Yes	-
Copper	mg/kg	79	79	100%	-	-	7.80E+00	1.01E+03	2.00E+02	3.72E+02	Non-Parametric	FALSE	3.72E+02	Non-Parametric	2.85E+01	Yes	-
Cyanide, Total	mg/kg	28	61	46%	1.00E-01	1.00E+00	1.00E-01	5.50E+01	3.78E+00	1.17E+01	Non-Parametric	FALSE	1.17E+01	Non-Parametric	2.70E-02	Yes	-
Dibenzo(a,h)anthracene ^a	mg/kg	16	67	24%	3.00E-01	3.00E-01	1.00E-02	1.70E+01	1.01E+00	2.14E+00	Non-Parametric	FALSE	2.14E+00	Non-Parametric	-	Yes	-
Endosulfan II	mg/kg	1	6	17%	5.00E-03	5.00E-02	7.80E-03	7.80E-03	8.38E-03	1.61E-02	Normal	TRUE	7.80E-03	MAXDET	-	No	4
Fluoranthene	mg/kg	28	66	42%	3.00E-01	3.00E-01	2.00E-02	4.40E+02	1.05E+01	7.73E+01	Non-Parametric	FALSE	7.73E+01	Non-Parametric	-	Yes	-
Fluorene	mg/kg	14	67	21%	3.00E-01	3.00E+00	1.50E-03	3.00E+00	2.73E-01	6.62E-01	Non-Parametric	FALSE	6.62E-01	Non-Parametric	-	Yes	-
Fluoride ^a	mg/kg	82	88	93%	5.00E+00	1.50E+02	1.70E+02	4.11E+04	5.80E+03	8.72E+03	Non-Parametric	FALSE	8.72E+03	Non-Parametric	2.50E+02	Yes	-
Heavy Oil by HCID	mg/kg	1	4	25%	1.00E+02	1.00E+02	2.60E+02	2.60E+02	1.03E+02	3.31E+02	Non-Parametric	TRUE	2.60E+02	MAXDET	-	No	4
Indeno(1,2,3-cd)pyrene	mg/kg	18	66	27%	3.00E-01	3.00E-01	2.00E-02	4.20E+01	2.72E+00	9.22E+00	Non-Parametric	FALSE	9.22E+00	Non-Parametric	-	Yes	-
Iron	mg/kg	52	52	100%	-	-	3.29E+03	1.72E+04	9.68E+03	1.04E+04	Normal	FALSE	1.04E+04	Normal	1.22E+05	No	3
Lead	mg/kg	40	67	60%	5.00E+00	1.00E+01	2.10E+00	2.59E+02	3.10E+01	7.11E+01	Non-Parametric	FALSE	7.11E+01	Non-Parametric	2.80E+01	Yes	-
Magnesium	mg/kg	53	53	100%	-	-	2.14E+02	3.78E+03	1.89E+03	2.10E+03	Normal	FALSE	2.10E+03	Normal	3.95E+03	No	2
Manganese	mg/kg	53	53	100%	-	-	1.94E+01	1.79E+02	8.97E+01	9.75E+01	Normal	FALSE	9.75E+01	Normal	2.52E+02	No	3
Mercury	mg/kg	26	78	33%	2.00E-02	2.50E-01	3.00E-02	3.16E+00	3.75E-01	7.82E-01	Non-Parametric	FALSE	7.82E-01	Non-Parametric	8.00E-02	Yes	-
Naphthalene	mg/kg	12	67	18%	3.00E-02	3.00E+00	1.90E-03	2.65E+00	2.42E-01	5.46E-01	Non-Parametric	FALSE	5.46E-01	Non-Parametric	-	Yes	-
Nickel	mg/kg	55	55	100%	-	-	5.80E+00	3.24E+03	4.04E+02	1.04E+03	Non-Parametric	FALSE	1.04E+03	Non-Parametric	1.55E+01	Yes	-
Phenanthrene	mg/kg	27	66	41%	3.00E-01	3.00E-01	1.00E-02	2.80E+01	1.73E+00	5.42E+00	Non-Parametric	FALSE	5.42E+00	Non-Parametric	-	No	4
Polychlorinated Biphenyls (PCBs) ^a	mg/kg	38	105	36%	2.00E-01	3.00E-01	3.00E-01	1.10E+01	1.40E+00	2.09E+00	Non-Parametric	FALSE	2.09E+00	Non-Parametric	-	Yes	-
Potassium	mg/kg	52	52	100%	-	-	8.70E+01	8.68E+02	4.57E+02	5.05E+02	Normal	FALSE	5.05E+02	Normal	1.90E+03	No	2
Pyrene	mg/kg	27	66	41%	3.00E-01	3.00E-01	1.00E-02	4.00E+02	8.88E+00	4.69E+01	Non-Parametric	FALSE	4.69E+01	Non-Parametric	-	Yes	-
Selenium	mg/kg	13	59	22%	1.00E+00	1.00E+00	1.00E+00	1.22E+01	1.24E+00	2.49E+00	Non-Parametric	FALSE	2.49E+00	Non-Parametric	3.50E-01	Yes	-
Silver	mg/kg	8	59	14%	1.00E+00	1.00E+00	1.00E+00	3.79E+00	6.71E-01	7.92E-01	Non-Parametric	FALSE	7.92E-01	Non-Parametric	-	Yes	-
Sodium	mg/kg	53	53	100%	-	-	3.82E+02	1.95E+03	9.94E+02	1.08E+03	Normal	FALSE	1.08E+03	Normal	6.70E+02	No	2
Thallium	mg/kg	1	59	2%	1.00E+00	1.00E+00	1.30E+00	1.30E+00	5.14E-01	5.38E-01	Non-Parametric	FALSE	5.38E-01	Non-Parametric	-	No	1
Total Organic Carbon	mg/kg	43	59	73%	5.00E+01	5.00E+01	5.50E+01	7.91E+04	2.91E+03	1.22E+04	Non-Parametric	FALSE	1.22E+04	Non-Parametric	-	No	4
Total PAH	mg/kg	2	7	29%	2.00E-01	2.00E-01	2.50E-01	1.90E+01	2.82E+00	2.97E+01	Non-Parametric	TRUE	1.90E+01	MAXDET	-	No	4
TPH by 418_1	mg/kg	14	23	61%	5.00E+01	5.00E+01	6.80E+01	9.30E+04	4.86E+03	4.52E+04	Non-Parametric	FALSE	4.52E+04	Non-Parametric	-	No	4
Vanadium ^a	mg/kg	74	74	100%	-	-	1.83E+01	2.26E+03	3.34E+02	5.10E+02	Non-Parametric	FALSE	5.10E+02	Non-Parametric	1.25E+02	Yes	-
Zinc	mg/kg	59	59	100%	-	-	1.11E+01	2.74E+02	5.22E+01	5.93E+01	Non-Parametric	FALSE	5.93E+01	Non-Parametric	1.40E+02	Yes	-

^a These risk estimates are based on EPCs calculated as the 90 percent upper confidence limit (UCL) for the primary contributing constituents (benzo(a)pyrene, dibenzo(a,h)anthracene, PCBs, fluoride, and vanadium), in accordance with DEQ guidance, and as outlined in Section 4.3 of *Memorandum WP No. 67: Post-Demolition Residual Risk Assessment Scoping Document for RMC-Troutdale* (CH2M HILL, 2005a).

^b Background values from *Technical Memorandum DS No. 12: Background Data Summary for RMC-Troutdale* (CH2M HILL, December 3, 1996).

Reasons:

1. Frequency of detection is less than 5 percent.
2. Chemical is an essential nutrient.
3. EPC does not exceed background levels.
4. No toxicity factor exists for chemical.

**Table 4-8
East Area Surface Soil Summary Statistics and Exposure Point Concentrations (EPCs)**

Analyte	Units	Number of Detects	Number of Samples	Frequency of Detection	Minimum Nondetect Value	Maximum Nondetect Value	Minimum Detected Value	Maximum Detected Value	Arithmetic Mean	EPC	Basis	EPC > Max	Final EPC	Basis	Background ^b	Retain as COPC?	Reason
1,2,4-Trimethylbenzene	mg/kg	1	14	7%	5.00E-03	2.00E-02	8.40E-04	8.40E-04	3.44E-03	6.36E-03	Non-Parametric	TRUE	8.40E-04	MAXDET	-	Yes	-
1,4-Dichlorobenzene	mg/kg	1	15	7%	5.00E-03	1.00E+00	5.00E+00	5.00E+00	3.69E-01	3.68E+00	Non-Parametric	FALSE	3.68E+00	Non-Parametric	-	Yes	-
2-Methylnaphthalene	mg/kg	2	26	8%	4.90E-03	1.80E+00	5.80E-03	8.00E-02	2.01E-01	5.23E-01	Non-Parametric	TRUE	8.00E-02	MAXDET	-	Yes	-
Acenaphthene	mg/kg	74	209	35%	2.80E-03	6.70E-01	4.80E-04	1.00E+00	7.27E-02	1.33E-01	Non-Parametric	FALSE	1.33E-01	Non-Parametric	-	Yes	-
Acenaphthylene	mg/kg	12	209	6%	2.80E-03	1.80E+00	7.30E-04	1.30E-01	5.24E-02	9.41E-02	Non-Parametric	FALSE	9.41E-02	Non-Parametric	-	No	4
Acetone	mg/kg	2	8	25%	9.75E-04	2.00E-02	1.19E-03	4.00E-02	6.72E-03	6.62E-02	Non-Parametric	TRUE	4.00E-02	MAXDET	-	Yes	-
Aluminum	mg/kg	69	69	100%	-	-	2.95E+03	5.63E+04	1.15E+04	1.30E+04	Lognormal	FALSE	1.30E+04	Lognormal	1.46E+04	Yes	-
Anthracene	mg/kg	89	209	43%	2.80E-03	6.70E-01	6.40E-04	2.30E+00	1.11E-01	2.91E-01	Non-Parametric	FALSE	2.91E-01	Non-Parametric	-	Yes	-
Antimony	mg/kg	1	43	2%	5.00E-01	5.40E+00	1.10E+01	1.10E+01	1.47E+00	1.90E+00	Non-Parametric	FALSE	1.90E+00	Non-Parametric	2.50E+00	No	1
Aroclor-1242	mg/kg	2	106	2%	3.00E-02	5.00E-01	7.00E-02	3.00E-01	2.65E-02	4.51E-02	Non-Parametric	FALSE	4.51E-02	Non-Parametric	-	No	1
Aroclor-1248	mg/kg	14	106	13%	3.00E-02	1.40E+00	4.00E-02	2.06E+00	5.92E-02	7.92E-01	Non-Parametric	FALSE	7.92E-01	Non-Parametric	-	Yes	-
Aroclor-1254	mg/kg	4	106	4%	3.00E-02	5.00E-01	5.00E-02	4.30E-01	3.02E-02	5.42E-02	Non-Parametric	FALSE	5.42E-02	Non-Parametric	-	No	1
Aroclor-1260	mg/kg	5	105	5%	3.00E-02	5.00E-01	6.60E-03	2.60E-01	2.82E-02	5.65E-01	Non-Parametric	FALSE	2.60E-01	Non-Parametric	-	No	1
Aroclor-1262	mg/kg	1	44	2%	3.00E-02	5.00E-01	1.10E-01	1.10E-01	2.95E-02	5.61E-02	Non-Parametric	FALSE	5.61E-02	Non-Parametric	-	No	1
Aroclor-1268	mg/kg	44	97	45%	3.00E-02	3.70E+00	4.30E-03	3.10E+00	2.09E-01	5.29E-01	Non-Parametric	FALSE	5.29E-01	Non-Parametric	-	Yes	-
Arsenic ^a	mg/kg	83	142	58%	2.00E-01	1.11E+01	3.20E-01	1.98E+01	2.84E+00	3.75E+00	Non-Parametric	FALSE	3.75E+00	Non-Parametric	1.19E+01	Yes	-
Barium	mg/kg	84	84	100%	-	-	9.92E+00	8.42E+02	6.03E+01	6.46E+01	Lognormal	FALSE	6.46E+01	Lognormal	1.07E+02	Yes	-
Benzo(a)anthracene	mg/kg	165	234	71%	2.80E-03	5.00E-01	6.10E-04	1.00E+01	6.80E-01	#N/A	Non-Parametric	FALSE	#N/A	Non-Parametric	-	Yes	-
Benzo(a)pyrene ^a	mg/kg	168	234	72%	2.81E-03	5.00E-01	7.00E-04	1.40E+01	7.95E-01	1.32E+00	Non-Parametric	FALSE	1.32E+00	Non-Parametric	-	Yes	-
Benzo(b)fluoranthene	mg/kg	169	234	72%	2.81E-03	5.00E-01	9.90E-04	1.70E+01	1.15E+00	#N/A	Non-Parametric	FALSE	#N/A	Non-Parametric	-	Yes	-
Benzo(g,h,i)perylene	mg/kg	138	208	66%	2.81E-03	5.00E-01	1.00E-03	5.47E-01	5.47E-01	#N/A	Non-Parametric	FALSE	#N/A	Non-Parametric	-	No	4
Benzo(k)fluoranthene ^a	mg/kg	158	236	67%	2.80E-03	5.00E-01	4.80E-04	7.97E+00	4.85E-01	7.53E-01	Non-Parametric	FALSE	7.53E-01	Non-Parametric	-	Yes	-
Beryllium	mg/kg	49	127	39%	1.00E-01	3.75E+00	1.10E-01	1.12E+01	5.44E-01	9.46E-01	Non-Parametric	FALSE	9.46E-01	Non-Parametric	7.20E-01	Yes	-
Bis(2-Ethylhexyl) Phthalate	mg/kg	1	21	5%	3.00E-02	2.00E+00	6.50E-01	6.50E-01	2.70E-01	5.13E-01	Non-Parametric	FALSE	5.13E-01	Non-Parametric	-	No	1
Bromomethane	mg/kg	5	21	24%	9.75E-04	1.00E-02	1.60E-03	2.30E-03	1.96E-03	3.34E-03	Non-Parametric	TRUE	2.30E-03	MAXDET	-	Yes	-
Cadmium	mg/kg	13	84	15%	4.90E-01	3.75E+00	1.20E-01	5.21E+00	6.73E-01	1.12E+00	Non-Parametric	FALSE	1.12E+00	Non-Parametric	7.70E-01	Yes	-
Calcium	mg/kg	8	8	100%	-	-	1.84E+03	6.40E+03	3.13E+03	4.13E+03	Normal	FALSE	4.13E+03	Normal	2.86E+03	No	2
Chromium	mg/kg	84	84	100%	-	-	2.90E+00	1.30E+02	1.38E+01	2.14E+01	Non-Parametric	FALSE	2.14E+01	Non-Parametric	1.93E+01	Yes	-
Chrysene	mg/kg	163	234	70%	2.81E-03	5.00E-01	1.10E-03	1.30E+01	9.24E-01	2.40E+00	Non-Parametric	FALSE	2.40E+00	Non-Parametric	-	Yes	-
Cobalt	mg/kg	9	13	69%	2.50E+00	5.40E+00	3.40E+00	2.30E+01	7.66E+00	1.21E+01	Non-Parametric	FALSE	1.21E+01	Non-Parametric	7.21E+00	Yes	-
Copper	mg/kg	59	59	100%	-	-	5.71E+00	4.90E+02	3.82E+01	8.25E+01	Non-Parametric	FALSE	8.25E+01	Non-Parametric	2.85E+01	Yes	-
Cyanide, Total	mg/kg	86	159	54%	4.00E-02	1.00E+00	3.50E-02	4.10E+02	5.29E+00	2.21E+01	Non-Parametric	FALSE	2.21E+01	Non-Parametric	2.70E-02	Yes	-
Dibenzo(a,h)anthracene ^a	mg/kg	149	236	63%	2.80E-03	6.70E-01	1.00E-03	2.60E+00	1.87E-01	2.80E-01	Non-Parametric	FALSE	2.80E-01	Non-Parametric	-	Yes	-
Dibenzofuran	mg/kg	3	23	13%	4.90E-03	1.80E+00	7.50E-03	4.10E-01	1.99E-01	5.68E-01	Non-Parametric	TRUE	4.10E-01	MAXDET	-	Yes	-
Diesel	mg/kg	16	56	29%	1.01E+01	5.01E+02	9.93E+00	1.33E+03	7.22E+01	1.76E+02	Non-Parametric	FALSE	1.76E+02	Non-Parametric	-	No	4
Fluoranthene	mg/kg	144	207	70%	2.87E-03	5.00E-01	8.20E-04	1.50E+01	7.41E-01	2.25E+00	Non-Parametric	FALSE	2.25E+00	Non-Parametric	-	Yes	-
Fluorene	mg/kg	57	209	27%	2.80E-03	7.20E-01	5.70E-04	7.60E-01	5.97E-02	1.07E-01	Non-Parametric	FALSE	1.07E-01	Non-Parametric	-	Yes	-
Fluoride	mg/kg	189	240	79%	5.00E+00	3.80E+02	6.80E+00	2.10E+04	6.61E+02	1.32E+03	Non-Parametric	FALSE	1.32E+03	Non-Parametric	2.50E+02	Yes	-
Heavy Oil	mg/kg	4	13	31%	1.00E+02	2.50E+02	1.00E+02	1.00E+03	1.75E+02	5.09E+02	Non-Parametric	FALSE	5.09E+02	Non-Parametric	-	No	4
Indeno(1,2,3-cd)pyrene	mg/kg	164	235	70%	2.80E-03	5.00E-01	1.50E-03	1.20E+01	6.30E-01	#N/A	Non-Parametric	FALSE	#N/A	Non-Parametric	-	Yes	-
Iron	mg/kg	8	8	100%	-	-	5.00E+03	1.65E+04	1.00E+04	1.26E+04	Normal	FALSE	1.26E+04	Normal	1.22E+05	No	3
Lead	mg/kg	81	130	62%	5.00E+00	3.75E+01	6.20E-01	3.38E+02	2.27E+01	4.96E+01	Non-Parametric	FALSE	4.96E+01	Non-Parametric	2.80E+01	Yes	-
Magnesium	mg/kg	11	11	100%	-	-	5.18E+02	3.30E+03	1.44E+03	1.85E+03	Normal	FALSE	1.85E+03	Normal	3.95E+03	No	2
Manganese	mg/kg	43	43	100%	-	-	5.40E+01	1.58E+03	1.86E+02	3.44E+02	Non-Parametric	FALSE	3.44E+02	Non-Parametric	2.52E+02	Yes	-
Mercury	mg/kg	24	129	19%	2.00E-02	1.01E+00	2.00E-02	3.79E+00	1.36E-01	3.34E-01	Non-Parametric	FALSE	3.34E-01	Non-Parametric	8.00E-02	Yes	-
Methylene Chloride	mg/kg	3	21	14%	9.75E-04	1.00E-02	1.04E-03	3.70E-03	2.81E-03	4.80E-03	Non-Parametric	TRUE	3.70E-03	MAXDET	-	Yes	-
Motor Oil	mg/kg	14	30	47%	9.80E+01	4.20E+02	2.80E+01	5.00E+02	1.68E+02	2.31E+02	Lognormal	FALSE	2.31E+02	Lognormal	-	No	4
Naphthalene	mg/kg	46	209	22%	2.80E-03	7.20E-01	2.40E-04	5.50E-01	4.44E-02	7.94E-02	Non-Parametric	FALSE	7.94E-02	Non-Parametric	-	Yes	-
Nickel	mg/kg	73	74	99%	3.00E+01	3.00E+01	2.50E+00	1.90E+02	1.40E+01	1.52E+01	Lognormal	FALSE	1.52E+01	Lognormal	1.55E+01	Yes	-
Oil	mg/kg	3	5	60%	4.66E+01	5.04E+01	6.74E+01	3.99E+02	1.27E+02	3.67E+02	Non-Parametric	FALSE	3.67E+02	Non-Parametric	-	No	4
Phenanthrene	mg/kg	133	209	64%	2.80E-03	6.70E-01	5.40E-04	6.80E+00	3.17E-01	9.46E-01	Non-Parametric	FALSE	9.46E-01	Non-Parametric	-	No	4
Polychlorinated Biphenyls (PCBs)	mg/kg	2	41	5%	2.00E-01	3.00E-01	3.80E-01	2.90E+00	2.12E-01	5.06E-01	Non-Parametric	FALSE	5.06E-01	Non-Parametric	-	No	1
Potassium	mg/kg	11	11	100%	-	-	1.68E+02	1.20E+03	4.50E+02	6.17E+02	Non-Parametric	FALSE	6.17E+02	Non-Parametric	1.90E+03	No	2
Pyrene	mg/kg	138	207	67%	2.81E-03	5.00E-01	1.10E-03	1.30E+01	7.11E-01	2.12E+00	Non-Parametric	FALSE	2.12E+00	Non-Parametric	-	Yes	-
Selenium	mg/kg	2	81	2%	7.00E-02	2.46E+01	1.10E+00	1.42E+00	4.12E+00	7.49E+00	Non-Parametric	TRUE	1.42E+00	MAXDET	3.50E-01	No	1
Silver	mg/kg	1	81	1%	2.00E-01	7.50E+00	1.70E+00	1.70E+00	7.34E-01	8.22E-01	Non-Parametric	FALSE	8.22E-01	Non-Parametric	0.00E+00	No	1
Sodium	mg/kg	12	12	100%	-	-	4.30E+02	2.25E+03	8.71E+02	1.15E+03	Non-Parametric	FALSE	1.15E+03	Non-Parametric	6.70E+02	No	2
Total Organic Carbon	mg/kg	6	6	100%	-	-	3.22E+03	4.89E+04	1.38E+04	3.63E+04	Lognormal	FALSE	3.63E+04	Lognormal	5.81E+04	No	3
Total PAH	mg/kg	6	12	50%	2.00E-01	2.00E-01	9.50E-01	4.90E+01	8.62E+00	5.65E+01	Non-Parametric	TRUE	4.90E+01	MAXDET	-	No	4
TPH by 418_1	mg/kg	4	5	80%	2.00E+01	2.00E+01	3.30E+01	1.60E+02	8.20E+01	1.41E+02	Normal	FALSE	1.41E+02	Normal	-	No	4
Vanadium	mg/kg	13	13	100%	-	-	1.77E+01	1.40E+02	5.19E+01	6.87E+01	Non-Parametric	FALSE	6.87E+01	Non-Parametric	1.25E+02	Yes	-
Zinc	mg/kg	59	59	100%	-	-	1.11E+01	2.74E+02	5.22E+01	9.88E+01	Non-Parametric	FALSE	9.88E+01	Non-Parametric	1.40E+02	Yes	-

^a These risk estimates are based on EPCs calculated as the 90 percent upper confidence limit (UCL) for the primary contributing constituents (arsenic, benzo(a)pyrene, benzo(k)fluoranthene, and dibenzo(a,h)anthracene), in accordance with DEQ guidance, and as outlined in Section 4.3 of Memorandum WP No. 67: Post Demolition Residual Risk Assessment Scoping Document for RMC-Troutdale (CH2M HILL, 2005a).

^b Background values from Technical Memorandum DS No. 12: Background Data Summary for RMC-Troutdale (CH2M HILL, December 3, 1996).

Reasons:

1. Frequency of detection is less than 5 percent.
2. Chemical is an essential nutrient.
3. EPC does not exceed background levels.
4. No toxicity factor exists for chemical.

**Table 4-9
East Area Subsurface Soil Summary Statistics and Exposure Point Concentrations (EPCs)**

Analyte	Units	Number of Detects	Number of Samples	Frequency of Detection	Minimum Nondetect Value	Maximum Nondetect Value	Minimum Detected Value	Maximum Detected Value	Arithmetic Mean	EPC	Basis	EPC > Max	Final EPC	Basis	Background ^b	Retain as COPC?	Reason
1,2,3-Trifluorobenzene	mg/Kg	3	3	100%	-	-	2.40E+00	2.40E+00	2.40E+00	2.40E+00	MAXDET	TRUE	2.40E+00	MAXDET	-	No	4
1,2,4-Trimethylbenzene	mg/Kg	2	41	5%	5.00E-03	6.80E-01	8.40E-04	2.20E-03	1.42E-02	5.05E-02	Non-Parametric	TRUE	2.20E-03	MAXDET	-	No	1
1,4-Dichlorobenzene	mg/Kg	1	44	2%	5.00E-03	1.00E+00	5.00E+00	5.00E+00	1.46E-01	1.28E+00	Non-Parametric	FALSE	1.28E+00	Non-Parametric	-	No	1
2-Methylnaphthalene	mg/Kg	4	63	6%	4.60E-03	3.30E+01	5.80E-03	6.40E-01	7.13E-01	2.94E+00	Non-Parametric	TRUE	2.94E+00	MAXDET	-	Yes	-
Acenaphthene	mg/Kg	99	376	26%	2.80E-03	3.30E+01	4.80E-04	5.64E+00	1.77E-01	8.08E-01	Non-Parametric	FALSE	8.08E-01	Non-Parametric	-	Yes	-
Acenaphthylene	mg/Kg	18	376	5%	2.80E-03	3.30E+01	7.30E-04	1.30E-01	1.50E-01	7.63E-01	Non-Parametric	TRUE	1.30E-01	MAXDET	-	No	1
Acetone	mg/Kg	5	30	17%	9.75E-04	2.50E+00	1.19E-03	4.00E-02	8.88E-02	6.63E-01	Non-Parametric	TRUE	4.00E-02	MAXDET	-	Yes	-
Aluminum	mg/Kg	124	124	100%	-	-	2.62E+03	5.63E+04	1.06E+04	1.14E+04	Lognormal	FALSE	1.14E+04	Lognormal	1.46E+04	Yes	-
Anthracene	mg/Kg	125	376	33%	2.80E-03	3.30E+01	6.40E-04	3.20E+00	2.02E-01	8.42E-01	Non-Parametric	FALSE	8.42E-01	Non-Parametric	-	Yes	-
Antimony	mg/Kg	4	105	4%	5.00E-01	5.40E+00	4.10E+00	1.10E-01	1.53E+00	1.76E+00	Non-Parametric	FALSE	1.76E+00	Non-Parametric	2.50E+00	No	1
Aroclor-1232 ^a	mg/Kg	3	267	1%	3.00E-02	1.66E+01	6.00E-02	9.10E-01	6.84E-02	1.06E-01	Non-Parametric	FALSE	1.06E-01	Non-Parametric	-	No	1
Aroclor-1242 ^a	mg/Kg	5	267	2%	3.00E-02	1.66E+01	6.00E-02	9.10E-01	6.96E-02	1.08E-01	Non-Parametric	FALSE	1.08E-01	Non-Parametric	-	No	1
Aroclor-1248 ^a	mg/Kg	54	267	20%	3.00E-02	1.66E+01	1.00E-02	3.70E+01	4.44E-01	9.25E-01	Non-Parametric	FALSE	9.25E-01	Non-Parametric	-	Yes	-
Aroclor-1254 ^a	mg/Kg	12	267	4%	3.00E-02	1.66E+01	5.00E-02	1.90E+01	1.77E-01	4.13E-01	Non-Parametric	FALSE	4.13E-01	Non-Parametric	-	No	1
Aroclor-1260 ^a	mg/Kg	81	266	30%	3.00E-02	8.80E-01	6.60E-03	1.04E+02	6.41E-01	1.12E+00	Non-Parametric	FALSE	1.12E+00	Non-Parametric	-	Yes	-
Aroclor-1262 ^a	mg/Kg	3	58	5%	3.00E-02	5.00E-01	7.00E-02	1.10E-01	3.09E-02	4.45E-02	Non-Parametric	FALSE	4.45E-02	Non-Parametric	-	Yes	-
Aroclor-1268 ^a	mg/Kg	68	253	27%	3.00E-02	1.66E+01	4.30E-03	5.40E+00	2.18E-01	3.31E-01	Non-Parametric	FALSE	3.31E-01	Non-Parametric	-	Yes	-
Arsenic	mg/Kg	162	274	59%	2.00E-01	1.11E+01	1.90E-01	1.98E+01	2.01E+00	3.05E+00	Non-Parametric	FALSE	3.05E+00	Non-Parametric	1.19E+01	Yes	-
Barium	mg/Kg	149	149	100%	-	-	6.70E+00	8.42E+02	5.27E+01	5.70E+01	Lognormal	FALSE	5.70E+01	Lognormal	1.07E+02	Yes	-
Benzo (a) anthracene	mg/Kg	241	404	60%	2.80E-03	3.30E+01	6.10E-04	4.00E+01	7.44E-01	2.10E+00	Non-Parametric	FALSE	2.10E+00	Non-Parametric	-	Yes	-
Benzo (a) pyrene	mg/Kg	242	404	60%	2.81E-03	3.30E+01	6.60E-04	3.60E+01	7.77E-01	2.06E+00	Non-Parametric	FALSE	2.06E+00	Non-Parametric	-	Yes	-
Benzo (b) fluoranthene	mg/Kg	249	404	62%	2.81E-03	3.30E+01	7.90E-04	8.40E+01	1.32E+00	4.13E+00	Non-Parametric	FALSE	4.13E+00	Non-Parametric	-	Yes	-
Benzo (g,h,i) perylene	mg/Kg	205	375	55%	2.81E-03	3.30E+01	1.00E-03	3.00E+01	6.22E-01	1.81E+00	Non-Parametric	FALSE	1.81E+00	Non-Parametric	-	No	4
Benzo (k) fluoranthene	mg/Kg	223	406	55%	2.80E-03	3.30E+01	4.80E-04	1.90E+01	5.20E-01	1.38E+00	Non-Parametric	FALSE	1.38E+00	Non-Parametric	-	Yes	-
Beryllium	mg/Kg	68	224	30%	1.00E-01	3.75E+00	1.10E-01	1.12E+01	4.53E-01	6.89E-01	Non-Parametric	FALSE	6.89E-01	Non-Parametric	7.20E-01	Yes	-
Bis(2-Ethylhexyl) Phthalate	mg/Kg	1	44	2%	3.00E-02	3.30E+01	6.50E-01	6.50E-01	9.69E-01	6.12E+00	Non-Parametric	TRUE	6.50E-01	MAXDET	-	No	1
Bromomethane	mg/Kg	8	63	13%	9.75E-04	6.80E-01	1.60E-03	3.00E-03	1.60E-02	6.35E-02	Non-Parametric	TRUE	3.00E-03	MAXDET	-	Yes	-
C10-C12 Aliphatics	mg/Kg	6	8	75%	1.25E+00	1.25E+00	4.95E+00	3.44E+01	8.13E+00	2.08E+01	Non-Parametric	FALSE	2.08E+01	Non-Parametric	-	No	4
C10-C12 Aromatics	mg/Kg	6	8	75%	1.25E+00	1.25E+00	1.46E+00	5.93E+00	3.19E+00	4.69E+00	Normal	FALSE	4.69E+00	Normal	-	No	4
C12-C13 Aromatics	mg/Kg	6	8	75%	1.25E+00	1.25E+00	1.25E+00	5.00E+00	2.74E+00	5.10E+00	Non-Parametric	TRUE	5.00E+00	MAXDET	-	No	4
C12-C16 Aliphatics	mg/Kg	8	8	100%	-	-	7.12E+00	1.23E+03	3.16E+02	1.02E+03	Normal	FALSE	1.02E+03	Normal	-	No	4
C12-C16 Aromatics	mg/Kg	1	8	13%	5.00E+00	5.00E+01	2.78E+01	2.78E+01	1.19E+01	1.86E+01	Normal	FALSE	1.86E+01	Normal	-	No	4
C16-C21 Aliphatics	mg/Kg	8	8	100%	-	-	9.15E+01	4.72E+03	1.42E+03	2.48E+03	Normal	FALSE	2.48E+03	Normal	-	No	4
C16-C21 Aromatics	mg/Kg	8	8	100%	-	-	5.17E+01	5.79E+02	2.35E+02	3.72E+02	Normal	FALSE	3.72E+02	Normal	-	No	4
C21-C34 Aliphatics	mg/Kg	8	8	100%	-	-	1.23E+02	3.25E+03	7.88E+02	1.85E+03	Non-Parametric	FALSE	1.85E+03	Non-Parametric	-	No	4
C21-C34 Aromatics	mg/Kg	7	8	88%	3.84E+01	3.84E+01	5.31E+01	5.91E+02	1.65E+02	3.46E+02	Non-Parametric	FALSE	3.46E+02	Non-Parametric	-	No	4
C5-C6 Aliphatics	mg/Kg	3	8	38%	6.10E-01	1.25E+00	5.00E+00	5.00E+00	2.23E+00	1.03E+01	Non-Parametric	TRUE	5.00E+00	MAXDET	-	No	4
C6-C8 Aliphatics	mg/Kg	4	8	50%	6.10E-01	1.25E+00	1.25E+00	5.00E+00	2.30E+00	5.25E+00	Non-Parametric	TRUE	5.00E+00	MAXDET	-	No	4
C8-C10 Aliphatics	mg/Kg	4	8	50%	1.25E+00	1.25E+00	5.00E+00	2.86E+01	5.76E+00	1.73E+01	Non-Parametric	FALSE	1.73E+01	Non-Parametric	-	No	4
C8-C10 Aromatics	mg/Kg	6	8	75%	1.25E+00	1.25E+00	2.36E+00	8.45E+00	4.07E+00	5.86E+00	Normal	FALSE	5.86E+00	Normal	-	No	4
Cadmium	mg/Kg	16	153	10%	2.50E-01	3.75E+00	1.20E-01	5.21E+00	5.10E-01	7.64E-01	Non-Parametric	FALSE	7.64E-01	Non-Parametric	7.70E-01	Yes	-
Calcium	mg/Kg	31	31	100%	-	-	1.84E+03	6.40E+03	3.48E+03	3.84E+03	Normal	FALSE	3.84E+03	Normal	2.86E+03	No	2
Chromium	mg/Kg	153	153	100%	-	-	1.80E+00	1.30E+02	1.22E+01	1.66E+01	Non-Parametric	FALSE	1.66E+01	Non-Parametric	1.93E+01	Yes	-
Chrysene	mg/Kg	240	404	59%	2.81E-03	3.30E+01	7.00E-04	8.70E+01	1.17E+00	3.89E+00	Non-Parametric	FALSE	3.89E+00	Non-Parametric	-	Yes	-
Cobalt	mg/Kg	32	41	78%	5.00E-01	5.40E+00	1.20E+00	2.30E+01	5.89E+00	7.39E+00	Normal	FALSE	7.39E+00	Normal	7.21E+00	Yes	-
Copper	mg/Kg	122	122	100%	-	-	2.79E+00	4.90E+02	2.73E+01	4.92E+01	Non-Parametric	FALSE	4.92E+01	Non-Parametric	2.85E+01	Yes	-
Cyanide, Total	mg/Kg	161	326	49%	4.00E-02	1.00E+00	3.50E-02	4.10E+02	3.40E+00	1.16E+01	Non-Parametric	FALSE	1.16E+01	Non-Parametric	2.70E-02	Yes	-
Decachlorobiphenyl	mg/Kg	3	3	100%	-	-	6.00E-02	7.00E-02	6.67E-02	7.00E-02	MAXDET	TRUE	7.00E-02	MAXDET	-	No	4
Dibenzo (a,h) anthracene	mg/Kg	199	406	49%	2.80E-03	3.30E+01	1.00E-03	8.70E+00	2.75E-01	9.07E-01	Non-Parametric	FALSE	9.07E-01	Non-Parametric	-	Yes	-
Dibenzofuran	mg/Kg	4	49	8%	4.60E-03	3.30E+01	7.50E-03	4.10E-01	8.35E-01	3.69E+00	Non-Parametric	TRUE	3.69E+00	MAXDET	-	Yes	-
Diesel	mg/Kg	90	211	43%	1.01E+01	1.42E+04	9.93E+00	2.56E+04	7.34E+02	1.88E+03	Non-Parametric	FALSE	1.88E+03	Non-Parametric	-	No	4

**Table 4-9
East Area Subsurface Soil Summary Statistics and Exposure Point Concentrations (EPCs)**

Analyte	Units	Number of Detects	Number of Samples	Frequency of Detection	Minimum Nondetect Value	Maximum Nondetect Value	Minimum Detected Value	Maximum Detected Value	Arithmetic Mean	EPC	Basis	EPC > Max	Final EPC	Basis	Background ^b	Retain as COPC?	Reason
Fluoranthene	mg/Kg	220	374	59%	2.87E-03	3.30E+01	8.20E-04	4.40E+01	9.74E-01	3.04E+00	Non-Parametric	FALSE	3.04E+00	Non-Parametric	-	Yes	-
Fluorene	mg/Kg	81	376	22%	2.80E-03	3.30E+01	5.70E-04	1.70E+00	1.61E-01	7.74E-01	Non-Parametric	FALSE	7.74E-01	Non-Parametric	-	Yes	-
Fluoride	mg/Kg	416	499	83%	5.00E+00	3.80E+02	2.00E+00	5.00E+04	7.52E+02	1.49E+03	Non-Parametric	FALSE	1.49E+03	Non-Parametric	2.50E+02	Yes	-
Gasoline	mg/Kg	6	156	4%	2.00E+00	1.00E+02	4.00E+00	5.40E+02	1.27E+01	3.24E+01	Non-Parametric	FALSE	3.24E+01	Non-Parametric	-	No	1
Heavy Oil	mg/Kg	21	89	24%	5.00E+01	5.00E+02	5.95E+01	5.72E+03	1.51E+02	4.32E+02	Non-Parametric	FALSE	4.32E+02	Non-Parametric	-	No	4
Indeno (1,2,3-cd) pyrene	mg/Kg	234	405	58%	2.80E-03	3.30E+01	9.40E-04	2.30E+01	6.54E-01	1.71E+00	Non-Parametric	FALSE	1.71E+00	Non-Parametric	-	Yes	-
Iron	mg/Kg	30	30	100%	-	-	5.00E+03	2.85E+04	1.16E+04	1.37E+04	Non-Parametric	FALSE	1.37E+04	Non-Parametric	1.22E+05	No	3
Isopropylbenzene	mg/Kg	1	41	2%	5.00E-03	2.00E-01	2.20E+00	2.20E+00	6.24E-02	5.95E-01	Non-Parametric	FALSE	5.95E-01	Non-Parametric	-	No	1
Lead	mg/Kg	109	230	47%	2.90E+00	3.75E+01	3.50E-01	3.38E+02	1.46E+01	3.03E+01	Non-Parametric	FALSE	3.03E+01	Non-Parametric	2.80E+01	Yes	-
Magnesium	mg/Kg	35	35	100%	-	-	4.22E+02	5.67E+03	1.69E+03	2.07E+03	Non-Parametric	FALSE	2.07E+03	Non-Parametric	3.95E+03	No	2
Manganese	mg/Kg	69	69	100%	-	-	3.86E+01	1.58E+03	1.66E+02	1.84E+02	Lognormal	FALSE	1.84E+02	Lognormal	2.52E+02	Yes	-
Mercury	mg/Kg	29	227	13%	2.00E-02	1.01E+00	1.00E-02	3.79E+00	1.19E-01	2.03E-01	Non-Parametric	FALSE	2.03E-01	Non-Parametric	8.00E-02	Yes	-
Methylene Chloride	mg/Kg	8	63	13%	9.75E-04	6.80E-01	1.04E-03	3.70E-03	1.70E-02	6.46E-02	Non-Parametric	TRUE	3.70E-03	MAXDET	-	Yes	-
Motor Oil	mg/Kg	27	86	31%	9.80E+01	5.60E+03	2.80E+01	2.00E+03	3.04E+02	6.38E+02	Non-Parametric	FALSE	6.38E+02	Non-Parametric	-	No	4
Naphthalene	mg/Kg	75	388	19%	2.80E-03	7.20E-01	1.80E-04	1.98E+00	6.21E-02	1.07E-01	Non-Parametric	FALSE	1.07E-01	Non-Parametric	-	Yes	-
n-Butylbenzene	mg/Kg	1	41	2%	5.00E-03	5.00E-01	1.60E+00	1.60E+00	5.51E-02	4.48E-01	Non-Parametric	FALSE	4.48E-01	Non-Parametric	-	No	1
Nickel	mg/Kg	134	137	98%	1.00E+00	3.00E+01	2.20E+00	1.90E+02	1.10E+01	1.16E+01	Lognormal	FALSE	1.16E+01	Lognormal	1.55E+01	Yes	-
n-Propylbenzene	mg/Kg	1	41	2%	5.00E-03	1.00E-01	4.10E+00	4.10E+00	1.06E-01	1.10E+00	Non-Parametric	FALSE	1.10E+00	Non-Parametric	-	No	1
Oil	mg/Kg	6	9	67%	1.02E+01	5.04E+01	6.74E+01	1.65E+04	3.43E+03	1.97E+04	Non-Parametric	TRUE	1.97E+04	MAXDET	-	No	4
Phenanthrene	mg/Kg	197	376	52%	2.80E-03	3.30E+01	5.40E-04	1.50E+01	4.42E-01	1.37E+00	Non-Parametric	FALSE	1.37E+00	Non-Parametric	-	No	4
Polychlorinated Biphenyls (PCBs) ^a	mg/Kg	40	192	21%	2.00E-01	3.00E-01	3.10E-01	2.20E+01	5.07E-01	8.88E-01	Non-Parametric	FALSE	8.88E-01	Non-Parametric	-	Yes	-
Potassium	mg/Kg	35	36	97%	5.00E+01	5.00E+01	8.11E+01	2.00E+03	4.96E+02	7.30E+02	Lognormal	FALSE	7.30E+02	Lognormal	1.90E+03	No	2
Pyrene	mg/Kg	210	374	56%	2.81E-03	3.30E+01	9.40E-04	4.00E+01	9.37E-01	2.88E+00	Non-Parametric	FALSE	2.88E+00	Non-Parametric	-	Yes	-
Sec-Butylbenzene	mg/Kg	1	41	2%	5.00E-03	1.00E-01	1.70E+00	1.70E+00	4.75E-02	4.59E-01	Non-Parametric	FALSE	4.59E-01	Non-Parametric	-	No	1
Selenium	mg/Kg	4	148	3%	7.00E-02	2.46E+01	3.20E-01	1.01E+01	2.63E+00	4.74E+00	Non-Parametric	FALSE	4.74E+00	Non-Parametric	3.50E-01	No	1
Silver	mg/Kg	1	148	1%	2.00E-01	7.50E+00	1.70E+00	1.70E+00	6.36E-01	6.88E-01	Non-Parametric	FALSE	6.88E-01	Non-Parametric	-	No	1
Sodium	mg/Kg	36	36	100%	-	-	2.70E+02	3.63E+03	1.20E+03	1.42E+03	Non-Parametric	FALSE	1.42E+03	Non-Parametric	6.70E+02	No	2
Tetrachloroethene	mg/Kg	2	63	3%	9.75E-04	6.80E-01	2.50E-03	4.00E-03	9.73E-03	4.38E-02	Non-Parametric	TRUE	4.00E-03	MAXDET	-	No	1
Tetrachloro-m-xylene	mg/Kg	3	3	100%	-	-	2.00E-02	2.00E-02	2.00E-02	2.00E-02	MAXDET	TRUE	2.00E-02	MAXDET	-	No	4
Total Extractable Petroleum Hydrocarbons	mg/Kg	8	8	100%	-	-	3.71E+02	8.06E+03	2.94E+03	6.63E+03	Non-Parametric	FALSE	6.63E+03	Non-Parametric	-	No	4
Total Organic Carbon	mg/Kg	17	21	81%	5.00E+01	5.00E+01	6.00E+01	4.89E+04	4.40E+03	1.02E+04	Non-Parametric	FALSE	1.02E+04	Non-Parametric	5.81E+04	No	3
Total PAH	mg/Kg	7	53	13%	2.00E-01	1.00E+00	9.50E-01	4.90E+01	2.23E+00	9.55E+00	Non-Parametric	FALSE	9.55E+00	Non-Parametric	-	No	4
Total Volatile Petroleum Hydrocarbons	mg/Kg	7	8	88%	1.25E+00	1.25E+00	2.36E+00	3.50E+01	1.80E+01	2.83E+01	Normal	FALSE	2.83E+01	Normal	-	No	4
TPH by 418_1	mg/Kg	12	30	40%	2.00E+01	5.00E+01	3.30E+01	2.70E+04	3.55E+03	1.82E+04	Non-Parametric	FALSE	1.82E+04	Non-Parametric	-	No	4
Vanadium	mg/Kg	41	41	100%	-	-	1.50E+01	1.40E+02	4.58E+01	5.24E+01	Non-Parametric	FALSE	5.24E+01	Non-Parametric	1.25E+02	Yes	-
Zinc	mg/Kg	104	104	100%	-	-	4.08E+00	5.57E+02	3.26E+01	5.59E+01	Non-Parametric	FALSE	5.59E+01	Non-Parametric	1.40E+02	Yes	-

^a These risk estimates are based on EPCs calculated as the 90 percent upper confidence limit (UCL) for the primary contributing constituents (aroclor 1232, 1242, 1248, 1254, 1260, 1262, and 1268, and polychlorinated biphenyls), in accordance with DEQ guidance, and as outlined in Section 4.3 of Memorandum WP No. 67: Post Demolition Residual Risk Assessment Scoping Document for RMC-Troutdale (CH2M HILL, 2005a).

^b Background values from *Technical Memorandum DS No. 12: Background Data Summary for RMC-Troutdale* (CH2M HILL, December 3, 1996).

Reasons:

1. Frequency of detection is less than 5 percent.
2. Chemical is an essential nutrient.
3. EPC does not exceed background levels.
4. No toxicity factor exists for chemical.

Table 4-10
Reasonable Maximum Exposure Assumptions

Parameter	Equation Parameter	Units	Short-Term Trespasser	Source	Short-Term Recreational User	Source	Near-Term Construction Worker	Source	Intermittent Excavation/Trench Worker	Source	Hypothetical Occupational Worker	Source
Constituent Concentration	C _s	mg/kg (dry wt.)	95% UCL of mean	Calculated	95% UCL of mean	Calculated	95% UCL of mean	Calculated	95% UCL of mean	Calculated	95% UCL of mean	Calculated
Body Weight	BW	kg	35	a	35	a	70	g	70	g	70	g
Carcinogenic Averaging Time	AT _c	yr	70	b	70	b	70	g	70	g	70	g
Noncarcinogenic Averaging Time	AT _n	yr	5	c	5	c	1	g	1	g	25	g
Exposure Frequency	EF	day/yr	26	c	26	c	250	g	9	g	250	g
Exposure Duration	ED	yr	5	c	5	c	1	g	1	g	25	g
Incidental Soil Ingestion Rate	IR _s	mg/day	200	b	200	b	330	g	330	g	100	g
Skin Surface Area	SA	cm ² /day	4,600	d	4,600	d	3,300	g	3,300	g	3,300	g
Dermal Absorption Factor	ABS	unitless	Chemical-specific	d	Chemical-specific	d	Chemical-specific	d	Chemical-specific	d	Chemical-specific	d
Soil-to-Skin Adherence Factor	AF	mg/cm ²	0.2	d	0.2	d	0.3	g	0.3	g	0.1	g
Inhalation Rate	INH	m ³ /day	14	e	14	e	7	g	7	g	7	g
Particulate Emission Factor	PEF	m ³ /kg	1.32E+09	f	1.32E+09	f	1.32E+09	f	1.32E+09	f	1.32E+09	f
Volatilization Factor	VF	m ³ /kg	Chemical-specific	f	Chemical-specific	f	Chemical-specific	f	Chemical-specific	f	Chemical-specific	f

Sources:

- a. *Exposure Factors Handbook* (EPA, August 1997, Table 7-3). Approximate body weight of a 10-yr-old juvenile.
- b. *Risk Assessment Guidance for Superfund—Vol I: Human Health Evaluation Manual*. Supplemental Guidance: Standard Default Exposure Factors. OSWER 9285.6-03. (EPA, 1991).
- c. *Draft-Final Baseline Risk Assessment, Part 1—Nongroundwater Media* (CH2M HILL, 2000) (BLRA).
- d. *Risk Assessment Guidance for Superfund, Vol I: Human Health Evaluation Manual*. Part E, Supplemental Guidance for Dermal Risk Assessment, Final. EPA/540/R/99/005. OSWER 9285.7-02EP (EPA, 2004).
- e. *Exposure Factors Handbook* (EPA, August 1997, Table 5-23). Approximate inhalation rate of a 10-year-old juvenile.
- f. *Soil Screening Guidance: Users Guide*. EPA/540/R-96/018. Office of Emergency and Remedial Response, Washington, D.C. PB96-963505.
- g. *Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites* (Oregon Department of Environmental Quality, September 22, 2003).

Abbreviations:

- cm²/day = square centimeters per day.
- day/yr = days per year.
- kg = kilogram.
- m³/day = cubic meters per day.
- m³/kg = cubic meters per kilogram.
- mg/cm² = milligrams per square centimeter.
- mg/day = milligrams per day.
- mg/kg = milligrams per kilogram.
- UCL = upper confidence limit.
- yr = years.

**Table 4-11
Central Tendency Exposure Assumptions**

Parameter	Equation Parameter	Units	Short-Term Trespasser	Source	Short-Term Recreational User	Source	Near-Term Construction Worker	Source	Intermittent Excavation/Trench Worker	Source	Hypothetical Occupational Worker	Source
Constituent Concentration	C _s	mg/kg (dry wt.)	95% UCL of mean	Calculated	95% UCL of mean	Calculated	95% UCL of mean	Calculated	95% UCL of mean	Calculated	95% UCL of mean	Calculated
Body Weight	BW	kg	35	a	35	a	70	g	70	g	70	g
Carcinogenic Averaging Time	AT _c	yr	70	b	70	b	70	g	70	g	70	g
Noncarcinogenic Averaging Time	AT _n	yr	5	c	5	c	1	g	1	g	6	g
Exposure Frequency	EF	day/yr	5	c	5	c	250	g	9	g	250	g
Exposure Duration	ED	yr	5	c	5	c	0.5	g	0.5	g	6	g
Incidental Soil Ingestion Rate	IR _s	mg/day	100	g	100	g	100	g	100	g	50	g
Skin Surface Area	SA	cm ² /day	2,800	g	2,800	g	3,300	g	3,300	g	3,300	g
Dermal Absorption Factor	ABS	unitless	Chemical-specific	d	Chemical-specific	d	Chemical-specific	d	Chemical-specific	d	Chemical-specific	d
Soil-to-Skin Adherence Factor	AF	mg/cm ²	0.04	g	0.04	g	0.1	g	0.1	g	0.02	g
Inhalation Rate	INH	m ³ /day	14	e	14	e	7	g	7	g	7	g
Particulate Emission Factor	PEF	m ³ /kg	1.32E+09	f	1.32E+09	f	1.32E+09	f	1.32E+09	f	1.32E+09	f
Volatilization Factor	VF	m ³ /kg	Chemical-specific	f	Chemical-specific	f	Chemical-specific	f	Chemical-specific	f	Chemical-specific	f

Sources:

- a. *Exposure Factors Handbook* (EPA, August 1997, Table 7-3). Approximate body weight of a 10-yr-old juvenile.
- b. *Risk Assessment Guidance for Superfund—Vol I: Human Health Evaluation Manual*. Supplemental Guidance: Standard Default Exposure Factors. OSWER 9285.6-03. (EPA, 1991).
- c. *Draft-Final Baseline Risk Assessment, Part 1—Nongroundwater Media* (CH2M HILL, 2000) (BLRA).
- d. *Risk Assessment Guidance for Superfund, Vol I: Human Health Evaluation Manual*. Part E, Supplemental Guidance for Dermal Risk Assessment, Final. EPA/540/R/99/005. OSWER 9285.7-02EP (EPA, 2004).
- e. *Exposure Factors Handbook* (EPA, August 1997, Table 5-23). Approximate inhalation rate of a 10-year-old juvenile.
- f. *Soil Screening Guidance: Users Guide*. EPA/540/R-96/018. Office of Emergency and Remedial Response, Washington, D.C. PB96-963505.
- g. *Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites* (Oregon Department of Environmental Quality, September 22, 2003).

Abbreviations:

- cm²/day = square centimeters per day.
- day/yr = days per year.
- kg = kilogram.
- m³/day = cubic meters per day.
- m³/kg = cubic meters per kilogram.
- mg/cm² = milligrams per square centimeter.
- mg/day = milligrams per day.
- mg/kg = milligrams per kilogram.
- UCL = upper confidence limit.
- yr = years.

**Table 4-12
Toxicity Factors for the Oral Route**

Chemical	Carcinogen Classification	Oral Cancer Slope Factor (mg/kg-day) ⁻¹	Source	Chronic Oral RfD (mg/kg-day)	Source	Uf	Mf	Confidence in Oral RfD ^a	Subchronic Oral RfD (mg/kg-day)	Source	Uf	% Dermal Absorption ^d	ABSgi	VF	Critical Systemic Effect
4,4-DDD	B2	2.4E-01	a	-	-	-	-	-	-	-	-	3%	1	-	
4,4-DDE	B2	3.4E-01	a	-	-	-	-	-	-	-	-	3%	1	-	
4,4-DDT	B2	3.4E-01	a	5.0E-04	a	100	1	medium	5.0E-04	c	100	3%	1	-	Liver lesions
Acenaphthene	NA	-	-	6.0E-02	a	3000	1	low	6.0E-01	c	300	-	1	1.82E+05	Hepatotoxicity
Acenaphthylene	D	-	-	-	-	-	-	-	-	-	-	-	1	-	
Aluminum	NA	-	-	1.0E+00	b	100	-	-	-	-	-	-	1	-	
Anthracene	D	-	-	3.0E-01	a	3000	1	low	3.0E+00	c	300	-	1	6.98E+05	No adverse effects observed
Antimony	NA	-	-	4.0E-04	a	1000	1	low	4.0E-04	c	1000	-	0.15	-	Longevity, blood glucose, and cholesterol
Aroclor-1016	NA	7.0E-02	d	7.0E-05	a	100	1	medium	-	-	-	14%	1	-	Reduced birth weights
Aroclor-1221	NA	2.0E+00	d	2.0E-05	d	-	-	-	-	-	-	14%	1	-	
Aroclor-1232	NA	2.0E+00	d	2.0E-05	d	-	-	-	-	-	-	14%	1	-	
Aroclor-1242	NA	2.0E+00	d	2.0E-05	d	-	-	-	-	-	-	14%	1	-	
Aroclor-1248	NA	2.0E+00	d	2.0E-05	d	-	-	-	-	-	-	14%	1	-	
Aroclor-1254	NA	2.0E+00	d	2.0E-05	a	300	1	medium	5.0E-05	c	100	14%	1	-	Ocular effects, distorted nail growth, immune system effects
Aroclor-1260	NA	2.0E+00	d	2.0E-05	d	-	-	-	-	-	-	14%	1	-	
Aroclor-1268	NA	2.0E+00	d	2.0E-05	d	-	-	-	-	-	-	14%	1	-	
Arsenic	A	1.5E+00	a	3.0E-04	a	3	1	medium	3.0E-04	c	3	3%	1	-	Hyperpigmentation, keratosis, and possible vascular complications
Barium	D	-	-	2.0E-01	a	300	1	medium	7.0E-02	c	3	-	0.07	-	Nephropathy
Benzo(a)anthracene	B2	7.3E-01	d	-	-	-	-	-	-	-	-	13%	1	-	
Benzo(a)pyrene	B2	7.3E+00	a	-	-	-	-	-	-	-	-	13%	1	-	
Benzo(b)fluoranthene	B2	7.3E-01	d	-	-	-	-	-	-	-	-	13%	1	-	
Benzo(g,h,i)perylene	D	-	-	-	-	-	-	-	-	-	-	13%	1	-	
Benzo(k)fluoranthene	B2	7.3E-02	d	-	-	-	-	-	-	-	-	13%	1	-	
Benzoic Acid	D	-	-	4.0E+00	a	1	1	medium	4.0E+00	c	1	10%	1	-	No adverse effects observed
Beryllium	B1	-	-	2.0E-03	a	300	1	low/medium	5.0E-03	c	100	-	0.007	-	Intestinal lesions
Bromomethane	D	-	-	1.4E-03	a	1000	1	medium	5.0E-03	b	300	-	1	1.81E+03	Epithelial hyperplasia of the forestomach
Cadmium	B1	-	-	1.0E-03	a	10	1	high	-	-	-	0.1%	0.025	-	Significant proteinuria
Calcium	NA	-	-	-	-	-	-	-	-	-	-	-	1	-	
Chromium	A	-	-	3.0E-03	a	300	3	low	2.0E-02	c	100	-	0.025	-	No adverse effects observed
Chrysene	B2	7.3E-03	d	-	-	-	-	-	-	-	-	13%	1	2.73E+06	
Cobalt	NA	-	-	2.0E-02	b	-	-	-	-	-	-	-	1	-	
Copper	D	-	-	4.0E-02	d	-	-	-	-	-	-	-	1	-	
Cyanide, Total	D	-	-	2.0E-02	a	100	5	medium	2.0E-02	c	500	10%	1	-	No adverse effects observed
Dibenzo(a,h)anthracene	B2	7.3E+00	d	-	-	-	-	-	-	-	-	13%	1	-	
Diesel	-	-	-	-	-	-	-	-	-	-	-	-	1	-	
Fluoranthene	D	-	-	4.0E-02	a	3000	1	low	4.0E-01	c	300	13%	1	-	Nephropathy, increased liver weight, and hematological alterations
Fluorene	D	-	-	4.0E-02	a	3000	1	low	4.0E-01	c	300	-	1	3.60E+05	Decreased red blood cells (RBC), packed cell volume and hemoglobin
Fluoride	NA	-	-	6.0E-02	a	1	1	high	6.0E-02	c	1	10%	1	-	Objectionable dental fluorosis
Indeno(1,2,3-cd)pyrene	B2	7.3E-01	d	-	-	-	-	-	-	-	-	13%	1	-	
Iron	NA	-	-	3.0E-01	d	-	-	-	-	-	-	-	1	-	
Lead	B2	-	-	-	-	-	-	-	-	-	-	-	1	-	Central nervous system (CNS) effects
Magnesium	NA	-	-	-	-	-	-	-	-	-	-	-	1	-	
Manganese	D	-	-	1.4E-01	a	1	1	medium	1.4E-01	c	1	-	0.04	-	CNS effects
Mercury	D	-	-	3.0E-04	a	1000	1	high	-	-	-	-	0.07	-	Hand tremor, increases in memory disturbances, autonomic dysfunction
Naphthalene	C	-	-	2.0E-02	a	3000	1	low	-	-	-	-	1	4.33E+04	Decreased mean terminal body weight in males
Nickel	NA	-	-	2.0E-02	a	300	1	medium	2.0E-02	c	300	-	0.04	-	Decreased body and organ weights
Polychlorinated Biphenyls (PCBs)	B2	2.0E+00	d	2.0E-05	d	-	-	-	-	-	-	14%	1	-	
Phenanthrene	D	-	-	-	-	-	-	-	-	-	-	13%	1	-	
Potassium	NA	-	-	-	-	-	-	-	-	-	-	-	1	-	
Pyrene	D	-	-	3.0E-02	a	3000	1	low	3.0E-01	c	300	13%	1	3.80E+06	Renal tubular pathology, decreased kidney weights
Selenium	D	-	-	5.0E-03	a	3	1	high	5.0E-03	c	3	-	1	-	Clinical selenosis
Silver	D	-	-	5.0E-03	a	3	1	low	5.0E-03	c	3	-	0.04	-	Argyria
Sodium	NA	-	-	-	-	-	-	-	-	-	-	-	1	-	
Thallium	D	-	-	6.6E-05	a	3000	1	low	8.0E-04	c	300	-	1	-	Increased blood enzyme levels
Toluene	D	-	-	8.0E-02	a	3000	1	medium	2.0E+00	c	100	-	1	3.98E+03	Changes in liver and kidney weights, degeneration of nasal epithelium
Total Petroleum Hydrocarbon	-	-	-	-	-	-	-	-	-	-	-	-	1	-	
Vanadium	NA	-	-	1.0E-03	d	-	-	-	7.0E-03	c	100	-	0.026	-	
Zinc	D	-	-	3.0E-01	a	3	1	med-high	3.0E-01	c	3	-	1	-	Decrease in erythrocyte superoxide dismutase (ESOD) concentration

Sources:
^a Integrated Risk Information System (IRIS).
^b Provisional Peer Reviewed Toxicity Values (PPRTVs).
^c Health Effects Assessment Summary Tables (HEAST).
^d Region IX Preliminary Remediation Goals (PRGs).

Abbreviations:
 ABSgi = gastrointestinal absorption factor.
 Mf = modifying factor.
 Uf = uncertainty factor.
 VF = volatilization factor.

**Table 4-13
Toxicity Factors for the Inhalation Route**

Chemical	Carcinogen Classification	Inhalation Cancer Slope Factor (mg/kg-day) ⁻¹	Source	Chronic Inhalation RfD (mg/kg-day)	Source	Uf	Mf	Confidence in Inhalation RfD ^a	Subchronic Inhalation RfD (mg/kg-day)	Source	Uf	Critical Systemic Effect
4,4-DDD	B2	-	-	-	-	-	-	-	-	-	-	
4,4-DDE	B2	-	-	-	-	-	-	-	-	-	-	
4,4-DDT	B2	3.4E-01	a	-	-	-	-	-	-	-	-	Liver lesions
Acenaphthene	NA	-	-	-	-	-	-	-	-	-	-	Hepatotoxicity
Acenaphthylene	D	-	-	-	-	-	-	-	-	-	-	-
Aluminum	NA	-	-	1.4E-03	b	300	-	-	-	-	-	
Anthracene	D	-	-	-	-	-	-	-	-	-	-	No adverse effects observed
Antimony	NA	-	-	-	-	-	-	-	1.4E-04	b	100	Longevity, blood glucose, and cholesterol
Aroclor-1016	NA	7.0E-02	d	-	-	-	-	-	-	-	-	Reduced birth weights
Aroclor-1221	NA	2.0E+00	d	-	-	-	-	-	-	-	-	
Aroclor-1232	NA	2.0E+00	d	-	-	-	-	-	-	-	-	
Aroclor-1242	NA	2.0E+00	d	-	-	-	-	-	-	-	-	
Aroclor-1248	NA	2.0E+00	d	-	-	-	-	-	-	-	-	
Aroclor-1254	NA	2.0E+00	d	-	-	-	-	-	-	-	-	Ocular effects, distorted nail growth, immune system effects
Aroclor-1260	NA	2.0E+00	d	-	-	-	-	-	-	-	-	
Aroclor-1268	NA	2.0E+00	d	-	-	-	-	-	-	-	-	
Arsenic	A	1.5E+01	i	-	-	-	-	-	-	-	-	Hyperpigmentation, keratosis, and possible vascular complications
Barium	D	-	-	1.4E-04	c	-	-	-	-	-	-	Increased blood pressure
Benzo(a)anthracene	B2	-	-	-	-	-	-	-	-	-	-	
Benzo(a)pyrene	B2	-	-	-	-	-	-	-	-	-	-	
Benzo(b)fluoranthene	B2	-	-	-	-	-	-	-	-	-	-	
Benzo(g,h,i)perylene	D	-	-	-	-	-	-	-	-	-	-	
Benzo(k)fluoranthene	B2	-	-	-	-	-	-	-	-	-	-	
Benzoic Acid	D	-	-	-	-	-	-	-	-	-	-	No adverse effects observed
Beryllium	B1	8.4E+00	a	5.7E-06	a	10	1	medium	-	-	-	Intestinal lesions
Bromomethane	D	-	-	1.4E-03	a	100	1	high	-	-	-	Nasal cavity lesions
Cadmium	B1	6.3E+00	a	-	-	-	-	-	-	-	-	Significant proteinuria
Calcium	NA	-	-	-	-	-	-	-	-	-	-	
Chromium	A	2.9E+02	a	2.2E-06	a	90	1	low	-	-	-	Nasal septum atrophy
Chrysene	B2	-	-	-	-	-	-	-	-	-	-	
Cobalt	NA	9.8E+00	b	5.7E-06	b	100	-	-	-	-	-	
Copper	D	-	-	-	-	-	-	-	-	-	-	
Cyanide, Total	D	-	-	-	-	-	-	-	-	-	-	No adverse effects observed
Dibenzo(a,h)anthracene	B2	-	-	-	-	-	-	-	-	-	-	
Diesel	-	-	-	-	-	-	-	-	-	-	-	
Fluoranthene	D	-	-	-	-	-	-	-	-	-	-	Nephropathy, increased liver weight, and hematological alterations
Fluorene	D	-	-	-	-	-	-	-	-	-	-	Decreased red blood cells (RBC), packed cell volume and hemoglobin
Fluoride	NA	-	-	-	-	-	-	-	-	-	-	Objectionable dental fluorosis
Indeno(1,2,3-cd)pyrene	B2	-	-	-	-	-	-	-	-	-	-	
Iron	NA	-	-	-	-	-	-	-	-	-	-	
Lead	B2	-	-	-	-	-	-	-	-	-	-	
Magnesium	NA	-	-	-	-	-	-	-	-	-	-	
Manganese	D	-	-	1.4E-05	a	-	-	-	-	-	-	Impairment of neurobehavioral function
Mercury	D	-	-	-	-	-	-	-	3.0E-03	c	100	Autoimmune effects
Naphthalene	C	-	-	8.6E-04	a	-	-	-	-	-	-	Hyperplasia in respiratory epithelium, metaplasia in olfactory epithelium
Nickel	NA	-	-	-	-	-	-	-	-	-	-	Decreased body and organ weights
Polychlorinated Biphenyls (PCBs)	B2	2.0E+00	a	-	-	-	-	-	-	-	-	
Phenanthrene	D	-	-	-	-	-	-	-	-	-	-	
Potassium	NA	-	-	-	-	-	-	-	-	-	-	
Pyrene	D	-	-	-	-	-	-	-	-	-	-	Renal tubular pathology, decreased kidney weights
Selenium	D	-	-	-	-	-	-	-	-	-	-	Clinical selenosis
Silver	D	-	-	-	-	-	-	-	-	-	-	Argyria
Sodium	NA	-	-	-	-	-	-	-	-	-	-	
Thallium	D	-	-	-	-	-	-	-	-	-	-	Increased blood enzyme levels
Toluene	D	-	-	1.4E+00	a	10	1	high	-	-	-	Neurological effects, degeneration of nasal epithelium
Total Petroleum Hydrocarbon	-	-	-	-	-	-	-	-	-	-	-	
Vanadium	NA	-	-	-	-	-	-	-	-	-	-	
Zinc	D	-	-	-	-	-	-	-	-	-	-	Decrease in erythrocyte superoxide dismutase (ESOD) concentration

Sources:

- ^a Integrated Risk Information System (IRIS).
- ^b Provisional Peer Reviewed Toxicity Values (PPRTVs).
- ^c Health Effects Assessment Summary Tables (HEAST).
- ^d Region IX Preliminary Remediation Goals (PRGs).

Abbreviations:

- Mf = modifying factor.
- mg/kg-day = milligrams of chemical contacting the body per kilogram body weight each per day
- RfD = reference dose.
- Uf = uncertainty factor.

**Table 4-14
Summary of Risk Estimates for Fairview Farms**

Exposure Area	Exposure Pathway	Excess Lifetime Cancer Risk	Noncancer Hazard Index	Primary ELCR Contributors^a	Primary HI Contributors^a
Short-Term Trespasser Surface Soil - RME	Ingestion	1 x 10 ⁻⁷	0.02	N/A	N/A
	Dermal	6 x 10 ⁻⁸	0.003		
	Inhalation	1 x 10 ⁻⁸	0.001		
	Total	2 x 10⁻⁷	0.02		
Short-Term Trespasser Surface Soil - CTE	Ingestion	9 x 10 ⁻⁹	0.002	N/A	N/A
	Dermal	1 x 10 ⁻⁹	0.00007		
	Inhalation	2 x 10 ⁻⁹	0.0002		
	Total	1 x 10⁻⁸	0.002		
Near-Term Construction Worker Subsurface Soil - RME	Ingestion	1 x 10 ⁻⁷	0.1	N/A	N/A
	Dermal	5 x 10 ⁻⁸	0.01		
	Inhalation	5 x 10 ⁻⁹	0.003		
	Total	2 x 10⁻⁷	0.1		
Near-Term Construction Worker Subsurface Soil - CTE	Ingestion	2 x 10 ⁻⁸	0.02	N/A	N/A
	Dermal	8 x 10 ⁻⁹	0.002		
	Inhalation	3 x 10 ⁻⁹	0.001		
	Total	3 x 10⁻⁸	0.02		
Intermittent Excavation/Trench Worker Subsurface Soil - RME	Ingestion	5 x 10 ⁻⁹	0.005	N/A	N/A
	Dermal	2 x 10 ⁻⁹	0.0005		
	Inhalation	2 x 10 ⁻¹⁰	0.0001		
	Total	6 x 10⁻⁹	0.005		
Intermittent Excavation/Trench Worker Subsurface Soil - CTE	Ingestion	7 x 10 ⁻¹⁰	0.0007	N/A	N/A
	Dermal	3 x 10 ⁻¹⁰	0.00008		
	Inhalation	9 x 10 ⁻¹¹	0.0001		
	Total	1 x 10⁻⁹	0.0008		
Occupational Worker Surface Soil - RME	Ingestion	1 x 10 ⁻⁶	0.05	N/A	N/A
	Dermal	5 x 10 ⁻⁷	0.005		
	Inhalation	1 x 10 ⁻⁷	0.003		
	Total	2 x 10⁻⁶	0.05		
Occupational Worker Surface Soil - CTE	Ingestion	1 x 10 ⁻⁷	0.02	N/A	N/A
	Dermal	2 x 10 ⁻⁸	0.001		
	Inhalation	3 x 10 ⁻⁸	0.003		
	Total	2 x 10⁻⁷	0.03		

^a Primary contributors to the total risk are listed when chemical-specific ELCR > 10⁻⁶ or HQ > 1.0, and when that chemical contributes 10 percent or greater to the overall risk.

CTE = central tendency estimate.

ELCR = excess lifetime cancer risk.

HI = hazard index.

N/A = Not applicable since none identified.

RME = reasonable maximum exposure.

**Table 4-15
Summary of Risk Estimates for Outside the Dike**

Exposure Area	Exposure Pathway	Excess Lifetime Cancer Risk	Noncancer Hazard Index	Primary ELCR Contributors ^a	Primary HI Contributors ^a
Short-Term Trespasser Surface Soil - RME	Ingestion	1 x 10 ⁻⁶	0.2	N/A	N/A
	Dermal	7 x 10 ⁻⁷	0.1		
	Inhalation	1 x 10 ⁻⁸	0.002		
	Total	2 x 10⁻⁶	0.3		
Short-Term Trespasser Surface Soil - CTE	Ingestion	1 x 10 ⁻⁷	0.02	N/A	N/A
	Dermal	2 x 10 ⁻⁸	0.002		
	Inhalation	2 x 10 ⁻⁹	0.0003		
	Total	1 x 10⁻⁷	0.02		
Short-Term Recreational User Surface Soil - RME	Ingestion	1 x 10 ⁻⁶	0.2	N/A	N/A
	Dermal	6 x 10 ⁻⁷	0.08		
	Inhalation	1 x 10 ⁻⁸	0.002		
	Total	2 x 10⁻⁶	0.3		
Short-Term Recreational User Surface Soil - CTE	Ingestion	1 x 10 ⁻⁷	0.02	N/A	N/A
	Dermal	1 x 10 ⁻⁸	0.002		
	Inhalation	2 x 10 ⁻⁹	0.0003		
	Total	1 x 10⁻⁷	0.02		

^a Primary contributors to the total risk are listed when chemical-specific ELCR > 10⁻⁶ or HQ > 1.0, and when that chemical contributes 10 percent or greater to the overall risk.

CTE = central tendency estimate.

ELCR = excess lifetime cancer risk.

HI = hazard index.

N/A = Not applicable since none identified.

RME = reasonable maximum exposure.

Table 4-16
Summary of Risk Estimates for South Wetlands

Exposure Area	Exposure Pathway	Excess Lifetime Cancer Risk	Noncancer Hazard Index	Primary ELCR Contributors ^a	Primary HI Contributors ^a
Short-Term Trespasser Surface Soil - RME	Ingestion	7 x 10 ⁻⁶	0.4	Benzo(a)pyrene ELCR = 3 x 10 ⁻⁶ (32%) Dibenzo(a,h)anthracene EELR = 2 x 10 ⁻⁶ (21%)	N/A
	Dermal	4 x 10 ⁻⁶	0.1		
	Inhalation	4 x 10 ⁻⁸	0.002		
	Total	1 x 10⁻⁵	0.5		
Short-Term Trespasser Surface Soil - CTE	Ingestion	7 x 10 ⁻⁷	0.04	N/A	N/A
	Dermal	9 x 10 ⁻⁸	0.003		
	Inhalation	7 x 10 ⁻⁹	0.0004		
	Total	8 x 10⁻⁷	0.04		
Near-Term Construction Worker Subsurface Soil - RME	Ingestion	2 x 10 ⁻⁶	0.6	N/A	N/A
	Dermal	7 x 10 ⁻⁷	0.1		
	Inhalation	4 x 10 ⁻⁹	0.002		
	Total	3 x 10⁻⁶	0.7		
Near-Term Construction Worker Subsurface Soil - CTE	Ingestion	3 x 10 ⁻⁷	0.1	N/A	N/A
	Dermal	1 x 10 ⁻⁷	0.02		
	Inhalation	2 x 10 ⁻⁹	0.001		
	Total	4 x 10⁻⁷	0.1		
Intermittent Excavation/Trench Worker Subsurface Soil - RME	Ingestion	2 x 10 ⁻⁷	0.06	N/A	N/A
	Dermal	7 x 10 ⁻⁸	0.01		
	Inhalation	4 x 10 ⁻¹⁰	0.0002		
	Total	3 x 10⁻⁷	0.07		
Intermittent Excavation/Trench Worker Subsurface Soil - CTE	Ingestion	3 x 10 ⁻⁸	0.01	N/A	N/A
	Dermal	1 x 10 ⁻⁸	0.002		
	Inhalation	2 x 10 ⁻¹⁰	0.0001		
	Total	4 x 10⁻⁸	0.01		

Note: Calculations based on 90 percent upper confidence limit.

^a Primary contributors to the total risk are listed when chemical-specific ELCR > 10⁻⁶ or HQ > 1.0, and when that chemical contributes 10 percent or greater to the overall risk.

CTE = central tendency estimate.

ELCR = excess lifetime cancer risk.

HI = hazard index.

N/A = Not applicable since none identified.

RME = reasonable maximum exposure.

**Table 4-17
Summary of Risk Estimates for East Area**

Exposure Area	Exposure Pathway	Excess Lifetime Cancer Risk	Noncancer Hazard Index	Primary ELCR Contributors^a	Primary HI Contributors^a
Short-Term Trespasser Surface Soil - RME	Ingestion	8 x 10 ⁻⁷	0.07	N/A	N/A
	Dermal	4 x 10 ⁻⁷	0.03		
	Inhalation	2 x 10 ⁻⁸	0.001		
	Total	1 x 10⁻⁶	0.10		
Short-Term Trespasser Surface Soil - CTE	Ingestion	7 x 10 ⁻⁸	0.006	N/A	N/A
	Dermal	9 x 10 ⁻⁹	0.0007		
	Inhalation	4 x 10 ⁻⁹	0.0002		
	Total	9 x 10⁻⁸	0.007		
Near-Term Construction Worker Subsurface Soil - RME	Ingestion	2 x 10 ⁻⁶	0.7	N/A	N/A
	Dermal	6 x 10 ⁻⁷	0.3		
	Inhalation	4 x 10 ⁻⁹	0.002		
	Total	2 x 10⁻⁶	1		
Near-Term Construction Worker Subsurface Soil - CTE	Ingestion	3 x 10 ⁻⁷	0.1	N/A	N/A
	Dermal	1 x 10 ⁻⁷	0.04		
	Inhalation	2 x 10 ⁻⁹	0.001		
	Total	4 x 10⁻⁷	0.2		
Intermittent Excavation/Trench Worker Subsurface Soil - RME	Ingestion	7 x 10 ⁻⁸	0.03	N/A	N/A
	Dermal	2 x 10 ⁻⁸	0.01		
	Inhalation	1 x 10 ⁻¹⁰	0.0001		
	Total	9 x 10⁻⁸	0.05		
Intermittent Excavation/Trench Worker Subsurface Soil - CTE	Ingestion	1 x 10 ⁻⁸	0.004	N/A	N/A
	Dermal	4 x 10 ⁻⁹	0.002		
	Inhalation	7 x 10 ⁻¹¹	0.00003		
	Total	1 x 10⁻⁸	0.01		
Occupational Worker Surface Soil - RME	Ingestion	9 x 10 ⁻⁶	0.2	Benzo(a)pyrene ELCR = 5 x 10 ⁻⁶ (38%) Arsenic ELCR = 2 x 10 ⁻⁶ (17%) (EPC = 3.8 mg/kg)	N/A
	Dermal	3 x 10 ⁻⁶	0.05		
	Inhalation	3 x 10 ⁻⁷	0.003		
	Total	1 x 10⁻⁵	0.2		
Occupational Worker Surface Soil - CTE	Ingestion	1 x 10 ⁻⁶	0.08	N/A	N/A
	Dermal	2 x 10 ⁻⁷	0.01		
	Inhalation	7 x 10 ⁻⁸	0.003		
	Total	1 x 10⁻⁶	0.09		

Note: Calculations based on 90 percent upper confidence limit.

^a Primary contributors to the total risk are listed when chemical-specific ELCR > 10⁻⁶ or HQ > 1.0, and when that chemical contributes 10 percent or greater to the overall risk.

CTE = central tendency estimate.

ELCR = excess lifetime cancer risk.

HI = hazard index.

N/A = Not applicable since none identified.

RME = reasonable maximum exposure.

**Table 5-1
Summary of Tier 1 Ecological Hazard Quotients for South Wetlands**

Ecological Receptor	Chemicals^a with Tier 1 Ecological Hazard Quotient >1.0	South Wetlands Ecological Hazard Quotient	Background Ecological Hazard Quotient^b
American Robin	Aluminum	44	10
	Cadmium	2.2	0.6
	Chromium	12	2.8
	Copper	1.5	0.1
	Fluoride	48	0.6
	Lead	2.4	1.0
	Mercury	1.5	NA
	Nickel	3.2	0.03
	Selenium	8.9	0.3
	Vanadium	2.0	0.4
	Zinc	3.4	5.1
	PAHs	9.0	-- ^c
	PCB	8.0	-- ^c
Mallard	Fluoride	9.4	0.1
Great Blue Heron	Aluminum	7.2	1.7
	Chromium	3.8	0.5
	Fluoride	18	0.8
	Zinc	4.4	1.5
	PCB	41	-- ^c
Mink	Aluminum	29	6.7
	Antimony	1.2	1.0
	Arsenic	2.5	1.8
	Barium	2.3	1.2
	Beryllium	1.2	0.3
	Cobalt	2.4	0.3
	Fluoride	2.8	0.1
	Nickel	2.0	0.04
	Selenium	9.9	0.8
	Vanadium	28	4.8
	PCB	52	-- ^c
Coyote	Aluminum	14	3.4
	Barium	1.2	0.6
	Copper	1.2	0.2
	Fluoride	6.1	0.2
	Nickel	1.1	0.02
	Selenium	5.2	0.4
	Vanadium	15	2.5
	PAHs	2.9	-- ^c
	PCB	28	-- ^c
	Mule Deer	Aluminum	1.9
Arsenic		1.3	1.0
Cobalt		1.1	0.2
Copper		2.5	0.2
Fluoride		7.7	0.1
Nickel		2.1	0.02
Selenium		4.3	0.21.7
Vanadium		9.9	-- ^c
PAHs		2.7	-- ^c

**Table 5-1
Summary of Tier 1 Ecological Hazard Quotients for South Wetlands**

Ecological Receptor	Chemicals^a with Tier 1 Ecological Hazard Quotient >1.0	South Wetlands Ecological Hazard Quotient	Background Ecological Hazard Quotient^b
Red-tailed Hawk	Aluminum	6.7	1.6
	Chromium	3.5	0.5
	Fluoride	17	0.8
	Selenium	1.9	0.2
	Zinc	4.1	1.4
	PCB	39	-- ^c

^a Hazard quotients consider aggregate exposure from soil, food items, and water. Chemicals listed in bold are those with hazard quotients exceeding corresponding background quotients by 1.0 or more. These chemicals are carried forward to the Tier 2 risk assessment.

^b Background data for wetland/upland soil are used for south wetlands background comparison.

^c Background data for PAHs and PCBs are not relevant.

**Table 5-2
Tier 2 Adjustments to Tier 1 Ecological Quotients for Open Water/Wetland Areas**

Chemical	Endpoint Species	Company Lake				South Wetlands				East Lake				Depression East of Outfall Ditch			
		Tier 1 Hazard Quotient	Area Weighting Factor	Habitat Suitability Factor	Tier 2 Hazard Quotient	Tier 1 Hazard Quotient	Area Weighting Factor	Habitat Suitability Factor	Tier 2 Hazard Quotient	Tier 1 Hazard Quotient	Area Weighting Factor	Habitat Suitability Factor	Tier 2 Hazard Quotient	Tier 1 Hazard Quotient	Area Weighting Factor	Habitat Suitability Factor	Tier 2 Hazard Quotient
Inorganics																	
Aluminum	Great Blue Heron	0.324	0.233	1	0.08	7.18	0.442	0.25	0.79	0.279	0.033	0.5	0.00	0.313	0.020	0.75	0.00
	Mink	2.536	0.233	1	0.59	28.90	0.442	0.25	3.19	2.712	0.033	0.5	0.05	2.418	0.020	0.75	0.04
Barium	Mink	0.795	0.233	1	0.18	2.33	0.442	0.25	0.26	1.018	0.033	0.5	0.02	0.992	0.020	0.75	0.01
Cadmium	Mink	0.072	0.233	1	0.02	1.32	0.442	0.25	0.15	0.102	0.033	0.5	0.00	0.114	0.020	0.75	0.00
Cobalt	Mink	0.471	0.233	1	0.11	2.41	0.442	0.25	0.27	0.551	0.033	0.5	0.01	0.393	0.020	0.75	0.01
Fluoride	Mallard	0.218	0.233	1	0.05	9.44	0.442	0.25	1.04	0.268	0.033	0.5	0.00	0.301	0.020	0.75	0.00
	Great Blue Heron	0.69	0.233	1	0.16	17.86	0.442	0.25	1.97	0.385	0.033	0.5	0.01	0.772	0.020	0.75	0.01
	Mink	0.098	0.233	1	0.02	2.78	0.442	0.25	0.31	0.064	0.033	0.5	0.00	0.114	0.020	0.75	0.00
Nickel	Mink	0.029	0.233	1	0.01	2.03	0.442	0.25	0.22	0.038	0.033	0.5	0.00	0.023	0.020	0.75	0.00
Selenium	Mink	0.000	0.233	1	0.00	9.93	0.442	0.25	1.10	0.000	0.033	0.5	0.00	0.000	0.020	0.75	0.00
Vanadium	Mink	2.099	0.233	1	0.49	28.40	0.442	0.25	3.14	2.663	0.033	0.5	0.04	0.004	0.020	0.75	0.00
Zinc	Great Blue Heron	0.000	0.233	1	0.00	4.38	0.442	0.25	0.48	0.116	0.033	0.5	0.00	0.125	0.020	0.75	0.00
Organics																	
Total PCBs	Great Blue Heron	0.00	0.233	1	0.00	41.1	0.442	0.25	4.54	0.00	0.033	0.5	0.00	0.00	0.020	0.75	0.00
	Mink	0.00	0.233	1	0.00	52.1	0.442	0.25	5.75	0.00	0.033	0.5	0.00	0.00	0.020	0.75	0.00

Chemical	Endpoint Species	East South Ditch				Salmon Creek/West Drainage				Columbia/Sandy Rivers				Total Tier 2 Hazard Quotient ^a
		Tier 1 Hazard Quotient	Area Weighting Factor	Habitat Suitability Factor	Tier 2 Hazard Quotient	Tier 1 Hazard Quotient	Area Weighting Factor	Habitat Suitability Factor	Tier 2 Hazard Quotient	Tier 1 Hazard Quotient	Area Weighting Factor	Habitat Suitability Factor	Tier 2 Hazard Quotient	
Inorganics														
Aluminum	Great Blue Heron	0.591	0.003	0.25	0.00	1.370	0.017	0.75	0.02	0.14	0.252	1.0	0.04	0.9
	Mink	3.989	0.003	0.25	0.00	5.780	0.017	0.75	0.07	1.19	0.252	1.0	0.30	4.2
Barium	Mink	0.966	0.003	0.25	0.00	0.574	0.017	0.75	0.01	0.50	0.252	1.0	0.13	0.5
Cadmium	Mink	0.381	0.003	0.25	0.00	0.083	0.017	0.75	0.00	0.00	0.252	1.0	0.00	0.2
Cobalt	Mink	3.050	0.003	0.25	0.00	0.590	0.017	0.75	0.01	0.36	0.252	1.0	0.09	0.5
Fluoride	Mallard	4.211	0.003	0.25	0.00	0.186	0.017	0.75	0.00	0.16	0.252	1.0	0.04	1.1
	Great Blue Heron	8.264	0.003	0.25	0.01	0.347	0.017	0.75	0.00	0.28	0.252	1.0	0.07	2.2
	Mink	1.279	0.003	0.25	0.00	0.054	0.017	0.75	0.00	0.04	0.252	1.0	0.01	0.3
Nickel	Mink	0.191	0.003	0.25	0.00	0.037	0.017	0.75	0.00	0.01	0.252	1.0	0.00	0.2
Selenium	Mink	0.000	0.003	0.25	0.00	0.000	0.017	0.75	0.00	0.00	0.252	1.0	0.00	1.1
Vanadium	Mink	3.454	0.003	0.25	0.00	2.516	0.017	0.75	0.03	1.21	0.252	1.0	0.30	4.0
Zinc	Great Blue Heron	0.209	0.003	0.25	0.00	0.295	0.017	0.75	0.00	0.04	0.252	1.0	0.01	0.5
Organics														
Total PCBs	Great Blue Heron	0.00	0.003	0.25	0.00	0.05	0.017	0.75	0.00	0.00	0.252	1.0	0.00	4.5
	Mink	0.00	0.003	0.25	0.00	0.46	0.017	0.75	0.01	0.00	0.252	1.0	0.00	5.8

Values in bold are those exceeding an EQ of 1.0.

^aTotal Tier II hazard quotient is the sum of the area-specific hazard quotients for all open water/ wetland areas.

Open Water/Wetland Areas	Acres	Area Weighting Factor
East South Ditch	0.2	3.32E-03
East Depression	1.2	1.99E-02
Salmon Creek/West Ditch	1	1.66E-02
Company Lake	14	2.33E-01
East Lake	2	3.32E-02
South Wetlands	26.6	4.42E-01
River Shoreline ^a	15.2	2.52E-01
Total	60.2	1.00E+00

Habitat Suitability Rating	Suitability Weighting Factor
Excellent	1.00
Good	0.75
Average	0.50
Poor	0.25
Unsuitable	0.00

^a Area estimate assumes use of total shoreline length (~6,600 feet) by endpoint species, along a 100-foot strip, for a total of about 15.2 acres.

**Table 5-3
Tier 2 Adjustments to Tier 1 Ecological Quotients for Upland Areas**

Chemical	Endpoint Species	East Potliner				Fairview Farms				North Landfill				South Landfill				South Wetlands				Total Tier 2 Hazard Quotient ^a
		Tier 1 Hazard Quotient	Area Weighting Factor	Habitat Suitability Factor	Tier 2 Hazard Quotient	Tier 1 Hazard Quotient	Area Weighting Factor	Habitat Suitability Factor	Tier 2 Hazard Quotient	Tier 1 Hazard Quotient	Area Weighting Factor	Habitat Suitability Factor	Tier 2 Hazard Quotient	Tier 1 Hazard Quotient	Area Weighting Factor	Habitat Suitability Factor	Tier 2 Hazard Quotient	Tier 1 Hazard Quotient	Area Weighting Factor	Habitat Suitability Factor	Tier 2 Hazard Quotient	
Inorganics																						
Aluminum	Coyote	3.543	0.012	0.75	0.031	4.564	0.857	1.0	3.911	24.200	0.009	0.25	0.054	7.218	0.019	0.25	0.035	14.48	0.103	0.25	0.373	4.4
	Red-tailed Hawk	1.648	0.012	0.75	0.014	2.123	0.857	1.0	1.819	11.250	0.009	0.25	0.025	3.352	0.019	0.25	0.016	6.744	0.103	0.25	0.174	2.0
	American Robin	10.66	0.012	0.75	0.093	13.73	0.857	1.0	11.77	72.80	0.009	0.25	0.162	21.65	0.019	0.25	0.104	43.60	0.103	0.25	1.123	13.3
	Mule Deer	0.452	0.012	0.75	0.004	0.583	0.857	1.0	0.500	3.089	0.009	0.25	0.007	0.942	0.019	0.25	0.005	1.873	0.103	0.25	0.048	0.6
Barium	Coyote	0.470	0.012	0.75	0.004	0.809	0.857	1.0	0.693	0.506	0.009	0.25	0.001	0.704	0.019	0.25	0.003	1.241	0.103	0.25	0.032	0.7
Cadmium	American Robin	0.000	0.012	0.75	0.000	0.305	0.857	1.0	0.261	1.291	0.009	0.25	0.003	2.910	0.019	0.25	0.014	2.237	0.103	0.25	0.058	0.3
Chromium	Red-tailed Hawk	0.016	0.012	0.75	0.000	0.608	0.857	1.0	0.521	0.875	0.009	0.25	0.002	2.185	0.019	0.25	0.011	3.570	0.103	0.25	0.092	0.6
	American Robin	4.115	0.012	0.75	0.036	3.483	0.857	1.0	2.985	5.541	0.009	0.25	0.012	15.85	0.019	0.25	0.076	11.60	0.103	0.25	0.299	3.4
Copper	Coyote	0.195	0.012	0.75	0.002	0.215	0.857	1.0	0.184	0.931	0.009	0.25	0.002	3.260	0.019	0.25	0.016	1.211	0.103	0.25	0.031	0.2
	American Robin	0.070	0.012	0.75	0.001	0.115	0.857	1.0	0.099	3.96	0.009	0.25	0.009	13.10	0.019	0.25	0.063	1.518	0.103	0.25	0.039	0.2
	Mule Deer	0.113	0.012	0.75	0.001	0.187	0.857	1.0	0.160	6.42	0.009	0.25	0.014	21.22	0.019	0.25	0.102	2.460	0.103	0.25	0.063	0.3
Fluoride	Coyote	0.654	0.012	0.75	0.006	0.306	0.857	1.0	0.262	1.268	0.009	0.25	0.003	0.688	0.019	0.25	0.003	6.101	0.103	0.25	0.157	0.4
	Red-tailed Hawk	1.907	0.012	0.75	0.017	0.975	0.857	1.0	0.836	3.307	0.009	0.25	0.007	1.540	0.019	0.25	0.007	16.86	0.103	0.25	0.434	1.3
	American Robin	4.156	0.012	0.75	0.036	0.925	0.857	1.0	0.793	12.19	0.009	0.25	0.027	3.02	0.019	0.25	0.015	47.54	0.103	0.25	1.224	2.1
	Mule Deer	0.674	0.012	0.75	0.006	0.153	0.857	1.0	0.131	1.976	0.009	0.25	0.004	0.646	0.019	0.25	0.003	7.748	0.103	0.25	0.200	0.3
Lead	American Robin	0.185	0.012	0.75	0.002	0.749	0.857	1.0	0.642	2.786	0.009	0.25	0.006	10.68	0.019	0.25	0.052	2.443	0.103	0.25	0.063	0.8
Mercury	American Robin	0.000	0.012	0.75	0.000	0.000	0.857	1.0	0.000	0.202	0.009	0.25	0.000	0.188	0.019	0.25	0.001	1.526	0.103	0.25	0.039	0.0
Nickel	Coyote	0.014	0.012	0.75	0.000	0.020	0.857	1.0	0.017	0.223	0.009	0.25	0.000	0.131	0.019	0.25	0.001	1.054	0.103	0.25	0.027	0.0
	American Robin	0.018	0.012	0.75	0.000	0.039	0.857	1.0	0.033	0.603	0.009	0.25	0.001	0.391	0.019	0.25	0.002	3.157	0.103	0.25	0.081	0.1
	Mule Deer	0.012	0.012	0.75	0.000	0.026	0.857	1.0	0.022	0.405	0.009	0.25	0.001	0.262	0.019	0.25	0.001	2.119	0.103	0.25	0.055	0.1
Selenium	Coyote	0.000	0.012	0.75	0.000	0.516	0.857	1.0	0.442	1.065	0.009	0.25	0.002	0.951	0.019	0.25	0.005	5.219	0.103	0.25	0.134	0.6
	Red-tailed Hawk	0.000	0.012	0.75	0.000	0.197	0.857	1.0	0.169	0.388	0.009	0.25	0.001	0.351	0.019	0.25	0.002	1.944	0.103	0.25	0.050	0.2
	American Robin	0.000	0.012	0.75	0.000	0.509	0.857	1.0	0.436	2.350	0.009	0.25	0.005	1.808	0.019	0.25	0.009	8.906	0.103	0.25	0.229	0.7
	Mule Deer	0.000	0.012	0.75	0.000	0.246	0.857	1.0	0.211	1.138	0.009	0.25	0.003	0.875	0.019	0.25	0.004	4.311	0.103	0.25	0.111	0.3
Vanadium	Coyote	0.000	0.012	0.75	0.000	0.134	0.857	1.0	0.114	4.544	0.009	0.25	0.010	2.594	0.019	0.25	0.013	14.79	0.103	0.25	0.381	0.5
	American Robin	0.000	0.012	0.75	0.000	0.185	0.857	1.0	0.159	0.630	0.009	0.25	0.001	0.359	0.019	0.25	0.002	2.048	0.103	0.25	0.053	0.2
	Mule Deer	0.000	0.012	0.75	0.000	0.893	0.857	1.0	0.765	3.039	0.009	0.25	0.007	1.735	0.019	0.25	0.008	9.916	0.103	0.25	0.255	1.0
Zinc	Red-tailed Hawk	1.234	0.012	0.75	0.011	0.144	0.857	1.0	0.123	1.422	0.009	0.25	0.003	1.519	0.019	0.25	0.007	4.113	0.103	0.25	0.106	0.3
	American Robin	1.261	0.012	0.75	0.011	3.091	0.857	1.0	2.649	5.281	0.009	0.25	0.012	7.543	0.019	0.25	0.036	3.443	0.103	0.25	0.089	2.8
Organics																						
Total PAHs	Coyote	0.027	0.012	0.75	0.000	0.059	0.857	1.0	0.050	0.15	0.009	0.25	0.000	0.11	0.019	0.25	0.001	2.922	0.103	0.25	0.075	0.1
	Mule Deer	0.027	0.012	0.75	0.000	0.086	0.857	1.0	0.073	0.14	0.009	0.25	0.000	0.107	0.019	0.25	0.001	2.743	0.103	0.25	0.071	0.1
	American Robin	0.063	0.012	0.75	0.001	0.145	0.857	1.0	0.125	0.32	0.009	0.25	0.001	0.11	0.019	0.25	0.001	9.010	0.103	0.25	0.232	0.4
Total PCBs	Coyote	0.000	0.012	0.75	0.000	0.000	0.857	1.0	0.000	25.41	0.009	0.25	0.056	0.01	0.019	0.25	0.000	28.4	0.103	0.25	0.730	0.8
	Red-tailed Hawk	0.000	0.012	0.75	0.000	0.119	0.857	1.0	0.102	12.28	0.009	0.25	0.027	0.00	0.019	0.25	0.000	38.6	0.103	0.25	0.994	1.1
	American Robin	0.000	0.012	0.75	0.000	0.239	0.857	1.0	0.205	5.282	0.009	0.25	0.012	0.00	0.019	0.25	0.000	8.00	0.103	0.25	0.206	0.4

Values in bold are Tier 2 values exceeding an EQ of 1.0.

^a Total Tier II hazard quotient is the sum of the area-specific hazard quotients for all upland areas.

Upland Areas	Acres	Area Weighting Factor
East Potliner	3	1.16E-02
Fairview Farms	222	8.57E-01
North Landfill	2.3	8.88E-03
South Landfill	5	1.93E-02
South Wetlands	26.6	1.03E-01
Total	258.9	1.00E+00

Habitat Suitability Ratio	Weighting Factor
Excellent	1.00
Good	0.75
Average	0.50
Poor	0.25
Unsuitable	0.00

**Table 5-4
Comparison of Open Water/Wetland Area Ecological Risk Estimates with Background Risk Estimates**

Chemical	Endpoint Species	Total Tier 2 Hazard Quotient^a	Upland/Wetland Background Hazard Quotient	Open Water Non-River Background Hazard Quotient	Salmon Creek Background Hazard Quotient
Inorganics					
Aluminum	Mink	4.2	6.7	1.1	2.0
Fluoride	Mallard	1.1	0.1	0.1	0.1
	Great Blue Heron	2.2	0.8	0.1	0.1
Selenium	Mink	1.1	0.8	0.1	NA
Vanadium	Mink	4.0	4.8	3.0	2.0
Organics					
Total PCBs	Great Blue Heron	4.5	<0.01	NA	NA
	Mink	5.8	<0.01	NA	NA

^a Total Tier 2 hazard quotient is the sum of the area-specific hazard quotients for all open water/wetland areas.

NA = not available.

Values in bold are those exceeding background by more than 1.0.

**Table 5-5
Open Water/Wetland Area Contribution Estimates for COPECs (Both NOAEL and LOAEL-Based Hazard Quotients)**

Area	Fluoride Ecological NOAEL-Based HQ (Heron)	Fluoride Ecological LOAEL-Based HQ (Heron)	Areal Percent Contribution	Total PCBs Ecological NOAEL-Based HQ (Mink)	Total PCBs Ecological LOAEL-Based HQ (Mink)	Areal Percent Contribution	Total PCBs Ecological NOAEL- Based HQ (Heron)	Total PCBs Ecological LOAEL-Based HQ (Heron)	Areal Percent Contribution
East South Ditch	0.01	<0.01	0.3%	<0.01	<0.01	<0.01%	<0.01	<0.01	<0.01%
East Depression	0.01	<0.01	0.5%	<0.01	<0.01	<0.01%	<0.01	<0.01	<0.01%
Salmon Creek/ West Drainage	<0.01	<0.01	0.2%	<0.01	<0.01	<0.01%	<0.01	<0.01	<0.01%
Company Lake	0.2	0.04	7.1%	<0.01	<0.01	<0.01%	<0.01	<0.01	<0.01%
East Lake	<0.01	<0.01	0.3%	<0.01	<0.01	<0.01%	<0.01	<0.01	<0.01%
South Wetlands	2.0	0.5	88.4%	5.8	1.2	100%	4.5	0.9	100%
River Shoreline ^a	0.07	0.02	3.1%	<0.01	<0.01	<0.01%	<0.01	<0.01	0.0%
Total	2.0	0.5	100%	5.8	1.2	100%	4.5	0.9	100%

Bold indicates the area with the greatest contribution to the ecological hazard quotient.

^a Area estimate assumes use of total shoreline length (~6,600 feet) by endpoint species, along a 100-foot strip, for a total of about 15.2 acres.

**Table 5-6
Comparison of Upland Area Ecological Risk Estimates with Background Risk Estimates**

Chemical	Receptor	Sitewide Tier II Hazard Quotient^a	Upland/Wetland Background Hazard Quotient
Aluminum	Coyote	4.4	3.4
	Red-tailed Hawk	2.0	1.6
	American Robin	13	10
Chromium	American Robin	3.5	2.8
Fluoride	Red-tailed Hawk	1.3	0.8
	American Robin	2.1	0.6
Zinc	American Robin	2.8	5.1
Organics			
Total PCBs	Red-tailed Hawk	1.1	<0.01

^a Total Tier 2 hazard quotient is the sum of the area-specific hazard quotients for all upland areas. Values in bold are those exceeding background by more than 1.0.

**Table 5-7
Upland Area Contribution Estimates for COPECs (Both NOAEL and LOAEL-Based Hazard Quotients)**

Area	Fluoride Ecological NOAEL-Based HQ (Robin)	Fluoride Ecological LOAEL-Based HQ (Robin)	Areal Percent Contribution	Total PCBs Ecological NOAEL-Based HQ (Hawk)	Total PCBs Ecological LOAEL-Based HQ (Hawk)	Areal Percent Contribution
East Potliner	0.04	0.01	1.7%	<0.01	<0.01	<0.01%
Fairview Farms	0.8	0.2	37.8%	0.10	0.02	9.1%
North Landfill	0.03	0.01	1.3%	0.03	0.01	2.4%
South Landfill	0.01	<0.01	0.7%	<0.01	<0.01	<0.01%
South Wetlands	1.2	0.3	58.4%	1.0	0.2	88.5%
Total	2.1	0.5	100%	1.1	0.2	100%

Bold indicates the area with the greatest contribution to the ecological hazard quotient.

Table 5-8
Available LOAELs for Fluoride and PCBs

Chemical	Chemical Form Tested	Principal Study	Test Species	Exposure Route	Exposure Duration	Measured Effect	LOAEL (mg/kg-bw-day)
Fluoride	Sodium Fluoride	Patte et al., 1988 in Sample et al., 1996	Screech owl	Oral in diet	5-6 months/critical stage	Reproduction	32
Fluoride	Sodium Fluoride	Guenter and Hahn, 1986	Leghorn chicken	Oral in diet	252 days	Feed consumption, growth, egg quality, hen-day production	>49.3 ^a
PCBs	Aroclor 1254	Dahlgren et al., 1972 in Sample et al., 1996	Ring-necked pheasant	Oral gelatin capsule	17 weeks/critical stage	Reproduction	1.8
PCBs	Aroclor 1254	Bird et al., 1983 in Eisler, R. 1986	American kestrel	Oral in diet	62 to 69 days	Sperm reduction	9-10
PCBs	Aroclor 1254	Aulerich and Ringer, 1977 in Sample et al., 1996	Mink	Oral in diet	4.5 months/critical lifestage	Reproduction	0.69
PCBs	Aroclor 1242	McCoy et al., 1995 in Sample et al., 1996	Mink	Oral in diet	7 months/critical lifestage	Reproduction	0.69
PCBs	Aroclor 1016	Aulerich and Ringer, 1980 in Sample et al., 1996	Mink	Oral in diet	18 months/critical lifestage	Reproduction	3.43

Notes:

Values in bold were used in the Ecological Risk Assessment.

a. Based on a dietary fluoride intake of 700 mg/kg; dosage was calculated assuming leghorn body weight of 1.5 kg and food ingestion rate of 0.106 kg/day.

Sources:

Sample, B.E., D.M. Opresko, and G.W. Suter II. 1996. *Toxicological benchmarks for wildlife: 1996 revision*. Environmental Restoration Division, ORNL Environmental Restoration Program. ES/ER/TM-86/R3.

W. Guenter and P.H. Hahn. 1986. Fluorine toxicity and laying hen performance. *Poultry Science*. 65(4):769-78.

Eisler, R. 1986. *Polychlorinated biphenyls hazards to fish, wildlife, and invertebrates: a synoptic review*. U.S. Fish and Wildlife Service Biological Report 85(1.7), Contaminant Hazard Reviews Report No. 7. April.

Figures

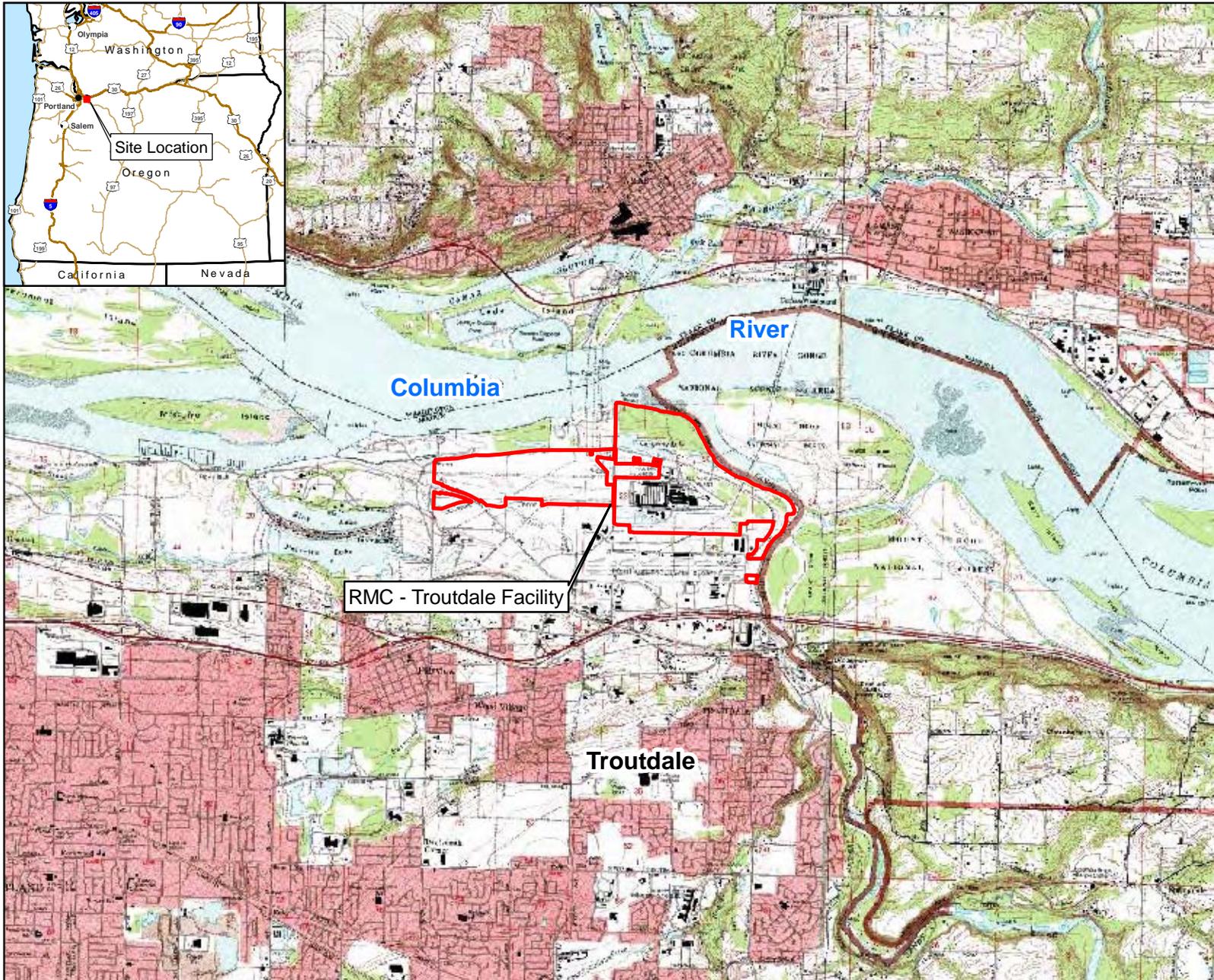


Figure 1-1
Vicinity Map
RMC-Troutdale Facility
 Troutdale, Oregon

Legend
 RMC-Troutdale
 Property Boundary



0 0.25 0.5 0.75 1
 Miles



Figure 2-1

Site Map

RMC-Troutdale Facility
Troutdale, Oregon

Legend

 RMC-Troutdale Property Boundary

 Other Tax Lots

Exposure Areas

 East Area

 Fairview Farms

 Outside the Dike

 South Wetlands

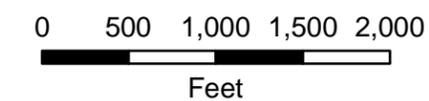
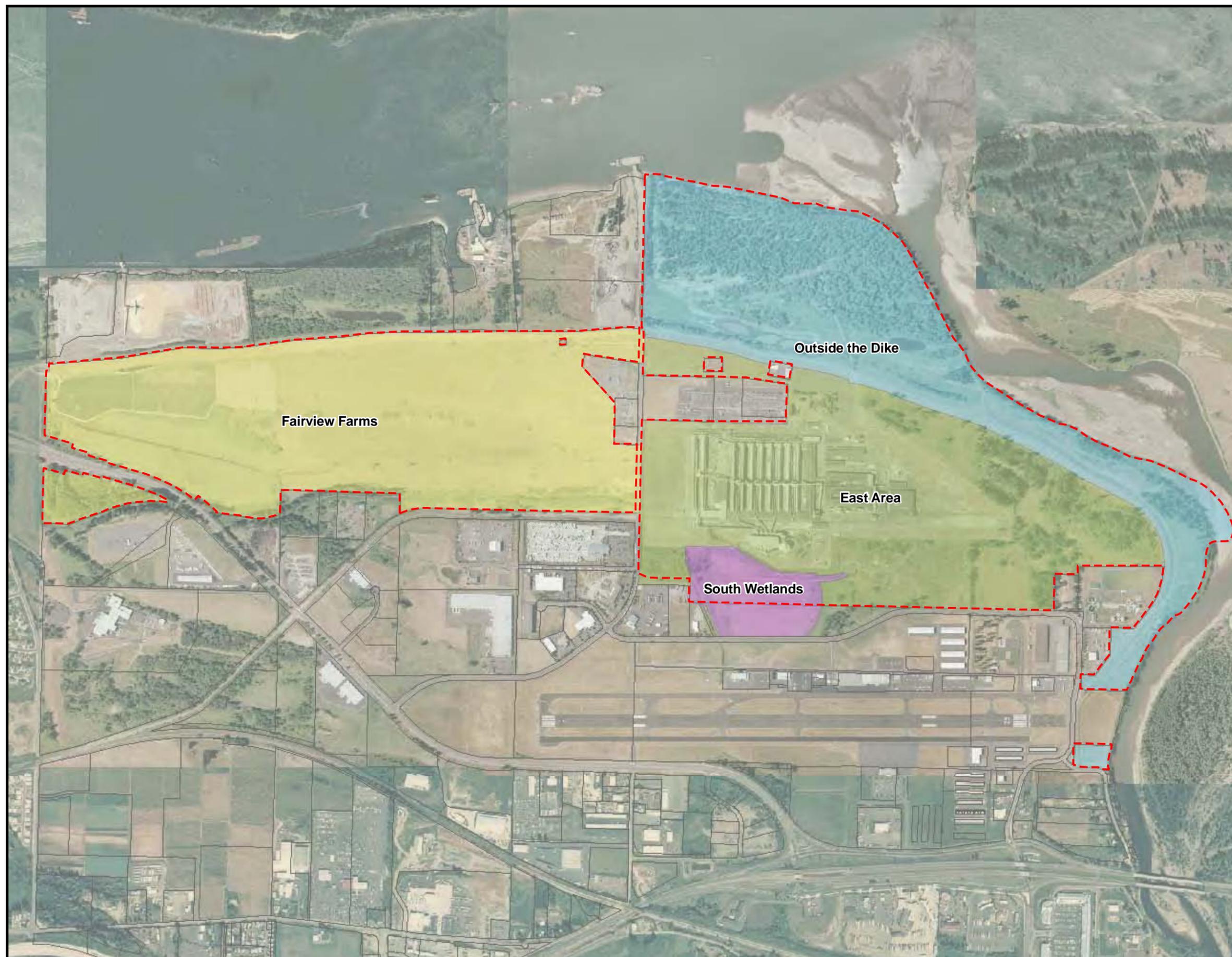
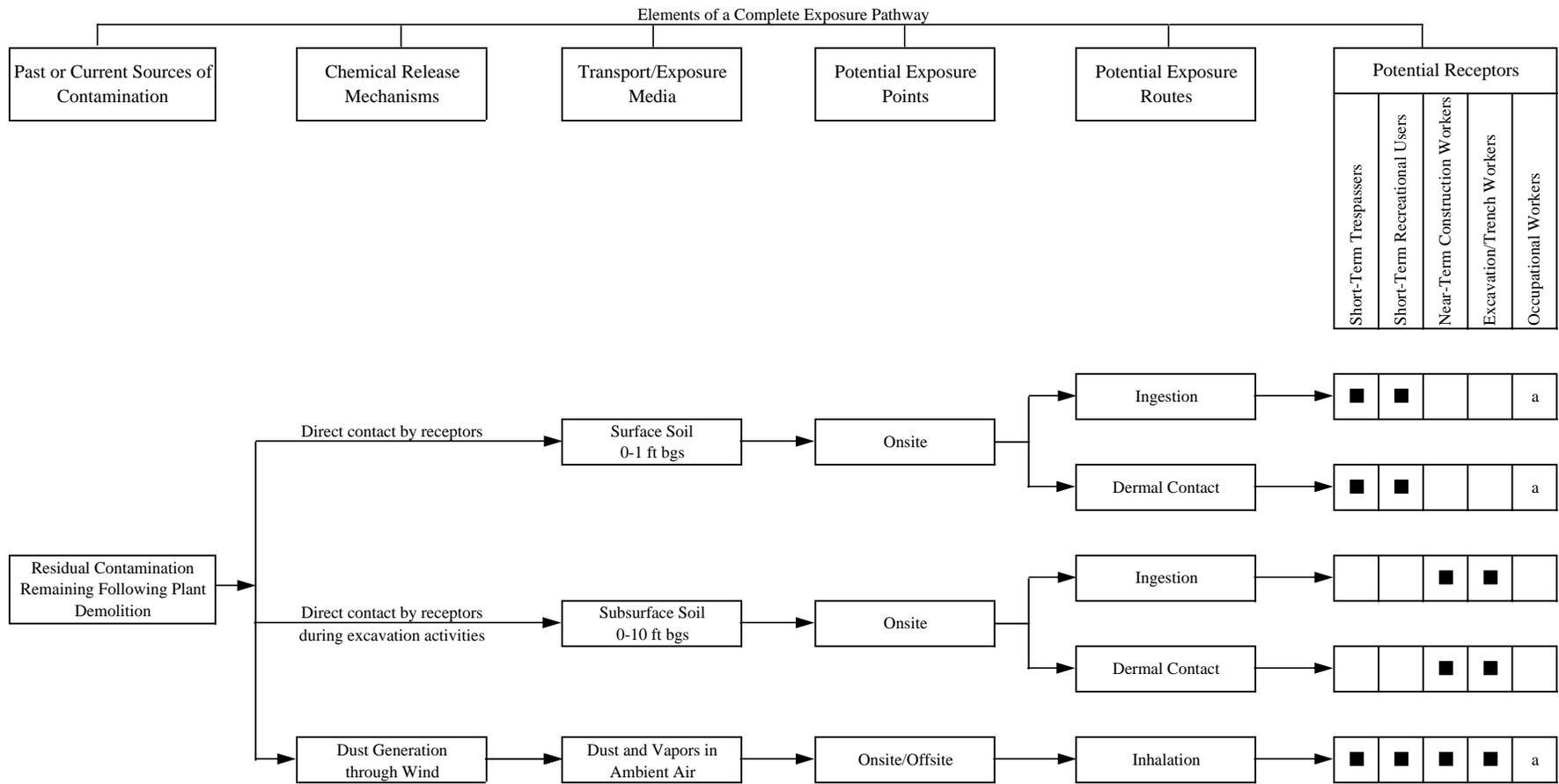
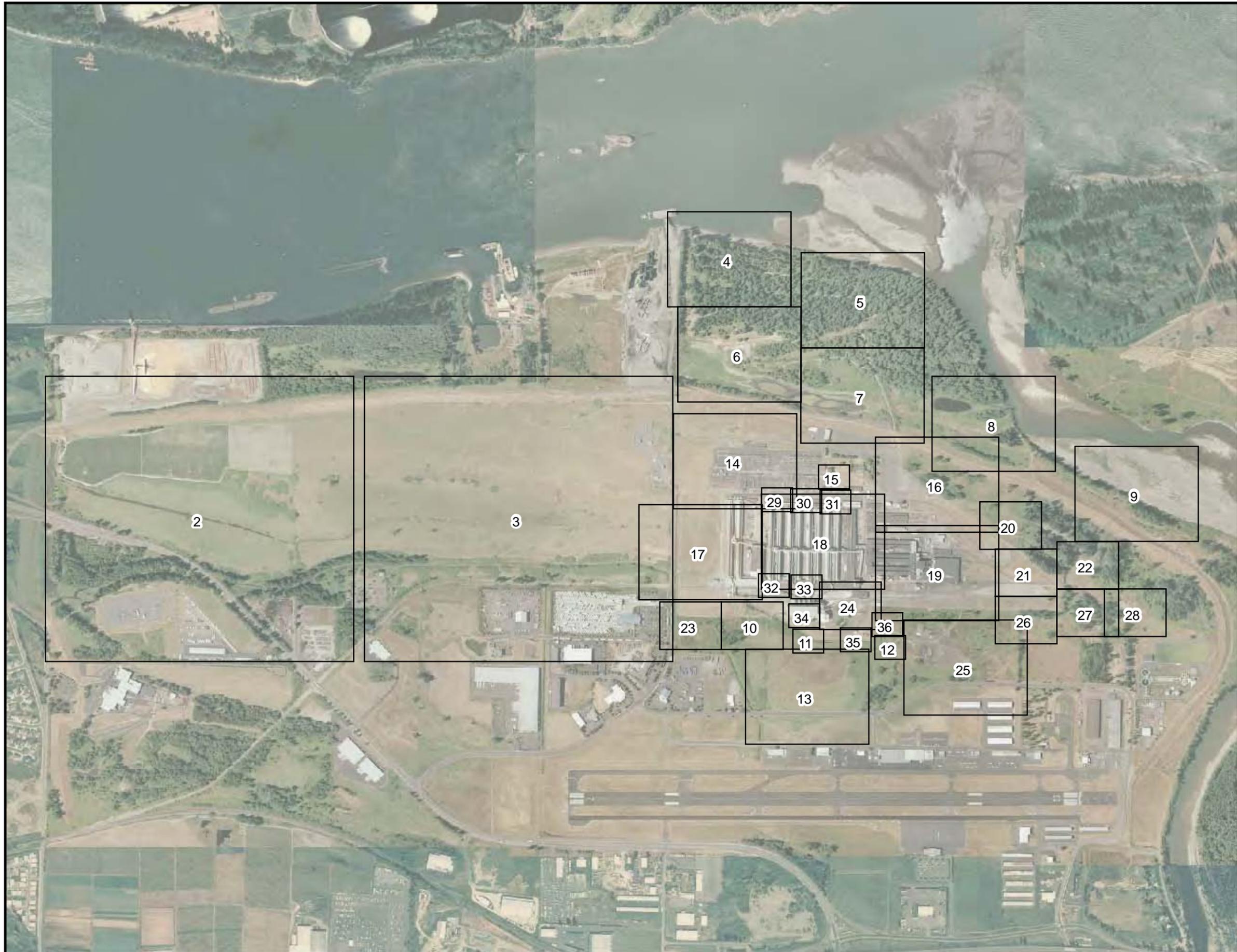


Figure 2-2
Conceptual Exposure Model
 RMC-Troutdale Facility
 Troutdale, Oregon



■ = Potentially complete pathway
 Blank = Incomplete pathway

a. Conceptual development of areas for planned industrial use include covering the areas with structural fill, railways, rail bed ballast (crushed rock), roadways, parking areas, structures, and/or landscaping as part of development. However, the occupational worker exposure scenario is included to demonstrate whether controls may be necessary to ensure acceptable risk.



**Figure 3-1
Sample Locations**

**Page Identifier Map
RMC-Troutdale Facility**

Troutdale, Oregon

Page 1 of 36

Legend

□ Page Identifier

NOTES:

1) PLANT STRUCTURES SHOWN IN THESE PHOTOGRAPHS ARE FOR REFERENCE ONLY.

2) PLANT DEMOLITION IS COMPLETE. ALL STRUCTURES HAVE BEEN REMOVED BY ALCOA IN ACCORDANCE WITH THE DEMOLITION WORK PLAN AND EPA REQUIREMENTS.

3) AERIAL PHOTOGRAPHS WERE TAKEN IN 2003.

4) ALL SAMPLE LOCATIONS ARE IN SOIL. SAMPLES THAT APPEAR ON OR IN BUILDINGS WERE COLLECTED FROM SOIL ADJACENT TO BUILDINGS OR AFTER BUILDINGS WERE DEMOLISHED.

5) TABLES 3-1 THROUGH 3-4 IDENTIFY WHICH SAMPLE LOCATIONS ARE IN EACH EXPOSURE AREA. SOME FIGURES SHOW SAMPLE LOCATIONS IN MORE THAN ONE EXPOSURE AREA.

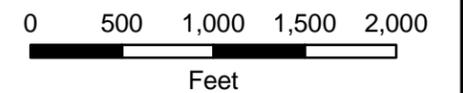


Figure 3-1
Sample Locations
Fairview Farms
RMC-Troutdale Facility
 Troutdale, Oregon
 Page 2 of 36

Legend

- Sample Locations

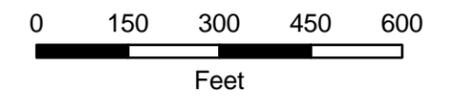




Figure 3-1 Sample Locations

**Fairview Farms
RMC-Troutdale Facility**

Troutdale, Oregon

Page 3 of 36

Legend

- Sample Locations

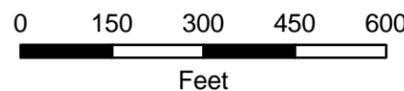




Figure 3-1
Sample Locations
Outside The Dike
RMC-Troutdale Facility

Troutdale, Oregon
 Page 4 of 36

Legend

- Sample Locations

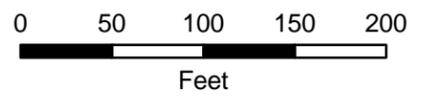


Figure 3-1
Sample Locations
Outside The Dike
RMC-Troutdale Facility

Troutdale, Oregon
Page 5 of 36

Legend

- Sample Locations

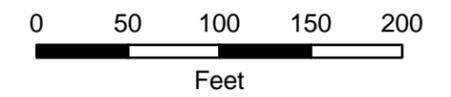


Figure 3-1
Sample Locations
Outside The Dike
RMC-Troutdale Facility
 Troutdale, Oregon
 Page 6 of 36

Legend
 ○ Sample Locations

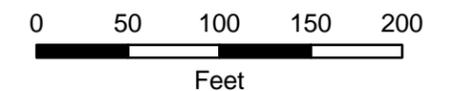




Figure 3-1
Sample Locations
Outside The Dike
RMC-Troutdale Facility

Troutdale, Oregon
 Page 7 of 36

Legend

- Sample Locations

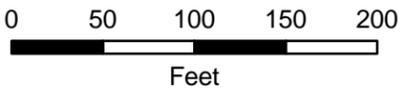


Figure 3-1
Sample Locations
Outside The Dike
RMC-Troutdale Facility

Troutdale, Oregon
Page 8 of 36

Legend

○ Sample Locations

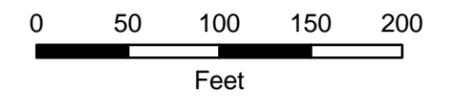




Figure 3-1
Sample Locations
Outside The Dike
RMC-Troutdale Facility

Troutdale, Oregon
Page 9 of 36

Legend

- Sample Locations

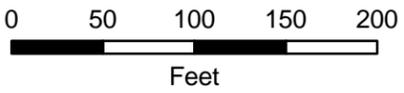


Figure 3-1
Sample Locations
South Wetlands
RMC-Troutdale Facility
 Troutdale, Oregon
 Page 10 of 36

Legend

- Sample Locations

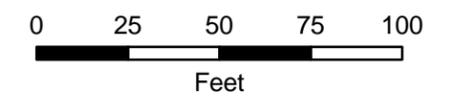


Figure 3-1
Sample Locations
South Wetlands
RMC-Troutdale Facility

Troutdale, Oregon
Page 11 of 36

Legend

- Sample Locations

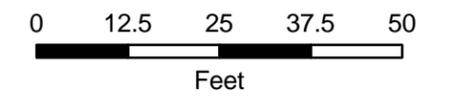




Figure 3-1
Sample Locations
 South Wetlands General Area
 RMC-Troutdale Facility
 Troutdale, Oregon
 Page 12 of 36

Legend
 ○ Sample Locations

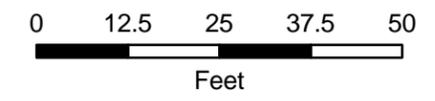




Figure 3-1
Sample Locations
South Wetlands
RMC-Troutdale Facility

Troutdale, Oregon
 Page 13 of 36

Legend

- Sample Locations

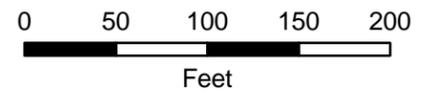


Figure 3-1
Sample Locations
East Plant
RMC-Troutdale Facility
 Troutdale, Oregon
 Page 14 of 36

Legend
 ○ Sample Locations



See Pages 29, 30, and 31

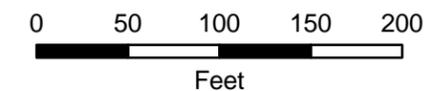




Figure 3-1
Sample Locations
East Plant
RMC-Troutdale Facility

Troutdale, Oregon
Page 15 of 36

Legend

- Sample Locations

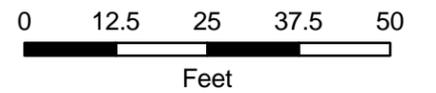
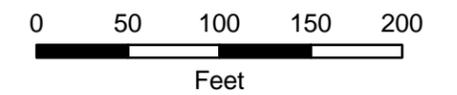


Figure 3-1
Sample Locations
East Plant
RMC-Troutdale Facility
 Troutdale, Oregon
 Page 16 of 36

Legend

- Sample Locations



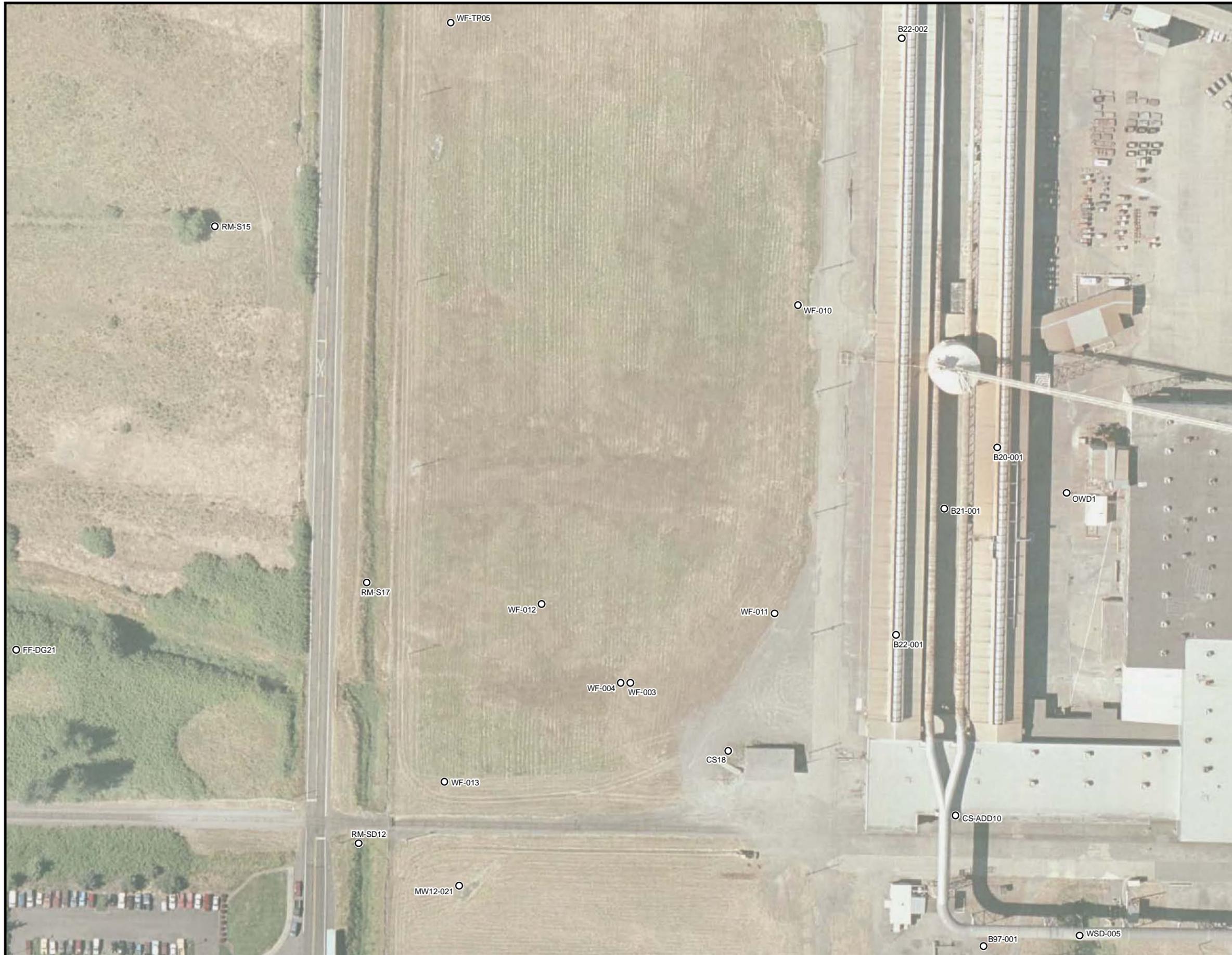


Figure 3-1
Sample Locations
East Plant
RMC-Troutdale Facility
 Troutdale, Oregon
 Page 17 of 36

Legend
 ○ Sample Locations

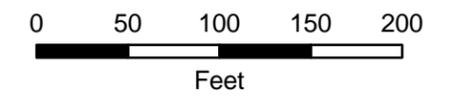


Figure 3-1
Sample Locations
East Plant
RMC-Troutdale Facility
 Troutdale, Oregon
 Page 19 of 36

Legend
 ○ Sample Locations

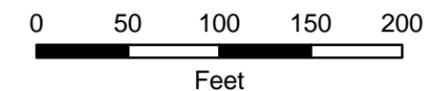


Figure 3-1
Sample Locations
East Plant
RMC-Troutdale Facility

Troutdale, Oregon
Page 20 of 36

Legend

○ Sample Locations

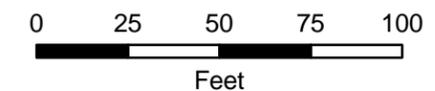


Figure 3-1
Sample Locations
East Plant
RMC-Troutdale Facility
 Troutdale, Oregon
 Page 21 of 36

Legend

- Sample Locations

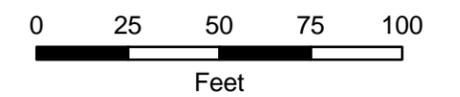


Figure 3-1
Sample Locations
East Plant
RMC-Troutdale Facility
 Troutdale, Oregon
 Page 22 of 36

Legend

- Sample Locations

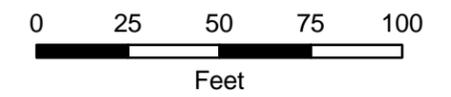
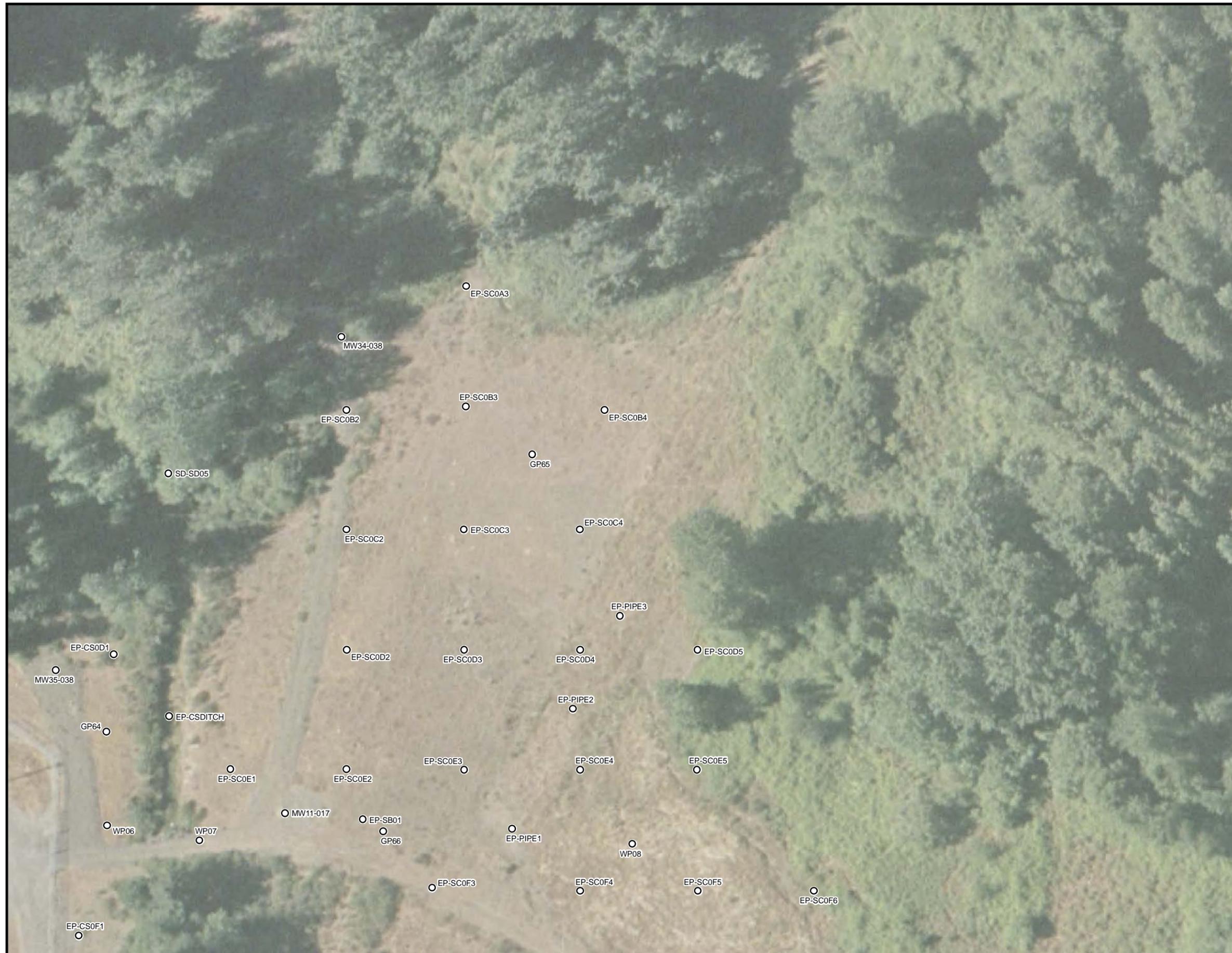




Figure 3-1
Sample Locations
East Plant
RMC-Troutdale Facility

Troutdale, Oregon
 Page 23 of 36

- Legend**
- Sample Locations

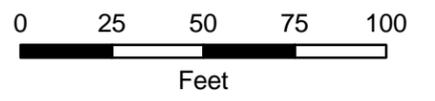


Figure 3-1
Sample Locations
East Plant
RMC-Troutdale Facility
 Troutdale, Oregon
 Page 24 of 36

Legend
 ○ Sample Locations

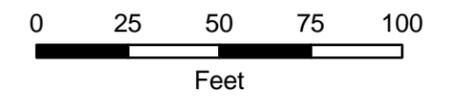




Figure 3-1
Sample Locations
East Plant
RMC-Troutdale Facility
 Troutdale, Oregon
 Page 25 of 36

Legend
 ○ Sample Locations

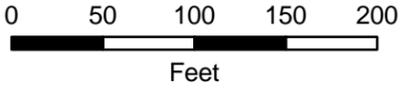




Figure 3-1
Sample Locations
East Plant
RMC-Troutdale Facility

Troutdale, Oregon

Page 26 of 36

Legend

- Sample Locations

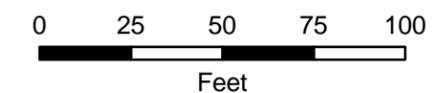




Figure 3-1
Sample Locations
East Plant
RMC-Troutdale Facility

Troutdale, Oregon
 Page 27 of 36

Legend

- Sample Locations

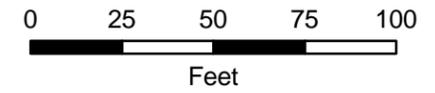


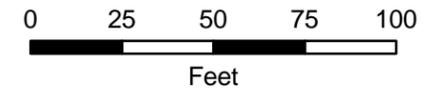


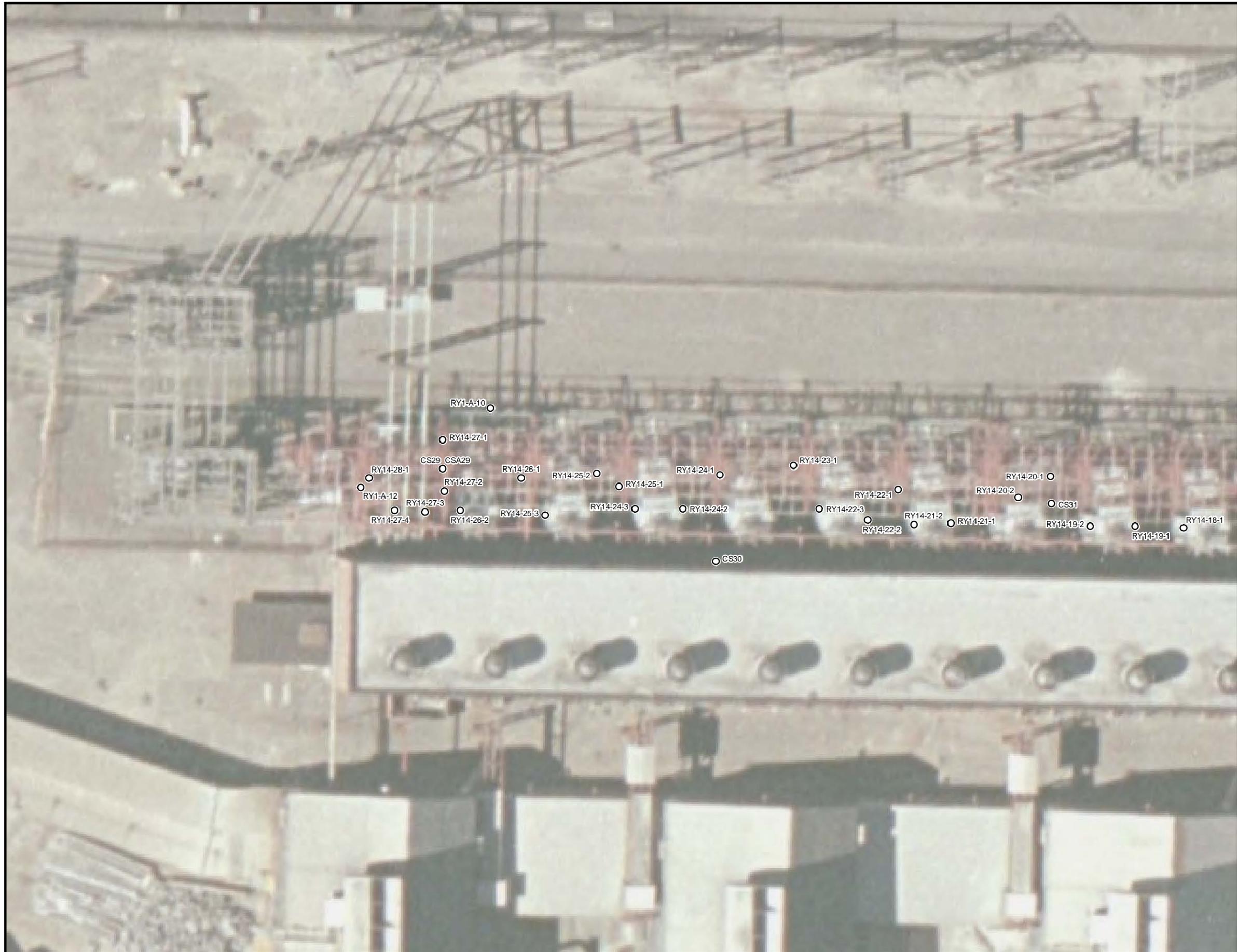
Figure 3-1
Sample Locations
East Plant
RMC-Troutdale Facility

Troutdale, Oregon
Page 28 of 36

Legend

- Sample Locations





**Figure 3-1
Sample Locations**

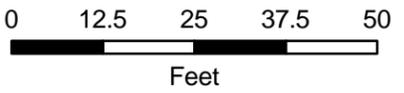
**East Plant
RMC-Troutdale Facility**

Troutdale, Oregon

Page 29 of 36

Legend

- Sample Locations





**Figure 3-1
Sample Locations**

**East Plant
RMC-Troutdale Facility**

Troutdale, Oregon

Page 30 of 36

Legend

- Sample Locations

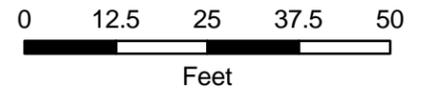




Figure 3-1
Sample Locations
East Plant
RMC-Troutdale Facility

Troutdale, Oregon
Page 31 of 36

Legend

- Sample Locations

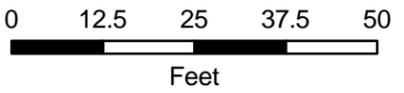
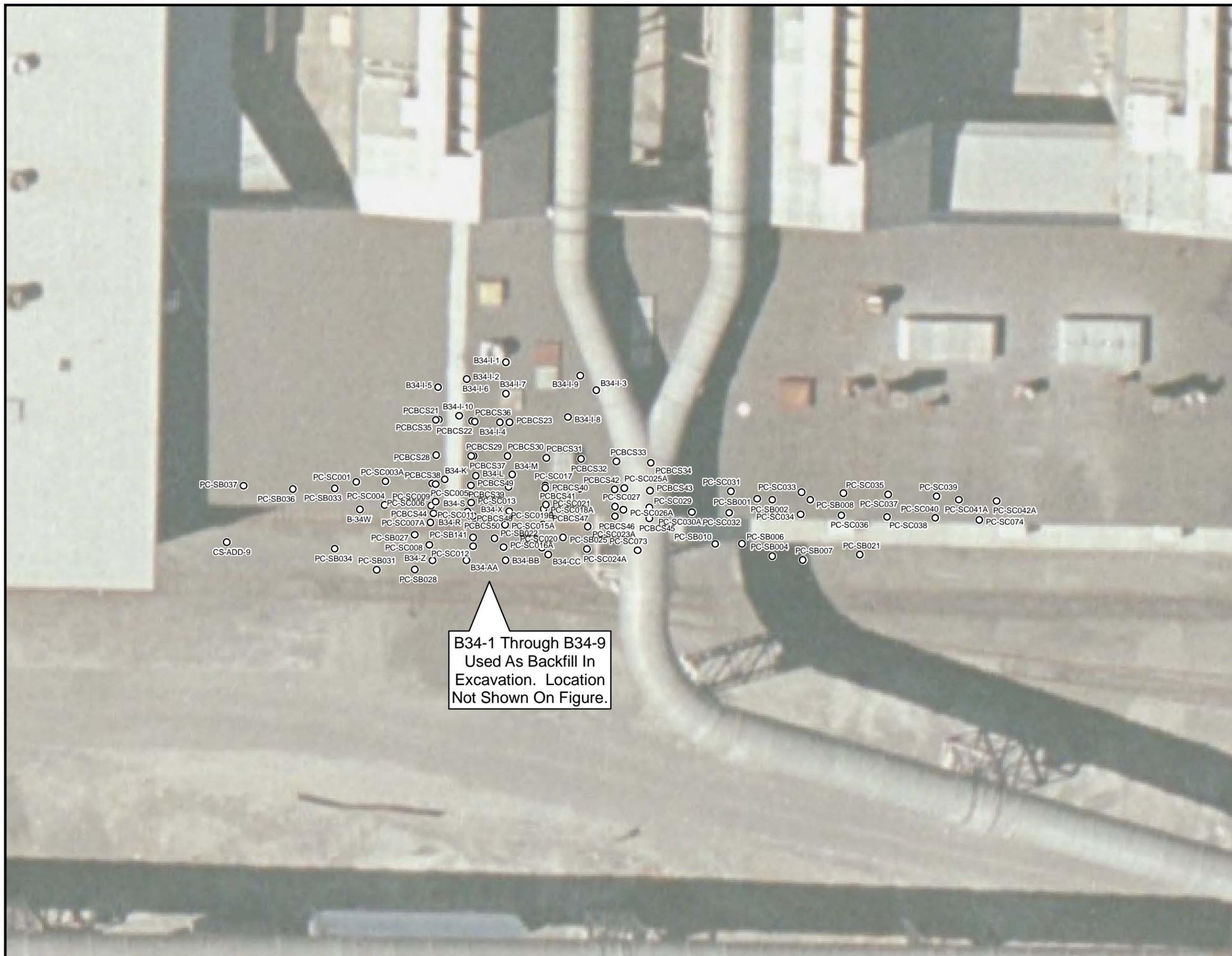
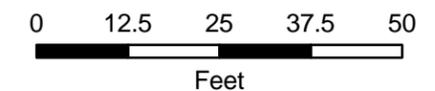


Figure 3-1
Sample Locations
East Plant
RMC-Troutdale Facility
 Troutdale, Oregon
 Page 32 of 36

Legend
 ○ Sample Locations



B34-1 Through B34-9
 Used As Backfill In
 Excavation. Location
 Not Shown On Figure.



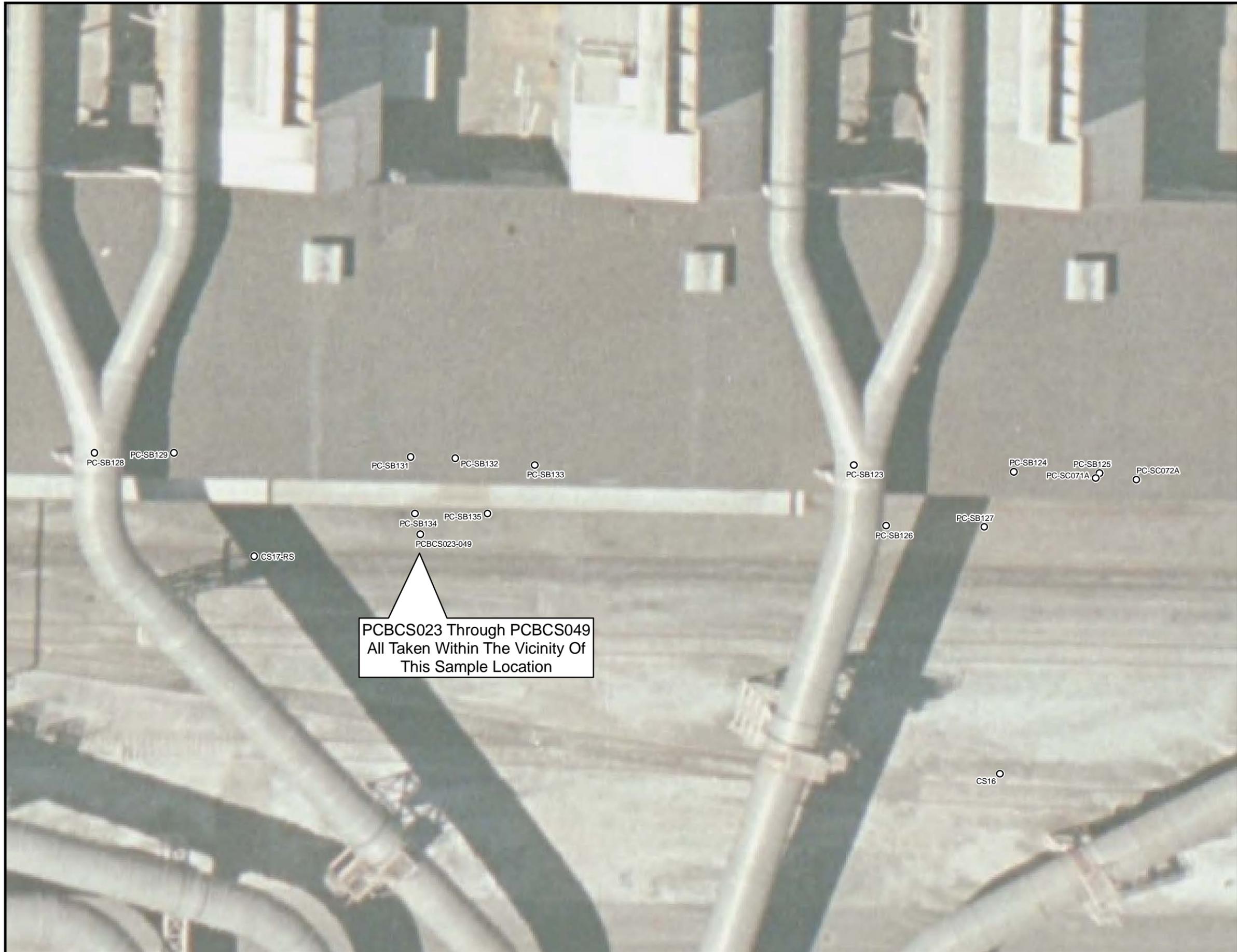


Figure 3-1
Sample Locations
East Plant
RMC-Troutdale Facility

Troutdale, Oregon
Page 33 of 36

Legend

- Sample Locations

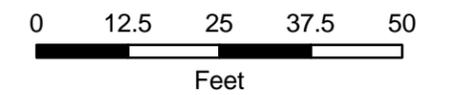




Figure 3-1
Sample Locations

East Plant
RMC-Troutdale Facility

Troutdale, Oregon

Page 34 of 36

Legend

- Sample Locations

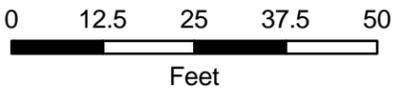




Figure 3-1
Sample Locations

East Plant
RMC-Troutdale Facility

Troutdale, Oregon

Page 35 of 36

Legend

- Sample Locations

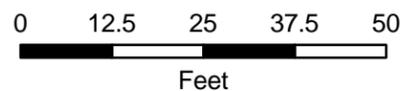
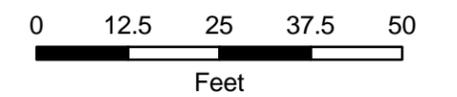


Figure 3-1
Sample Locations
East Plant
RMC-Troutdale Facility
 Troutdale, Oregon
 Page 36 of 36

Legend

- Sample Locations



APPENDIX A

Area-Specific Human Health Risk Calculation Data Sheets

Table A-1

Short-Term Trespasser Scenario - Potential Excess Lifetime Cancer Risk - RME

Surface Soil - Fairview Farms

RMC-Troutdale Facility

Chemical	WOE	SF _o	SF _d	SF _i	Ingestion				Dermal		Inhalation		Total ELCR	Contribution	%	
		(mg/kg-day) ¹	(mg/kg-day) ¹	(mg/kg-day) ¹	EPC (mg/kg)	ABS _d	ABS _{gi}	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)				ELCR
Aluminum	NA				1.98E+04		1.00E+00	5.75E-04				3.05E-08				
Anthracene	D				1.68E-01		1.00E+00	4.88E-09				4.89E-10				
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	1.25E-01	1.40E-01	1.00E+00	3.62E-09	7.2E-09	2.33E-09	4.7E-09	1.92E-13	3.8E-13	1.2E-08	7	
Barium	D				1.49E+02		7.00E-02	4.35E-06				2.30E-10				
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		3.07E-01	1.30E-01	1.00E+00	8.93E-09	6.5E-09	5.34E-09	3.9E-09	4.74E-13		1.0E-08	6	
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		2.99E-01	1.30E-01	1.00E+00	8.71E-09	6.4E-08	5.21E-09	3.8E-08	4.62E-13		1.0E-07	62	
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		4.43E-01	1.30E-01	1.00E+00	1.29E-08	9.4E-09	7.70E-09	5.6E-09	6.83E-13		1.5E-08	9	
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		3.31E-01	1.30E-01	1.00E+00	9.63E-09	7.0E-10	5.76E-09	4.2E-10	5.11E-13		1.1E-09	1	
Beryllium	B1			8.40E+00	7.24E-01		7.00E-03	2.11E-08				1.12E-12	9.4E-12	9.4E-12	0	
Bromomethane	D				5.00E-03		1.00E+00	1.45E-10				5.63E-09				
Cadmium	B1			6.30E+00	4.04E-01	1.00E-03	2.50E-02	1.18E-08		5.41E-11		6.24E-13	3.9E-12	3.9E-12	0	
Chromium	A			2.94E+02	2.41E+01		2.50E-02	7.01E-07				3.72E-11	1.1E-08	1.1E-08	7	
Chrysene	B2	7.30E-03	7.30E-03		5.32E-01	1.30E-01	1.00E+00	1.55E-08	1.1E-10	9.24E-09	6.7E-11	3.98E-10		1.8E-10	0	
Cobalt	NA			9.80E+00	1.03E+01		1.00E+00	2.99E-07				1.58E-11	1.6E-10	1.6E-10	0	
Copper	D				3.36E+01		1.00E+00	9.77E-07				5.18E-11				
Cyanide, Total	D				7.84E-01	1.00E-01	1.00E+00	2.28E-08		1.05E-08		1.21E-12				
Fluoranthene	D				2.41E-01	1.30E-01	1.00E+00	7.00E-09		4.18E-09		3.71E-13				
Fluoride	NA				3.83E+02	1.00E-01	1.00E+00	1.11E-05		5.12E-06		5.91E-10				
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		3.87E-01	1.30E-01	1.00E+00	1.12E-08	8.2E-09	6.72E-09	4.9E-09	5.96E-13		1.3E-08	8	
Lead	B2				2.11E+01		1.00E+00	6.14E-07				3.26E-11				
Manganese	D				3.88E+02		4.00E-02	1.13E-05				5.97E-10				
Nickel	NA				2.07E+01		4.00E-02	6.01E-07				3.19E-11				
Pyrene	D				3.50E-01	1.30E-01	1.00E+00	1.02E-08		6.08E-09		1.88E-10				
Selenium	D				5.63E-01		1.00E+00	1.64E-08				8.68E-13				
Zinc	D				8.43E+01		1.00E+00	2.45E-06				1.30E-10				
Total Risk									1E-07		6E-08					100
												Total Risk =	2E-07			

Note:

Cancer WOE Classifications:

- Group A: Human carcinogen
- Group B (B1, B2): Probable human carcinogen
- Group C: Possible human carcinogen
- Group D: Not classifiable
- Group E: No evidence of carcinogenicity

ABS_d = Dermal Absorption FactorABS_{gi} = Gastrointestinal Absorption Factor

CDI = Chronic Daily Intake

ELCR = Excess Lifetime Cancer Risk

EPC = Exposure Point Concentration

mg/kg-day = milligrams per kilogram per day

SF_d = Dermal Slope FactorSF_o = Oral Slope FactorSF_i = Inhalation Slope Factor

WOE = Weight of Evidence

Table A-2

Short-Term Trespasser Scenario - Potential Noncarcinogenic Risk - RME

Surface Soil - Fairview Farms

RMC-Troutdale Facility

Chemical	RfD _o (mg/kg-day)	RfD _d (mg/kg-day)	RfD _i (mg/kg-day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total HI	Contribution	%
							CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ			
Aluminum	1.00E+00	1.00E+00	1.42E-03	1.98E+04		1.00E+00	8.05E-03	0.008			4.27E-07	0.00	0.008	39	
Anthracene	3.00E+00	3.00E+00		1.68E-01		1.00E+00	6.83E-08	0.000			6.85E-09		0.000	0	
Aroclor-1260	2.00E-05	2.00E-05		1.25E-01	1.40E-01	1.00E+00	5.07E-08	0.003	3.27E-08	0.0016	2.69E-12		0.004	20	
Barium	7.00E-02	4.90E-03	1.40E-04	1.49E+02		7.00E-02	6.08E-05	0.001			3.23E-09	0.00	0.001	4	
Benzo (a) anthracene				3.07E-01	1.30E-01	1.00E+00	1.25E-07		7.48E-08		6.63E-12				
Benzo (a) pyrene				2.99E-01	1.30E-01	1.00E+00	1.22E-07		7.29E-08		6.46E-12				
Benzo (b) fluoranthene				4.43E-01	1.30E-01	1.00E+00	1.80E-07		1.08E-07		9.56E-12				
Benzo (k) fluoranthene				3.31E-01	1.30E-01	1.00E+00	1.35E-07		8.07E-08		7.15E-12				
Beryllium	5.00E-03	3.50E-05	5.71E-06	7.24E-01		7.00E-03	2.95E-07	0.000			1.56E-11	0.00	0.000	0	
Bromomethane	5.00E-03	5.00E-03	1.43E-03	5.00E-03		1.00E+00	2.04E-09	0.000			7.88E-08	0.00	0.000	0	
Cadmium	1.00E-03	2.50E-05		4.04E-01	1.00E-03	2.50E-02	1.65E-07	0.000	7.57E-10	0.0000	8.73E-12		0.000	1	
Chromium	2.00E-02	5.00E-04	2.20E-06	2.41E+01		2.50E-02	9.81E-06	0.000			5.20E-10	0.00	0.001	3	
Chrysene				5.32E-01	1.30E-01	1.00E+00	2.16E-07		1.29E-07		5.57E-09				
Cobalt	2.00E-02	2.00E-02	5.70E-06	1.03E+01		1.00E+00	4.18E-06	0.000			2.22E-10	0.00	0.000	1	
Copper	4.00E-02	4.00E-02		3.36E+01		1.00E+00	1.37E-05	0.000			7.25E-10		0.000	2	
Cyanide, Total	2.00E-02	2.00E-02		7.84E-01	1.00E-01	1.00E+00	3.19E-07	0.000	1.47E-07	0.0000	1.69E-11		0.000	0	
Fluoranthene	4.00E-01	4.00E-01		2.41E-01	1.30E-01	1.00E+00	9.80E-08	0.000	5.86E-08	0.0000	5.19E-12		0.000	0	
Fluoride	6.00E-02	6.00E-02		3.83E+02	1.00E-01	1.00E+00	1.56E-04	0.003	7.17E-05	0.0012	8.27E-09		0.004	18	
Indeno (1,2,3-cd) pyrene				3.87E-01	1.30E-01	1.00E+00	1.57E-07		9.41E-08		8.35E-12				
Lead				2.11E+01		1.00E+00	8.60E-06				4.56E-10				
Manganese	1.40E-01	5.60E-03	1.40E-05	3.88E+02		4.00E-02	1.58E-04	0.001			8.36E-09	0.00	0.002	8	
Nickel	2.00E-02	8.00E-04		2.07E+01		4.00E-02	8.41E-06	0.000			4.46E-10		0.000	2	
Pyrene	3.00E-01	3.00E-01		3.50E-01	1.30E-01	1.00E+00	1.42E-07	0.000	8.51E-08	0.0000	2.63E-09		0.000	0	
Selenium	5.00E-03	5.00E-03		5.63E-01		1.00E+00	2.29E-07	0.000			1.21E-11		0.000	0	
Zinc	3.00E-01	3.00E-01		8.43E+01		1.00E+00	3.43E-05	0.000			1.82E-09		0.000	1	
								0.02		0.003					100
											Total HI =	0.001			
												0.02			

Note:

- ABS_d = Dermal Absorption Factor
- ABS_{gi} = Gastrointestinal Absorption Factor
- CDI = Chronic Daily Intake
- EPC = Exposure Point Concentration
- HI = Hazard Index
- HQ = Hazard Quotient;
- mg/kg-day = milligrams per kilogram per day
- RfC = Reference Concentration
- RfD_d = Dermal Reference Dose;
- RfD_o = Oral Reference Dose
- RfD_i = Inhalation Reference Dose

Table A-3

Short-Term Trespasser Scenario - Potential Excess Lifetime Cancer Risk - CTE

Surface Soil - Fairview Farms

RMC-Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	EPC (mg/kg)	Ingestion			Dermal		Inhalation		Total ELCR	Contribution	
						ABS _d	ABS _{gi}	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)			ELCR
Aluminum	NA				1.98E+04		1.00E+00	5.53E-05				5.86E-09			
Anthracene	D				1.68E-01		1.00E+00	4.69E-10				9.40E-11			
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	1.25E-01	1.40E-01	1.00E+00	3.48E-10	7.0E-10	5.46E-11	1.1E-10	3.69E-14	7.4E-14	8.1E-10	6
Barium	D				1.49E+02		7.00E-02	4.18E-07				4.43E-11			
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		3.07E-01	1.30E-01	1.00E+00	8.59E-10	6.3E-10	1.25E-10	9.1E-11	9.11E-14		7.2E-10	6
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		2.99E-01	1.30E-01	1.00E+00	8.37E-10	6.1E-09	1.22E-10	8.9E-10	8.88E-14		7.0E-09	55
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		4.43E-01	1.30E-01	1.00E+00	1.24E-09	9.0E-10	1.80E-10	1.3E-10	1.31E-13		1.0E-09	8
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		3.31E-01	1.30E-01	1.00E+00	9.26E-10	6.8E-11	1.35E-10	9.8E-12	9.82E-14		7.7E-11	1
Beryllium	B1			8.40E+00	7.24E-01		7.00E-03	2.02E-09				2.15E-13	1.8E-12	1.8E-12	0
Bromomethane	D				5.00E-03		1.00E+00	1.40E-11				1.08E-09			
Cadmium	B1			6.30E+00	4.04E-01	1.00E-03	2.50E-02	1.13E-09		1.27E-12		1.20E-13	7.6E-13	7.6E-13	0
Chromium	A			2.94E+02	2.41E+01		2.50E-02	6.74E-08				7.15E-12	2.1E-09	2.1E-09	17
Chrysene	B2	7.30E-03	7.30E-03		5.32E-01	1.30E-01	1.00E+00	1.49E-09	1.1E-11	2.16E-10	1.6E-12	7.65E-11		1.2E-11	0
Cobalt	NA			9.80E+00	1.03E+01		1.00E+00	2.87E-08				3.05E-12	3.0E-11	3.0E-11	0
Copper	D				3.36E+01		1.00E+00	9.39E-08				9.96E-12			
Cyanide, Total	D				7.84E-01	1.00E-01	1.00E+00	2.19E-09		2.46E-10		2.33E-13			
Fluoranthene	D				2.41E-01	1.30E-01	1.00E+00	6.73E-10		9.80E-11		7.14E-14			
Fluoride	NA				3.83E+02	1.00E-01	1.00E+00	1.07E-06				1.20E-07		1.14E-10	
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		3.87E-01	1.30E-01	1.00E+00	1.08E-09	7.9E-10	1.57E-10	1.1E-10	1.15E-13		9.0E-10	7
Lead	B2				2.11E+01		1.00E+00	5.91E-08				6.26E-12			
Manganese	D				3.88E+02		4.00E-02	1.08E-06				1.16E-10			
Nickel	NA				2.07E+01		4.00E-02	5.78E-08				6.13E-12			
Pyrene	D				3.50E-01	1.30E-01	1.00E+00	9.78E-10		1.42E-10		3.61E-11			
Selenium	D				5.63E-01		1.00E+00	1.57E-09				1.67E-13			
Zinc	D				8.43E+01		1.00E+00	2.36E-07				2.50E-11			
Total Risk									9E-09		1E-09		2E-09		100
												Total Risk =	1E-08		

Note:

Cancer WOE Classifications:

- Group A: Human carcinogen
- Group B (B1, B2): Probable human carcinogen
- Group C: Possible human carcinogen
- Group D: Not classifiable
- Group E: No evidence of carcinogenicity

ABS_d = Dermal Absorption Factor

ABS_{gi} = Gastrointestinal Absorption Factor

CDI = Chronic Daily Intake

ELCR = Excess Lifetime Cancer Risk

EPC = Exposure Point Concentration

mg/kg-day = milligrams per kilogram per day

SF_d = Dermal Slope Factor

SF_o = Oral Slope Factor

SF_i = Inhalation Slope Factor

WOE = Weight of Evidence

Table A-4

Short-Term Trespasser Scenario - Potential Noncarcinogenic Risk - CTE

Surface Soil - Fairview Farms

RMC-Troutdale Facility

Chemical	RfD _o (mg/kg- day)	RfD _d (mg/kg- day)	RfD _i (mg/kg- day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total HI	Contribution	%
							CDI (mg/kg- day)	HQ	CDI (mg/kg- day)	HQ	CDI (mg/kg- day)	HQ			
Aluminum	1.00E+00	1.00E+00	1.42E-03	1.98E+04		1.00E+00	7.74E-04	0.001			8.21E-08	0.00	0.001	43	
Anthracene	3.00E+00	3.00E+00		1.68E-01		1.00E+00	6.56E-09	0.000			1.32E-09		0.000	0	
Aroclor-1260	2.00E-05	2.00E-05		1.25E-01	1.40E-01	1.00E+00	4.88E-09	0.000	7.65E-10	0.0000	5.17E-13		0.000	14	
Barium	7.00E-02	4.90E-03	1.40E-04	1.49E+02		7.00E-02	5.85E-06	0.000			6.21E-10	0.00	0.000	5	
Benzo (a) anthracene				3.07E-01	1.30E-01	1.00E+00	1.20E-08		1.75E-09		1.27E-12				
Benzo (a) pyrene				2.99E-01	1.30E-01	1.00E+00	1.17E-08		1.71E-09		1.24E-12				
Benzo (b) fluoranthene				4.43E-01	1.30E-01	1.00E+00	1.73E-08		2.52E-09		1.84E-12				
Benzo (k) fluoranthene				3.31E-01	1.30E-01	1.00E+00	1.30E-08		1.89E-09		1.38E-12				
Beryllium	5.00E-03	3.50E-05	5.71E-06	7.24E-01		7.00E-03	2.83E-08	0.000			3.01E-12	0.00	0.000	0	
Bromomethane	5.00E-03	5.00E-03	1.43E-03	5.00E-03		1.00E+00	1.96E-10	0.000			1.52E-08	0.00	0.000	1	
Cadmium	1.00E-03	2.50E-05		4.04E-01	1.00E-03	2.50E-02	1.58E-08	0.000	1.77E-11	0.0000	1.68E-12		0.000	1	
Chromium	2.00E-02	5.00E-04	2.20E-06	2.41E+01		2.50E-02	9.43E-07	0.000			1.00E-10	0.00	0.000	5	
Chrysene				5.32E-01	1.30E-01	1.00E+00	2.08E-08		3.03E-09		1.07E-09				
Cobalt	2.00E-02	2.00E-02	5.70E-06	1.03E+01		1.00E+00	4.02E-07	0.000			4.27E-11	0.00	0.000	1	
Copper	4.00E-02	4.00E-02		3.36E+01		1.00E+00	1.31E-06	0.000			1.39E-10		0.000	2	
Cyanide, Total	2.00E-02	2.00E-02		7.84E-01	1.00E-01	1.00E+00	3.07E-08	0.000	3.44E-09	0.0000	3.26E-12		0.000	0	
Fluoranthene	4.00E-01	4.00E-01		2.41E-01	1.30E-01	1.00E+00	9.42E-09	0.000	1.37E-09	0.0000	9.99E-13		0.000	0	
Fluoride	6.00E-02	6.00E-02		3.83E+02	1.00E-01	1.00E+00	1.50E-05	0.000	1.68E-06	0.0000	1.59E-09		0.000	14	
Indeno (1,2,3-cd) pyrene				3.87E-01	1.30E-01	1.00E+00	1.51E-08		2.20E-09		1.61E-12				
Lead				2.11E+01		1.00E+00	8.27E-07				8.77E-11				
Manganese	1.40E-01	5.60E-03	1.40E-05	3.88E+02		4.00E-02	1.52E-05	0.000			1.61E-09	0.00	0.000	11	
Nickel	2.00E-02	8.00E-04		2.07E+01		4.00E-02	8.09E-07	0.000			8.58E-11		0.000	2	
Pyrene	3.00E-01	3.00E-01		3.50E-01	1.30E-01	1.00E+00	1.37E-08	0.000	1.99E-09	0.0000	5.06E-10		0.000	0	
Selenium	5.00E-03	5.00E-03		5.63E-01		1.00E+00	2.20E-08	0.000			2.34E-12		0.000	0	
Zinc	3.00E-01	3.00E-01		8.43E+01		1.00E+00	3.30E-06	0.000			3.50E-10		0.000	1	
								0.002		0.00007		0.0002			100
											Total HI =	0.002			

Note:

ABS_d = Dermal Absorption FactorABS_{gi} = Gastrointestinal Absorption Factor

CDI = Chronic Daily Intake

EPC = Exposure Point Concentration

HI = Hazard Index

HQ = Hazard Quotient;

mg/kg-day = milligrams per kilogram per day

RfC = Reference Concentration

RfD_d = Dermal Reference Dose;RfD_o = Oral Reference DoseRfD_i = Inhalation Reference Dose

Table A-5

Near-Term Construction Worker Scenario - Potential Excess Lifetime Cancer Risk - RME

Subsurface Soil - Fairview Farms

RMC-Troutdale Facility

Chemical	WOE	SF _o (mg/kg- day) ⁻¹	SF _d (mg/kg- day) ⁻¹	SF _i (mg/kg- day) ⁻¹	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total ELCR	Contribution	%	
								CDI (mg/kg-day)	ELCR	CDI (mg/kg- day)	ELCR	CDI (mg/kg- day)	ELCR				
Aluminum	NA				1.92E+04		1.00E+00	8.87E-04				1.43E-08					
Anthracene	D				1.66E-01		1.00E+00	7.64E-09				2.32E-10					
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	1.25E-01	1.40E-01	1.00E+00	5.75E-09	1.1E-08	2.41E-09	4.8E-09	9.24E-14	1.8E-13	1.6E-08	9		
Barium	D				1.43E+02		7.00E-02	6.62E-06				1.06E-10					
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		2.89E-01	1.30E-01	1.00E+00	1.33E-08	9.7E-09	5.19E-09	3.8E-09	2.14E-13		1.4E-08	8		
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		2.29E-01	1.30E-01	1.00E+00	1.06E-08	7.7E-08	4.12E-09	3.0E-08	1.70E-13		1.1E-07	60		
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		4.08E-01	1.30E-01	1.00E+00	1.88E-08	1.4E-08	7.35E-09	5.4E-09	3.03E-13		1.9E-08	11		
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		3.10E-01	1.30E-01	1.00E+00	1.43E-08	1.0E-09	5.58E-09	4.1E-10	2.30E-13		1.5E-09	1		
Beryllium	B1			8.40E+00	6.94E-01		7.00E-03	3.20E-08				5.15E-13	4.3E-12	4.3E-12	0		
Bromomethane	D				5.00E-03		1.00E+00	2.31E-10				2.71E-09					
Cadmium	B1			6.30E+00	3.84E-01	1.00E-03	2.50E-02	1.77E-08		5.31E-11		2.86E-13	1.8E-12	1.8E-12	0		
Chromium	A			2.94E+02	2.33E+01		2.50E-02	1.07E-06				1.73E-11	5.1E-09	5.1E-09	3		
Chrysene	B2	7.30E-03	7.30E-03		4.87E-01	1.30E-01	1.00E+00	2.25E-08	1.6E-10	8.76E-09	6.4E-11	1.75E-10		2.3E-10	0		
Cobalt	NA			9.80E+00	9.88E+00		1.00E+00	4.56E-07				7.32E-12	7.2E-11	7.2E-11	0		
Copper	D				3.33E+01		1.00E+00	1.54E-06				2.47E-11					
Cyanide, Total	D				7.33E-01	1.00E-01	1.00E+00	3.38E-08		1.02E-08		5.44E-13					
Fluoranthene	D				2.29E-01	1.30E-01	1.00E+00	1.06E-08		4.13E-09		1.70E-13					
Fluoride	NA				3.27E+02	1.00E-01	1.00E+00	1.51E-05		4.53E-06		2.43E-10					
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		3.59E-01	1.30E-01	1.00E+00	1.65E-08	1.2E-08	6.45E-09	4.7E-09	2.66E-13		1.7E-08	9		
Lead	B2				1.97E+01		1.00E+00	9.07E-07				1.46E-11					
Manganese	D				3.64E+02		4.00E-02	1.68E-05				2.70E-10					
Nickel	NA				1.99E+01		4.00E-02	9.16E-07				1.47E-11					
Pyrene	D				3.26E-01	1.30E-01	1.00E+00	1.50E-08		5.86E-09		8.42E-11					
Zinc	D				8.04E+01		1.00E+00	3.71E-06				5.96E-11					
Total Risk									1E-07		5E-08		5E-09		100		
												Total Risk =	2E-07				

Note:

Cancer WOE Classifications:

Group A: Human carcinogen

Group B (B1, B2): Probable human carcinogen

Group C: Possible human carcinogen

Group D: Not classifiable

Group E: No evidence of carcinogenicity

ABS_d = Dermal Absorption FactorABS_{gi} = Gastrointestinal Absorption Factor

CDI = Chronic Daily Intake

ELCR = Excess Lifetime Cancer Risk

EPC = Exposure Point Concentration

mg/kg-day = milligrams per kilogram per day

SF_d = Dermal Slope FactorSF_o = Oral Slope FactorSF_i = Inhalation Slope Factor

WOE = Weight of Evidence

Table A-6

Near-Term Construction Worker Scenario - Potential Noncarcinogenic Risk - RME

Subsurface Soil - Fairview Farms

RMC-Troutdale Facility

Chemical	RfD _o (mg/kg-day)	RfD _d (mg/kg-day)	RfD _i (mg/kg-day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total HI	Contribution	%
							CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ			
Aluminum	1.00E+00	1.00E+00	1.42E-03	1.92E+04		1.00E+00	6.21E-02	0.062			9.98E-07	0.00	0.063	43	
Anthracene	3.00E+00	3.00E+00		1.66E-01		1.00E+00	5.35E-07	0.000			1.63E-08		0.000	0	
Aroclor-1260	2.00E-05	2.00E-05		1.25E-01	1.40E-01	1.00E+00	4.02E-07	0.020	1.69E-07	0.0084	6.47E-12		0.029	20	
Barium	7.00E-02	4.90E-03	1.40E-04	1.43E+02		7.00E-02	4.63E-04	0.007			7.44E-09	0.00	0.007	5	
Benzo (a) anthracene				2.89E-01	1.30E-01	1.00E+00	9.32E-07		3.64E-07		1.50E-11				
Benzo (a) pyrene				2.29E-01	1.30E-01	1.00E+00	7.39E-07		2.88E-07		1.19E-11				
Benzo (b) fluoranthene				4.08E-01	1.30E-01	1.00E+00	1.32E-06		5.14E-07		2.12E-11				
Benzo (k) fluoranthene				3.10E-01	1.30E-01	1.00E+00	1.00E-06		3.90E-07		1.61E-11				
Beryllium	5.00E-03	3.50E-05	5.71E-06	6.94E-01		7.00E-03	2.24E-06	0.000			3.60E-11	0.00	0.000	0	
Bromomethane	5.00E-03	5.00E-03	1.43E-03	5.00E-03		1.00E+00	1.61E-08	0.000			1.89E-07	0.00	0.000	0	
Cadmium	1.00E-03	2.50E-05		3.84E-01	1.00E-03	2.50E-02	1.24E-06	0.001	3.72E-09	0.0001	1.99E-11		0.001	1	
Chromium	2.00E-02	5.00E-04	2.20E-06	2.33E+01		2.50E-02	7.51E-05	0.004			1.21E-09	0.00	0.004	3	
Chrysene				4.87E-01	1.30E-01	1.00E+00	1.57E-06		6.13E-07		1.23E-08				
Cobalt	2.00E-02	2.00E-02	5.70E-06	9.88E+00		1.00E+00	3.19E-05	0.002			5.13E-10	0.00	0.002	1	
Copper	4.00E-02	4.00E-02		3.33E+01		1.00E+00	1.07E-04	0.003			1.73E-09		0.003	2	
Cyanide, Total	2.00E-02	2.00E-02		7.33E-01	1.00E-01	1.00E+00	2.37E-06	0.000	7.11E-07	0.0000	3.81E-11		0.000	0	
Fluoranthene	4.00E-01	4.00E-01		2.29E-01	1.30E-01	1.00E+00	7.41E-07	0.000	2.89E-07	0.0000	1.19E-11		0.000	0	
Fluoride	6.00E-02	6.00E-02		3.27E+02	1.00E-01	1.00E+00	1.06E-03	0.018	3.17E-04	0.0053	1.70E-08		0.023	16	
Indeno (1,2,3-cd) pyrene				3.59E-01	1.30E-01	1.00E+00	1.16E-06		4.52E-07		1.86E-11				
Lead				1.97E+01		1.00E+00	6.35E-05				1.02E-09				
Manganese	1.40E-01	5.60E-03	1.40E-05	3.64E+02		4.00E-02	1.18E-03	0.008			1.89E-08	0.00	0.010	7	
Nickel	2.00E-02	8.00E-04		1.99E+01		4.00E-02	6.41E-05	0.003			1.03E-09		0.003	2	
Pyrene	3.00E-01	3.00E-01		3.26E-01	1.30E-01	1.00E+00	1.05E-06	0.000	4.10E-07	0.0000	5.89E-09		0.000	0	
Zinc	3.00E-01	3.00E-01		8.04E+01		1.00E+00	2.60E-04	0.001			4.17E-09		0.001	1	
								0.1		0.01		0.003			100
												Total HI =	0.1		

Note:

ABS_d = Dermal Absorption Factor
 ABS_{gi} = Gastrointestinal Absorption Factor
 CDI = Chronic Daily Intake
 EPC = Exposure Point Concentration
 HI = Hazard Index
 HQ = Hazard Quotient;
 mg/kg-day = milligrams per kilogram per day
 RfC = Reference Concentration
 RfD_d = Dermal Reference Dose;
 RfD_o = Oral Reference Dose
 RfD_i = Inhalation Reference Dose

Table A-7

Near-Term Construction Worker Scenario - Potential Excess Lifetime Cancer Risk - CTE

Subsurface Soil - Fairview Farms

RMC-Troutdale Facility

Chemical	WOE	SF _o (mg/kg- day) ⁻¹	SF _d (mg/kg- day) ⁻¹	SF _i (mg/kg- day) ⁻¹	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total ELCR	Contribution	%	
								CDI (mg/kg-day)	ELCR	CDI (mg/kg- day)	ELCR	CDI (mg/kg- day)	ELCR				
Aluminum	NA				1.92E+04		1.00E+00	1.34E-04				7.13E-09					
Anthracene	D				1.66E-01		1.00E+00	1.16E-09				1.16E-10					
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	1.25E-01	1.40E-01	1.00E+00	8.71E-10	1.7E-09	4.02E-10	8.0E-10	4.62E-14	9.2E-14	2.5E-09	9		
Barium	D				1.43E+02		7.00E-02	1.00E-06				5.32E-11					
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		2.89E-01	1.30E-01	1.00E+00	2.02E-09	1.5E-09	8.66E-10	6.3E-10	1.07E-13		2.1E-09	7		
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		2.29E-01	1.30E-01	1.00E+00	1.60E-09	1.2E-08	6.86E-10	5.0E-09	8.48E-14		1.7E-08	56		
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		4.08E-01	1.30E-01	1.00E+00	2.85E-09	2.1E-09	1.22E-09	8.9E-10	1.51E-13		3.0E-09	10		
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		3.10E-01	1.30E-01	1.00E+00	2.17E-09	1.6E-10	9.29E-10	6.8E-11	1.15E-13		2.3E-10	1		
Beryllium	B1			8.40E+00	6.94E-01		7.00E-03	4.85E-09				2.57E-13	2.2E-12	2.2E-12	0		
Bromomethane	D				5.00E-03		1.00E+00	3.49E-11				1.35E-09					
Cadmium	B1			6.30E+00	3.84E-01	1.00E-03	2.50E-02	2.68E-09		8.86E-12		1.42E-13	9.0E-13	9.0E-13	0		
Chromium	A			2.94E+02	2.33E+01		2.50E-02	1.63E-07				8.63E-12	2.5E-09	2.5E-09	9		
Chrysene	B2	7.30E-03	7.30E-03		4.87E-01	1.30E-01	1.00E+00	3.40E-09	2.5E-11	1.46E-09	1.1E-11	8.76E-11		3.6E-11	0		
Cobalt	NA			9.80E+00	9.88E+00		1.00E+00	6.91E-08				3.66E-12	3.6E-11	3.6E-11	0		
Copper	D				3.33E+01		1.00E+00	2.33E-07				1.23E-11					
Cyanide, Total	D				7.33E-01	1.00E-01	1.00E+00	5.13E-09		1.69E-09		2.72E-13					
Fluoranthene	D				2.29E-01	1.30E-01	1.00E+00	1.60E-09		6.88E-10		8.51E-14					
Fluoride	NA				3.27E+02	1.00E-01	1.00E+00	2.29E-06		7.55E-07		1.21E-10					
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		3.59E-01	1.30E-01	1.00E+00	2.51E-09	1.8E-09	1.08E-09	7.9E-10	1.33E-13		2.6E-09	9		
Lead	B2				1.97E+01		1.00E+00	1.37E-07				7.29E-12					
Manganese	D				3.64E+02		4.00E-02	2.55E-06				1.36E-10					
Nickel	NA				1.99E+01		4.00E-02	1.39E-07				7.36E-12					
Pyrene	D				3.26E-01	1.30E-01	1.00E+00	2.28E-09		9.77E-10		4.21E-11					
Zinc	D				8.04E+01		1.00E+00	5.62E-07				2.98E-11					
Total Risk									2E-08		8E-09			3E-09		100	
														Total Risk =			
														3E-08			

Note:

Cancer WOE Classifications:

Group A: Human carcinogen

Group B (B1, B2): Probable human carcinogen

Group C: Possible human carcinogen

Group D: Not classifiable

Group E: No evidence of carcinogenicity

ABS_d = Dermal Absorption FactorABS_{gi} = Gastrointestinal Absorption Factor

CDI = Chronic Daily Intake

ELCR = Excess Lifetime Cancer Risk

EPC = Exposure Point Concentration

mg/kg-day = milligrams per kilogram per day

SF_d = Dermal Slope FactorSF_o = Oral Slope FactorSF_i = Inhalation Slope Factor

WOE = Weight of Evidence

Table A-8

Near-Term Construction Worker Scenario - Potential Noncarcinogenic Risk - CTE

Subsurface Soil - Fairview Farms

RMC-Troutdale Facility

Chemical	RfD _o (mg/kg-day)	RfD _d (mg/kg-day)	RfD _i (mg/kg-day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total HI	Contribution	%
							CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ			
Aluminum	1.00E+00	1.00E+00	1.42E-03	1.92E+04		1.00E+00	9.41E-03	0.009			4.99E-07	0.00	0.010	42	
Anthracene	3.00E+00	3.00E+00		1.66E-01		1.00E+00	8.11E-08	0.000			8.13E-09		0.000	0	
Aroclor-1260	2.00E-05	2.00E-05		1.25E-01	1.40E-01	1.00E+00	6.10E-08	0.003	2.82E-08	0.0014	3.23E-12		0.004	19	
Barium	7.00E-02	4.90E-03	1.40E-04	1.43E+02		7.00E-02	7.02E-05	0.001			3.72E-09	0.00	0.001	4	
Benzo (a) anthracene				2.89E-01	1.30E-01	1.00E+00	1.41E-07		6.06E-08		7.49E-12				
Benzo (a) pyrene				2.29E-01	1.30E-01	1.00E+00	1.12E-07		4.80E-08		5.94E-12				
Benzo (b) fluoranthene				4.08E-01	1.30E-01	1.00E+00	2.00E-07		8.57E-08		1.06E-11				
Benzo (k) fluoranthene				3.10E-01	1.30E-01	1.00E+00	1.52E-07		6.51E-08		8.04E-12				
Beryllium	5.00E-03	3.50E-05	5.71E-06	6.94E-01		7.00E-03	3.40E-07	0.000			1.80E-11	0.00	0.000	0	
Bromomethane	5.00E-03	5.00E-03	1.43E-03	5.00E-03		1.00E+00	2.45E-09	0.000			9.47E-08	0.00	0.000	0	
Cadmium	1.00E-03	2.50E-05		3.84E-01	1.00E-03	2.50E-02	1.88E-07	0.000	6.20E-10	0.0000	9.96E-12		0.000	1	
Chromium	2.00E-02	5.00E-04	2.20E-06	2.33E+01		2.50E-02	1.14E-05	0.001			6.04E-10	0.00	0.001	4	
Chrysene				4.87E-01	1.30E-01	1.00E+00	2.38E-07		1.02E-07		6.13E-09				
Cobalt	2.00E-02	2.00E-02	5.70E-06	9.88E+00		1.00E+00	4.83E-06	0.000			2.56E-10	0.00	0.000	1	
Copper	4.00E-02	4.00E-02		3.33E+01		1.00E+00	1.63E-05	0.000			8.63E-10		0.000	2	
Cyanide, Total	2.00E-02	2.00E-02		7.33E-01	1.00E-01	1.00E+00	3.59E-07	0.000	1.18E-07	0.0000	1.90E-11		0.000	0	
Fluoranthene	4.00E-01	4.00E-01		2.29E-01	1.30E-01	1.00E+00	1.12E-07	0.000	4.82E-08	0.0000	5.95E-12		0.000	0	
Fluoride	6.00E-02	6.00E-02		3.27E+02	1.00E-01	1.00E+00	1.60E-04	0.003	5.28E-05	0.0009	8.49E-09		0.004	15	
Indeno (1,2,3-cd) pyrene				3.59E-01	1.30E-01	1.00E+00	1.75E-07		7.53E-08		9.31E-12				
Lead				1.97E+01		1.00E+00	9.62E-06				5.10E-10				
Manganese	1.40E-01	5.60E-03	1.40E-05	3.64E+02		4.00E-02	1.78E-04	0.001			9.45E-09	0.00	0.002	8	
Nickel	2.00E-02	8.00E-04		1.99E+01		4.00E-02	9.72E-06	0.000			5.15E-10		0.000	2	
Pyrene	3.00E-01	3.00E-01		3.26E-01	1.30E-01	1.00E+00	1.59E-07	0.000	6.84E-08	0.0000	2.95E-09		0.000	0	
Zinc	3.00E-01	3.00E-01		8.04E+01		1.00E+00	3.93E-05	0.000			2.09E-09		0.000	1	
								0.02		0.002		0.001			100
												0.02			

Note:

ABS_d = Dermal Absorption Factor
 ABS_{gi} = Gastrointestinal Absorption Factor
 CDI = Chronic Daily Intake
 EPC = Exposure Point Concentration
 HI = Hazard Index
 HQ = Hazard Quotient;
 mg/kg-day = milligrams per kilogram per day
 RfC = Reference Concentration
 RfD_d = Dermal Reference Dose;
 RfD_o = Oral Reference Dose
 RfD_i = Inhalation Reference Dose

Table A-9

Intermittent Excavation / Trench Worker Scenario - Potential Excess Lifetime Cancer Risk - RME

Subsurface Soil - Fairview Farms

RMC-Troutdale Facility

Chemical	WOE	SF _o (mg/kg- day) ⁻¹	SF _d (mg/kg- day) ⁻¹	SF _i (mg/kg- day) ⁻¹	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total ELCR	Contribution	%	
								CDI (mg/kg-day)	ELCR	CDI (mg/kg- day)	ELCR	CDI (mg/kg- day)	ELCR				
Aluminum	NA				1.92E+04		1.00E+00	3.19E-05				5.13E-10					
Anthracene	D				1.66E-01		1.00E+00	2.75E-10				8.36E-12					
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	1.25E-01	1.40E-01	1.00E+00	2.07E-10	4.1E-10	8.69E-11	1.7E-10	3.33E-15	6.7E-15	5.9E-10	9		
Barium	D				1.43E+02		7.00E-02	2.38E-07				3.83E-12					
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		2.89E-01	1.30E-01	1.00E+00	4.79E-10	3.5E-10	1.87E-10	1.4E-10	7.70E-15		4.9E-10	8		
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		2.29E-01	1.30E-01	1.00E+00	3.80E-10	2.8E-09	1.48E-10	1.1E-09	6.11E-15		3.9E-09	60		
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		4.08E-01	1.30E-01	1.00E+00	6.78E-10	4.9E-10	2.64E-10	1.9E-10	1.09E-14		6.9E-10	11		
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		3.10E-01	1.30E-01	1.00E+00	5.15E-10	3.8E-11	2.01E-10	1.5E-11	8.27E-15		5.2E-11	1		
Beryllium	B1			8.40E+00	6.94E-01		7.00E-03	1.15E-09				1.85E-14	1.6E-13	1.6E-13	0		
Bromomethane	D				5.00E-03		1.00E+00	8.30E-12				9.74E-11					
Cadmium	B1			6.30E+00	3.84E-01	1.00E-03	2.50E-02	6.38E-10		1.91E-12		1.02E-14	6.5E-14	6.5E-14	0		
Chromium	A			2.94E+02	2.33E+01		2.50E-02	3.86E-08				6.21E-13	1.8E-10	1.8E-10	3		
Chrysene	B2	7.30E-03	7.30E-03		4.87E-01	1.30E-01	1.00E+00	8.09E-10	5.9E-12	3.15E-10	2.3E-12	6.31E-12		8.2E-12	0		
Cobalt	NA			9.80E+00	9.88E+00		1.00E+00	1.64E-08				2.64E-13	2.6E-12	2.6E-12	0		
Copper	D				3.33E+01		1.00E+00	5.53E-08				8.88E-13					
Cyanide, Total	D				7.33E-01	1.00E-01	1.00E+00	1.22E-09		3.65E-10		1.96E-14					
Fluoranthene	D				2.29E-01	1.30E-01	1.00E+00	3.81E-10				1.49E-10		6.12E-15			
Fluoride	NA				3.27E+02	1.00E-01	1.00E+00	5.43E-07				1.63E-07		8.73E-12			
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		3.59E-01	1.30E-01	1.00E+00	5.96E-10	4.3E-10	2.32E-10	1.7E-10	9.57E-15		6.0E-10	9		
Lead	B2				1.97E+01		1.00E+00	3.27E-08				5.25E-13					
Manganese	D				3.64E+02		4.00E-02	6.05E-07				9.72E-12					
Nickel	NA				1.99E+01		4.00E-02	3.30E-08				5.30E-13					
Pyrene	D				3.26E-01	1.30E-01	1.00E+00	5.41E-10		2.11E-10		3.03E-12					
Zinc	D				8.04E+01		1.00E+00	1.33E-07				2.14E-12					
Total Risk									5E-09		2E-09						100
													Total Risk =	6E-09			

Note:

Cancer WOE Classifications:

Group A: Human carcinogen

Group B (B1, B2): Probable human carcinogen

Group C: Possible human carcinogen

Group D: Not classifiable

Group E: No evidence of carcinogenicity

ABS_d = Dermal Absorption FactorABS_{gi} = Gastrointestinal Absorption Factor

CDI = Chronic Daily Intake

ELCR = Excess Lifetime Cancer Risk

EPC = Exposure Point Concentration

mg/kg-day = milligrams per kilogram per day

SF_d = Dermal Slope FactorSF_o = Oral Slope FactorSF_i = Inhalation Slope Factor

WOE = Weight of Evidence

Table A-10

Intermittent Excavation / Trench Worker Scenario - Potential Noncarcinogenic Risk - RME

Subsurface Soil - Fairview Farms

RMC-Troutdale Facility

Chemical	RfD _o (mg/kg-day)	RfD _d (mg/kg-day)	RfD _i (mg/kg-day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total HI	Contribution	%
							CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ			
Aluminum	1.00E+00	1.00E+00	1.42E-03	1.92E+04		1.00E+00	2.24E-03	0.002			3.59E-08	0.00	0.002		43
Anthracene	3.00E+00	3.00E+00		1.66E-01		1.00E+00	1.93E-08	0.000			5.85E-10		0.000		0
Aroclor-1260	2.00E-05	2.00E-05		1.25E-01	1.40E-01	1.00E+00	1.45E-08	0.001	6.08E-09	0.0003	2.33E-13		0.001		20
Barium	7.00E-02	4.90E-03	1.40E-04	1.43E+02		7.00E-02	1.67E-05	0.000			2.68E-10	0.00	0.000		5
Benzo (a) anthracene				2.89E-01	1.30E-01	1.00E+00	3.36E-08		1.31E-08		5.39E-13				
Benzo (a) pyrene				2.29E-01	1.30E-01	1.00E+00	2.66E-08		1.04E-08		4.28E-13				
Benzo (b) fluoranthene				4.08E-01	1.30E-01	1.00E+00	4.75E-08		1.85E-08		7.63E-13				
Benzo (k) fluoranthene				3.10E-01	1.30E-01	1.00E+00	3.60E-08		1.41E-08		5.79E-13				
Beryllium	5.00E-03	3.50E-05	5.71E-06	6.94E-01		7.00E-03	8.07E-08	0.000			1.30E-12	0.00	0.000		0
Bromomethane	5.00E-03	5.00E-03	1.43E-03	5.00E-03		1.00E+00	5.81E-10	0.000			6.82E-09	0.00	0.000		0
Cadmium	1.00E-03	2.50E-05		3.84E-01	1.00E-03	2.50E-02	4.46E-08	0.000	1.34E-10	0.0000	7.17E-13		0.000		1
Chromium	2.00E-02	5.00E-04	2.20E-06	2.33E+01		2.50E-02	2.71E-06	0.000			4.35E-11	0.00	0.000		3
Chrysene				4.87E-01	1.30E-01	1.00E+00	5.66E-08		2.21E-08		4.41E-10				
Cobalt	2.00E-02	2.00E-02	5.70E-06	9.88E+00		1.00E+00	1.15E-06	0.000			1.85E-11	0.00	0.000		1
Copper	4.00E-02	4.00E-02		3.33E+01		1.00E+00	3.87E-06	0.000			6.22E-11		0.000		2
Cyanide, Total	2.00E-02	2.00E-02		7.33E-01	1.00E-01	1.00E+00	8.53E-08	0.000	2.56E-08	0.0000	1.37E-12		0.000		0
Fluoranthene	4.00E-01	4.00E-01		2.29E-01	1.30E-01	1.00E+00	2.67E-08	0.000	1.04E-08	0.0000	4.29E-13		0.000		0
Fluoride	6.00E-02	6.00E-02		3.27E+02	1.00E-01	1.00E+00	3.80E-05	0.001	1.14E-05	0.0002	6.11E-10		0.001		16
Indeno (1,2,3-cd) pyrene				3.59E-01	1.30E-01	1.00E+00	4.17E-08		1.63E-08		6.70E-13				
Lead				1.97E+01		1.00E+00	2.29E-06				3.67E-11				
Manganese	1.40E-01	5.60E-03	1.40E-05	3.64E+02		4.00E-02	4.23E-05	0.000			6.80E-10	0.00	0.000		7
Nickel	2.00E-02	8.00E-04		1.99E+01		4.00E-02	2.31E-06	0.000			3.71E-11		0.000		2
Pyrene	3.00E-01	3.00E-01		3.26E-01	1.30E-01	1.00E+00	3.79E-08	0.000	1.48E-08	0.0000	2.12E-10		0.000		0
Zinc	3.00E-01	3.00E-01		8.04E+01		1.00E+00	9.34E-06	0.000			1.50E-10		0.000		1
								0.005		0.0005		0.0001			100
											Total HI =	0.005			

Note:

ABS_d = Dermal Absorption Factor
 ABS_{gi} = Gastrointestinal Absorption Factor
 CDI = Chronic Daily Intake
 EPC = Exposure Point Concentration
 HI = Hazard Index
 HQ = Hazard Quotient;
 mg/kg-day = milligrams per kilogram per day
 RfC = Reference Concentration
 RfD_d = Dermal Reference Dose;
 RfD_o = Oral Reference Dose
 RfD_i = Inhalation Reference Dose

Table A-11

Intermittent Excavation / Trench Worker Scenario - Potential Excess Lifetime Cancer Risk - CTE

Subsurface Soil - Fairview Farms

RMC-Troutdale Facility

Chemical	WOE	SF _o (mg/kg- day) ⁻¹	SF _d (mg/kg- day) ⁻¹	SF _i (mg/kg- day) ⁻¹	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total ELCR	Contribution	%	
								CDI (mg/kg-day)	ELCR	CDI (mg/kg- day)	ELCR	CDI (mg/kg- day)	ELCR				
Aluminum	NA				1.92E+04		1.00E+00	4.84E-06				2.57E-10					
Anthracene	D				1.66E-01		1.00E+00	4.17E-11				4.18E-12					
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	1.25E-01	1.40E-01	1.00E+00	3.14E-11	6.3E-11	1.45E-11	2.9E-11	1.66E-15	3.3E-15	9.2E-11	9		
Barium	D				1.43E+02		7.00E-02	3.61E-08				1.91E-12					
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		2.89E-01	1.30E-01	1.00E+00	7.26E-11	5.3E-11	3.12E-11	2.3E-11	3.85E-15		7.6E-11	7		
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		2.29E-01	1.30E-01	1.00E+00	5.76E-11	4.2E-10	2.47E-11	1.8E-10	3.05E-15		6.0E-10	56		
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		4.08E-01	1.30E-01	1.00E+00	1.03E-10	7.5E-11	4.41E-11	3.2E-11	5.45E-15		1.1E-10	10		
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		3.10E-01	1.30E-01	1.00E+00	7.80E-11	5.7E-12	3.35E-11	2.4E-12	4.14E-15		8.1E-12	1		
Beryllium	B1			8.40E+00	6.94E-01		7.00E-03	1.75E-10				9.26E-15	7.8E-14	7.8E-14	0		
Bromomethane	D				5.00E-03		1.00E+00	1.26E-12				4.87E-11					
Cadmium	B1			6.30E+00	3.84E-01	1.00E-03	2.50E-02	9.66E-11		3.19E-13		5.12E-15	3.2E-14	3.2E-14	0		
Chromium	A			2.94E+02	2.33E+01		2.50E-02	5.86E-09				3.11E-13	9.1E-11	9.1E-11	9		
Chrysene	B2	7.30E-03	7.30E-03		4.87E-01	1.30E-01	1.00E+00	1.23E-10	8.9E-13	5.26E-11	3.8E-13	3.15E-12		1.3E-12	0		
Cobalt	NA			9.80E+00	9.88E+00		1.00E+00	2.49E-09				1.32E-13	1.3E-12	1.3E-12	0		
Copper	D				3.33E+01		1.00E+00	8.37E-09				4.44E-13					
Cyanide, Total	D				7.33E-01	1.00E-01	1.00E+00	1.85E-10		6.09E-11		9.79E-15					
Fluoranthene	D				2.29E-01	1.30E-01	1.00E+00	5.77E-11				2.48E-11		3.06E-15			
Fluoride	NA				3.27E+02	1.00E-01	1.00E+00	8.23E-08				2.72E-08		4.37E-12			
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		3.59E-01	1.30E-01	1.00E+00	9.03E-11	6.6E-11	3.87E-11	2.8E-11	4.79E-15		9.4E-11	9		
Lead	B2				1.97E+01		1.00E+00	4.95E-09				2.62E-13					
Manganese	D				3.64E+02		4.00E-02	9.16E-08				4.86E-12					
Nickel	NA				1.99E+01		4.00E-02	5.00E-09				2.65E-13					
Pyrene	D				3.26E-01	1.30E-01	1.00E+00	8.20E-11		3.52E-11		1.51E-12					
Zinc	D				8.04E+01		1.00E+00	2.02E-08				1.07E-12					
Total Risk									7E-10		3E-10		9E-11		100		
													Total Risk =	1E-09			

Note:

Cancer WOE Classifications:

Group A: Human carcinogen

Group B (B1, B2): Probable human carcinogen

Group C: Possible human carcinogen

Group D: Not classifiable

Group E: No evidence of carcinogenicity

ABS_d = Dermal Absorption FactorABS_{gi} = Gastrointestinal Absorption Factor

CDI = Chronic Daily Intake

ELCR = Excess Lifetime Cancer Risk

EPC = Exposure Point Concentration

mg/kg-day = milligrams per kilogram per day

SF_d = Dermal Slope FactorSF_o = Oral Slope FactorSF_i = Inhalation Slope Factor

WOE = Weight of Evidence

Table A-12

Intermittent Excavation / Trench Worker Scenario - Potential Noncarcinogenic Risk - CTE

Subsurface Soil - Fairview Farms

RMC-Troutdale Facility

Chemical	RfD _o (mg/kg-day)	RfD _d (mg/kg-day)	RfD _i (mg/kg-day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion			Dermal		Inhalation		Total HI	Contribution	%
							CDI (mg/kg-day)	HQ	HQ	CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ			
Aluminum	1.00E+00	1.00E+00	1.42E-03	1.92E+04		1.00E+00	3.39E-04	0.000			1.80E-08	0.00	0.000		42	
Anthracene	3.00E+00	3.00E+00		1.66E-01		1.00E+00	2.92E-09	0.000			2.93E-10		0.000		0	
Aroclor-1260	2.00E-05	2.00E-05		1.25E-01	1.40E-01	1.00E+00	2.19E-09	0.000	1.01E-09	0.0001			1.16E-13	0.000	19	
Barium	7.00E-02	4.90E-03	1.40E-04	1.43E+02		7.00E-02	2.53E-06	0.000			1.34E-10	0.00	0.000		4	
Benzo (a) anthracene				2.89E-01	1.30E-01	1.00E+00	5.08E-09		2.18E-09		2.70E-13					
Benzo (a) pyrene				2.29E-01	1.30E-01	1.00E+00	4.03E-09		1.73E-09		2.14E-13					
Benzo (b) fluoranthene				4.08E-01	1.30E-01	1.00E+00	7.19E-09		3.09E-09		3.81E-13					
Benzo (k) fluoranthene				3.10E-01	1.30E-01	1.00E+00	5.46E-09		2.34E-09		2.89E-13					
Beryllium	5.00E-03	3.50E-05	5.71E-06	6.94E-01		7.00E-03	1.22E-08	0.000			6.48E-13	0.00	0.000		0	
Bromomethane	5.00E-03	5.00E-03	1.43E-03	5.00E-03		1.00E+00	8.81E-11	0.000			3.41E-09	0.00	0.000		0	
Cadmium	1.00E-03	2.50E-05		3.84E-01	1.00E-03	2.50E-02	6.76E-09	0.000	2.23E-11	0.0000	3.59E-13		0.000		1	
Chromium	2.00E-02	5.00E-04	2.20E-06	2.33E+01		2.50E-02	4.10E-07	0.000			2.17E-11	0.00	0.000		4	
Chrysene				4.87E-01	1.30E-01	1.00E+00	8.58E-09		3.68E-09		2.21E-10					
Cobalt	2.00E-02	2.00E-02	5.70E-06	9.88E+00		1.00E+00	1.74E-07	0.000			9.23E-12	0.00	0.000		1	
Copper	4.00E-02	4.00E-02		3.33E+01		1.00E+00	5.86E-07	0.000			3.11E-11		0.000		2	
Cyanide, Total	2.00E-02	2.00E-02		7.33E-01	1.00E-01	1.00E+00	1.29E-08	0.000	4.26E-09	0.0000	6.85E-13		0.000		0	
Fluoranthene	4.00E-01	4.00E-01		2.29E-01	1.30E-01	1.00E+00	4.04E-09	0.000	1.73E-09	0.0000	2.14E-13		0.000		0	
Fluoride	6.00E-02	6.00E-02		3.27E+02	1.00E-01	1.00E+00	5.76E-06	0.000	1.90E-06	0.0000	3.06E-10		0.000		15	
Indeno (1,2,3-cd) pyrene				3.59E-01	1.30E-01	1.00E+00	6.32E-09		2.71E-09		3.35E-13					
Lead				1.97E+01		1.00E+00	3.46E-07				1.84E-11					
Manganese	1.40E-01	5.60E-03	1.40E-05	3.64E+02		4.00E-02	6.41E-06	0.000			3.40E-10	0.00	0.000		8	
Nickel	2.00E-02	8.00E-04		1.99E+01		4.00E-02	3.50E-07	0.000			1.85E-11		0.000		2	
Pyrene	3.00E-01	3.00E-01		3.26E-01	1.30E-01	1.00E+00	5.74E-09	0.000	2.46E-09	0.0000	1.06E-10		0.000		0	
Zinc	3.00E-01	3.00E-01		8.04E+01		1.00E+00	1.42E-06	0.000			7.51E-11		0.000		1	
								0.0007		0.00008			0.0001		100	
											Total HI =		0.0008			

Note:

ABS_d = Dermal Absorption Factor
 ABS_{gi} = Gastrointestinal Absorption Factor
 CDI = Chronic Daily Intake
 EPC = Exposure Point Concentration
 HI = Hazard Index
 HQ = Hazard Quotient;
 mg/kg-day = milligrams per kilogram per day
 RfC = Reference Concentration
 RfD_d = Dermal Reference Dose;
 RfD_o = Oral Reference Dose
 RfD_i = Inhalation Reference Dose

Table A-13

Hypothetical Occupational Worker Scenario - Potential Excess Lifetime Cancer Risk - RME

Surface Soil - Fairview Farms

RMC-Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total ELCR	Contribution
								CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR		
Aluminum	NA				1.98E+04		1.00E+00	6.91E-03				3.67E-07			
Anthracene	D				1.68E-01		1.00E+00	5.86E-08				5.88E-09			
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	1.25E-01	1.40E-01	1.00E+00	4.35E-08	8.7E-08	2.01E-08	4.0E-08	2.31E-12	4.6E-12	1.3E-07	7
Barium	D				1.49E+02		7.00E-02	5.22E-05				2.77E-09			
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		3.07E-01	1.30E-01	1.00E+00	1.07E-07	7.8E-08	4.60E-08	3.4E-08	5.69E-12		1.1E-07	6
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		2.99E-01	1.30E-01	1.00E+00	1.05E-07	7.6E-07	4.49E-08	3.3E-07	5.55E-12		1.1E-06	61
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		4.43E-01	1.30E-01	1.00E+00	1.55E-07	1.1E-07	6.64E-08	4.8E-08	8.20E-12		1.6E-07	9
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		3.31E-01	1.30E-01	1.00E+00	1.16E-07	8.5E-09	4.97E-08	3.6E-09	6.14E-12		1.2E-08	1
Beryllium	B1			8.40E+00	7.24E-01		7.00E-03	2.53E-07				1.34E-11	1.1E-10	1.1E-10	0
Bromomethane	D				5.00E-03		1.00E+00	1.75E-09				6.76E-08			
Cadmium	B1			6.30E+00	4.04E-01	1.00E-03	2.50E-02	1.41E-07		4.66E-10		7.50E-12	4.7E-11	4.7E-11	0
Chromium	A			2.94E+02	2.41E+01		2.50E-02	8.42E-06				4.47E-10	1.3E-07	1.3E-07	7
Chrysene	B2	7.30E-03	7.30E-03		5.32E-01	1.30E-01	1.00E+00	1.86E-07	1.4E-09	7.97E-08	5.8E-10	4.78E-09		1.9E-09	0
Cobalt	NA			9.80E+00	1.03E+01		1.00E+00	3.59E-06				1.90E-10	1.9E-09	1.9E-09	0
Copper	D				3.36E+01		1.00E+00	1.17E-05				6.23E-10			
Cyanide, Total	D				7.84E-01	1.00E-01	1.00E+00	2.74E-07		9.05E-08		1.45E-11			
Fluoranthene	D				2.41E-01	1.30E-01	1.00E+00	8.41E-08		3.61E-08		4.46E-12			
Fluoride	NA				3.83E+02	1.00E-01	1.00E+00	1.34E-04		4.42E-05		7.10E-09			
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		3.87E-01	1.30E-01	1.00E+00	1.35E-07	9.9E-08	5.80E-08	4.2E-08	7.17E-12		1.4E-07	8
Lead	B2				2.11E+01		1.00E+00	7.38E-06				3.91E-10			
Manganese	D				3.88E+02		4.00E-02	1.35E-04				7.18E-09			
Nickel	NA				2.07E+01		4.00E-02	7.22E-06				3.83E-10			
Pyrene	D				3.50E-01	1.30E-01	1.00E+00	1.22E-07		5.24E-08		2.26E-09			
Selenium	D				5.63E-01		1.00E+00	1.97E-07				1.04E-11			
Zinc	D				8.43E+01		1.00E+00	2.95E-05				1.56E-09			
Total Risk									1E-06		5E-07				100
												Total Risk =	1E-07 2E-06		

Note:

Cancer WOE Classifications:

- Group A: Human carcinogen
- Group B (B1, B2): Probable human carcinogen
- Group C: Possible human carcinogen
- Group D: Not classifiable
- Group E: No evidence of carcinogenicity

ABS_d = Dermal Absorption Factor

ABS_{gi} = Gastrointestinal Absorption Factor

CDI = Chronic Daily Intake

ELCR = Excess Lifetime Cancer Risk

EPC = Exposure Point Concentration

mg/kg-day = milligrams per kilogram per day

SF_d = Dermal Slope Factor

SF_o = Oral Slope Factor

SF_i = Inhalation Slope Factor

WOE = Weight of Evidence

Table A-14

Hypothetical Occupational Worker Scenario - Potential Noncarcinogenic Risk - RME

Surface Soil - Fairview Farms

RMC-Troutdale Facility

Chemical	RfD _o (mg/kg-day)	RfD _d (mg/kg-day)	RfD _i (mg/kg-day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total HI	Contribution	%
							CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ			
Aluminum	1.00E+00	1.00E+00	1.42E-03	1.98E+04		1.00E+00	1.94E-02	0.019			1.03E-06	0.00	0.020		37
Anthracene	3.00E-01	3.00E-01		1.68E-01		1.00E+00	1.64E-07	0.000			1.65E-08		0.000		0
Aroclor-1260	2.00E-05	2.00E-05		1.25E-01	1.40E-01	1.00E+00	1.22E-07	0.006	5.63E-08	0.0028	6.47E-12		0.009		16
Barium	2.00E-01	1.40E-02	1.40E-04	1.49E+02		7.00E-02	1.46E-04	0.001			7.76E-09	0.00	0.001		1
Benzo (a) anthracene				3.07E-01	1.30E-01	1.00E+00	3.01E-07		1.29E-07		1.59E-11				
Benzo (a) pyrene				2.99E-01	1.30E-01	1.00E+00	2.93E-07		1.26E-07		1.55E-11				
Benzo (b) fluoranthene				4.43E-01	1.30E-01	1.00E+00	4.33E-07		1.86E-07		2.30E-11				
Benzo (k) fluoranthene				3.31E-01	1.30E-01	1.00E+00	3.24E-07		1.39E-07		1.72E-11				
Beryllium	2.00E-03	1.40E-05	5.71E-06	7.24E-01		7.00E-03	7.09E-07	0.000			3.76E-11	0.00	0.000		1
Bromomethane	1.40E-03	1.40E-03	1.43E-03	5.00E-03		1.00E+00	4.89E-09	0.000			1.89E-07	0.00	0.000		0
Cadmium	1.00E-03	2.50E-05		4.04E-01	1.00E-03	2.50E-02	3.96E-07	0.000	1.31E-09	0.0001	2.10E-11		0.000		1
Chromium	3.00E-03	7.50E-05	2.20E-06	2.41E+01		2.50E-02	2.36E-05	0.008			1.25E-09	0.00	0.008		15
Chrysene				5.32E-01	1.30E-01	1.00E+00	5.20E-07		2.23E-07		1.34E-08				
Cobalt	2.00E-02	2.00E-02	5.70E-06	1.03E+01		1.00E+00	1.01E-05	0.001			5.33E-10	0.00	0.001		1
Copper	4.00E-02	4.00E-02		3.36E+01		1.00E+00	3.29E-05	0.001			1.74E-09		0.001		2
Cyanide, Total	2.00E-02	2.00E-02		7.84E-01	1.00E-01	1.00E+00	7.68E-07	0.000	2.53E-07	0.0000	4.07E-11		0.000		0
Fluoranthene	4.00E-02	4.00E-02		2.41E-01	1.30E-01	1.00E+00	2.35E-07	0.000	1.01E-07	0.0000	1.25E-11		0.000		0
Fluoride	6.00E-02	6.00E-02		3.83E+02	1.00E-01	1.00E+00	3.75E-04	0.006	1.24E-04	0.0021	1.99E-08		0.008		15
Indeno (1,2,3-cd) pyrene				3.87E-01	1.30E-01	1.00E+00	3.78E-07		1.62E-07		2.01E-11				
Lead				2.11E+01		1.00E+00	2.07E-05				1.10E-09				
Manganese	1.40E-01	5.60E-03	1.40E-05	3.88E+02		4.00E-02	3.79E-04	0.003			2.01E-08	0.00	0.004		8
Nickel	2.00E-02	8.00E-04		2.07E+01		4.00E-02	2.02E-05	0.001			1.07E-09		0.001		2
Pyrene	3.00E-02	3.00E-02		3.50E-01	1.30E-01	1.00E+00	3.42E-07	0.000	1.47E-07	0.0000	6.32E-09		0.000		0
Selenium	5.00E-03	5.00E-03		5.63E-01		1.00E+00	5.51E-07	0.000			2.92E-11		0.000		0
Zinc	3.00E-01	3.00E-01		8.43E+01		1.00E+00	8.25E-05	0.000			4.38E-09		0.000		1
								0.05		0.005					100
											Total HI =	0.003			
												0.05			

Note:

- ABS_d = Dermal Absorption Factor
- ABS_{gi} = Gastrointestinal Absorption Factor
- CDI = Chronic Daily Intake
- EPC = Exposure Point Concentration
- HI = Hazard Index
- HQ = Hazard Quotient;
- mg/kg-day = milligrams per kilogram per day
- RfC = Reference Concentration
- RfD_d = Dermal Reference Dose;
- RfD_o = Oral Reference Dose
- RfD_i = Inhalation Reference Dose

Table A-15

Hypothetical Occupational Worker Scenario - Potential Excess Lifetime Cancer Risk - CTE

Surface Soil - Fairview Farms

RMC-Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	EPC (mg/kg)	Ingestion			Dermal		Inhalation		Total ELCR	Contribution	%	
						ABS _d	ABS _{gi}	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)				ELCR
Aluminum	NA				1.98E+04		1.00E+00	8.29E-04				8.80E-08				
Anthracene	D				1.68E-01		1.00E+00	7.03E-09				1.41E-09				
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	1.25E-01	1.40E-01	1.00E+00	5.23E-09	1.0E-08	9.66E-10	1.9E-09	5.54E-13	1.1E-12	1.2E-08	6	
Barium	D				1.49E+02		7.00E-02	6.27E-06				6.65E-10				
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		3.07E-01	1.30E-01	1.00E+00	1.29E-08	9.4E-09	2.21E-09	1.6E-09	1.37E-12		1.1E-08	6	
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		2.99E-01	1.30E-01	1.00E+00	1.26E-08	9.2E-08	2.15E-09	1.6E-08	1.33E-12		1.1E-07	55	
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		4.43E-01	1.30E-01	1.00E+00	1.86E-08	1.4E-08	3.19E-09	2.3E-09	1.97E-12		1.6E-08	8	
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		3.31E-01	1.30E-01	1.00E+00	1.39E-08	1.0E-09	2.38E-09	1.7E-10	1.47E-12		1.2E-09	1	
Beryllium	B1			8.40E+00	7.24E-01		7.00E-03	3.04E-08				3.22E-12	2.7E-11	2.7E-11	0	
Bromomethane	D				5.00E-03		1.00E+00	2.10E-10				1.62E-08				
Cadmium	B1			6.30E+00	4.04E-01	1.00E-03	2.50E-02	1.70E-08		2.24E-11		1.80E-12	1.1E-11	1.1E-11	0	
Chromium	A			2.94E+02	2.41E+01		2.50E-02	1.01E-06				1.07E-10	3.2E-08	3.2E-08	16	
Chrysene	B2	7.30E-03	7.30E-03		5.32E-01	1.30E-01	1.00E+00	2.23E-08	1.6E-10	3.83E-09	2.8E-11	1.15E-09		1.9E-10	0	
Cobalt	NA			9.80E+00	1.03E+01		1.00E+00	4.31E-07				4.57E-11	4.5E-10	4.5E-10	0	
Copper	D				3.36E+01		1.00E+00	1.41E-06				1.49E-10				
Cyanide, Total	D				7.84E-01	1.00E-01	1.00E+00	3.29E-08		4.34E-09		3.49E-12				
Fluoranthene	D				2.41E-01	1.30E-01	1.00E+00	1.01E-08				1.73E-09		1.07E-12		
Fluoride	NA				3.83E+02	1.00E-01	1.00E+00	1.61E-05				2.12E-06		1.70E-09		
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		3.87E-01	1.30E-01	1.00E+00	1.62E-08	1.2E-08	2.78E-09	2.0E-09	1.72E-12		1.4E-08	7	
Lead	B2				2.11E+01		1.00E+00	8.86E-07				9.39E-11				
Manganese	D				3.88E+02		4.00E-02	1.63E-05				1.72E-09				
Nickel	NA				2.07E+01		4.00E-02	8.66E-07				9.19E-11				
Pyrene	D				3.50E-01	1.30E-01	1.00E+00	1.47E-08		2.52E-09		5.42E-10				
Selenium	D				5.63E-01		1.00E+00	2.36E-08				2.50E-12				
Zinc	D				8.43E+01		1.00E+00	3.54E-06				3.75E-10				
Total Risk									1E-07		2E-08		3E-08		100	
												Total Risk =	2E-07			

Note:

Cancer WOE Classifications:

Group A: Human carcinogen

Group B (B1, B2): Probable human carcinogen

Group C: Possible human carcinogen

Group D: Not classifiable

Group E: No evidence of carcinogenicity

ABS_d = Dermal Absorption Factor

ABS_{gi} = Gastrointestinal Absorption Factor

CDI = Chronic Daily Intake

ELCR = Excess Lifetime Cancer Risk

EPC = Exposure Point Concentration

mg/kg-day = milligrams per kilogram per day

SF_d = Dermal Slope Factor

SF_o = Oral Slope Factor

SF_i = Inhalation Slope Factor

WOE = Weight of Evidence

Table A-16

Hypothetical Occupational Worker Scenario - Potential Noncarcinogenic Risk - CTE

Surface Soil - Fairview Farms

RMC-Troutdale Facility

Chemical	RfD _o (mg/kg-day)	RfD _d (mg/kg-day)	RfD _i (mg/kg-day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total HI	Contribution	%
							CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ			
Aluminum	1.00E+00	1.00E+00	1.42E-03	1.98E+04		1.00E+00	9.68E-03	0.010			1.03E-06	0.00	0.010		38
Anthracene	3.00E-01	3.00E-01		1.68E-01		1.00E+00	8.20E-08	0.000			1.65E-08		0.000		0
Aroclor-1260	2.00E-05	2.00E-05		1.25E-01	1.40E-01	1.00E+00	6.10E-08	0.003	1.13E-08	0.0006	6.47E-12		0.004		13
Barium	2.00E-01	1.40E-02	1.40E-04	1.49E+02		7.00E-02	7.31E-05	0.000			7.76E-09	0.00	0.000		2
Benzo (a) anthracene				3.07E-01	1.30E-01	1.00E+00	1.50E-07		2.58E-08		1.59E-11				
Benzo (a) pyrene				2.99E-01	1.30E-01	1.00E+00	1.47E-07		2.51E-08		1.55E-11				
Benzo (b) fluoranthene				4.43E-01	1.30E-01	1.00E+00	2.17E-07		3.72E-08		2.30E-11				
Benzo (k) fluoranthene				3.31E-01	1.30E-01	1.00E+00	1.62E-07		2.78E-08		1.72E-11				
Beryllium	2.00E-03	1.40E-05	5.71E-06	7.24E-01		7.00E-03	3.54E-07	0.000			3.76E-11	0.00	0.000		1
Bromomethane	1.40E-03	1.40E-03	1.43E-03	5.00E-03		1.00E+00	2.45E-09	0.000			1.89E-07	0.00	0.000		0
Cadmium	1.00E-03	2.50E-05		4.04E-01	1.00E-03	2.50E-02	1.98E-07	0.000	2.61E-10	0.0000	2.10E-11		0.000		1
Chromium	3.00E-03	7.50E-05	2.20E-06	2.41E+01		2.50E-02	1.18E-05	0.004			1.25E-09	0.00	0.004		16
Chrysene				5.32E-01	1.30E-01	1.00E+00	2.60E-07		4.46E-08		1.34E-08				
Cobalt	2.00E-02	2.00E-02	5.70E-06	1.03E+01		1.00E+00	5.03E-06	0.000			5.33E-10	0.00	0.000		1
Copper	4.00E-02	4.00E-02		3.36E+01		1.00E+00	1.64E-05	0.000			1.74E-09		0.000		2
Cyanide, Total	2.00E-02	2.00E-02		7.84E-01	1.00E-01	1.00E+00	3.84E-07	0.000	5.07E-08	0.0000	4.07E-11		0.000		0
Fluoranthene	4.00E-02	4.00E-02		2.41E-01	1.30E-01	1.00E+00	1.18E-07	0.000	2.02E-08	0.0000	1.25E-11		0.000		0
Fluoride	6.00E-02	6.00E-02		3.83E+02	1.00E-01	1.00E+00	1.87E-04	0.003	2.47E-05	0.0004	1.99E-08		0.004		13
Indeno (1,2,3-cd) pyrene				3.87E-01	1.30E-01	1.00E+00	1.89E-07		3.25E-08		2.01E-11				
Lead				2.11E+01		1.00E+00	1.03E-05				1.10E-09				
Manganese	1.40E-01	5.60E-03	1.40E-05	3.88E+02		4.00E-02	1.90E-04	0.001			2.01E-08	0.00	0.003		10
Nickel	2.00E-02	8.00E-04		2.07E+01		4.00E-02	1.01E-05	0.001			1.07E-09		0.001		2
Pyrene	3.00E-02	3.00E-02		3.50E-01	1.30E-01	1.00E+00	1.71E-07	0.000	2.94E-08	0.0000	6.32E-09		0.000		0
Selenium	5.00E-03	5.00E-03		5.63E-01		1.00E+00	2.75E-07	0.000			2.92E-11		0.000		0
Zinc	3.00E-01	3.00E-01		8.43E+01		1.00E+00	4.13E-05	0.000			4.38E-09		0.000		1
								0.02		0.001					100
											Total HI =	0.003			

Note:

- ABS_d = Dermal Absorption Factor
- ABS_{gi} = Gastrointestinal Absorption Factor
- CDI = Chronic Daily Intake
- EPC = Exposure Point Concentration
- HI = Hazard Index
- HQ = Hazard Quotient;
- mg/kg-day = milligrams per kilogram per day
- RfC = Reference Concentration
- RfD_d = Dermal Reference Dose;
- RfD_o = Oral Reference Dose
- RfD_i = Inhalation Reference Dose

Table A-17

Trespasser Scenario - Potential Excess Lifetime Cancer Risk - RME

Surface Soil - Outside the Dike

RMC-Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total ELCR	Contribution	%	
								CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR				
Acenaphthene	NA				1.26E-01		1.00E+00	3.67E-09				1.41E-09					
Aluminum	NA				5.50E+04		1.00E+00	1.60E-03				8.48E-08					
Anthracene	D				1.50E-01		1.00E+00	4.36E-09				4.38E-10					
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	8.90E-01	1.40E-01	1.00E+00	2.59E-08	5.2E-08	1.67E-08	3.3E-08	1.37E-12	2.7E-12	8.5E-08		4	
Aroclor-1268	NA	2.00E+00	2.00E+00	2.00E+00	1.64E+00	1.40E-01	1.00E+00	4.78E-08	9.6E-08	3.08E-08	6.2E-08	2.53E-12	5.1E-12	1.6E-07		8	
Arsenic	A	1.50E+00	1.50E+00	1.51E+01	6.33E+00	3.00E-02	1.00E+00	1.84E-07	2.8E-07	2.54E-08	3.8E-08	9.76E-12	1.5E-10	3.1E-07		15	
Barium	D				7.86E+01		7.00E-02	2.28E-06				1.21E-10					
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		1.58E+00	1.30E-01	1.00E+00	4.60E-08	3.4E-08	2.75E-08	2.0E-08	2.44E-12		5.4E-08		3	
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		2.19E+00	1.30E-01	1.00E+00	6.38E-08	4.7E-07	3.81E-08	2.8E-07	3.38E-12		7.4E-07		37	
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		2.74E+00	1.30E-01	1.00E+00	7.97E-08	5.8E-08	4.77E-08	3.5E-08	4.23E-12		9.3E-08		5	
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		1.51E+00	1.30E-01	1.00E+00	4.39E-08	3.2E-09	2.63E-08	1.9E-09	2.33E-12		5.1E-09		0	
Beryllium	B1			8.40E+00	6.53E+00		7.00E-03	1.90E-07				1.01E-11	8.5E-11	8.5E-11		0	
Cadmium	B1			6.30E+00	1.42E+00	1.00E-03	2.50E-02	4.14E-08		1.90E-10		2.19E-12	1.4E-11	1.4E-11		0	
Chromium	A			2.94E+02	2.46E+01		2.50E-02	7.15E-07				3.79E-11	1.1E-08	1.1E-08		1	
Chrysene	B2	7.30E-03	7.30E-03		2.82E+00	1.30E-01	1.00E+00	8.20E-08	6.0E-10	4.90E-08	3.6E-10	2.11E-09		9.6E-10		0	
Cobalt	NA			9.80E+00	1.02E+01		1.00E+00	2.95E-07				1.57E-11	1.5E-10	1.5E-10		0	
Copper	D				8.65E+02		1.00E+00	2.52E-05				1.33E-09					
Cyanide, Total	D				7.95E+00	1.00E-01	1.00E+00	2.31E-07		1.06E-07		1.23E-11					
Dibenzo (a,h) anthracene	B2	7.30E+00	7.30E+00		3.20E-01	1.30E-01	1.00E+00	9.32E-09	6.8E-08	5.57E-09	4.1E-08	4.94E-13		1.1E-07		5	
Fluoranthene	D				1.65E+00	1.30E-01	1.00E+00	4.78E-08				2.54E-12					
Fluorene	D				1.39E-01		1.00E+00	4.04E-09				7.86E-10					
Fluoride	NA				1.30E+03	1.00E-01	1.00E+00	3.79E-05		1.74E-05		2.01E-09					
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		1.18E+00	1.30E-01	1.00E+00	3.42E-08	2.5E-08	2.04E-08	1.5E-08	1.81E-12		4.0E-08		2	
Lead	B2				3.62E+01		1.00E+00	1.05E-06				5.58E-11					
Manganese	D				2.68E+02		4.00E-02	7.79E-06				4.13E-10					
Mercury	D				1.54E-01		7.00E-02	4.48E-09				2.38E-13					
Naphthalene	C				1.20E-01		1.00E+00	3.49E-09				5.64E-09					
Nickel	NA				1.40E+02		4.00E-02	4.07E-06				2.16E-10					
Polychlorinated Biphenyls (PCBs)	B2	2.00E+00	2.00E+00	2.00E+00	4.44E+00	1.40E-01	1.00E+00	1.29E-07	2.6E-07	8.31E-08	1.7E-07	6.84E-12	1.4E-11	4.2E-07		21	
Pyrene	D				1.87E+00	1.30E-01	1.00E+00	5.44E-08		3.25E-08		1.01E-09					
Vanadium	NA				9.62E+01		2.60E-02	2.80E-06				1.48E-10					
Zinc	D				1.15E+02		1.00E+00	3.34E-06				1.77E-10					
Total Risk									1E-06		7E-07			Total Risk = 1E-08 2E-06		100	

Note:

Cancer WOE Classifications:

- Group A: Human carcinogen
- Group B (B1, B2): Probable human carcinogen
- Group C: Possible human carcinogen
- Group D: Not classifiable
- Group E: No evidence of carcinogenicity

ABS_d = Dermal Absorption Factor

ABS_{gi} = Gastrointestinal Absorption Factor

CDI = Chronic Daily Intake

ELCR = Excess Lifetime Cancer Risk

EPC = Exposure Point Concentration

mg/kg-day = milligrams per kilogram per day

SF_d = Dermal Slope Factor

SF_o = Oral Slope Factor

SF_i = Inhalation Slope Factor

WOE = Weight of Evidence

Table A-18

Trespasser Scenario - Potential Noncarcinogenic Risk - RME

Surface Soil - Outside the Dike

RMC-Troutdale Facility

Chemical	RfD _o (mg/kg-day)	RfD _d (mg/kg-day)	RfD _i (mg/kg-day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total HI	Contribution	%
							CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ			
Acenaphthene	6.00E-01	6.00E-01		1.26E-01		1.00E+00	5.13E-08	0.000			1.97E-08		0.000	0	
Aluminum	1.00E+00	1.00E+00	1.42E-03	5.50E+04		1.00E+00	2.24E-02	0.022			1.19E-06	0.00	0.023	8	
Anthracene	3.00E+00	3.00E+00		1.50E-01		1.00E+00	6.11E-08	0.000			6.13E-09		0.000	0	
Aroclor-1260	2.00E-05	2.00E-05		8.90E-01	1.40E-01	1.00E+00	3.62E-07	0.018	2.33E-07	0.0117	1.92E-11		0.030	10	
Aroclor-1268	2.00E-05	2.00E-05		1.64E+00	1.40E-01	1.00E+00	6.69E-07	0.033	4.31E-07	0.0215	3.55E-11		0.055	18	
Arsenic	3.00E-04	3.00E-04		6.33E+00	3.00E-02	1.00E+00	2.58E-06	0.009	3.55E-07	0.0012	1.37E-10		0.010	3	
Barium	7.00E-02	4.90E-03	1.40E-04	7.86E+01		7.00E-02	3.20E-05	0.000			1.70E-09	0.00	0.000	0	
Benzo (a) anthracene				1.58E+00	1.30E-01	1.00E+00	6.44E-07		3.85E-07		3.42E-11				
Benzo (a) pyrene				2.19E+00	1.30E-01	1.00E+00	8.93E-07		5.34E-07		4.73E-11				
Benzo (b) fluoranthene				2.74E+00	1.30E-01	1.00E+00	1.12E-06		6.67E-07		5.92E-11				
Benzo (k) fluoranthene				1.51E+00	1.30E-01	1.00E+00	6.15E-07		3.68E-07		3.26E-11				
Beryllium	5.00E-03	3.50E-05	5.71E-06	6.53E+00		7.00E-03	2.66E-06	0.001			1.41E-10	0.00	0.001	0	
Cadmium	1.00E-03	2.50E-05		1.42E+00	1.00E-03	2.50E-02	5.79E-07	0.001	2.66E-09	0.0001	3.07E-11		0.001	0	
Chromium	2.00E-02	5.00E-04	2.20E-06	2.46E+01		2.50E-02	1.00E-05	0.001			5.31E-10	0.00	0.001	0	
Chrysene				2.82E+00	1.30E-01	1.00E+00	1.15E-06		6.87E-07		2.95E-08				
Cobalt	2.00E-02	2.00E-02	5.70E-06	1.02E+01		1.00E+00	4.13E-06	0.000			2.19E-10	0.00	0.000	0	
Copper	4.00E-02	4.00E-02		8.65E+02		1.00E+00	3.52E-04	0.009			1.87E-08		0.009	3	
Cyanide, Total	2.00E-02	2.00E-02		7.95E+00	1.00E-01	1.00E+00	3.24E-06	0.000	1.49E-06	0.0001	1.72E-10		0.000	0	
Dibenzo (a,h) anthracene				3.20E-01	1.30E-01	1.00E+00	1.30E-07		7.80E-08		6.92E-12				
Fluoranthene	4.00E-01	4.00E-01		1.65E+00	1.30E-01	1.00E+00	6.70E-07	0.000	4.01E-07	0.0000	3.55E-11		0.000	0	
Fluorene	4.00E-01	4.00E-01		1.39E-01		1.00E+00	5.66E-08	0.000			1.10E-08		0.000	0	
Fluoride	6.00E-02	6.00E-02		1.30E+03	1.00E-01	1.00E+00	5.31E-04	0.009	2.44E-04	0.0041	2.81E-08		0.013	4	
Indeno (1,2,3-cd) pyrene				1.18E+00	1.30E-01	1.00E+00	4.79E-07		2.86E-07		2.54E-11				
Lead				3.62E+01		1.00E+00	1.47E-05				7.82E-10				
Manganese	1.40E-01	5.60E-03	1.40E-05	2.68E+02		4.00E-02	1.09E-04	0.001			5.78E-09	0.00	0.001	0	
Mercury	3.00E-04	2.10E-05	3.00E-03	1.54E-01		7.00E-02	6.27E-08	0.000			3.33E-12	0.00	0.000	0	
Naphthalene	2.00E-02	2.00E-02	8.57E-04	1.20E-01		1.00E+00	4.88E-08	0.000			7.90E-08	0.00	0.000	0	
Nickel	2.00E-02	8.00E-04		1.40E+02		4.00E-02	5.69E-05	0.003			3.02E-09		0.003	1	
Polychlorinated Biphenyls (PCBs)	2.00E-05	2.00E-05		4.44E+00	1.40E-01	1.00E+00	1.81E-06	0.090	1.16E-06	0.0582	9.58E-11		0.148	49	
Pyrene	3.00E-01	3.00E-01		1.87E+00	1.30E-01	1.00E+00	7.62E-07	0.000	4.56E-07	0.0000	1.41E-08		0.000	0	
Vanadium	7.00E-03	1.82E-04		9.62E+01		2.60E-02	3.92E-05	0.006			2.08E-09		0.006	2	
Zinc	3.00E-01	3.00E-01		1.15E+02		1.00E+00	4.68E-05	0.000			2.48E-09		0.000	0	
								0.2		0.1		0.002			100
												Total HI =	0.3		

Note:

- ABS_d = Dermal Absorption Factor
- ABS_{gi} = Gastrointestinal Absorption Factor
- CDI = Chronic Daily Intake
- EPC = Exposure Point Concentration
- HI = Hazard Index
- HQ = Hazard Quotient;
- mg/kg-day = milligrams per kilogram per day
- RfC = Reference Concentration
- RfD_d = Dermal Reference Dose;
- RfD_o = Oral Reference Dose
- RfD_i = Inhalation Reference Dose

Table A-19

Trespasser Scenario - Potential Excess Lifetime Cancer Risk - CTE

Surface Soil - Outside the Dike

RMC-Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total ELCR	Contribution	%
								CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR			
Acenaphthene	NA				1.26E-01		1.00E+00	3.52E-10				2.71E-10				
Aluminum	NA				5.50E+04		1.00E+00	1.54E-04				1.63E-08				
Anthracene	D				1.50E-01		1.00E+00	4.20E-10				8.42E-11				
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	8.90E-01	1.40E-01	1.00E+00	2.49E-09	5.0E-09	3.90E-10	7.8E-10	2.64E-13	5.3E-13	5.8E-09	4	
Aroclor-1268	NA	2.00E+00	2.00E+00	2.00E+00	1.64E+00	1.40E-01	1.00E+00	4.59E-09	9.2E-09	7.20E-10	1.4E-09	4.87E-13	9.7E-13	1.1E-08	7	
Arsenic	A	1.50E+00	1.50E+00	1.51E+01	6.33E+00	3.00E-02	1.00E+00	1.77E-08	2.7E-08	5.94E-10	8.9E-10	1.88E-12	2.8E-11	2.7E-08	19	
Barium	D				7.86E+01		7.00E-02	2.20E-07				2.33E-11				
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		1.58E+00	1.30E-01	1.00E+00	4.42E-09	3.2E-09	6.44E-10	4.7E-10	4.69E-13		3.7E-09	3	
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		2.19E+00	1.30E-01	1.00E+00	6.13E-09	4.5E-08	8.93E-10	6.5E-09	6.50E-13		5.1E-08	35	
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		2.74E+00	1.30E-01	1.00E+00	7.66E-09	5.6E-09	1.12E-09	8.1E-10	8.13E-13		6.4E-09	4	
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		1.51E+00	1.30E-01	1.00E+00	4.22E-09	3.1E-10	6.15E-10	4.5E-11	4.48E-13		3.5E-10	0	
Beryllium	B1			8.40E+00	6.53E+00		7.00E-03	1.83E-08				1.94E-12	1.6E-11	1.6E-11	0	
Cadmium	B1			6.30E+00	1.42E+00	1.00E-03	2.50E-02	3.98E-09		4.45E-12		4.22E-13	2.7E-12	2.7E-12	0	
Chromium	A			2.94E+02	2.46E+01		2.50E-02	6.87E-08				7.29E-12	2.1E-09	2.1E-09	1	
Chrysene	B2	7.30E-03	7.30E-03		2.82E+00	1.30E-01	1.00E+00	7.89E-09	5.8E-11	1.15E-09	8.4E-12	4.06E-10		6.6E-11	0	
Cobalt	NA			9.80E+00	1.02E+01		1.00E+00	2.84E-08				3.01E-12	2.9E-11	2.9E-11	0	
Copper	D				8.65E+02		1.00E+00	2.42E-06				2.56E-10				
Cyanide, Total	D				7.95E+00	1.00E-01	1.00E+00	2.22E-08		2.49E-09		2.36E-12				
Dibenzo (a,h) anthracene	B2	7.30E+00	7.30E+00		3.20E-01	1.30E-01	1.00E+00	8.96E-10	6.5E-09	1.30E-10	9.5E-10	9.50E-14		7.5E-09	5	
Fluoranthene	D				1.65E+00	1.30E-01	1.00E+00	4.60E-09		6.70E-10		4.88E-13				
Fluorene	D				1.39E-01		1.00E+00	3.89E-10				1.51E-10				
Fluoride	NA				1.30E+03	1.00E-01	1.00E+00	3.64E-06		4.08E-07		3.86E-10				
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		1.18E+00	1.30E-01	1.00E+00	3.29E-09	2.4E-09	4.79E-10	3.5E-10	3.49E-13		2.7E-09	2	
Lead	B2				3.62E+01		1.00E+00	1.01E-07				1.07E-11				
Manganese	D				2.68E+02		4.00E-02	7.49E-07				7.94E-11				
Mercury	D				1.54E-01		7.00E-02	4.31E-10				4.57E-14				
Naphthalene	C				1.20E-01		1.00E+00	3.35E-10				1.08E-09				
Nickel	NA				1.40E+02		4.00E-02	3.91E-07				4.15E-11				
Polychlorinated Biphenyls (PCBs)	B2	2.00E+00	2.00E+00	2.00E+00	4.44E+00	1.40E-01	1.00E+00	1.24E-08	2.5E-08	1.95E-09	3.9E-09	1.32E-12	2.6E-12	2.9E-08	20	
Pyrene	D				1.87E+00	1.30E-01	1.00E+00	5.23E-09		7.62E-10		1.93E-10				
Vanadium	NA				9.62E+01		2.60E-02	2.69E-07				2.85E-11				
Zinc	D				1.15E+02		1.00E+00	3.21E-07				3.41E-11				
Total Risk									1E-07		2E-08		2E-09			100
												Total Risk =	1E-07			

Note:

Cancer WOE Classifications:

- Group A: Human carcinogen
- Group B (B1, B2): Probable human carcinogen
- Group C: Possible human carcinogen
- Group D: Not classifiable
- Group E: No evidence of carcinogenicity

ABS_d = Dermal Absorption Factor

ABS_{gi} = Gastrointestinal Absorption Factor

CDI = Chronic Daily Intake

ELCR = Excess Lifetime Cancer Risk

EPC = Exposure Point Concentration

mg/kg-day = milligrams per kilogram per day

SF_d = Dermal Slope Factor

SF_o = Oral Slope Factor

SF_i = Inhalation Slope Factor

WOE = Weight of Evidence

Table A-20

Trespasser Scenario - Potential Noncarcinogenic Risk - CTE

Surface Soil - Outside the Dike

RMC-Troutdale Facility

Chemical	RfD _o (mg/kg-day)	RfD _d (mg/kg-day)	RfD _i (mg/kg-day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total HI	Contribution	%
							CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ			
Acenaphthene	6.00E-01	6.00E-01		1.26E-01		1.00E+00	4.93E-09	0.000			3.79E-09		0.000	0	
Aluminum	1.00E+00	1.00E+00	1.42E-03	5.50E+04		1.00E+00	2.15E-03	0.002			2.28E-07	0.00	0.002	10	
Anthracene	3.00E+00	3.00E+00		1.50E-01		1.00E+00	5.88E-09	0.000			1.18E-09		0.000	0	
Aroclor-1260	2.00E-05	2.00E-05		8.90E-01	1.40E-01	1.00E+00	3.48E-08	0.002	5.46E-09	0.0003	3.69E-12		0.002	9	
Aroclor-1268	2.00E-05	2.00E-05		1.64E+00	1.40E-01	1.00E+00	6.43E-08	0.003	1.01E-08	0.0005	6.82E-12		0.004	17	
Arsenic	3.00E-04	3.00E-04		6.33E+00	3.00E-02	1.00E+00	2.48E-07	0.001	8.32E-09	0.0000	2.63E-11		0.001	4	
Barium	7.00E-02	4.90E-03	1.40E-04	7.86E+01		7.00E-02	3.08E-06	0.000			3.26E-10	0.00	0.000	0	
Benzo (a) anthracene				1.58E+00	1.30E-01	1.00E+00	6.19E-08		9.02E-09		6.57E-12				
Benzo (a) pyrene				2.19E+00	1.30E-01	1.00E+00	8.58E-08		1.25E-08		9.10E-12				
Benzo (b) fluoranthene				2.74E+00	1.30E-01	1.00E+00	1.07E-07		1.56E-08		1.14E-11				
Benzo (k) fluoranthene				1.51E+00	1.30E-01	1.00E+00	5.91E-08		8.61E-09		6.27E-12				
Beryllium	5.00E-03	3.50E-05	5.71E-06	6.53E+00		7.00E-03	2.56E-07	0.000			2.71E-11	0.00	0.000	0	
Cadmium	1.00E-03	2.50E-05		1.42E+00	1.00E-03	2.50E-02	5.57E-08	0.000	6.23E-11	0.0000	5.90E-12		0.000	0	
Chromium	2.00E-02	5.00E-04	2.20E-06	2.46E+01		2.50E-02	9.62E-07	0.000			1.02E-10	0.00	0.000	0	
Chrysene				2.82E+00	1.30E-01	1.00E+00	1.10E-07		1.61E-08		5.68E-09				
Cobalt	2.00E-02	2.00E-02	5.70E-06	1.02E+01		1.00E+00	3.97E-07	0.000			4.21E-11	0.00	0.000	0	
Copper	4.00E-02	4.00E-02		8.65E+02		1.00E+00	3.39E-05	0.001			3.59E-09		0.001	4	
Cyanide, Total	2.00E-02	2.00E-02		7.95E+00	1.00E-01	1.00E+00	3.11E-07	0.000	3.49E-08	0.0000	3.30E-11		0.000	0	
Dibenzo (a,h) anthracene				3.20E-01	1.30E-01	1.00E+00	1.25E-08		1.83E-09		1.33E-12				
Fluoranthene	4.00E-01	4.00E-01		1.65E+00	1.30E-01	1.00E+00	6.44E-08	0.000	9.38E-09	0.0000	6.83E-12		0.000	0	
Fluorene	4.00E-01	4.00E-01		1.39E-01		1.00E+00	5.44E-09	0.000			2.12E-09		0.000	0	
Fluoride	6.00E-02	6.00E-02		1.30E+03	1.00E-01	1.00E+00	5.10E-05	0.001	5.71E-06	0.0001	5.41E-09		0.001	4	
Indeno (1,2,3-cd) pyrene				1.18E+00	1.30E-01	1.00E+00	4.60E-08		6.70E-09		4.88E-12				
Lead				3.62E+01		1.00E+00	1.42E-06				1.50E-10				
Manganese	1.40E-01	5.60E-03	1.40E-05	2.68E+02		4.00E-02	1.05E-05	0.000			1.11E-09	0.00	0.000	1	
Mercury	3.00E-04	2.10E-05	3.00E-03	1.54E-01		7.00E-02	6.03E-09	0.000			6.40E-13	0.00	0.000	0	
Naphthalene	2.00E-02	2.00E-02	8.57E-04	1.20E-01		1.00E+00	4.70E-09	0.000			1.52E-08	0.00	0.000	0	
Nickel	2.00E-02	8.00E-04		1.40E+02		4.00E-02	5.47E-06	0.000			5.81E-10		0.000	1	
Polychlorinated Biphenyls (PCBs)	2.00E-05	2.00E-05		4.44E+00	1.40E-01	1.00E+00	1.74E-07	0.009	2.72E-08	0.0014	1.84E-11		0.010	46	
Pyrene	3.00E-01	3.00E-01		1.87E+00	1.30E-01	1.00E+00	7.33E-08	0.000	1.07E-08	0.0000	2.71E-09		0.000	0	
Vanadium	7.00E-03	1.82E-04		9.62E+01		2.60E-02	3.77E-06	0.001			3.99E-10		0.001	2	
Zinc	3.00E-01	3.00E-01		1.15E+02		1.00E+00	4.50E-06	0.000			4.77E-10		0.000	0	
								0.02		0.002		0.0003			100
												Total HI =	0.02		

Note:

- ABS_d = Dermal Absorption Factor
- ABS_{gi} = Gastrointestinal Absorption Factor
- CDI = Chronic Daily Intake
- EPC = Exposure Point Concentration
- HI = Hazard Index
- HQ = Hazard Quotient;
- mg/kg-day = milligrams per kilogram per day
- RfC = Reference Concentration
- RfD_d = Dermal Reference Dose;
- RfD_o = Oral Reference Dose
- RfD_i = Inhalation Reference Dose

Table A-21

Recreational User Scenario - Potential Excess Lifetime Cancer Risk - RME

Surface Soil - Outside the Dike

RMC-Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total ELCR	Contribution	%		
								CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR					
Acenaphthene	NA				1.32E-01		1.00E+00	3.84E-09				1.48E-09						
Aluminum	NA				4.44E+04		1.00E+00	1.29E-03				6.84E-08						
Anthracene	D				1.70E-01		1.00E+00	4.95E-09				4.96E-10						
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	8.90E-01	1.40E-01	1.00E+00	2.59E-08	5.2E-08	1.67E-08	3.3E-08	1.37E-12	2.7E-12	8.5E-08	4			
Aroclor-1268	NA	2.00E+00	2.00E+00	2.00E+00	1.29E+00	1.40E-01	1.00E+00	3.76E-08	7.5E-08	2.42E-08	4.8E-08	2.00E-12	4.0E-12	1.2E-07	6			
Arsenic	A	1.50E+00	1.50E+00	1.51E+01	7.51E+00	3.00E-02	1.00E+00	2.18E-07	3.3E-07	3.01E-08	4.5E-08	1.16E-11	1.7E-10	3.7E-07	20			
Barium	D				8.56E+01		7.00E-02	2.49E-06				1.32E-10						
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		1.44E+00	1.30E-01	1.00E+00	4.20E-08	3.1E-08	2.51E-08	1.8E-08	2.23E-12		4.9E-08	3			
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		2.02E+00	1.30E-01	1.00E+00	5.87E-08	4.3E-07	3.51E-08	2.6E-07	3.11E-12		6.8E-07	36			
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		2.53E+00	1.30E-01	1.00E+00	7.34E-08	5.4E-08	4.39E-08	3.2E-08	3.89E-12		8.6E-08	4			
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		1.01E+00	1.30E-01	1.00E+00	2.94E-08	2.1E-09	1.76E-08	1.3E-09	1.56E-12		3.4E-09	0			
Benzoic Acid	D				5.30E+00	1.00E-01	1.00E+00	1.54E-07		7.09E-08		8.17E-12						
Beryllium	B1			8.40E+00	2.60E+00		7.00E-03	7.55E-08				4.00E-12	3.4E-11	3.4E-11	0			
Cadmium	B1			6.30E+00	1.27E+00	1.00E-03	2.50E-02	3.70E-08		1.70E-10		1.96E-12	1.2E-11	1.2E-11	0			
Chromium	A			2.94E+02	2.39E+01		2.50E-02	6.94E-07				3.68E-11	1.1E-08	1.1E-08	1			
Chrysene	B2	7.30E-03	7.30E-03		2.38E+00	1.30E-01	1.00E+00	6.92E-08	5.1E-10	4.14E-08	3.0E-10	1.78E-09		8.1E-10	0			
Cobalt	NA			9.80E+00	1.15E+01		1.00E+00	3.34E-07				1.77E-11	1.7E-10	1.7E-10	0			
Copper	D				6.44E+02		1.00E+00	1.87E-05				9.93E-10						
Cyanide, Total	D				5.83E+00	1.00E-01	1.00E+00	1.70E-07		7.80E-08		8.99E-12						
Dibenzo (a,h) anthracene	B2	7.30E+00	7.30E+00		3.05E-01	1.30E-01	1.00E+00	8.87E-09	6.5E-08	5.31E-09	3.9E-08	4.71E-13		1.0E-07	5			
Fluoranthene	D				1.53E+00	1.30E-01	1.00E+00	4.46E-08		2.67E-08		2.37E-12						
Fluorene	D				1.43E-01		1.00E+00	4.16E-09				8.09E-10						
Fluoride	NA				1.21E+03	1.00E-01	1.00E+00	3.52E-05		1.62E-05		1.87E-09						
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		1.09E+00	1.30E-01	1.00E+00	3.18E-08	2.3E-08	1.90E-08	1.4E-08	1.68E-12		3.7E-08	2			
Lead	B2				3.04E+01		1.00E+00	8.84E-07				4.69E-11						
Manganese	D				2.94E+02		4.00E-02	8.55E-06				4.54E-10						
Mercury	D				1.99E-01		7.00E-02	5.77E-09				3.06E-13						
Naphthalene	C				1.20E-01		1.00E+00	3.49E-09				5.64E-09						
Nickel	NA				1.09E+02		4.00E-02	3.16E-06				1.67E-10						
Polychlorinated Biphenyls (PCBs)	B2	2.00E+00	2.00E+00	2.00E+00	3.64E+00	1.40E-01	1.00E+00	1.06E-07	2.1E-07	6.82E-08	1.4E-07	5.62E-12	1.1E-11	3.5E-07	18			
Pyrene	D				1.77E+00	1.30E-01	1.00E+00	5.15E-08		3.08E-08		9.52E-10						
Vanadium	NA				8.41E+01		2.60E-02	2.45E-06				1.30E-10						
Zinc	D				1.08E+02		1.00E+00	3.13E-06				1.66E-10						
Total Risk									1E-06		6E-07					100		
												Total Risk =	1E-08	2E-06				

Note:

Cancer WOE Classifications:

Group A: Human carcinogen

Group B (B1, B2): Probable human carcinogen

Group C: Possible human carcinogen

Group D: Not classifiable

Group E: No evidence of carcinogenicity

ABS_d = Dermal Absorption Factor

ABS_{gi} = Gastrointestinal Absorption Factor

CDI = Chronic Daily Intake

ELCR = Excess Lifetime Cancer Risk

EPC = Exposure Point Concentration

mg/kg-day = milligrams per kilogram per day

SF_d = Dermal Slope Factor

SF_o = Oral Slope Factor

SF_i = Inhalation Slope Factor

WOE = Weight of Evidence

Table A-23

Recreational User Scenario - Potential Excess Lifetime Cancer Risk - CTE

Surface Soil - Outside the Dike

RMC-Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total ELCR	Contribution	%
								CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR			
Acenaphthene	NA				1.32E-01		1.00E+00	3.70E-10				2.84E-10				
Aluminum	NA				4.44E+04		1.00E+00	1.24E-04				1.32E-08				
Anthracene	D				1.70E-01		1.00E+00	4.76E-10				9.55E-11				
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	8.90E-01	1.40E-01	1.00E+00	2.49E-09	5.0E-09	3.90E-10	7.8E-10	2.64E-13	5.3E-13	5.8E-09	4	
Aroclor-1268	NA	2.00E+00	2.00E+00	2.00E+00	1.29E+00	1.40E-01	1.00E+00	3.62E-09	7.2E-09	5.67E-10	1.1E-09	3.84E-13	7.7E-13	8.4E-09	6	
Arsenic	A	1.50E+00	1.50E+00	1.51E+01	7.51E+00	3.00E-02	1.00E+00	2.10E-08	3.2E-08	7.06E-10	1.1E-09	2.23E-12	3.4E-11	3.3E-08	23	
Barium	D				8.56E+01		7.00E-02	2.39E-07				2.54E-11				
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		1.44E+00	1.30E-01	1.00E+00	4.04E-09	2.9E-09	5.88E-10	4.3E-10	4.28E-13		3.4E-09	2	
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		2.02E+00	1.30E-01	1.00E+00	5.64E-09	4.1E-08	8.22E-10	6.0E-09	5.99E-13		4.7E-08	34	
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		2.53E+00	1.30E-01	1.00E+00	7.06E-09	5.2E-09	1.03E-09	7.5E-10	7.49E-13		5.9E-09	4	
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		1.01E+00	1.30E-01	1.00E+00	2.83E-09	2.1E-10	4.12E-10	3.0E-11	3.00E-13		2.4E-10	0	
Benzoic Acid	D				5.30E+00	1.00E-01	1.00E+00	1.48E-08		1.66E-09		1.57E-12				
Beryllium	B1			8.40E+00	2.60E+00		7.00E-03	7.26E-09				7.69E-13	6.5E-12	6.5E-12	0	
Cadmium	B1			6.30E+00	1.27E+00	1.00E-03	2.50E-02	3.56E-09		3.98E-12		3.77E-13	2.4E-12	2.4E-12	0	
Chromium	A			2.94E+02	2.39E+01		2.50E-02	6.67E-08				7.08E-12	2.1E-09	2.1E-09	1	
Chrysene	B2	7.30E-03	7.30E-03		2.38E+00	1.30E-01	1.00E+00	6.65E-09	4.9E-11	9.69E-10	7.1E-12	3.42E-10		5.6E-11	0	
Cobalt	NA			9.80E+00	1.15E+01		1.00E+00	3.21E-08				3.40E-12	3.3E-11	3.3E-11	0	
Copper	D				6.44E+02		1.00E+00	1.80E-06				1.91E-10				
Cyanide, Total	D				5.83E+00	1.00E-01	1.00E+00	1.63E-08		1.83E-09		1.73E-12				
Dibenzo (a,h) anthracene	B2	7.30E+00	7.30E+00		3.05E-01	1.30E-01	1.00E+00	8.53E-10	6.2E-09	1.24E-10	9.1E-10	9.05E-14		7.1E-09	5	
Fluoranthene	D				1.53E+00	1.30E-01	1.00E+00	4.29E-09		6.24E-10		4.55E-13				
Fluorene	D				1.43E-01		1.00E+00	4.00E-10				1.56E-10				
Fluoride	NA				1.21E+03	1.00E-01	1.00E+00	3.38E-06		3.79E-07		3.59E-10				
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		1.09E+00	1.30E-01	1.00E+00	3.05E-09	2.2E-09	4.45E-10	3.2E-10	3.24E-13		2.6E-09	2	
Lead	B2				3.04E+01		1.00E+00	8.50E-08				9.02E-12				
Manganese	D				2.94E+02		4.00E-02	8.23E-07				8.72E-11				
Mercury	D				1.99E-01		7.00E-02	5.55E-10				5.89E-14				
Naphthalene	C				1.20E-01		1.00E+00	3.35E-10				1.08E-09				
Nickel	NA				1.09E+02		4.00E-02	3.04E-07				3.22E-11				
Polychlorinated Biphenyls (PCBs)	B2	2.00E+00	2.00E+00	2.00E+00	3.64E+00	1.40E-01	1.00E+00	1.02E-08	2.0E-08	1.60E-09	3.2E-09	1.08E-12	2.2E-12	2.4E-08	17	
Pyrene	D				1.77E+00	1.30E-01	1.00E+00	4.96E-09		7.22E-10		1.83E-10				
Vanadium	NA				8.41E+01		2.60E-02	2.35E-07				2.49E-11				
Zinc	D				1.08E+02		1.00E+00	3.01E-07				3.19E-11				
Total Risk									1E-07		1E-08					100
												Total Risk =	2E-09	1E-07		

Note:

Cancer WOE Classifications:

Group A: Human carcinogen

Group B (B1, B2): Probable human carcinogen

Group C: Possible human carcinogen

Group D: Not classifiable

Group E: No evidence of carcinogenicity

ABS_d = Dermal Absorption FactorABS_{gi} = Gastrointestinal Absorption Factor

CDI = Chronic Daily Intake

ELCR = Excess Lifetime Cancer Risk

EPC = Exposure Point Concentration

mg/kg-day = milligrams per kilogram per day

SF_d = Dermal Slope FactorSF_o = Oral Slope FactorSF_i = Inhalation Slope Factor

WOE = Weight of Evidence

Table A-25
 Trespasser Scenario - Potential Excess Lifetime Cancer Risk - RME
 Surface Soil - So. Wetlands
 RMC Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	Ingestion				Dermal		Inhalation		Total ELCR	%	
					EPC (mg/kg)	ABS _d	ABS _{gi}	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)			ELCR
Acenaphthene	NA				4.69E-01		1.00E+00	1.36E-08				5.24E-09			
Aluminum	NA				6.28E+04		1.00E+00	1.83E-03				9.69E-08			
Anthracene	D				5.66E-01		1.00E+00	1.64E-08				1.65E-09			
Antimony	NA				3.21E+00		1.50E-01	9.34E-08				4.95E-12			
Aroclor-1248	NA	2.00E+00	2.00E+00	2.00E+00	3.00E-02	1.40E-01	1.00E+00	8.72E-10	1.7E-09	5.62E-10	1.1E-09	4.63E-14	9.3E-14	2.9E-09	0
Aroclor-1254	NA	2.00E+00	2.00E+00	2.00E+00	4.40E-01	1.40E-01	1.00E+00	1.28E-08	2.6E-08	8.24E-09	1.6E-08	6.78E-13	1.4E-12	4.2E-08	0
Arsenic	A	1.50E+00	1.50E+00	1.51E+01	1.53E+01	3.00E-02	1.00E+00	4.46E-07	6.7E-07	6.15E-08	9.2E-08	2.36E-11	3.6E-10	7.6E-07	7
Barium	D				1.03E+02		7.00E-02	3.00E-06				1.59E-10			
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		2.67E+01	1.30E-01	1.00E+00	7.77E-07	5.7E-07	4.65E-07	3.4E-07	4.12E-11		9.1E-07	8
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		1.02E+01	1.30E-01	1.00E+00	2.97E-07	2.2E-06	1.78E-07	1.3E-06	1.58E-11		3.5E-06	32
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		6.16E+01	1.30E-01	1.00E+00	1.79E-06	1.3E-06	1.07E-06	7.8E-07	9.50E-11		2.1E-06	20
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		1.16E+01	1.30E-01	1.00E+00	3.36E-07	2.5E-08	2.01E-07	1.5E-08	1.78E-11		3.9E-08	0
Beryllium	B1			8.40E+00	3.51E+00		7.00E-03	1.02E-07				5.41E-12	4.5E-11	4.5E-11	0
Cadmium	B1			6.30E+00	2.97E+00	1.00E-03	2.50E-02	8.63E-08		3.97E-10		4.58E-12	2.9E-11	2.9E-11	0
Chromium	A			2.94E+02	8.03E+01		2.50E-02	2.33E-06				1.24E-10	3.6E-08	3.6E-08	0
Chrysene	B2	7.30E-03	7.30E-03		7.80E+01	1.30E-01	1.00E+00	2.27E-06	1.7E-08	1.36E-06	9.9E-09	5.84E-08		2.6E-08	0
Cobalt	NA			9.80E+00	3.59E+01		1.00E+00	1.05E-06				5.54E-11	5.4E-10	5.4E-10	0
Copper	D				4.43E+02		1.00E+00	1.29E-05				6.83E-10			
Cyanide, Total	D				2.65E+01	1.00E-01	1.00E+00	7.70E-07		3.54E-07		4.08E-11			
Dibenzo (a,h) anthracene	B2	7.30E+00	7.30E+00		6.62E+00	1.30E-01	1.00E+00	1.92E-07	1.4E-06	1.15E-07	8.4E-07	1.02E-11		2.2E-06	21
Fluoranthene	D				1.87E+02	1.30E-01	1.00E+00	5.45E-06		3.26E-06		2.89E-10			
Fluorene	D				4.28E-01		1.00E+00	1.24E-08				2.42E-09			
Fluoride	NA				2.04E+04	1.00E-01	1.00E+00	5.93E-04		2.73E-04		3.14E-08			
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		1.96E+01	1.30E-01	1.00E+00	5.70E-07	4.2E-07	3.41E-07	2.5E-07	3.02E-11		6.6E-07	6
Lead	B2				6.88E+01		1.00E+00	2.00E-06				1.06E-10			
Mercury	D				1.92E+00		7.00E-02	5.58E-08				2.96E-12			
Naphthalene	C				4.00E-01		1.00E+00	1.16E-08				1.88E-08			
Nickel	NA				1.65E+03		4.00E-02	4.81E-05				2.55E-09			
Polychlorinated Biphenyls (PCBs)	B2	2.00E+00	2.00E+00	2.00E+00	4.19E+00	1.40E-01	1.00E+00	1.22E-07	2.4E-07	7.84E-08	1.6E-07	6.46E-12	1.3E-11	4.0E-07	4
Pyrene	D				1.70E+02	1.30E-01	1.00E+00	4.94E-06		2.96E-06		9.13E-08			
Selenium	D				9.85E+00		1.00E+00	2.86E-07				1.52E-11			
Silver	D				1.75E+00		4.00E-02	5.08E-08				2.69E-12			
Thallium	D				6.10E-01		1.00E+00	1.77E-08				9.41E-13			
Vanadium	NA				7.39E+02		2.60E-02	2.15E-05				1.14E-09			
Zinc	D				9.38E+01		1.00E+00	2.73E-06				1.45E-10			
Total Risk									7E-06		4E-06	Total Risk =	4E-08 1E-05		100

Note:
 Cancer WOE Classifications:
 Group A: Human carcinogen
 Group B (B1, B2): Probable human carcinogen
 Group C: Possible human carcinogen
 Group D: Not classifiable
 Group E: No evidence of carcinogenicity
 ABS_d = Dermal Absorption Factor
 ABS_{gi} = Gastrointestinal Absorption Factor
 CDI = Chronic Daily Intake
 ELCR = Excess Lifetime Cancer Risk
 EPC = Exposure Point Concentration
 mg/kg-day = milligrams per kilogram per day
 SF_d = Dermal Slope Factor
 SF_o = Oral Slope Factor
 SF_i = Inhalation Slope Factor
 WOE = Weight of Evidence

Table A-26

Trespasser Scenario - Potential Noncarcinogenic Risk - RME

Surface Soil - So. Wetlands

RMC Troutdale Facility

Chemical	RfD _o (mg/kg-day)	RfD _d (mg/kg-day)	RfD _i (mg/kg-day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total HI	Contribution	%
							CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ			
Acenaphthene	6.00E-01	6.00E-01		4.69E-01		1.00E+00	1.91E-07	0.000			7.34E-08		0.000	0	
Aluminum	1.00E+00	1.00E+00	1.42E-03	6.28E+04		1.00E+00	2.56E-02	0.026			1.36E-06	0.00	0.027	5	
Anthracene	3.00E+00	3.00E+00		5.66E-01		1.00E+00	2.30E-07	0.000			2.31E-08		0.000	0	
Antimony	4.00E-04	6.00E-05	1.40E-04	3.21E+00		1.50E-01	1.31E-06	0.003			6.93E-11	0.00	0.003	1	
Aroclor-1248	2.00E-05	2.00E-05		3.00E-02	1.40E-01	1.00E+00	1.22E-08	0.001	7.86E-09	0.0004	6.48E-13		0.001	0	
Aroclor-1254	5.00E-05	5.00E-05		4.40E-01	1.40E-01	1.00E+00	1.79E-07	0.004	1.15E-07	0.0023	9.50E-12		0.006	1	
Arsenic	3.00E-04	3.00E-04		1.53E+01	3.00E-02	1.00E+00	6.24E-06	0.021	8.62E-07	0.0029	3.31E-10		0.024	5	
Barium	7.00E-02	4.90E-03	1.40E-04	1.03E+02		7.00E-02	4.20E-05	0.001			2.23E-09	0.00	0.001	0	
Benzo (a) anthracene				2.67E+01	1.30E-01	1.00E+00	1.09E-05		6.51E-06		5.77E-10				
Benzo (a) pyrene				1.02E+01	1.30E-01	1.00E+00	4.16E-06		2.49E-06		2.21E-10				
Benzo (b) fluoranthene				6.16E+01	1.30E-01	1.00E+00	2.51E-05		1.50E-05		1.33E-09				
Benzo (k) fluoranthene				1.16E+01	1.30E-01	1.00E+00	4.70E-06		2.81E-06		2.49E-10				
Beryllium	5.00E-03	3.50E-05	5.71E-06	3.51E+00		7.00E-03	1.43E-06	0.000			7.57E-11	0.00	0.000	0	
Cadmium	1.00E-03	2.50E-05		2.97E+00	1.00E-03	2.50E-02	1.21E-06	0.001	5.56E-09	0.0002	6.41E-11		0.001	0	
Chromium	2.00E-02	5.00E-04	2.20E-06	8.03E+01		2.50E-02	3.27E-05	0.002			1.73E-09	0.00	0.002	0	
Chrysene				7.80E+01	1.30E-01	1.00E+00	3.18E-05		1.90E-05		8.17E-07				
Cobalt	2.00E-02	2.00E-02	5.70E-06	3.59E+01		1.00E+00	1.46E-05	0.001			7.76E-10	0.00	0.001	0	
Copper	4.00E-02	4.00E-02		4.43E+02		1.00E+00	1.80E-04	0.005			9.56E-09		0.005	1	
Cyanide, Total	2.00E-02	2.00E-02		2.65E+01	1.00E-01	1.00E+00	1.08E-05	0.001	4.96E-06	0.0002	5.72E-10		0.001	0	
Dibenzo (a,h) anthracene				6.62E+00	1.30E-01	1.00E+00	2.69E-06		1.61E-06		1.43E-10				
Fluoranthene	4.00E-01	4.00E-01		1.87E+02	1.30E-01	1.00E+00	7.63E-05	0.000	4.56E-05	0.0001	4.04E-09		0.000	0	
Fluorene	4.00E-01	4.00E-01		4.28E-01		1.00E+00	1.74E-07	0.000			3.39E-08		0.000	0	
Fluoride	6.00E-02	6.00E-02		2.04E+04	1.00E-01	1.00E+00	8.30E-03	0.138	3.82E-03	0.0636	4.40E-07		0.202	41	
Indeno (1,2,3-cd) pyrene				1.96E+01	1.30E-01	1.00E+00	7.97E-06		4.77E-06		4.23E-10				
Lead				6.88E+01		1.00E+00	2.80E-05				1.49E-09				
Mercury	3.00E-04	2.10E-05	3.00E-03	1.92E+00		7.00E-02	7.81E-07	0.003			4.14E-11	0.00	0.003	1	
Naphthalene	2.00E-02	2.00E-02	8.57E-04	4.00E-01		1.00E+00	1.63E-07	0.000			2.63E-07	0.00	0.000	0	
Nickel	2.00E-02	8.00E-04		1.65E+03		4.00E-02	6.73E-04	0.034			3.57E-08		0.034	7	
Polychlorinated Biphenyls (PCBs)	2.00E-05	2.00E-05		4.19E+00	1.40E-01	1.00E+00	1.70E-06	0.085	1.10E-06	0.0549	9.04E-11		0.140	28	
Pyrene	3.00E-01	3.00E-01		1.70E+02	1.30E-01	1.00E+00	6.92E-05	0.000	4.14E-05	0.0001	1.28E-06		0.000	0	
Selenium	5.00E-03	5.00E-03		9.85E+00		1.00E+00	4.01E-06	0.001			2.13E-10		0.001	0	
Silver	5.00E-03	2.00E-04		1.75E+00		4.00E-02	7.11E-07	0.000			3.77E-11		0.000	0	
Thallium	8.00E-04	8.00E-04		6.10E-01		1.00E+00	2.48E-07	0.000			1.32E-11		0.000	0	
Vanadium	7.00E-03	1.82E-04		7.39E+02		2.60E-02	3.01E-04	0.043			1.60E-08		0.043	9	
Zinc	3.00E-01	3.00E-01		9.38E+01		1.00E+00	3.82E-05	0.000			2.02E-09		0.000	0	
								0.4		0.1		0.002			100
												0.5			

Note:

ABS_d = Dermal Absorption FactorABS_{gi} = Gastrointestinal Absorption Factor

CDI = Chronic Daily Intake

EPC = Exposure Point Concentration

HI = Hazard Index

HQ = Hazard Quotient;

mg/kg-day = milligrams per kilogram per day

RfC = Reference Concentration

RfD_d = Dermal Reference Dose;RfD_o = Oral Reference DoseRfD_i = Inhalation Reference Dose

Table A-27

Trespasser Scenario - Potential Excess Lifetime Cancer Risk - CTE

Surface Soil - So. Wetlands

RMC Troutdale Facility

Chemical	WOE	SF _o (mg/kg- day) ⁻¹	SF _d (mg/kg- day) ⁻¹	SF _i (mg/kg- day) ⁻¹	EPC (mg/kg)	Ingestion			Dermal		Inhalation		Total ELCR	%	
						ABS _d	ABS _{gi}	CDI (mg/kg-day)	ELCR	CDI (mg/kg- day)	ELCR	CDI (mg/kg- day)			ELCR
Acenaphthene	NA				4.69E-01	1.00E+00	1.00E+00	1.31E-09					1.01E-09		
Aluminum	NA				6.28E+04	1.00E+00	1.76E-04						1.86E-08		
Anthracene	D				5.66E-01	1.00E+00	1.58E-09						3.17E-10		
Antimony	NA				3.21E+00	1.50E-01	8.98E-09						9.52E-13		
Aroclor-1248	NA	2.00E+00	2.00E+00	2.00E+00	3.00E-02	1.40E-01	1.00E+00	8.39E-11	1.7E-10	1.32E-11	2.6E-11	8.90E-15	1.8E-14	1.9E-10	0
Aroclor-1254	NA	2.00E+00	2.00E+00	2.00E+00	4.40E-01	1.40E-01	1.00E+00	1.23E-09	2.5E-09	1.93E-10	3.9E-10	1.30E-13	2.6E-13	2.8E-09	0
Arsenic	A	1.50E+00	1.50E+00	1.51E+01	1.53E+01	3.00E-02	1.00E+00	4.29E-08	6.4E-08	1.44E-09	2.2E-09	4.55E-12	6.8E-11	6.7E-08	9
Barium	D				1.03E+02	7.00E-02	2.88E-07						3.06E-11		
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		2.67E+01	1.30E-01	1.00E+00	7.47E-08	5.5E-08	1.09E-08	7.9E-09	7.93E-12		6.2E-08	8
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		1.02E+01	1.30E-01	1.00E+00	2.86E-08	2.1E-07	4.16E-09	3.0E-08	3.03E-12		2.4E-07	32
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		6.16E+01	1.30E-01	1.00E+00	1.72E-07	1.3E-07	2.51E-08	1.8E-08	1.83E-11		1.4E-07	19
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		1.16E+01	1.30E-01	1.00E+00	3.23E-08	2.4E-09	4.70E-09	3.4E-10	3.43E-12		2.7E-09	0
Beryllium	B1			8.40E+00	3.51E+00		7.00E-03	9.80E-09				1.04E-12	8.7E-12	8.7E-12	0
Cadmium	B1			6.30E+00	2.97E+00	1.00E-03	2.50E-02	8.30E-09		9.29E-12		8.80E-13	5.5E-12	5.5E-12	0
Chromium	A			2.94E+02	8.03E+01		2.50E-02	2.24E-07				2.38E-11	7.0E-09	7.0E-09	1
Chrysene	B2	7.30E-03	7.30E-03		7.80E+01	1.30E-01	1.00E+00	2.18E-07	1.6E-09	3.18E-08	2.3E-10	1.12E-08		1.8E-09	0
Cobalt	NA			9.80E+00	3.59E+01		1.00E+00	1.00E-07				1.07E-11	1.0E-10	1.0E-10	0
Copper	D				4.43E+02		1.00E+00	1.24E-06				1.31E-10			
Cyanide, Total	D				2.65E+01	1.00E-01	1.00E+00	7.40E-08		8.29E-09		7.85E-12			
Dibenzo (a,h) anthracene	B2	7.30E+00	7.30E+00		6.62E+00	1.30E-01	1.00E+00	1.85E-08	1.4E-07	2.69E-09	2.0E-08	1.96E-12		1.5E-07	21
Fluoranthene	D				1.87E+02	1.30E-01	1.00E+00	5.24E-07		7.63E-08		5.55E-11			
Fluorene	D				4.28E-01		1.00E+00	1.20E-09				4.65E-10			
Fluoride	NA				2.04E+04	1.00E-01	1.00E+00	5.70E-05		6.39E-06		6.05E-09			
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		1.96E+01	1.30E-01	1.00E+00	5.48E-08	4.0E-08	7.97E-09	5.8E-09	5.81E-12		4.6E-08	6
Lead	B2				6.88E+01		1.00E+00	1.92E-07				2.04E-11			
Mercury	D				1.92E+00		7.00E-02	5.36E-09				5.69E-13			
Naphthalene	C				4.00E-01		1.00E+00	1.12E-09				3.62E-09			
Nickel	NA				1.65E+03		4.00E-02	4.62E-06				4.91E-10			
Polychlorinated Biphenyls (PCBs)	B2	2.00E+00	2.00E+00	2.00E+00	4.19E+00	1.40E-01	1.00E+00	1.17E-08	2.3E-08	1.84E-09	3.7E-09	1.24E-12	2.5E-12	2.7E-08	4
Pyrene	D				1.70E+02	1.30E-01	1.00E+00	4.75E-07		6.92E-08		1.76E-08			
Selenium	D				9.85E+00		1.00E+00	2.75E-08				2.92E-12			
Silver	D				1.75E+00		4.00E-02	4.89E-09				5.18E-13			
Thallium	D				6.10E-01		1.00E+00	1.71E-09				1.81E-13			
Vanadium	NA				7.39E+02		2.60E-02	2.07E-06				2.19E-10			
Zinc	D				9.38E+01		1.00E+00	2.62E-07				2.78E-11			
Total Risk								7E-07		9E-08			7E-09		100
												Total Risk =	8E-07		

Note:

Cancer WOE Classifications:

Group A: Human carcinogen

Group B (B1, B2): Probable human carcinogen

Group C: Possible human carcinogen

Group D: Not classifiable

Group E: No evidence of carcinogenicity

ABS_d = Dermal Absorption FactorABS_{gi} = Gastrointestinal Absorption Factor

CDI = Chronic Daily Intake

ELCR = Excess Lifetime Cancer Risk

EPC = Exposure Point Concentration

mg/kg-day = milligrams per kilogram per day

SF_d = Dermal Slope FactorSF_o = Oral Slope FactorSF_i = Inhalation Slope Factor

WOE = Weight of Evidence

Table A-28

Trespasser Scenario - Potential Noncarcinogenic Risk - CTE

Surface Soil - So. Wetlands

RMC Troutdale Facility

Chemical	RfD _o (mg/kg-day)	RfD _d (mg/kg-day)	RfD _i (mg/kg-day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total HI	Contribution
							CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ		
Acenaphthene	6.00E-01	6.00E-01		4.69E-01		1.00E+00	1.84E-08	0.000			1.41E-08		0.000	0
Aluminum	1.00E+00	1.00E+00	1.42E-03	6.28E+04		1.00E+00	2.46E-03	0.002			2.61E-07	0.00	0.003	7
Anthracene	3.00E+00	3.00E+00		5.66E-01		1.00E+00	2.21E-08	0.000			4.44E-09		0.000	0
Antimony	4.00E-04	6.00E-05	1.40E-04	3.21E+00		1.50E-01	1.26E-07	0.000			1.33E-11	0.00	0.000	1
Aroclor-1248	2.00E-05	2.00E-05		3.00E-02	1.40E-01	1.00E+00	1.17E-09	0.000	1.84E-10	0.0000	1.25E-13		0.000	0
Aroclor-1254	5.00E-05	5.00E-05		4.40E-01	1.40E-01	1.00E+00	1.72E-08	0.000	2.70E-09	0.0001	1.83E-12		0.000	1
Arsenic	3.00E-04	3.00E-04		1.53E+01	3.00E-02	1.00E+00	6.00E-07	0.002	2.02E-08	0.0001	6.37E-11		0.002	5
Barium	7.00E-02	4.90E-03	1.40E-04	1.03E+02		7.00E-02	4.04E-06	0.000			4.28E-10	0.00	0.000	0
Benzo (a) anthracene				2.67E+01	1.30E-01	1.00E+00	1.05E-06		1.52E-07		1.11E-10			
Benzo (a) pyrene				1.02E+01	1.30E-01	1.00E+00	4.00E-07		5.83E-08		4.25E-11			
Benzo (b) fluoranthene				6.16E+01	1.30E-01	1.00E+00	2.41E-06		3.51E-07		2.56E-10			
Benzo (k) fluoranthene				1.16E+01	1.30E-01	1.00E+00	4.52E-07		6.58E-08		4.80E-11			
Beryllium	5.00E-03	3.50E-05	5.71E-06	3.51E+00		7.00E-03	1.37E-07	0.000			1.46E-11	0.00	0.000	0
Cadmium	1.00E-03	2.50E-05		2.97E+00	1.00E-03	2.50E-02	1.16E-07	0.000	1.30E-10	0.0000	1.23E-11		0.000	0
Chromium	2.00E-02	5.00E-04	2.20E-06	8.03E+01		2.50E-02	3.14E-06	0.000			3.33E-10	0.00	0.000	1
Chrysene				7.80E+01	1.30E-01	1.00E+00	3.05E-06		4.45E-07		1.57E-07			
Cobalt	2.00E-02	2.00E-02	5.70E-06	3.59E+01		1.00E+00	1.41E-06	0.000			1.49E-10	0.00	0.000	0
Copper	4.00E-02	4.00E-02		4.43E+02		1.00E+00	1.73E-05	0.000			1.84E-09		0.000	1
Cyanide, Total	2.00E-02	2.00E-02		2.65E+01	1.00E-01	1.00E+00	1.04E-06	0.000	1.16E-07	0.0000	1.10E-10		0.000	0
Dibenzo (a,h) anthracene				6.62E+00	1.30E-01	1.00E+00	2.59E-07		3.77E-08		2.75E-11			
Fluoranthene	4.00E-01	4.00E-01		1.87E+02	1.30E-01	1.00E+00	7.33E-06	0.000	1.07E-06	0.0000	7.78E-10		0.000	0
Fluorene	4.00E-01	4.00E-01		4.28E-01		1.00E+00	1.68E-08	0.000			6.52E-09		0.000	0
Fluoride	6.00E-02	6.00E-02		2.04E+04	1.00E-01	1.00E+00	7.98E-04	0.013	8.94E-05	0.0015	8.47E-08		0.015	38
Indeno (1,2,3-cd) pyrene				1.96E+01	1.30E-01	1.00E+00	7.67E-07		1.12E-07		8.13E-11			
Lead				6.88E+01		1.00E+00	2.69E-06				2.86E-10			
Mercury	3.00E-04	2.10E-05	3.00E-03	1.92E+00		7.00E-02	7.51E-08	0.000			7.96E-12	0.00	0.000	1
Naphthalene	2.00E-02	2.00E-02	8.57E-04	4.00E-01		1.00E+00	1.57E-08	0.000			5.06E-08	0.00	0.000	0
Nickel	2.00E-02	8.00E-04		1.65E+03		4.00E-02	6.47E-05	0.003			6.87E-09		0.003	8
Polychlorinated Biphenyls (PCBs)	2.00E-05	2.00E-05		4.19E+00	1.40E-01	1.00E+00	1.64E-07	0.008	2.57E-08	0.0013	1.74E-11		0.009	24
Pyrene	3.00E-01	3.00E-01		1.70E+02	1.30E-01	1.00E+00	6.65E-06	0.000	9.69E-07	0.0000	2.46E-07		0.000	0
Selenium	5.00E-03	5.00E-03		9.85E+00		1.00E+00	3.86E-07	0.000			4.09E-11		0.000	0
Silver	5.00E-03	2.00E-04		1.75E+00		4.00E-02	6.84E-08	0.000			7.26E-12		0.000	0
Thallium	8.00E-04	8.00E-04		6.10E-01		1.00E+00	2.39E-08	0.000			2.53E-12		0.000	0
Vanadium	7.00E-03	1.82E-04		7.39E+02		2.60E-02	2.89E-05	0.004			3.07E-09		0.004	11
Zinc	3.00E-01	3.00E-01		9.38E+01		1.00E+00	3.67E-06	0.000			3.89E-10		0.000	0
								0.04		0.003		0.0004		100
												0.04		

Note:

ABS_d = Dermal Absorption FactorABS_{gi} = Gastrointestinal Absorption Factor

CDI = Chronic Daily Intake

EPC = Exposure Point Concentration

HI = Hazard Index

HQ = Hazard Quotient;

mg/kg-day = milligrams per kilogram per day

RfC = Reference Concentration

RfD_d = Dermal Reference Dose;RfD_o = Oral Reference DoseRfD_i = Inhalation Reference Dose

Table A-29
Near Term Construction Worker Scenario - Potential Excess Lifetime Cancer Risk - RME
Subsurface Soil - So. Wetlands
RMC Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	Ingestion				Dermal		Inhalation		Total ELCR	Contribution	%
					EPC (mg/kg)	ABS _d	ABS _{gi}	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)			
4,4-DDD	B2	2.40E-01	2.40E-01		8.00E-02	3.00E-02	1.00E+00	1.33E-09	3.2E-10	1.20E-10	2.9E-11	2.13E-14	3.5E-10	0	
4,4-DDE	B2	3.40E-01	3.40E-01		3.15E-02	3.00E-02	1.00E+00	5.23E-10	1.8E-10	4.71E-11	1.6E-11	8.40E-15	1.9E-10	0	
4,4-DDT	B2	3.40E-01	3.40E-01	3.40E-01	2.80E-01	3.00E-02	1.00E+00	4.65E-09	1.6E-09	4.18E-10	1.4E-10	7.47E-14	2.5E-14	1.7E-09	0
Acenaphthene	NA				1.06E+00		1.00E+00	1.75E-08				2.04E-09			
Aluminum	NA				4.96E+04		1.00E+00	8.23E-04				1.32E-08			
Anthracene	D				1.27E+00		1.00E+00	2.11E-08				6.43E-10			
Antimony	NA				1.59E+00		1.50E-01	2.65E-08				4.25E-13			
Aroclor-1248	NA	2.00E+00	2.00E+00	2.00E+00	2.75E-02	1.40E-01	1.00E+00	4.57E-10	9.1E-10	1.92E-10	3.8E-10	7.34E-15	1.5E-14	1.3E-09	0
Aroclor-1254	NA	2.00E+00	2.00E+00	2.00E+00	2.49E-01	1.40E-01	1.00E+00	4.14E-09	8.3E-09	1.74E-09	3.5E-09	6.65E-14	1.3E-13	1.2E-08	0
Arsenic	A	1.50E+00	1.50E+00	1.51E+01	1.05E+01	3.00E-02	1.00E+00	1.74E-07	2.6E-07	1.57E-08	2.3E-08	2.80E-12	4.2E-11	2.8E-07	11
Barium	D				1.03E+02		7.00E-02	1.71E-06				2.75E-11			
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		1.03E+01	1.30E-01	1.00E+00	1.71E-07	1.2E-07	6.66E-08	4.9E-08	2.74E-12		1.7E-07	7
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		6.93E+00	1.30E-01	1.00E+00	1.15E-07	8.4E-07	4.49E-08	3.3E-07	1.85E-12		1.2E-06	45
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		2.00E+01	1.30E-01	1.00E+00	3.33E-07	2.4E-07	1.30E-07	9.5E-08	5.35E-12		3.4E-07	13
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		5.08E+00	1.30E-01	1.00E+00	8.44E-08	6.2E-09	3.29E-08	2.4E-09	1.36E-12		8.6E-09	0
Beryllium	B1			8.40E+00	2.17E+00		7.00E-03	3.61E-08				5.79E-13	4.9E-12	4.9E-12	0
Cadmium	B1			6.30E+00	1.26E+00	1.00E-03	2.50E-02	2.09E-08		6.28E-11		3.37E-13	2.1E-12	2.1E-12	0
Chromium	A			2.94E+02	5.12E+01		2.50E-02	8.50E-07				1.37E-11	4.0E-09	4.0E-09	0
Chrysene	B2	7.30E-03	7.30E-03		2.33E+01	1.30E-01	1.00E+00	3.86E-07	2.8E-09	1.51E-07	1.1E-09	3.01E-09		3.9E-09	0
Cobalt	NA			9.80E+00	2.34E+01		1.00E+00	3.88E-07				6.23E-12	6.1E-11	6.1E-11	0
Copper	D				3.72E+02		1.00E+00	6.18E-06				9.93E-11			
Cyanide, Total	D				1.17E+01	1.00E-01	1.00E+00	1.95E-07		5.84E-08		3.13E-12			
Dibenzo (a,h) anthracene	B2	7.30E+00	7.30E+00		2.14E+00	1.30E-01	1.00E+00	3.56E-08	2.6E-07	1.39E-08	1.0E-07	5.72E-13		3.6E-07	14
Fluoranthene	D				7.73E+01	1.30E-01	1.00E+00	1.28E-06		5.01E-07		2.06E-11			
Fluorene	D				6.62E-01		1.00E+00	1.10E-08				6.48E-10			
Fluoride	NA				8.72E+03	1.00E-01	1.00E+00	1.45E-04		4.34E-05		2.33E-09			
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		9.22E+00	1.30E-01	1.00E+00	1.53E-07	1.1E-07	5.97E-08	4.4E-08	2.46E-12		1.6E-07	6
Lead	B2				7.11E+01		1.00E+00	1.18E-06				1.90E-11			
Mercury	D				7.82E-01		7.00E-02	1.30E-08				2.09E-13			
Naphthalene	C				5.46E-01		1.00E+00	9.06E-09				4.44E-09			
Nickel	NA				1.04E+03		4.00E-02	1.73E-05				2.78E-10			
Polychlorinated Biphenyls (PCBs)	B2	2.00E+00	2.00E+00	2.00E+00	2.09E+00	1.40E-01	1.00E+00	3.47E-08	6.9E-08	1.46E-08	2.9E-08	5.58E-13	1.1E-12	9.9E-08	4
Pyrene	D				4.69E+01	1.30E-01	1.00E+00	7.78E-07		3.04E-07		4.36E-09			
Selenium	D				2.49E+00		1.00E+00	4.14E-08				6.65E-13			
Silver	D				7.92E-01		4.00E-02	1.32E-08				2.11E-13			
Vanadium	NA				5.10E+02		2.60E-02	8.47E-06				1.36E-10			
Zinc	D				5.93E+01		1.00E+00	9.85E-07				1.58E-11			
Total Risk									2E-06		7E-07				100
												Total Risk =	4E-09	3E-06	

Note:
Cancer WOE Classifications:
Group A: Human carcinogen
Group B (B1, B2): Probable human carcinogen
Group C: Possible human carcinogen
Group D: Not classifiable
Group E: No evidence of carcinogenicity
ABS_d = Dermal Absorption Factor
ABS_{gi} = Gastrointestinal Absorption Factor
CDI = Chronic Daily Intake
ELCR = Excess Lifetime Cancer Risk
EPC = Exposure Point Concentration
mg/kg-day = milligrams per kilogram per day
SF_d = Dermal Slope Factor
SF_o = Oral Slope Factor
SF_i = Inhalation Slope Factor
WOE = Weight of Evidence

Table A-30
Near-Term Construction Worker Scenario - Potential Noncarcinogenic Risk - RME
Subsurface Soil - So. Wetlands
RMC Troutdale Facility

Chemical	RfD _o (mg/kg-day)	RfD _d (mg/kg-day)	RfD _i (mg/kg-day)	EPC (mg/kg)	Ingestion				Dermal		Inhalation		Total HI	Contribution	%
					ABS _d	ABS _{gi}	CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ			
4,4-DDD				8.00E-02	3.00E-02	1.00E+00	9.30E-08			8.37E-09		1.49E-12			
4,4-DDE				3.15E-02	3.00E-02	1.00E+00	3.66E-08			3.29E-09		5.88E-13			
4,4-DDT	5.00E-04	5.00E-04		2.80E-01	3.00E-02	1.00E+00	3.25E-07	0.001		2.93E-08	0.0001	5.23E-12	0.001		0
Acenaphthene	6.00E-01	6.00E-01		1.06E+00		1.00E+00	1.23E-06	0.000				1.43E-07	0.000		0
Aluminum	1.00E+00	1.00E+00	1.42E-03	4.96E+04		1.00E+00	5.76E-02	0.058				9.26E-07	0.00	0.058	9
Anthracene	3.00E+00	3.00E+00		1.27E+00		1.00E+00	1.48E-06	0.000				4.50E-08	0.000		0
Antimony	4.00E-04	6.00E-05	1.40E-04	1.59E+00		1.50E-01	1.85E-06	0.005				2.98E-11	0.00	0.005	1
Aroclor-1248	2.00E-05	2.00E-05		2.75E-02	1.40E-01	1.00E+00	3.20E-08	0.002	1.34E-08	0.0007		5.14E-13	0.002		0
Aroclor-1254	5.00E-05	5.00E-05		2.49E-01	1.40E-01	1.00E+00	2.90E-07	0.006	1.22E-07	0.0024		4.65E-12	0.008		1
Arsenic	3.00E-04	3.00E-04		1.05E+01	3.00E-02	1.00E+00	1.22E-05	0.041	1.10E-06	0.0037		1.96E-10	0.044		6
Barium	7.00E-02	4.90E-03	1.40E-04	1.03E+02		7.00E-02	1.20E-04	0.002				1.93E-09	0.00	0.002	0
Benzo (a) anthracene				1.03E+01	1.30E-01	1.00E+00	1.20E-05		4.66E-06			1.92E-10			
Benzo (a) pyrene				6.93E+00	1.30E-01	1.00E+00	8.05E-06		3.14E-06			1.29E-10			
Benzo (b) fluoranthene				2.00E+01	1.30E-01	1.00E+00	2.33E-05		9.09E-06			3.74E-10			
Benzo (k) fluoranthene				5.08E+00	1.30E-01	1.00E+00	5.91E-06		2.30E-06			9.50E-11			
Beryllium	5.00E-03	3.50E-05	5.71E-06	2.17E+00		7.00E-03	2.52E-06	0.001				4.06E-11	0.00	0.001	0
Cadmium	1.00E-03	2.50E-05		1.26E+00	1.00E-03	2.50E-02	1.47E-06	0.001	4.40E-09	0.0002		2.36E-11	0.002		0
Chromium	2.00E-02	5.00E-04	2.20E-06	5.12E+01		2.50E-02	5.95E-05	0.003				9.57E-10	0.00	0.003	1
Chrysene				2.33E+01	1.30E-01	1.00E+00	2.70E-05		1.05E-05			2.11E-07			
Cobalt	2.00E-02	2.00E-02	5.70E-06	2.34E+01		1.00E+00	2.71E-05	0.001				4.36E-10	0.00	0.001	0
Copper	4.00E-02	4.00E-02		3.72E+02		1.00E+00	4.33E-04	0.011				6.95E-09	0.011		2
Cyanide, Total	2.00E-02	2.00E-02		1.17E+01	1.00E-01	1.00E+00	1.36E-05	0.001	4.09E-06	0.0002		2.19E-10	0.001		0
Dibenzo (a,h) anthracene				2.14E+00	1.30E-01	1.00E+00	2.49E-06		9.72E-07			4.01E-11			
Fluoranthene	4.00E-01	4.00E-01		7.73E+01	1.30E-01	1.00E+00	8.99E-05	0.000	3.51E-05	0.0001		1.44E-09	0.000		0
Fluorene	4.00E-01	4.00E-01		6.62E-01		1.00E+00	7.70E-07	0.000				4.54E-08	0.000		0
Fluoride	6.00E-02	6.00E-02		8.72E+03	1.00E-01	1.00E+00	1.01E-02	0.169	3.04E-03	0.0507		1.63E-07	0.220		32
Indeno (1,2,3-cd) pyrene				9.22E+00	1.30E-01	1.00E+00	1.07E-05		4.18E-06			1.72E-10			
Lead				7.11E+01		1.00E+00	8.26E-05					1.33E-09			
Mercury	3.00E-04	2.10E-05	3.00E-03	7.82E-01		7.00E-02	9.09E-07	0.003				1.46E-11	0.00	0.003	0
Naphthalene	2.00E-02	2.00E-02	8.57E-04	5.46E-01		1.00E+00	6.34E-07	0.000				3.11E-07	0.00	0.000	0
Nickel	2.00E-02	8.00E-04		1.04E+03		4.00E-02	1.21E-03	0.060				1.94E-08	0.060		9
Polychlorinated Biphenyls (PCBs)	2.00E-05	2.00E-05		2.09E+00	1.40E-01	1.00E+00	2.43E-06	0.122	1.02E-06	0.0511		3.91E-11	0.173		25
Pyrene	3.00E-01	3.00E-01		4.69E+01	1.30E-01	1.00E+00	5.45E-05	0.000	2.13E-05	0.0001		3.05E-07	0.000		0
Selenium	5.00E-03	5.00E-03		2.49E+00		1.00E+00	2.90E-06	0.001				4.66E-11	0.001		0
Silver	5.00E-03	2.00E-04		7.92E-01		4.00E-02	9.21E-07	0.000				1.48E-11	0.000		0
Vanadium	7.00E-03	1.82E-04		5.10E+02		2.60E-02	5.93E-04	0.085				9.52E-09	0.085		12
Zinc	3.00E-01	3.00E-01		5.93E+01		1.00E+00	6.89E-05	0.000				1.11E-09	0.000		0
								0.6		0.1			0.002		100
													0.7		
													Total HI =		

Note:
ABS_d = Dermal Absorption Factor
ABS_{gi} = Gastrointestinal Absorption Factor
CDI = Chronic Daily Intake
EPC = Exposure Point Concentration
HI = Hazard Index
HQ = Hazard Quotient;
mg/kg-day = milligrams per kilogram per day
RfC = Reference Concentration
RfD_d = Dermal Reference Dose;
RfD_o = Oral Reference Dose
RfD_i = Inhalation Reference Dose

Table A-31
Near Term Construction Worker Scenario - Potential Excess Lifetime Cancer Risk - CTE
Subsurface Soil - So. Wetlands
RMC Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	Ingestion				Dermal		Inhalation		Total ELCR	Contribution	%
					EPC (mg/kg)	ABS _d	ABS _{gi}	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)			
4,4-DDD	B2	2.40E-01	2.40E-01		8.00E-02	3.00E-02	1.00E+00	2.01E-10	4.8E-11	1.99E-11	4.8E-12	1.07E-14		5.3E-11	0
4,4-DDE	B2	3.40E-01	3.40E-01		3.15E-02	3.00E-02	1.00E+00	7.92E-11	2.7E-11	7.84E-12	2.7E-12	4.20E-15		3.0E-11	0
4,4-DDT	B2	3.40E-01	3.40E-01	3.40E-01	2.80E-01	3.00E-02	1.00E+00	7.05E-10	2.4E-10	6.97E-11	2.4E-11	3.74E-14	1.3E-14	2.6E-10	0
Acenaphthene	NA				1.06E+00		1.00E+00	2.65E-09				1.02E-09			
Aluminum	NA				4.96E+04		1.00E+00	1.25E-04				6.61E-09			
Anthracene	D				1.27E+00		1.00E+00	3.20E-09				3.21E-10			
Antimony	NA				1.59E+00		1.50E-01	4.01E-09				2.13E-13			
Aroclor-1248	NA	2.00E+00	2.00E+00	2.00E+00	2.75E-02	1.40E-01	1.00E+00	6.92E-11	1.4E-10	3.20E-11	6.4E-11	3.67E-15	7.3E-15	2.0E-10	0
Aroclor-1254	NA	2.00E+00	2.00E+00	2.00E+00	2.49E-01	1.40E-01	1.00E+00	6.27E-10	1.3E-09	2.90E-10	5.8E-10	3.32E-14	6.6E-14	1.8E-09	0
Arsenic	A	1.50E+00	1.50E+00	1.51E+01	1.05E+01	3.00E-02	1.00E+00	2.64E-08	4.0E-08	2.61E-09	3.9E-09	1.40E-12	2.1E-11	4.3E-08	11
Barium	D				1.03E+02		7.00E-02	2.60E-07				1.38E-11			
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		1.03E+01	1.30E-01	1.00E+00	2.59E-08	1.9E-08	1.11E-08	8.1E-09	1.37E-12		2.7E-08	7
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		6.93E+00	1.30E-01	1.00E+00	1.74E-08	1.3E-07	7.48E-09	5.5E-08	9.25E-13		1.8E-07	45
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		2.00E+01	1.30E-01	1.00E+00	5.04E-08	3.7E-08	2.16E-08	1.6E-08	2.67E-12		5.3E-08	13
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		5.08E+00	1.30E-01	1.00E+00	1.28E-08	9.3E-10	5.49E-09	4.0E-10	6.78E-13		1.3E-09	0
Beryllium	B1			8.40E+00	2.17E+00		7.00E-03	5.46E-09				2.90E-13	2.4E-12	2.4E-12	0
Cadmium	B1			6.30E+00	1.26E+00	1.00E-03	2.50E-02	3.17E-09		1.05E-11		1.68E-13	1.1E-12	1.1E-12	0
Chromium	A			2.94E+02	5.12E+01		2.50E-02	1.29E-07				6.83E-12	2.0E-09	2.0E-09	0
Chrysene	B2	7.30E-03	7.30E-03		2.33E+01	1.30E-01	1.00E+00	5.85E-08	4.3E-10	2.51E-08	1.8E-10	1.51E-09		6.1E-10	0
Cobalt	NA			9.80E+00	2.34E+01		1.00E+00	5.88E-08				3.12E-12	3.1E-11	3.1E-11	0
Copper	D				3.72E+02		1.00E+00	9.36E-07				4.97E-11			
Cyanide, Total	D				1.17E+01	1.00E-01	1.00E+00	2.95E-08		9.73E-09		1.56E-12			
Dibenzo (a,h) anthracene	B2	7.30E+00	7.30E+00		2.14E+00	1.30E-01	1.00E+00	5.40E-09	3.9E-08	2.31E-09	1.7E-08	2.86E-13		5.6E-08	14
Fluoranthene	D				7.73E+01	1.30E-01	1.00E+00	1.95E-07		8.35E-08		1.03E-11			
Fluorene	D				6.62E-01		1.00E+00	1.67E-09				3.24E-10			
Fluoride	NA				8.72E+03	1.00E-01	1.00E+00	2.19E-05		7.24E-06		1.16E-09			
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		9.22E+00	1.30E-01	1.00E+00	2.32E-08	1.7E-08	9.95E-09	7.3E-09	1.23E-12		2.4E-08	6
Lead	B2				7.11E+01		1.00E+00	1.79E-07				9.49E-12			
Mercury	D				7.82E-01		7.00E-02	1.97E-09				1.04E-13			
Naphthalene	C				5.46E-01		1.00E+00	1.37E-09				2.22E-09			
Nickel	NA				1.04E+03		4.00E-02	2.62E-06				1.39E-10			
Polychlorinated Biphenyls (PCBs)	B2	2.00E+00	2.00E+00	2.00E+00	2.09E+00	1.40E-01	1.00E+00	5.27E-09	1.1E-08	2.43E-09	4.9E-09	2.79E-13	5.6E-13	1.5E-08	4
Pyrene	D				4.69E+01	1.30E-01	1.00E+00	1.18E-07		5.06E-08		2.18E-09			
Selenium	D				2.49E+00		1.00E+00	6.27E-09				3.33E-13			
Silver	D				7.92E-01		4.00E-02	1.99E-09				1.06E-13			
Vanadium	NA				5.10E+02		2.60E-02	1.28E-06				6.80E-11			
Zinc	D				5.93E+01		1.00E+00	1.49E-07				7.91E-12			
Total Risk								3E-07		1E-07		Total Risk =	2E-09		100
												4E-07			

Note:
Cancer WOE Classifications:
Group A: Human carcinogen
Group B (B1, B2): Probable human carcinogen
Group C: Possible human carcinogen
Group D: Not classifiable
Group E: No evidence of carcinogenicity
ABS_d = Dermal Absorption Factor
ABS_{gi} = Gastrointestinal Absorption Factor
CDI = Chronic Daily Intake
ELCR = Excess Lifetime Cancer Risk
EPC = Exposure Point Concentration
mg/kg-day = milligrams per kilogram per day
SF_d = Dermal Slope Factor
SF_o = Oral Slope Factor
SF_i = Inhalation Slope Factor
WOE = Weight of Evidence

Table A-33
 Intermittent Excavation/Trench Worker Scenario - Potential Excess Lifetime Cancer Risk - RME
 Subsurface Soil - So. Wetlands
 RMC Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total ELCR	Contribution	%
								CDI	ELCR	CDI	ELCR	CDI	ELCR			
								(mg/kg-day)		(mg/kg-day)		(mg/kg-day)				
4,4-DDD	B2	2.40E-01	2.40E-01		8.00E-02	3.00E-02	1.00E+00	1.33E-10	3.2E-11	1.20E-11	2.9E-12	2.13E-15		3.5E-11	0	
4,4-DDE	B2	3.40E-01	3.40E-01		3.15E-02	3.00E-02	1.00E+00	5.23E-11	1.8E-11	4.71E-12	1.6E-12	8.40E-16		1.9E-11	0	
4,4-DDT	B2	3.40E-01	3.40E-01	3.40E-01	2.80E-01	3.00E-02	1.00E+00	4.65E-10	1.6E-10	4.18E-11	1.4E-11	7.47E-15	2.5E-15	1.7E-10	0	
Acenaphthene	NA				1.06E+00		1.00E+00	1.75E-09				2.04E-10				
Aluminum	NA				4.96E+04		1.00E+00	8.23E-05				1.32E-09				
Anthracene	D				1.27E+00		1.00E+00	2.11E-09				6.43E-11				
Antimony	NA				1.59E+00		1.50E-01	2.65E-09				4.25E-14				
Aroclor-1248	NA	2.00E+00	2.00E+00	2.00E+00	2.75E-02	1.40E-01	1.00E+00	4.57E-11	9.1E-11	1.92E-11	3.8E-11	7.34E-16	1.5E-15	1.3E-10	0	
Aroclor-1254	NA	2.00E+00	2.00E+00	2.00E+00	2.49E-01	1.40E-01	1.00E+00	4.14E-10	8.3E-10	1.74E-10	3.5E-10	6.65E-15	1.3E-14	1.2E-09	0	
Arsenic	A	1.50E+00	1.50E+00	1.51E+01	1.05E+01	3.00E-02	1.00E+00	1.74E-08	2.6E-08	1.57E-09	2.3E-09	2.80E-13	4.2E-12	2.8E-08	11	
Barium	D				1.03E+02		7.00E-02	1.71E-07				2.75E-12				
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		1.03E+01	1.30E-01	1.00E+00	1.71E-08	1.2E-08	6.66E-09	4.9E-09	2.74E-13		1.7E-08	7	
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		6.93E+00	1.30E-01	1.00E+00	1.15E-08	8.4E-08	4.49E-09	3.3E-08	1.85E-13		1.2E-07	45	
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		2.00E+01	1.30E-01	1.00E+00	3.33E-08	2.4E-08	1.30E-08	9.5E-09	5.35E-13		3.4E-08	13	
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		5.08E+00	1.30E-01	1.00E+00	8.44E-09	6.2E-10	3.29E-09	2.4E-10	1.36E-13		8.6E-10	0	
Beryllium	B1			8.40E+00	2.17E+00		7.00E-03	3.61E-09				5.79E-14	4.9E-13	4.9E-13	0	
Cadmium	B1			6.30E+00	1.26E+00	1.00E-03	2.50E-02	2.09E-09		6.28E-12		3.37E-14	2.1E-13	2.1E-13	0	
Chromium	A			2.94E+02	5.12E+01		2.50E-02	8.50E-08				1.37E-12	4.0E-10	4.0E-10	0	
Chrysene	B2	7.30E-03	7.30E-03		2.33E+01	1.30E-01	1.00E+00	3.86E-08	2.8E-10	1.51E-08	1.1E-10	3.01E-10		3.9E-10	0	
Cobalt	NA			9.80E+00	2.34E+01		1.00E+00	3.88E-08				6.23E-13	6.1E-12	6.1E-12	0	
Copper	D				3.72E+02		1.00E+00	6.18E-07				9.93E-12				
Cyanide, Total	D				1.17E+01	1.00E-01	1.00E+00	1.95E-08		5.84E-09		3.13E-13				
Dibenzo (a,h) anthracene	B2	7.30E+00	7.30E+00		2.14E+00	1.30E-01	1.00E+00	3.56E-09	2.6E-08	1.39E-09	1.0E-08	5.72E-14		3.6E-08	14	
Fluoranthene	D				7.73E+01	1.30E-01	1.00E+00	1.28E-07		5.01E-08		2.06E-12				
Fluorene	D				6.62E-01		1.00E+00	1.10E-09				6.48E-11				
Fluoride	NA				8.72E+03	1.00E-01	1.00E+00	1.45E-05		4.34E-06		2.33E-10				
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		9.22E+00	1.30E-01	1.00E+00	1.53E-08	1.1E-08	5.97E-09	4.4E-09	2.46E-13		1.6E-08	6	
Lead	B2				7.11E+01		1.00E+00	1.18E-07				1.90E-12				
Mercury	D				7.82E-01		7.00E-02	1.30E-09				2.09E-14				
Naphthalene	C				5.46E-01		1.00E+00	9.06E-10				4.44E-10				
Nickel	NA				1.04E+03		4.00E-02	1.73E-06				2.78E-11				
Polychlorinated Biphenyls (PCBs)	B2	2.00E+00	2.00E+00	2.00E+00	2.09E+00	1.40E-01	1.00E+00	3.47E-09	6.9E-09	1.46E-09	2.9E-09	5.58E-14	1.1E-13	9.9E-09	4	
Pyrene	D				4.69E+01	1.30E-01	1.00E+00	7.78E-08		3.04E-08		4.36E-10				
Selenium	D				2.49E+00		1.00E+00	4.14E-09				6.65E-14				
Silver	D				7.92E-01		4.00E-02	1.32E-09				2.11E-14				
Vanadium	NA				5.10E+02		2.60E-02	8.47E-07				1.36E-11				
Zinc	D				5.93E+01		1.00E+00	9.85E-08				1.58E-12				
Total Risk									2E-07		7E-08			Total Risk =		100
														3E-07		

Note:
 Cancer WOE Classifications:
 Group A: Human carcinogen
 Group B (B1, B2): Probable human carcinogen
 Group C: Possible human carcinogen
 Group D: Not classifiable
 Group E: No evidence of carcinogenicity
 ABS_d = Dermal Absorption Factor
 ABS_{gi} = Gastrointestinal Absorption Factor
 CDI = Chronic Daily Intake
 ELCR = Excess Lifetime Cancer Risk
 EPC = Exposure Point Concentration
 mg/kg-day = milligrams per kilogram per day
 SF_d = Dermal Slope Factor
 SF_o = Oral Slope Factor
 SF_i = Inhalation Slope Factor
 WOE = Weight of Evidence

Table A-34
 Intermittent Excavation/Trench Worker Scenario - Potential Noncarcinogenic Risk - RME
 Subsurface Soil - So. Wetlands
 RMC Troutdale Facility

Chemical	RfD _o (mg/kg-day)	RfD _d (mg/kg-day)	RfD _i (mg/kg-day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total HI	Contribution	%	
							CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ				
4,4-DDD				8.00E-02	3.00E-02	1.00E+00	9.30E-09		8.37E-10		1.49E-13					
4,4-DDE				3.15E-02	3.00E-02	1.00E+00	3.66E-09		3.29E-10		5.88E-14					
4,4-DDT	5.00E-04	5.00E-04		2.80E-01	3.00E-02	1.00E+00	3.25E-08	0.000	2.93E-09	0.0000	5.23E-13		0.000	0		
Acenaphthene	6.00E-01	6.00E-01		1.06E+00		1.00E+00	1.23E-07	0.000			1.43E-08		0.000	0		
Aluminum	1.00E+00	1.00E+00	1.42E-03	4.96E+04		1.00E+00	5.76E-03	0.006			9.26E-08	0.00	0.006	9		
Anthracene	3.00E+00	3.00E+00		1.27E+00		1.00E+00	1.48E-07	0.000			4.50E-09		0.000	0		
Antimony	4.00E-04	6.00E-05	1.40E-04	1.59E+00		1.50E-01	1.85E-07	0.000			2.98E-12	0.00	0.000	1		
Aroclor-1248	2.00E-05	2.00E-05		2.75E-02	1.40E-01	1.00E+00	3.20E-09	0.000	1.34E-09	0.0001	5.14E-14		0.000	0		
Aroclor-1254	5.00E-05	5.00E-05		2.49E-01	1.40E-01	1.00E+00	2.90E-08	0.001	1.22E-08	0.0002	4.65E-13		0.001	1		
Arsenic	3.00E-04	3.00E-04		1.05E+01	3.00E-02	1.00E+00	1.22E-06	0.004	1.10E-07	0.0004	1.96E-11		0.004	6		
Barium	7.00E-02	4.90E-03	1.40E-04	1.03E+02		7.00E-02	1.20E-05	0.000			1.93E-10	0.00	0.000	0		
Benzo (a) anthracene				1.03E+01	1.30E-01	1.00E+00	1.20E-06		4.66E-07		1.92E-11					
Benzo (a) pyrene				6.93E+00	1.30E-01	1.00E+00	8.05E-07		3.14E-07		1.29E-11					
Benzo (b) fluoranthene				2.00E+01	1.30E-01	1.00E+00	2.33E-06		9.09E-07		3.74E-11					
Benzo (k) fluoranthene				5.08E+00	1.30E-01	1.00E+00	5.91E-07		2.30E-07		9.50E-12					
Beryllium	5.00E-03	3.50E-05	5.71E-06	2.17E+00		7.00E-03	2.52E-07	0.000			4.06E-12	0.00	0.000	0		
Cadmium	1.00E-03	2.50E-05		1.26E+00	1.00E-03	2.50E-02	1.47E-07	0.000	4.40E-10	0.0000	2.36E-12		0.000	0		
Chromium	2.00E-02	5.00E-04	2.20E-06	5.12E+01		2.50E-02	5.95E-06	0.000			9.57E-11	0.00	0.000	1		
Chrysene				2.33E+01	1.30E-01	1.00E+00	2.70E-06		1.05E-06		2.11E-08					
Cobalt	2.00E-02	2.00E-02	5.70E-06	2.34E+01		1.00E+00	2.71E-06	0.000			4.36E-11	0.00	0.000	0		
Copper	4.00E-02	4.00E-02		3.72E+02		1.00E+00	4.33E-05	0.001			6.95E-10		0.001	2		
Cyanide, Total	2.00E-02	2.00E-02		1.17E+01	1.00E-01	1.00E+00	1.36E-06	0.000	4.09E-07	0.0000	2.19E-11		0.000	0		
Dibenzo (a,h) anthracene				2.14E+00	1.30E-01	1.00E+00	2.49E-07		9.72E-08		4.01E-12					
Fluoranthene	4.00E-01	4.00E-01		7.73E+01	1.30E-01	1.00E+00	8.99E-06	0.000	3.51E-06	0.0000	1.44E-10		0.000	0		
Fluorene	4.00E-01	4.00E-01		6.62E-01		1.00E+00	7.70E-08	0.000			4.54E-09		0.000	0		
Fluoride	6.00E-02	6.00E-02		8.72E+03	1.00E-01	1.00E+00	1.01E-03	0.017	3.04E-04	0.0051	1.63E-08		0.022	32		
Indeno (1,2,3-cd) pyrene				9.22E+00	1.30E-01	1.00E+00	1.07E-06		4.18E-07		1.72E-11					
Lead				7.11E+01		1.00E+00	8.26E-06				1.33E-10					
Mercury	3.00E-04	2.10E-05	3.00E-03	7.82E-01		7.00E-02	9.09E-08	0.000			1.46E-12	0.00	0.000	0		
Naphthalene	2.00E-02	2.00E-02	8.57E-04	5.46E-01		1.00E+00	6.34E-08	0.000			3.11E-08	0.00	0.000	0		
Nickel	2.00E-02	8.00E-04		1.04E+03		4.00E-02	1.21E-04	0.006			1.94E-09		0.006	9		
Polychlorinated Biphenyls (PCBs)	2.00E-05	2.00E-05		2.09E+00	1.40E-01	1.00E+00	2.43E-07	0.012	1.02E-07	0.0051	3.91E-12		0.017	25		
Pyrene	3.00E-01	3.00E-01		4.69E+01	1.30E-01	1.00E+00	5.45E-06	0.000	2.13E-06	0.0000	3.05E-08		0.000	0		
Selenium	5.00E-03	5.00E-03		2.49E+00		1.00E+00	2.90E-07	0.000			4.66E-12		0.000	0		
Silver	5.00E-03	2.00E-04		7.92E-01		4.00E-02	9.21E-08	0.000			1.48E-12		0.000	0		
Vanadium	7.00E-03	1.82E-04		5.10E+02		2.60E-02	5.93E-05	0.008			9.52E-10		0.008	12		
Zinc	3.00E-01	3.00E-01		5.93E+01		1.00E+00	6.89E-06	0.000			1.11E-10		0.000	0		
								0.06		0.01		0.0002				100
												Total HI =	0.07			

Note:
 ABS_d = Dermal Absorption Factor
 ABS_{gi} = Gastrointestinal Absorption Factor
 CDI = Chronic Daily Intake
 EPC = Exposure Point Concentration
 HI = Hazard Index
 HQ = Hazard Quotient;
 mg/kg-day = milligrams per kilogram per day
 RfC = Reference Concentration
 RfD_d = Dermal Reference Dose;
 RfD_o = Oral Reference Dose
 RfD_i = Inhalation Reference Dose

Table A-35
 Intermittent Excavation/Trench Worker Scenario - Potential Excess Lifetime Cancer Risk - CTE
 Subsurface Soil - So. Wetlands
 RMC Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	Ingestion				Dermal		Inhalation		Total ELCR	Contribution	%
					EPC (mg/kg)	ABS _d	ABS _{gi}	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)			
4,4-DDD	B2	2.40E-01	2.40E-01		8.00E-02	3.00E-02	1.00E+00	2.01E-11	4.8E-12	1.99E-12	4.8E-13	1.07E-15		5.3E-12	0
4,4-DDE	B2	3.40E-01	3.40E-01		3.15E-02	3.00E-02	1.00E+00	7.92E-12	2.7E-12	7.84E-13	2.7E-13	4.20E-16		3.0E-12	0
4,4-DDT	B2	3.40E-01	3.40E-01	3.40E-01	2.80E-01	3.00E-02	1.00E+00	7.05E-11	2.4E-11	6.97E-12	2.4E-12	3.74E-15	1.3E-15	2.6E-11	0
Acenaphthene	NA				1.06E+00		1.00E+00	2.65E-10				1.02E-10			
Aluminum	NA				4.96E+04		1.00E+00	1.25E-05				6.61E-10			
Anthracene	D				1.27E+00		1.00E+00	3.20E-10				3.21E-11			
Antimony	NA				1.59E+00		1.50E-01	4.01E-10				2.13E-14			
Aroclor-1248	NA	2.00E+00	2.00E+00	2.00E+00	2.75E-02	1.40E-01	1.00E+00	6.92E-12	1.4E-11	3.20E-12	6.4E-12	3.67E-16	7.3E-16	2.0E-11	0
Aroclor-1254	NA	2.00E+00	2.00E+00	2.00E+00	2.49E-01	1.40E-01	1.00E+00	6.27E-11	1.3E-10	2.90E-11	5.8E-11	3.32E-15	6.6E-15	1.8E-10	0
Arsenic	A	1.50E+00	1.50E+00	1.51E+01	1.05E+01	3.00E-02	1.00E+00	2.64E-09	4.0E-09	2.61E-10	3.9E-10	1.40E-13	2.1E-12	4.3E-09	11
Barium	D				1.03E+02		7.00E-02	2.60E-08				1.38E-12			
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		1.03E+01	1.30E-01	1.00E+00	2.59E-09	1.9E-09	1.11E-09	8.1E-10	1.37E-13		2.7E-09	7
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		6.93E+00	1.30E-01	1.00E+00	1.74E-09	1.3E-08	7.48E-10	5.5E-09	9.25E-14		1.8E-08	45
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		2.00E+01	1.30E-01	1.00E+00	5.04E-09	3.7E-09	2.16E-09	1.6E-09	2.67E-13		5.3E-09	13
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		5.08E+00	1.30E-01	1.00E+00	1.28E-09	9.3E-11	5.49E-10	4.0E-11	6.78E-14		1.3E-10	0
Beryllium	B1			8.40E+00	2.17E+00		7.00E-03	5.46E-10				2.90E-14	2.4E-13	2.4E-13	0
Cadmium	B1			6.30E+00	1.26E+00	1.00E-03	2.50E-02	3.17E-10		1.05E-12		1.68E-14	1.1E-13	1.1E-13	0
Chromium	A			2.94E+02	5.12E+01		2.50E-02	1.29E-08				6.83E-13	2.0E-10	2.0E-10	0
Chrysene	B2	7.30E-03	7.30E-03		2.33E+01	1.30E-01	1.00E+00	5.85E-09	4.3E-11	2.51E-09	1.8E-11	1.51E-10		6.1E-11	0
Cobalt	NA			9.80E+00	2.34E+01		1.00E+00	5.88E-09				3.12E-13	3.1E-12	3.1E-12	0
Copper	D				3.72E+02		1.00E+00	9.36E-08				4.97E-12			
Cyanide, Total	D				1.17E+01	1.00E-01	1.00E+00	2.95E-09		9.73E-10		1.56E-13			
Dibenzo (a,h) anthracene	B2	7.30E+00	7.30E+00		2.14E+00	1.30E-01	1.00E+00	5.40E-10	3.9E-09	2.31E-10	1.7E-09	2.86E-14		5.6E-09	14
Fluoranthene	D				7.73E+01	1.30E-01	1.00E+00	1.95E-08		8.35E-09		1.03E-12			
Fluorene	D				6.62E-01		1.00E+00	1.67E-10				3.24E-11			
Fluoride	NA				8.72E+03	1.00E-01	1.00E+00	2.19E-06		7.24E-07		1.16E-10			
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		9.22E+00	1.30E-01	1.00E+00	2.32E-09	1.7E-09	9.95E-10	7.3E-10	1.23E-13		2.4E-09	6
Lead	B2				7.11E+01		1.00E+00	1.79E-08				9.49E-13			
Mercury	D				7.82E-01		7.00E-02	1.97E-10				1.04E-14			
Naphthalene	C				5.46E-01		1.00E+00	1.37E-10				2.22E-10			
Nickel	NA				1.04E+03		4.00E-02	2.62E-07				1.39E-11			
Polychlorinated Biphenyls (PCBs)	B2	2.00E+00	2.00E+00	2.00E+00	2.09E+00	1.40E-01	1.00E+00	5.27E-10	1.1E-09	2.43E-10	4.9E-10	2.79E-14	5.6E-14	1.5E-09	4
Pyrene	D				4.69E+01	1.30E-01	1.00E+00	1.18E-08		5.06E-09		2.18E-10			
Selenium	D				2.49E+00		1.00E+00	6.27E-10				3.33E-14			
Silver	D				7.92E-01		4.00E-02	1.99E-10				1.06E-14			
Vanadium	NA				5.10E+02		2.60E-02	1.28E-07				6.80E-12			
Zinc	D				5.93E+01		1.00E+00	1.49E-08				7.91E-13			
Total Risk								3E-08		1E-08		Total Risk =	2E-10		100
												4E-08			

Note:
 Cancer WOE Classifications:
 Group A: Human carcinogen
 Group B (B1, B2): Probable human carcinogen
 Group C: Possible human carcinogen
 Group D: Not classifiable
 Group E: No evidence of carcinogenicity
 ABS_d = Dermal Absorption Factor
 ABS_{gi} = Gastrointestinal Absorption Factor
 CDI = Chronic Daily Intake
 ELCR = Excess Lifetime Cancer Risk
 EPC = Exposure Point Concentration
 mg/kg-day = milligrams per kilogram per day
 SF_d = Dermal Slope Factor
 SF_o = Oral Slope Factor
 SF_i = Inhalation Slope Factor
 WOE = Weight of Evidence

Table A-36
 Intermittent Excavation/Trench Worker Scenario - Potential Noncarcinogenic Risk - CTE
 Subsurface Soil - So. Wetlands
 RMC Troutdale Facility

Chemical	RfD _o (mg/kg-day)	RfD _d (mg/kg-day)	RfD _i (mg/kg-day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total HI	Contribution	%	
							CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ				
4,4-DDD				8.00E-02	3.00E-02	1.00E+00	1.41E-09			1.39E-10		7.47E-14				
4,4-DDE				3.15E-02	3.00E-02	1.00E+00	5.55E-10			5.49E-11		2.94E-14				
4,4-DDT	5.00E-04	5.00E-04		2.80E-01	3.00E-02	1.00E+00	4.93E-09	0.000		4.88E-10	0.0000	2.62E-13	0.000	0		
Acenaphthene	6.00E-01	6.00E-01		1.06E+00		1.00E+00	1.86E-08	0.000				7.15E-09	0.000	0		
Aluminum	1.00E+00	1.00E+00	1.42E-03	4.96E+04		1.00E+00	8.73E-04	0.001				4.63E-08	0.00	0.001	9	
Anthracene	3.00E+00	3.00E+00		1.27E+00		1.00E+00	2.24E-08	0.000				2.25E-09	0.000	0		
Antimony	4.00E-04	6.00E-05	1.40E-04	1.59E+00		1.50E-01	2.81E-08	0.000				1.49E-12	0.00	0.000	1	
Aroclor-1248	2.00E-05	2.00E-05		2.75E-02	1.40E-01	1.00E+00	4.85E-10	0.000		2.24E-10	0.0000	2.57E-14	0.000	0		
Aroclor-1254	5.00E-05	5.00E-05		2.49E-01	1.40E-01	1.00E+00	4.39E-09	0.000		2.03E-09	0.0000	2.33E-13	0.000	1		
Arsenic	3.00E-04	3.00E-04		1.05E+01	3.00E-02	1.00E+00	1.85E-07	0.001		1.83E-08	0.0001	9.79E-12	0.001	6		
Barium	7.00E-02	4.90E-03	1.40E-04	1.03E+02		7.00E-02	1.82E-06	0.000				9.64E-11	0.00	0.000	0	
Benzo (a) anthracene				1.03E+01	1.30E-01	1.00E+00	1.81E-07			7.77E-08		9.61E-12				
Benzo (a) pyrene				6.93E+00	1.30E-01	1.00E+00	1.22E-07			5.24E-08		6.47E-12				
Benzo (b) fluoranthene				2.00E+01	1.30E-01	1.00E+00	3.53E-07			1.51E-07		1.87E-11				
Benzo (k) fluoranthene				5.08E+00	1.30E-01	1.00E+00	8.95E-08			3.84E-08		4.75E-12				
Beryllium	5.00E-03	3.50E-05	5.71E-06	2.17E+00		7.00E-03	3.82E-08	0.000				2.03E-12	0.00	0.000	0	
Cadmium	1.00E-03	2.50E-05		1.26E+00	1.00E-03	2.50E-02	2.22E-08	0.000		7.33E-11	0.0000	1.18E-12	0.000	0		
Chromium	2.00E-02	5.00E-04	2.20E-06	5.12E+01		2.50E-02	9.02E-07	0.000				4.78E-11	0.00	0.000	1	
Chrysene				2.33E+01	1.30E-01	1.00E+00	4.10E-07			1.76E-07		1.05E-08				
Cobalt	2.00E-02	2.00E-02	5.70E-06	2.34E+01		1.00E+00	4.11E-07	0.000				2.18E-11	0.00	0.000	0	
Copper	4.00E-02	4.00E-02		3.72E+02		1.00E+00	6.56E-06	0.000				3.48E-10	0.000	2		
Cyanide, Total	2.00E-02	2.00E-02		1.17E+01	1.00E-01	1.00E+00	2.06E-07	0.000		6.81E-08	0.0000	1.09E-11	0.000	0		
Dibenzo (a,h) anthracene				2.14E+00	1.30E-01	1.00E+00	3.78E-08			1.62E-08		2.00E-12				
Fluoranthene	4.00E-01	4.00E-01		7.73E+01	1.30E-01	1.00E+00	1.36E-06	0.000		5.84E-07	0.0000	7.22E-11	0.000	0		
Fluorene	4.00E-01	4.00E-01		6.62E-01		1.00E+00	1.17E-08	0.000				2.27E-09	0.000	0		
Fluoride	6.00E-02	6.00E-02		8.72E+03	1.00E-01	1.00E+00	1.54E-04	0.003		5.07E-05	0.0008	8.14E-09	0.003	32		
Indeno (1,2,3-cd) pyrene				9.22E+00	1.30E-01	1.00E+00	1.62E-07			6.96E-08		8.61E-12				
Lead				7.11E+01		1.00E+00	1.25E-06					6.64E-11				
Mercury	3.00E-04	2.10E-05	3.00E-03	7.82E-01		7.00E-02	1.38E-08	0.000				7.30E-13	0.00	0.000	0	
Naphthalene	2.00E-02	2.00E-02	8.57E-04	5.46E-01		1.00E+00	9.61E-09	0.000				1.55E-08	0.00	0.000	0	
Nickel	2.00E-02	8.00E-04		1.04E+03		4.00E-02	1.83E-05	0.001				9.72E-10	0.001	9		
Polychlorinated Biphenyls (PCBs)	2.00E-05	2.00E-05		2.09E+00	1.40E-01	1.00E+00	3.69E-08	0.002		1.70E-08	0.0009	1.95E-12	0.003	26		
Pyrene	3.00E-01	3.00E-01		4.69E+01	1.30E-01	1.00E+00	8.26E-07	0.000		3.54E-07	0.0000	1.53E-08	0.000	0		
Selenium	5.00E-03	5.00E-03		2.49E+00		1.00E+00	4.39E-08	0.000				2.33E-12	0.000	0		
Silver	5.00E-03	2.00E-04		7.92E-01		4.00E-02	1.40E-08	0.000				7.40E-13	0.000	0		
Vanadium	7.00E-03	1.82E-04		5.10E+02		2.60E-02	8.98E-06	0.001				4.76E-10	0.001	12		
Zinc	3.00E-01	3.00E-01		5.93E+01		1.00E+00	1.04E-06	0.000				5.54E-11	0.000	0		
								0.01		0.002		0.0001				100
												Total HI =	0.01			

Note:
 ABS_d = Dermal Absorption Factor
 ABS_{gi} = Gastrointestinal Absorption Factor
 CDI = Chronic Daily Intake
 EPC = Exposure Point Concentration
 HI = Hazard Index
 HQ = Hazard Quotient;
 mg/kg-day = milligrams per kilogram per day
 RfC = Reference Concentration
 RfD_d = Dermal Reference Dose;
 RfD_o = Oral Reference Dose
 RfD_i = Inhalation Reference Dose

Table A-37
 Trespasser Scenario - Potential Excess Lifetime Cancer Risk - RME
 Surface Soil - East Plant Area
 RMC Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total ELCR	Contribution
								CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR		
1,2,4-Trimethylbenzene	-				8.40E-04		1.00E+00	2.44E-11				8.69E-11			
1,4-Dichlorobenzene	-	2.40E-02	2.40E-02	2.20E-02	3.68E+00		1.00E+00	1.07E-07	2.6E-09			5.78E-07	1.3E-08	1.5E-08	1
2-Methylnaphthalene	NA				8.00E-02		1.00E+00	2.33E-09				1.23E-13			
Acenaphthene	NA				1.33E-01		1.00E+00	3.86E-09				1.48E-09			
Acetone	NA				4.00E-02		1.00E+00	1.16E-09				6.49E-09			
Aluminum	NA				1.30E+04		1.00E+00	3.77E-04				2.00E-08			
Anthracene	D				2.91E-01		1.00E+00	8.47E-09				8.49E-10			
Aroclor-1248	NA	2.00E+00	2.00E+00	2.00E+00	7.92E-01	1.40E-01	1.00E+00	2.30E-08	4.6E-08	1.48E-08	3.0E-08	1.22E-12	2.4E-12	7.6E-08	7
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	5.65E-01	1.40E-01	1.00E+00	1.64E-08	3.3E-08	1.06E-08	2.1E-08	8.72E-13	1.7E-12	5.4E-08	5
Aroclor-1268	NA	2.00E+00	2.00E+00	2.00E+00	5.29E-01	1.40E-01	1.00E+00	1.54E-08	3.1E-08	9.91E-09	2.0E-08	8.16E-13	1.6E-12	5.1E-08	4
Arsenic	A	1.50E+00	1.50E+00	1.51E+01	3.75E+00	3.00E-02	1.00E+00	1.09E-07	1.6E-07	1.50E-08	2.3E-08	5.78E-12	8.7E-11	1.9E-07	16
Barium	D				6.46E+01		7.00E-02	1.88E-06				9.96E-11			
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		1.79E+00	1.30E-01	1.00E+00	5.21E-08	3.8E-08	3.11E-08	2.3E-08	2.76E-12		6.1E-08	5
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		1.32E+00	1.30E-01	1.00E+00	3.83E-08	2.8E-07	2.29E-08	1.7E-07	2.03E-12		4.5E-07	38
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		3.13E+00	1.30E-01	1.00E+00	9.10E-08	6.6E-08	5.44E-08	4.0E-08	4.82E-12		1.1E-07	9
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		7.53E-01	1.30E-01	1.00E+00	2.19E-08	1.6E-09	1.31E-08	9.6E-10	1.16E-12		2.6E-09	0
Beryllium	B1			8.40E+00	9.46E-01		7.00E-03	2.75E-08				1.46E-12	1.2E-11	1.2E-11	0
Bromomethane	D				2.30E-03		1.00E+00	6.69E-11				2.59E-09			
Cadmium	B1				6.30E+00	1.12E+00	1.00E-03	2.50E-02	3.25E-08	1.49E-10		1.72E-12	1.1E-11	1.1E-11	0
Chromium	A				2.94E+02	2.14E+01	2.50E-02	6.21E-07				3.29E-11	9.7E-09	9.7E-09	1
Chrysene	B2	7.30E-03	7.30E-03		2.40E+00	1.30E-01	1.00E+00	6.99E-08	5.1E-10	4.18E-08	3.1E-10	1.80E-09		8.2E-10	0
Cobalt	NA			9.80E+00	1.21E+01		1.00E+00	3.51E-07				1.86E-11	1.8E-10	1.8E-10	0
Copper	D				8.25E+01		1.00E+00	2.40E-06				1.27E-10			
Cyanide, Total	D				2.21E+01	1.00E-01	1.00E+00	6.44E-07			2.96E-07	3.41E-11			
Dibenzo (a,h) anthracene	B2	7.30E+00	7.30E+00		2.80E-01	1.30E-01	1.00E+00	8.13E-09	5.9E-08	4.86E-09	3.5E-08	4.31E-13		9.5E-08	8
Dibenzofuran	D				4.10E-01		1.00E+00	1.19E-08				1.28E-09			
Fluoranthene	D				2.25E+00	1.30E-01	1.00E+00	6.55E-08			3.92E-08	3.48E-12			
Fluorene	D				1.07E-01		1.00E+00	3.11E-09				6.05E-10			
Fluoride	NA				1.32E+03	1.00E-01	1.00E+00	3.84E-05			1.77E-05	2.04E-09			
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		1.76E+00	1.30E-01	1.00E+00	5.11E-08	3.7E-08	3.06E-08	2.2E-08	2.71E-12		6.0E-08	5
Lead	B2				4.96E+01		1.00E+00	1.44E-06				7.65E-11			
Manganese	D				3.44E+02		4.00E-02	1.00E-05				5.31E-10			
Mercury	D				3.34E-01		7.00E-02	9.71E-09				5.15E-13			
Methylene Chloride	B2	7.50E-03	7.50E-03	1.60E-03	3.70E-03		1.00E+00	1.08E-10	8.1E-13			3.02E-09	4.8E-12	5.6E-12	0
Naphthalene	C				7.94E-02		1.00E+00	2.31E-09				3.73E-09			
Nickel	NA				1.52E+01		4.00E-02	4.43E-07				2.35E-11			
Pyrene	D				2.12E+00	1.30E-01	1.00E+00	6.17E-08			3.69E-08	1.14E-09			
Vanadium	NA				6.87E+01		2.60E-02	2.00E-06				1.06E-10			
Zinc	D				9.88E+01		1.00E+00	2.87E-06				1.52E-10			
Total Risk								8E-07		4E-07		Total Risk =	2E-08	1E-06	100

Note:
 Cancer WOE Classifications:
 Group A: Human carcinogen
 Group B (B1, B2): Probable human carcinogen
 Group C: Possible human carcinogen
 Group D: Not classifiable
 Group E: No evidence of carcinogenicity
 ABS_d = Dermal Absorption Factor
 ABS_{gi} = Gastrointestinal Absorption Factor
 CDI = Chronic Daily Intake
 ELCR = Excess Lifetime Cancer Risk
 EPC = Exposure Point Concentration
 mg/kg-day = milligrams per kilogram per day
 SF_d = Dermal Slope Factor
 SF_o = Oral Slope Factor
 SF_i = Inhalation Slope Factor
 WOE = Weight of Evidence

Table A-38
 Trespasser Scenario - Potential Noncarcinogenic Risk - RME
 Surface Soil - East Plant Area
 RMC Troutdale Facility

Chemical	RfD _o (mg/kg-day)	RfD _d (mg/kg-day)	RfD _i (mg/kg-day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total HI	Contribution	
							CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ	CDI (mg/kg-day)	HQ			
1,2,4-Trimethylbenzene	5.00E-02	5.00E-02	1.70E-03	8.40E-04		1.00E+00	3.42E-10	0.000			1.22E-09	0.00	0.000	0	
1,4-Dichlorobenzene	3.00E-02	3.00E-02	2.50E+00	3.68E+00		1.00E+00	1.50E-06	0.000			8.09E-06	0.00	0.000	0	
2-Methylnaphthalene	4.00E-03	4.00E-03		8.00E-02		1.00E+00	3.26E-08	0.000			1.73E-12		0.000	0	
Acenaphthene	6.00E-01	6.00E-01		1.33E-01		1.00E+00	5.40E-08	0.000			2.08E-08		0.000	0	
Acetone	1.00E+00	1.00E+00		4.00E-02		1.00E+00	1.63E-08	0.000			9.08E-08		0.000	0	
Aluminum	1.00E+00	1.00E+00	1.42E-03	1.30E+04		1.00E+00	5.27E-03	0.005			2.80E-07	0.00	0.005	6	
Anthracene	3.00E+00	3.00E+00		2.91E-01		1.00E+00	1.19E-07	0.000			1.19E-08		0.000	0	
Aroclor-1248	2.00E-05	2.00E-05		7.92E-01	1.40E-01	1.00E+00	3.22E-07	0.016	2.08E-07	0.0104	1.71E-11		0.027	27	
Aroclor-1260	2.00E-05	2.00E-05		5.65E-01	1.40E-01	1.00E+00	2.30E-07	0.012	1.48E-07	0.0074	1.22E-11		0.019	19	
Aroclor-1268	2.00E-05	2.00E-05		5.29E-01	1.40E-01	1.00E+00	2.15E-07	0.011	1.39E-07	0.0069	1.14E-11		0.018	18	
Arsenic	3.00E-04	3.00E-04		3.75E+00	3.00E-02	1.00E+00	1.53E-06	0.005	2.11E-07	0.0007	8.10E-11		0.006	6	
Barium	7.00E-02	4.90E-03	1.40E-04	6.46E+01		7.00E-02	2.63E-05	0.000			1.39E-09	0.00	0.000	0	
Benzo (a) anthracene				1.79E+00	1.30E-01	1.00E+00	7.29E-07		4.36E-07		3.87E-11				
Benzo (a) pyrene				1.32E+00	1.30E-01	1.00E+00	5.36E-07		3.20E-07		2.84E-11				
Benzo (b) fluoranthene				3.13E+00	1.30E-01	1.00E+00	1.27E-06		7.61E-07		6.75E-11				
Benzo (k) fluoranthene				7.53E-01	1.30E-01	1.00E+00	3.06E-07		1.83E-07		1.63E-11				
Beryllium	5.00E-03	3.50E-05	5.71E-06	9.46E-01		7.00E-03	3.85E-07	0.000			2.04E-11	0.00	0.000	0	
Bromomethane	5.00E-03	5.00E-03	1.43E-03	2.30E-03		1.00E+00	9.36E-10	0.000			3.62E-08	0.00	0.000	0	
Cadmium	1.00E-03	2.50E-05		1.12E+00	1.00E-03	2.50E-02	4.55E-07	0.000	2.09E-09	0.0001	2.41E-11		0.001	1	
Chromium	2.00E-02	5.00E-04	2.20E-06	2.14E+01		2.50E-02	8.69E-06	0.000			4.61E-10	0.00	0.001	1	
Chrysene				2.40E+00	1.30E-01	1.00E+00	9.78E-07		5.85E-07		2.52E-08				
Cobalt	2.00E-02	2.00E-02	5.70E-06	1.21E+01		1.00E+00	4.92E-06	0.000			2.61E-10	0.00	0.000	0	
Copper	4.00E-02	4.00E-02		8.25E+01		1.00E+00	3.36E-05	0.001			1.78E-09		0.001	1	
Cyanide, Total	2.00E-02	2.00E-02		2.21E+01	1.00E-01	1.00E+00	9.01E-06	0.000	4.14E-06	0.0002	4.78E-10		0.001	1	
Dibenzo (a,h) anthracene				2.80E-01	1.30E-01	1.00E+00	1.14E-07		6.81E-08		6.04E-12				
Dibenzofuran	2.00E-03	2.00E-03		4.10E-01		1.00E+00	1.67E-07	0.000			1.80E-08		0.000	0	
Fluoranthene	4.00E-01	4.00E-01		2.25E+00	1.30E-01	1.00E+00	9.18E-07	0.000	5.49E-07	0.0000	4.87E-11		0.000	0	
Fluorene	4.00E-01	4.00E-01		1.07E-01		1.00E+00	4.36E-08	0.000			8.47E-09		0.000	0	
Fluoride	6.00E-02	6.00E-02		1.32E+03	1.00E-01	1.00E+00	5.38E-04	0.009	2.48E-04	0.0041	2.85E-08		0.013	13	
Indeno (1,2,3-cd) pyrene				1.76E+00	1.30E-01	1.00E+00	7.15E-07		4.28E-07		3.79E-11				
Lead				4.96E+01		1.00E+00	2.02E-05				1.07E-09				
Manganese	1.40E-01	5.60E-03	1.40E-05	3.44E+02		4.00E-02	1.40E-04	0.001			7.44E-09	0.00	0.002	2	
Mercury	3.00E-04	2.10E-05	3.00E-03	3.34E-01		7.00E-02	1.36E-07	0.000			7.21E-12	0.00	0.000	0	
Methylene Chloride	6.00E-02	6.00E-02	8.60E-01	3.70E-03		1.00E+00	1.51E-09	0.000			4.23E-08	0.00	0.000	0	
Naphthalene	2.00E-02	2.00E-02	8.57E-04	7.94E-02		1.00E+00	3.23E-08	0.000			5.23E-08	0.00	0.000	0	
Nickel	2.00E-02	8.00E-04		1.52E+01		4.00E-02	6.20E-06	0.000			3.29E-10		0.000	0	
Pyrene	3.00E-01	3.00E-01		2.12E+00	1.30E-01	1.00E+00	8.64E-07	0.000	5.17E-07	0.0000	1.60E-08		0.000	0	
Vanadium	7.00E-03	1.82E-04		6.87E+01		2.60E-02	2.80E-05	0.004			1.48E-09		0.004	4	
Zinc	3.00E-01	3.00E-01		9.88E+01		1.00E+00	4.02E-05	0.000			2.13E-09		0.000	0	
								0.07		0.03		0.001		100	
											Total HI =	0.1			

Note:
 ABS_d = Dermal Absorption Factor
 ABS_{gi} = Gastrointestinal Absorption Factor
 CDI = Chronic Daily Intake
 EPC = Exposure Point Concentration
 HI = Hazard Index
 HQ = Hazard Quotient;
 mg/kg-day = milligrams per kilogram per day
 RfC = Reference Concentration
 RfD_d = Dermal Reference Dose;
 RfD_o = Oral Reference Dose
 RfD_i = Inhalation Reference Dose

Table A-39
 Trespasser Scenario - Potential Excess Lifetime Cancer Risk - CTE
 Surface Soil - East Plant Area
 RMC Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total ELCR	Contribution	%	
								CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR				
1,2,4-Trimethylbenzene	-				8.40E-04		1.00E+00	2.35E-12				1.67E-11					
1,4-Dichlorobenzene	NA	2.40E-02	2.40E-02	2.20E-02	3.68E+00		1.00E+00	1.03E-08	2.5E-10			1.11E-07	2.4E-09	2.7E-09	3		
2-Methylnaphthalene	NA				8.00E-02		1.00E+00	2.24E-10				2.37E-14					
Acenaphthene	NA				1.33E-01		1.00E+00	3.71E-10				2.85E-10					
Acetone	NA				4.00E-02		1.00E+00	1.12E-10				1.25E-09					
Aluminum	NA				1.30E+04		1.00E+00	3.62E-05				3.84E-09					
Anthracene	D				2.91E-01		1.00E+00	8.14E-10				1.63E-10					
Aroclor-1248	NA	2.00E+00	2.00E+00	2.00E+00	7.92E-01	1.40E-01	1.00E+00	2.21E-09	4.4E-09	3.47E-10	6.9E-10	2.35E-13	4.7E-13	5.1E-09	6		
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	5.65E-01	1.40E-01	1.00E+00	1.58E-09	3.2E-09	2.48E-10	5.0E-10	1.68E-13	3.4E-13	3.7E-09	4		
Aroclor-1268	NA	2.00E+00	2.00E+00	2.00E+00	5.29E-01	1.40E-01	1.00E+00	1.48E-09	3.0E-09	2.32E-10	4.6E-10	1.57E-13	3.1E-13	3.4E-09	4		
Arsenic	A	1.50E+00	1.50E+00	1.51E+01	3.75E+00	3.00E-02	1.00E+00	1.05E-08	1.6E-08	3.52E-10	5.3E-10	1.11E-12	1.7E-11	1.6E-08	19		
Barium	D				6.46E+01		7.00E-02	1.81E-07				1.92E-11					
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		1.79E+00	1.30E-01	1.00E+00	5.01E-09	3.7E-09	7.29E-10	5.3E-10	5.31E-13		4.2E-09	5		
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		1.32E+00	1.30E-01	1.00E+00	3.68E-09	2.7E-08	5.36E-10	3.9E-09	3.90E-13		3.1E-08	36		
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		3.13E+00	1.30E-01	1.00E+00	8.75E-09	6.4E-09	1.27E-09	9.3E-10	9.28E-13		7.3E-09	8		
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		7.53E-01	1.30E-01	1.00E+00	2.10E-09	1.5E-10	3.06E-10	2.2E-11	2.23E-13		1.8E-10	0		
Beryllium	B1			8.40E+00	9.46E-01		7.00E-03	2.64E-09				2.80E-13	2.4E-12	2.4E-12	0		
Bromomethane	D				2.30E-03		1.00E+00	6.43E-12				4.98E-10					
Cadmium	B1			6.30E+00	1.12E+00	1.00E-03	2.50E-02	3.12E-09		3.50E-12		3.31E-13	2.1E-12	2.1E-12	0		
Chromium	A			2.94E+02	2.14E+01		2.50E-02	5.97E-08				6.33E-12	1.9E-09	1.9E-09	2		
Chrysene	B2	7.30E-03	7.30E-03		2.40E+00	1.30E-01	1.00E+00	6.72E-09	4.9E-11	9.78E-10	7.1E-12	3.46E-10		5.6E-11	0		
Cobalt	NA			9.80E+00	1.21E+01		1.00E+00	3.38E-08				3.58E-12	3.5E-11	3.5E-11	0		
Copper	D				8.25E+01		1.00E+00	2.31E-07				2.45E-11					
Cyanide, Total	D				2.21E+01	1.00E-01	1.00E+00	6.19E-08		6.93E-09		6.56E-12					
Dibenzo (a,h) anthracene	B2	7.30E+00	7.30E+00		2.80E-01	1.30E-01	1.00E+00	7.82E-10	5.7E-09	1.14E-10	8.3E-10	8.29E-14		6.5E-09	8		
Dibenzofuran	D				4.10E-01		1.00E+00	1.15E-09				2.47E-10					
Fluoranthene	D				2.25E+00	1.30E-01	1.00E+00	6.30E-09		9.18E-10		6.68E-13					
Fluorene	D				1.07E-01		1.00E+00	2.99E-10				1.16E-10					
Fluoride	NA				1.32E+03	1.00E-01	1.00E+00	3.70E-06		4.14E-07		3.92E-10					
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		1.76E+00	1.30E-01	1.00E+00	4.91E-09	3.6E-09	7.15E-10	5.2E-10	5.21E-13		4.1E-09	5		
Lead	B2				4.96E+01		1.00E+00	1.39E-07				1.47E-11					
Manganese	D				3.44E+02		4.00E-02	9.63E-07				1.02E-10					
Mercury	D				3.34E-01		7.00E-02	9.33E-10				9.90E-14					
Methylene Chloride	B2	7.50E-03	7.50E-03	1.60E-03	3.70E-03		1.00E+00	1.03E-11	7.8E-14			5.81E-10	9.3E-13	1.0E-12	0		
Naphthalene	C				7.94E-02		1.00E+00	2.22E-10				7.18E-10					
Nickel	NA				1.52E+01		4.00E-02	4.26E-08				4.51E-12					
Pyrene	D				2.12E+00	1.30E-01	1.00E+00	5.94E-09		8.64E-10		2.19E-10					
Vanadium	NA				6.87E+01		2.60E-02	1.92E-07				2.04E-11					
Zinc	D				9.88E+01		1.00E+00	2.76E-07				2.93E-11					
Total Risk									7E-08		9E-09					100	
												Total Risk =	4E-09	9E-08			

Note:
 Cancer WOE Classifications:
 Group A: Human carcinogen
 Group B (B1, B2): Probable human carcinogen
 Group C: Possible human carcinogen
 Group D: Not classifiable
 Group E: No evidence of carcinogenicity
 ABS_d = Dermal Absorption Factor
 ABS_{gi} = Gastrointestinal Absorption Factor
 CDI = Chronic Daily Intake
 ELCR = Excess Lifetime Cancer Risk
 EPC = Exposure Point Concentration
 mg/kg-day = milligrams per kilogram per day
 SF_d = Dermal Slope Factor
 SF_o = Oral Slope Factor
 SF_i = Inhalation Slope Factor
 WOE = Weight of Evidence

Table A-41
Near-Term Construction Worker Scenario - Potential Excess Lifetime Cancer Risk - RME
Subsurface Soil - East Plant Area
RMC Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total ELCR	Contribution	%
								CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR			
2-Methylnaphthalene	NA				2.94E+00		1.00E+00	1.36E-07				2.18E-12				
Acenaphthene	NA				8.08E-01		1.00E+00	3.73E-08				4.34E-09				
Acetone	NA				4.00E-02		1.00E+00	1.85E-09				3.12E-09				
Aluminum	NA				1.14E+04		1.00E+00	5.25E-04				8.44E-09				
Anthracene	D				8.42E-01		1.00E+00	3.88E-08				1.18E-09				
Aroclor-1248	NA	2.00E+00	2.00E+00	2.00E+00	9.25E-01	1.40E-01	1.00E+00	4.26E-08	8.5E-08	1.79E-08	3.6E-08	6.85E-13	1.4E-12	1.2E-07		5
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	1.12E+00	1.40E-01	1.00E+00	5.17E-08	1.0E-07	2.17E-08	4.3E-08	8.31E-13	1.7E-12	1.5E-07		6
Aroclor-1262	NA	2.00E+00	2.00E+00	2.00E+00	4.45E-02	1.40E-01	1.00E+00	2.05E-09	4.1E-09	8.61E-10	1.7E-09	3.30E-14	6.6E-14	5.8E-09		0
Aroclor-1268	NA	2.00E+00	2.00E+00	2.00E+00	3.31E-01	1.40E-01	1.00E+00	1.53E-08	3.1E-08	6.42E-09	1.3E-08	2.46E-13	4.9E-13	4.3E-08		2
Arsenic	A	1.50E+00	1.50E+00	1.51E+01	3.05E+00	3.00E-02	1.00E+00	1.41E-07	2.1E-07	1.27E-08	1.9E-08	2.26E-12	3.4E-11	2.3E-07		9
Barium	D				5.70E+01		7.00E-02	2.63E-06				4.22E-11				
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		2.10E+00	1.30E-01	1.00E+00	9.71E-08	7.1E-08	3.79E-08	2.8E-08	1.56E-12		9.8E-08		4
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		2.06E+00	1.30E-01	1.00E+00	9.52E-08	7.0E-07	3.71E-08	2.7E-07	1.53E-12		9.7E-07		40
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		4.13E+00	1.30E-01	1.00E+00	1.91E-07	1.4E-07	7.44E-08	5.4E-08	3.06E-12		1.9E-07		8
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		1.38E+00	1.30E-01	1.00E+00	6.38E-08	4.7E-09	2.49E-08	1.8E-09	1.03E-12		6.5E-09		0
Beryllium	B1			8.40E+00	6.89E-01		7.00E-03	3.18E-08				5.11E-13	4.3E-12	4.3E-12		0
Bromomethane	D				3.00E-03		1.00E+00	1.38E-10				1.62E-09				
Cadmium	B1			6.30E+00	7.64E-01	1.00E-03	2.50E-02	3.53E-08		1.06E-10		5.67E-13	3.6E-12	3.6E-12		0
Chromium	A			2.94E+02	1.66E+01		2.50E-02	7.66E-07				1.23E-11	3.6E-09	3.6E-09		0
Chrysene	B2	7.30E-03	7.30E-03		3.89E+00	1.30E-01	1.00E+00	1.79E-07	1.3E-09	6.99E-08	5.1E-10	1.40E-09		1.8E-09		0
Cobalt	NA			9.80E+00	7.39E+00		1.00E+00	3.41E-07				5.47E-12	5.4E-11	5.4E-11		0
Copper	D				4.92E+01		1.00E+00	2.27E-06				3.64E-11				
Cyanide, Total	D				1.16E+01	1.00E-01	1.00E+00	5.33E-07		1.60E-07		8.57E-12				
Dibenzo (a,h) anthracene	B2	7.30E+00	7.30E+00		9.07E-01	1.30E-01	1.00E+00	4.18E-08	3.1E-07	1.63E-08	1.2E-07	6.72E-13		4.2E-07		17
Dibenzofuran	D				3.69E+00		1.00E+00	1.70E-07				5.55E-09				
Fluoranthene	D				3.04E+00	1.30E-01	1.00E+00	1.40E-07		5.47E-08		2.25E-12				
Fluorene	D				7.74E-01		1.00E+00	3.57E-08				2.10E-09				
Fluoride	NA				1.49E+03	1.00E-01	1.00E+00	6.88E-05		2.06E-05		1.11E-09				
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		1.71E+00	1.30E-01	1.00E+00	7.91E-08	5.8E-08	3.09E-08	2.3E-08	1.27E-12		8.0E-08		3
Lead	B2				3.03E+01		1.00E+00	1.40E-06				2.24E-11				
Manganese	D				1.84E+02		4.00E-02	8.49E-06				1.36E-10				
Mercury	D				2.03E-01		7.00E-02	9.38E-09				1.51E-13				
Methylene Chloride	B2	7.50E-03	7.50E-03	1.60E-03	3.70E-03		1.00E+00	1.71E-10	1.3E-12			1.45E-09	2.3E-12	3.6E-12		0
Naphthalene	C				1.07E-01		1.00E+00	4.93E-09				2.41E-09				
Nickel	NA				1.16E+01		4.00E-02	5.35E-07				8.60E-12				
Polychlorinated Biphenyls (PCBs)	B2	2.00E+00	2.00E+00	2.00E+00	8.88E-01	1.40E-01	1.00E+00	4.10E-08	8.2E-08	1.72E-08	3.4E-08	6.59E-13	1.3E-12	1.2E-07		5
Pyrene	D				2.88E+00	1.30E-01	1.00E+00	1.33E-07		5.19E-08		7.45E-10				
Vanadium	NA				5.24E+01		2.60E-02	2.42E-06				3.89E-11				
Zinc	D				5.59E+01		1.00E+00	2.58E-06				4.15E-11				
Total Risk									2E-06		6E-07					100
												Total Risk =	4E-09			
													2E-06			

Note:
Cancer WOE Classifications:
Group A: Human carcinogen
Group B (B1, B2): Probable human carcinogen
Group C: Possible human carcinogen
Group D: Not classifiable
Group E: No evidence of carcinogenicity
ABS_d = Dermal Absorption Factor
ABS_{gi} = Gastrointestinal Absorption Factor
CDI = Chronic Daily Intake
ELCR = Excess Lifetime Cancer Risk
EPC = Exposure Point Concentration
mg/kg-day = milligrams per kilogram per day
SF_d = Dermal Slope Factor
SF_o = Oral Slope Factor
SF_i = Inhalation Slope Factor
WOE = Weight of Evidence

Table A-42
Near-Term Construction Worker Scenario - Potential Noncarcinogenic Risk - RME
Subsurface Soil - East Plant Area
RMC Troutdale Facility

Chemical	RfD _o (mg/kg- day)	RfD _d (mg/kg- day)	RfD _i (mg/kg- day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total HI	Contribution	%
							CDI (mg/kg- day)	HQ	CDI (mg/kg- day)	HQ	CDI (mg/kg- day)	HQ			
2-Methylnaphthalene	4.00E-03	4.00E-03		2.94E+00		1.00E+00	9.49E-06	0.002			1.53E-10		0.002	0	
Acenaphthene	6.00E-01	6.00E-01		8.08E-01		1.00E+00	2.61E-06	0.000			3.04E-07		0.000	0	
Acetone	1.00E+00	1.00E+00		4.00E-02		1.00E+00	1.29E-07	0.000			2.18E-07		0.000	0	
Aluminum	1.00E+00	1.00E+00	1.42E-03	1.14E+04		1.00E+00	3.67E-02	0.037			5.90E-07	0.00	0.037	4	
Anthracene	3.00E+00	3.00E+00		8.42E-01		1.00E+00	2.72E-06	0.000			8.26E-08		0.000	0	
Aroclor-1248	2.00E-05	2.00E-05		9.25E-01	1.40E-01	1.00E+00	2.99E-06	0.149	1.25E-06	0.0627	4.80E-11		0.212	21	
Aroclor-1260	2.00E-05	2.00E-05		1.12E+00	1.40E-01	1.00E+00	3.62E-06	0.181	1.52E-06	0.0761	5.82E-11		0.257	26	
Aroclor-1262	2.00E-05	2.00E-05		4.45E-02	1.40E-01	1.00E+00	1.44E-07	0.007	6.03E-08	0.0030	2.31E-12		0.010	1	
Aroclor-1268	2.00E-05	2.00E-05		3.31E-01	1.40E-01	1.00E+00	1.07E-06	0.054	4.49E-07	0.0225	1.72E-11		0.076	8	
Arsenic	3.00E-04	3.00E-04		3.05E+00	3.00E-02	1.00E+00	9.84E-06	0.033	8.86E-07	0.0030	1.58E-10		0.036	4	
Barium	7.00E-02	4.90E-03	1.40E-04	5.70E+01		7.00E-02	1.84E-04	0.003			2.96E-09	0.00	0.003	0	
Benzo (a) anthracene				2.10E+00	1.30E-01	1.00E+00	6.79E-06		2.65E-06		1.09E-10				
Benzo (a) pyrene				2.06E+00	1.30E-01	1.00E+00	6.67E-06		2.60E-06		1.07E-10				
Benzo (b) fluoranthene				4.13E+00	1.30E-01	1.00E+00	1.34E-05		5.21E-06		2.15E-10				
Benzo (k) fluoranthene				1.38E+00	1.30E-01	1.00E+00	4.47E-06		1.74E-06		7.18E-11				
Beryllium	5.00E-03	3.50E-05	5.71E-06	6.89E-01		7.00E-03	2.22E-06	0.000			3.57E-11	0.00	0.000	0	
Bromomethane	5.00E-03	5.00E-03	1.43E-03	3.00E-03		1.00E+00	9.69E-09	0.000			1.14E-07	0.00	0.000	0	
Cadmium	1.00E-03	2.50E-05		7.64E-01	1.00E-03	2.50E-02	2.47E-06	0.002	7.40E-09	0.0003	3.97E-11		0.003	0	
Chromium	2.00E-02	5.00E-04	2.20E-06	1.66E+01		2.50E-02	5.37E-05	0.003			8.62E-10	0.00	0.003	0	
Chrysene				3.89E+00	1.30E-01	1.00E+00	1.25E-05		4.89E-06		9.78E-08				
Cobalt	2.00E-02	2.00E-02	5.70E-06	7.39E+00		1.00E+00	2.38E-05	0.001			3.83E-10	0.00	0.001	0	
Copper	4.00E-02	4.00E-02		4.92E+01		1.00E+00	1.59E-04	0.004			2.55E-09		0.004	0	
Cyanide, Total	2.00E-02	2.00E-02		1.16E+01	1.00E-01	1.00E+00	3.73E-05	0.002	1.12E-05	0.0006	6.00E-10		0.002	0	
Dibenzo (a,h) anthracene				9.07E-01	1.30E-01	1.00E+00	2.93E-06		1.14E-06		4.71E-11				
Dibenzofuran	2.00E-03	2.00E-03		3.69E+00		1.00E+00	1.19E-05	0.006			3.89E-07		0.006	1	
Fluoranthene	4.00E-01	4.00E-01		3.04E+00	1.30E-01	1.00E+00	9.82E-06	0.000	3.83E-06	0.0000	1.58E-10		0.000	0	
Fluorene	4.00E-01	4.00E-01		7.74E-01		1.00E+00	2.50E-06	0.000			1.47E-07		0.000	0	
Fluoride	6.00E-02	6.00E-02		1.49E+03	1.00E-01	1.00E+00	4.82E-03	0.080	1.44E-03	0.0241	7.74E-08		0.104	10	
Indeno (1,2,3-cd) pyrene				1.71E+00	1.30E-01	1.00E+00	5.54E-06		2.16E-06		8.90E-11				
Lead				3.03E+01		1.00E+00	9.78E-05				1.57E-09				
Manganese	1.40E-01	5.60E-03	1.40E-05	1.84E+02		4.00E-02	5.94E-04	0.004			9.55E-09	0.00	0.005	0	
Mercury	3.00E-04	2.10E-05	3.00E-03	2.03E-01		7.00E-02	6.56E-07	0.002			1.05E-11	0.00	0.002	0	
Methylene Chloride	6.00E-02	6.00E-02	8.60E-01	3.70E-03		1.00E+00	1.19E-08	0.000			1.02E-07	0.00	0.000	0	
Naphthalene	2.00E-02	2.00E-02	8.57E-04	1.07E-01		1.00E+00	3.45E-07	0.000			1.69E-07	0.00	0.000	0	
Nickel	2.00E-02	8.00E-04		1.16E+01		4.00E-02	3.75E-05	0.002			6.02E-10		0.002	0	
Polychlorinated Biphenyls (PCBs)	2.00E-05	2.00E-05		8.88E-01	1.40E-01	1.00E+00	2.87E-06	0.143	1.20E-06	0.0602	4.61E-11		0.204	20	
Pyrene	3.00E-01	3.00E-01		2.88E+00	1.30E-01	1.00E+00	9.31E-06	0.000	3.63E-06	0.0000	5.21E-08		0.000	0	
Vanadium	7.00E-03	1.82E-04		5.24E+01		2.60E-02	1.69E-04	0.024			2.72E-09		0.024	2	
Zinc	3.00E-01	3.00E-01		5.59E+01		1.00E+00	1.81E-04	0.001			2.90E-09		0.001	0	
								0.7		0.3		0.002			100
												Total HI =	1.0		

Note:
ABS_d = Dermal Absorption Factor
ABS_{gi} = Gastrointestinal Absorption Factor
CDI = Chronic Daily Intake
EPC = Exposure Point Concentration
HI = Hazard Index
HQ = Hazard Quotient;
mg/kg-day = milligrams per kilogram per day
RfC = Reference Concentration
RfD_d = Dermal Reference Dose;
RfD_o = Oral Reference Dose
RfD_i = Inhalation Reference Dose

Table A-43
 Near-Term Construction Worker Scenario - Potential Excess Lifetime Cancer Risk - CTE
 Subsurface Soil - East Plant Area
 RMC Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total ELCR	Contribution
								CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR		
2-Methylnaphthalene	NA				2.94E+00		1.00E+00	2.05E-08				1.09E-12			
Acenaphthene	NA				8.08E-01		1.00E+00	5.65E-09				2.17E-09			
Acetone	NA				4.00E-02		1.00E+00	2.80E-10				1.56E-09			
Aluminum	NA				1.14E+04		1.00E+00	7.95E-05				4.22E-09			
Anthracene	D				8.42E-01		1.00E+00	5.89E-09				5.90E-10			
Aroclor-1248	NA	2.00E+00	2.00E+00	2.00E+00	9.25E-01	1.40E-01	1.00E+00	6.46E-09	1.3E-08	2.99E-09	6.0E-09	3.43E-13	6.9E-13	1.9E-08	5
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	1.12E+00	1.40E-01	1.00E+00	7.84E-09	1.6E-08	3.62E-09	7.2E-09	4.16E-13	8.3E-13	2.3E-08	6
Aroclor-1262	NA	2.00E+00	2.00E+00	2.00E+00	5.06E-02	1.40E-01	1.00E+00	3.54E-10	7.1E-10	1.63E-10	3.3E-10	1.88E-14	3.8E-14	1.0E-09	0
Aroclor-1268	NA	2.00E+00	2.00E+00	2.00E+00	3.31E-01	1.40E-01	1.00E+00	2.32E-09	4.6E-09	1.07E-09	2.1E-09	1.23E-13	2.5E-13	6.8E-09	2
Arsenic	A	1.50E+00	1.50E+00	1.51E+01	3.05E+00	3.00E-02	1.00E+00	2.13E-08	3.2E-08	2.11E-09	3.2E-09	1.13E-12	1.7E-11	3.5E-08	9
Barium	D				5.70E+01		7.00E-02	3.98E-07				2.11E-11			
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		2.10E+00	1.30E-01	1.00E+00	1.47E-08	1.1E-08	6.31E-09	4.6E-09	7.80E-13		1.5E-08	4
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		2.06E+00	1.30E-01	1.00E+00	1.44E-08	1.1E-07	6.19E-09	4.5E-08	7.65E-13		1.5E-07	39
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		4.13E+00	1.30E-01	1.00E+00	2.89E-08	2.1E-08	1.24E-08	9.0E-09	1.53E-12		3.0E-08	8
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		1.38E+00	1.30E-01	1.00E+00	9.67E-09	7.1E-10	4.15E-09	3.0E-10	5.13E-13		1.0E-09	0
Beryllium	B1			8.40E+00	6.89E-01		7.00E-03	4.81E-09				2.55E-13	2.1E-12	2.1E-12	0
Bromomethane	D				3.00E-03		1.00E+00	2.10E-11				8.12E-10			
Cadmium	B1			6.30E+00	7.64E-01	1.00E-03	2.50E-02	5.34E-09		1.76E-11		2.83E-13	1.8E-12	1.8E-12	0
Chromium	A			2.94E+02	1.66E+01		2.50E-02	1.16E-07				6.16E-12	1.8E-09	1.8E-09	0
Chrysene	B2	7.30E-03	7.30E-03		3.89E+00	1.30E-01	1.00E+00	2.72E-08	2.0E-10	1.17E-08	8.5E-11	6.99E-10		2.8E-10	0
Cobalt	NA			9.80E+00	7.39E+00		1.00E+00	5.16E-08				2.74E-12	2.7E-11	2.7E-11	0
Copper	D				4.92E+01		1.00E+00	3.44E-07				1.82E-11			
Cyanide, Total	D				1.16E+01	1.00E-01	1.00E+00	8.08E-08		2.67E-08		4.29E-12			
Dibenzo (a,h) anthracene	B2	7.30E+00	7.30E+00		9.07E-01	1.30E-01	1.00E+00	6.34E-09	4.6E-08	2.72E-09	2.0E-08	3.36E-13		6.6E-08	17
Dibenzofuran	D				3.69E+00		1.00E+00	2.58E-08				2.78E-09			
Fluoranthene	D				3.04E+00	1.30E-01	1.00E+00	2.13E-08		9.12E-09		1.13E-12			
Fluorene	D				7.74E-01		1.00E+00	5.41E-09				1.05E-09			
Fluoride	NA				1.49E+03	1.00E-01	1.00E+00	1.04E-05		3.44E-06		5.53E-10			
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		1.71E+00	1.30E-01	1.00E+00	1.20E-08	8.7E-09	5.14E-09	3.8E-09	6.36E-13		1.3E-08	3
Lead	B2				3.03E+01		1.00E+00	2.12E-07				1.12E-11			
Manganese	D				1.84E+02		4.00E-02	1.29E-06				6.82E-11			
Mercury	D				2.03E-01		7.00E-02	1.42E-09				7.53E-14			
Methylene Chloride	B2	7.50E-03	7.50E-03	1.60E-03	3.70E-03		1.00E+00	2.59E-11	1.9E-13			7.26E-10	1.2E-12	1.4E-12	0
Naphthalene	C				1.07E-01		1.00E+00	7.47E-10				1.21E-09			
Nickel	NA				1.16E+01		4.00E-02	8.11E-08				4.30E-12			
Polychlorinated Biphenyls (PCBs)	B2	2.00E+00	2.00E+00	2.00E+00	1.06E+00	1.40E-01	1.00E+00	7.42E-09	1.5E-08	3.43E-09	6.9E-09	3.93E-13	7.9E-13	2.2E-08	6
Pyrene	D				2.88E+00	1.30E-01	1.00E+00	2.02E-08		8.65E-09		3.72E-10			
Vanadium	NA				5.24E+01		2.60E-02	3.66E-07				1.94E-11			
Zinc	D				5.59E+01		1.00E+00	3.91E-07				2.07E-11			
Total Risk								3E-07		1E-07			2E-09		100
												Total Risk =	4E-07		

Note:
 Cancer WOE Classifications:
 Group A: Human carcinogen
 Group B (B1, B2): Probable human carcinogen
 Group C: Possible human carcinogen
 Group D: Not classifiable
 Group E: No evidence of carcinogenicity
 ABS_d = Dermal Absorption Factor
 ABS_{gi} = Gastrointestinal Absorption Factor
 CDI = Chronic Daily Intake
 ELCR = Excess Lifetime Cancer Risk
 EPC = Exposure Point Concentration
 mg/kg-day = milligrams per kilogram per day
 SF_d = Dermal Slope Factor
 SF_o = Oral Slope Factor
 SF_i = Inhalation Slope Factor
 WOE = Weight of Evidence

Table A-44
Near-Term Construction Worker Scenario - Potential Noncarcinogenic Risk - CTE
Subsurface Soil - East Plant Area
RMC Troutdale Facility

Chemical	RfD _o (mg/kg- day)	RfD _d (mg/kg- day)	RfD _i (mg/kg- day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		%	
							CDI (mg/kg- day)	HQ	CDI (mg/kg- day)	HQ	CDI (mg/kg- day)	HQ	Total HI	Contribution
2-Methylnaphthalene	4.00E-03	4.00E-03		2.94E+00		1.00E+00	1.44E-06	0.000			7.63E-11		0.000	0
Acenaphthene	6.00E-01	6.00E-01		8.08E-01		1.00E+00	3.95E-07	0.000			1.52E-07		0.000	0
Acetone	1.00E+00	1.00E+00		4.00E-02		1.00E+00	1.96E-08	0.000			1.09E-07		0.000	0
Aluminum	1.00E+00	1.00E+00	1.42E-03	1.14E+04		1.00E+00	5.57E-03	0.006			2.95E-07	0.00	0.006	4
Anthracene	3.00E+00	3.00E+00		8.42E-01		1.00E+00	4.12E-07	0.000			4.13E-08		0.000	0
Aroclor-1248	2.00E-05	2.00E-05		9.25E-01	1.40E-01	1.00E+00	4.52E-07	0.023	2.09E-07	0.0104	2.40E-11		0.033	20
Aroclor-1260	2.00E-05	2.00E-05		1.12E+00	1.40E-01	1.00E+00	5.49E-07	0.027	2.54E-07	0.0127	2.91E-11		0.040	25
Aroclor-1262	2.00E-05	2.00E-05		5.06E-02	1.40E-01	1.00E+00	2.48E-08	0.001	1.14E-08	0.0006	1.31E-12		0.002	1
Aroclor-1268	2.00E-05	2.00E-05		3.31E-01	1.40E-01	1.00E+00	1.62E-07	0.008	7.49E-08	0.0037	8.60E-12		0.012	7
Arsenic	3.00E-04	3.00E-04		3.05E+00	3.00E-02	1.00E+00	1.49E-06	0.005	1.48E-07	0.0005	7.91E-11		0.005	3
Barium	7.00E-02	4.90E-03	1.40E-04	5.70E+01		7.00E-02	2.79E-05	0.000			1.48E-09	0.00	0.000	0
Benzo (a) anthracene				2.10E+00	1.30E-01	1.00E+00	1.03E-06		4.42E-07		5.46E-11			
Benzo (a) pyrene				2.06E+00	1.30E-01	1.00E+00	1.01E-06		4.33E-07		5.36E-11			
Benzo (b) fluoranthene				4.13E+00	1.30E-01	1.00E+00	2.02E-06		8.68E-07		1.07E-10			
Benzo (k) fluoranthene				1.38E+00	1.30E-01	1.00E+00	6.77E-07		2.90E-07		3.59E-11			
Beryllium	5.00E-03	3.50E-05	5.71E-06	6.89E-01		7.00E-03	3.37E-07	0.000			1.79E-11	0.00	0.000	0
Bromomethane	5.00E-03	5.00E-03	1.43E-03	3.00E-03		1.00E+00	1.47E-09	0.000			5.68E-08	0.00	0.000	0
Cadmium	1.00E-03	2.50E-05		7.64E-01	1.00E-03	2.50E-02	3.74E-07	0.000	1.23E-09	0.0000	1.98E-11		0.000	0
Chromium	2.00E-02	5.00E-04	2.20E-06	1.66E+01		2.50E-02	8.13E-06	0.000			4.31E-10	0.00	0.001	0
Chrysene				3.89E+00	1.30E-01	1.00E+00	1.90E-06		8.16E-07		4.89E-08			
Cobalt	2.00E-02	2.00E-02	5.70E-06	7.39E+00		1.00E+00	3.61E-06	0.000			1.92E-10	0.00	0.000	0
Copper	4.00E-02	4.00E-02		4.92E+01		1.00E+00	2.41E-05	0.001			1.28E-09		0.001	0
Cyanide, Total	2.00E-02	2.00E-02		1.16E+01	1.00E-01	1.00E+00	5.66E-06	0.000	1.87E-06	0.0001	3.00E-10		0.000	0
Dibenzo (a,h) anthracene				9.07E-01	1.30E-01	1.00E+00	4.44E-07		1.90E-07		2.35E-11			
Dibenzofuran	2.00E-03	2.00E-03		3.69E+00		1.00E+00	1.81E-06	0.001			1.94E-07		0.001	1
Fluoranthene	4.00E-01	4.00E-01		3.04E+00	1.30E-01	1.00E+00	1.49E-06	0.000	6.38E-07	0.0000	7.89E-11		0.000	0
Fluorene	4.00E-01	4.00E-01		7.74E-01		1.00E+00	3.79E-07	0.000			7.36E-08		0.000	0
Fluoride	6.00E-02	6.00E-02		1.49E+03	1.00E-01	1.00E+00	7.30E-04	0.012	2.41E-04	0.0040	3.87E-08		0.016	10
Indeno (1,2,3-cd) pyrene				1.71E+00	1.30E-01	1.00E+00	8.39E-07		3.60E-07		4.45E-11			
Lead				3.03E+01		1.00E+00	1.48E-05				7.86E-10			
Manganese	1.40E-01	5.60E-03	1.40E-05	1.84E+02		4.00E-02	9.00E-05	0.001			4.77E-09	0.00	0.001	1
Mercury	3.00E-04	2.10E-05	3.00E-03	2.03E-01		7.00E-02	9.94E-08	0.000			5.27E-12	0.00	0.000	0
Methylene Chloride	6.00E-02	6.00E-02	8.60E-01	3.70E-03		1.00E+00	1.81E-09	0.000			5.08E-08	0.00	0.000	0
Naphthalene	2.00E-02	2.00E-02	8.57E-04	1.07E-01		1.00E+00	5.23E-08	0.000			8.45E-08	0.00	0.000	0
Nickel	2.00E-02	8.00E-04		1.16E+01		4.00E-02	5.68E-06	0.000			3.01E-10		0.000	0
Polychlorinated Biphenyls (PCBs)	2.00E-05	2.00E-05		1.06E+00	1.40E-01	1.00E+00	5.19E-07	0.026	2.40E-07	0.0120	2.75E-11		0.038	23
Pyrene	3.00E-01	3.00E-01		2.88E+00	1.30E-01	1.00E+00	1.41E-06	0.000	6.05E-07	0.0000	2.61E-08		0.000	0
Vanadium	7.00E-03	1.82E-04		5.24E+01		2.60E-02	2.56E-05	0.004			1.36E-09		0.004	2
Zinc	3.00E-01	3.00E-01		5.59E+01		1.00E+00	2.74E-05	0.000			1.45E-09		0.000	0
								0.1		0.04		0.001		100
												Total HI =	0.2	

Note:
ABS_d = Dermal Absorption Factor
ABS_{gi} = Gastrointestinal Absorption Factor
CDI = Chronic Daily Intake
EPC = Exposure Point Concentration
HI = Hazard Index
HQ = Hazard Quotient;
mg/kg-day = milligrams per kilogram per day
RfC = Reference Concentration
RfD_d = Dermal Reference Dose;
RfD_o = Oral Reference Dose
RfD_i = Inhalation Reference Dose

Table A-45
 Intermittent Excavation / Trench Worker Scenario - Potential Excess Lifetime Cancer Risk - RME
 Subsurface Soil - East Plant Area
 RMC Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total ELCR	Contribution	%	
								CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR				
2-Methylnaphthalene	NA				2.94E+00		1.00E+00	4.88E-09				7.84E-14					
Acenaphthene	NA				8.08E-01		1.00E+00	1.34E-09				1.56E-10					
Acetone	NA				4.00E-02		1.00E+00	6.64E-11				1.12E-10					
Aluminum	NA				1.14E+04		1.00E+00	1.89E-05				3.04E-10					
Anthracene	D				8.42E-01		1.00E+00	1.40E-09				4.25E-11					
Aroclor-1248	NA	2.00E+00	2.00E+00	2.00E+00	9.25E-01	1.40E-01	1.00E+00	1.54E-09	3.1E-09	6.45E-10	1.3E-09	2.47E-14	4.9E-14	4.4E-09		5	
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	1.12E+00	1.40E-01	1.00E+00	1.86E-09	3.7E-09	7.82E-10	1.6E-09	2.99E-14	6.0E-14	5.3E-09		6	
Aroclor-1262	NA	2.00E+00	2.00E+00	2.00E+00	5.06E-02	1.40E-01	1.00E+00	8.41E-11	1.7E-10	3.53E-11	7.1E-11	1.35E-15	2.7E-15	2.4E-10		0	
Aroclor-1268	NA	2.00E+00	2.00E+00	2.00E+00	3.31E-01	1.40E-01	1.00E+00	5.50E-10	1.1E-09	2.31E-10	4.6E-10	8.84E-15	1.8E-14	1.6E-09		2	
Arsenic	A	1.50E+00	1.50E+00	1.51E+01	3.05E+00	3.00E-02	1.00E+00	5.06E-09	7.6E-09	4.56E-10	6.8E-10	8.13E-14	1.2E-12	8.3E-09		9	
Barium	D				5.70E+01		7.00E-02	9.46E-08				1.52E-12					
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		2.10E+00	1.30E-01	1.00E+00	3.49E-09	2.6E-09	1.36E-09	9.9E-10	5.62E-14		3.5E-09		4	
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		2.06E+00	1.30E-01	1.00E+00	3.43E-09	2.5E-08	1.34E-09	9.8E-09	5.51E-14		3.5E-08		39	
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		4.13E+00	1.30E-01	1.00E+00	6.87E-09	5.0E-09	2.68E-09	2.0E-09	1.10E-13		7.0E-09		8	
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		1.38E+00	1.30E-01	1.00E+00	2.30E-09	1.7E-10	8.96E-10	6.5E-11	3.69E-14		2.3E-10		0	
Beryllium	B1			8.40E+00	6.89E-01		7.00E-03	1.14E-09				1.84E-14	1.5E-13	1.5E-13		0	
Bromomethane	D				3.00E-03		1.00E+00	4.98E-12				5.84E-11					
Cadmium	B1			6.30E+00	7.64E-01	1.00E-03	2.50E-02	1.27E-09		3.81E-12		2.04E-14	1.3E-13	1.3E-13		0	
Chromium	A			2.94E+02	1.66E+01		2.50E-02	2.76E-08				4.43E-13	1.3E-10	1.3E-10		0	
Chrysene	B2	7.30E-03	7.30E-03		3.89E+00	1.30E-01	1.00E+00	6.45E-09	4.7E-11	2.52E-09	1.8E-11	5.03E-11		6.5E-11		0	
Cobalt	NA			9.80E+00	7.39E+00		1.00E+00	1.23E-08				1.97E-13	1.9E-12	1.9E-12		0	
Copper	D				4.92E+01		1.00E+00	8.17E-08				1.31E-12					
Cyanide, Total	D				1.16E+01	1.00E-01	1.00E+00	1.92E-08		5.76E-09		3.09E-13					
Dibenzo (a,h) anthracene	B2	7.30E+00	7.30E+00		9.07E-01	1.30E-01	1.00E+00	1.51E-09	1.1E-08	5.87E-10	4.3E-09	2.42E-14		1.5E-08		17	
Dibenzofuran	D				3.69E+00		1.00E+00	6.13E-09				2.00E-10					
Fluoranthene	D				3.04E+00	1.30E-01	1.00E+00	5.05E-09		1.97E-09		8.12E-14					
Fluorene	D				7.74E-01		1.00E+00	1.29E-09				7.58E-11					
Fluoride	NA				1.49E+03	1.00E-01	1.00E+00	2.48E-06		7.43E-07		3.98E-11					
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		1.71E+00	1.30E-01	1.00E+00	2.85E-09	2.1E-09	1.11E-09	8.1E-10	4.58E-14		2.9E-09		3	
Lead	B2				3.03E+01		1.00E+00	5.03E-08				8.08E-13					
Manganese	D				1.84E+02		4.00E-02	3.06E-07				4.91E-12					
Mercury	D				2.03E-01		7.00E-02	3.38E-10				5.42E-15					
Methylene Chloride	B2	7.50E-03	7.50E-03	1.60E-03	3.70E-03		1.00E+00	6.14E-12	4.6E-14			5.23E-11	8.4E-14	1.3E-13		0	
Naphthalene	C				1.07E-01		1.00E+00	1.77E-10				8.69E-11					
Nickel	NA				1.16E+01		4.00E-02	1.93E-08				3.10E-13					
Polychlorinated Biphenyls (PCBs)	B2	2.00E+00	2.00E+00	2.00E+00	1.06E+00	1.40E-01	1.00E+00	1.76E-09	3.5E-09	7.40E-10	1.5E-09	2.83E-14	5.7E-14	5.0E-09		6	
Pyrene	D				2.88E+00	1.30E-01	1.00E+00	4.79E-09		1.87E-09		2.68E-11					
Vanadium	NA				5.24E+01		2.60E-02	8.70E-08				1.40E-12					
Zinc	D				5.59E+01		1.00E+00	9.29E-08				1.49E-12					
Total Risk									7E-08		2E-08						100
												Total Risk =					
													1E-10				
													9E-08				

Note:
 Cancer WOE Classifications:
 Group A: Human carcinogen
 Group B (B1, B2): Probable human carcinogen
 Group C: Possible human carcinogen
 Group D: Not classifiable
 Group E: No evidence of carcinogenicity
 ABS_d = Dermal Absorption Factor
 ABS_{gi} = Gastrointestinal Absorption Factor
 CDI = Chronic Daily Intake
 ELCR = Excess Lifetime Cancer Risk
 EPC = Exposure Point Concentration
 mg/kg-day = milligrams per kilogram per day
 SF_d = Dermal Slope Factor
 SF_o = Oral Slope Factor
 SF_i = Inhalation Slope Factor
 WOE = Weight of Evidence

Table A-47
 Intermittent Excavation / Trench Worker Scenario - Potential Excess Lifetime Cancer Risk - CTE
 Subsurface Soil - East Plant Area
 RMC Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total ELCR	Contribution	%
								CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR			
2-Methylnaphthalene	NA				2.94E+00		1.00E+00	7.39E-10				3.92E-14				
Acenaphthene	NA				8.08E-01		1.00E+00	2.03E-10				7.82E-11				
Acetone	NA				4.00E-02		1.00E+00	1.01E-11				5.61E-11				
Aluminum	NA				1.14E+04		1.00E+00	2.86E-06				1.52E-10				
Anthracene	D				8.42E-01		1.00E+00	2.12E-10				2.13E-11				
Aroclor-1248	NA	2.00E+00	2.00E+00	2.00E+00	9.25E-01	1.40E-01	1.00E+00	2.33E-10	4.7E-10	1.07E-10	2.1E-10	1.23E-14	2.5E-14	6.8E-10	5	
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	1.12E+00	1.40E-01	1.00E+00	2.82E-10	5.6E-10	1.30E-10	2.6E-10	1.50E-14	3.0E-14	8.3E-10	6	
Aroclor-1262	NA	2.00E+00	2.00E+00	2.00E+00	5.06E-02	1.40E-01	1.00E+00	1.27E-11	2.5E-11	5.89E-12	1.2E-11	6.76E-16	1.4E-15	3.7E-11	0	
Aroclor-1268	NA	2.00E+00	2.00E+00	2.00E+00	3.31E-01	1.40E-01	1.00E+00	8.34E-11	1.7E-10	3.85E-11	7.7E-11	4.42E-15	8.8E-15	2.4E-10	2	
Arsenic	A	1.50E+00	1.50E+00	1.51E+01	3.05E+00	3.00E-02	1.00E+00	7.67E-10	1.2E-09	7.59E-11	1.1E-10	4.07E-14	6.1E-13	1.3E-09	9	
Barium	D				5.70E+01		7.00E-02	1.43E-08				7.60E-13				
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		2.10E+00	1.30E-01	1.00E+00	5.29E-10	3.9E-10	2.27E-10	1.7E-10	2.81E-14		5.5E-10	4	
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		2.06E+00	1.30E-01	1.00E+00	5.20E-10	3.8E-09	2.23E-10	1.6E-09	2.76E-14		5.4E-09	39	
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		4.13E+00	1.30E-01	1.00E+00	1.04E-09	7.6E-10	4.46E-10	3.3E-10	5.52E-14		1.1E-09	8	
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		1.38E+00	1.30E-01	1.00E+00	3.48E-10	2.5E-11	1.49E-10	1.1E-11	1.85E-14		3.6E-11	0	
Beryllium	B1			8.40E+00	6.89E-01		7.00E-03	1.73E-10				9.19E-15	7.7E-14	7.7E-14	0	
Bromomethane	D				3.00E-03		1.00E+00	7.55E-13				2.92E-11				
Cadmium	B1			6.30E+00	7.64E-01	1.00E-03	2.50E-02	1.92E-10		6.35E-13		1.02E-14	6.4E-14	6.4E-14	0	
Chromium	A			2.94E+02	1.66E+01		2.50E-02	4.18E-09				2.22E-13	6.5E-11	6.5E-11	0	
Chrysene	B2	7.30E-03	7.30E-03		3.89E+00	1.30E-01	1.00E+00	9.78E-10	7.1E-12	4.19E-10	3.1E-12	2.52E-11		1.0E-11	0	
Cobalt	NA			9.80E+00	7.39E+00		1.00E+00	1.86E-09				9.85E-14	9.7E-13	9.7E-13	0	
Copper	D				4.92E+01		1.00E+00	1.24E-08				6.56E-13				
Cyanide, Total	D				1.16E+01	1.00E-01	1.00E+00	2.91E-09		9.60E-10		1.54E-13				
Dibenzo (a,h) anthracene	B2	7.30E+00	7.30E+00		9.07E-01	1.30E-01	1.00E+00	2.28E-10	1.7E-09	9.79E-11	7.1E-10	1.21E-14		2.4E-09	17	
Dibenzofuran	D				3.69E+00		1.00E+00	9.28E-10				9.99E-11				
Fluoranthene	D				3.04E+00	1.30E-01	1.00E+00	7.65E-10		3.28E-10		4.06E-14				
Fluorene	D				7.74E-01		1.00E+00	1.95E-10				3.79E-11				
Fluoride	NA				1.49E+03	1.00E-01	1.00E+00	3.75E-07		1.24E-07		1.99E-11				
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		1.71E+00	1.30E-01	1.00E+00	4.32E-10	3.1E-10	1.85E-10	1.4E-10	2.29E-14		4.5E-10	3	
Lead	B2				3.03E+01		1.00E+00	7.62E-09				4.04E-13				
Manganese	D				1.84E+02		4.00E-02	4.63E-08				2.46E-12				
Mercury	D				2.03E-01		7.00E-02	5.11E-11				2.71E-15				
Methylene Chloride	B2	7.50E-03	7.50E-03	1.60E-03	3.70E-03		1.00E+00	9.31E-13	7.0E-15			2.61E-11	4.2E-14	4.9E-14	0	
Naphthalene	C				1.07E-01		1.00E+00	2.69E-11				4.34E-11				
Nickel	NA				1.16E+01		4.00E-02	2.92E-09				1.55E-13				
Polychlorinated Biphenyls (PCBs)	B2	2.00E+00	2.00E+00	2.00E+00	1.06E+00	1.40E-01	1.00E+00	2.67E-10	5.3E-10	1.23E-10	2.5E-10	1.42E-14	2.8E-14	7.8E-10	6	
Pyrene	D				2.88E+00	1.30E-01	1.00E+00	7.26E-10		3.11E-10		1.34E-11				
Vanadium	NA				5.24E+01		2.60E-02	1.32E-08				6.99E-13				
Zinc	D				5.59E+01		1.00E+00	1.41E-08				7.47E-13				
Total Risk									1E-08		4E-09					100
												Total Risk =				
													7E-11			
													1E-08			

Note:
 Cancer WOE Classifications:
 Group A: Human carcinogen
 Group B (B1, B2): Probable human carcinogen
 Group C: Possible human carcinogen
 Group D: Not classifiable
 Group E: No evidence of carcinogenicity
 ABS_d = Dermal Absorption Factor
 ABS_{gi} = Gastrointestinal Absorption Factor
 CDI = Chronic Daily Intake
 ELCR = Excess Lifetime Cancer Risk
 EPC = Exposure Point Concentration
 mg/kg-day = milligrams per kilogram per day
 SF_d = Dermal Slope Factor
 SF_o = Oral Slope Factor
 SF_i = Inhalation Slope Factor
 WOE = Weight of Evidence

Table A-48
 Intermittent Excavation / Trench Worker Scenario - Potential Noncarcinogenic Risk - CTE
 Subsurface Soil - East Plant Area
 RMC Troutdale Facility

Chemical	RfD _o (mg/kg- day)	RfD _d (mg/kg- day)	RfD _i (mg/kg- day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total HI	Contribution	%
							CDI (mg/kg- day)	HQ	CDI (mg/kg- day)	HQ	CDI (mg/kg- day)	HQ			
2-Methylnaphthalene	4.00E-03	4.00E-03		2.94E+00		1.00E+00	5.18E-08	0.000			2.75E-12		0.000	0	
Acenaphthene	6.00E-01	6.00E-01		8.08E-01		1.00E+00	1.42E-08	0.000			5.47E-09		0.000	0	
Acetone	1.00E+00	1.00E+00		4.00E-02		1.00E+00	7.05E-10	0.000			3.93E-09		0.000	0	
Aluminum	1.00E+00	1.00E+00	1.42E-03	1.14E+04		1.00E+00	2.00E-04	0.000			1.06E-08	0.00	0.000	4	
Anthracene	3.00E+00	3.00E+00		8.42E-01		1.00E+00	1.48E-08	0.000			1.49E-09		0.000	0	
Aroclor-1248	2.00E-05	2.00E-05		9.25E-01	1.40E-01	1.00E+00	1.63E-08	0.001	7.52E-09	0.0004	8.64E-13		0.001	20	
Aroclor-1260	2.00E-05	2.00E-05		1.12E+00	1.40E-01	1.00E+00	1.98E-08	0.001	9.13E-09	0.0005	1.05E-12		0.001	25	
Aroclor-1262	2.00E-05	2.00E-05		5.06E-02	1.40E-01	1.00E+00	8.92E-10	0.000	4.12E-10	0.0000	4.73E-14		0.000	1	
Aroclor-1268	2.00E-05	2.00E-05		3.31E-01	1.40E-01	1.00E+00	5.84E-09	0.000	2.70E-09	0.0001	3.10E-13		0.000	7	
Arsenic	3.00E-04	3.00E-04		3.05E+00	3.00E-02	1.00E+00	5.37E-08	0.000	5.32E-09	0.0000	2.85E-12		0.000	3	
Barium	7.00E-02	4.90E-03	1.40E-04	5.70E+01		7.00E-02	1.00E-06	0.000			5.32E-11	0.00	0.000	0	
Benzo (a) anthracene				2.10E+00	1.30E-01	1.00E+00	3.71E-08		1.59E-08		1.97E-12				
Benzo (a) pyrene				2.06E+00	1.30E-01	1.00E+00	3.64E-08		1.56E-08		1.93E-12				
Benzo (b) fluoranthene				4.13E+00	1.30E-01	1.00E+00	7.28E-08		3.12E-08		3.86E-12				
Benzo (k) fluoranthene				1.38E+00	1.30E-01	1.00E+00	2.44E-08		1.05E-08		1.29E-12				
Beryllium	5.00E-03	3.50E-05	5.71E-06	6.89E-01		7.00E-03	1.21E-08	0.000			6.43E-13	0.00	0.000	0	
Bromomethane	5.00E-03	5.00E-03	1.43E-03	3.00E-03		1.00E+00	5.28E-11	0.000			2.05E-09	0.00	0.000	0	
Cadmium	1.00E-03	2.50E-05		7.64E-01	1.00E-03	2.50E-02	1.35E-08	0.000	4.44E-11	0.0000	7.14E-13		0.000	0	
Chromium	2.00E-02	5.00E-04	2.20E-06	1.66E+01		2.50E-02	2.93E-07	0.000			1.55E-11	0.00	0.000	0	
Chrysene				3.89E+00	1.30E-01	1.00E+00	6.84E-08		2.94E-08		1.76E-09				
Cobalt	2.00E-02	2.00E-02	5.70E-06	7.39E+00		1.00E+00	1.30E-07	0.000			6.90E-12	0.00	0.000	0	
Copper	4.00E-02	4.00E-02		4.92E+01		1.00E+00	8.66E-07	0.000			4.59E-11		0.000	0	
Cyanide, Total	2.00E-02	2.00E-02		1.16E+01	1.00E-01	1.00E+00	2.04E-07	0.000	6.72E-08	0.0000	1.08E-11		0.000	0	
Dibenzo (a,h) anthracene				9.07E-01	1.30E-01	1.00E+00	1.60E-08		6.85E-09		8.47E-13				
Dibenzofuran	2.00E-03	2.00E-03		3.69E+00		1.00E+00	6.50E-08	0.000			7.00E-09		0.000	1	
Fluoranthene	4.00E-01	4.00E-01		3.04E+00	1.30E-01	1.00E+00	5.36E-08	0.000	2.30E-08	0.0000	2.84E-12		0.000	0	
Fluorene	4.00E-01	4.00E-01		7.74E-01		1.00E+00	1.36E-08	0.000			2.65E-09		0.000	0	
Fluoride	6.00E-02	6.00E-02		1.49E+03	1.00E-01	1.00E+00	2.63E-05	0.000	8.67E-06	0.0001	1.39E-09		0.001	10	
Indeno (1,2,3-cd) pyrene				1.71E+00	1.30E-01	1.00E+00	3.02E-08		1.30E-08		1.60E-12				
Lead				3.03E+01		1.00E+00	5.33E-07				2.83E-11				
Manganese	1.40E-01	5.60E-03	1.40E-05	1.84E+02		4.00E-02	3.24E-06	0.000			1.72E-10	0.00	0.000	1	
Mercury	3.00E-04	2.10E-05	3.00E-03	2.03E-01		7.00E-02	3.58E-09	0.000			1.90E-13	0.00	0.000	0	
Methylene Chloride	6.00E-02	6.00E-02	8.60E-01	3.70E-03		1.00E+00	6.52E-11	0.000			1.83E-09	0.00	0.000	0	
Naphthalene	2.00E-02	2.00E-02	8.57E-04	1.07E-01		1.00E+00	1.88E-09	0.000			3.04E-09	0.00	0.000	0	
Nickel	2.00E-02	8.00E-04		1.16E+01		4.00E-02	2.04E-07	0.000			1.08E-11		0.000	0	
Polychlorinated Biphenyls (PCBs)	2.00E-05	2.00E-05		1.06E+00	1.40E-01	1.00E+00	1.87E-08	0.001	8.63E-09	0.0004	9.91E-13		0.001	23	
Pyrene	3.00E-01	3.00E-01		2.88E+00	1.30E-01	1.00E+00	5.08E-08	0.000	2.18E-08	0.0000	9.38E-10		0.000	0	
Vanadium	7.00E-03	1.82E-04		5.24E+01		2.60E-02	9.23E-07	0.000			4.90E-11		0.000	2	
Zinc	3.00E-01	3.00E-01		5.59E+01		1.00E+00	9.85E-07	0.000			5.23E-11		0.000	0	
								0.004		0.002		0.00003			100
											Total HI =	0.01			

Note:
 ABS_d = Dermal Absorption Factor
 ABS_{gi} = Gastrointestinal Absorption Factor
 CDI = Chronic Daily Intake
 EPC = Exposure Point Concentration
 HI = Hazard Index
 HQ = Hazard Quotient;
 mg/kg-day = milligrams per kilogram per day
 RfC = Reference Concentration
 RfD_d = Dermal Reference Dose;
 RfD_o = Oral Reference Dose
 RfD_i = Inhalation Reference Dose

Table A-49
Hypothetical Occupational Worker Scenario - Potential Excess Lifetime Cancer Risk - RME
Surface Soil - East Plant Area
RMC Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total ELCR	Contribution	%	
								CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR				
1,2,4-Trimethylbenzene	-				8.40E-04		1.00E+00	2.94E-10				1.04E-09					
1,4-Dichlorobenzene	NA	2.40E-02	2.40E-02	2.20E-02	3.68E+00		1.00E+00	1.28E-06	3.1E-08			6.95E-06	1.5E-07	1.8E-07		1	
2-Methylnaphthalene	NA				8.00E-02		1.00E+00	2.80E-08				1.48E-12					
Acenaphthene	NA				1.33E-01		1.00E+00	4.64E-08				1.78E-08					
Acetone	NA				4.00E-02		1.00E+00	1.40E-08				7.79E-08					
Aluminum	NA				1.30E+04		1.00E+00	4.53E-03				2.40E-07					
Anthracene	D				2.91E-01		1.00E+00	1.02E-07				1.02E-08					
Aroclor-1248	NA	2.00E+00	2.00E+00	2.00E+00	7.92E-01	1.40E-01	1.00E+00	2.77E-07	5.5E-07	1.28E-07	2.6E-07	1.47E-11	2.9E-11	8.1E-07		6	
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	5.65E-01	1.40E-01	1.00E+00	1.98E-07	4.0E-07	9.13E-08	1.8E-07	1.05E-11	2.1E-11	5.8E-07		5	
Aroclor-1268	NA	2.00E+00	2.00E+00	2.00E+00	5.29E-01	1.40E-01	1.00E+00	1.85E-07	3.7E-07	8.54E-08	1.7E-07	9.80E-12	2.0E-11	5.4E-07		4	
Arsenic	A	1.50E+00	1.50E+00	1.51E+01	3.75E+00	3.00E-02	1.00E+00	1.31E-06	2.0E-06	1.30E-07	1.9E-07	6.95E-11	1.0E-09	2.2E-06		17	
Barium	D				6.46E+01		7.00E-02	2.26E-05				1.20E-09					
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		1.79E+00	1.30E-01	1.00E+00	6.26E-07	4.6E-07	2.69E-07	2.0E-07	3.32E-11		6.5E-07		5	
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		1.32E+00	1.30E-01	1.00E+00	4.60E-07	3.4E-06	1.97E-07	1.4E-06	2.44E-11		4.8E-06		38	
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		3.13E+00	1.30E-01	1.00E+00	1.09E-06	8.0E-07	4.69E-07	3.4E-07	5.80E-11		1.1E-06		9	
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		7.53E-01	1.30E-01	1.00E+00	2.63E-07	1.9E-08	1.13E-07	8.2E-09	1.40E-11		2.7E-08		0	
Beryllium	B1			8.40E+00	9.46E-01		7.00E-03	3.30E-07				1.75E-11	1.5E-10	1.5E-10		0	
Bromomethane	D				2.30E-03		1.00E+00	8.04E-10				3.11E-08					
Cadmium	B1			6.30E+00	1.12E+00	1.00E-03	2.50E-02	3.90E-07		1.29E-09		2.07E-11	1.3E-10	1.3E-10		0	
Chromium	A			2.94E+02	2.14E+01		2.50E-02	7.46E-06				3.96E-10	1.2E-07	1.2E-07		1	
Chrysene	B2	7.30E-03	7.30E-03		2.40E+00	1.30E-01	1.00E+00	8.40E-07	6.1E-09	3.60E-07	2.6E-09	2.16E-08		8.8E-09		0	
Cobalt	NA			9.80E+00	1.21E+01		1.00E+00	4.22E-06				2.24E-10	2.2E-09	2.2E-09		0	
Copper	D				8.25E+01		1.00E+00	2.88E-05				1.53E-09					
Cyanide, Total	D				2.21E+01	1.00E-01	1.00E+00	7.73E-06		2.55E-06		4.10E-10					
Dibenzo (a,h) anthracene	B2	7.30E+00	7.30E+00		2.80E-01	1.30E-01	1.00E+00	9.77E-08	7.1E-07	4.19E-08	3.1E-07	5.18E-12		1.0E-06		8	
Dibenzofuran	D				4.10E-01		1.00E+00	1.43E-07				1.54E-08					
Fluoranthene	D				2.25E+00	1.30E-01	1.00E+00	7.88E-07		3.38E-07		4.18E-11					
Fluorene	D				1.07E-01		1.00E+00	3.74E-08				7.27E-09					
Fluoride	NA				1.32E+03	1.00E-01	1.00E+00	4.62E-04		1.52E-04		2.45E-08					
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		1.76E+00	1.30E-01	1.00E+00	6.14E-07	4.5E-07	2.63E-07	1.9E-07	3.26E-11		6.4E-07		5	
Lead	B2				4.96E+01		1.00E+00	1.73E-05				9.20E-10					
Manganese	D				3.44E+02		4.00E-02	1.20E-04				6.38E-09					
Mercury	D				3.34E-01		7.00E-02	1.17E-07				6.19E-12					
Methylene Chloride	B2	7.50E-03	7.50E-03	1.60E-03	3.70E-03		1.00E+00	1.29E-09	9.7E-12			3.63E-08	5.8E-11	6.8E-11		0	
Naphthalene	C				7.94E-02		1.00E+00	2.78E-08				4.49E-08					
Nickel	NA				1.52E+01		4.00E-02	5.32E-06				2.82E-10					
Pyrene	D				2.12E+00	1.30E-01	1.00E+00	7.42E-07		3.18E-07		1.37E-08					
Vanadium	NA				6.87E+01		2.60E-02	2.40E-05				1.27E-09					
Zinc	D				9.88E+01		1.00E+00	3.45E-05				1.83E-09					
Total Risk									9E-06		3E-06						100
												Total Risk =	3E-07	1E-05			

Note:
Cancer WOE Classifications:
Group A: Human carcinogen
Group B (B1, B2): Probable human carcinogen
Group C: Possible human carcinogen
Group D: Not classifiable
Group E: No evidence of carcinogenicity
ABS_d = Dermal Absorption Factor
ABS_{gi} = Gastrointestinal Absorption Factor
CDI = Chronic Daily Intake
ELCR = Excess Lifetime Cancer Risk
EPC = Exposure Point Concentration
mg/kg-day = milligrams per kilogram per day
SF_d = Dermal Slope Factor
SF_o = Oral Slope Factor
SF_i = Inhalation Slope Factor
WOE = Weight of Evidence

Table A-50
Hypothetical Occupational Worker Scenario - Potential Noncarcinogenic Risk - RME
Surface Soil - East Plant Area
RMC Troutdale Facility

Chemical	RfD _o (mg/kg- day)	RfD _d (mg/kg- day)	RfD _i (mg/kg- day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total HI	Contribution	%
							CDI (mg/kg- day)	HQ	CDI (mg/kg- day)	HQ	CDI (mg/kg- day)	HQ			
1,2,4-Trimethylbenzene	5.00E-02	5.00E-02	1.70E-03	8.40E-04		1.00E+00	8.22E-10	0.000			2.93E-09	0.00	0.000	0	
1,4-Dichlorobenzene	3.00E-02	3.00E-02	2.50E+00	3.68E+00		1.00E+00	3.60E-06	0.000			1.94E-05	0.00	0.000	0	
2-Methylnaphthalene	4.00E-03	4.00E-03		8.00E-02		1.00E+00	7.83E-08	0.000			4.15E-12		0.000	0	
Acenaphthene	6.00E-01	6.00E-01		1.33E-01		1.00E+00	1.30E-07	0.000			4.99E-08		0.000	0	
Acetone	1.00E+00	1.00E+00		4.00E-02		1.00E+00	3.91E-08	0.000			2.18E-07		0.000	0	
Aluminum	1.00E+00	1.00E+00	1.42E-03	1.30E+04		1.00E+00	1.27E-02	0.013			6.72E-07	0.00	0.013	6	
Anthracene	3.00E+00	3.00E+00		2.91E-01		1.00E+00	2.85E-07	0.000			2.86E-08		0.000	0	
Aroclor-1248	2.00E-05	2.00E-05		7.92E-01	1.40E-01	1.00E+00	7.75E-07	0.039	3.58E-07	0.0179	4.11E-11		0.057	26	
Aroclor-1260	2.00E-05	2.00E-05		5.65E-01	1.40E-01	1.00E+00	5.53E-07	0.028	2.56E-07	0.0128	2.93E-11		0.040	19	
Aroclor-1268	2.00E-05	2.00E-05		5.29E-01	1.40E-01	1.00E+00	5.18E-07	0.026	2.39E-07	0.0120	2.75E-11		0.038	18	
Arsenic	3.00E-04	3.00E-04		3.75E+00	3.00E-02	1.00E+00	3.67E-06	0.012	3.63E-07	0.0012	1.95E-10		0.013	6	
Barium	7.00E-02	4.90E-03	1.40E-04	6.46E+01		7.00E-02	6.32E-05	0.001			3.35E-09	0.00	0.001	0	
Benzo (a) anthracene				1.79E+00	1.30E-01	1.00E+00	1.75E-06		7.52E-07		9.29E-11				
Benzo (a) pyrene				1.32E+00	1.30E-01	1.00E+00	1.29E-06		5.52E-07		6.83E-11				
Benzo (b) fluoranthene				3.13E+00	1.30E-01	1.00E+00	3.06E-06		1.31E-06		1.62E-10				
Benzo (k) fluoranthene				7.53E-01	1.30E-01	1.00E+00	7.37E-07		3.16E-07		3.91E-11				
Beryllium	5.00E-03	3.50E-05	5.71E-06	9.46E-01		7.00E-03	9.25E-07	0.000			4.91E-11	0.00	0.000	0	
Bromomethane	5.00E-03	5.00E-03	1.43E-03	2.30E-03		1.00E+00	2.25E-09	0.000			8.71E-08	0.00	0.000	0	
Cadmium	1.00E-03	2.50E-05		1.12E+00	1.00E-03	2.50E-02	1.09E-06	0.001	3.61E-09	0.0001	5.79E-11		0.001	1	
Chromium	2.00E-02	5.00E-04	2.20E-06	2.14E+01		2.50E-02	2.09E-05	0.001			1.11E-09	0.00	0.002	1	
Chrysene				2.40E+00	1.30E-01	1.00E+00	2.35E-06		1.01E-06		6.05E-08				
Cobalt	2.00E-02	2.00E-02	5.70E-06	1.21E+01		1.00E+00	1.18E-05	0.001			6.27E-10	0.00	0.001	0	
Copper	4.00E-02	4.00E-02		8.25E+01		1.00E+00	8.07E-05	0.002			4.28E-09		0.002	1	
Cyanide, Total	2.00E-02	2.00E-02		2.21E+01	1.00E-01	1.00E+00	2.17E-05	0.001	7.15E-06	0.0004	1.15E-09		0.001	1	
Dibenzo (a,h) anthracene				2.80E-01	1.30E-01	1.00E+00	2.74E-07		1.17E-07		1.45E-11				
Dibenzofuran	2.00E-03	2.00E-03		4.10E-01		1.00E+00	4.01E-07	0.000			4.32E-08		0.000	0	
Fluoranthene	4.00E-01	4.00E-01		2.25E+00	1.30E-01	1.00E+00	2.21E-06	0.000	9.46E-07	0.0000	1.17E-10		0.000	0	
Fluorene	4.00E-01	4.00E-01		1.07E-01		1.00E+00	1.05E-07	0.000			2.04E-08		0.000	0	
Fluoride	6.00E-02	6.00E-02		1.32E+03	1.00E-01	1.00E+00	1.29E-03	0.022	4.27E-04	0.0071	6.86E-08		0.029	13	
Indeno (1,2,3-cd) pyrene				1.76E+00	1.30E-01	1.00E+00	1.72E-06		7.38E-07		9.12E-11				
Lead				4.96E+01		1.00E+00	4.86E-05				2.58E-09				
Manganese	1.40E-01	5.60E-03	1.40E-05	3.44E+02		4.00E-02	3.37E-04	0.002			1.79E-08	0.00	0.004	2	
Mercury	3.00E-04	2.10E-05	3.00E-03	3.34E-01		7.00E-02	3.27E-07	0.001			1.73E-11	0.00	0.001	1	
Methylene Chloride	6.00E-02	6.00E-02	8.60E-01	3.70E-03		1.00E+00	3.62E-09	0.000			1.02E-07	0.00	0.000	0	
Naphthalene	2.00E-02	2.00E-02	8.57E-04	7.94E-02		1.00E+00	7.77E-08	0.000			1.26E-07	0.00	0.000	0	
Nickel	2.00E-02	8.00E-04		1.52E+01		4.00E-02	1.49E-05	0.001			7.90E-10		0.001	0	
Pyrene	3.00E-01	3.00E-01		2.12E+00	1.30E-01	1.00E+00	2.08E-06	0.000	8.91E-07	0.0000	3.84E-08		0.000	0	
Vanadium	7.00E-03	1.82E-04		6.87E+01		2.60E-02	6.72E-05	0.010			3.56E-09		0.010	4	
Zinc	3.00E-01	3.00E-01		9.88E+01		1.00E+00	9.67E-05	0.000			5.13E-09		0.000	0	
								0.2		0.05		0.003			100
												0.2			

Note:
ABS_d = Dermal Absorption Factor
ABS_{gi} = Gastrointestinal Absorption Factor
CDI = Chronic Daily Intake
EPC = Exposure Point Concentration
HI = Hazard Index
HQ = Hazard Quotient;
mg/kg-day = milligrams per kilogram per day
RfC = Reference Concentration
RfD_d = Dermal Reference Dose;
RfD_o = Oral Reference Dose
RfD_i = Inhalation Reference Dose

Table A-51
Hypothetical Occupational Worker Scenario - Potential Excess Lifetime Cancer Risk - CTE
Surface Soil - East Plant Area
RMC Troutdale Facility

Chemical	WOE	SF _o (mg/kg-day) ⁻¹	SF _d (mg/kg-day) ⁻¹	SF _i (mg/kg-day) ⁻¹	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total ELCR	Contribution	%	
								CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR	CDI (mg/kg-day)	ELCR				
1,2,4-Trimethylbenzene	-				8.40E-04		1.00E+00	3.52E-11				2.51E-10					
1,4-Dichlorobenzene	NA	2.40E-02	2.40E-02	2.20E-02	3.68E+00		1.00E+00	1.54E-07	3.7E-09			1.67E-06	3.7E-08	4.0E-08	3		
2-Methylnaphthalene	NA				8.00E-02		1.00E+00	3.35E-09				3.56E-13					
Acenaphthene	NA				1.33E-01		1.00E+00	5.56E-09				4.28E-09					
Acetone	NA				4.00E-02		1.00E+00	1.68E-09				1.87E-08					
Aluminum	NA				1.30E+04		1.00E+00	5.43E-04				5.76E-08					
Anthracene	D				2.91E-01		1.00E+00	1.22E-08				2.45E-09					
Aroclor-1248	NA	2.00E+00	2.00E+00	2.00E+00	7.92E-01	1.40E-01	1.00E+00	3.32E-08	6.6E-08	6.14E-09	1.2E-08	3.52E-12	7.0E-12	7.9E-08	6		
Aroclor-1260	NA	2.00E+00	2.00E+00	2.00E+00	5.65E-01	1.40E-01	1.00E+00	2.37E-08	4.7E-08	4.38E-09	8.8E-09	2.51E-12	5.0E-12	5.6E-08	4		
Aroclor-1268	NA	2.00E+00	2.00E+00	2.00E+00	5.29E-01	1.40E-01	1.00E+00	2.22E-08	4.4E-08	4.10E-09	8.2E-09	2.35E-12	4.7E-12	5.3E-08	4		
Arsenic	A	1.50E+00	1.50E+00	1.51E+01	3.75E+00	3.00E-02	1.00E+00	1.57E-07	2.4E-07	6.23E-09	9.3E-09	1.67E-11	2.5E-10	2.5E-07	19		
Barium	D				6.46E+01		7.00E-02	2.71E-06				2.87E-10					
Benzo (a) anthracene	B2	7.30E-01	7.30E-01		1.79E+00	1.30E-01	1.00E+00	7.51E-08	5.5E-08	1.29E-08	9.4E-09	7.97E-12		6.4E-08	5		
Benzo (a) pyrene	B2	7.30E+00	7.30E+00		1.32E+00	1.30E-01	1.00E+00	5.52E-08	4.0E-07	9.47E-09	6.9E-08	5.85E-12		4.7E-07	36		
Benzo (b) fluoranthene	B2	7.30E-01	7.30E-01		3.13E+00	1.30E-01	1.00E+00	1.31E-07	9.6E-08	2.25E-08	1.6E-08	1.39E-11		1.1E-07	9		
Benzo (k) fluoranthene	B2	7.30E-02	7.30E-02		7.53E-01	1.30E-01	1.00E+00	3.16E-08	2.3E-09	5.42E-09	4.0E-10	3.35E-12		2.7E-09	0		
Beryllium	B1			8.40E+00	9.46E-01		7.00E-03	3.97E-08				4.21E-12	3.5E-11	3.5E-11	0		
Bromomethane	D				2.30E-03		1.00E+00	9.64E-11				7.47E-09					
Cadmium	B1			6.30E+00	1.12E+00	1.00E-03	2.50E-02	4.68E-08		6.18E-11		4.97E-12	3.1E-11	3.1E-11	0		
Chromium	A			2.94E+02	2.14E+01		2.50E-02	8.95E-07				9.50E-11	2.8E-08	2.8E-08	2		
Chrysene	B2	7.30E-03	7.30E-03		2.40E+00	1.30E-01	1.00E+00	1.01E-07	7.4E-10	1.73E-08	1.3E-10	5.19E-09		8.6E-10	0		
Cobalt	NA			9.80E+00	1.21E+01		1.00E+00	5.07E-07				5.37E-11	5.3E-10	5.3E-10	0		
Copper	D				8.25E+01		1.00E+00	3.46E-06				3.67E-10					
Cyanide, Total	D				2.21E+01	1.00E-01	1.00E+00	9.28E-07		1.23E-07		9.84E-11					
Dibenzo (a,h) anthracene	B2	7.30E+00	7.30E+00		2.80E-01	1.30E-01	1.00E+00	1.17E-08	8.6E-08	2.01E-09	1.5E-08	1.24E-12		1.0E-07	8		
Dibenzofuran	D				4.10E-01		1.00E+00	1.72E-08				3.70E-09					
Fluoranthene	D				2.25E+00	1.30E-01	1.00E+00	9.45E-08		1.62E-08		1.00E-11					
Fluorene	D				1.07E-01		1.00E+00	4.49E-09				1.75E-09					
Fluoride	NA				1.32E+03	1.00E-01	1.00E+00	5.54E-05		7.32E-06		5.88E-09					
Indeno (1,2,3-cd) pyrene	B2	7.30E-01	7.30E-01		1.76E+00	1.30E-01	1.00E+00	7.37E-08	5.4E-08	1.26E-08	9.2E-09	7.82E-12		6.3E-08	5		
Lead	B2				4.96E+01		1.00E+00	2.08E-06				2.21E-10					
Manganese	D				3.44E+02		4.00E-02	1.44E-05				1.53E-09					
Mercury	D				3.34E-01		7.00E-02	1.40E-08				1.48E-12					
Methylene Chloride	B2	7.50E-03	7.50E-03	1.60E-03	3.70E-03		1.00E+00	1.55E-10	1.2E-12			8.71E-09	1.4E-11	1.5E-11	0		
Naphthalene	C				7.94E-02		1.00E+00	3.33E-09				1.08E-08					
Nickel	NA				1.52E+01		4.00E-02	6.38E-07				6.77E-11					
Pyrene	D				2.12E+00	1.30E-01	1.00E+00	8.90E-08		1.53E-08		3.29E-09					
Vanadium	NA				6.87E+01		2.60E-02	2.88E-06				3.05E-10					
Zinc	D				9.88E+01		1.00E+00	4.14E-06				4.40E-10					
Total Risk								1E-06		2E-07		Total Risk =	7E-08	1E-06		100	

Note:
Cancer WOE Classifications:
Group A: Human carcinogen
Group B (B1, B2): Probable human carcinogen
Group C: Possible human carcinogen
Group D: Not classifiable
Group E: No evidence of carcinogenicity
ABS_d = Dermal Absorption Factor
ABS_{gi} = Gastrointestinal Absorption Factor
CDI = Chronic Daily Intake
ELCR = Excess Lifetime Cancer Risk
EPC = Exposure Point Concentration
mg/kg-day = milligrams per kilogram per day
SF_d = Dermal Slope Factor
SF_o = Oral Slope Factor
SF_i = Inhalation Slope Factor
WOE = Weight of Evidence

Table A-52
Hypothetical Occupational Worker Scenario - Potential Noncarcinogenic Risk - CTE
Surface Soil - East Plant Area
RMC Troutdale Facility

Chemical	RfD _o (mg/kg- day)	RfD _d (mg/kg- day)	RfD _i (mg/kg- day)	EPC (mg/kg)	ABS _d	ABS _{gi}	Ingestion		Dermal		Inhalation		Total HI	Contribution	%
							CDI (mg/kg- day)	HQ	CDI (mg/kg- day)	HQ	CDI (mg/kg- day)	HQ			
1,2,4-Trimethylbenzene	5.00E-02	5.00E-02	1.70E-03	8.40E-04		1.00E+00	4.11E-10	0.000			2.93E-09	0.00	0.000	0	
1,4-Dichlorobenzene	3.00E-02	3.00E-02	2.50E+00	3.68E+00		1.00E+00	1.80E-06	0.000			1.94E-05	0.00	0.000	0	
2-Methylnaphthalene	4.00E-03	4.00E-03		8.00E-02		1.00E+00	3.91E-08	0.000			4.15E-12		0.000	0	
Acenaphthene	6.00E-01	6.00E-01		1.33E-01		1.00E+00	6.49E-08	0.000			4.99E-08		0.000	0	
Acetone	1.00E+00	1.00E+00		4.00E-02		1.00E+00	1.96E-08	0.000			2.18E-07		0.000	0	
Aluminum	1.00E+00	1.00E+00	1.42E-03	1.30E+04		1.00E+00	6.34E-03	0.006			6.72E-07	0.00	0.007	7	
Anthracene	3.00E+00	3.00E+00		2.91E-01		1.00E+00	1.42E-07	0.000			2.86E-08		0.000	0	
Aroclor-1248	2.00E-05	2.00E-05		7.92E-01	1.40E-01	1.00E+00	3.87E-07	0.019	7.16E-08	0.0036	4.11E-11		0.023	25	
Aroclor-1260	2.00E-05	2.00E-05		5.65E-01	1.40E-01	1.00E+00	2.77E-07	0.014	5.11E-08	0.0026	2.93E-11		0.016	18	
Aroclor-1268	2.00E-05	2.00E-05		5.29E-01	1.40E-01	1.00E+00	2.59E-07	0.013	4.78E-08	0.0024	2.75E-11		0.015	16	
Arsenic	3.00E-04	3.00E-04		3.75E+00	3.00E-02	1.00E+00	1.83E-06	0.006	7.27E-08	0.0002	1.95E-10		0.006	7	
Barium	7.00E-02	4.90E-03	1.40E-04	6.46E+01		7.00E-02	3.16E-05	0.000			3.35E-09	0.00	0.000	1	
Benzo (a) anthracene				1.79E+00	1.30E-01	1.00E+00	8.76E-07		1.50E-07		9.29E-11				
Benzo (a) pyrene				1.32E+00	1.30E-01	1.00E+00	6.44E-07		1.10E-07		6.83E-11				
Benzo (b) fluoranthene				3.13E+00	1.30E-01	1.00E+00	1.53E-06		2.63E-07		1.62E-10				
Benzo (k) fluoranthene				7.53E-01	1.30E-01	1.00E+00	3.68E-07		6.32E-08		3.91E-11				
Beryllium	5.00E-03	3.50E-05	5.71E-06	9.46E-01		7.00E-03	4.63E-07	0.000			4.91E-11	0.00	0.000	0	
Bromomethane	5.00E-03	5.00E-03	1.43E-03	2.30E-03		1.00E+00	1.13E-09	0.000			8.71E-08	0.00	0.000	0	
Cadmium	1.00E-03	2.50E-05		1.12E+00	1.00E-03	2.50E-02	5.46E-07	0.001	7.21E-10	0.0000	5.79E-11		0.001	1	
Chromium	2.00E-02	5.00E-04	2.20E-06	2.14E+01		2.50E-02	1.04E-05	0.001			1.11E-09	0.00	0.001	1	
Chrysene				2.40E+00	1.30E-01	1.00E+00	1.18E-06		2.02E-07		6.05E-08				
Cobalt	2.00E-02	2.00E-02	5.70E-06	1.21E+01		1.00E+00	5.91E-06	0.000			6.27E-10	0.00	0.000	0	
Copper	4.00E-02	4.00E-02		8.25E+01		1.00E+00	4.03E-05	0.001			4.28E-09		0.001	1	
Cyanide, Total	2.00E-02	2.00E-02		2.21E+01	1.00E-01	1.00E+00	1.08E-05	0.001	1.43E-06	0.0001	1.15E-09		0.001	1	
Dibenzo (a,h) anthracene				2.80E-01	1.30E-01	1.00E+00	1.37E-07		2.35E-08		1.45E-11				
Dibenzofuran	2.00E-03	2.00E-03		4.10E-01		1.00E+00	2.01E-07	0.000			4.32E-08		0.000	0	
Fluoranthene	4.00E-01	4.00E-01		2.25E+00	1.30E-01	1.00E+00	1.10E-06	0.000	1.89E-07	0.0000	1.17E-10		0.000	0	
Fluorene	4.00E-01	4.00E-01		1.07E-01		1.00E+00	5.23E-08	0.000			2.04E-08		0.000	0	
Fluoride	6.00E-02	6.00E-02		1.32E+03	1.00E-01	1.00E+00	6.47E-04	0.011	8.54E-05	0.0014	6.86E-08		0.012	13	
Indeno (1,2,3-cd) pyrene				1.76E+00	1.30E-01	1.00E+00	8.60E-07		1.48E-07		9.12E-11				
Lead				4.96E+01		1.00E+00	2.43E-05				2.58E-09				
Manganese	1.40E-01	5.60E-03	1.40E-05	3.44E+02		4.00E-02	1.69E-04	0.001			1.79E-08	0.00	0.002	3	
Mercury	3.00E-04	2.10E-05	3.00E-03	3.34E-01		7.00E-02	1.63E-07	0.001			1.73E-11	0.00	0.001	1	
Methylene Chloride	6.00E-02	6.00E-02	8.60E-01	3.70E-03		1.00E+00	1.81E-09	0.000			1.02E-07	0.00	0.000	0	
Naphthalene	2.00E-02	2.00E-02	8.57E-04	7.94E-02		1.00E+00	3.89E-08	0.000			1.26E-07	0.00	0.000	0	
Nickel	2.00E-02	8.00E-04		1.52E+01		4.00E-02	7.45E-06	0.000			7.90E-10		0.000	0	
Pyrene	3.00E-01	3.00E-01		2.12E+00	1.30E-01	1.00E+00	1.04E-06	0.000	1.78E-07	0.0000	3.84E-08		0.000	0	
Vanadium	7.00E-03	1.82E-04		6.87E+01		2.60E-02	3.36E-05	0.005			3.56E-09		0.005	5	
Zinc	3.00E-01	3.00E-01		9.88E+01		1.00E+00	4.84E-05	0.000			5.13E-09		0.000	0	
								0.08		0.010		0.003			100
												0.009			

Note:
ABS_d = Dermal Absorption Factor
ABS_{gi} = Gastrointestinal Absorption Factor
CDI = Chronic Daily Intake
EPC = Exposure Point Concentration
HI = Hazard Index
HQ = Hazard Quotient;
mg/kg-day = milligrams per kilogram per day
RfC = Reference Concentration
RfD_d = Dermal Reference Dose;
RfD_o = Oral Reference Dose
RfD_i = Inhalation Reference Dose

APPENDIX B

Area-Specific Ecological Risk Calculation Data Sheets

Table B-1
 South Wetlands Ecological Risk Assessment
 Surface Soil/Sediment Exposure Point Concentrations and Summary Statistics Used for the Ecological Risk Assessment
 RMC - Troutdale Facility

Analyte	Units	Number of Detects	Number of Samples	Frequency of Detection	Minimum Nondetect Value	Maximum Nondetect Value	Minimum Detected Value	Maximum Detected Value	Arithmetic Mean	EPC	Basis	EPC > Max	Final EPC	Basis
Acenaphthene	mg/kg	6	27	22%	3.00E-01	3.00E+00	1.00E-02	8.00E-01	2.24E-01	4.69E-01	Non-Parametric	FALSE	4.69E-01	Non-Parametric
Acenaphthylene	mg/kg	1	27	4%	5.30E-03	3.00E+00	4.00E-01	4.00E-01	1.85E-01	7.08E-01	Non-Parametric	TRUE	4.00E-01	MAXDET
Aluminum	mg/kg	30	30	100%	-	-	9.34E+03	1.79E+05	4.87E+04	6.28E+04	Non-Parametric	FALSE	6.28E+04	Non-Parametric
Anthracene	mg/kg	6	27	22%	5.00E-02	3.00E+00	2.00E-02	1.40E+00	2.66E-01	5.66E-01	Non-Parametric	FALSE	5.66E-01	Non-Parametric
Antimony	mg/kg	2	11	18%	1.30E+00	2.50E+00	4.00E+00	4.00E+00	1.70E+00	3.21E+00	Non-Parametric	FALSE	3.21E+00	Non-Parametric
Aroclor-1248	mg/kg	1	3	33%	4.00E-02	5.00E-02	3.00E-02	3.00E-02	2.50E-02	3.60E-02	MAXDET	TRUE	3.00E-02	MAXDET
Aroclor-1254	mg/kg	1	3	33%	4.00E-02	4.00E-02	4.40E-01	4.40E-01	1.60E-01	4.45E-01	MAXDET	TRUE	4.40E-01	MAXDET
Arsenic	mg/kg	23	23	100%	-	-	4.70E-01	3.18E+01	1.06E+01	1.53E+01	Non-Parametric	FALSE	1.53E+01	Non-Parametric
Barium	mg/kg	21	21	100%	-	-	3.14E+01	1.67E+02	9.20E+01	1.03E+02	Normal	FALSE	1.03E+02	Normal
Benzo(a)anthracene	mg/kg	18	26	69%	3.00E-01	3.00E-01	1.20E-01	6.10E+01	3.46E+00	2.67E+01	Non-Parametric	FALSE	2.67E+01	Non-Parametric
Benzo(a)pyrene	mg/kg	12	26	46%	3.00E-01	3.00E-01	1.50E-01	5.80E+01	3.36E+00	2.61E+01	Non-Parametric	FALSE	2.61E+01	Non-Parametric
Benzo(b)fluoranthene	mg/kg	20	26	77%	3.00E-01	3.00E-01	1.90E-01	1.40E+02	7.99E+00	6.16E+01	Non-Parametric	FALSE	6.16E+01	Non-Parametric
Benzo(g,h,i)perylene	mg/kg	12	26	46%	3.00E-01	3.00E-01	1.30E-01	6.70E+01	4.08E+00	3.13E+01	Non-Parametric	FALSE	3.13E+01	Non-Parametric
Benzo(k)fluoranthene	mg/kg	15	26	58%	3.00E-01	3.00E-01	7.00E-02	2.60E+01	1.62E+00	1.16E+01	Non-Parametric	FALSE	1.16E+01	Non-Parametric
Beryllium	mg/kg	12	23	52%	1.10E-01	1.00E+00	5.20E-01	5.77E+00	1.32E+00	3.51E+00	Lognormal	FALSE	3.51E+00	Lognormal
Cadmium	mg/kg	5	21	24%	5.00E-01	1.00E+00	5.30E-01	1.06E+01	8.31E-01	2.97E+00	Non-Parametric	FALSE	2.97E+00	Non-Parametric
Chromium	mg/kg	21	21	100%	-	-	1.29E+01	1.73E+02	5.79E+01	8.03E+01	Non-Parametric	FALSE	8.03E+01	Non-Parametric
Chrysene	mg/kg	20	26	77%	3.00E-01	3.00E-01	1.40E-01	1.80E+02	9.95E+00	7.80E+01	Non-Parametric	FALSE	7.80E+01	Non-Parametric
Cobalt	mg/kg	21	21	100%	-	-	3.40E+00	6.97E+01	2.46E+01	3.59E+01	Non-Parametric	FALSE	3.59E+01	Non-Parametric
Copper	mg/kg	41	41	100%	-	-	2.46E+01	1.01E+03	3.43E+02	4.43E+02	Non-Parametric	FALSE	4.43E+02	Non-Parametric
Cyanide, Total	mg/kg	17	22	77%	1.00E+00	1.00E+00	1.00E-01	5.50E+01	8.50E+00	2.65E+01	Lognormal	FALSE	2.65E+01	Lognormal
Dibenzo(a,h)anthracene	mg/kg	8	27	30%	3.00E-01	3.00E-01	4.00E-02	1.50E+01	9.61E-01	6.62E+00	Non-Parametric	FALSE	6.62E+00	Non-Parametric
Fluoranthene	mg/kg	20	26	77%	3.00E-01	3.00E-01	1.90E-01	4.40E+02	1.99E+01	1.87E+02	Non-Parametric	FALSE	1.87E+02	Non-Parametric
Fluorene	mg/kg	6	27	22%	3.00E-01	3.00E+00	7.30E-03	5.00E-01	1.98E-01	4.28E-01	Non-Parametric	FALSE	4.28E-01	Non-Parametric
Fluoride	mg/kg	43	47	91%	1.50E+02	1.50E+02	3.20E+02	3.50E+04	7.65E+03	2.04E+04	Non-Parametric	FALSE	2.04E+04	Non-Parametric
Indeno(1,2,3-cd)pyrene	mg/kg	10	26	38%	3.00E-01	3.00E-01	1.60E-01	4.20E+01	2.66E+00	1.96E+01	Non-Parametric	FALSE	1.96E+01	Non-Parametric
Iron	mg/kg	20	20	100%	-	-	3.29E+03	1.56E+04	9.87E+03	1.10E+04	Normal	FALSE	1.10E+04	Normal
Lead	mg/kg	23	23	100%	-	-	2.10E+00	2.59E+02	4.65E+01	6.88E+01	Non-Parametric	FALSE	6.88E+01	Non-Parametric
Manganese	mg/kg	21	21	100%	-	-	2.75E+01	1.52E+02	9.51E+01	1.08E+02	Normal	FALSE	1.08E+02	Normal
Mercury	mg/kg	19	34	56%	2.00E-02	2.00E-01	2.10E-01	3.16E+00	6.37E-01	1.92E+00	Non-Parametric	FALSE	1.92E+00	Non-Parametric
Naphthalene	mg/kg	4	27	15%	3.00E-02	3.00E+00	6.10E-03	4.00E-01	1.86E-01	7.08E-01	Non-Parametric	TRUE	4.00E-01	MAXDET
Nickel	mg/kg	21	21	100%	-	-	1.52E+01	3.24E+03	9.47E+02	1.65E+03	Non-Parametric	FALSE	1.65E+03	Non-Parametric
Phenanthrene	mg/kg	19	26	73%	3.00E-01	3.00E-01	8.00E-02	9.80E+00	1.22E+00	1.90E+00	Non-Parametric	FALSE	1.90E+00	Non-Parametric
Polychlorinated Biphenyls (PCBs)	mg/kg	33	41	80%	3.00E-01	3.00E-01	3.00E-01	1.10E+01	3.07E+00	4.19E+00	Non-Parametric	FALSE	4.19E+00	Non-Parametric
Pyrene	mg/kg	19	26	73%	3.00E-01	3.00E-01	1.30E-01	4.00E+02	1.76E+01	1.70E+02	Non-Parametric	FALSE	1.70E+02	Non-Parametric
Selenium	mg/kg	8	21	38%	1.00E+00	1.00E+00	1.20E+00	1.22E+01	2.44E+00	9.85E+00	Non-Parametric	FALSE	9.85E+00	Non-Parametric
Silver	mg/kg	8	21	38%	1.00E+00	1.00E+00	1.00E+00	3.79E+00	9.80E-01	1.75E+00	Non-Parametric	FALSE	1.75E+00	Non-Parametric
Thallium	mg/kg	1	21	5%	1.00E+00	1.00E+00	1.30E+00	1.30E+00	5.38E-01	6.10E-01	Non-Parametric	FALSE	6.10E-01	Non-Parametric
Vanadium	mg/kg	42	42	100%	-	-	4.32E+01	2.26E+03	5.49E+02	7.39E+02	Non-Parametric	FALSE	7.39E+02	Non-Parametric
Zinc	mg/kg	21	21	100%	-	-	3.64E+01	2.74E+02	7.63E+01	9.38E+01	Non-Parametric	FALSE	9.38E+01	Non-Parametric

Table B-2
 South Wetlands Tier 1 Ecological Risk Assessment
 Intake Estimation for Ecological Endpoint Species
 RMC - Troutdale Facility

Chemical	Receptor Species	Body Weight (kg)	Daily Food Intake (kg/day)	Daily Water Intake (L/day)	Area Use Factor	Migration Factor	Daily Food Ingestion from Site (kg/day)	Daily Water Intake from Site (L/day)	Fraction of Diet as Small Mammal/Bird	Sediment to Prey Transfer Factor	Fraction of Diet as Invertebrates	Sediment to Invertebrate Transfer Factor	Fraction of Diet as Plants	Sediment to Plant Transfer Factor	Fraction of Diet as Sediment	Sediment Conc. (mg/kg)	Bioavailability	Water Conc. (mg/L)	Chemical Intake (mg/kg-d)
Inorganics																			
Aluminum	Mallard	1.16	0.135	0.065	1	0.5	0.07	0.03	0	0.023	0.078	0.054	0.902	0.001	0.02	62837	0.07	5.71E+00	2.40E+01
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.31	0.08	0.98	0.023	0	0.054	0	0.001	0.02	62837	0.07	5.71E+00	1.97E+02
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.023	0	0.054	0	0.001	0.02	62837	0.07	5.71E+00	1.85E+02
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.023	0.76	0.054	0.218	0.001	0.022	62837	0.07	5.71E+00	1.20E+03
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.023	0	0.054	0.98	0.001	0.02	62837	0.07	5.71E+00	2.81E+01
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0.023	0	0.054	0.029	0.001	0.028	62837	0.07	5.71E+00	2.17E+02
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0.023	0.039	0.054	0.01	0.001	0.028	62837	0.07	5.71E+00	4.34E+02
Antimony	Mallard	1.16	0.135	0.065	1	0.5	0.07	0.0325	0	0.022	0.078	1	0.902	0.01	0.02	3.21	1.00	---	2.00E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.31	0.078	0.98	0.022	0	1	0	0.01	0.02	3.21	1.00	---	1.75E-02
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.022	0	1	0	0.01	0.02	3.21	1.00	---	1.64E-02
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.022	0.76	1	0.218	0.01	0.022	3.21	1.00	---	1.12E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.022	0	1	0.98	0.01	0.02	3.21	1.00	---	1.77E-02
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0.022	0	1	0.029	0.01	0.028	3.21	1.00	---	2.29E-02
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0.022	0.039	1	0.01	0.01	0.028	3.21	1.00	---	7.65E-02
Arsenic	Mallard	1.16	0.135	0.065	1	0.5	0.07	0.0325	0	0.0048	0.078	0.15	0.902	0.01	0.02	15.34	1.00	---	3.63E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.31	0.078	0.98	0.0048	0	0.15	0	0.01	0.02	15.34	1.00	---	4.95E-02
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.0048	0	0.15	0	0.01	0.02	15.34	1.00	---	4.65E-02
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.0048	0.76	0.15	0.218	0.01	0.022	15.34	1.00	---	9.42E-01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.0048	0	0.15	0.98	0.01	0.02	15.34	1.00	---	8.47E-02
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0.0048	0	0.15	0.029	0.01	0.028	15.34	1.00	---	7.33E-02
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0.0048	0.039	0.15	0.01	0.01	0.028	15.34	1.00	---	1.60E-01
Barium	Mallard	1.16	0.135	0.065	1	0.5	0.07	0.0325	0	0.081	0.078	0.058	0.902	0.003	0.02	103.10	1.00	---	1.63E-01
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.31	0.078	0.98	0.081	0	0.058	0	0.003	0.02	103.10	1.00	---	1.34E+00
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.081	0	0.058	0	0.003	0.02	103.10	1.00	---	1.26E+00
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.081	0.76	0.058	0.218	0.003	0.022	103.10	1.00	---	3.06E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.081	0	0.058	0.98	0.003	0.02	103.10	1.00	---	4.39E-01
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0.081	0	0.058	0.029	0.003	0.028	103.10	1.00	---	1.57E+00
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0.081	0.039	0.058	0.01	0.003	0.028	103.10	1.00	---	2.95E+00
Beryllium	Mallard	1.16	0.135	0.065	1	0.5	0.07	0.0325	0	0.19	0.078	0.19	0.902	0.0025	0.02	3.51	1.00	1.20E-03	7.60E-03
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.31	0.078	0.98	0.19	0	0.19	0	0.0025	0.02	3.51	1.00	1.20E-03	9.46E-02
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.19	0	0.19	0	0.0025	0.02	3.51	1.00	1.20E-03	8.88E-02
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.19	0.76	0.19	0.218	0.0025	0.022	3.51	1.00	1.20E-03	2.60E-01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.19	0	0.19	0.98	0.0025	0.02	3.51	1.00	1.20E-03	1.47E-02
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0.19	0	0.19	0.029	0.0025	0.028	3.51	1.00	1.20E-03	1.06E-01
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0.19	0.039	0.19	0.01	0.0025	0.028	3.51	1.00	1.20E-03	2.02E-01
Cadmium	Mallard	1.16	0.135	0.065	1	0.5	0.07	0.0325	0	0.38	0.078	0.74	0.902	0.14	0.02	2.97	1.00	---	3.52E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.31	0.078	0.98	0.38	0	0.74	0	0.14	0.02	2.97	1.00	---	1.52E-01
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.38	0	0.74	0	0.14	0.02	2.97	1.00	---	1.43E-01
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.38	0.76	0.74	0.218	0.14	0.022	2.97	1.00	---	8.11E-01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.38	0	0.74	0.98	0.14	0.02	2.97	1.00	---	8.65E-02
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0.38	0	0.74	0.029	0.14	0.028	2.97	1.00	---	1.69E-01
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0.38	0.039	0.74	0.01	0.14	0.028	2.97	1.00	---	3.31E-01

Table B-2
 South Wetlands Tier 1 Ecological Risk Assessment
 Intake Estimation for Ecological Endpoint Species
 RMC - Troutdale Facility

Chemical	Receptor Species	Body Weight (kg)	Daily Food Intake (kg/day)	Daily Water Intake (L/day)	Area Use Factor	Migration Factor	Daily Food Ingestion from Site (kg/day)	Daily Water Intake from Site (L/day)	Fraction of Diet as Small Mammal/Bird	Sediment to Prey Transfer Factor	Fraction of Diet as Invertebrates	Sediment to Invertebrate Transfer Factor	Fraction of Diet as Plants	Sediment to Plant Transfer Factor	Fraction of Diet as Sediment	Sediment Conc. (mg/kg)	Bioavailability	Water Conc. (mg/L)	Chemical Intake (mg/kg-d)
Chromium	Mallard	1.16	0.135	0.065	1	0.5	0.07	0.0325	0	0.072	0.078	0.078	0.902	0.0001	0.02	80.25	1.00	---	1.22E-01
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.31	0.078	0.98	0.072	0	0.078	0	0.0001	0.02	80.25	1.00	---	9.50E-01
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.072	0	0.078	0	0.0001	0.02	80.25	1.00	---	8.92E-01
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.072	0.76	0.078	0.218	0.0001	0.022	80.25	1.00	---	2.90E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.072	0	0.078	0.98	0.0001	0.02	80.25	1.00	---	2.99E-01
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0.072	0	0.078	0.029	0.0001	0.028	80.25	1.00	---	1.12E+00
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0.072	0.039	0.078	0.01	0.0001	0.028	80.25	1.00	---	2.13E+00
Cobalt	Mallard	1.16	0.135	0.065	1	0.5	0.07	0.0325	0	0.034	0.078	0.047	0.902	0.023	0.02	35.95	1.00	---	9.29E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.31	0.078	0.98	0.034	0	0.047	0	0.023	0.02	35.95	1.00	---	2.51E-01
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.034	0	0.047	0	0.023	0.02	35.95	1.00	---	2.35E-01
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.034	0.76	0.047	0.218	0.023	0.022	35.95	1.00	---	1.00E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.034	0	0.047	0.98	0.023	0.02	35.95	1.00	---	2.84E-01
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0.034	0	0.047	0.029	0.023	0.028	35.95	1.00	---	3.18E-01
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0.034	0.039	0.047	0.01	0.023	0.028	35.95	1.00	---	6.02E-01
Copper	Mallard	1.16	0.135	0.065	1	0.5	0.07	0.0325	0	0.042	0.078	0.083	0.902	0.08	0.02	442.77	0.46	6.35E-02	2.26E+00
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.31	0.078	0.98	0.042	0	0.083	0	0.08	0.02	442.77	0.46	6.35E-02	2.92E+00
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.042	0	0.083	0	0.08	0.02	442.77	0.46	6.35E-02	2.74E+00
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.042	0.76	0.083	0.218	0.08	0.022	442.77	0.46	6.35E-02	1.78E+01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.042	0	0.083	0.98	0.08	0.02	442.77	0.46	6.35E-02	7.20E+00
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0.042	0	0.083	0.029	0.08	0.028	442.77	0.46	6.35E-02	3.54E+00
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0.042	0.039	0.083	0.01	0.08	0.028	442.77	0.46	6.35E-02	6.73E+00
Cyanide	Mallard	1.16	0.135	0.065	1	0.5	0.07	0.0325	0	0	0.078	1	0.902	1.8	0.02	26.48	1.00	2.16E-02	2.65E+00
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.31	0.078	0.98	0	0	1	0	1.8	0.02	26.48	1.00	2.16E-02	7.00E-02
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	1	0	1.8	0.02	26.48	1.00	2.16E-02	6.59E-02
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	1	0.218	1.8	0.022	26.48	1.00	2.16E-02	1.38E+01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	1	0.98	1.8	0.02	26.48	1.00	2.16E-02	8.76E+00
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0	0	1	0.029	1.8	0.028	26.48	1.00	2.16E-02	3.11E-01
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0	0.039	1	0.01	1.8	0.028	26.48	1.00	2.16E-02	6.16E-01
Fluoride	Mallard	1.16	0.135	0.065	1	0.5	0.07	0.0325	0	0.006	0.078	0.0006	0.902	0.009	0.02	20394.63	0.35	1.45E+01	1.84E+01
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.31	0.078	0.98	0.006	0	0.0006	0	0.009	0.02	20394.63	0.35	1.45E+01	3.48E+01
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.006	0	0.0006	0	0.009	0.02	20394.63	0.35	1.45E+01	3.29E+01
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.006	0.76	0.0006	0.218	0.009	0.022	20394.63	0.35	1.45E+01	9.27E+01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.006	0	0.0006	0.98	0.009	0.02	20394.63	0.35	1.45E+01	6.08E+01
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0.006	0	0.0006	0.029	0.009	0.028	20394.63	0.35	1.45E+01	4.78E+01
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0.006	0.039	0.0006	0.01	0.009	0.028	20394.63	0.35	1.45E+01	8.73E+01
Lead	Mallard	1.16	0.135	0.065	1	0.5	0.07	0.0325	0	0.01	0.078	0.072	0.902	0.00076	0.02	68.81	1.00	6.65E-03	1.05E-01
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.31	0.078	0.98	0.01	0	0.072	0	0.00076	0.02	68.81	1.00	6.65E-03	2.68E-01
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.01	0	0.072	0	0.00076	0.02	68.81	1.00	6.65E-03	2.52E-01
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.01	0.76	0.072	0.218	0.00076	0.022	68.81	1.00	6.65E-03	2.35E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.01	0	0.072	0.98	0.00076	0.02	68.81	1.00	6.65E-03	2.65E-01
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0.01	0	0.072	0.029	0.00076	0.028	68.81	1.00	6.65E-03	3.76E-01
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0.01	0.039	0.072	0.01	0.00076	0.028	68.81	1.00	6.65E-03	7.52E-01

Table B-2
 South Wetlands Tier 1 Ecological Risk Assessment
 Intake Estimation for Ecological Endpoint Species
 RMC - Troutdale Facility

Chemical	Receptor Species	Body Weight (kg)	Daily Food Intake (kg/day)	Daily Water Intake (L/day)	Area Use Factor	Migration Factor	Daily Food Ingestion from Site (kg/day)	Daily Water Intake from Site (L/day)	Fraction of Diet as Small Mammal/Bird	Sediment to Prey Transfer Factor	Fraction of Diet as Invertebrates	Sediment to Invertebrate Transfer Factor	Fraction of Diet as Plants	Sediment to Plant Transfer Factor	Fraction of Diet as Sediment	Sediment Conc. (mg/kg)	Bioavailability	Water Conc. (mg/L)	Chemical Intake (mg/kg-d)
Manganese	Mallard	1.16	0.135	0.065	1	0.5	0.07	0.0325	0	0.025	0.078	0.064	0.902	0.069	0.02	107.56	1.00	3.70E-01	5.56E-01
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.31	0.078	0.98	0.025	0	0.064	0	0.069	0.02	107.56	1.00	3.70E-01	6.38E-01
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.025	0	0.064	0	0.069	0.02	107.56	1.00	3.70E-01	6.03E-01
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.025	0.76	0.064	0.218	0.069	0.022	107.56	1.00	3.70E-01	4.12E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.025	0	0.064	0.98	0.069	0.02	107.56	1.00	3.70E-01	1.77E+00
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0.025	0	0.064	0.029	0.069	0.028	107.56	1.00	3.70E-01	8.69E-01
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0.025	0.039	0.064	0.01	0.069	0.028	107.56	1.00	3.70E-01	1.63E+00
Mercury	Mallard	1.16	0.135	0.065	1	0.5	0.07	0.0325	0	0.061	0.078	0.15	0.902	0.3	0.02	1.92	1.00	---	3.37E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.31	0.078	0.98	0.061	0	0.15	0	0.3	0.02	1.92	1.00	---	2.00E-02
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.061	0	0.15	0	0.3	0.02	1.92	1.00	---	1.88E-02
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.061	0.76	0.15	0.218	0.3	0.022	1.92	1.00	---	1.72E-01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.061	0	0.15	0.98	0.3	0.02	1.92	1.00	---	1.12E-01
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0.061	0	0.15	0.029	0.3	0.028	1.92	1.00	---	2.63E-02
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0.061	0.039	0.15	0.01	0.3	0.028	1.92	1.00	---	4.87E-02
Nickel	Mallard	1.16	0.135	0.065	1	0.5	0.07	0.0325	0	0.015	0.078	0.066	0.902	0.05	0.02	1654.35	1.00	3.71E-01	6.77E+00
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.31	0.078	0.98	0.015	0	0.066	0	0.05	0.02	1654.35	1.00	3.71E-01	7.52E+00
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.015	0	0.066	0	0.05	0.02	1654.35	1.00	3.71E-01	7.06E+00
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.015	0.76	0.066	0.218	0.05	0.022	1654.35	1.00	3.71E-01	6.11E+01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.015	0	0.066	0.98	0.05	0.02	1654.35	1.00	3.71E-01	2.12E+01
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0.015	0	0.066	0.029	0.05	0.028	1654.35	1.00	3.71E-01	1.05E+01
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0.015	0.039	0.066	0.01	0.05	0.028	1654.35	1.00	3.71E-01	2.03E+01
Selenium	Mallard	1.16	0.135	0.065	1	0.5	0.07	0.0325	0	0.16	0.078	0.21	0.902	0.1	0.02	9.85	1.00	---	7.26E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.31	0.078	0.98	0.16	0	0.21	0	0.1	0.02	9.85	1.00	---	2.28E-01
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.16	0	0.21	0	0.1	0.02	9.85	1.00	---	2.14E-01
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.16	0.76	0.21	0.218	0.1	0.022	9.85	1.00	---	8.91E-01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.16	0	0.21	0.98	0.1	0.02	9.85	1.00	---	2.16E-01
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0.16	0	0.21	0.029	0.1	0.028	9.85	1.00	---	2.61E-01
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0.16	0.039	0.21	0.01	0.1	0.028	9.85	1.00	---	4.96E-01
Silver	Mallard	1.16	0.135	0.065	1	0.5	0.07	0.0325	0	0.16	0.078	2.45	0.902	0.000022	0.02	1.75	1.00	---	2.15E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.31	0.078	0.98	0.16	0	2.45	0	0.000022	0.02	1.75	1.00	---	4.04E-02
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.16	0	2.45	0	0.000022	0.02	1.75	1.00	---	3.79E-02
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.16	0.76	2.45	0.218	0.000022	0.022	1.75	1.00	---	1.46E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.16	0	2.45	0.98	0.000022	0.02	1.75	1.00	---	6.49E-03
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0.16	0	2.45	0.029	0.000022	0.028	1.75	1.00	---	4.56E-02
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0.16	0.039	2.45	0.01	0.000022	0.028	1.75	1.00	---	1.29E-01
Vanadium	Mallard	1.16	0.135	0.065	1	0.5	0.07	0.0325	0	0.006	0.078	0.014	0.902	0.0014	0.02	738.92	0.31	5.82E-02	3.69E-01
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.31	0.078	0.98	0.006	0	0.014	0	0.0014	0.02	738.92	0.31	5.82E-02	1.17E+00
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.006	0	0.014	0	0.0014	0.02	738.92	0.31	5.82E-02	1.10E+00
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.006	0.76	0.014	0.218	0.0014	0.022	738.92	0.31	5.82E-02	5.84E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.006	0	0.014	0.98	0.0014	0.02	738.92	0.31	5.82E-02	1.04E+00
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0.006	0	0.014	0.029	0.0014	0.028	738.92	0.31	5.82E-02	1.55E+00
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0.006	0.039	0.014	0.01	0.0014	0.028	738.92	0.31	5.82E-02	2.98E+00

Table B-2
 South Wetlands Tier 1 Ecological Risk Assessment
 Intake Estimation for Ecological Endpoint Species
 RMC - Troutdale Facility

Chemical	Receptor Species	Body Weight (kg)	Daily Food Intake (kg/day)	Daily Water Intake (L/day)	Area Use Factor	Migration Factor	Daily Food Ingestion from Site (kg/day)	Daily Water Intake from Site (L/day)	Fraction of Diet as Small Mammal/Bird	Sediment to Prey Transfer Factor	Fraction of Diet as Invertebrates	Sediment to Invertebrate Transfer Factor	Fraction of Diet as Plants	Sediment to Plant Transfer Factor	Fraction of Diet as Sediment	Sediment Conc. (mg/kg)	Bioavailability	Water Conc. (mg/L)	Chemical Intake (mg/kg-d)
Zinc	Mallard	1.16	0.135	0.065	1	0.5	0.07	0.0325	0	1.3	0.078	0.29	0.902	0.26	0.02	93.78	1.00	2.39E-01	1.52E+00
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.31	0.078	0.98	1.3	0	0.29	0	0.26	0.02	93.78	1.00	2.39E-01	1.59E+01
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	1.3	0	0.29	0	0.26	0.02	93.78	1.00	2.39E-01	1.49E+01
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	1.3	0.76	0.29	0.218	0.26	0.022	93.78	1.00	2.39E-01	1.25E+01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	1.3	0	0.29	0.98	0.26	0.02	93.78	1.00	2.39E-01	4.79E+00
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	1.3	0	0.29	0.029	0.26	0.028	93.78	1.00	2.39E-01	1.73E+01
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	1.3	0.039	0.29	0.01	0.26	0.028	93.78	1.00	2.39E-01	3.18E+01
Organics																			
Acenaphthene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	0	0.078	0.048	0.902	0.0369	0.02	0.47	1.00	---	1.56E-03
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	0	0	0.048	0	0.0369	0.02	0.47	1.00	---	1.23E-03
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.048	0	0.0369	0.02	0.47	1.00	---	1.15E-03
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.048	0.218	0.0369	0.022	0.47	1.00	---	1.39E-02
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.048	0.98	0.0369	0.02	0.47	1.00	---	4.88E-03
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0	0	0.048	0.029	0.0369	0.028	0.47	1.00	---	1.99E-03
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0	0.039	0.048	0.01	0.0369	0.028	0.47	1.00	---	3.87E-03
Acenaphthylene	Mallard	1.16	0.132	0.065	1	0.5	0.066	0.0325	0	0	0.078	0.035	0.902	0.028	0.02	0.40	1.00	---	1.09E-03
	Great Blue Heron	2.34	0.400	0.104	1	0.75	0.3	0.078	0.98	0	0	0.035	0	0.028	0.02	0.40	1.00	---	1.03E-03
	Red-tailed Hawk	1.13	0.181	0.064	1	1	0.18	0.06	0.98	0	0	0.035	0	0.028	0.02	0.40	1.00	---	1.28E-03
	American Robin	0.081	0.009	0.011	1	0.5	0.00	0.01	0	0	0.69	0.035	0.206	0.028	0.104	0.40	1.00	---	2.98E-03
	Mule Deer	66.5	12.09	4.327	1	1	12.09	4.33	0	0	0	0.035	0.98	0.028	0.02	0.40	1.00	---	3.45E-03
	Coyote	10.5	1.49	0.822	1	1	1.49	0.82	0.943	0	0	0.035	0.029	0.028	0.028	0.40	1.00	---	1.64E-03
	Mink	1.24	0.328	0.12	1	1	0.328	0.12	0.923	0	0.039	0.035	0.01	0.028	0.028	0.40	1.00	---	3.14E-03
Anthracene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	0	0.078	0.051	0.902	0.0121	0.02	0.57	1.00	---	1.15E-03
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	0	0	0.051	0	0.0121	0.02	0.57	1.00	---	1.48E-03
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.051	0	0.0121	0.02	0.57	1.00	---	1.39E-03
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.051	0.218	0.0121	0.022	0.57	1.00	---	1.59E-02
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.051	0.98	0.0121	0.02	0.57	1.00	---	3.34E-03
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0	0	0.051	0.029	0.0121	0.028	0.57	1.00	---	2.34E-03
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0	0.039	0.051	0.01	0.0121	0.028	0.57	1.00	---	4.64E-03
Benzo(a)anthracene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	0	0.078	0.043	0.902	0.0019	0.02	26.73	1.00	1.17E-04	3.90E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	0	0	0.043	0	0.0019	0.02	26.73	1.00	1.17E-04	6.99E-02
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.043	0	0.0019	0.02	26.73	1.00	1.17E-04	6.57E-02
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.043	0.218	0.0019	0.022	26.73	1.00	1.17E-04	6.55E-01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.043	0.98	0.0019	0.02	26.73	1.00	1.17E-04	1.08E-01
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0	0	0.043	0.029	0.0019	0.028	26.73	1.00	1.17E-04	1.09E-01
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0	0.039	0.043	0.01	0.0019	0.028	26.73	1.00	1.17E-04	2.16E-01
Benzo(a)pyrene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	0	0.078	0.054	0.902	0.0011	0.02	26.14	1.00	1.41E-04	3.83E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	0	0	0.054	0	0.0011	0.02	26.14	1.00	1.41E-04	6.84E-02
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.054	0	0.0011	0.02	26.14	1.00	1.41E-04	6.42E-02
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.054	0.218	0.0011	0.022	26.14	1.00	1.41E-04	7.35E-01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.054	0.98	0.0011	0.02	26.14	1.00	1.41E-04	1.02E-01
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0	0	0.054	0.029	0.0011	0.028	26.14	1.00	1.41E-04	1.07E-01
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0	0.039	0.054	0.01	0.0011	0.028	26.14	1.00	1.41E-04	2.15E-01

Table B-2
 South Wetlands Tier 1 Ecological Risk Assessment
 Intake Estimation for Ecological Endpoint Species
 RMC - Troutdale Facility

Chemical	Receptor Species	Body Weight (kg)	Daily Food Intake (kg/day)	Daily Water Intake (L/day)	Area Use Factor	Migration Factor	Daily Food Ingestion from Site (kg/day)	Daily Water Intake from Site (L/day)	Fraction of Diet as Small Mammal/Bird	Sediment to Prey Transfer Factor	Fraction of Diet as Invertebrates	Sediment to Invertebrate Transfer Factor	Fraction of Diet as Plants	Sediment to Plant Transfer Factor	Fraction of Diet as Sediment	Sediment Conc. (mg/kg)	Bioavailability	Water Conc. (mg/L)	Chemical Intake (mg/kg-d)
Benzo(b)fluoranthene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	0	0.078	0.034	0.902	0.0011	0.02	61.64	1.00	2.10E-04	8.48E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	0	0	0.034	0	0.0011	0.02	61.64	1.00	2.10E-04	1.61E-01
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.034	0	0.0011	0.02	61.64	1.00	2.10E-04	1.51E-01
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.034	0.218	0.0011	0.022	61.64	1.00	2.10E-04	1.32E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.034	0.98	0.0011	0.02	61.64	1.00	2.10E-04	2.41E-01
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0	0	0.034	0.029	0.0011	0.028	61.64	1.00	2.10E-04	2.52E-01
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0	0.039	0.034	0.01	0.0011	0.028	61.64	1.00	2.10E-04	4.93E-01
Benzo(g,h,i)perylene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	0	0.078	0.024	0.902	0.0006	0.02	31.28	1.00	1.57E-04	4.08E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	0	0	0.024	0	0.0006	0.02	31.28	1.00	1.57E-04	8.18E-02
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.024	0	0.0006	0.02	31.28	1.00	1.57E-04	7.68E-02
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.024	0.218	0.0006	0.022	31.28	1.00	1.57E-04	5.61E-01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.024	0.98	0.0006	0.02	31.28	1.00	1.57E-04	1.19E-01
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0	0	0.024	0.029	0.0006	0.028	31.28	1.00	1.57E-04	1.28E-01
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0	0.039	0.024	0.01	0.0006	0.028	31.28	1.00	1.57E-04	2.47E-01
Benzo(k)fluoranthene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	0	0.078	0.034	0.902	0.0009	0.02	11.55	1.00	0.00E+00	1.58E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	0	0	0.034	0	0.0009	0.02	11.55	1.00	5.71E+00	2.21E-01
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.034	0	0.0009	0.02	11.55	1.00	5.71E+00	2.71E-01
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.034	0.218	0.0009	0.022	11.55	1.00	5.71E+00	6.35E-01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.034	0.98	0.0009	0.02	11.55	1.00	5.71E+00	4.17E-01
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0	0	0.034	0.029	0.0009	0.028	11.55	1.00	5.71E+00	4.95E-01
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0	0.039	0.034	0.01	0.0009	0.028	11.55	1.00	5.71E+00	6.45E-01
Chrysene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	0	0.078	0.07	0.902	0.0019	0.02	78.05	1.00	2.04E-04	1.23E-01
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	0	0	0.07	0	0.0019	0.02	78.05	1.00	2.04E-04	2.04E-01
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.07	0	0.0019	0.02	78.05	1.00	2.04E-04	1.92E-01
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.07	0.218	0.0019	0.022	78.05	1.00	2.04E-04	2.62E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.07	0.98	0.0019	0.02	78.05	1.00	2.04E-04	3.16E-01
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0	0	0.07	0.029	0.0019	0.028	78.05	1.00	2.04E-04	3.19E-01
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0	0.039	0.07	0.01	0.0019	0.028	78.05	1.00	2.04E-04	6.54E-01
Dibenzo(a,h)anthracene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	0	0.078	0.078	0.902	0.0005	0.02	6.62	1.00	0.00E+00	1.02E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	0	0	0.078	0	0.0005	0.02	6.62	1.00	0.00E+00	1.73E-02
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.078	0	0.0005	0.02	6.62	1.00	0.00E+00	1.63E-02
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.078	0.218	0.0005	0.022	6.62	1.00	0.00E+00	2.39E-01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.078	0.98	0.0005	0.02	6.62	1.00	0.00E+00	2.51E-02
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0	0	0.078	0.029	0.0005	0.028	6.62	1.00	0.00E+00	2.70E-02
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0	0.039	0.078	0.01	0.0005	0.028	6.62	1.00	0.00E+00	5.60E-02
Fluoranthene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	0	0.078	0.059	0.902	0.0047	0.02	187.34	1.00	2.04E-04	3.14E-01
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	0	0	0.059	0	0.0047	0.02	187.34	1.00	2.04E-04	4.90E-01
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.059	0	0.0047	0.02	187.34	1.00	2.04E-04	4.60E-01
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.059	0.218	0.0047	0.022	187.34	1.00	2.04E-04	5.65E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.059	0.98	0.0047	0.02	187.34	1.00	2.04E-04	8.55E-01
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0	0	0.059	0.029	0.0047	0.028	187.34	1.00	2.04E-04	7.68E-01
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0	0.039	0.059	0.01	0.0047	0.028	187.34	1.00	2.04E-04	1.55E+00

Table B-2
 South Wetlands Tier 1 Ecological Risk Assessment
 Intake Estimation for Ecological Endpoint Species
 RMC - Troutdale Facility

Chemical	Receptor Species	Body Weight (kg)	Daily Food Intake (kg/day)	Daily Water Intake (L/day)	Area Use Factor	Migration Factor	Daily Food Ingestion from Site (kg/day)	Daily Water Intake from Site (L/day)	Fraction of Diet as Small Mammal/Bird	Sediment to Prey Transfer Factor	Fraction of Diet as Invertebrates	Sediment to Invertebrate Transfer Factor	Fraction of Diet as Plants	Sediment to Plant Transfer Factor	Fraction of Diet as Sediment	Sediment Conc. (mg/kg)	Bioavailability	Water Conc. (mg/L)	Chemical Intake (mg/kg-d)
Fluorene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	0	0.078	0.032	0.902	0.0218	0.02	0.43	1.00	0.00E+00	1.05E-03
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	0	0	0.032	0	0.0218	0.02	0.43	1.00	0.00E+00	1.12E-03
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.032	0	0.0218	0.02	0.43	1.00	0.00E+00	1.05E-03
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.032	0.218	0.0218	0.022	0.43	1.00	0.00E+00	9.72E-03
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.032	0.98	0.0218	0.02	0.43	1.00	0.00E+00	3.28E-03
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0	0	0.032	0.029	0.0218	0.028	0.43	1.00	0.00E+00	1.79E-03
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0	0.039	0.032	0.01	0.0218	0.028	0.43	1.00	0.00E+00	3.44E-03
Indeno(1,2,3-cd)pyrene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	0	0.078	0.066	0.902	0.0005	0.02	19.59	1.00	1.21E-04	2.92E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	0	0	0.066	0	0.0005	0.02	19.59	1.00	1.21E-04	5.12E-02
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.066	0	0.0005	0.02	19.59	1.00	1.21E-04	4.81E-02
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.066	0.218	0.0005	0.022	19.59	1.00	1.21E-04	6.29E-01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.066	0.98	0.0005	0.02	19.59	1.00	1.21E-04	7.44E-02
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0	0	0.066	0.029	0.0005	0.028	19.59	1.00	1.21E-04	8.00E-02
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0	0.039	0.066	0.01	0.0005	0.028	19.59	1.00	1.21E-04	1.63E-01
Naphthalene	Mallard	1.16	0.132	0.065	1	0.5	0.066	0.0325	0	0	0.078	0.034	0.902	0.1064	0.02	0.40	1.00	---	2.70E-03
	Great Blue Heron	2.34	0.400	0.104	1	0.75	0.3	0.078	0.98	0	0	0.034	0	0.1064	0.02	0.40	1.00	---	1.03E-03
	Red-tailed Hawk	1.13	0.181	0.064	1	1	0.18	0.06	0.98	0	0	0.034	0	0.1064	0.02	0.40	1.00	---	1.28E-03
	American Robin	0.081	0.009	0.011	1	0.5	0.00	0.01	0	0	0.69	0.034	0.206	0.1064	0.104	0.40	1.00	---	3.32E-03
	Mule Deer	66.5	12.09	4.327	1	1	12.09	4.33	0	0	0	0.034	0.98	0.1064	0.02	0.40	1.00	---	9.04E-03
	Coyote	10.5	1.49	0.822	1	1	1.49	0.82	0.943	0	0	0.034	0.029	0.1064	0.028	0.40	1.00	---	1.76E-03
	Mink	1.24	0.328	0.12	1	1	0.328	0.12	0.923	0	0.039	0.034	0.01	0.1064	0.028	0.40	1.00	---	3.22E-03
PCBs	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	6.87	0.078	0.48	0.902	0.0009	0.02	4.19	1.00	---	1.42E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	6.87	0	0.48	0	0.0009	0.02	4.19	1.00	---	3.70E+00
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	6.87	0	0.48	0	0.0009	0.02	4.19	1.00	---	3.47E+00
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	6.87	0.76	0.48	0.218	0.0009	0.022	4.19	1.00	---	7.20E-01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	6.87	0	0.48	0.98	0.0009	0.02	4.19	1.00	---	1.62E-02
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	6.87	0	0.48	0.029	0.0009	0.028	4.19	1.00	---	3.97E+00
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	6.87	0.039	0.48	0.01	0.0009	0.028	4.19	1.00	---	7.29E+00
Phenanthrene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	0	0.078	0.045	0.902	0.0117	0.02	1.90	1.00	---	3.76E-03
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	0	0	0.045	0	0.0117	0.02	1.90	1.00	---	4.97E-03
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.045	0	0.0117	0.02	1.90	1.00	---	4.66E-03
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.045	0.218	0.0117	0.022	1.90	1.00	---	4.96E-02
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.045	0.98	0.0117	0.02	1.90	1.00	---	1.11E-02
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0	0	0.045	0.029	0.0117	0.028	1.90	1.00	---	7.84E-03
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0	0.039	0.045	0.01	0.0117	0.028	1.90	1.00	---	1.55E-02
Pyrene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	0	0.078	0.062	0.902	0.0048	0.02	170.03	1.00	1.23E-04	2.89E-01
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	0	0	0.062	0	0.0048	0.02	170.03	1.00	1.23E-04	4.45E-01
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.062	0	0.0048	0.02	170.03	1.00	1.23E-04	4.18E-01
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.062	0.218	0.0048	0.022	170.03	1.00	1.23E-04	5.30E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.062	0.98	0.0048	0.02	170.03	1.00	1.23E-04	7.79E-01
	Coyote	10.5	1.53	0.822	1	1	1.53	0.82	0.943	0	0	0.062	0.029	0.0048	0.028	170.03	1.00	1.23E-04	6.97E-01
	Mink	1.24	0.338	0.12	1	1	0.34	0.12	0.923	0	0.039	0.062	0.01	0.0048	0.028	170.03	1.00	1.23E-04	1.41E+00

Table B-3
 South Wetlands Tier 1 Ecological Risk Assessment
 Hazard Quotient Summary
 RMC - Troutdale Facility

Chemical	Receptor	NOAEL ^a (mg/kgbw-d)	Toxicity Test Species	Taxa UFs ^b	TRV ^c (mg/kgbw-d)	Intake (mg/kgbw-d)	Hazard Quotient
Inorganics							
Aluminum	Mallard	1.10E+02	Ringed dove	4	2.74E+01	2.40E+01	0.87
	Great Blue Heron	1.10E+02	Ringed dove	4	2.74E+01	1.97E+02	7.2
	Red-tailed Hawk	1.10E+02	Ringed dove	4	2.74E+01	1.85E+02	6.7
	American Robin	1.10E+02	Ringed dove	4	2.74E+01	1.20E+03	44
	Mule Deer	6.00E+01	Beagle (dog)	4	1.50E+01	2.81E+01	1.9
	Coyote	6.00E+01	Beagle (dog)	4	1.50E+01	2.17E+02	14
	Mink	6.00E+01	Beagle (dog)	4	1.50E+01	4.34E+02	29
Antimony	Mallard	---	---	---	---	2.00E-02	---
	Great Blue Heron	---	---	---	---	1.75E-02	---
	Red-tailed Hawk	---	---	---	---	1.64E-02	---
	American Robin	---	---	---	---	1.12E+00	---
	Mule Deer	2.50E-01	Mouse	4	6.25E-02	1.77E-02	0.28
	Coyote	2.50E-01	Mouse	4	6.25E-02	2.29E-02	0.37
	Mink	2.50E-01	Mouse	4	6.25E-02	7.65E-02	1.2
Arsenic	Mallard	5.14E+00	Mallard duck	1	5.14E+00	3.63E-02	0.01
	Great Blue Heron	5.14E+00	Mallard duck	4	1.29E+00	4.95E-02	0.04
	Red-tailed Hawk	5.14E+00	Mallard duck	4	1.29E+00	4.65E-02	0.04
	American Robin	5.14E+00	Mallard duck	4	1.29E+00	9.42E-01	0.73
	Mule Deer	2.52E-01	Mouse	4	6.30E-02	8.47E-02	1.3
	Coyote	5.06E+00	Rat	4	1.27E+00	7.33E-02	0.06
	Mink	2.52E-01	Mouse	4	6.30E-02	1.60E-01	2.5
Barium	Mallard	4.16E+01	1-day-old chicks	4	1.04E+01	1.63E-01	0.02
	Great Blue Heron	4.16E+01	1-day-old chicks	4	1.04E+01	1.34E+00	0.13
	Red-tailed Hawk	4.16E+01	1-day-old chicks	4	1.04E+01	1.26E+00	0.12
	American Robin	4.16E+01	1-day-old chicks	4	1.04E+01	3.06E+00	0.29
	Mule Deer	5.06E+00	Rat	4	1.27E+00	4.39E-01	0.35
	Coyote	5.06E+00	Rat	4	1.27E+00	1.57E+00	1.2
	Mink	5.06E+00	Rat	4	1.27E+00	2.95E+00	2.3
Beryllium	Mallard	---	---	---	---	7.60E-03	---
	Great Blue Heron	---	---	---	---	9.46E-02	---
	Red-tailed Hawk	---	---	---	---	8.88E-02	---
	American Robin	---	---	---	---	2.60E-01	---
	Mule Deer	6.60E-01	Rat	4	1.65E-01	1.47E-02	0.09
	Coyote	6.60E-01	Rat	4	1.65E-01	1.06E-01	0.64
	Mink	6.60E-01	Rat	4	1.65E-01	2.02E-01	1.2
Cadmium	Mallard	1.45E+00	Mallard duck	1	1.45E+00	3.52E-02	0.02
	Great Blue Heron	1.45E+00	Mallard duck	4	3.63E-01	1.52E-01	0.42
	Red-tailed Hawk	1.45E+00	Mallard duck	4	3.63E-01	1.43E-01	0.39
	American Robin	1.45E+00	Mallard duck	4	3.63E-01	8.11E-01	2.2
	Mule Deer	1.00E+00	Rat	4	2.50E-01	8.65E-02	0.35
	Coyote	1.00E+00	Rat	4	2.50E-01	1.69E-01	0.68
	Mink	1.00E+00	Rat	4	2.50E-01	3.31E-01	1.3
Chromium	Mallard	1.00E+00	Black duck	1	1.00E+00	1.22E-01	0.12
	Great Blue Heron	1.00E+00	Black duck	4	2.50E-01	9.50E-01	3.8
	Red-tailed Hawk	1.00E+00	Black duck	4	2.50E-01	8.92E-01	3.6
	American Robin	1.00E+00	Black duck	4	2.50E-01	2.90E+00	12
	Mule Deer	2.74E+03	Rat	4	6.84E+02	2.99E-01	<0.01
	Coyote	2.74E+03	Rat	4	6.84E+02	1.12E+00	<0.01
	Mink	2.74E+03	Rat	4	6.84E+02	2.13E+00	<0.01
Cobalt	Mallard	1.30E+01	1-day old chicks	4	3.25E+00	9.29E-02	0.03
	Great Blue Heron	1.30E+01	1-day old chicks	4	3.25E+00	2.51E-01	0.08
	Red-tailed Hawk	1.30E+01	1-day old chicks	4	3.25E+00	2.35E-01	0.07
	American Robin	1.30E+01	1-day old chicks	4	3.25E+00	1.00E+00	0.31
	Mule Deer	1.00E+00	Rat	4	2.50E-01	2.84E-01	1.1
	Coyote	1.00E+00	Rat	4	2.50E-01	3.18E-01	1.3
	Mink	1.00E+00	Rat	4	2.50E-01	6.02E-01	2.4

Table B-3
 South Wetlands Tier 1 Ecological Risk Assessment
 Hazard Quotient Summary
 RMC - Troutdale Facility

Chemical	Receptor	NOAEL ^a (mg/kgbw-d)	Toxicity Test Species	Taxa UFs ^b	TRV ^c (mg/kgbw-d)	Intake (mg/kgbw-d)	Hazard Quotient
Copper	Mallard	4.70E+01	1-day-old chicks	4	1.18E+01	2.26E+00	0.19
	Great Blue Heron	4.70E+01	1-day-old chicks	4	1.18E+01	2.92E+00	0.25
	Red-tailed Hawk	4.70E+01	1-day-old chicks	4	1.18E+01	2.74E+00	0.23
	American Robin	4.70E+01	1-day-old chicks	4	1.18E+01	1.78E+01	1.5
	Mule Deer	1.17E+01	Mink	4	2.93E+00	7.20E+00	2.5
	Coyote	1.17E+01	Mink	4	2.93E+00	3.54E+00	1.2
	Mink	1.17E+01	Mink	1	1.17E+01	6.73E+00	0.57
Cyanide	Mallard	---	---	---	---	2.65E+00	---
	Great Blue Heron	---	---	---	---	7.00E-02	---
	Red-tailed Hawk	---	---	---	---	6.59E-02	---
	American Robin	---	---	---	---	1.38E+01	---
	Mule Deer	6.87E+01	Rat	4	1.72E+01	8.76E+00	0.51
	Coyote	6.87E+01	Rat	4	1.72E+01	3.11E-01	0.02
	Mink	6.87E+01	Rat	4	1.72E+01	6.16E-01	0.04
Fluoride	Mallard	7.80E+00	Screech owl	4	1.95E+00	1.84E+01	9.4
	Great Blue Heron	7.80E+00	Screech owl	4	1.95E+00	3.48E+01	18
	Red-tailed Hawk	7.80E+00	Screech owl	4	1.95E+00	3.29E+01	17
	American Robin	7.80E+00	Screech owl	4	1.95E+00	9.27E+01	48
	Mule Deer	3.14E+01	Mink	4	7.84E+00	6.08E+01	7.7
	Coyote	3.14E+01	Mink	4	7.84E+00	4.78E+01	6.1
	Mink	3.14E+01	Mink	1	3.14E+01	8.73E+01	2.8
Lead	Mallard	3.85E+00	American kestrels	4	9.63E-01	1.05E-01	0.11
	Great Blue Heron	3.85E+00	American kestrels	4	9.63E-01	2.68E-01	0.28
	Red-tailed Hawk	3.85E+00	American kestrels	4	9.63E-01	2.52E-01	0.26
	American Robin	3.85E+00	American kestrels	4	9.63E-01	2.35E+00	2.4
	Mule Deer	8.00E+00	Rat	4	2.00E+00	2.65E-01	0.13
	Coyote	8.00E+00	Rat	4	2.00E+00	3.76E-01	0.19
	Mink	8.00E+00	Rat	4	2.00E+00	7.52E-01	0.38
Manganese	Mallard	9.77E+02	Japanese quail	4	2.44E+02	5.56E-01	<0.01
	Great Blue Heron	9.77E+02	Japanese quail	4	2.44E+02	6.38E-01	<0.01
	Red-tailed Hawk	9.77E+02	Japanese quail	4	2.44E+02	6.03E-01	<0.01
	American Robin	9.77E+02	Japanese quail	4	2.44E+02	4.12E+00	0.02
	Mule Deer	8.80E+01	Rat	4	2.20E+01	1.77E+00	0.08
	Coyote	8.80E+01	Rat	4	2.20E+01	8.69E-01	0.04
	Mink	8.80E+01	Rat	4	2.20E+01	1.63E+00	0.07
Mercury	Mallard	4.50E-01	Japanese quail	4	1.13E-01	3.37E-02	0.30
	Great Blue Heron	4.50E-01	Japanese quail	4	1.13E-01	2.00E-02	0.18
	Red-tailed Hawk	4.50E-01	Japanese quail	4	1.13E-01	1.88E-02	0.17
	American Robin	4.50E-01	Japanese quail	4	1.13E-01	1.72E-01	1.5
	Mule Deer	1.00E+00	Mink	4	2.50E-01	1.12E-01	0.45
	Coyote	1.00E+00	Mink	4	2.50E-01	2.63E-02	0.11
	Mink	1.00E+00	Mink	1	1.00E+00	4.87E-02	0.05
Nickel	Mallard	7.74E+01	Mallard duckling	1	7.74E+01	6.77E+00	0.09
	Great Blue Heron	7.74E+01	Mallard duckling	4	1.94E+01	7.52E+00	0.39
	Red-tailed Hawk	7.74E+01	Mallard duckling	4	1.94E+01	7.06E+00	0.37
	American Robin	7.74E+01	Mallard duckling	4	1.94E+01	6.11E+01	3.2
	Mule Deer	4.00E+01	Rat	4	1.00E+01	2.12E+01	2.1
	Coyote	4.00E+01	Rat	4	1.00E+01	1.05E+01	1.1
	Mink	4.00E+01	Rat	4	1.00E+01	2.03E+01	2.0
Selenium	Mallard	4.00E-01	Mallard duck	1	4.00E-01	7.26E-02	0.18
	Great Blue Heron	1.80E+00	Black-crowned Night-heron	1	1.80E+00	2.28E-01	0.13
	Red-tailed Hawk	4.40E-01	Screech owl	4	1.10E-01	2.14E-01	1.9
	American Robin	4.00E-01	Mallard duck	4	1.00E-01	8.91E-01	8.9
	Mule Deer	2.00E-01	Rat	4	5.00E-02	2.16E-01	4.3
	Coyote	2.00E-01	Rat	4	5.00E-02	2.61E-01	5.2
	Mink	2.00E-01	Rat	4	5.00E-02	4.96E-01	9.9

Table B-3
 South Wetlands Tier 1 Ecological Risk Assessment
 Hazard Quotient Summary
 RMC - Troutdale Facility

Chemical	Receptor	NOAEL ^a (mg/kgbw-d)	Toxicity Test Species	Taxa UFs ^b	TRV ^c (mg/kgbw-d)	Intake (mg/kgbw-d)	Hazard Quotient
Silver	Mallard	8.50E+00	Chicken	4	2.13E+00	2.15E-02	0.01
	Great Blue Heron	8.50E+00	Chicken	4	2.13E+00	4.04E-02	0.02
	Red-tailed Hawk	8.50E+00	Chicken	4	2.13E+00	3.79E-02	0.02
	American Robin	8.50E+00	Chicken	4	2.13E+00	1.46E+00	0.69
	Mule Deer	1.81E+01	Mouse	4	4.53E+00	6.49E-03	<0.01
	Coyote	1.81E+01	Mouse	4	4.53E+00	4.56E-02	0.01
	Mink	1.81E+01	Mouse	4	4.53E+00	1.29E-01	0.03
Vanadium	Mallard	1.14E+01	Mallard duck	1	1.14E+01	3.69E-01	0.03
	Great Blue Heron	1.14E+01	Mallard duck	4	2.85E+00	1.17E+00	0.41
	Red-tailed Hawk	1.14E+01	Mallard duck	4	2.85E+00	1.10E+00	0.39
	American Robin	1.14E+01	Mallard duck	4	2.85E+00	5.84E+00	2.0
	Mule Deer	4.20E-01	Rat	4	1.05E-01	1.04E+00	9.9
	Coyote	4.20E-01	Rat	4	1.05E-01	1.55E+00	15
	Mink	4.20E-01	Rat	4	1.05E-01	2.98E+00	28
Zinc	Mallard	1.45E+01	White leghorn chickens	4	3.63E+00	1.52E+00	0.42
	Great Blue Heron	1.45E+01	White leghorn chickens	4	3.63E+00	1.59E+01	4.4
	Red-tailed Hawk	1.45E+01	White leghorn chickens	4	3.63E+00	1.49E+01	4.1
	American Robin	1.45E+01	White leghorn chickens	4	3.63E+00	1.25E+01	3.4
	Mule Deer	1.60E+02	Rat	4	4.00E+01	4.79E+00	0.12
	Coyote	1.60E+02	Rat	4	4.00E+01	1.73E+01	0.43
	Mink	1.60E+02	Rat	4	4.00E+01	3.18E+01	0.79
Organics							
Acenaphthene	Mallard	7.98E+01	Mallard	1	7.98E+01	1.56E-03	<0.01
	Great Blue Heron	7.98E+01	Mallard	4	1.99E+01	1.23E-03	<0.01
	Red-tailed Hawk	7.98E+01	Mallard	4	1.99E+01	1.15E-03	<0.01
	American Robin	7.98E+01	Mallard	4	1.99E+01	1.39E-02	<0.01
	Mule Deer	4.10E+01	Rat	4	1.03E+01	4.88E-03	<0.01
	Coyote	4.10E+01	Rat	4	1.03E+01	1.99E-03	<0.01
	Mink	4.10E+01	Rat	4	1.03E+01	3.87E-03	<0.01
Acenaphthylene	Mallard	7.98E+01	Mallard	1	7.98E+01	1.09E-03	<0.01
	Great Blue Heron	7.98E+01	Mallard	4	1.99E+01	1.03E-03	<0.01
	Red-tailed Hawk	7.98E+01	Mallard	4	1.99E+01	1.28E-03	<0.01
	American Robin	7.98E+01	Mallard	4	1.99E+01	2.98E-03	<0.01
	Mule Deer	4.10E+01	Rat	4	1.03E+01	3.45E-03	<0.01
	Coyote	4.10E+01	Rat	4	1.03E+01	3.14E-03	<0.01
	Mink	4.10E+01	Rat	4	1.03E+01	4.64E-03	<0.01
Anthracene	Mallard	7.98E+01	Mallard	1	7.98E+01	1.15E-03	<0.01
	Great Blue Heron	7.98E+01	Mallard	4	1.99E+01	1.48E-03	<0.01
	Red-tailed Hawk	7.98E+01	Mallard	4	1.99E+01	1.39E-03	<0.01
	American Robin	7.98E+01	Mallard	4	1.99E+01	1.59E-02	<0.01
	Mule Deer	4.10E+01	Rat	4	1.03E+01	3.34E-03	<0.01
	Coyote	4.10E+01	Rat	4	1.03E+01	2.34E-03	<0.01
	Mink	4.10E+01	Rat	4	1.03E+01	4.64E-03	<0.01
Benzo(a)anthracene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	3.90E-02	0.02
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	6.99E-02	0.04
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	6.57E-02	0.03
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	6.55E-01	0.33
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	1.08E-01	0.22
	Coyote	2.00E+00	Mouse	4	5.00E-01	1.09E-01	0.22
	Mink	2.00E+00	Mouse	4	5.00E-01	2.16E-01	0.43
Benzo(a)pyrene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	3.83E-02	0.02
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	6.84E-02	0.03
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	6.42E-02	0.03
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	7.35E-01	0.37
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	1.02E-01	0.20
	Coyote	2.00E+00	Mouse	4	5.00E-01	1.07E-01	0.21
	Mink	2.00E+00	Mouse	4	5.00E-01	2.15E-01	0.43

Table B-3
 South Wetlands Tier 1 Ecological Risk Assessment
 Hazard Quotient Summary
 RMC - Troutdale Facility

Chemical	Receptor	NOAEL ^a (mg/kgbw-d)	Toxicity Test Species	Taxa UFs ^b	TRV ^c (mg/kgbw-d)	Intake (mg/kgbw-d)	Hazard Quotient
Benzo(b)fluoranthene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	8.48E-02	0.04
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	1.61E-01	0.08
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	1.51E-01	0.08
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	1.32E+00	0.67
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	2.41E-01	0.48
	Coyote	2.00E+00	Mouse	4	5.00E-01	2.52E-01	0.50
	Mink	2.00E+00	Mouse	4	5.00E-01	4.93E-01	0.99
Benzo(g,h,i)perylene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	4.08E-02	0.02
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	8.18E-02	0.04
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	7.68E-02	0.04
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	5.61E-01	0.29
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	1.19E-01	0.24
	Coyote	2.00E+00	Mouse	4	5.00E-01	1.28E-01	0.26
	Mink	2.00E+00	Mouse	4	5.00E-01	2.47E-01	0.49
Benzo(k)fluoranthene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	1.58E-02	0.01
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	2.21E-01	0.11
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	2.71E-01	0.14
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	6.35E-01	0.32
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	4.17E-01	0.83
	Coyote	2.00E+00	Mouse	4	5.00E-01	4.95E-01	0.99
	Mink	2.00E+00	Mouse	4	5.00E-01	6.45E-01	1.3
Chrysene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	1.23E-01	0.06
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	2.04E-01	0.10
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	1.92E-01	0.10
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	2.62E+00	1.3
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	3.16E-01	0.63
	Coyote	2.00E+00	Mouse	4	5.00E-01	3.19E-01	0.64
	Mink	2.00E+00	Mouse	4	5.00E-01	6.54E-01	1.3
Dibenzo(a,h)anthracene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	1.02E-02	0.01
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	1.73E-02	0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	1.63E-02	0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	2.39E-01	0.12
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	2.51E-02	0.05
	Coyote	2.00E+00	Mouse	4	5.00E-01	2.70E-02	0.05
	Mink	2.00E+00	Mouse	4	5.00E-01	5.60E-02	0.11
Fluoranthene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	3.14E-01	0.16
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	4.90E-01	0.25
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	4.60E-01	0.23
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	5.65E+00	2.9
	Mule Deer	1.25E+02	Mouse	4	3.13E+01	8.55E-01	0.03
	Coyote	1.25E+02	Mouse	4	3.13E+01	7.68E-01	0.02
	Mink	1.25E+02	Mouse	4	3.13E+01	1.55E+00	0.05
Fluorene	Mallard	7.98E+01	Mallard	1	7.98E+01	1.05E-03	<0.01
	Great Blue Heron	7.98E+01	Mallard	4	1.99E+01	1.12E-03	<0.01
	Red-tailed Hawk	7.98E+01	Mallard	4	1.99E+01	1.05E-03	<0.01
	American Robin	7.98E+01	Mallard	4	1.99E+01	9.72E-03	<0.01
	Mule Deer	4.10E+01	Rat	4	1.03E+01	3.28E-03	<0.01
	Coyote	4.10E+01	Rat	4	1.03E+01	1.79E-03	<0.01
	Mink	4.10E+01	Rat	4	1.03E+01	3.44E-03	<0.01
Indeno(1,2,3-cd)pyrene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	1.05E-03	<0.01
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	1.12E-03	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	1.05E-03	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	9.72E-03	<0.01
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	3.28E-03	0.01
	Coyote	2.00E+00	Mouse	4	5.00E-01	1.79E-03	<0.01
	Mink	2.00E+00	Mouse	4	5.00E-01	3.44E-03	0.01

Table B-3
 South Wetlands Tier 1 Ecological Risk Assessment
 Hazard Quotient Summary
 RMC - Troutdale Facility

Chemical	Receptor	NOAEL ^a (mg/kgbw-d)	Toxicity Test Species	Taxa UFs ^b	TRV ^c (mg/kgbw-d)	Intake (mg/kgbw-d)	Hazard Quotient
Naphthalene	Mallard	7.98E+01	Mallard	1	7.98E+01	2.70E-03	<0.01
	Great Blue Heron	7.98E+01	Mallard	4	1.99E+01	1.03E-03	<0.01
	Red-tailed Hawk	7.98E+01	Mallard	4	1.99E+01	1.28E-03	<0.01
	American Robin	7.98E+01	Mallard	4	1.99E+01	3.32E-03	<0.01
	Mule Deer	4.10E+01	Rat	4	1.03E+01	9.04E-03	<0.01
	Mink	4.10E+01	Rat	4	1.03E+01	3.22E-03	<0.01
PCBs	Mallard	3.60E-01	Ring-necked pheasant	4	9.00E-02	1.42E-02	0.16
	Great Blue Heron	3.60E-01	Ring-necked pheasant	4	9.00E-02	3.70E+00	41
	Red-tailed Hawk	3.60E-01	Ring-necked pheasant	4	9.00E-02	3.47E+00	39
	American Robin	3.60E-01	Ring-necked pheasant	4	9.00E-02	7.20E-01	8.0
	Mule Deer	1.40E-01	Mink	1	1.40E-01	1.62E-02	0.12
	Coyote	1.40E-01	Mink	1	1.40E-01	3.97E+00	28
	Mink	1.40E-01	Mink	1	1.40E-01	7.29E+00	52
Phenanthrene	Mallard	7.98E+01	Mallard	1	7.98E+01	3.76E-03	<0.01
	Great Blue Heron	7.98E+01	Mallard	4	1.99E+01	4.97E-03	<0.01
	Red-tailed Hawk	7.98E+01	Mallard	4	1.99E+01	4.66E-03	<0.01
	American Robin	7.98E+01	Mallard	4	1.99E+01	4.96E-02	<0.01
	Mule Deer	1.40E+01	Rat	4	3.50E+00	1.11E-02	<0.01
	Coyote	1.40E+01	Rat	4	3.50E+00	7.84E-03	<0.01
	Mink	1.40E+01	Rat	4	3.50E+00	1.55E-02	<0.01
Pyrene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	2.89E-01	0.15
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	4.45E-01	0.23
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	4.18E-01	0.21
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	5.30E+00	2.69
	Mule Deer	7.50E+01	Mouse	4	1.88E+01	7.79E-01	0.04
	Coyote	7.50E+01	Mouse	4	1.88E+01	6.97E-01	0.04
	Mink	7.50E+01	Mouse	4	1.88E+01	1.41E+00	0.08

- a) Value is as calculated in Tables G-2 and G-3 of the BLRA; dose divided by the uncertainty factor for the toxicity endpoint
 b) Uncertainty factors (UFs) used to extrapolate from the test species to the receptor; UFs are based on EPA Region 10 guidance (EPA, 1997)
 c) Reference toxicity value is the NOAEL divided by the interspecies (taxa) uncertainty factor

Table B-4
Company Lake Ecological Risk Assessment
Surface Soil/Sediment Exposure Point Concentrations and Summary Statistics Used for the Ecological Risk Assessment
RMC - Troutdale Facility

Analyte	Number of Detects	Number of Samples	Frequency of Detection	Minimum Nondetect Value	Maximum Nondetect Value	Minimum Detected Value	Maximum Detected Value	Arithmetic Mean	EPC	Basis	EPC > Max	Final EPC	Basis
Aluminum	5	5	100%	-	-	1.35E+04	3.41E+04	1.82E+04	2.74E+04	Non-Parametric	FALSE	2.74E+04	Non-Parametric
Arsenic	4	6	67%	3.20E+00	5.40E+00	1.90E+00	3.20E+00	2.32E+00	2.79E+00	Normal	FALSE	2.79E+00	Normal
Barium	6	6	100%	-	-	6.50E+01	1.56E+02	8.84E+01	1.22E+02	Non-Parametric	FALSE	1.22E+02	Non-Parametric
Benzo(a)anthracene	3	8	38%	3.30E-01	5.00E-01	1.90E-01	7.20E-01	2.93E-01	4.84E-01	Lognormal	FALSE	4.84E-01	Lognormal
Benzo(a)pyrene	3	8	38%	3.30E-01	5.00E-01	2.20E-01	9.00E-01	3.27E-01	7.24E-01	Non-Parametric	FALSE	7.24E-01	Non-Parametric
Benzo(b)fluoranthene	3	8	38%	3.30E-01	5.00E-01	2.30E-01	1.40E+00	4.01E-01	1.06E+00	Non-Parametric	FALSE	1.06E+00	Non-Parametric
Benzo(g,h,i)perylene	3	8	38%	3.30E-01	5.00E-01	1.80E-01	7.60E-01	2.87E-01	4.44E-01	Non-Parametric	FALSE	4.44E-01	Non-Parametric
Benzo(k)fluoranthene	2	8	25%	1.70E-01	5.00E-01	1.50E-01	3.30E-01	1.95E-01	2.48E-01	Normal	FALSE	2.48E-01	Normal
Benzoic Acid	2	2	100%	-	-	4.80E+00	5.30E+00	5.05E+00	5.30E+00	MAXDET	FALSE	5.30E+00	MAXDET
Cadmium	2	6	33%	5.00E-01	1.10E+00	1.10E+00	1.60E+00	6.67E-01	1.13E+00	Normal	FALSE	1.13E+00	Normal
Chromium	6	6	100%	-	-	1.72E+01	3.68E+01	2.17E+01	2.83E+01	Non-Parametric	FALSE	2.83E+01	Non-Parametric
Chrysene	3	8	38%	3.30E-01	5.00E-01	2.50E-01	1.00E+00	3.44E-01	7.89E-01	Non-Parametric	FALSE	7.89E-01	Non-Parametric
Cobalt	6	6	100%	-	-	1.00E+01	1.68E+01	1.19E+01	1.44E+01	Non-Parametric	FALSE	1.44E+01	Non-Parametric
Copper	6	6	100%	-	-	2.24E+01	5.88E+01	3.32E+01	4.46E+01	Normal	FALSE	4.46E+01	Normal
Dibenzo(a,h)anthracene	2	8	25%	1.70E-01	5.00E-01	4.00E-02	1.00E-01	1.53E-01	2.03E-01	Normal	TRUE	1.00E-01	MAXDET
Fluoranthene	3	8	38%	3.30E-01	5.00E-01	2.40E-01	9.60E-01	3.44E-01	7.79E-01	Non-Parametric	FALSE	7.79E-01	Non-Parametric
Fluoride	5	8	63%	5.00E+00	1.40E+02	2.20E+02	5.70E+02	2.45E+02	3.86E+02	Normal	FALSE	3.86E+02	Normal
Indeno(1,2,3-cd)pyrene	3	8	38%	3.30E-01	5.00E-01	1.90E-01	6.90E-01	2.87E-01	4.36E-01	Non-Parametric	FALSE	4.36E-01	Non-Parametric
Iron	5	5	100%	-	-	1.87E+04	4.15E+04	2.43E+04	3.42E+04	Non-Parametric	FALSE	3.42E+04	Non-Parametric
Lead	6	6	100%	-	-	6.90E+00	2.80E+01	1.44E+01	2.18E+01	Normal	FALSE	2.18E+01	Normal
Manganese	5	5	100%	-	-	2.56E+02	4.47E+02	3.06E+02	4.01E+02	Non-Parametric	FALSE	4.01E+02	Non-Parametric
Nickel	6	6	100%	-	-	1.56E+01	4.50E+01	2.48E+01	3.42E+01	Normal	FALSE	3.42E+01	Normal
Phenanthrene	1	8	13%	1.70E-01	5.00E-01	3.30E-01	3.30E-01	1.88E-01	2.45E-01	Normal	FALSE	2.45E-01	Normal
Pyrene	3	8	38%	3.30E-01	5.00E-01	2.30E-01	1.00E+00	3.46E-01	7.98E-01	Non-Parametric	FALSE	7.98E-01	Non-Parametric
Vanadium	6	6	100%	-	-	4.76E+01	1.11E+02	6.32E+01	8.75E+01	Non-Parametric	FALSE	8.75E+01	Non-Parametric
Zinc	5	5	100%	-	-	4.28E+01	1.35E+02	7.12E+01	107.628419	Normal	FALSE	107.628419	Normal

Table B-5
Company Lake Tier 1 Ecological Risk Assessment
Intake Estimation for Ecological Endpoint Species
RMC - Troutdale Facility

Chemical	Receptor Species	Body Weight (kg)	Daily Food Intake (kg/day)	Daily Water Intake (L/day)	Area Use Factor	Migration Factor	Daily Food Ingestion from Site (kg/day)	Daily Water Intake from Site (L/day)	Fraction of Diet as Fish/Amphibians	Water to Fish Transfer Factor	Fraction of Diet as Invertebrates	Sediment to Invertebrate Transfer Factor	Fraction of Diet as Plants	Sediment to Plant Transfer Factor	Fraction of Diet as Sediment	Sediment Conc. (mg/kg)	Bioavailability	Water Conc. (mg/L)	Chemical Intake (mg/kg-d) ^a
Inorganics																			
Aluminum	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	50	0.078	0.054	0.902	0.001	0.02	27391.81	0.07	0.60	1.04E+01
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.3	0.078	0.98	50	0	0.054	0	0.001	0.02	27391.81	0.07	0.60	8.88E+00
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	50	0.039	0.054	0.01	0.001	0.028	27391.81	0.07	0.60	3.80E+01
Antimony	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	1	0.902	0.01	0.02	0.00	1.00	---	0.00E+00
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	1	0	0.01	0.02	0.00	1.00	---	0.00E+00
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	1	0.01	0.01	0.028	0.00	1.00	---	0.00E+00
Arsenic	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.15	0.902	0.01	0.02	2.79	1.00	---	6.60E-03
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.15	0	0.01	0.02	2.79	1.00	---	7.29E-03
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.15	0.01	0.01	0.028	2.79	1.00	---	2.58E-02
Barium	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.058	0.902	0.003	0.02	121.79	1.00	---	1.93E-01
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.058	0	0.003	0.02	121.79	1.00	---	3.19E-01
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.058	0.01	0.003	0.028	121.79	1.00	---	1.01E+00
Beryllium	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.19	0.902	0.0025	0.02	0.00	1.00	---	0.00E+00
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.19	0	0.0025	0.02	0.00	1.00	---	0.00E+00
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.19	0.01	0.0025	0.028	0.00	1.00	---	0.00E+00
Cadmium	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.74	0.902	0.14	0.02	1.13	1.00	---	1.34E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.74	0	0.14	0.02	1.13	1.00	---	2.96E-03
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.74	0.01	0.14	0.028	1.13	1.00	---	1.80E-02
Chromium	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.078	0.902	0.0001	0.02	28.31	1.00	---	4.31E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.078	0	0.0001	0.02	28.31	1.00	---	7.40E-02
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.078	0.01	0.0001	0.028	28.31	1.00	---	2.40E-01
Cobalt	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.047	0.902	0.023	0.02	14.37	1.00	---	3.71E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.047	0	0.023	0.02	14.37	1.00	---	3.76E-02
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.047	0.01	0.023	0.028	14.37	1.00	---	1.18E-01
Copper	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.083	0.902	0.08	0.02	44.60	0.46	---	2.28E-01
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.083	0	0.08	0.02	44.60	0.46	---	5.37E-02
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.083	0.01	0.08	0.028	44.60	0.46	---	2.06E-01
Fluoride	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	2.3	0.078	0.0006	0.902	0.009	0.02	385.55	0.35	3.00	4.24E-01
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	2.3	0	0.0006	0	0.009	0.02	385.55	0.35	3.00	1.34E+00
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	2.3	0.039	0.0006	0.01	0.009	0.028	385.55	0.35	3.00	3.07E+00
Lead	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.072	0.902	0.00076	0.02	21.77	1.00	---	3.33E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.072	0	0.00076	0.02	21.77	1.00	---	5.69E-02
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.072	0.01	0.00076	0.028	21.77	1.00	---	1.83E-01
Manganese	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	400	0.078	0.064	0.902	0.069	0.02	400.91	1.00	0.06	2.04E+00
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	400	0	0.064	0	0.069	0.02	400.91	1.00	0.06	4.07E+00
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	400	0.039	0.064	0.01	0.069	0.028	400.91	1.00	0.06	9.35E+00
Mercury	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.15	0.902	0.3	0.02	0.00	1.00	---	0.00E+00
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.15	0	0.3	0.02	0.00	1.00	---	0.00E+00
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.15	0.01	0.3	0.028	0.00	1.00	---	0.00E+00
Nickel	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.066	0.902	0.05	0.02	34.20	1.00	---	1.40E-01
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.066	0	0.05	0.02	34.20	1.00	---	8.95E-02
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.066	0.01	0.05	0.028	34.20	1.00	---	2.90E-01

Table B-5
Company Lake Tier 1 Ecological Risk Assessment
Intake Estimation for Ecological Endpoint Species
RMC - Troutdale Facility

Chemical	Receptor Species	Body Weight (kg)	Daily Food Intake (kg/day)	Daily Water Intake (L/day)	Area Use Factor	Migration Factor	Daily Food Ingestion from Site (kg/day)	Daily Water Intake from Site (L/day)	Fraction of Diet as Fish/Amphibians	Water to Fish Transfer Factor	Fraction of Diet as Invertebrates	Sediment to Invertebrate Transfer Factor	Fraction of Diet as Plants	Sediment to Plant Transfer Factor	Fraction of Diet as Sediment	Sediment Conc. (mg/kg)	Bioavailability	Water Conc. (mg/L)	Chemical Intake (mg/kg-d) ^a
Selenium	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.21	0.902	0.1	0.02	0.00	1.00	---	0.00E+00
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.21	0	0.1	0.02	0.00	1.00	---	0.00E+00
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.21	0.01	0.1	0.028	0.00	1.00	---	0.00E+00
Silver	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	2.45	0.902	0.000022	0.02	0.00	1.00	---	0.00E+00
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	2.45	0	0.000022	0.02	0.00	1.00	---	0.00E+00
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	2.45	0.01	0.000022	0.028	0.00	1.00	---	0.00E+00
Thallium	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.038	0.902	0.001	0.02	0.00	1.00	---	0.00E+00
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.038	0	0.001	0.02	0.00	1.00	---	0.00E+00
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.038	0.01	0.001	0.028	0.00	1.00	---	0.00E+00
Vanadium	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.014	0.902	0.0014	0.02	87.50	0.31	---	4.36E-02
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.014	0	0.0014	0.02	87.50	0.31	---	7.09E-02
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.014	0.01	0.0014	0.028	87.50	0.31	---	2.20E-01
Zinc	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.29	0.902	0.26	0.02	0.00	1.00	---	0.00E+00
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.29	0	0.26	0.02	0.00	1.00	---	0.00E+00
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.29	0.01	0.26	0.028	0.00	1.00	---	0.00E+00
Organics																			
Acenaphthene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0	0.902	0	0.02	0.00	1.00	---	0.00E+00
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0	0	0	0.02	0.00	1.00	---	0.00E+00
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0	0.01	0	0.028	0.00	1.00	---	0.00E+00
Anthracene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0	0.902	0	0.02	0.00	1.00	---	0.00E+00
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0	0	0	0.02	0.00	1.00	---	0.00E+00
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0	0.01	0	0.028	0.00	1.00	---	0.00E+00
Aroclor 1248	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.48	0.902	0.0009	0.02	0.00	1.00	---	0.00E+00
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.48	0	0.0009	0.02	0.00	1.00	---	0.00E+00
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.48	0.01	0.0009	0.028	0.00	1.00	---	0.00E+00
Aroclor 1268	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.48	0.902	0.0009	0.02	0.00	1.00	---	0.00E+00
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.48	0	0.0009	0.02	0.00	1.00	---	0.00E+00
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.48	0.01	0.0009	0.028	0.00	1.00	---	0.00E+00
Benzo(a)anthracene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.043	0.902	0.0019	0.02	0.48	1.00	---	7.07E-04
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.043	0	0.0019	0.02	0.48	1.00	---	1.27E-03
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.043	0.01	0.0019	0.028	0.48	1.00	---	3.92E-03
Benzo(a)pyrene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.054	0.902	0.0011	0.02	0.72	1.00	---	1.06E-03
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.054	0	0.0011	0.02	0.72	1.00	---	1.89E-03
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.054	0.01	0.0011	0.028	0.72	1.00	---	5.95E-03
Benzo(b)fluoranthene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.034	0.902	0.0011	0.02	1.06	1.00	---	1.46E-03
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.034	0	0.0011	0.02	1.06	1.00	---	2.77E-03
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.034	0.01	0.0011	0.028	1.06	1.00	---	8.46E-03
Benzo(g,h,i)perylene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.024	0.902	0.0006	0.02	0.44	1.00	---	5.80E-04
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.024	0	0.0006	0.02	0.44	1.00	---	1.16E-03
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.024	0.01	0.0006	0.028	0.44	1.00	---	3.51E-03
Benzo(k)fluoranthene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.034	0.902	0.0009	0.02	0.25	1.00	---	3.39E-04
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.034	0	0.0009	0.02	0.25	1.00	---	6.49E-04
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.034	0.01	0.0009	0.028	0.25	1.00	---	1.99E-03

Table B-5
Company Lake Tier 1 Ecological Risk Assessment
Intake Estimation for Ecological Endpoint Species
RMC - Troutdale Facility

Chemical	Receptor Species	Body Weight (kg)	Daily Food Intake (kg/day)	Daily Water Intake (L/day)	Area Use Factor	Migration Factor	Daily Food Ingestion from Site (kg/day)	Daily Water Intake from Site (L/day)	Fraction of Diet as Fish/Amphibians	Water to Fish Transfer Factor	Fraction of Diet as Invertebrates	Sediment to Invertebrate Transfer Factor	Fraction of Diet as Plants	Sediment to Plant Transfer Factor	Fraction of Diet as Sediment	Sediment Conc. (mg/kg)	Bioavailability	Water Conc. (mg/L)	Chemical Intake (mg/kg-d) ^a
Chrysene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.07	0.902	0.0019	0.02	0.79	1.00	---	1.25E-03
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.07	0	0.0019	0.02	0.79	1.00	---	2.06E-03
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.07	0.01	0.0019	0.028	0.79	1.00	---	6.61E-03
Dibenzo(a,h)anthracene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.078	0.902	0.0005	0.02	0.00	1.00	---	0.00E+00
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.078	0	0.0005	0.02	0.00	1.00	---	0.00E+00
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.078	0.01	0.0005	0.028	0.00	1.00	---	0.00E+00
Fluoranthene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.059	0.902	0.0047	0.02	0.78	1.00	---	1.31E-03
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.059	0	0.0047	0.02	0.78	1.00	---	2.04E-03
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.059	0.01	0.0047	0.028	0.78	1.00	---	6.44E-03
Fluorene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.032	0.902	0.0218	0.02	0.00	1.00	---	0.00E+00
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.032	0	0.0218	0.02	0.00	1.00	---	0.00E+00
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.032	0.01	0.0218	0.028	0.00	1.00	---	0.00E+00
Indeno(1,2,3-cd)pyrene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.066	0.902	0.0005	0.02	0.44	1.00	---	6.49E-04
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.066	0	0.0005	0.02	0.44	1.00	---	1.14E-03
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.066	0.01	0.0005	0.028	0.44	1.00	---	3.63E-03
Phenanthrene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.045	0.902	0.0117	0.02	0.24	1.00	---	4.85E-04
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.045	0	0.0117	0.02	0.24	1.00	---	6.40E-04
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.045	0.01	0.0117	0.028	0.24	1.00	---	1.99E-03
Pyrene	Mallard	1.16	0.135	0.065	1	0.5	0.0675	0.0325	0	---	0.078	0.062	0.902	0.0048	0.02	0.80	1.00	---	1.35E-03
	Great Blue Heron	2.34	0.408	0.104	1	0.75	0.306	0.078	0.98	---	0	0.062	0	0.0048	0.02	0.80	1.00	---	2.09E-03
	Mink	1.24	0.338	0.12	1	1	0.338	0.12	0.923	---	0.039	0.062	0.01	0.0048	0.028	0.80	1.00	---	6.62E-03

a) During the BLERA, open water areas with available sediment, surface water, and biota tissue data included only Company Lake, and only for fluoride and PAHs. For these constituents, the intake equation for Company Lake included biota tissue data. Because the biota tissue data were collected prior to restoration activities at Company Lake, the tissue data are no longer representative of current conditions. Instead, the PDERA calculates bioaccumulation and intake rates at Company Lake using the same equations as other open water areas.

Table B-6
Company Lake Tier 1 Ecological Risk Assessment
Hazard Quotient Summary
RMC - Troutdale Facility

Chemical	Receptor	NOAEL ^a (mg/kgbw-d)	Toxicity Test Species	Taxa UFs ^b	TRV ^c (mg/kgbw-d)	Intake (mg/kgbw-d)	Hazard Quotient
Inorganics							
Aluminum	Mallard	1.10E+02	Ringed dove	4	2.74E+01	1.04E+01	0.38
	Great Blue Heron	1.10E+02	Ringed dove	4	2.74E+01	8.88E+00	0.32
	Mink	6.00E+01	Beagle (dog)	4	1.50E+01	3.80E+01	2.5
Antimony	Mallard	---	---	---	---	---	---
	Great Blue Heron	---	---	---	---	---	---
	Mink	2.50E-01	Mouse	4	6.25E-02	---	---
Arsenic	Mallard	5.14E+00	Mallard duck	1	5.14E+00	6.60E-03	<0.01
	Great Blue Heron	5.14E+00	Mallard duck	4	1.29E+00	7.29E-03	0.01
	Mink	2.52E-01	Mouse	4	6.30E-02	2.58E-02	0.41
Barium	Mallard	4.16E+01	1-day-old chicks	4	1.04E+01	1.93E-01	0.02
	Great Blue Heron	4.16E+01	1-day-old chicks	4	1.04E+01	3.19E-01	0.03
	Mink	5.06E+00	Rat	4	1.27E+00	1.01E+00	0.79
Beryllium	Mallard	---	---	---	---	---	---
	Great Blue Heron	---	---	---	---	---	---
	Mink	6.60E-01	Rat	4	1.65E-01	---	---
Cadmium	Mallard	1.45E+00	Mallard duck	1	1.45E+00	1.34E-02	<0.01
	Great Blue Heron	1.45E+00	Mallard duck	4	3.63E-01	2.96E-03	<0.01
	Mink	1.00E+00	Rat	4	2.50E-01	1.80E-02	0.07
Chromium	Mallard	1.00E+00	Black duck	1	1.00E+00	4.31E-02	0.04
	Great Blue Heron	1.00E+00	Black duck	4	2.50E-01	7.40E-02	0.30
	Mink	2.74E+03	Rat	4	6.84E+02	2.40E-01	<0.01
Cobalt	Mallard	1.30E+01	1-day-old chicks	4	3.25E+00	3.71E-02	0.01
	Great Blue Heron	1.30E+01	1-day-old chicks	4	3.25E+00	3.76E-02	0.01
	Mink	1.00E+00	Rat	4	2.50E-01	1.18E-01	0.47
Copper	Mallard	4.70E+01	1-day-old chicks	4	1.18E+01	2.28E-01	0.02
	Great Blue Heron	4.70E+01	1-day-old chicks	4	1.18E+01	5.37E-02	<0.01
	Mink	1.17E+01	Mink	1	1.17E+01	2.06E-01	0.02
Fluoride	Mallard	7.80E+00	Screech owl	4	1.95E+00	4.24E-01	0.22
	Great Blue Heron	7.80E+00	Screech owl	4	1.95E+00	1.34E+00	0.69
	Mink	3.14E+01	Mink	1	3.14E+01	3.07E+00	0.10
Lead	Mallard	3.85E+00	American kestrels	4	9.63E-01	3.33E-02	0.03
	Great Blue Heron	3.85E+00	American kestrels	4	9.63E-01	5.69E-02	0.06
	Mink	8.00E+00	Rat	4	2.00E+00	1.83E-01	0.09
Manganese	Mallard	9.77E+02	Japanese quail	4	2.44E+02	2.04E+00	<0.01
	Great Blue Heron	9.77E+02	Japanese quail	4	2.44E+02	4.07E+00	0.02
	Mink	8.80E+01	Rat	4	2.20E+01	9.35E+00	0.43
Mercury	Mallard	4.50E-01	Japanese quail	4	1.13E-01	---	---
	Great Blue Heron	4.50E-01	Japanese quail	4	1.13E-01	---	---
	Mink	1.00E+00	Mink	1	1.00E+00	---	---
Nickel	Mallard	7.74E+01	Mallard duckling	1	7.74E+01	1.40E-01	<0.01
	Great Blue Heron	7.74E+01	Mallard duckling	4	1.94E+01	8.95E-02	<0.01
	Mink	4.00E+01	Rat	4	1.00E+01	2.90E-01	0.03
Selenium	Mallard	4.00E-01	Mallard duck	1	4.00E-01	---	---
	Great Blue Heron	1.80E+00	Black-crowned Night-heron	1	1.80E+00	---	---
	Mink	2.00E-01	Rat	4	5.00E-02	---	---
Silver	Mallard	8.50E+00	Chicken	4	2.13E+00	---	---
	Great Blue Heron	8.50E+00	Chicken	4	2.13E+00	---	---
	Mink	1.81E+01	Mouse	4	4.53E+00	---	---
Thallium	Mallard	7.34E-01	Mallard	1	7.34E-01	---	---
	Great Blue Heron	7.34E-01	Mallard	4	1.84E-01	---	---
	Mink	7.40E-02	Rat	4	1.85E-02	---	---
Vanadium	Mallard	1.14E+01	Mallard duck	1	1.14E+01	4.36E-02	<0.01
	Great Blue Heron	1.14E+01	Mallard duck	4	2.85E+00	7.09E-02	0.02
	Mink	4.20E-01	Rat	4	1.05E-01	2.20E-01	2.1
Zinc	Mallard	1.45E+01	White leghorn chickens	4	3.63E+00	---	---
	Great Blue Heron	1.45E+01	White leghorn chickens	4	3.63E+00	---	---
	Mink	1.60E+02	Rat	4	4.00E+01	---	---

Table B-6
Company Lake Tier 1 Ecological Risk Assessment
Hazard Quotient Summary
RMC - Troutdale Facility

Chemical	Receptor	NOAEL ^a (mg/kgbw-d)	Toxicity Test Species	Taxa UFs ^b	TRV ^c (mg/kgbw-d)	Intake (mg/kgbw-d)	Hazard Quotient
Organics							
Acenaphthene	Mallard	7.98E+01	Mallard	1	7.98E+01	---	---
	Great Blue Heron	7.98E+01	Mallard	4	1.99E+01	---	---
	Mink	4.10E+01	Rat	4	1.03E+01	---	---
Anthracene	Mallard	7.98E+01	Mallard	1	7.98E+01	---	---
	Great Blue Heron	7.98E+01	Mallard	4	1.99E+01	---	---
	Mink	4.10E+01	Rat	4	1.03E+01	---	---
Aroclor 1248	Mallard	3.60E-01	Ring-necked pheasant	4	9.00E-02	---	---
	Great Blue Heron	3.60E-01	Ring-necked pheasant	4	9.00E-02	---	---
	Mink	1.40E-01	Mink	1	1.40E-01	---	---
Aroclor 1268	Mallard	3.60E-01	Ring-necked pheasant	4	9.00E-02	---	---
	Great Blue Heron	3.60E-01	Ring-necked pheasant	4	9.00E-02	---	---
	Mink	1.40E-01	Mink	1	1.40E-01	---	---
Benzo(a)anthracene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	7.07E-04	<0.01
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	1.27E-03	<0.01
	Mink	2.00E+00	Mouse	4	5.00E-01	3.92E-03	<0.01
Benzo(a)pyrene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	1.06E-03	<0.01
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	1.89E-03	<0.01
	Mink	2.00E+00	Mouse	4	5.00E-01	5.95E-03	0.01
Benzo(b)fluoranthene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	1.46E-03	<0.01
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	2.77E-03	<0.01
	Mink	2.00E+00	Mouse	4	5.00E-01	8.46E-03	0.02
Benzo(g,h,i)perylene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	5.80E-04	<0.01
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	1.16E-03	<0.01
	Mink	2.00E+00	Mouse	4	5.00E-01	3.51E-03	<0.01
Benzo(k)fluoranthene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	3.39E-04	<0.01
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	6.49E-04	<0.01
	Mink	2.00E+00	Mouse	4	5.00E-01	1.99E-03	<0.01
Chrysene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	1.25E-03	<0.01
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	2.06E-03	<0.01
	Mink	2.00E+00	Mouse	4	5.00E-01	6.61E-03	0.01
Dibenzo(a,h)anthracene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	---	---
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	---	---
	Mink	2.00E+00	Mouse	4	5.00E-01	---	---
Fluoranthene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	1.31E-03	<0.01
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	2.04E-03	<0.01
	Mink	1.25E+02	Mouse	4	3.13E+01	6.44E-03	<0.01
Fluorene	Mallard	7.98E+01	Mallard	1	7.98E+01	---	---
	Great Blue Heron	7.98E+01	Mallard	4	1.99E+01	---	---
	Mink	4.10E+01	Rat	4	1.03E+01	---	---
Indeno(1,2,3-cd)pyrene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	6.49E-04	<0.01
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	1.14E-03	<0.01
	Mink	2.00E+00	Mouse	4	5.00E-01	3.63E-03	<0.01
Phenanthrene	Mallard	7.98E+01	Mallard	1	7.98E+01	4.85E-04	<0.01
	Great Blue Heron	7.98E+01	Mallard	4	1.99E+01	6.40E-04	<0.01
	Mink	1.40E+01	Rat	4	3.50E+00	1.99E-03	<0.01
Pyrene	Mallard	7.87E+00	White leghorn chickens	4	1.97E+00	1.35E-03	<0.01
	Great Blue Heron	7.87E+00	White leghorn chickens	4	1.97E+00	2.09E-03	<0.01
	Mink	7.50E+01	Mouse	4	1.88E+01	6.62E-03	<0.01

a) Value is as calculated in Tables G-2 and G-3 of the BLRA; dose divided by the uncertainty factor for the toxicity endpoint

b) Uncertainty factors (UFs) used to extrapolate from the test species to the receptor; UFs are based on EPA Region 10 guidance (EPA, 1997)

c) Reference toxicity value is the NOAEL divided by the interspecies (taxa) uncertainty factor

Table B-7
Fairview Farms Tier 1 Ecological Risk Assessment
Intake Estimation for Ecological Endpoint Species
RMC - Troutdale Facility

Chemical	Receptor Species	Body Weight (kg)	Daily Food Intake (kg/day)	Area Use Factor	Migration Factor	Daily Food Ingestion from Site (kg/day)	Daily Water Intake from Site (L/day)	Fraction of Diet as Prey	Sediment to Prey Transfer Factor	Fraction of Diet as Invertebrates	Sediment to Invertebrate Transfer Factor	Fraction of Diet as Plants	Sediment to Plant Transfer Factor	Fraction of Diet as Sediment	Sediment Conc. (mg/kg)	Bioavailability	Water Conc. (mg/L)	Chemical Intake (mg/kg-d)
Inorganics																		
Aluminum	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0.023	0	0.054	0.029	0.001	0.028	19800.00	0.07	0.20	6.85E+01
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0.023	0	0.054	0	0.001	0.02	19800.00	0.07	0.20	5.82E+01
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0.023	0.76	0.054	0.218	0.001	0.022	19800.00	0.07	0.20	3.77E+02
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0.023	0	0.054	0.98	0.001	0.02	19800.00	0.07	0.20	8.75E+00
Arsenic	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0.0018	0	0.15	0.029	0.01	0.028	5.94	1.00	---	2.60E-02
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0.0018	0	0.15	0	0.01	0.02	5.94	1.00	---	1.59E-02
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0.0018	0.76	0.15	0.218	0.01	0.022	5.94	1.00	---	3.65E-01
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0.0018	0	0.15	0.98	0.01	0.02	5.94	1.00	---	3.28E-02
Barium	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0.02	0	0.058	0.029	0.003	0.028	149.00	1.00	0.03	1.02E+00
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0.02	0	0.058	0	0.003	0.02	149.00	1.00	0.03	7.26E-01
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0.02	0.76	0.058	0.218	0.003	0.022	149.00	1.00	0.03	4.42E+00
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0.02	0	0.058	0.98	0.003	0.02	149.00	1.00	0.03	6.36E-01
Beryllium	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0.19	0	0.19	0.029	0.0025	0.028	0.72	1.00	---	2.19E-02
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0.19	0	0.19	0	0.0025	0.02	0.72	1.00	---	1.83E-02
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0.19	0.76	0.19	0.218	0.0025	0.022	0.72	1.00	---	5.37E-02
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0.19	0	0.19	0.98	0.0025	0.02	0.72	1.00	---	3.01E-03
Cadmium	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0.36	0	0.74	0.029	0.14	0.028	0.40	1.00	---	2.19E-02
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0.36	0	0.74	0	0.14	0.02	0.40	1.00	---	1.85E-02
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0.36	0.76	0.74	0.218	0.14	0.022	0.40	1.00	---	1.10E-01
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	1.2	0	0.74	0.98	0.14	0.02	0.40	1.00	---	1.18E-02
Chromium	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0.032	0	0.078	0.029	0.0001	0.028	24.10	1.00	---	2.05E-01
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0.032	0	0.078	0	0.0001	0.02	24.10	1.00	---	1.52E-01
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0.032	0.76	0.078	0.218	0.0001	0.022	24.10	1.00	---	8.71E-01
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0.032	0	0.078	0.98	0.0001	0.02	24.10	1.00	---	8.98E-02
Cobalt	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0.0075	0	0.047	0.029	0.023	0.028	10.30	1.00	0.09	6.06E-02
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0.0075	0	0.047	0	0.023	0.02	10.30	1.00	0.09	3.83E-02
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0.0075	0.76	0.047	0.218	0.023	0.022	10.30	1.00	0.09	2.93E-01
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0.0075	0	0.047	0.98	0.023	0.02	10.30	1.00	0.09	8.69E-02
Copper	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0.12	0	0.083	0.029	0.08	0.028	33.60	0.46	---	6.30E-01
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0.12	0	0.083	0	0.08	0.02	33.60	0.46	---	5.23E-01
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0.12	0.76	0.083	0.218	0.08	0.022	33.60	0.46	---	1.35E+00
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0.12	0	0.083	0.98	0.08	0.02	33.60	0.46	---	5.46E-01
Cyanide	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0	0	1	0.029	1.8	0.028	0.78	1.00	---	9.18E-03
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0	0	1	0	1.8	0.02	0.78	1.00	---	1.93E-03
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0	0.76	1	0.218	1.8	0.022	0.78	1.00	---	4.09E-01
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0	0	1	0.98	1.8	0.02	0.78	1.00	---	2.59E-01
Fluoride	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0.033	0	0.0006	0.029	0.009	0.028	383.00	0.35	1.20	2.40E+00
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0.033	0	0.0006	0	0.009	0.02	383.00	0.35	1.20	1.90E+00
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0.033	0.76	0.0006	0.218	0.009	0.022	383.00	0.35	1.20	1.80E+00
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0.033	0	0.0006	0.98	0.009	0.02	383.00	0.35	1.20	1.20E+00

Table B-7
Fairview Farms Tier 1 Ecological Risk Assessment
Intake Estimation for Ecological Endpoint Species
RMC - Troutdale Facility

Chemical	Receptor Species	Body Weight (kg)	Daily Food Intake (kg/day)	Area Use Factor	Migration Factor	Daily Food Ingestion from Site (kg/day)	Daily Water Intake from Site (L/day)	Fraction of Diet as Prey	Sediment to Prey Transfer Factor	Fraction of Diet as Invertebrates	Sediment to Invertebrate Transfer Factor	Fraction of Diet as Plants	Sediment to Plant Transfer Factor	Fraction of Diet as Sediment	Sediment Conc. (mg/kg)	Bioavailability	Water Conc. (mg/L)	Chemical Intake (mg/kg-d)
Lead	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0.062	0	0.072	0.029	0.00076	0.028	21.10	1.00	---	2.66E-01
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0.062	0	0.072	0	0.00076	0.02	21.10	1.00	---	2.09E-01
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0.062	0.76	0.072	0.218	0.00076	0.022	21.10	1.00	---	7.21E-01
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0.062	0	0.072	0.98	0.00076	0.02	21.10	1.00	---	8.12E-02
Manganese	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0.025	0	0.064	0.029	0.069	0.028	388.00	1.00	16.40	4.32E+00
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0.025	0	0.064	0	0.069	0.02	388.00	1.00	16.40	2.82E+00
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0.025	0.76	0.064	0.218	0.069	0.022	388.00	1.00	16.40	1.59E+01
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0.025	0	0.064	0.98	0.069	0.02	388.00	1.00	16.40	7.37E+00
Nickel	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0.04	0	0.066	0.029	0.05	0.028	20.70	1.00	---	2.03E-01
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0.04	0	0.066	0	0.05	0.02	20.70	1.00	---	1.50E-01
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0.04	0.76	0.066	0.218	0.05	0.022	20.70	1.00	---	7.64E-01
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0.04	0	0.066	0.98	0.05	0.02	20.70	1.00	---	2.65E-01
Selenium	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0.3	0	0.21	0.029	0.1	0.028	0.56	1.00	---	2.58E-02
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0.3	0	0.21	0	0.1	0.02	0.56	1.00	---	2.17E-02
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0.3	0.76	0.21	0.218	0.1	0.022	0.56	1.00	---	5.09E-02
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0.3	0	0.21	0.98	0.1	0.02	0.56	1.00	---	1.23E-02
Vanadium	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0.006	0	0.014	0.029	0.0014	0.028	66.78	0.31	---	1.40E-01
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0.006	0	0.014	0	0.0014	0.02	66.78	0.31	---	9.90E-02
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0.006	0.76	0.014	0.218	0.0014	0.022	66.78	0.31	---	5.27E-01
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0.006	0	0.014	0.98	0.0014	0.02	66.78	0.31	---	9.38E-02
Zinc	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0.46	0	0.29	0.029	0.26	0.028	84.30	1.00	---	5.78E+00
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0.46	0	0.29	0	0.26	0.02	84.30	1.00	---	4.87E+00
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0.46	0.76	0.29	0.218	0.26	0.022	84.30	1.00	---	1.12E+01
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0.46	0	0.29	0.98	0.26	0.02	84.30	1.00	---	4.30E+00
Organics																		
Acenaphthene	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0	0	0.048	0.029	0.0369	0.028	0.15	1.00	---	6.43E-04
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0	0	0.048	0	0.0369	0.02	0.15	1.00	---	3.72E-04
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0	0.76	0.048	0.218	0.0369	0.022	0.15	1.00	---	4.48E-03
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0	0	0.048	0.98	0.0369	0.02	0.15	1.00	---	1.58E-03
Anthracene	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0	0	0.051	0.029	0.0121	0.028	0.17	1.00	---	6.95E-04
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0	0	0.051	0	0.0121	0.02	0.17	1.00	---	4.13E-04
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0	0.76	0.051	0.218	0.0121	0.022	0.17	1.00	---	4.73E-03
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0	0	0.051	0.98	0.0121	0.02	0.17	1.00	---	9.92E-04
Aroclor 1260	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0.69	0	0.48	0.029	0.0003	0.028	0.13	1.00	---	1.24E-02
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0.69	0	0.48	0	0.0003	0.02	0.13	1.00	---	1.07E-02
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0.69	0.76	0.48	0.218	0.0003	0.022	0.13	1.00	---	2.15E-02
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0.69	0	0.48	0.98	0.0003	0.02	0.13	1.00	---	4.70E-04
Benzo(a)anthracene	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0	0	0.043	0.029	0.0019	0.028	0.31	1.00	---	1.26E-03
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0	0	0.043	0	0.0019	0.02	0.31	1.00	---	7.54E-04
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0	0.76	0.043	0.218	0.0019	0.022	0.31	1.00	---	7.52E-03
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0	0	0.043	0.98	0.0019	0.02	0.31	1.00	---	1.24E-03

Table B-7
Fairview Farms Tier 1 Ecological Risk Assessment
Intake Estimation for Ecological Endpoint Species
RMC - Troutdale Facility

Chemical	Receptor Species	Body Weight (kg)	Daily Food Intake (kg/day)	Area Use Factor	Migration Factor	Daily Food Ingestion from Site (kg/day)	Daily Water Intake from Site (L/day)	Fraction of Diet as Prey	Sediment to Prey Transfer Factor	Fraction of Diet as Invertebrates	Sediment to Invertebrate Transfer Factor	Fraction of Diet as Plants	Sediment to Plant Transfer Factor	Fraction of Diet as Sediment	Sediment Conc. (mg/kg)	Bioavailability	Water Conc. (mg/L)	Chemical Intake (mg/kg-d)
Benzo(a)pyrene	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0	0	0.054	0.029	0.0011	0.028	0.30	1.00	---	1.22E-03
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0	0	0.054	0	0.0011	0.02	0.30	1.00	---	7.34E-04
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0	0.76	0.054	0.218	0.0011	0.022	0.30	1.00	---	8.41E-03
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0	0	0.054	0.98	0.0011	0.02	0.30	1.00	---	1.17E-03
Benzo(b)fluoranthene	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0	0	0.034	0.029	0.0011	0.028	0.44	1.00	---	1.81E-03
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0	0	0.034	0	0.0011	0.02	0.44	1.00	---	1.09E-03
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0	0.76	0.034	0.218	0.0011	0.022	0.44	1.00	---	9.47E-03
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0	0	0.034	0.98	0.0011	0.02	0.44	1.00	---	1.73E-03
Benzo(g,h,i)perylene	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0	0	0.024	0.029	0.0006	0.028	0.39	1.00	---	1.58E-03
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0	0	0.024	0	0.0006	0.02	0.39	1.00	---	9.49E-04
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0	0.76	0.024	0.218	0.0006	0.022	0.39	1.00	---	6.94E-03
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0	0	0.024	0.98	0.0006	0.02	0.39	1.00	---	1.48E-03
Benzo(k)fluoranthene	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0	0	0.034	0.029	0.0009	0.028	0.33	1.00	---	1.35E-03
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0	0	0.034	0	0.0009	0.02	0.33	1.00	---	8.13E-04
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0	0.76	0.034	0.218	0.0009	0.022	0.33	1.00	---	7.07E-03
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0	0	0.034	0.98	0.0009	0.02	0.33	1.00	---	1.28E-03
Chrysene	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0	0	0.07	0.029	0.0019	0.028	0.53	1.00	---	2.18E-03
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0	0	0.07	0	0.0019	0.02	0.53	1.00	---	1.31E-03
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0	0.76	0.07	0.218	0.0019	0.022	0.53	1.00	---	1.79E-02
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0	0	0.07	0.98	0.0019	0.02	0.53	1.00	---	2.16E-03
Dibenzo(a,h)anthracene	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0	0	0.078	0.029	0.0005	0.028	0.19	1.00	---	7.64E-04
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0	0	0.078	0	0.0005	0.02	0.19	1.00	---	4.59E-04
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0	0.76	0.078	0.218	0.0005	0.022	0.19	1.00	---	6.76E-03
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0	0	0.078	0.98	0.0005	0.02	0.19	1.00	---	7.10E-04
Fluoranthene	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0	0	0.059	0.029	0.0047	0.028	0.24	1.00	---	9.90E-04
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0	0	0.059	0	0.0047	0.02	0.24	1.00	---	5.92E-04
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0	0.76	0.059	0.218	0.0047	0.022	0.24	1.00	---	7.27E-03
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0	0	0.059	0.98	0.0047	0.02	0.24	1.00	---	1.10E-03
Indeno(1,2,3-cd)pyrene	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0	0	0.066	0.029	0.0005	0.028	0.39	1.00	---	1.58E-03
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0	0	0.066	0	0.0005	0.02	0.39	1.00	---	9.50E-04
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0	0.76	0.066	0.218	0.0005	0.022	0.39	1.00	---	1.24E-02
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0	0	0.066	0.98	0.0005	0.02	0.39	1.00	---	1.47E-03
Phenanthrene	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0	0	0.045	0.029	0.0117	0.028	0.27	1.00	---	1.11E-03
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0	0	0.045	0	0.0117	0.02	0.27	1.00	---	6.58E-04
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0	0.76	0.045	0.218	0.0117	0.022	0.27	1.00	---	6.99E-03
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0	0	0.045	0.98	0.0117	0.02	0.27	1.00	---	1.56E-03
Pyrene	Coyote	10.50	1.533	1	1	1.53	0.82	0.943	0	0	0.062	0.029	0.0048	0.028	0.35	1.00	---	1.44E-03
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.05	0.98	0	0	0.062	0	0.0048	0.02	0.35	1.00	---	8.60E-04
	American Robin	0.081	0.072	1	0.5	0.036	0.01	0	0	0.76	0.062	0.218	0.0048	0.022	0.35	1.00	---	1.09E-02
	Mule Deer	66.5	12.33	1	1	12.33	4.33	0	0	0	0.062	0.98	0.0048	0.02	0.35	1.00	---	1.60E-03

Table B-8
Fairview Farms Tier 1 Ecological Risk Assessment
Hazard Quotient Summary
RMC - Troutdale Facility

Chemical	Receptor	NOAEL ^a (mg/kgbw-d)	Toxicity Test Species	Taxa UFs ^b	TRV ^c (mg/kgbw-d)	Intake (mg/kgbw-d)	Hazard Quotient
Inorganics							
Aluminum	Coyote	6.00E+01	Beagle (dog)	4	1.50E+01	6.85E+01	4.6
	Red-tailed Hawk	1.10E+02	Ringed dove	4	2.74E+01	5.82E+01	2.1
	American Robin	1.10E+02	Ringed dove	4	2.74E+01	3.77E+02	14
	Mule Deer	6.00E+01	Beagle (dog)	4	1.50E+01	8.75E+00	0.58
Arsenic	Coyote	2.52E-01	Mouse	4	6.30E-02	2.60E-02	0.41
	Red-tailed Hawk	5.14E+00	Mallard duck	4	1.29E+00	1.59E-02	0.01
	American Robin	5.14E+00	Mallard duck	4	1.29E+00	3.65E-01	0.28
	Mule Deer	2.52E-01	Mouse	4	6.30E-02	3.28E-02	0.52
Barium	Coyote	5.06E+00	Rat	4	1.27E+00	1.02E+00	0.81
	Red-tailed Hawk	4.16E+01	1-day-old chicks	4	1.04E+01	7.26E-01	0.07
	American Robin	4.16E+01	1-day-old chicks	4	1.04E+01	4.42E+00	0.43
	Mule Deer	5.06E+00	Rat	4	1.27E+00	6.36E-01	0.50
Beryllium	Coyote	6.60E-01	Rat	4	1.65E-01	2.19E-02	0.13
	Red-tailed Hawk	---	---	---	---	---	---
	American Robin	---	---	---	---	---	---
	Mule Deer	---	---	---	---	---	---
Cadmium	Coyote	1.00E+00	Rat	4	2.50E-01	2.19E-02	0.09
	Red-tailed Hawk	1.45E+00	Mallard duck	4	3.63E-01	1.85E-02	0.05
	American Robin	1.45E+00	Mallard duck	4	3.63E-01	1.10E-01	0.30
	Mule Deer	1.00E+00	Rat	4	2.50E-01	1.18E-02	0.05
Chromium	Coyote	2.74E+03	Rat	4	6.84E+02	2.05E-01	<0.01
	Red-tailed Hawk	1.00E+00	Black duck	4	2.50E-01	1.52E-01	0.61
	American Robin	1.00E+00	Black duck	4	2.50E-01	8.71E-01	3.5
	Mule Deer	2.74E+03	Rat	4	6.84E+02	8.98E-02	<0.01
Cobalt	Coyote	1.00E+00	Rat	4	2.50E-01	6.06E-02	0.24
	Red-tailed Hawk	1.30E+01	1-day-old chicks	4	3.25E+00	3.83E-02	0.01
	American Robin	1.30E+01	1-day-old chicks	4	3.25E+00	2.93E-01	0.09
	Mule Deer	1.00E+00	Rat	4	2.50E-01	8.69E-02	0.35
Copper	Coyote	1.17E+01	Mink	4	2.93E+00	6.30E-01	0.22
	Red-tailed Hawk	4.70E+01	1-day-old chicks	4	1.18E+01	5.23E-01	0.04
	American Robin	4.70E+01	1-day-old chicks	4	1.18E+01	1.35E+00	0.12
	Mule Deer	1.17E+01	Mink	4	2.93E+00	5.46E-01	0.19
Cyanide	Coyote	6.87E+01	Rat	4	1.72E+01	9.18E-03	<0.01
	Red-tailed Hawk	---	---	---	---	---	---
	American Robin	---	---	---	---	---	---
	Mule Deer	6.87E+01	Rat	4	1.72E+01	2.59E-01	0.02
Fluoride	Coyote	3.14E+01	Mink	4	7.84E+00	2.40E+00	0.31
	Red-tailed Hawk	7.80E+00	Screech owl	4	1.95E+00	1.90E+00	0.97
	American Robin	7.80E+00	Screech owl	4	1.95E+00	1.80E+00	0.93
	Mule Deer	3.14E+01	Mink	4	7.84E+00	1.20E+00	0.15
Lead	Coyote	8.00E+00	Rat	4	2.00E+00	2.66E-01	0.13
	Red-tailed Hawk	3.85E+00	American kestrels	4	9.63E-01	2.09E-01	0.22
	American Robin	3.85E+00	American kestrels	4	9.63E-01	7.21E-01	0.75
	Mule Deer	8.00E+00	Rat	4	2.00E+00	8.12E-02	0.04
Manganese	Coyote	8.80E+01	Rat	4	2.20E+01	4.32E+00	0.20
	Red-tailed Hawk	9.77E+02	Japanese quail	4	2.44E+02	2.82E+00	0.01
	American Robin	9.77E+02	Japanese quail	4	2.44E+02	1.59E+01	0.07
	Mule Deer	8.80E+01	Rat	4	2.20E+01	7.37E+00	0.34

Table B-8
Fairview Farms Tier 1 Ecological Risk Assessment
Hazard Quotient Summary
RMC - Troutdale Facility

Chemical	Receptor	NOAEL ^a (mg/kgbw-d)	Toxicity Test Species	Taxa UFs ^b	TRV ^c (mg/kgbw-d)	Intake (mg/kgbw-d)	Hazard Quotient
Nickel	Coyote	4.00E+01	Rat	4	1.00E+01	2.03E-01	0.02
	Red-tailed Hawk	7.74E+01	Mallard duckling	4	1.94E+01	1.50E-01	<0.01
	American Robin	7.74E+01	Mallard duckling	4	1.94E+01	7.64E-01	0.04
	Mule Deer	4.00E+01	Rat	4	1.00E+01	2.65E-01	0.03
Selenium	Coyote	2.00E-01	Rat	4	5.00E-02	2.58E-02	0.52
	Red-tailed Hawk	4.40E-01	Screech owl	4	1.10E-01	2.17E-02	0.20
	American Robin	4.00E-01	Mallard duck	4	1.00E-01	5.09E-02	0.51
	Mule Deer	2.00E-01	Rat	4	5.00E-02	1.23E-02	0.25
Vanadium	Coyote	4.20E-01	Rat	4	1.05E-01	1.40E-01	1.3
	Red-tailed Hawk	1.14E+01	Mallard duck	4	2.85E+00	9.90E-02	0.03
	American Robin	1.14E+01	Mallard duck	4	2.85E+00	5.27E-01	0.18
	Mule Deer	4.20E-01	Rat	4	1.05E-01	9.38E-02	0.89
Zinc	Coyote	1.60E+02	Rat	4	4.00E+01	5.78E+00	0.14
	Red-tailed Hawk	1.45E+01	White leghorn chickens	4	3.63E+00	4.87E+00	1.3
	American Robin	1.45E+01	White leghorn chickens	4	3.63E+00	1.12E+01	3.1
	Mule Deer	1.60E+02	Rat	4	4.00E+01	4.30E+00	0.11
Organics							
Acenaphthene	Coyote	4.10E+01	Rat	4	1.03E+01	6.43E-04	<0.01
	Red-tailed Hawk	7.98E+01	Mallard	4	1.99E+01	3.72E-04	<0.01
	American Robin	7.98E+01	Mallard	4	1.99E+01	4.48E-03	<0.01
	Mule Deer	4.10E+01	Rat	4	1.03E+01	1.58E-03	<0.01
Anthracene	Coyote	4.10E+01	Rat	4	1.03E+01	6.95E-04	<0.01
	Red-tailed Hawk	7.98E+01	Mallard	4	1.99E+01	4.13E-04	<0.01
	American Robin	7.98E+01	Mallard	4	1.99E+01	4.73E-03	<0.01
	Mule Deer	4.10E+01	Rat	4	1.03E+01	9.92E-04	<0.01
Aroclor 1260	Coyote	1.40E-01	Mink	1	1.40E-01	1.24E-02	0.09
	Red-tailed Hawk	3.60E-01	Ring-necked pheasant	4	9.00E-02	1.07E-02	0.12
	American Robin	3.60E-01	Ring-necked pheasant	4	9.00E-02	2.15E-02	0.24
	Mule Deer	1.40E-01	Mink	1	1.40E-01	4.70E-04	<0.01
Benzo(a)anthracene	Coyote	2.00E+00	Mouse	4	5.00E-01	1.26E-03	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	7.54E-04	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	7.52E-03	<0.01
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	1.24E-03	<0.01
Benzo(a)pyrene	Coyote	2.00E+00	Mouse	4	5.00E-01	1.22E-03	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	7.34E-04	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	8.41E-03	<0.01
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	1.17E-03	<0.01
Benzo(b)fluoranthene	Coyote	2.00E+00	Mouse	4	5.00E-01	1.81E-03	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	1.09E-03	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	9.47E-03	<0.01
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	1.73E-03	<0.01
Benzo(g,h,i)perylene	Coyote	2.00E+00	Mouse	4	5.00E-01	1.58E-03	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	9.49E-04	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	6.94E-03	<0.01
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	1.48E-03	<0.01
Benzo(k)fluoranthene	Coyote	2.00E+00	Mouse	4	5.00E-01	1.35E-03	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	8.13E-04	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	7.07E-03	<0.01
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	1.28E-03	<0.01

Table B-8
Fairview Farms Tier 1 Ecological Risk Assessment
Hazard Quotient Summary
RMC - Troutdale Facility

Chemical	Receptor	NOAEL ^a (mg/kgbw-d)	Toxicity Test Species	Taxa UFs ^b	TRV ^c (mg/kgbw-d)	Intake (mg/kgbw-d)	Hazard Quotient
Chrysene	Coyote	2.00E+00	Mouse	4	5.00E-01	2.18E-03	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	1.31E-03	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	1.79E-02	<0.01
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	2.16E-03	<0.01
Dibenzo(a,h)anthracene	Coyote	2.00E+00	Mouse	4	5.00E-01	7.64E-04	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	4.59E-04	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	6.76E-03	<0.01
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	7.10E-04	<0.01
Fluoranthene	Coyote	1.25E+02	Mouse	4	3.13E+01	9.90E-04	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	5.92E-04	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	7.27E-03	<0.01
	Mule Deer	1.25E+02	Mouse	4	3.13E+01	1.10E-03	<0.01
Fluorene	Coyote	4.10E+01	Rat	4	1.03E+01	3.52E-01	0.03
	Red-tailed Hawk	7.98E+01	Mallard	4	1.99E+01	2.07E-01	0.01
	American Robin	7.98E+01	Mallard	4	1.99E+01	1.91E+00	0.10
	Mule Deer	4.10E+01	Rat	4	1.03E+01	6.47E-01	0.06
Indeno(1,2,3-cd)pyrene	Coyote	2.00E+00	Mouse	4	5.00E-01	1.58E-03	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	9.50E-04	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	1.24E-02	<0.01
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	1.47E-03	<0.01
Phenanthrene	Coyote	1.40E+01	Rat	4	3.50E+00	1.11E-03	<0.01
	Red-tailed Hawk	7.98E+01	Mallard	4	1.99E+01	6.58E-04	<0.01
	American Robin	7.98E+01	Mallard	4	1.99E+01	6.99E-03	<0.01
	Mule Deer	1.40E+01	Rat	4	3.50E+00	1.56E-03	<0.01
Pyrene	Coyote	7.50E+01	Mouse	4	1.88E+01	1.44E-03	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	8.60E-04	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	1.09E-02	<0.01
	Mule Deer	7.50E+01	Mouse	4	1.88E+01	1.60E-03	<0.01

a) Value is as calculated in Tables G-2 and G-3 of the BLRA; dose divided by the uncertainty factor for the toxicity endpoint

b) Uncertainty factors used to extrapolate from the test species to the receptor; UFs are based on EPA Region 10 guidance (EPA, 1997)

c) Reference toxicity value is the NOAEL divided by the interspecies (taxa) uncertainty factor

Table B-9
North Landfill Ecological Risk Assessment
Surface Soil Exposure Point Concentrations and Summary Statistics Used for the Ecological Risk Assessment
RMC - Troutdale Facility

Analyte	Units	Number of Samples	Number of Detects	Frequency of Detect	Minimum Nondetect Value	Maximum Nondetect Value	Minimum Detected Value	Maximum Detected Value	Arithmetic Mean	EPC	EPC > Max	Final EPC	Basis
Acenaphthene	mg/kg	21	15	71%	6.40E-03	8.70E-01	7.60E-03	6.30E-01	1.00E-01	1.84E-01	FALSE	1.84E-01	NON-PARAMETRIC
Aluminum	mg/kg	5	5	100%	--	--	9.26E+03	1.05E+05	3.31E+04	1.15E+05	TRUE	1.05E+05	MAX DETECT
Anthracene	mg/kg	21	18	86%	6.80E-03	6.90E-02	2.50E-03	9.20E-01	1.34E-01	2.45E-01	FALSE	2.45E-01	NON-PARAMETRIC
Aroclor-1260	mg/kg	6	1	17%	2.00E-01	3.70E+00	8.90E-01	8.90E-01	6.93E-01	1.20E+00	TRUE	8.90E-01	MAX DETECT
Aroclor-1268	mg/kg	5	2	40%	8.00E-01	3.70E+00	1.20E+00	1.95E+00	1.17E+00	1.87E+00	FALSE	1.87E+00	NORMAL
Arsenic	mg/kg	6	6	100%	--	--	2.20E+00	2.12E+01	7.46E+00	1.72E+01	FALSE	1.72E+01	LOGNORMAL
Barium	mg/kg	6	6	100%	--	--	4.64E+01	8.48E+01	7.56E+01	8.76E+01	TRUE	8.48E+01	MAX DETECT
Benzo (a) anthracene	mg/kg	20	20	100%	--	--	4.50E-03	7.30E+00	1.05E+00	2.23E+00	FALSE	2.23E+00	NON-PARAMETRIC
Benzo(a)pyrene	mg/kg	20	20	100%	--	--	5.60E-03	9.80E+00	1.30E+00	2.76E+00	FALSE	2.76E+00	NON-PARAMETRIC
Benzo(b)fluoranthene	mg/kg	20	20	100%	--	--	5.90E-03	1.00E+01	1.72E+00	3.74E+00	FALSE	3.74E+00	NON-PARAMETRIC
Benzo(g,h,i)perylene	mg/kg	20	20	100%	--	--	2.90E-03	6.50E+00	6.35E-01	1.36E+00	FALSE	1.36E+00	NON-PARAMETRIC
Benzo(k)fluoranthene	mg/kg	20	20	100%	--	--	2.50E-03	5.10E+00	1.04E+00	2.39E+00	FALSE	2.39E+00	NON-PARAMETRIC
Beryllium	mg/kg	6	3	50%	5.50E-01	1.00E+00	1.40E+00	9.20E+00	2.21E+00	8.34E+00	FALSE	8.34E+00	NON-PARAMETRIC
Cadmium	mg/kg	6	5	83%	1.00E+00	1.00E+00	7.20E-01	2.10E+00	1.21E+00	1.71E+00	FALSE	1.71E+00	NORMAL
Chromium	mg/kg	6	6	100%	--	--	1.10E+01	5.19E+01	2.60E+01	3.83E+01	FALSE	3.83E+01	NORMAL
Chrysene	mg/kg	20	20	100%	--	--	4.90E-03	7.40E+00	1.24E+00	2.62E+00	FALSE	2.62E+00	NON-PARAMETRIC
Cobalt	mg/kg	1	1	100%	--	--	1.10E+01	1.10E+01				1.10E+01	MAX DETECT
Copper	mg/kg	6	6	100%	--	--	2.80E+01	1.18E+03	3.22E+02	1.16E+03	FALSE	1.16E+03	NON-PARAMETRIC
Cyanide, Total	mg/kg	6	5	83%	5.50E-01	5.50E-01	1.90E-01	1.37E+01	3.17E+00	1.39E+01	TRUE	1.37E+01	MAX DETECT
Dibenzo(a,h)anthracene	mg/kg	21	19	90%	6.80E-03	6.90E-02	1.10E-03	1.50E+00	2.57E-01	5.22E-01	FALSE	5.22E-01	NON-PARAMETRIC
Fluoranthene	mg/kg	20	20	100%	--	--	5.50E-03	8.30E+00	1.42E+00	2.97E+00	FALSE	2.97E+00	NON-PARAMETRIC
Fluorene	mg/kg	21	13	62%	6.40E-03	1.50E+00	2.90E-03	3.60E-01	1.08E-01	5.26E-01	TRUE	3.60E-01	MAX DETECT
Fluoride	mg/kg	21	21	100%	--	--	5.90E+00	9.50E+03	9.64E+02	5.28E+03	FALSE	5.28E+03	NON-PARAMETRIC
Indeno(1,2,3-cd)pyrene	mg/kg	20	20	100%	--	--	4.20E-03	8.00E+00	9.21E-01	1.97E+00	FALSE	1.97E+00	NON-PARAMETRIC
Lead	mg/kg	6	6	100%	--	--	1.19E+01	1.23E+02	4.48E+01	7.85E+01	FALSE	7.85E+01	NORMAL
Manganese	mg/kg	1	1	100%	--	--	3.00E+02	3.00E+02				3.00E+02	MAX DETECT
Mercury	mg/kg	6	4	67%	8.00E-02	2.50E-01	1.00E-01	3.00E-01	1.63E-01	2.53E-01	FALSE	2.53E-01	NORMAL
Naphthalene	mg/kg	21	15	71%	6.70E-03	1.50E+00	3.50E-04	1.20E-01	1.00E-01	5.28E-01	TRUE	1.20E-01	MAX DETECT
Nickel	mg/kg	6	6	100%	--	--	1.50E+01	3.64E+02	9.18E+01	3.16E+02	FALSE	3.16E+02	NON-PARAMETRIC
Phenanthrene	mg/kg	21	20	95%	6.90E-02	6.90E-02	2.30E-03	3.20E+00	5.89E-01	1.19E+00	FALSE	1.19E+00	NON-PARAMETRIC
Potassium	mg/kg	1	1	100%	--	--	9.10E+02	9.10E+02				9.10E+02	MAX DETECT
Pyrene	mg/kg	20	20	100%	--	--	5.00E-03	7.90E+00	1.22E+00	2.54E+00	FALSE	2.54E+00	NON-PARAMETRIC
Sodium	mg/kg	1	1	100%	--	--	4.80E+02	4.80E+02				4.80E+02	MAX DETECT
Vanadium	mg/kg	6	6	100%	--	--	4.59E+01	2.47E+02	8.64E+01	2.27E+02	FALSE	2.27E+02	NON-PARAMETRIC
Zinc	mg/kg	6	6	100%	--	--	4.07E+01	2.02E+02	9.93E+01	1.44E+02	FALSE	1.44E+02	LOGNORMAL

Table B-10
North Landfill Tier 1 Ecological Risk Assessment
Intake Estimation for Ecological Endpoint Species
RMC - Troutdale Facility

Chemical	Receptor Species	Body Weight (kg)	Daily Food Intake (kg/day)	Area Use Factor	Migration Factor	Daily Food Ingestion from Site (kg/day)	Fraction of Diet as Prey	Sediment to Prey Transfer Factor	Fraction of Diet as Invertebrates	Sediment to Invertebrate Transfer Factor	Fraction of Diet as Plants	Sediment to Plant Transfer Factor	Fraction of Diet as Sediment	Sediment Conc. (mg/kg)	Bioavailability	Chemical Intake (mg/kg-d)
Inorganics																
Aluminum	Coyote	10.50	1.533	1	1	1.53	0.943	0.023	0	0.054	0.029	0.001	0.028	1.05E+05	0.07	3.63E+02
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0.023	0	0.054	0	0.001	0.02	1.05E+05	0.07	3.09E+02
	American Robin	0.081	0.072	1	0.5	0.036	0	0.023	0.76	0.054	0.218	0.001	0.022	1.05E+05	0.07	2.00E+03
	Mule Deer	66.5	12.33	1	1	12.33	0	0.023	0	0.054	0.98	0.001	0.02	1.05E+05	0.07	4.63E+01
Arsenic	Coyote	10.50	1.533	1	1	1.53	0.943	0.0016	0	0.15	0.029	0.01	0.028	1.72E+01	1	7.48E-02
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0.0016	0	0.15	0	0.01	0.02	1.72E+01	1	4.56E-02
	American Robin	0.081	0.072	1	0.5	0.036	0	0.0016	0.76	0.15	0.218	0.01	0.022	1.72E+01	1	1.06E+00
	Mule Deer	66.5	12.33	1	1	12.33	0	0.0016	0	0.15	0.98	0.01	0.02	1.72E+01	1	9.51E-02
Barium	Coyote	10.50	1.533	1	1	1.53	0.943	0.025	0	0.058	0.029	0.003	0.028	8.48E+01	1	6.40E-01
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0.025	0	0.058	0	0.003	0.02	8.48E+01	1	4.63E-01
	American Robin	0.081	0.072	1	0.5	0.036	0	0.025	0.76	0.058	0.218	0.003	0.022	8.48E+01	1	2.52E+00
	Mule Deer	66.5	12.33	1	1	12.33	0	0.025	0	0.058	0.98	0.003	0.02	8.48E+01	1	3.61E-01
Beryllium	Coyote	10.50	1.533	1	1	1.53	0.943	0.19	0	0.19	0.029	0.0025	0.028	8.34E+00	1	2.52E-01
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0.19	0	0.19	0	0.0025	0.02	8.34E+00	1	2.11E-01
	American Robin	0.081	0.072	1	0.5	0.036	0	0.19	0.76	0.19	0.218	0.0025	0.022	8.34E+00	1	6.19E-01
	Mule Deer	66.5	12.33	1	1	12.33	0	0.19	0	0.19	0.98	0.0025	0.02	8.34E+00	1	3.47E-02
Cadmium	Coyote	10.50	1.533	1	1	1.53	0.943	0.134	0	0.74	0.029	0.14	0.028	1.71E+00	1	3.96E-02
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0.134	0	0.74	0	0.14	0.02	1.71E+00	1	3.18E-02
	American Robin	0.081	0.072	1	0.5	0.036	0	0.134	0.76	0.74	0.218	0.14	0.022	1.71E+00	1	4.68E-01
	Mule Deer	66.5	12.33	1	1	12.33	0	0.134	0	0.74	0.98	0.14	0.02	1.71E+00	1	4.99E-02
Chromium	Coyote	10.50	1.533	1	1	1.53	0.943	0.027	0	0.078	0.029	0.0001	0.028	3.83E+01	1	2.99E-01
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0.027	0	0.078	0	0.0001	0.02	3.83E+01	1	2.19E-01
	American Robin	0.081	0.072	1	0.5	0.036	0	0.027	0.76	0.078	0.218	0.0001	0.022	3.83E+01	1	1.39E+00
	Mule Deer	66.5	12.33	1	1	12.33	0	0.027	0	0.078	0.98	0.0001	0.02	3.83E+01	1	1.43E-01
Copper	Coyote	10.50	1.533	1	1	1.53	0.943	0.001	0	0.083	0.029	0.08	0.028	1.16E+03	0.46	2.72E+00
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0.001	0	0.083	0	0.08	0.02	1.16E+03	0.46	1.44E+00
	American Robin	0.081	0.072	1	0.5	0.036	0	0.001	0.76	0.083	0.218	0.08	0.022	1.16E+03	0.46	4.65E+01
	Mule Deer	66.5	12.33	1	1	12.33	0	0.001	0	0.083	0.98	0.08	0.02	1.16E+03	0.46	1.88E+01
Cyanide	Coyote	10.50	1.533	1	1	1.53	0.943	0	0	1	0.029	1.8	0.028	1.37E+01	1	1.60E-01
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0	0	1	0	1.8	0.02	1.37E+01	1	3.36E-02
	American Robin	0.081	0.072	1	0.5	0.036	0	0	0.76	1	0.218	1.8	0.022	1.37E+01	1	7.15E+00
	Mule Deer	66.5	12.33	1	1	12.33	0	0	0	1	0.98	1.8	0.02	1.37E+01	1	4.53E+00
Fluoride	Coyote	10.50	1.533	1	1	1.53	0.943	0.003	0	0.0006	0.029	0.009	0.028	5.28E+03	0.35	9.94E+00
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0.003	0	0.0006	0	0.009	0.02	5.28E+03	0.35	6.45E+00
	American Robin	0.081	0.072	1	0.5	0.036	0	0.003	0.76	0.0006	0.218	0.009	0.022	5.28E+03	0.35	2.38E+01
	Mule Deer	66.5	12.33	1	1	12.33	0	0.003	0	0.0006	0.98	0.009	0.02	5.28E+03	0.35	1.55E+01
Lead	Coyote	10.50	1.533	1	1	1.53	0.943	0.033	0	0.072	0.029	0.00076	0.028	7.85E+01	1	6.78E-01
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0.033	0	0.072	0	0.00076	0.02	7.85E+01	1	5.04E-01
	American Robin	0.081	0.072	1	0.5	0.036	0	0.033	0.76	0.072	0.218	0.00076	0.022	7.85E+01	1	2.68E+00
	Mule Deer	66.5	12.33	1	1	12.33	0	0.033	0	0.072	0.98	0.00076	0.02	7.85E+01	1	3.02E-01

Table B-10
North Landfill Tier 1 Ecological Risk Assessment
Intake Estimation for Ecological Endpoint Species
RMC - Troutdale Facility

Chemical	Receptor Species	Body Weight (kg)	Daily Food Intake (kg/day)	Area Use Factor	Migration Factor	Daily Food Ingestion from Site (kg/day)	Fraction of Diet as Prey	Sediment to Prey Transfer Factor	Fraction of Diet as Invertebrates	Sediment to Invertebrate Transfer Factor	Fraction of Diet as Plants	Sediment to Plant Transfer Factor	Fraction of Diet as Sediment	Sediment Conc. (mg/kg)	Bioavailability	Chemical Intake (mg/kg-d)
Mercury	Coyote	10.50	1.533	1	1	1.53	0.943	0.061	0	0.15	0.029	0.3	0.028	2.53E-01	1	3.48E-03
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0.061	0	0.15	0	0.3	0.02	2.53E-01	1	2.48E-03
	American Robin	0.081	0.072	1	0.5	0.036	0	0.061	0.76	0.15	0.218	0.3	0.022	2.53E-01	1	2.27E-02
	Mule Deer	66.5	12.33	1	1	12.33	0	0.061	0	0.15	0.98	0.3	0.02	2.53E-01	1	1.47E-02
Nickel	Coyote	10.50	1.533	1	1	1.53	0.943	0.02	0	0.066	0.029	0.05	0.028	3.16E+02	1	2.23E+00
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0.02	0	0.066	0	0.05	0.02	3.16E+02	1	1.54E+00
	American Robin	0.081	0.072	1	0.5	0.036	0	0.02	0.76	0.066	0.218	0.05	0.022	3.16E+02	1	1.17E+01
	Mule Deer	66.5	12.33	1	1	12.33	0	0.02	0	0.066	0.98	0.05	0.02	3.16E+02	1	4.05E+00
Vanadium	Coyote	10.50	1.533	1	1	1.53	0.943	0.006	0	0.014	0.029	0.0014	0.028	2.27E+02	0.31	4.77E-01
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0.006	0	0.014	0	0.0014	0.02	2.27E+02	0.31	3.37E-01
	American Robin	0.081	0.072	1	0.5	0.036	0	0.006	0.76	0.014	0.218	0.0014	0.022	2.27E+02	0.31	1.79E+00
	Mule Deer	66.5	12.33	1	1	12.33	0	0.006	0	0.014	0.98	0.0014	0.02	2.27E+02	0.31	3.19E-01
Zinc	Coyote	10.50	1.533	1	1	1.53	0.943	0.277	0	0.29	0.029	0.26	0.028	1.44E+02	1	6.24E+00
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0.277	0	0.29	0	0.26	0.02	1.44E+02	1	5.15E+00
	American Robin	0.081	0.072	1	0.5	0.036	0	0.277	0.76	0.29	0.218	0.26	0.022	1.44E+02	1	1.91E+01
	Mule Deer	66.5	12.33	1	1	12.33	0	0.277	0	0.29	0.98	0.26	0.02	1.44E+02	1	7.34E+00
Organics																
Acenaphthene	Coyote	10.50	1.533	1	1	1.53	0.943	0	0	0.048	0.029	0.0369	0.028	1.84E-01	1	7.81E-04
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0	0	0.048	0	0.0369	0.02	1.84E-01	1	4.52E-04
	American Robin	0.081	0.072	1	0.5	0.036	0	0	0.76	0.048	0.218	0.0369	0.022	1.84E-01	1	5.44E-03
	Mule Deer	66.5	12.33	1	1	12.33	0	0	0	0.048	0.98	0.0369	0.02	1.84E-01	1	1.92E-03
Anthracene	Coyote	10.50	1.533	1	1	1.53	0.943	0	0	0.051	0.029	0.0121	0.028	2.45E-01	1	1.01E-03
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0	0	0.051	0	0.0121	0.02	2.45E-01	1	6.01E-04
	American Robin	0.081	0.072	1	0.5	0.036	0	0	0.76	0.051	0.218	0.0121	0.022	2.45E-01	1	6.90E-03
	Mule Deer	66.5	12.33	1	1	12.33	0	0	0	0.051	0.98	0.0121	0.02	2.45E-01	1	1.45E-03
Aroclor 1260	Coyote	10.50	1.533	1	1	1.53	0.943	6.2	0	0.48	0.029	0.0003	0.028	8.90E-01	1	7.63E-01
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	6.2	0	0.48	0	0.0003	0.02	8.90E-01	1	6.66E-01
	American Robin	0.081	0.072	1	0.5	0.036	0	6.2	0.76	0.48	0.218	0.0003	0.022	8.90E-01	1	1.53E-01
	Mule Deer	66.5	12.33	1	1	12.33	0	6.2	0	0.48	0.98	0.0003	0.02	8.90E-01	1	3.35E-03
Aroclor 1268	Coyote	10.50	1.533	1	1	1.53	0.943	1.93	0	0.48	0.029	0.0009	0.028	1.87E+00	1	5.06E-01
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	1.93	0	0.48	0	0.0009	0.02	1.87E+00	1	4.40E-01
	American Robin	0.081	0.072	1	0.5	0.036	0	1.93	0.76	0.48	0.218	0.0009	0.022	1.87E+00	1	3.22E-01
	Mule Deer	66.5	12.33	1	1	12.33	0	1.93	0	0.48	0.98	0.0009	0.02	1.87E+00	1	7.26E-03
Benzo(a)anthracene	Coyote	10.50	1.533	1	1	1.53	0.943	0	0	0.043	0.029	0.0019	0.028	2.23E+00	1	9.12E-03
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0	0	0.043	0	0.0019	0.02	2.23E+00	1	5.47E-03
	American Robin	0.081	0.072	1	0.5	0.036	0	0	0.76	0.043	0.218	0.0019	0.022	2.23E+00	1	5.45E-02
	Mule Deer	66.5	12.33	1	1	12.33	0	0	0	0.043	0.98	0.0019	0.02	2.23E+00	1	9.02E-03
Benzo(a)pyrene	Coyote	10.50	1.533	1	1	1.53	0.943	0	0	0.054	0.029	0.0011	0.028	2.76E+00	1	1.13E-02
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0	0	0.054	0	0.0011	0.02	2.76E+00	1	6.77E-03
	American Robin	0.081	0.072	1	0.5	0.036	0	0	0.76	0.054	0.218	0.0011	0.022	2.76E+00	1	7.75E-02
	Mule Deer	66.5	12.33	1	1	12.33	0	0	0	0.054	0.98	0.0011	0.02	2.76E+00	1	1.08E-02

Table B-10
North Landfill Tier 1 Ecological Risk Assessment
Intake Estimation for Ecological Endpoint Species
RMC - Troutdale Facility

Chemical	Receptor Species	Body Weight (kg)	Daily Food Intake (kg/day)	Area Use Factor	Migration Factor	Daily Food Ingestion from Site (kg/day)	Fraction of Diet as Prey	Sediment to Prey Transfer Factor	Fraction of Diet as Invertebrates	Sediment to Invertebrate Transfer Factor	Fraction of Diet as Plants	Sediment to Plant Transfer Factor	Fraction of Diet as Sediment	Sediment Conc. (mg/kg)	Bioavailability	Chemical Intake (mg/kg-d)
Benzo(b)fluoranthene	Coyote	10.50	1.533	1	1	1.53	0.943	0	0	0.034	0.029	0.0011	0.028	3.74E+00	1	1.53E-02
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0	0	0.034	0	0.0011	0.02	3.74E+00	1	9.18E-03
	American Robin	0.081	0.072	1	0.5	0.036	0	0	0.76	0.034	0.218	0.0011	0.022	3.74E+00	1	7.99E-02
	Mule Deer	66.5	12.33	1	1	12.33	0	0	0	0.034	0.98	0.0011	0.02	3.74E+00	1	1.46E-02
Benzo(g,h,i)perylene	Coyote	10.50	1.533	1	1	1.53	0.943	0	0	0.024	0.029	0.0006	0.028	1.36E+00	1	5.57E-03
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0	0	0.024	0	0.0006	0.02	1.36E+00	1	3.34E-03
	American Robin	0.081	0.072	1	0.5	0.036	0	0	0.76	0.024	0.218	0.0006	0.022	1.36E+00	1	2.44E-02
	Mule Deer	66.5	12.33	1	1	12.33	0	0	0	0.024	0.98	0.0006	0.02	1.36E+00	1	5.20E-03
Benzo(k)fluoranthene	Coyote	10.50	1.533	1	1	1.53	0.943	0	0	0.034	0.029	0.0009	0.028	2.39E+00	1	9.78E-03
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0	0	0.034	0	0.0009	0.02	2.39E+00	1	5.87E-03
	American Robin	0.081	0.072	1	0.5	0.036	0	0	0.76	0.034	0.218	0.0009	0.022	2.39E+00	1	5.10E-02
	Mule Deer	66.5	12.33	1	1	12.33	0	0	0	0.034	0.98	0.0009	0.02	2.39E+00	1	9.25E-03
Chrysene	Coyote	10.50	1.533	1	1	1.53	0.943	0	0	0.07	0.029	0.0019	0.028	2.62E+00	1	1.08E-02
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0	0	0.07	0	0.0019	0.02	2.62E+00	1	6.45E-03
	American Robin	0.081	0.072	1	0.5	0.036	0	0	0.76	0.07	0.218	0.0019	0.022	2.62E+00	1	8.82E-02
	Mule Deer	66.5	12.33	1	1	12.33	0	0	0	0.07	0.98	0.0019	0.02	2.62E+00	1	1.06E-02
Dibenzo(a,h)anthracene	Coyote	10.50	1.533	1	1	1.53	0.943	0	0	0.078	0.029	0.0005	0.028	5.22E-01	1	2.14E-03
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0	0	0.078	0	0.0005	0.02	5.22E-01	1	1.28E-03
	American Robin	0.081	0.072	1	0.5	0.036	0	0	0.76	0.078	0.218	0.0005	0.022	5.22E-01	1	1.89E-02
	Mule Deer	66.5	12.33	1	1	12.33	0	0	0	0.078	0.98	0.0005	0.02	5.22E-01	1	1.98E-03
Fluoranthene	Coyote	10.50	1.533	1	1	1.53	0.943	0	0	0.059	0.029	0.0047	0.028	2.97E+00	1	1.22E-02
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0	0	0.059	0	0.0047	0.02	2.97E+00	1	7.30E-03
	American Robin	0.081	0.072	1	0.5	0.036	0	0	0.76	0.059	0.218	0.0047	0.022	2.97E+00	1	8.97E-02
	Mule Deer	66.5	12.33	1	1	12.33	0	0	0	0.059	0.98	0.0047	0.02	2.97E+00	1	1.36E-02
Fluorene	Coyote	10.50	1.533	1	1	1.53	0.943	0	0	0.032	0.029	0.0218	0.028	3.60E-01	1	1.50E-03
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0	0	0.032	0	0.0218	0.02	3.60E-01	1	8.84E-04
	American Robin	0.081	0.072	1	0.5	0.036	0	0	0.76	0.032	0.218	0.0218	0.022	3.60E-01	1	8.17E-03
	Mule Deer	66.5	12.33	1	1	12.33	0	0	0	0.032	0.98	0.0218	0.02	3.60E-01	1	2.76E-03
Indeno(1,2,3-cd)pyrene	Coyote	10.50	1.533	1	1	1.53	0.943	0	0	0.066	0.029	0.0005	0.028	1.97E+00	1	8.05E-03
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0	0	0.066	0	0.0005	0.02	1.97E+00	1	4.83E-03
	American Robin	0.081	0.072	1	0.5	0.036	0	0	0.76	0.066	0.218	0.0005	0.022	1.97E+00	1	6.32E-02
	Mule Deer	66.5	12.33	1	1	12.33	0	0	0	0.066	0.98	0.0005	0.02	1.97E+00	1	7.48E-03
Naphthalene	Coyote	10.50	1.533	1	1	1.53	0.943	0	0	0.034	0.029	0.1064	0.028	1.20E-01	1	5.45E-04
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0	0	0.034	0	0.1064	0.02	1.20E-01	1	2.95E-04
	American Robin	0.081	0.072	1	0.5	0.036	0	0	0.76	0.034	0.218	0.1064	0.022	1.20E-01	1	3.79E-03
	Mule Deer	66.5	12.33	1	1	12.33	0	0	0	0.034	0.98	0.1064	0.02	1.20E-01	1	2.77E-03
Phenanthrene	Coyote	10.50	1.533	1	1	1.53	0.943	0	0	0.045	0.029	0.0117	0.028	1.19E+00	1	4.94E-03
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0	0	0.045	0	0.0117	0.02	1.19E+00	1	2.93E-03
	American Robin	0.081	0.072	1	0.5	0.036	0	0	0.76	0.045	0.218	0.0117	0.022	1.19E+00	1	3.12E-02
	Mule Deer	66.5	12.33	1	1	12.33	0	0	0	0.045	0.98	0.0117	0.02	1.19E+00	1	6.97E-03
Pyrene	Coyote	10.50	1.533	1	1	1.53	0.943	0	0	0.062	0.029	0.0048	0.028	2.54E+00	1	1.04E-02
	Red-tailed Hawk	1.13	0.185	1	0.75	0.14	0.98	0	0	0.062	0	0.0048	0.02	2.54E+00	1	6.23E-03
	American Robin	0.081	0.072	1	0.5	0.036	0	0	0.76	0.062	0.218	0.0048	0.022	2.54E+00	1	7.91E-02
	Mule Deer	66.5	12.33	1	1	12.33	0	0	0	0.062	0.98	0.0048	0.02	2.54E+00	1	1.16E-02

Table B-11
North Landfill Tier 1 Ecological Risk Assessment
Hazard Quotient Summary
RMC - Troutdale Facility

Chemical	Receptor	NOAEL ^a (mg/kgbw-d)	Toxicity Test Species	Taxa UFs ^b	TRV ^c (mg/kgbw-d)	Intake (mg/kgbw-d)	Hazard Quotient
Inorganics							
Aluminum	Coyote	6.00E+01	Beagle (dog)	4	1.50E+01	3.63E+02	24
	Red-tailed Hawk	1.10E+02	Ringed dove	4	2.74E+01	3.09E+02	11
	American Robin	1.10E+02	Ringed dove	4	2.74E+01	2.00E+03	73
	Mule Deer	6.00E+01	Beagle (dog)	4	1.50E+01	4.63E+01	3.1
Arsenic	Coyote	2.52E-01	Mouse	4	6.30E-02	7.48E-02	1.2
	Red-tailed Hawk	5.14E+00	Mallard duck	4	1.29E+00	4.56E-02	0.04
	American Robin	5.14E+00	Mallard duck	4	1.29E+00	1.06E+00	0.82
	Mule Deer	2.52E-01	Mouse	4	6.30E-02	9.51E-02	1.5
Barium	Coyote	5.06E+00	Rat	4	1.27E+00	6.40E-01	0.51
	Red-tailed Hawk	4.16E+01	1-day-old chicks	4	1.04E+01	4.63E-01	0.04
	American Robin	4.16E+01	1-day-old chicks	4	1.04E+01	2.52E+00	0.24
	Mule Deer	5.06E+00	Rat	4	1.27E+00	3.61E-01	0.29
Beryllium	Coyote	6.60E-01	Rat	4	1.65E-01	2.52E-01	1.5
	Red-tailed Hawk	---	---	---	---	---	---
	American Robin	---	---	---	---	---	---
	Mule Deer	6.60E-01	Rat	4	1.65E-01	3.47E-02	0.21
Cadmium	Coyote	1.00E+00	Rat	4	2.50E-01	3.96E-02	0.16
	Red-tailed Hawk	1.45E+00	Mallard duck	4	3.63E-01	3.18E-02	0.09
	American Robin	1.45E+00	Mallard duck	4	3.63E-01	4.68E-01	1.3
	Mule Deer	1.00E+00	Rat	4	2.50E-01	4.99E-02	0.20
Chromium	Coyote	2.74E+03	Rat	4	6.84E+02	2.99E-01	<0.01
	Red-tailed Hawk	1.00E+00	Black duck	4	2.50E-01	2.19E-01	0.87
	American Robin	1.00E+00	Black duck	4	2.50E-01	1.39E+00	5.5
	Mule Deer	2.74E+03	Rat	4	6.84E+02	1.43E-01	<0.01
Copper	Coyote	1.17E+01	Mink	4	2.93E+00	2.72E+00	0.93
	Red-tailed Hawk	4.70E+01	1-day-old chicks	4	1.18E+01	1.44E+00	0.12
	American Robin	4.70E+01	1-day-old chicks	4	1.18E+01	4.65E+01	4.0
	Mule Deer	1.17E+01	Mink	4	2.93E+00	1.88E+01	6.4
Cyanide	Coyote	6.87E+01	Rat	4	1.72E+01	1.60E-01	0.01
	Red-tailed Hawk	---	---	---	---	---	---
	American Robin	---	---	---	---	---	---
	Mule Deer	6.87E+01	Rat	4	1.72E+01	4.53E+00	0.26

Table B-11
North Landfill Tier 1 Ecological Risk Assessment
Hazard Quotient Summary
RMC - Troutdale Facility

Chemical	Receptor	NOAEL ^a (mg/kgbw-d)	Toxicity Test Species	Taxa UFs ^b	TRV ^c (mg/kgbw-d)	Intake (mg/kgbw-d)	Hazard Quotient
Fluoride	Coyote	3.14E+01	Mink	4	7.84E+00	9.94E+00	1.3
	Red-tailed Hawk	7.80E+00	Screech owl	4	1.95E+00	6.45E+00	3.3
	American Robin	7.80E+00	Screech owl	4	1.95E+00	2.38E+01	12
	Mule Deer	3.14E+01	Mink	4	7.84E+00	1.55E+01	2.0
Lead	Coyote	8.00E+00	Rat	4	2.00E+00	6.78E-01	0.34
	Red-tailed Hawk	3.85E+00	American kestrels	4	9.63E-01	5.04E-01	0.52
	American Robin	3.85E+00	American kestrels	4	9.63E-01	2.68E+00	2.8
	Mule Deer	8.00E+00	Rat	4	2.00E+00	3.02E-01	0.15
Mercury	Coyote	1.00E+00	Mink	4	2.50E-01	3.48E-03	0.01
	Red-tailed Hawk	4.50E-01	Japanese quail	4	1.13E-01	2.48E-03	0.02
	American Robin	4.50E-01	Japanese quail	4	1.13E-01	2.27E-02	0.20
	Mule Deer	1.00E+00	Mink	4	2.50E-01	1.47E-02	0.06
Nickel	Coyote	4.00E+01	Rat	4	1.00E+01	2.23E+00	0.22
	Red-tailed Hawk	7.74E+01	Mallard duckling	4	1.94E+01	1.54E+00	0.08
	American Robin	7.74E+01	Mallard duckling	4	1.94E+01	1.17E+01	0.60
	Mule Deer	4.00E+01	Rat	4	1.00E+01	4.05E+00	0.40
Vanadium	Coyote	4.20E-01	Rat	4	1.05E-01	4.77E-01	4.5
	Red-tailed Hawk	1.14E+01	Mallard duck	4	2.85E+00	3.37E-01	0.12
	American Robin	1.14E+01	Mallard duck	4	2.85E+00	1.79E+00	0.63
	Mule Deer	4.20E-01	Rat	4	1.05E-01	3.19E-01	3.0
Zinc	Coyote	1.60E+02	Rat	4	4.00E+01	6.24E+00	0.16
	Red-tailed Hawk	1.45E+01	White leghorn chickens	4	3.63E+00	5.15E+00	1.4
	American Robin	1.45E+01	White leghorn chickens	4	3.63E+00	1.91E+01	5.3
	Mule Deer	1.60E+02	Rat	4	4.00E+01	7.34E+00	0.18
Organics							
Acenaphthene	Coyote	4.10E+01	Rat	4	1.03E+01	7.81E-04	<0.01
	Red-tailed Hawk	7.98E+01	Mallard	4	1.99E+01	4.52E-04	<0.01
	American Robin	7.98E+01	Mallard	4	1.99E+01	5.44E-03	<0.01
	Mule Deer	4.10E+01	Rat	4	1.03E+01	1.92E-03	<0.01
Anthracene	Coyote	4.10E+01	Rat	4	1.03E+01	1.01E-03	<0.01
	Red-tailed Hawk	7.98E+01	Mallard	4	1.99E+01	6.01E-04	<0.01
	American Robin	7.98E+01	Mallard	4	1.99E+01	6.90E-03	<0.01
	Mule Deer	4.10E+01	Rat	4	1.03E+01	1.45E-03	<0.01

Table B-11
North Landfill Tier 1 Ecological Risk Assessment
Hazard Quotient Summary
RMC - Troutdale Facility

Chemical	Receptor	NOAEL ^a (mg/kgbw-d)	Toxicity Test Species	Taxa UFs ^b	TRV ^c (mg/kgbw-d)	Intake (mg/kgbw-d)	Hazard Quotient
Aroclor 1260	Coyote	1.40E-01	Mink	4	3.50E-02	7.63E-01	22
	Red-tailed Hawk	3.60E-01	Ring-necked pheasant	4	9.00E-02	6.66E-01	7.4
	American Robin	3.60E-01	Ring-necked pheasant	4	9.00E-02	1.53E-01	1.7
	Mule Deer	1.40E-01	Mink	4	3.50E-02	3.35E-03	0.10
Aroclor 1268	Coyote	1.40E-01	Mink	1	1.40E-01	5.06E-01	3.6
	Red-tailed Hawk	3.60E-01	Ring-necked pheasant	4	9.00E-02	4.40E-01	4.9
	American Robin	3.60E-01	Ring-necked pheasant	4	9.00E-02	3.22E-01	3.6
	Mule Deer	1.40E-01	Mink	1	1.40E-01	7.26E-03	0.05
Benzo(a)anthracene	Coyote	2.00E+00	Mouse	4	5.00E-01	9.12E-03	0.02
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	5.47E-03	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	5.45E-02	0.03
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	9.02E-03	0.02
Benzo(a)pyrene	Coyote	2.00E+00	Mouse	4	5.00E-01	1.13E-02	0.02
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	6.77E-03	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	7.75E-02	0.04
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	1.08E-02	0.02
Benzo(b)fluoranthene	Coyote	2.00E+00	Mouse	4	5.00E-01	1.53E-02	0.03
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	9.18E-03	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	7.99E-02	0.04
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	1.46E-02	0.03
Benzo(g,h,i)perylene	Coyote	2.00E+00	Mouse	4	5.00E-01	5.57E-03	0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	3.34E-03	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	2.44E-02	0.01
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	5.20E-03	0.01
Benzo(k)fluoranthene	Coyote	2.00E+00	Mouse	4	5.00E-01	9.78E-03	0.02
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	5.87E-03	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	5.10E-02	0.03
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	9.25E-03	0.02
Chrysene	Coyote	2.00E+00	Mouse	4	5.00E-01	1.08E-02	0.02
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	6.45E-03	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	8.82E-02	0.04
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	1.06E-02	0.02

Table B-11
North Landfill Tier 1 Ecological Risk Assessment
Hazard Quotient Summary
RMC - Troutdale Facility

Chemical	Receptor	NOAEL ^a (mg/kgbw-d)	Toxicity Test Species	Taxa UFs ^b	TRV ^c (mg/kgbw-d)	Intake (mg/kgbw-d)	Hazard Quotient
Dibenz(a,h)anthracene	Coyote	2.00E+00	Mouse	4	5.00E-01	2.14E-03	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	1.28E-03	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	1.89E-02	0.01
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	1.98E-03	<0.01
Fluoranthene	Coyote	1.25E+02	Mouse	4	3.13E+01	1.22E-02	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	7.30E-03	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	8.97E-02	0.05
	Mule Deer	1.25E+02	Mouse	4	3.13E+01	1.36E-02	<0.01
Fluorene	Coyote	4.10E+01	Rat	4	1.03E+01	1.50E-03	<0.01
	Red-tailed Hawk	7.98E+01	Mallard	4	1.99E+01	8.84E-04	<0.01
	American Robin	7.98E+01	Mallard	4	1.99E+01	8.17E-03	<0.01
	Mule Deer	4.10E+01	Rat	4	1.03E+01	2.76E-03	<0.01
Indeno(1,2,3-cd)pyrene	Coyote	2.00E+00	Mouse	4	5.00E-01	8.05E-03	0.02
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	4.83E-03	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	6.32E-02	0.03
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	7.48E-03	0.01
Phenanthrene	Coyote	1.40E+01	Rat	4	3.50E+00	4.94E-03	<0.01
	Red-tailed Hawk	7.98E+01	Mallard	4	1.99E+01	2.93E-03	<0.01
	American Robin	7.98E+01	Mallard	4	1.99E+01	3.12E-02	<0.01
	Mule Deer	1.40E+01	Rat	4	3.50E+00	6.97E-03	<0.01
Pyrene	Coyote	7.50E+01	Mouse	4	1.88E+01	1.04E-02	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	6.23E-03	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	7.91E-02	0.04
	Mule Deer	7.50E+01	Mouse	4	1.88E+01	1.16E-02	<0.01

a) Value is as calculated in Tables G-2 and G-3 of the BLRA; dose divided by the uncertainty factor for the toxicity endpoint

b) Uncertainty factors used to extrapolate from the test species to the receptor; UFs are based on EPA Region 10 guidance (EPA, 1997)

c) Reference toxicity value is the NOAEL divided by the interspecies (taxa) uncertainty factor

Table B-12
 South Landfill Ecological Risk Assessment
 Surface Soil Exposure Point Concentrations and Summary Statistics Used for the Ecological Risk Assessment
 RMC - Troutdale Facility

Analyte	Units	Number of Samples	Number of Detects	Frequency of Detect	Minimum Nondetect Value	Maximum Nondetect Value	Minimum Detected Value	Maximum Detected Value	Arithmetic Mean	EPC	EPC > Max	Basis	Final EPC	Basis
2-Methylnaphthalene	mg/kg	1	1	100%	--	--	5.80E-03	5.80E-03	5.80E-03	5.80E-03	=	MAX DETECT	5.80E-03	MAX DETECT
Acenaphthene	mg/kg	13	6	46%	3.00E-03	6.00E-03	2.10E-03	3.70E-02	1.21E-02	1.89E-02	FALSE	NON-PARA	1.89E-02	NON-PARA
Aluminum	mg/kg	10	10	100%	--	--	1.66E+04	3.72E+04	2.69E+04	3.12E+04	FALSE	NORM	3.12E+04	NORM
Anthracene	mg/kg	13	10	77%	3.00E-03	5.60E-03	6.40E-04	6.90E-02	1.47E-02	3.11E-02	FALSE	NON-PARA	3.11E-02	NON-PARA
Antimony	mg/kg	10	6	60%	2.80E+00	3.00E+00	3.60E+00	6.30E+00	3.34E+00	5.32E+00	FALSE	ADJNORM	5.32E+00	ADJNORM
Arsenic	mg/kg	10	10	100%	--	--	6.10E+00	2.42E+01	1.48E+01	1.83E+01	FALSE	NORM	1.83E+01	NORM
Barium	mg/kg	10	10	100%	--	--	5.25E+01	1.52E+02	1.04E+02	1.22E+02	FALSE	NORM	1.22E+02	NORM
Benzo(a)anthracene	mg/kg	13	12	92%	5.40E-03	5.40E-03	6.10E-04	7.90E-01	1.19E-01	3.38E-01	FALSE	GAMMA	3.38E-01	GAMMA
Benzo(a)pyrene	mg/kg	13	12	92%	5.40E-03	5.40E-03	4.10E-03	1.10E+00	1.66E-01	4.50E-01	FALSE	GAMMA	4.50E-01	GAMMA
Benzo(b)fluoranthene	mg/kg	13	12	92%	5.40E-03	5.40E-03	1.10E-03	1.40E+00	2.13E-01	6.13E-01	FALSE	GAMMA	6.13E-01	GAMMA
Benzo(g,h,i)perylene	mg/kg	13	12	92%	5.40E-03	5.40E-03	5.10E-03	7.50E-01	1.33E-01	3.42E-01	FALSE	GAMMA	3.42E-01	GAMMA
Benzo(k)fluoranthene	mg/kg	13	12	92%	5.40E-03	5.40E-03	4.80E-04	5.50E-01	1.02E-01	2.83E-01	FALSE	GAMMA	2.83E-01	GAMMA
Beryllium	mg/kg	10	10	100%	--	--	6.80E-01	6.00E+00	3.06E+00	3.89E+00	FALSE	NORM	3.89E+00	NORM
Cadmium	mg/kg	10	10	100%	--	--	1.10E+00	5.20E+00	3.12E+00	3.86E+00	FALSE	NORM	3.86E+00	NORM
Chromium	mg/kg	10	10	100%	--	--	2.50E+01	1.29E+02	7.00E+01	1.10E+02	FALSE	LOGNORM	1.10E+02	LOGNORM
Chrysene	mg/kg	13	12	92%	5.40E-03	5.40E-03	1.10E-03	9.10E-01	1.54E-01	4.33E-01	FALSE	GAMMA	4.33E-01	GAMMA
Copper	mg/kg	10	10	100%	--	--	6.41E+02	5.19E+03	2.96E+03	3.82E+03	FALSE	NORM	3.82E+03	NORM
Cyanide, Total	mg/kg	2	1	50%	1.00E-01	1.00E-01	2.80E-01	2.80E-01	2.80E-01	2.80E-01	=	MAX DETECT	2.80E-01	MAX DETECT
Dibenzo(a,h)anthracene	mg/kg	13	11	85%	5.40E-03	5.60E-03	1.30E-03	2.10E-01	3.90E-02	7.77E-02	FALSE	GAMMA	7.77E-02	GAMMA
Dibenzofuran	mg/kg	1	1	100%	--	--	7.50E-03	7.50E-03	7.50E-03	7.50E-03	=	MAX DETECT	7.50E-03	MAX DETECT
Fluoranthene	mg/kg	13	11	85%	5.40E-03	5.60E-03	3.80E-03	8.60E-01	1.54E-01	3.93E-01	FALSE	GAMMA	3.93E-01	GAMMA
Fluorene	mg/kg	13	4	31%	3.00E-03	6.80E-03	3.72E-03	1.80E-02	9.64E-03	1.07E-02	FALSE	NON-PARA	1.07E-02	NON-PARA
Fluoride	mg/kg	16	15	94%	5.00E+00	5.00E+00	1.20E+01	6.20E+02	3.54E+02	4.13E+02	FALSE	NORMAL	4.13E+02	NORMAL
Indeno(1,2,3-cd)pyrene	mg/kg	13	12	92%	5.40E-03	5.40E-03	5.30E-03	9.10E-01	1.42E-01	3.67E-01	FALSE	GAMMA	3.67E-01	GAMMA
Lead	mg/kg	10	10	100%	--	--	6.31E+01	4.32E+02	1.95E+02	3.01E+02	FALSE	LOGNORM	3.01E+02	LOGNORM
Mercury	mg/kg	10	8	80%	6.00E-02	6.00E-02	8.00E-02	3.50E-01	1.35E-01	2.36E-01	FALSE	ADJLOGNORM	2.36E-01	ADJLOGNORM
Naphthalene	mg/kg	13	6	46%	2.99E-03	5.60E-03	2.40E-04	8.00E-03	2.51E-03	3.67E-03	FALSE	GAMMA	3.67E-03	GAMMA
Nickel	mg/kg	10	10	100%	--	--	8.94E+01	2.86E+02	1.53E+02	2.05E+02	FALSE	LOGNORM	2.05E+02	LOGNORM
Phenanthrene	mg/kg	13	11	85%	5.40E-03	5.60E-03	2.40E-03	2.60E-01	5.76E-02	1.36E-01	FALSE	GAMMA	1.36E-01	GAMMA
Pyrene	mg/kg	13	11	85%	5.40E-03	5.60E-03	4.10E-03	8.00E-01	1.44E-01	3.60E-01	FALSE	GAMMA	3.60E-01	GAMMA
Selenium	mg/kg	10	3	30%	1.10E+00	1.20E+00	1.40E+00	2.70E+00	1.02E+00	2.00E+00	FALSE	NONPARA	2.00E+00	NONPARA
Silver	mg/kg	10	3	30%	1.10E+00	1.20E+00	1.20E+00	1.90E+00	8.75E-01	1.60E+00	FALSE	NONPARA	1.60E+00	NONPARA
Vanadium	mg/kg	10	10	100%	--	--	7.13E+01	1.72E+02	1.06E+02	1.30E+02	FALSE	LOGNORM	1.30E+02	LOGNORM
Zinc	mg/kg	10	10	100%	--	--	4.81E+01	2.61E+02	1.66E+02	2.06E+02	FALSE	NORM	2.06E+02	NORM

Table B-13
 South Landfill Tier 1 Ecological Risk Assessment
 Intake Estimation for Ecological Endpoint Species
 RMC - Troutdale Facility

Chemical	Receptor Species	Body Weight (kg)	Daily Food Intake (kg/day)	Daily Water Intake (L/day)	Area Use Factor	Migration Factor	Daily Food Ingestion from Site (kg/day)	Daily Water Intake from Site (L/day)	Fraction of Diet as Prey	Sediment to Prey Transfer Factor	Fraction of Diet as Invertebrates	Sediment to Invertebrate Transfer Factor	Fraction of Diet as Plants	Sediment to Plant Transfer Factor	Fraction of Diet as Sediment	Sediment Conc. (mg/kg)	Bioavailability	Water Conc. (mg/L)	Chemical Intake (mg/kg-d)
Inorganics																			
Aluminum	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0.023	0	0.054	0.029	0.001	0.028	3.12E+04	0.07	5.61E+00	1.08E+02
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.023	0	0.054	0	0.001	0.02	3.12E+04	0.07	5.61E+00	9.19E+01
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.023	0.76	0.054	0.218	0.001	0.022	3.12E+04	0.07	5.61E+00	5.94E+02
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.023	0	0.054	0.98	0.001	0.02	3.12E+04	0.07	5.61E+00	1.41E+01
Antimony	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0.022	0	1	0.029	0.01	0.028	5.32E+00	1.00	---	3.81E-02
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.022	0	1	0	0.01	0.02	5.32E+00	1.00	---	2.71E-02
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.022	0.76	1	0.218	0.01	0.022	5.32E+00	1.00	---	1.85E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.022	0	1	0.98	0.01	0.02	5.32E+00	1.00	---	2.94E-02
Arsenic	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0.0015	0	0.15	0.029	0.01	0.028	1.83E+01	1.00	---	7.94E-02
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.0015	0	0.15	0	0.01	0.02	1.83E+01	1.00	---	4.83E-02
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.0015	0.76	0.15	0.218	0.01	0.022	1.83E+01	1.00	---	1.12E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.0015	0	0.15	0.98	0.01	0.02	1.83E+01	1.00	---	1.01E-01
Barium	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0.023	0	0.058	0.029	0.003	0.028	1.22E+02	1.00	---	8.90E-01
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.023	0	0.058	0	0.003	0.02	1.22E+02	1.00	---	6.40E-01
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.023	0.76	0.058	0.218	0.003	0.022	1.22E+02	1.00	---	3.63E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.023	0	0.058	0.98	0.003	0.02	1.22E+02	1.00	---	5.21E-01
Beryllium	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0.19	0	0.19	0.029	0.0025	0.028	3.89E+00	1.00	5.40E-03	1.18E-01
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.19	0	0.19	0	0.0025	0.02	3.89E+00	1.00	5.40E-03	9.86E-02
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.19	0.76	0.19	0.218	0.0025	0.022	3.89E+00	1.00	5.40E-03	2.89E-01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.19	0	0.19	0.98	0.0025	0.02	3.89E+00	1.00	5.40E-03	1.65E-02
Cadmium	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0.107	0	0.74	0.029	0.14	0.028	3.86E+00	1.00	---	7.49E-02
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.107	0	0.74	0	0.14	0.02	3.86E+00	1.00	---	5.92E-02
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.107	0.76	0.74	0.218	0.14	0.022	3.86E+00	1.00	---	1.05E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.107	0	0.74	0.98	0.14	0.02	3.86E+00	1.00	---	1.12E-01
Chromium	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0.021	0	0.078	0.029	0.0001	0.028	1.10E+02	1.00	---	7.65E-01
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.021	0	0.078	0	0.0001	0.02	1.10E+02	1.00	---	5.46E-01
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.021	0.76	0.078	0.218	0.0001	0.022	1.10E+02	1.00	---	3.96E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.021	0	0.078	0.98	0.0001	0.02	1.10E+02	1.00	---	4.09E-01
Copper	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0.002	0	0.083	0.029	0.08	0.028	3.82E+03	0.46	3.08E-02	9.53E+00
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.002	0	0.083	0	0.08	0.02	3.82E+03	0.46	3.08E-02	5.24E+00
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.002	0.76	0.083	0.218	0.08	0.022	3.82E+03	0.46	3.08E-02	1.54E+02
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.002	0	0.083	0.98	0.08	0.02	3.82E+03	0.46	3.08E-02	6.21E+01
Cyanide	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0	0	1	0.029	1.8	0.028	2.80E-01	1.00	4.20E-02	6.57E-03
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	1	0	1.8	0.02	2.80E-01	1.00	4.20E-02	2.47E-03
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	1	0.218	1.8	0.022	2.80E-01	1.00	4.20E-02	1.49E-01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	1	0.98	1.8	0.02	2.80E-01	1.00	4.20E-02	9.54E-02
Fluoride	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0.0026	0	0.0006	0.029	0.009	0.028	4.13E+02	0.35	5.93E+01	5.40E+00
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.0026	0	0.0006	0	0.009	0.02	4.13E+02	0.35	5.93E+01	3.00E+00
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.0026	0.76	0.0006	0.218	0.009	0.022	4.13E+02	0.35	5.93E+01	5.88E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.0026	0	0.0006	0.98	0.009	0.02	4.13E+02	0.35	5.93E+01	5.07E+00
Lead	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0.014	0	0.072	0.029	0.00076	0.028	3.01E+02	1.00	---	1.81E+00
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.014	0	0.072	0	0.00076	0.02	3.01E+02	1.00	---	1.25E+00
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.014	0.76	0.072	0.218	0.00076	0.022	3.01E+02	1.00	---	1.03E+01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.014	0	0.072	0.98	0.00076	0.02	3.01E+02	1.00	---	1.16E+00

Table B-13
 South Landfill Tier 1 Ecological Risk Assessment
 Intake Estimation for Ecological Endpoint Species
 RMC - Troutdale Facility

Chemical	Receptor Species	Body Weight (kg)	Daily Food Intake (kg/day)	Daily Water Intake (L/day)	Area Use Factor	Migration Factor	Daily Food Ingestion from Site (kg/day)	Daily Water Intake from Site (L/day)	Fraction of Diet as Prey	Sediment to Prey Transfer Factor	Fraction of Diet as Invertebrates	Sediment to Invertebrate Transfer Factor	Fraction of Diet as Plants	Sediment to Plant Transfer Factor	Fraction of Diet as Sediment	Sediment Conc. (mg/kg)	Bioavailability	Water Conc. (mg/L)	Chemical Intake (mg/kg-d)
Mercury	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0.061	0	0.15	0.029	0.3	0.028	2.36E-01	1.00	---	3.25E-03
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.061	0	0.15	0	0.3	0.02	2.36E-01	1.00	---	2.31E-03
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.061	0.76	0.15	0.218	0.3	0.022	2.36E-01	1.00	---	2.12E-02
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.061	0	0.15	0.98	0.3	0.02	2.36E-01	1.00	---	1.38E-02
Nickel	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0.015	0	0.066	0.029	0.05	0.028	2.05E+02	1.00	---	1.31E+00
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.015	0	0.066	0	0.05	0.02	2.05E+02	1.00	---	8.74E-01
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.015	0.76	0.066	0.218	0.05	0.022	2.05E+02	1.00	---	7.57E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.015	0	0.066	0.98	0.05	0.02	2.05E+02	1.00	---	2.62E+00
Selenium	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0.14	0	0.21	0.029	0.1	0.028	2.00E+00	1.00	---	4.76E-02
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.14	0	0.21	0	0.1	0.02	2.00E+00	1.00	---	3.86E-02
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.14	0.76	0.21	0.218	0.1	0.022	2.00E+00	1.00	---	1.81E-01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.14	0	0.21	0.98	0.1	0.02	2.00E+00	1.00	---	4.38E-02
Silver	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0.16	0	2.45	0.029	0.000022	0.028	1.60E+00	1.00	---	4.18E-02
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.16	0	2.45	0	0.000022	0.02	1.60E+00	1.00	---	3.47E-02
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.16	0.76	2.45	0.218	0.000022	0.022	1.60E+00	1.00	---	1.34E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.16	0	2.45	0.98	0.000022	0.02	1.60E+00	1.00	---	5.94E-03
Vanadium	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0.006	0	0.014	0.029	0.0014	0.028	1.30E+02	0.31	---	2.72E-01
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.006	0	0.014	0	0.0014	0.02	1.30E+02	0.31	---	1.92E-01
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.006	0.76	0.014	0.218	0.0014	0.022	1.30E+02	0.31	---	1.02E+00
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.006	0	0.014	0.98	0.0014	0.02	1.30E+02	0.31	---	1.82E-01
Zinc	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0.202	0	0.29	0.029	0.26	0.028	2.06E+02	1.00	---	6.79E+00
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0.202	0	0.29	0	0.26	0.02	2.06E+02	1.00	---	5.51E+00
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0.202	0.76	0.29	0.218	0.26	0.022	2.06E+02	1.00	---	2.73E+01
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0.202	0	0.29	0.98	0.26	0.02	2.06E+02	1.00	---	1.05E+01
Organics																			
Acenaphthene	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0	0	0.048	0.029	0.0369	0.028	1.89E-02	1.00	---	8.01E-05
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.048	0	0.0369	0.02	1.89E-02	1.00	---	4.64E-05
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.048	0.218	0.0369	0.022	1.89E-02	1.00	---	5.58E-04
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.048	0.98	0.0369	0.02	1.89E-02	1.00	---	1.97E-04
Anthracene	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0	0	0.051	0.029	0.0121	0.028	3.11E-02	1.00	---	1.29E-04
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.051	0	0.0121	0.02	3.11E-02	1.00	---	7.63E-05
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.051	0.218	0.0121	0.022	3.11E-02	1.00	---	8.76E-04
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.051	0.98	0.0121	0.02	3.11E-02	1.00	---	1.84E-04
Benzo(a)anthracene	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0	0	0.043	0.029	0.0019	0.028	3.38E-01	1.00	---	1.38E-03
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.043	0	0.0019	0.02	3.38E-01	1.00	---	8.29E-04
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.043	0.218	0.0019	0.022	3.38E-01	1.00	---	8.26E-03
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.043	0.98	0.0019	0.02	3.38E-01	1.00	---	1.37E-03
Benzo(a)pyrene	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0	0	0.054	0.029	0.0011	0.028	4.50E-01	1.00	---	1.84E-03
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.054	0	0.0011	0.02	4.50E-01	1.00	---	1.10E-03
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.054	0.218	0.0011	0.022	4.50E-01	1.00	---	1.26E-02
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.054	0.98	0.0011	0.02	4.50E-01	1.00	---	1.76E-03
Benzo(b)fluoranthene	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0	0	0.034	0.029	0.0011	0.028	6.13E-01	1.00	---	2.51E-03
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.034	0	0.0011	0.02	6.13E-01	1.00	---	1.51E-03
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.034	0.218	0.0011	0.022	6.13E-01	1.00	---	1.31E-02
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.034	0.98	0.0011	0.02	6.13E-01	1.00	---	2.40E-03

Table B-13
 South Landfill Tier 1 Ecological Risk Assessment
 Intake Estimation for Ecological Endpoint Species
 RMC - Troutdale Facility

Chemical	Receptor Species	Body Weight (kg)	Daily Food Intake (kg/day)	Daily Water Intake (L/day)	Area Use Factor	Migration Factor	Daily Food Ingestion from Site (kg/day)	Daily Water Intake from Site (L/day)	Fraction of Diet as Prey	Sediment to Prey Transfer Factor	Fraction of Diet as Invertebrates	Sediment to Invertebrate Transfer Factor	Fraction of Diet as Plants	Sediment to Plant Transfer Factor	Fraction of Diet as Sediment	Sediment Conc. (mg/kg)	Bioavailability	Water Conc. (mg/L)	Chemical Intake (mg/kg-d)
Benzo(g,h,i)perylene	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0	0	0.024	0.029	0.0006	0.028	3.42E-01	1.00	---	1.40E-03
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.024	0	0.0006	0.02	3.42E-01	1.00	---	8.41E-04
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.024	0.218	0.0006	0.022	3.42E-01	1.00	---	6.14E-03
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.024	0.98	0.0006	0.02	3.42E-01	1.00	---	1.31E-03
Benzo(k)fluoranthene	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0	0	0.034	0.029	0.0009	0.028	2.83E-01	1.00	---	1.16E-03
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.034	0	0.0009	0.02	2.83E-01	1.00	---	6.95E-04
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.034	0.218	0.0009	0.022	2.83E-01	1.00	---	6.04E-03
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.034	0.98	0.0009	0.02	2.83E-01	1.00	---	1.10E-03
Chrysene	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0	0	0.07	0.029	0.0019	0.028	4.33E-01	1.00	---	1.77E-03
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.07	0	0.0019	0.02	4.33E-01	1.00	---	1.06E-03
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.07	0.218	0.0019	0.022	4.33E-01	1.00	---	1.45E-02
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.07	0.98	0.0019	0.02	4.33E-01	1.00	---	1.75E-03
Dibenzo(a,h)anthracene	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0	0	0.078	0.029	0.0005	0.028	7.77E-02	1.00	---	3.18E-04
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.078	0	0.0005	0.02	7.77E-02	1.00	---	1.91E-04
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.078	0.218	0.0005	0.022	7.77E-02	1.00	---	2.81E-03
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.078	0.98	0.0005	0.02	7.77E-02	1.00	---	2.95E-04
Fluoranthene	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0	0	0.059	0.029	0.0047	0.028	3.93E-01	1.00	---	1.61E-03
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.059	0	0.0047	0.02	3.93E-01	1.00	---	9.64E-04
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.059	0.218	0.0047	0.022	3.93E-01	1.00	---	1.18E-02
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.059	0.98	0.0047	0.02	3.93E-01	1.00	---	1.79E-03
Fluorene	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0	0	0.032	0.029	0.0218	0.028	1.07E-02	1.00	---	4.49E-05
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.032	0	0.0218	0.02	1.07E-02	1.00	---	2.64E-05
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.032	0.218	0.0218	0.022	1.07E-02	1.00	---	2.44E-04
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.032	0.98	0.0218	0.02	1.07E-02	1.00	---	8.23E-05
Indeno(1,2,3-cd)pyrene	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0	0	0.066	0.029	0.0005	0.028	3.67E-01	1.00	---	1.50E-03
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.066	0	0.0005	0.02	3.67E-01	1.00	---	9.02E-04
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.066	0.218	0.0005	0.022	3.67E-01	1.00	---	1.18E-02
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.066	0.98	0.0005	0.02	3.67E-01	1.00	---	1.40E-03
Naphthalene	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0	0	0.034	0.029	0.1064	0.028	0.004	1.00	---	1.67E-05
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.034	0	0.1064	0.02	0.004	1.00	---	9.02E-06
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.034	0.218	0.1064	0.022	0.004	1.00	---	1.16E-04
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.034	0.98	0.1064	0.02	0.004	1.00	---	8.47E-05
Phenanthrene	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0	0	0.045	0.029	0.0117	0.028	1.36E-01	1.00	---	5.64E-04
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.045	0	0.0117	0.02	1.36E-01	1.00	---	3.35E-04
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.045	0.218	0.0117	0.022	1.36E-01	1.00	---	3.56E-03
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.045	0.98	0.0117	0.02	1.36E-01	1.00	---	7.96E-04
Pyrene	Coyote	10.50	1.533	0.822	1	1	1.53	0.82	0.943	0	0	0.062	0.029	0.0048	0.028	3.60E-01	1.00	---	1.48E-03
	Red-tailed Hawk	1.13	0.185	0.064	1	0.75	0.14	0.05	0.98	0	0	0.062	0	0.0048	0.02	3.60E-01	1.00	---	8.85E-04
	American Robin	0.081	0.072	0.011	1	0.5	0.036	0.01	0	0	0.76	0.062	0.218	0.0048	0.022	3.60E-01	1.00	---	1.12E-02
	Mule Deer	66.5	12.33	4.327	1	1	12.33	4.33	0	0	0	0.062	0.98	0.0048	0.02	3.60E-01	1.00	---	1.65E-03

Table B-14
 South Landfill Tier 1 Ecological Risk Assessment
 Hazard Quotient Summary
 RMC - Troutdale Facility

Chemical	Receptor	NOAEL ^a (mg/kgbw-d)	Toxicity Test Species	Taxa UFs ^b	TRV ^c (mg/kgbw-d)	Intake (mg/kgbw-d)	Hazard Quotient
Inorganics							
Aluminum	Coyote	6.00E+01	Beagle (dog)	4	1.50E+01	1.08E+02	7.2
	Red-tailed Hawk	1.10E+02	Ringed dove	4	2.74E+01	9.19E+01	3.4
	American Robin	1.10E+02	Ringed dove	4	2.74E+01	5.94E+02	22
	Mule Deer	6.00E+01	Beagle (dog)	4	1.50E+01	1.41E+01	0.94
Antimony	Coyote	2.50E-01	Mouse	4	6.25E-02	3.81E-02	0.61
	Red-tailed Hawk	---	---	---	---	---	---
	American Robin	---	---	---	---	---	---
	Mule Deer	2.50E-01	Mouse	4	6.25E-02	2.94E-02	0.47
Arsenic	Coyote	2.52E-01	Mouse	4	6.30E-02	7.94E-02	1.3
	Red-tailed Hawk	5.14E+00	Mallard duck	4	1.29E+00	4.83E-02	0.04
	American Robin	5.14E+00	Mallard duck	4	1.29E+00	1.12E+00	0.88
	Mule Deer	2.52E-01	Mouse	4	6.30E-02	1.01E-01	1.6
Barium	Coyote	5.06E+00	Rat	4	1.27E+00	8.90E-01	0.70
	Red-tailed Hawk	4.16E+01	1-day-old chicks	4	1.04E+01	6.40E-01	0.06
	American Robin	4.16E+01	1-day-old chicks	4	1.04E+01	3.63E+00	0.35
	Mule Deer	5.06E+00	Rat	4	1.27E+00	5.21E-01	0.41
Beryllium	Coyote	6.60E-01	Rat	4	1.65E-01	1.18E-01	0.72
	Red-tailed Hawk	---	---	---	---	---	---
	American Robin	---	---	---	---	---	---
	Mule Deer	6.60E-01	Rat	4	1.65E-01	1.65E-02	0.10
Cadmium	Coyote	1.00E+00	Rat	4	2.50E-01	7.49E-02	0.30
	Red-tailed Hawk	1.45E+00	Mallard duck	4	3.63E-01	5.92E-02	0.16
	American Robin	1.45E+00	Mallard duck	4	3.63E-01	1.05E+00	2.9
	Mule Deer	1.00E+00	Rat	4	2.50E-01	1.12E-01	0.45
Chromium	Coyote	2.74E+03	Rat	4	6.84E+02	7.65E-01	0.00
	Red-tailed Hawk	1.00E+00	Black duck	4	2.50E-01	5.46E-01	2.2
	American Robin	1.00E+00	Black duck	4	2.50E-01	3.96E+00	16
	Mule Deer	2.74E+03	Rat	4	6.84E+02	4.09E-01	0.00
Copper	Coyote	1.17E+01	Mink	4	2.93E+00	9.53E+00	3.3
	Red-tailed Hawk	4.70E+01	1-day-old chicks	4	1.18E+01	5.24E+00	0.45
	American Robin	4.70E+01	1-day-old chicks	4	1.18E+01	1.54E+02	13
	Mule Deer	1.17E+01	Mink	4	2.93E+00	6.21E+01	21
Cyanide	Coyote	6.87E+01	Rat	4	1.72E+01	6.57E-03	0.00
	Red-tailed Hawk	---	---	---	---	---	---
	American Robin	---	---	---	---	---	---
	Mule Deer	6.87E+01	Rat	4	1.72E+01	9.54E-02	0.01
Fluoride	Coyote	3.14E+01	Mink	4	7.84E+00	5.40E+00	0.69
	Red-tailed Hawk	7.80E+00	Screech owl	4	1.95E+00	3.00E+00	1.5
	American Robin	7.80E+00	Screech owl	4	1.95E+00	5.88E+00	3.0
	Mule Deer	3.14E+01	Mink	4	7.84E+00	5.07E+00	0.65
Lead	Coyote	8.00E+00	Rat	4	2.00E+00	1.81E+00	0.91
	Red-tailed Hawk	3.85E+00	American kestrels	4	9.63E-01	1.25E+00	1.3
	American Robin	3.85E+00	American kestrels	4	9.63E-01	1.03E+01	11
	Mule Deer	8.00E+00	Rat	4	2.00E+00	1.16E+00	0.58
Mercury	Coyote	1.00E+00	Mink	4	2.50E-01	3.25E-03	0.01
	Red-tailed Hawk	4.50E-01	Japanese quail	4	1.13E-01	2.31E-03	0.02
	American Robin	4.50E-01	Japanese quail	4	1.13E-01	2.12E-02	0.19
	Mule Deer	1.00E+00	Mink	4	2.50E-01	1.38E-02	0.06

Table B-14
 South Landfill Tier 1 Ecological Risk Assessment
 Hazard Quotient Summary
 RMC - Troutdale Facility

Chemical	Receptor	NOAEL ^a (mg/kgbw-d)	Toxicity Test Species	Taxa UFs ^b	TRV ^c (mg/kgbw-d)	Intake (mg/kgbw-d)	Hazard Quotient
Nickel	Coyote	4.00E+01	Rat	4	1.00E+01	1.31E+00	0.13
	Red-tailed Hawk	7.74E+01	Mallard duckling	4	1.94E+01	8.74E-01	0.05
	American Robin	7.74E+01	Mallard duckling	4	1.94E+01	7.57E+00	0.39
	Mule Deer	4.00E+01	Rat	4	1.00E+01	2.62E+00	0.26
Selenium	Coyote	2.00E-01	Rat	4	5.00E-02	4.76E-02	0.95
	Red-tailed Hawk	4.40E-01	Screech owl	4	1.10E-01	3.86E-02	0.35
	American Robin	4.00E-01	Mallard duck	4	1.00E-01	1.81E-01	1.8
	Mule Deer	2.00E-01	Rat	4	5.00E-02	4.38E-02	0.88
Silver	Coyote	1.81E+01	Mouse	4	4.53E+00	4.18E-02	0.01
	Red-tailed Hawk	8.50E+00	Chicken	4	2.13E+00	3.47E-02	0.02
	American Robin	8.50E+00	Chicken	4	2.13E+00	1.34E+00	0.63
	Mule Deer	1.81E+01	Mouse	4	4.53E+00	5.94E-03	0.00
Vanadium	Coyote	4.20E-01	Rat	4	1.05E-01	2.72E-01	2.6
	Red-tailed Hawk	1.14E+01	Mallard duck	4	2.85E+00	1.92E-01	0.07
	American Robin	1.14E+01	Mallard duck	4	2.85E+00	1.02E+00	0.36
	Mule Deer	4.20E-01	Rat	4	1.05E-01	1.82E-01	1.7
Zinc	Coyote	1.60E+02	Rat	4	4.00E+01	6.79E+00	0.17
	Red-tailed Hawk	1.45E+01	White leghorn chickens	4	3.63E+00	5.51E+00	1.5
	American Robin	1.45E+01	White leghorn chickens	4	3.63E+00	2.73E+01	7.5
	Mule Deer	1.60E+02	Rat	4	4.00E+01	1.05E+01	0.26
Organics							
Acenaphthene	Coyote	4.10E+01	Rat	4	1.03E+01	8.01E-05	<0.01
	Red-tailed Hawk	7.98E+01	Mallard	4	1.99E+01	4.64E-05	<0.01
	American Robin	7.98E+01	Mallard	4	1.99E+01	5.58E-04	<0.01
	Mule Deer	4.10E+01	Rat	4	1.03E+01	1.97E-04	<0.01
Anthracene	Coyote	4.10E+01	Rat	4	1.03E+01	1.29E-04	<0.01
	Red-tailed Hawk	7.98E+01	Mallard	4	1.99E+01	7.63E-05	<0.01
	American Robin	7.98E+01	Mallard	4	1.99E+01	8.76E-04	<0.01
	Mule Deer	4.10E+01	Rat	4	1.03E+01	1.84E-04	<0.01
Benzo(a)anthracene	Coyote	2.00E+00	Mouse	4	5.00E-01	1.38E-03	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	8.29E-04	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	8.26E-03	<0.01
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	1.37E-03	<0.01
Benzo(a)pyrene	Coyote	2.00E+00	Mouse	4	5.00E-01	1.84E-03	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	1.10E-03	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	1.26E-02	0.01
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	1.76E-03	<0.01
Benzo(b)fluoranthene	Coyote	2.00E+00	Mouse	4	5.00E-01	2.51E-03	0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	1.51E-03	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	1.31E-02	0.01
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	2.40E-03	<0.01
Benzo(g,h,i)perylene	Coyote	2.00E+00	Mouse	4	5.00E-01	1.40E-03	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	8.41E-04	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	6.14E-03	<0.01
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	1.31E-03	<0.01
Benzo(k)fluoranthene	Coyote	2.00E+00	Mouse	4	5.00E-01	1.16E-03	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	6.95E-04	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	6.04E-03	<0.01
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	1.10E-03	<0.01

Table B-14
 South Landfill Tier 1 Ecological Risk Assessment
 Hazard Quotient Summary
 RMC - Troutdale Facility

Chemical	Receptor	NOAEL ^a (mg/kgbw-d)	Toxicity Test Species	Taxa UFs ^b	TRV ^c (mg/kgbw-d)	Intake (mg/kgbw-d)	Hazard Quotient
Chrysene	Coyote	2.00E+00	Mouse	4	5.00E-01	1.77E-03	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	1.06E-03	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	1.45E-02	0.01
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	1.75E-03	<0.01
Dibenzo(a,h)anthracene	Coyote	2.00E+00	Mouse	4	5.00E-01	3.18E-04	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	1.91E-04	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	2.81E-03	<0.01
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	2.95E-04	<0.01
Fluoranthene	Coyote	1.25E+02	Mouse	4	3.13E+01	1.61E-03	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	9.64E-04	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	1.18E-02	0.01
	Mule Deer	1.25E+02	Mouse	4	3.13E+01	1.79E-03	<0.01
Fluorene	Coyote	4.10E+01	Rat	4	1.03E+01	4.49E-05	<0.01
	Red-tailed Hawk	7.98E+01	Mallard	4	1.99E+01	2.64E-05	<0.01
	American Robin	7.98E+01	Mallard	4	1.99E+01	2.44E-04	<0.01
	Mule Deer	4.10E+01	Rat	4	1.03E+01	8.23E-05	<0.01
Indeno(1,2,3-cd)pyrene	Coyote	2.00E+00	Mouse	4	5.00E-01	1.50E-03	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	9.02E-04	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	1.18E-02	0.01
	Mule Deer	2.00E+00	Mouse	4	5.00E-01	1.40E-03	<0.01
Naphthalene	Coyote	4.10E+01	Rat	4	1.03E+01	1.67E-05	<0.01
	Red-tailed Hawk	7.98E+01	Mallard	4	1.99E+01	9.02E-06	<0.01
	American Robin	7.98E+01	Mallard	4	1.99E+01	1.16E-04	<0.01
	Mule Deer	4.10E+01	Rat	4	1.03E+01	8.47E-05	<0.01
Phenanthrene	Coyote	1.40E+01	Rat	4	3.50E+00	5.64E-04	<0.01
	Red-tailed Hawk	7.98E+01	Mallard	4	1.99E+01	3.35E-04	<0.01
	American Robin	7.98E+01	Mallard	4	1.99E+01	3.56E-03	<0.01
	Mule Deer	1.40E+01	Rat	4	3.50E+00	7.96E-04	<0.01
Pyrene	Coyote	7.50E+01	Mouse	4	1.88E+01	1.48E-03	<0.01
	Red-tailed Hawk	7.87E+00	White leghorn chickens	4	1.97E+00	8.85E-04	<0.01
	American Robin	7.87E+00	White leghorn chickens	4	1.97E+00	1.12E-02	0.01
	Mule Deer	7.50E+01	Mouse	4	1.88E+01	1.65E-03	<0.01

a) Value is as calculated in Tables G-2 and G-3 of the BLRA; dose divided by the uncertainty factor for the toxicity endpoint

b) Uncertainty factors used to extrapolate from the test species to the receptor; UFs are based on EPA Region 10 guidance (EPA, 1997)

c) Reference toxicity value is the NOAEL divided by the interspecies (taxa) uncertainty factor