

**THIRD FIVE-YEAR REVIEW FOR OPERABLE UNITS  
1, 2, 3, 7, AND 9  
Portsmouth Naval Shipyard  
Kittery, Maine**

**FINAL  
Version: 1**

**Prepared for:**



**Department of the Navy  
Naval Facilities Engineering Command, Mid-Atlantic  
9742 Maryland Ave.  
Norfolk, VA 23511-3095**

**Comprehensive Long-Term Environmental Action Navy  
Contract Number N62470-11-D-8013**

**September 11, 2017**

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**CTO WE55**

**Prepared by:**



**Resolution Consultants  
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**September 11, 2017**

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## **List of Acronyms and Abbreviations**

ACM	Asbestos-Containing Material
AOC	Area of Concern
ARAR	Applicable or Relevant Appropriate Requirements
BaP	Benzo(a)pyrene
bgs	Below ground surface
bss	Below sediment surface
CCR	Construction Completion Report
CDC	Child Development Center
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CIA	Controlled Industrial Area
COC	Contaminant of Concern
COPC	Chemical of Potential Concern
DoD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EE/CA	Engineering Evaluation/Cost Analysis
EERA	Estuarine Ecological Risk Assessment
ERP	Environmental Restoration Program
ESD	Explanation of Significant Difference
FCS	Final Confirmation Study
FFA	Federal Facilities Agreement
FS	Feasibility Study
HHRA	Human Health Risk Assessment
IAS	Initial Assessment Study
JILF	Jamaica Island Landfill
LTM	Long-Term Monitoring
LTMgt	Long-Term Management
LUCs	Land Use Controls
LUCRD	Land Use Control Remedial Design
MB	Mercury Burial
MEC	Munition and Explosives of Concern



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MEDEP	Maine Department of Environmental Protection
µg/L	Microgram per liter
mg/kg	Milligram per kilogram
MTADS	Multi-Sensor Towed Array Detection System
NAVFAC	Navy Facilities Engineering Command
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NFA	No Further Action
NIRIS	Naval Installation Restoration Information Solution
NOAA	National Oceanic and Atmospheric Administration
O&M	Operations and Maintenance
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PNS	Portsmouth Naval Shipyard
PVC	Polyvinyl chloride
RA	Remedial Action
RAB	Restoration Advisory Board
RACR	Remedial Action Completion Report
RAGs	Remedial Action Guidelines
RAO	Remedial Action Objective
RC	Response Complete
RCM	Reactive Core Matting
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RFI	RCRA Facility Investigation
RI	Remedial Investigation
ROD	Record of Decision
SASE	Site Assessment Screening Evaluation
SSI	Site Screening Investigation
SVOC	Semi-volatile organic compound
TAL	Target Analyte List

TBC	To-Be-Considered
TCL	Target Compound List
TEQ	Toxicity Equivalency Quotient
TSCA	Toxic Substances Control Act
UE	Unrestricted Exposure
USEPA	United States Environmental Protection Agency
UU	Unlimited Use
VOC	Volatile organic compound

## Five-Year Review Summary Form

### SITE IDENTIFICATION

**Site Name:** Portsmouth Naval Shipyard

**EPA ID:** ME7170022019

**Region:** 1

**State:** ME

**City/County:** Kittery/York

### SITE STATUS

**NPL Status:** Final

**Multiple OUs?**

Yes

**Has the site achieved construction completion?**

No

### REVIEW STATUS

**Lead agency:** Other Federal Agency

**If "Other Federal Agency" was selected above, enter Agency name:** U.S. Department of the Navy

**Author name (Federal or State Project Manager):** Ms. Linda Cole

**Author affiliation:** U.S. Navy, Naval Facilities Engineering Command, Mid-Atlantic

**Review period:** June 2012 – November 2016

**Date of site inspection:** 10/27/15, 6/14/16, 7/15/16

**Type of review:** Statutory

**Review number:** 3

**Triggering action date:** May 2, 2012

**Due date (five years after triggering action date):** May 2, 2017

**Five-Year Review Summary Form (continued)**

**Issues/Recommendations**

**OU(s) without Issues/Recommendations Identified in the Five-Year Review:**  
 OU1, OU2, OU7

**Issues and Recommendations Identified in the Five-Year Review:**

<b>OU(s): OU3</b>	<b>Issue Category: Changed Site Conditions</b>			
	<p><b>Issue:</b> Gas vent #14 upslope from the access road east of the Jamaica Island Landfill (JILF) parking area and west of Building 357 was observed to be slightly tilted (from vertical) between 2006 and 2011. Observed leaning of this landfill gas vent was determined to be consistent with the construction of the vent (i.e. angles of PVC fittings and connections) and/or the slope of the surrounding landfill cap. This may be associated with a minor shift/settlement in surface topography contours, as noted based on a comparison of surveyed elevations between 2006 and 2011. Tilted gas vents and minor slope movement upslope of access road are indicators of potential future slope instability.</p>			
	<p><b>Recommendation:</b> It is recommended that monitoring of cap elevation (including changes) continue to evaluate settling. Tilting gas vents has been inspected annually 2012 to 2016 as part of landfill inspections.</p>			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	Yes	Navy	USEPA and MEDEP	2018

<b>OU(s): OU9</b>	<b>Issue Category: Changed Site Conditions</b>			
	<p><b>Issue:</b> Residual petroleum hydrocarbon impacts observed during shoreline excavation performed as part of OU4 remediation will be addressed as part of OU9.</p>			
	<p><b>Recommendation:</b> The potential impact of the excavation on shoreline slope and residual contamination migration to surface water will be evaluated through inspections to be conducted under OU9. Based on assessment of residual contamination at the OU9 shoreline at area MS-01, Navy, EPA, and MEDEP agreed in May 2016 to expand the LUC boundary and monitoring/inspection of the OU9 shoreline. It is recommended that Navy prepare an Explanation of Significant Difference (ESD) in Fiscal Year 2017 to document these modifications to the remedy. In addition, Navy will prepare a Long-Term Management (LTMgt) Plan for OU9 to include annual inspections for petroleum sheen and the stabilization of the</p>			

	slope.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	No	Navy	USEPA and MEDEP	2021

<b>OU(s): OU9</b>	<b>Issue Category: Changed Site Conditions</b>			
	<b>Issue:</b> Updates in vapor intrusion assessment methodology make it unclear if there is a complete exposure pathway related to vapor intrusion in the Building 62 Annex.			
	<b>Recommendation:</b> Collection of soil gas data beneath the Building 62 Annex is recommended to reaffirm protectiveness of the remedy.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	Yes	Navy	USEPA and MEDEP	2018

**Five-Year Review Summary Form (continued)**

**Protectiveness Statement(s)**

<i>Operable Unit:</i> OU1	<i>Protectiveness Determination:</i> Protective	<i>Addendum Due Date</i> <i>(if applicable):</i>
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*Protectiveness Statement:*

The remedy implemented at OU1 is protective of human health and the environment. RAOs have been met and exposure to soil that could result in unacceptable risks at OU1 is prevented through LUCs. Site inspection has confirmed LUCs are in place including the integrity of the current site features such as Building 238 and asphalt pavement, which prevent residential site use and exposure to underlying contaminated soil.

<i>Operable Unit:</i> OU2	<i>Protectiveness Determination:</i> Protective	<i>Addendum Due Date</i> <i>(if applicable):</i>
------------------------------	--	---

*Protectiveness Statement:*

The remedy implemented at OU2 is protective of human health and the environment. RAOs have been met and exposure to soil that could result in unacceptable risks at Sites 6 and 29 is prevented through LUCs. Sediment accumulation and groundwater monitoring as well as inspections confirm that the waste disposal area cover system, shoreline stabilization measures, and other site features that are relied upon to prevent exposure to underlying contamination and prevent erosion into the offshore environment are intact.

<i>Operable Unit:</i> OU3	<i>Protectiveness Determination:</i> Short-term Protective	<i>Addendum Due Date</i> <i>(if applicable):</i>
------------------------------	---	---

*Protectiveness Statement:*

The remedy implemented at OU3 is currently protective of human health and the environment. RAOs have been achieved and exposure to media that could result in unacceptable risks at Site 8 is prevented through LUCs and O&M and monitoring. Continued cap elevation evaluation as part of the O&M program to address the identified issue will maintain the effectiveness of the remedy into the future.

<i>Operable Unit:</i> OU7	<i>Protectiveness Determination:</i> Protective	<i>Addendum Due Date</i> <i>(if applicable):</i>
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*Protectiveness Statement:*

The remedy implemented at OU7 is protective of human health and the environment. RAOs have been met and exposure to soil that could result in unacceptable risks at Site 32 is prevented through LUCs. Based on the completion of Remedial Action

excavations and implementation of LUCs in accordance with the LUC RD, the RAO of the OU7 ROD is achieved. Inspections confirm that the shoreline controls to prevent erosion into the offshore environment are intact, that the site is not used for residential purposes, and that excavated subsurface soil is managed appropriately.

*Operable Unit:*  
OU9

*Protectiveness Determination:*  
Short-term Protective

*Addendum Due Date  
(if applicable):*

*Protectiveness Statement:*

The remedy implemented at OU9 is currently protective of human health and the environment. However, to be protective in the long-term, additional data collection (i.e. soil borings) beneath Building 62 Annex is recommended to reaffirm protectiveness of the remedy associated with vapor intrusion. Exposure to soil that could result in unacceptable risks at Site 34 is prevented through LUCs. The shoreline excavation and placement of RCM has prevented further release of hydrocarbons to the environment into the Piscataqua River.

Signature of U.S. Department of the Navy and Date



D.S. Hunt  
Captain, United States Navy  
Commanding Officer  
Portsmouth Naval Shipyard

14 SEP 2017

Date

## **1.0 INTRODUCTION**

Resolution Consultants was contracted by the Department of the Navy (Navy), Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic, under Comprehensive Long-term Environmental Action Navy contract number N62470-11-D-8013, contract task order WE55, to perform this five-year review at Portsmouth Naval Shipyard (PNS) in Kittery, Maine.

The objective of this five-year review is to evaluate implementation and performance of remedies at five PNS Operable Units (OUs; OU1, OU2, OU3, OU7, and OU9) to determine if they remain protective of human health and the environment in accordance with the requirements outlined in decision documents. The five-year review is also intended to identify issues, if any, and provide recommendations for specific follow-up actions to address them. The methods, findings, and conclusions of the review are documented in this five-year review report.

### **1.1 Authority for Conducting the Five-Year Review**

This five-year review was prepared pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section §121(c), as amended by the Superfund Amendments and Reauthorization Act of 1986, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) in Title 40 Code of Federal Regulations (CFR) 300.430(f)(4)(ii).

Consistent with Executive Order 12580, the Secretary of Defense is responsible for ensuring that five-year reviews are conducted at federal facility sites under jurisdiction, custody, or control of the Department of Defense (DoD). The Navy is the lead agency responsible for this five-year review at PNS, working with the United States Environmental Protection Agency (U.S. EPA) and the Maine Department of Environmental Protection (MEDEP) under a Federal Facilities Agreement (FFA) signed by Navy and U.S. EPA on 30 September 1999.

This is the third five-year review for PNS. The first five-year review report was completed in June 2007 and the second Five Year Review Report was completed in May 2012. The triggering action for this third five-year review is the signature date of the previous five-year review. This Five Year Review includes assessment of OU1, OU2, OU3, OU7, and OU9 because the selected remedies allow hazardous contaminants to remain at concentrations exceeding criteria that allow for unlimited use (UU) and unrestricted exposure (UE).



## **1.2 Report Organization**

This five-year review report is organized as follows.

- Section 1 provides an overview of PNS, including responsibilities for conducting the five-year review; background and history for PNS; and elements common to each OU including physical characteristics, land and resource use, and natural resources.
- Section 2 describes the five-year review process including administrative components, site inspections, community involvement, interviews, and team members.
- Sections 3 through 8 are the five-year reviews for OUs 1, 2, 3, 7, and 9, respectively.
- Section 9 lists the references used during this five-year review.

Each individual OU five-year review section includes chronology and background, a summary of Remedial Action progress since the last five-year review, and the findings, technical assessment, issues, recommendations, and protectiveness statements associated with this five-year review.

## **1.3 Facility Background**

PNS is a military facility with restricted access located on Seavey Island in the Piscataqua River at the mouth of Portsmouth Harbor between Kittery, ME and Portsmouth, NH (Figure 1-1).

### **1.3.1 History**

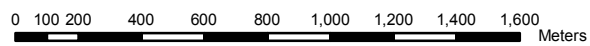
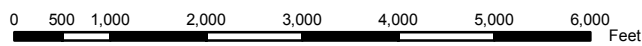
The primary mission of PNS is the conversion, overhaul, and repair of submarines for the Navy. Shipbuilding in Portsmouth Harbor dates back to 1690, and PNS was established as a government facility in 1800. The first government-built submarine was designed and constructed at PNS during World War I, and a large number of submarines have been designed, constructed, and repaired at this facility since 1917. Present military activities are concentrated in the western portion of the facility in the Controlled Industrial Area (CIA). This area includes dry docks, submarine berths, and numerous buildings that house trade shops related to maintenance activities. Access to the area is tightly controlled and limited to individuals having appropriate clearances. Uses of other portions of PNS include administration offices, officers' residences, equipment storage, parking, and recreational facilities.

Portsmouth  
Naval  
Shipyard

Map Location



**SITE LOCATION MAP**  
**PORTSMOUTH NAVAL SHIPYARD**  
**KITTERY, MAINE**



Scale: 1:24,000



**RESOLUTION  
CONSULTANTS**

Figure 1-1

Date: July 2016

Project #: 60342342

Contamination at PNS is the result of shipbuilding and submarine repair work, landfill operations at Jamaica Island between 1945 and 1978, spills and leaks from industrial operations and piping, storage of batteries and other materials, filling of land, and outfalls to the river.

Tables in the individual OU sections (Sections 3 through 8) provide a comprehensive summary of Environmental Restoration Program (ERP) and OU-specific investigations and documents since 1983. Historic operations at PNS resulted in soil, groundwater, and sediment contamination. There are currently eight on-shore sites that are undergoing various stages of environmental restoration. This Five Year Review includes assessment of OU1, OU2, OU3, OU7, and OU9 because the selected remedies allow hazardous contaminants to remain at concentrations that do not allow for UU/UE.

**OUs Included in the 2016 Five-Year Review**

- OU1 — Site 10, Former Battery Acid Tank No. 24
- OU2 — Site 6, DRMO Storage Yard  
Site 29, Former Teepee Incinerator Site
- OU3 — Site 8, Jamaica Island Landfill
- OU7 — Site 32, Topeka Pier Site
- OU9 — Site 34, Former Oil Gasification Plant, Building 62

**Construction Complete  
September 2019**

28 potential sites (referred to as Solid Waste Management Units at that time under Resource Conservation and Recovery Act (RCRA)) were examined in an initial investigation, of which 13 sites were found to require additional investigation and appropriate corrective action (Kearney & Baker/TSA, July 1986). These 13 sites were listed in the RCRA Hazardous and Solid Waste Amendment Permit. Following this, four sites were identified as No Further Action (NFA) sites, a portion of Site 6 was separated and given a separate number (Site 29), and four sites were newly identified. The 1999 FFA included 14 sites and the offshore area. Since that time, six additional sites and the Jamaica Island Landfill (JILF) Impact Area (within Site 8) have been removed from the ERP, including Site 30 through a No Further Action Decision Document in 2014 and Sites 9 and 11 through the OU3 Remedial Action Completion Report (RACR) in February 2015. The Navy organized the ERP sites into Operable Units (OUs) based on similar kinds of contamination and geographic proximity. Table 1-1 identifies the ERP sites at PNS and their current status. Site 31/OU8, is anticipated to have a Record of Decision completed in Fiscal Year 2017, and at that time all ERP sites will have a ROD in place. OU5 was removed from CERCLA in 2001 through a No Further Action Decision Document. OU6 was identified in 2000 to address management of migration from the Jamaica Island Landfill; however, OU6 was recombined with OU3 through an Explanation of Significant Difference (ESD) for the OU3 ROD signed in October 2005 to address management of migration of groundwater from the landfill as part of the OU3 remedy.

Figure 1-2 shows the Operable Units included in this five-year review.

After PNS was placed on the National Priorities List on 31 May 1994, the Navy and U.S. EPA signed the FFA to develop, implement, and monitor response actions at PNS in accordance with CERCLA. The State of Maine elected not to be a party to the FFA. However, the state is afforded a participatory role in the site remediation process by virtue of CERCLA. The PNS Project Team, comprised of representatives from the Navy, PNS, U.S. EPA, and MEDEP, review and approve work plans, reports, and decision documents.

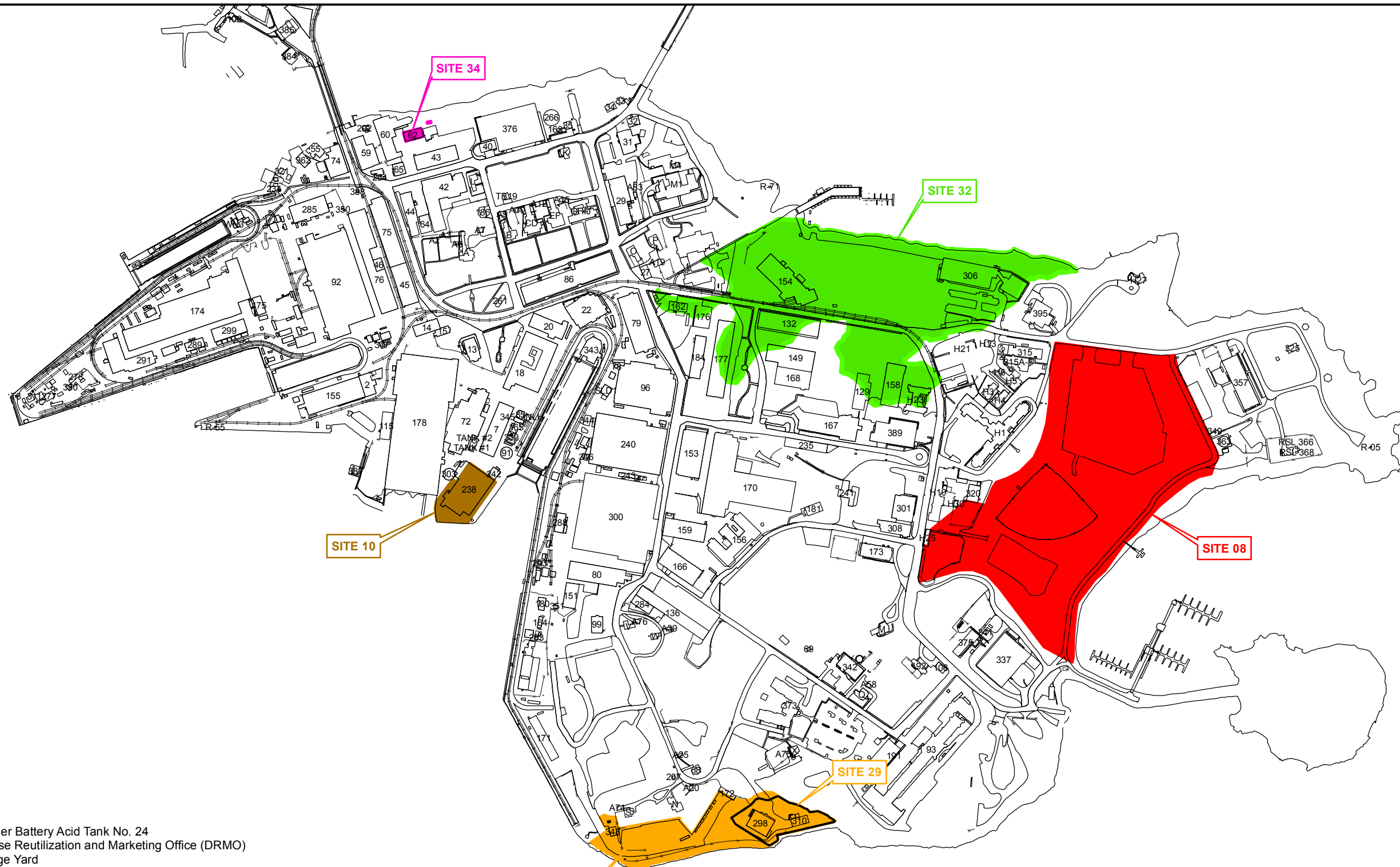
### **1.3.2 Land and Resource Use**

#### *Current PNS Land Use*

PNS is an active military base that employs approximately 5,000 civilian and approximately 200 active-duty military personnel (Seacoast Online, 2015; military.com, 2014). PNS is engaged in the conversion, overhaul, and repair of submarines for the Navy. PNS continues to service submarines as its primary military focus.

PNS is located on an island and access is controlled at two guarded gates. Within the base, access is restricted at the CIA. Military activities are concentrated in the western portion of the facility in the CIA. This area includes all of the dry docks and submarine berths and numerous buildings that house trade shops related to maintenance activities. Access to the area is tightly controlled and limited to individuals having appropriate clearances. The CIA is covered with buildings and asphalt to support military operations at PNS. Uses of other portions of PNS include administration offices, officers' residences, equipment storage, parking, and recreational facilities. Outside the CIA, areas are covered with asphalt, grass, and/or buildings, depending on the use of the area. Wetlands were constructed adjacent to Jamaica Cove, and a parking lot and recreational area were constructed on top of OU3.

A portion of PNS is on the National Register of Historic Places. The area between the two bridges connecting PNS to Kittery, Maine, was placed on the Register by the National Park Service in 1977. Based on a Cultural Resources Survey of PNS (Louis Berger Group, Inc., April 2003), the boundary of the PNS Historic District was expanded and includes the majority of the CIA. Two other PNS historic districts were also identified (Portsmouth Naval Hospital and Portsmouth Naval Prison Historic Districts).



- Operable Unit 1: Site 10 - Former Battery Acid Tank No. 24
- Operable Unit 2: Site 6 - Defense Reutilization and Marketing Office (DRMO) Storage Yard
- Operable Unit 3: Site 8 - Jamaica Island Landfill (JILF)
- Operable Unit 6: Site 29 - Former Teepee Incinerator Site
- Operable Unit 7: Site 32 - Topeka Pier Site
- Operable Unit 9: Site 34 - Former Oil Gasification Plant, Building 62

PISCATAQUA RIVER



Drawn: JB 06/02/2017  
 Approved: PD 06/02/2017  
 Project #: 60342342

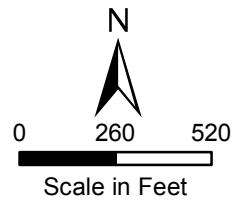


FIGURE 1-2  
 THIRD FIVE YEAR REVIEW - OPERABLE UNITS

PORTSMOUTH NAVAL SHIPYARD  
 KITTERY, MAINE

**Table 1-1  
 Status of Portsmouth Naval Shipyard Environmental Restoration Program Sites**

Operable Unit (OU)	Site Number	Site Name	Current Status	Included in this Five-Year Review? (Y/N)
<b>Active Operable Units</b>				
OU1	10	Former Battery Acid Tank No. 24	Long-Term Management	Y
OU2	6	Defense Reutilization and Marketing Office (DRMO) Storage Yard	Long-Term Management	Y
	29	Former Teepee Incinerator Site		Y
OU3	8	Jamaica Island Landfill (JILF)	Long-Term Management	Y
OU4	5	Former Industrial Waste Outfalls	UU/UE	Y
	Offshore Areas of Concern	Offshore Areas Potentially Impacted by PNS Onshore IRP Sites		Y
OU7	32	Topeka Pier Site	Long-Term Management	Y
OU8	31	Former West Timber Basin	Proposed Plan/ROD	N
OU9	34	Former Oil Gasification Plant, Building 62	Long-Term Management	Y
<b>Inactive Operable Units/Sites</b>				
OU1	21	Acid/Alkaline Drain Tank No. 28	No Further Action	N
OU2	DRMO Impact Area	DRMO Impact Area (Quarters S, N, & 68)	No Further Action	N
OU3	9	Former Mercury Burial Sites (MBI and MBII)	No Further Action	N
	11	Former Waste Oil Tanks Nos. 6 & 7	No Further Action	N
	JILF Impact Area	JILF Impact Area (Former Child Development Center)	No Further Action	N
OU4	26	Portable Oil Water Dumpsters	No Further Action	N
OU5	27	Berth 6 Industrial Area/Fuel Oil Spill Area	No Further Action	N
	1	Hazardous Waste Storage Facility	No Further Action	N
	2	Freon Recovery Operation	No Further Action	N
	3	Industrial Waste Treatment Plant	No Further Action	N
	4	Interim Storage Facilities	No Further Action	N
	7	Interim Storage Areas	No Further Action	N
	12	Boiler Blowdown Tank, Building 72 (Tank No. 25)	No Further Action	N
	13	Rinse Water Tank, Building 76 (Tank No. 27)	No Further Action	N
	14	Waste Oil Tank No. 31	No Further Action	N
	15	Oil/Water Separator No. 32	No Further Action	N
	16	Rinse Water Tank, Building 174 (Tank No. 34)	No Further Action	N
	17	Floor Drain Tank No. 26	No Further Action	N
	18	Waste Lube Tank No. 35	No Further Action	N
	19	Waste Oil Tank No. 37	No Further Action	N
	20	Oil/Water Separator No. 38	No Further Action	N
22	Chemical Cleaning Facility Tank, Building 155	No Further Action	N	

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<b>Operable Unit (OU)</b>	<b>Site Number</b>	<b>Site Name</b>	<b>Current Status</b>	<b>Included in this Five-Year Review? (Y/N)</b>
	23	Chemical Cleaning Facility Tank, Building 174	No Further Action	N
	24	Asbestos Collection Dumpster	No Further Action	N
	25	Burnable Dumpsters	No Further Action	N
	28	Silver Recovery System	No Further Action	N
	30	Former Galvanizing Plant, Building 184	No Further Action	N

Land use and land cover classifications at the facility include residential; commercial and services; industrial; transportation, communications, and utilities; industrial complexes (warehouses and associated storage areas); and wetlands.

#### *Surrounding Land Use*

PNS is located on an island in the Piscataqua River, as shown on Figure 1-1. PNS is referred to on National Oceanic and Atmospheric Administration (NOAA) nautical charts as Seavey Island, with the eastern tip given the name Jamaica Island. Clark's Island is to the east and attached by a rock causeway to Seavey Island. The Piscataqua River is a brackish tidal estuary that forms the southern boundary between Maine and New Hampshire. PNS is located in Kittery, Maine, north of Portsmouth, New Hampshire, at the mouth of the Great Bay Estuary (commonly referred to as Portsmouth Harbor). Land use on the other side of the river primarily includes residential, recreational, and commercial uses.

#### *Natural Resources*

Limited natural resources exist at PNS, which is a small island primarily covered with asphalt and buildings. The surrounding Piscataqua River is an aquatic habitat used for fishing, boating and other recreational uses.

Water for operations and drinking at the Shipyard are supplied by the Kittery Water District. Kittery's water supply originates from surface reservoirs located in the vicinity of York, Maine. Groundwater at PNS is not used for drinking, irrigation, industrial processes, firefighting, or any other purposes.



## **2.0 FIVE-YEAR REVIEW PROCESS**

The five-year review was conducted using the following U.S. EPA and Navy guidance:

- Chief of Naval Operations Letter 5090 N453 Ser/11U158119 (7 June 2011)
- U.S. EPA Office of Solid Waste and Emergency Response (OSWER) Directive 9355.7-03B-P Comprehensive Five-Year Review Guidance (U.S. EPA, June 2001)
- OSWER Directive 9355.7-18 Recommended Evaluation of Institutional Controls: Supplement to the Comprehensive Five-Year Review Guidance (U.S. EPA, September 2011)
- OSWER Directive 9200.2-111 Clarifying the Use of Protectiveness Determinations for CERCLA Five-Year Reviews (U.S. EPA, September 2012)
- NAVFAC Toolkit for Preparing Five-Year Reviews (NAVFAC, April 2013)

### **2.1 Document Review**

This five-year review consisted of reviews of site-specific documentation, including Records of Decision (RODs) and Remedial Investigation (RI)/Feasibility Study (FS) reports to identify potential risks to human health and the environment. Those documents identified the following information useful to the five-year review process: human health and ecological risk assessments, remedial action objectives (RAOs), interim and final selected remedies, and ARARs.

To confirm remedies are operational and are functioning to meet RAOs, long-term monitoring (LTM) reports, operations and maintenance (O&M) documents, inspection reports, Land Use Control Remedial Design (LUCRD) documents, Site Assessment Screening Evaluations (SASEs), Remedial Action Completion Reports (RACRs), and Remedial Design (RD) documents were identified and examined. These and other documents issued during this five-year review period were reviewed to assess remedy performance and continued protection of human health and the environment. Prior five-year reviews were also reviewed to ensure past issues associated with protectiveness have been addressed in accordance with recommendations. Section 10 lists the documents reviewed during the preparation of this report.

### **2.2 Site Inspection**

Inspections supporting the five-year review process to ensure protectiveness of selected remedies have been performed by Resolution Consultants on behalf of the Navy. Inspections supporting the five-year review were combined with regularly scheduled LUC and Long Term Management (LTMgt)

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inspections that are performed to ensure protectiveness of the remedy and existing LUCs. OU-specific inspections were performed on the following dates:

- OU1 – June 14, 2016 (Paul Dombrowski, Resolution Consultants)
- OU2 – October 27, 2015 (Paul Dombrowski, Resolution Consultants) and December 7, 2016 (Helen Jones, Resolution Consultants)
- OU3 – July 31, 2016 (Paul Dombrowski, Resolution Consultants)
- OU7 – June 14, 2016 (Paul Dombrowski, Resolution Consultants)
- OU9 – June 14, 2016 (Paul Dombrowski, Resolution Consultants)

Inspection findings have been incorporated into each site section discussion, as appropriate. Inspection forms for OUs 1, 2, 3, 7, and 9 are in Appendix A. Information from annual LTMgt reports was used to facilitate the completion of the five-year review inspection forms.

### **2.3 Interviews**

Formal interviews were not conducted for this five-year review. However, input from the following personnel was used to complete the inspection forms in Appendix A:

- Linda Cole, Navy Remedial Project Manager
- Lisa Joy, Navy PWD-Maine Environmental Division
- Frederick Thyng, Navy PWD-Maine Environmental Division

Findings associated with personnel input have also been incorporated into applicable sections of this five-year review.

### **2.4 Community Involvement**

Notice of the five-year review process was provided to the Restoration Advisory Board (RAB) during the June 14, 2016 meeting. At the conclusion of the five-year review, a status update fact sheet will be distributed to the RAB members, will be posted on the Navy public website for PNS, and will be distributed to community organizations in accordance with the Community Involvement Plan. Public notice of the availability of the final Third Five-Year Review Report will be provided in the Portsmouth Herald and Fosters Daily Democrat when the document has been finalized.

The estimated completion date for the final five-year review report is 31 May 2017. The five-year review report will be placed in the Naval Installation Restoration Information Solution

(NIRIS) database and in the Information Repositories and Administrative Record File for PNS. Documentation can be found at the following Information Repository locations:

Rice Public Library	Portsmouth Public Library
8 Wentworth Street	175 Parrott Street
Kittery, ME 03904	Portsmouth, NH 03801
(207) 439-1633	(603) 427-1540

In addition, the Administrative Record can be accessed on-line through the following Navy website: <http://go.usa.gov/DyRH>.

## 2.5 Costs

LTMgt is performed at any OU where LUCs are put in place as part of the selected remedy. OUs 1, 2, 3, 7, and 9 are in the LTMgt phase which consists of inspections of site use, surface condition, and shoreline areas as necessary based on the site. Groundwater sampling has also been incorporated into LTMgt for select OUs. The objectives of the LTMgt program are to determine if the remedial strategy is effective to meet the RAOs, inspect and maintain LUCs, and optimize the remedial strategy, if applicable.

A description of activities and annual costs for LTMgt efforts for each OU are presented in **Table 2-1**.

**Table 2-1  
 Overview of Environmental Restoration Program Long Term Management Activities**

Operable Unit	Annual O&M Activities	Annual O&M Costs
OU 1 (Site 10)	<ul style="list-style-type: none"> <li>LUC Inspection with LUC Checklist</li> </ul>	\$2,000 (annual)
OU2 (Sites 6 & 29)	<ul style="list-style-type: none"> <li>LUC Inspection with LUC Checklist</li> <li>Shoreline Inspection with Sediment Accumulation Monitoring</li> <li>Baseline Post-Remediation Groundwater Sampling</li> </ul>	\$8,000 (annual) \$100,000 <sup>1</sup>
OU3 (Site 8)	<ul style="list-style-type: none"> <li>LUC Inspection with LUC Checklist</li> <li>Landfill Inspection with Inspection Checklist</li> <li>Annual Round Inspection Report</li> <li>Groundwater Sampling<sup>2</sup> (every 5 years)</li> <li>Survey of Settlement Disks (every 5 years)</li> </ul>	\$10,000 (annual) \$120,000 <sup>3</sup> (every 5 years)
OU7 (Site 32)	<ul style="list-style-type: none"> <li>LUC Inspection with LUC Checklist</li> <li>Shoreline Inspection with Checklist</li> <li>Long-Term Management Report</li> </ul>	\$8,000 (annual)
OU9 (Site 34)	<ul style="list-style-type: none"> <li>LUC Inspection with LUC Checklist</li> </ul>	\$2,000 (annual)

**Notes:**

- OU2 baseline post-remediation groundwater sampling includes preparation of SAP, installation of new monitoring wells, four rounds of groundwater sampling labor, laboratory analysis, data validation, and reporting.
- OU3 groundwater sampling includes preparation of SAP, sampling labor, laboratory analysis and data validation.
- Every five year cost for OU3 includes groundwater sampling (see Note 2), surveyor, and reporting.

## **2.6 Applicable or Relevant and Appropriate Requirements, To-Be-Considered Criteria, and Site-Specific Action Levels**

The ARARs and To-Be-Considered (TBC) criteria identified in each ROD, a summary of which is in Appendix B, were reviewed to determine if there have been any changes that affect the protectiveness of the remedy at each OU. Guidance documents that may be relevant to changes since remedy decisions are discussed throughout each section.

Chemical-specific ARARs are discussed for each OU relative to Technical Assessment Question B (i.e. are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?) Most of the applicable changes in chemical-specific ARARs since the last five-year review or ROD issuance have included changes to existing standards or addition of new constituents, based on changes to toxicological factors.

## **2.7 Next Five-Year Review**

The next five-year review, which will be conducted pursuant to CERCLA, using U.S. EPA and Navy five-year review guidance, is due within five years of the signature date of this five-year review report. The Navy will be responsible for completing the next five-year review, planning and development of which should begin 12 months prior to the due date to ensure statutory deadlines are met.

### **3.0 OPERABLE UNIT 1, SITE 10**

OU1 consists of Site 10 (Former Battery Acid Tank No. 24) and occupies a small peninsula located in the CIA near the southern shore of PNS. The OU1 ROD was signed in 2010. OU1 is included in this five-year review because a remedy was selected that resulted in contaminants remaining on site above levels that allow for UU/UE. The location of OU1 at PNS is shown on Figure 1-2 and the layout of OU1 is shown on Figure 3-1.

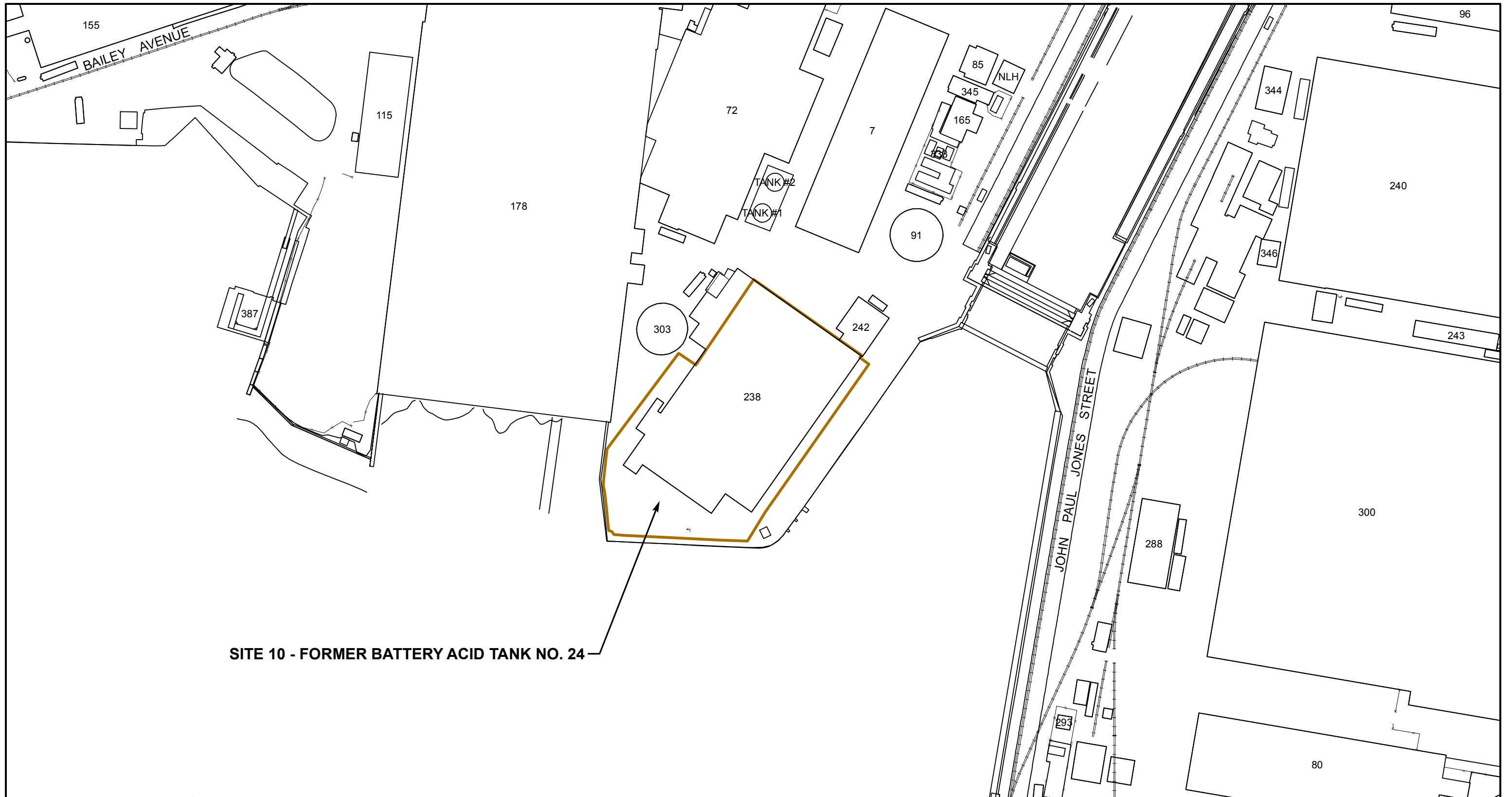
#### **3.1 Site History and Background**

Table 3-1 summarizes the chronology of site events at Site 10. Figure 3-1 shows the boundary of Site 10.

Large lead-acid storage batteries were drained inside Building 238 as part of lead-acid recharging operations, and until 1974, the acidic discharges drained directly to the offshore through an industrial waste outfall (Site 5) (Tetra Tech, June 2006a; Weston, June 1983). In 1974, the acidic discharges were directed into a lead-acid drain pipeline, which exited the building and entered the crawl space, and then dropped vertically into the earthen floor of the crawl space. The acidic discharge then flowed through the drain line to a steel underground storage tank (Battery Acid Tank No. 24) with a 9,680-gallon capacity. Use of the piping and tank was discontinued when a leak was discovered in the tank in 1984. During tank closure in 1986, the tank and surrounding contaminated soil were removed (Tetra Tech, June 2006a). Testing of the soil during tank excavation indicated no exceedances of hazardous waste criteria for metals. MEDEP did not require additional cleanup action at the time of the tank removal (Tetra Tech, March 2000).

#### **3.2 Conceptual Site Model**

The primary chemicals associated with CERCLA releases to soil and groundwater at OU1 are lead and antimony. Lead was released from lead-acid battery operations conducted in Building 238. The releases occurred under the crawl space of the building (by a former acid drain line) and from a former battery acid tank located outside the building. The highest lead contamination was detected around areas where piping and tank leaks occurred. Lead concentrations decreased rapidly moving away from these areas. Antimony contamination was found collocated with the greatest levels of lead contamination. Site conditions during Remedial Investigation support that there is limited mobilization of lead from soil to groundwater (in either particulate or dissolved form) and that site groundwater migrating to the offshore would not adversely impact the offshore.



SITE 10 - FORMER BATTERY ACID TANK NO. 24




**RESOLUTION  
CONSULTANTS**

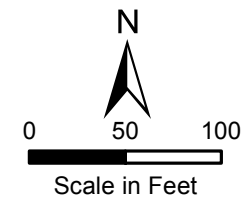
Drawn: HJ 02/24/2017

Approved: PD 02/24/2017

Project #: 60342342

Legend

 OU1 Boundary



**FIGURE 3-1  
OPERABLE UNIT 1, SITE 10  
LAND USE CONTROL BOUNDARY**

**PORTSMOUTH NAVAL SHIPYARD  
KITTERY, MAINE**

**Table 3-1  
 Operable Unit 1 (Site 10) – Site Chronology**

<b>Date</b>	<b>Event</b>	<b>Description</b>	<b>AR Number</b>
1986	Tank Closure	A leak was discovered in 1984 in an underground storage tank located outside of Building 238. The tank and surrounding soil were removed in 1986, and a 2-inch hole was discovered in the tank bottom. The drain lines to the tank are believed not to have been exhumed. Activities were performed under MEDEP supervision.	Not Listed
1991	Resource Conservation and Recovery Act Facility Investigation (RFI)	Four soil samples were collected from three soil boring locations around the former tank as part of the RFI.	Not Listed
1998	Field Investigation	Two soil borings (one upgradient and one near the former tank) were installed and later converted to groundwater monitoring wells as part of the Site 10 Field Investigation. Two subsurface soil samples were collected from the on-site borings. In addition, five surface soil samples were collected from the earthen floor of the Building 238 crawl space, beneath the overhead drain lines and from a depression in the earthen floor associated with the buried portion of the drain lines. One round of groundwater samples was collected from the two monitoring wells.	Not Listed
2001	Additional Investigation	Based on RFI and 1998 Field Investigation data, further investigation was required to determine the nature and extent of residual inorganic (metals) contamination in soil and groundwater and to evaluate associated site risks. Organic contamination associated with the site was not found. The investigation also included evaluation of whether contaminants in groundwater could migrate to the offshore to create current or future unacceptable impacts. Soil and groundwater samples were collected and analyzed for metals. Four surface and subsurface soil samples were collected in the area of the acid drain pipeline and at 12 randomly selected locations elsewhere at the site. Two groundwater samples were collected from each of three newly installed monitoring wells and two existing monitoring wells. The Additional Investigation showed that lead was the primary contaminant associated with site releases and that the extent of high-level lead contamination [greater than 10,000 milligram per kilogram (mg/kg)] was not sufficiently delineated.	Not Listed
2006	Data Gap Investigation	The investigation was conducted to collect lead data to determine the nature and extent of high-level lead contamination from past battery operations and to collect additional information to evaluate the potential for lead migration from onshore soil to the offshore area. Soil samples were collected at 35 locations on a grid-based plan and at an additional 22 locations under the building. Thirteen soil borings were installed and sampled outside of the building. Three downgradient monitoring wells were installed, and 17 soil samples were collected from the borings during installation. Groundwater monitoring wells were sampled over three rounds.	Not Listed
2007	Remedial Investigation (RI) Report	The document was prepared to assess the nature and extent of contamination and risks associated with contamination at OU1 and concluded that the nature and extent of contamination in soil and groundwater were adequately defined. The risk assessment showed that, under current site conditions, risks for construction worker exposure to lead in soil under Building 238 were unacceptable based on USEPA risk goals. Risks under future potential site conditions (if Building 238 was removed or modified or if the site was developed for non-industrial uses) were unacceptable for exposure to lead in soil under Building 238 for occupational workers, recreational users, and residential users, for exposure to antimony in soil under Building 238 for residential users, and for exposure to lead in soil outside Building 238 for residential users. Risks were acceptable for construction worker, occupational worker, and recreational user exposure to lead in soil outside Building 238 and to antimony in soil in the crawl space and outside of Building 238. Because the site is and has historically been in an industrial area of PNS, residential land use and recreational exposure are not considered likely future exposure pathways at OU1. Based on the evaluations of human health risk and migration potential, groundwater was determined not to be a medium of concern.	N00102.AR. 001606

Date	Event	Description	AR Number
2010	Feasibility Study (FS) Report	Based on the nature and extent of soil contamination determined during the RI, an FS was conducted to develop and evaluate soil remedial alternatives.	N00102.AR.001754
2010	Proposed Plan	Presented the Navy's Preferred Alternative to address contamination. A 30-day public comment period was held from June 17 to July 16, 2010. No modification to the proposed remedy was necessary based on comments received during the public comment period.	N00102.AR.001759
2010	ROD	The ROD was signed in September 2010, and the selected remedy was limited soil excavation and disposal with LUCs and monitoring.	N00102.AR.002495
2011	Remedial Action	The Remedial Action Work Plan was completed in October 2011 (Revision 1) and the Remedial Action construction was conducted between October 2011 and March 2012.	N00102.AR.002627
2012, 2014	OU1 Land Use Control Remedial Design (LUCRD)	LUCs and inspection requirements for Site 10 (required as part of Remedial Action at OU1).	N00102.AR.002643, 003045
2014	Remedial Action Completion Report (RACR)	Documents selected remedy was implemented and is in place, RAOs have been met, implementation of LUCs will ensure RAOs will continue to be met, and that status is "Response Complete" at OU1.	N00102.AR.003090



### **3.3 Basis for Taking Action**

As provided in Table 3-1, lead-contaminated soil at the site and antimony-contaminated soil within the crawl space resulted in potential unacceptable risks at OU1 for current and potential future human receptors. Specifically, current construction worker exposures for lead in soil under Building 238; future occupational worker, recreational user, and residential user exposure to lead in soil under Building 238; and, residential user exposure to antimony in soil under Building 238 and lead in soil outside Building 238. Risks were concluded to be acceptable for construction worker, occupational worker, and recreational user exposure to lead in soil outside Building 238 and to antimony in soil in the crawl space and outside of Building 238. Based on the evaluations of human health risk and migration potential, groundwater was determined not to be a medium of concern. Ecological risks were not calculated because the site is currently and has historically been located within an industrial area of PNS, and no ecological habitat has been identified at the site. Potential offshore impacts from past releases of contamination from OU1 to the offshore were addressed under OU4 (offshore area) through MS-12.

### **3.4 Remedial Actions**

The ROD for OU1 was signed in September 2010. The RAOs, remedial components, remedy implementation, and progress since the previous five-year review are described below.

#### **3.4.1 Remedial Action Objectives**

The RAOs for Site 10 are to prevent human exposure to surface and subsurface soil within the crawl space of Building 238 and outside of Building 238 due to identified human health risks. Specific RAOs include

- Prevent construction worker and future potential recreational user and occupational worker exposure to unacceptable levels of lead-contaminated soil under Building 238.
- Prevent future potential residential user exposure due to unacceptable levels of lead contaminated soil under and outside of Building 238.
- Prevent future potential residential user exposure through ingestion, dust inhalation, and dermal contact due to unacceptable levels of antimony contaminated soil under Building 238.

To achieve these RAOs, the following cleanup goals were established in the ROD.

Media	Contaminant	Value	Receptor	Basis
Soil within the crawl space under Building 238	Lead	2,000 mg/kg	Construction Worker	Human Health Risk Based
		1,600 mg/kg	Future Occupational Worker	Human Health Risk Based
		4,600 mg/kg	Future Adult Recreational User	Human Health Risk Based
	400 mg/kg	Future Resident	USEPA OSWER soil screening level for residential land use (USEPA, July 1994)	
	Antimony	73 mg/kg	Future Resident	Human Health Risk Based
Soil outside Building 238	Lead	400 mg/kg	Future Resident	USEPA OSWER soil screening level for residential land use (USEPA, July 1994)

### 3.4.2 Remedy Selection

The selected remedy described in the ROD includes the following components to meet the RAOs:

- Excavation of contaminated soil with lead concentrations greater than acceptable levels for construction workers and hypothetical future recreational users and occupational workers, around the drain lines within the crawl space of Building 238.
- Off-site disposal of excavated soil at an appropriate treatment, storage, and disposal facility.
- Restoration of excavated areas to pre-existing elevations with clean soil.
- Implementation of land use controls (LUCs) through a LUCRD to ensure maintenance of current site features to prevent future residential site use.
- Groundwater monitoring to confirm the lack of groundwater impacts from the soil removal.
- Five-year site reviews to confirm that the remedy remains protective of human health and the environment.

### 3.4.3 Remedy Implementation

Soil in two excavation areas in the crawl space under Building 238 was removed using hand tools. Excavation was performed until the sidewall confirmation samples had lead concentrations less than 2,000 mg/kg and antimony concentrations less than 73 mg/kg, and excavation extended vertically to 3 feet below ground surface (bgs) where floor confirmation samples were collected. Lead concentrations in some of the floor confirmation samples exceeded 2,000 mg/kg; however, the Navy, USEPA, and MEDEP determined that due to the depth of the floor samples within the saturated zone and the rocky conditions of the soil, no further vertical excavation was required. Excavated soil from beneath Building 238 was placed on conveyors and transported to a loader outside. Approximately 394 tons of soil were transported to the Stablex Canada, Inc. disposal

facility in Quebec, Canada. A nonwoven geotextile fabric was placed on the floor and along the sidewalls of the excavated areas, and the areas were backfilled. Confirmation soil sampling results showed that antimony-contaminated soil in the excavation areas had been removed to meet the residential cleanup level (73 mg/kg). Post-remediation residual lead concentrations in soil in the crawl space were determined to be less than the cleanup goals for construction workers, occupational workers, and recreational users. Upon completion of the remedial action, plywood that had been removed to allow access into the crawl space was replaced with plywood. The crawl space is vented by vents installed along the outside of Building 238.

The Remedial Action construction was completed during this five-year review period. The Remedial Action was completed between October 2011 and March 2012. The Construction Completion Report for OU1 (CB&I, 2013) documents the excavation and off-yard disposal of contaminated soil.

Because waste remains in place at the site, a LUCRD for OU1 was completed in 2012 (Navy, January 2012). The LUCRD provides the required implementation activities to comply with the LUC portion of the remedy, including to prohibit residential reuse of the site unless additional action is undertaken to prevent residential exposure to lead-contaminated soil, to maintain current site features including Building 238 and asphalt pavement to prevent exposure to underlying contaminated soil, and to institute requirements for proper management of excavated soil as part of any future construction and maintenance activities at OU1. Annual post-remediation LUC inspections have been conducted since 2013.

Two rounds of post-remediation groundwater monitoring were conducted in February and November 2012 to confirm that soil remediation activities had no adverse impact on groundwater. Seven site monitoring wells downgradient of the excavation area were included in groundwater monitoring for OU1. Based on the low levels of lead in groundwater samples collected during the February 2012 round, and per the groundwater monitoring plan, the second round of sampling was conducted approximately 9 months later. The results for Rounds 1 and 2 showed that lead concentrations remained less than risk levels and did not indicate adverse impact to groundwater from soil remediation activities. The Post-Remediation Groundwater Monitoring Report concluded that no further groundwater monitoring is required for OU1 (Tetra Tech, July 2013). The LUCRD was revised in 2014 as a result of the groundwater sampling (September 2014a). The final RACR for OU1 was signed by the Navy in December 2014 and monitoring wells were abandoned in 2016.

#### **3.4.4 Five-Year Review Process**

The following documents were reviewed as part of the Five Year Review process for OU1.

- Remedial Investigation Report (Tetra Tech, July 2007)

- ROD (Navy, September 2010)
- LUCRD, including Revision 1 (Navy, January 2012 and September 2014a)
- Post-Remediation Groundwater Monitoring Report for Operable Unit 1 (Tetra Tech, July 2013)
- LUC Inspection Checklists (2013, 2014, 2015, 2016)
- RACR (Navy, December 2014)

Annual LUC inspections have been conducted since 2013. Consistent with the LUCRD, annual LUC inspections have looked for changes in land use and that current site features including the Building 238 and asphalt pavement remain in place to prevent exposure to underlying contaminated soil. The annual inspections have not identified any major deficiencies that jeopardized the protectiveness of the OU1 remedy. The June 2015 inspection noted removed asphalt and exposed soil in the area near LUC boundary during as a result of construction activities associated with adjacent Building 178; the area was subsequently paved to restore surface cover.

### **3.4.5 Progress Since the Last Five-Year Review**

Though the remedy had not yet been implemented, the 2012 five-year review stated that the results of investigations did not indicate any imminent threats to human health or the environment under current land use scenarios as the site conditions and Shipyard policies at the time provided for protection of human health and the environment until the remedy was implemented. During this five year reporting period, remedial construction was completed between October 2011 and March 2012 and the RACR was signed in December 2014. OU1 monitoring wells were abandoned in 2016. No additional actions were recommended in the 2012 five-year review that needed to be addressed during this five year reporting period.

## **3.5 Technical Assessment**

### **3.5.1 Question A: Is the Remedy Functioning as Intended by Decision Documents?**

#### *Remedy Summary*

The selected remedy for OU1 included excavation and off-yard disposal of contaminated soil. LUCs have been implemented to prohibit residential use of the site and maintain current site features including the Building 238 and asphalt pavement and for appropriate management of excavated soil to prevent exposure to underlying contaminated soil. Remedial Action construction has been completed, and after excavation residual lead concentrations in soil in the crawl space were determined to be less than the cleanup goals for construction workers, occupational workers, and

recreational users. In accordance with the LUCRD for OU1, annual visual inspections are conducted to verify that the required controls have been implemented and are being properly maintained.

*Technical Evaluation*

Based on review of historical and recent documents and the site visit on 14 June 2016, the OU1 remedy is functioning as intended by the ROD as summarized in the technical evaluation for Question A in Table 3-2.

**Table 3-2  
 Operable Unit 1 (Site 10)**

Question	Summary
Remedial Action Performance	Remedial Action (excavation with off-yard disposal) was completed in 2011. LUCs are in place and operating in accordance with the LUCRD for OU1. Remedial Action has been implemented and been successful in preventing unacceptable levels of exposure to site-related contaminants.
Systems Operation/ Operation and Maintenance	Asphalt pavement and Building 238 remain in place to prevent exposure to underlying contaminated soil.
Opportunities for Optimization	Not applicable
Implementation of LUCs and Institutional/ Engineering Controls	LUCs are in place and operating in accordance with the LUCRD for OU1. LUCRD Revision 1 was finalized in September 2014; the revision removed groundwater monitoring based on Post-Remediation groundwater sampling results.
Early Indicators of Potential Remedy Problems	During the 2015 annual LUC inspection, equipment laydown was observed without weight dissipation. Continued storage without weight dissipation could adversely impact the asphalt. Equipment laydown without weight dissipation was not observed on subsequent LUC inspection and site visits.

**3.5.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives used at the time of the remedy selection still valid?**

*Risk Summary*

The 2010 ROD assumed that land at OU1 would continue to be used for industrial purposes. There have been no changes in land use since the ROD or Remedial Action was completed. The Remedial Action removed most contaminated materials concentrations that exceeded levels protective of construction, occupation, and recreational exposures. The post-excavation average lead concentration above the saturated zone under Building 238 is less than construction worker, occupational worker, and recreational user cleanup levels. Concentrations of the contaminants for residential exposure to soil remain greater than current residential cleanup levels. Therefore LUCs preventing residential exposures as part of the OU1 remedy are still required. There have been no

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changes at the site that would have resulted in new exposure pathways to human or ecological receptors. Default exposure assumptions for adult body weight and skin surface area have been updated since the 2010 ROD (US EPA, 2011; US EPA, 2014). Default adult body weight has increased from 70 kilograms (kg) to 80 kg. Risks calculated with updated adult body weight would be similar or lower than those previously calculated. Default skin surface area for exposure to soil has decreased for occupational workers [5,800 to 3,527 square centimeters (cm<sup>2</sup>)], and child recreational users (2,800 to 2,373 cm<sup>2</sup>). Risks calculated with updated skin surface area for these receptors would be similar or lower than those previously calculated. Default skin surface area has increased for construction workers (3,300 to 3,527 cm<sup>2</sup>) and adult residents and recreational users (5,700 to 6,032 cm<sup>2</sup>). Risks calculated with updated skin surface area for these receptors would be similar or higher than those previously calculated. Based on lead being the primary COC for the site (see below), these exposure parameter changes would not impact protectiveness to adult workers and recreational users, as lead modeling utilizes different exposure assessment methods. With respect to antimony exposures, potential residential exposures are based on child exposure parameters, which would result in lower risk, as discussed above relative to skin surface area.

Lead was determined to be the only initial COC for the site; risks were not unacceptable for other COPCs (antimony, barium, mercury, and thallium), based on the initial exposure pathways/areas evaluated. The selected cleanup value for lead was protective of construction workers, hypothetical future recreational users, and occupational workers. The cleanup value of 1,600 mg/kg was calculated using the Adult Lead Model based on occupational worker exposures (US EPA, 2016). Modeling assumed a geometric standard deviation PbB of 2.0 and a baseline PbB of 2.0. Updated assumptions include a geometric standard deviation PbB of 1.74 and a baseline PbB of 0.73 (US EPA, 2016). Assuming the existing exposure frequency of 150 days per year (occupational worker) the updated cleanup value for lead is 3,789 mg/kg (see Appendix C). Assuming updated parameters, a cleanup value of 10,931 mg/kg is calculated for adult recreational users. With the cleanup level of 1,600 mg/kg being well below both of these updated values, the remedy is still protective related to potential exposures to lead in soils. It should be noted that EPA is considering lowering the recommended allowable blood lead level used during modeling, along with changes to other exposure parameters. Application of these changes will need to be performed when these values are finalized to determine if there would be any change in protectiveness.

Additional evaluation was performed related to residential child exposures to higher localized antimony concentrations within the crawl space under building 238 and unacceptable risks were concluded. Thus, cleanup levels were established to protect this receptor from potential future exposures. A cleanup level for antimony was calculated as 73 milligrams per kilogram (mg/kg) which assumes a soil exposure frequency of 150 days per year. This value was a US EPA Region 1

recommendation, accounting for those days of the year when snow and ice limit contact (US EPA, 1994) and is no longer considered applicable. Using the current US EPA default exposure frequency of 350 days per year (US EPA, 2016), a cleanup level of 31 mg/kg would be calculated for antimony. One post-excavation confirmation soil sample (139281-CONF-FLR-001 ) containing antimony at a concentration (43.6 mg/kg) greater than the lower cleanup level remains in place. However, this sample was taken from the floor of the excavation at 3 ft bgs which is the maximum excavation depth needed to mitigate risk according to the OU1 ROD. In addition, a LUC is in place which protects against future potential residential exposures to antimony in soil under Building 238. Therefore, the remedy is still considered protective. There have not been changes to toxicity data since the 2010 ROD or Remedial Action that would affect the current risk-based cleanup levels.

#### *Technical Evaluation*

The technical evaluation for Question B is in Table 3-3.

#### *Conclusions*

The RAOs outlined in the ROD for OU1 have been achieved and OU1 is Response Complete. Direct contact with contaminated soil has been eliminated through the excavation of soil and maintenance of current site features including Building 238 and asphalt pavement. The ROD-specified remedy mitigates exposure to contaminants in surface and subsurface soil by human receptors at Site 10 by implementing the LUCs as outlined in the OU1 LUCRD. LUCs are operating as designed and include measures that mitigate or reduce exposure and corresponding risks. The remedy implemented at Site 10 is protective of human health and the environment. While OU1 is response complete as RAOs have been achieved, it will not achieve site closure because contamination remains above levels acceptable for UU/UE.

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

No other information has come to light that could call into question the protectiveness of the remedy.

### **3.6 Issues, Recommendations, and Follow-Up Actions**

This five-year review did not identify issues for which follow-up actions are recommended.

### **3.7 Protectiveness Statement**

The remedy implemented at OU1 is protective of human health and the environment. RAOs have been met and exposure to soil that could result in unacceptable risks at OU1 is prevented through LUCs. Site inspection has confirmed LUCs are in place including the integrity of the current site features such as Building 238 and asphalt pavement, which prevent residential site use and exposure to underlying contaminated soil.



**Table 3-3**  
**Operable Unit 1 (Site 10)**

Question	Summary
Changes in Applicable or Relevant and Appropriate Requirements (ARARs) or To-Be-Considered (TBC) Criteria	The ARARs and TBC criteria listed in the ROD for OU1 are shown in Appendix B. As the soil excavation work has been completed, the location-specific and action-specific ARARs and TBCs have been met. The ROD included chemical-specific TBCs that were used in assessing human health risk and developing risk-based soil remedial goals for antimony and lead.
Expected Progress towards Meeting Remedial Action Objectives (RAOs)	RAOs are being met. Remedial Action excavation reduced unacceptable risks for construction, occupational, and recreational users. LUCs are in place to prevent future residential usage and require management of any excavated soil.
Changes in Exposure Pathways	No changes in exposure pathways were identified during this five-year review.
Changes in Land Use	No changes in land use have been identified during annual LUC inspections, from input from Navy, or during site visits.
New/Emerging Contaminants and Contaminant Sources	No new or emerging contaminants or contaminant sources have been identified at OU1. An evaluation of use of Poly- and Perfluoroalkyl Substances (PFASs) base-wide was conducted for PNS, and no potential uses or sources were identified at OU1 (Resolution, 2015).
Changes in Toxicity, Risk Assessment Methods, and Cleanup Levels	While there has been a change to residential exposure duration which would result in a lower residential cleanup level for antimony if developed currently, the established LUC limits residential exposures, thereby maintaining protectiveness. There have been no changes in toxicity, risk assessment methods, and exposure models which would have an effect on remedy protectiveness, which focuses on prevention of exposure to contaminated soil beneath Building 238. As long as the cover materials are maintained and LUCs are enforced to eliminate the direct and indirect contact pathways, the remedies remain protective.

## **4.0 OPERABLE UNIT 2, SITES 6 AND 29**

OU2 consists of Site 6 [Defense Reutilization and Marketing Office (DRMO) Storage Yard] and Site 29 (Former Teepee Incinerator Site) and is located in the south-central portion of PNS along the Piscataqua River. The location of OU2 at PNS is shown on Figure 1-2. The OU2 ROD was signed in September 2011. OU2, Sites 6 and 29, is included in this five-year review because the Site 6 and 29 remedies required LUCs to protect the integrity of the soil cover and because contaminants remain in surface and subsurface soil at concentrations that do not allow for UU/UE.

### **4.1 Site History and Background**

Table 4-1 summarizes the chronology of events at Site 6 and Site 29. Figure 4-1 shows the boundaries of Site 6 and Site 29.

The DRMO was located within Site 6 and was responsible for the reuse, transfer, donation, sale, or disposal of excess and surplus Department of Defense (DoD) property in New England from approximately 1920 until 2010. Materials reportedly stored at the DRMO included lead and nickel-cadmium battery elements, motors, typewriters, paper products, and scrap metal. The lead battery cells and plates and nickel-cadmium batteries were stockpiled on uncovered pallets. It is thought that historical DRMO operations occurred primarily in the current fenced area of the DRMO, but operations could have occurred in areas directly adjacent to the DRMO. Open storage of batteries and other materials that could have resulted in releases of contaminants was discontinued in approximately 1983. In 1993, interim corrective measures were conducted for a portion of DRMO and included capping and paving, installation of storm water controls, and installation of a new concrete curb (McLaren/Hart, April 1993).

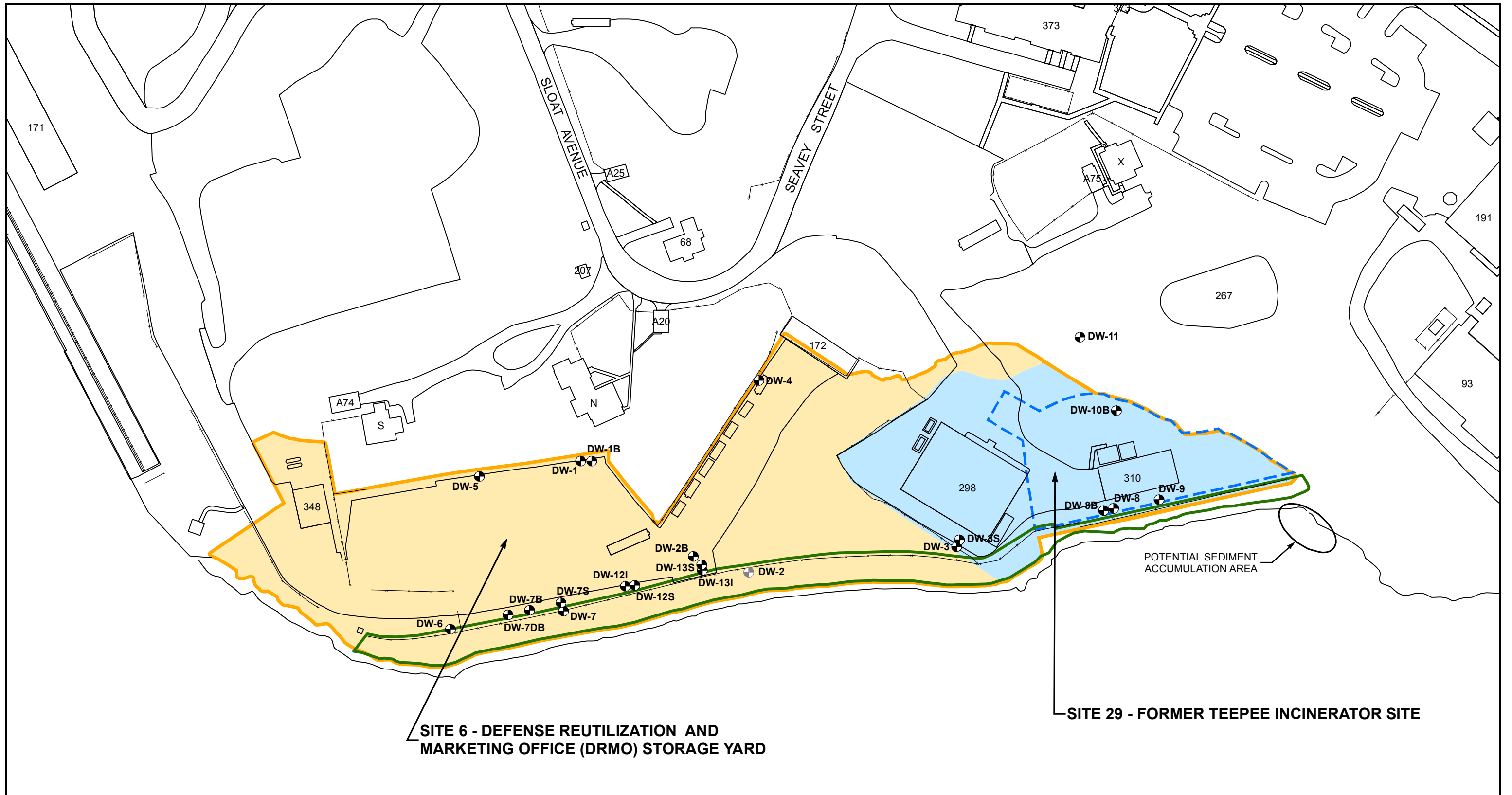
The main activities at Site 29 were related to open burning, waste disposal, and industrial incineration. The waste disposal area was apparently filled with paper, wood, rubbish, and ash reportedly from open burning of trash conducted within the waste disposal area from approximately 1918 until 1965. In 1965, a teepee incinerator (Building 290) was built for combustion of wood, paper, and rubbish, with occasional burning of cans of paint and solvents. Ash from the incinerator was deposited south of the incinerator until 1971 when the residue began to be landfilled in the JILF (at OU3, located approximately 1,000 feet northeast of OU2) and the Kittery municipal landfill. The incinerator was apparently demolished soon after operations ended in 1975 and trash was taken off yard for disposal. Materials identified in soil borings located in the waste disposal area are generally consistent with this background information (i.e. containing ash, cinders, wire, glass, wood, and metal pieces). Asbestos was also found during excavation of the Building 310 foundation, which is located over the waste disposal area.

**Table 4-1**  
**Operable Unit 2 (Site 6 and Site 29) – Site Chronology**

Date	Event	Description
1984-1998	Final Confirmation Study (FCS), Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI), RFI Data Gap Investigation, Groundwater and Seep and Sediment Monitoring, Field Investigation at Site 29	Environmental samples were collected as part of various investigations, and the data were used to evaluate the nature and extent of contamination and human health risks for OU2. Investigations began with the FCS in 1984. From 1989 to 1992, as part of the RFI, surface and subsurface soil, and groundwater (bailer sampling method) samples were collected from Site 6 and the areas later identified as the DRMO Impact Area and Site 29. During the RFI Data Gap Investigation conducted in 1994, hydrogeology and tidal influences were further investigated. In 1996/1997, four rounds of groundwater monitoring (low-flow sampling method) were conducted for the OU2 monitoring wells. A field investigation was conducted in 1998 at Site 29 to define the nature and extent of contamination in this portion of OU2.
1992	Onshore Ecological Risk Assessment	This risk assessment was conducted for three areas at PNS including the DRMO Storage Yard to determine risks to onshore ecological receptors. Tissue and vegetation sampling and vegetation, small mammal population, and bird population surveys were conducted to support the risk assessment. The risk assessment concluded that there were no onshore ecological concerns for OU2 because there is little habitat for ecological receptors. No further evaluation of OU2 onshore ecological risks was conducted.
1993	Interim Corrective Measures at the DRMO Storage Yard	Interim measures were conducted to cover (with a cap or pavement) two areas of exposed contaminated soil in the DRMO Storage Yard to minimize migration of soil contaminants via surface runoff. An impermeable interim cap was installed over the area with the greatest levels of lead and other contamination, and pavement was placed in the other area. Storm water controls and concrete curbs were also installed to address stormwater runoff.
1996-1999	Contaminant Fate and Transport Modeling	Modeling was conducted to evaluate migration of onshore contaminants to the offshore environment. Two phases of modeling were conducted, with the second phase conducted to refine the input parameters used in the first phase of modeling. The model results for OU2 were used to support initial understanding of contaminant fate and transport for OU2.
1999, 2005, 2006, and 2008	Emergency Removal Actions (Shoreline Stabilization)	Shoreline stabilization along Site 6 was conducted in 1999 after soil erosion was observed. Existing concrete blocks and other materials were removed, the embankment regraded with existing rock, and a shoreline stabilization structure (including geotextile and riprap) was installed over the existing soil along the shoreline. The shoreline between Site 6 and the seawall at Site 29 and the area east of the seawall were stabilized in the 2000s. West of the seawall, debris on the shoreline slope was removed, the embankment regraded, and a shoreline stabilization structure similar to the 1999 structure was placed. Signs of potential failure of these shoreline controls (sloughing of riprap and exposure of underlying filter fabric) were observed in 2007, and in 2008, interlocking precast concrete slabs (A-Jacks) were placed at the bottom of the slope to provide additional slope stability. In 2006, surficial debris was removed in the wooded area east of the seawall, and the area was covered with gravel. The area prone to erosion was stabilized with geotextile and rock.

Date	Event	Description
2000	Revised Risk Assessment	Human health risks were calculated and evaluated for different land use scenarios for Site 6, Site 29, and the DRMO Impact Area using updated risk assessment guidance and data collected to date to update RFI risk calculations.
2002	Building 298 Trenching	Soil sampling was conducted on the western and northern sides of Building 298 to support Shipyard utility trenching activities for the building. The data were used to support the nature and extent of contamination evaluation in the 2010 Supplemental Remedial Investigation (RI) Report.
2004-2006	Soil Washing Treatability Study	Large-volume soil samples were collected from five test pits in areas with highly elevated contaminant concentrations, and a soil washing treatability study was conducted on the soil samples to support evaluation of a potential treatment option as part of a Feasibility Study (FS) for OU2. The results indicated that contamination associated with fine-grained materials could be separated from large-grained materials.
2007-2008	Additional Investigation	Additional sampling was conducted to refine the nature and extent of contamination for delineation of remediation areas at Sites 6 and 29 and in the portion of the DRMO Impact Area immediately adjacent to Site 6 and to further evaluate contaminant migration in groundwater to the offshore. The results were used as part of the 2010 Supplemental RI Report.
2010	Supplemental RI Report	The report summarizes the results of previous investigations and risk assessments and updates the site characterization, nature and extent of contaminant, and site risks for contaminant migration to the offshore. The conclusions of the Supplemental RI Report were that the nature and extent of contamination and site risks associated with exposure to soil and groundwater at OU2 were sufficiently defined to support an FS. Lead and other contaminants of concern (COC) concentrations in soil at Sites 6 and 29 indicated potential unacceptable risks if the soil would be exposed or excavated. Lead and copper concentrations in soil in the backyards of Quarters S and N indicated potential unacceptable risks. Uncertainty in the extent of contamination was identified for an area west of the DRMO, which was later investigated as part of the 2011 Pre-Design Investigation. Exposure to groundwater did not pose unacceptable risks for human receptors, and contaminant fate and transport modeling and groundwater sampling indicated that migration of groundwater to the offshore was not anticipated to cause adverse impacts based on current conditions. However, copper, lead, and nickel contamination in soil at Site 6 in the interim capped area may pose an unacceptable risk to the offshore if the contaminants migrate to groundwater, and copper, lead, and nickel contamination in soil may pose an unacceptable future risk to the offshore if soil erodes.
2010	Non-Time-Critical Removal Action for DRMO Impact Area	Based on the 2009 DRMO Impact Area Action Memorandum including an Engineering Evaluation/Cost Analysis, a removal action was conducted to remove lead- and copper-contaminated soil from the DRMO Impact Area to allow for unlimited use and unrestricted exposure. Post-excavation confirmation sampling confirmed that soil associated with unacceptable risks was removed from this area.

Date	Event	Description
2011	FS Report	An FS was conducted to develop and evaluate potential cleanup alternatives for Sites 6 and 29. The types and concentrations of contaminants at Site 6 and in the western portion of Site 29 were similar; therefore, the areas were combined and referred to as the DRMO area for development of remedial alternatives. The remainder of Site 29 was evaluated as the waste disposal area. Remedial options for the DRMO Impact Area were not included because the 2010 removal action eliminated all unacceptable risks in this area. As part of the FS, the extent of contamination was evaluated to delineate remediation areas for the DRMO area, and the evaluation showed that delineation of remediation areas based on lead concentrations exceeding 4,000 milligrams per kilogram (mg/kg) would result in post-remedial site-wide average exposure concentrations that are less than construction worker, occupational worker, and recreational user cleanup levels for all COCs.
2011	Proposed Plan	The Proposed Plan presented the Navy's Preferred Alternative to address contamination at the DRMO area (Site 6 and western portion of Site 29) and waste disposal area (eastern portion of Site 29) and the no further action (NFA) recommendation for the DRMO Impact Area. A 30-day public comment period was held from July 21 to August 19, 2011, and the comment period was extended an additional 30 days until September 19, 2011. No modification to the proposed remedies was necessary based on comments received during the public comment period.
2011	Pre-Design Investigation	This investigation was conducted to delineate the extent of soil contamination in an area west of the DRMO Storage Yard to support the Remedial Action selected for OU2. The results were used as part of the delineation of excavation areas for the Remedial Action for the DRMO area.
2011	ROD	The ROD was signed in September 2011. The selected remedies for the DRMO area and waste disposal area include soil excavation, soil cover (for the waste disposal area), LUCs, and monitoring. NFA is the selected remedy for the DRMO Impact Area.
2012	LUCRD	The LUCRD, completed before Remedial Action construction, provided the necessary implementation actions for LUCs for OU2. An update to the LUCRD (Revision 1) was prepared in 2016 and is included in the LTMgt Plan for OU2.
2013-2014	Remedial Action Construction	Remedial action construction was conducted separately for the DRMO area and waste disposal area. Remedy construction was completed in 2014, and the Construction Completion Reports were completed in 2015.
2015-present	Post-Remediation LTMgt Program	The LTMgt program for OU2 includes site inspections, groundwater monitoring, and sediment accumulation monitoring. The LTMgt Plan was finalized in March 2016, and implementation per the plan is scheduled to begin in 2016. The first post-remediation LUC inspection was conducted in October 2015. Revision 1 of the LUCRD, dated March 2016, is included as an appendix to the LTMgt Plan.
2016	RACR	Documents selected remedy was implemented and is in place, RAOs have been met, implementation of LUCs will ensure RAOs will continue to be met, and the site status is Response Complete.



**SITE 6 - DEFENSE REUTILIZATION AND MARKETING OFFICE (DRMO) STORAGE YARD**

**SITE 29 - FORMER TEEPEE INCINERATOR SITE**

**RESOLUTION CONSULTANTS**  
 Drawn: HJ 03/02/2017  
 Approved: PD 03/02/2017  
 Project #: 60342342

<b>Legend</b>	Existing Monitoring Well
OU2 Boundary	Destroyed Monitoring Well
Site 06 Boundary	
Site 29 Boundary	
Shoreline Erosion Control	
Waste Disposal Limits	

N

0 50 100  
Scale in Feet

**FIGURE 4-1**  
**OPERABLE UNIT 2, SITES 6 AND 29**  
**LAND USE CONTROL BOUNDARY**

**PORTSMOUTH NAVAL SHIPYARD**  
**KITTERY, MAINE**

## 4.2 Conceptual Site Model

The primary contaminant sources at OU2 are associated with the storage of materials and equipment at the DRMO Storage Yard, disposal of waste materials in the waste disposal area, and industrial incineration. The Supplemental RI Report, finalized in March 2010, concluded that the main contaminants in soil at Sites 6 and 29 include metals (particularly lead), polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs), and the main contaminants in groundwater are metals (Tetra Tech, March 2010). Contaminant fate and transport modeling and groundwater sampling conducted for OU2 indicated that migration of groundwater was not anticipated to adversely impact the offshore. Off-shore sediment sampling under OU4 included collection of sediment samples eroding along the top of the Site 29 shoreline. These sediment samples showed that the erosion likely caused the elevated metals (copper, lead, nickel) concentrations detected in offshore sediments (Tetra Tech, August 2005; Tetra Tech, February 2006). The groundwater at OU2 is tidally influenced and is generally brackish or saline. There have been no changes in land use during the five-year review period that would affect the conceptual site model.

## 4.3 Basis for Taking Action

As provided in Table 4-1, unacceptable human health and environmental risks were identified due to lead and other contaminants of concern (COC) concentrations in soil in the DRMO area and waste disposal area for current and potential future human receptors at OU2 as concluded by the RI. Potentially unacceptable human health risks were identified for exposure to contaminated soil for current industrial (construction and occupational) workers, recreational users, and future hypothetical residents. Exposure to groundwater does not pose unacceptable risks for human receptors, and groundwater is not a source of contamination to the offshore area based on conditions evaluated in the RI. Interim measures were conducted to cover (with a cap or pavement) two areas of exposed contaminated soil in the DRMO Storage Yard to minimize migration of soil contaminants via surface runoff. An impermeable interim cap was installed over the area with the greatest levels of lead and other contamination, and pavement was placed in the other area. Lead, copper, and nickel contamination in soil in the interim capped area in the DRMO area were identified to pose unacceptable future risk to the offshore environment if the contaminants migrate from unsaturated soil to groundwater. In addition, lead, copper, and nickel contamination in soil were identified to pose an unacceptable future risk to the offshore environment if these contaminants erode to the offshore area. These areas were later excavated as a part of the remedial action activities that took place in 2013 and 2014. In addition, during the remedial action for the waste disposal area, contaminated soil was excavated in three ancillary

areas east of the waste disposal area cover system to reduce COC concentrations to less than cleanup levels for all receptors.

#### 4.4 Remedial Actions

The ROD for OU2 was signed in September 2011. The RAOs, remedial components, remedy implementation, and progress since the previous five-year review are described below.

##### 4.4.1 Remedial Action Objectives

The RAOs for Sites 6 and 29 are to prevent human exposure to surface and subsurface soil with COC concentrations that exceed cleanup standards, to protect the offshore environment from erosion of contaminated soil from the OU2 shoreline, and to prevent unacceptable risk from future potential migration of contamination from unsaturated zone soil to groundwater in the interim capped area at Site 6 to groundwater. Specific RAOs include

- Prevent human exposure through ingestion, dust inhalation, and dermal contact to contaminated soil with COC concentrations that exceed cleanup levels.
- Protect the offshore environment from erosion of contaminated soil from the OU2 shoreline.
- Prevent unacceptable risk from future potential migration of copper, lead, and nickel from unsaturated zone soil in the interim capped area at Site 6 to groundwater.

To achieve these RAOs, the following remedial cleanup levels were established in the ROD, as developed in the OU2 FS using risk-based, receptor-specific basis for protection of human health from exposure to soil contaminants.

COC	CONSTRUCTION WORKER (mg/kg)	OCCUPATIONAL WORKER (mg/kg)	RECREATIONAL USER (mg/kg)	RESIDENT (mg/kg)	Basis
Antimony	516	681	3,930	73	Site-specific risk based, HI = 1
Copper	NA	NA	NA	7,300	Site-specific risk based, HI = 1
Lead	2,000	1,600	4,600	400	Residential is based on OSWER soil screening level; others are site specific risk based.
Nickel	NA	NA	NA	3,650	Site-specific risk based, HI = 1
PAHs (BaPEqs)	NA	2	5	0.7	Site-specific risk based, cancer goal less than 5 x



					10 <sup>-6</sup>
PCBs (total)	NA	6	34	1	Site-specific risk based, cancer goal less than 5 x 10 <sup>-6</sup>

#### 4.4.2 Remedy Selection

The selected remedy described in the ROD includes the following components to meet the RAOs:

##### DRMO Area

- Excavation and offsite disposal of soil with lead concentrations greater than 4,000 mg/kg and with concentrations of other COCs greater than industrial cleanup levels (the lesser of the occupational or construction worker cleanup levels) to the designated depth to reduce average soil COC concentrations in accessible portions of the DRMO area to less than construction worker, occupational worker, and recreational user cleanup levels. Soil removal depths are to where concentrations are at the target excavation concentrations or where there is very little soil and mostly rock (i.e., to the rock fragment layer).
- Restoration of excavated areas to pre-construction conditions to allow for continued industrial site use.
- Implementation of LUCs via a LUC RD to require the continued presence of site features to prevent erosion, prevent exposure to soil beneath buildings, prohibit residential land use, identify inspection requirements, establish signage requirements, and document responsible parties.
- Groundwater monitoring to provide confidence that copper, lead, and nickel contamination does not migrate to groundwater at unacceptable levels.
- Sediment accumulation monitoring to provide confidence that contaminated soil does not erode and migrate to the offshore area and accumulate in a potential sediment accumulation area offshore of OU2 (an intertidal area immediately east of Site 29 where there is potential ecological exposure to sediment).
- Five-year site reviews to ensure that the remedy remains protective of human health and the environment.

## Waste Disposal Area

- Excavation and offsite disposal of soil and waste material from 0 to 2 feet bgs within the soil cover limits.
- Excavation and offsite disposal of soil and waste material in debris areas adjacent to the waste disposal area (ancillary areas).
- Construction of a 2-foot-thick soil cover system over the area where waste material remains below 2 feet bgs. Excavation of soil from 0 to 2 feet bgs within the waste disposal area before placement of the cover system will reduce the impact to final site elevations, thereby reducing the impact to site operations.
- Implementation of LUCs via a LUC RD to require the continued presence of site features to prevent erosion, require maintenance of the soil cover system, prohibit unauthorized digging within the soil cover system limits, identify inspection requirements, establish signage requirements, prohibit residential land use, and document responsible parties.
- Groundwater monitoring to provide confidence that copper, lead, and nickel in waste material does not migrate to groundwater at unacceptable levels.
- Sediment accumulation monitoring to provide confidence that contaminated material does not erode and migrate to the offshore area and accumulate in the intertidal area immediately east of Site 29.
- Five-year site reviews to ensure that the remedy remains protective of human health and the environment.

### 4.4.3 Remedy Implementation

The LUCRD for OU2 was finalized in March 2012. Remedial Action activities for OU2 took place during this Five-Year Review period, from August 2013 until August 2014. A total of eleven areas were excavated during the Remedial Action in OU2 (Areas 1 through 11) that were previously delineated during site characterization. Within the DRMO area (Site 6), contaminated soil was excavated from seven areas (Areas 1 through 7) to reduce average COC concentrations to less than industrial and recreational cleanup levels. Contaminated soil that could potentially migrate was removed as part of the soil removal for Area 7, and groundwater monitoring per the LTMgt Plan will provide confidence that groundwater had not been adversely impacted. As part of the Remedial Action for the waste disposal area, contaminated soil was excavated to bedrock in three ancillary areas east of the waste disposal area cover system (Areas 9 through 11) to reduce COC concentrations to less than cleanup levels for all receptors.

The Construction Completion Report for the DRMO area (CB&I, March 2015) documents the excavation and off-yard disposal of contaminated soil in Areas 1 through 7 and site restoration in the DRMO area. For Areas 1, 2, 3, 4, and 5, the target depths were identified based on soil concentrations, and for Areas 6 (A and B) and 7, the target depths were to the top of rock fragment fill. After excavation, geotextile was placed over remaining underlying soil or rock fragment fill before backfilling and restoration of surface material (asphalt, gravel, or vegetation). As part of soil excavation activities along the shoreline in Areas 6 and 7, the shoreline erosion controls above mean high tide were removed, contaminated surface fill was removed, clean fill was placed, and the shoreline erosion controls were replaced. During excavation of Area 7, soil near the western sidewall of the excavation (though not collected from the sidewall) was found to have PCB concentrations greater than 50 mg/kg, requiring that soil is managed in accordance with the Toxic Substances Control Act (TSCA). To direct further excavation, confirmation soil samples were collected along this portion of the western sidewall. No confirmation sample result exceeded the TSCA PCB limit of 50 mg/kg; however, the results for several sidewall samples were greater than the PCB target excavation concentration (6 mg/kg), such that additional excavation was conducted. After excavation activities were completed, all soil with COC concentrations exceeding the target excavation concentrations had been removed from the DRMO area.

The Construction Completion Report for the waste disposal area (AGVIQ, May 2015) documents the excavation of the top 2 feet of soil and placement of a 2-foot-thick cover system over the waste disposal area (Area 8) and removal of contaminated soil in Areas 9 through 11. In Area 8, a geotextile was placed over the remaining material before backfilling. Portions that were previously vegetated were revegetated, and portions that were previously paved were repaved. Building 310 and its outbuildings and the seawall were not disturbed during excavation and cover placement. As part of remedial activities for the waste disposal area, soil pockets in the bedrock outcrop east of the waste disposal area were excavated in three ancillary areas (Areas 9 through 11) to remove contaminated soil in these areas. Therefore, there are no unacceptable risks in these three ancillary areas and they are not included within the OU2 LUC boundary.

A LUCRD, finalized in March 2012, was prepared before completion of the soil Remedial Action and details the implementation actions required for the LUC portion of the OU2 remedy. The LUCRD was updated based on completion of the Remedial Action, and Revision 1 of the LUCRD is provided as Appendix A to the LTMgt Plan (Tetra Tech, March 2016a). LUCs for OU2 are being implemented through the LUCRD to prohibit residential land use, maintain the waste disposal area cover system to prevent exposure to underlying contamination, ensure that current site features (including Buildings 298, 310, and 348, the seawall, and shoreline stabilization features) remain to prevent

exposure to contamination or to prevent erosion, and provide requirements for management of excavated soil.

The LTMgt Plan provides the necessary activities for performing inspection, maintenance, monitoring, and associated recordkeeping and reporting for the LTMgt component of the OU2 remedies. Pre-remediation groundwater concentrations at OU2 were at acceptable levels, and post-remediation groundwater monitoring will be conducted (2016 to 2017) to provide confidence that copper, lead, and nickel do not migrate to groundwater at unacceptable levels. The groundwater monitoring will be evaluated in accordance with the LTMgt Plan (Tetra Tech, March 2016a). In addition, although sediment accumulation along and adjacent to the OU2 shoreline has not been observed, post-remediation sediment accumulation monitoring will be conducted in the offshore area to provide confidence that contaminated material at the site does not erode and migrate to the offshore area such that sediment accumulates in the intertidal area immediately east of Site 29. The final RACR for OU2 was signed by the Navy in September 2016.

#### 4.4.4 Five-Year Review Process

The following documents were reviewed as part of the Five Year Review process for OU2.

- Remedial Investigation (Tetra Tech, March 2010)
- ROD (Navy, September 2011)
- LUCRD, including Revision 1 (Navy, March 2016)
- Long Term Management Plan (with attached SAP) (Tetra Tech, March 2016a)
- LUC Inspection Checklists (2013, 2014, 2015, 2016)
- RACR (Navy, August 2016a)

Annual LUC inspections have been conducted since 2013. Consistent with the LUCRD, annual LUC inspections have looked for changes in land use, that current site features remain in place to prevent exposure to residual contamination (including Building 310, Building 298, Building 348, installed soil cover in the waste disposal area, and shoreline stabilization features), and if dig restrictions have been instituted including signage. Consistent with the LTMgt Plan that was finalized for OU2 in March 2016, and baseline LTMgt groundwater sampling will be initiated in 2017. The annual inspections have not identified any deficiencies or issues related to site operations, conditions, or activities that prevented the OU 2 remedy from being protective in the short or long term.

#### 4.4.5 Progress Since the Last Five-Year Review

No issues were identified in the second five-year review; therefore, no recommendations or actions were needed to address issues. Though the remedy had not yet been implemented, the 2012 five-year review stated that the results of investigations and removal/interim actions did not indicate any imminent threats to human health or the environment under current land use scenarios as the site conditions and Shipyard policies at the time provided for protection of human health and the environment until the final remedy was implemented.

#### 4.5 Technical Assessment

##### 4.5.1 Question A: Is the Remedy Functioning as Intended by Decision Documents?

###### *Remedy Summary*

The selected remedy for OU2 (see Section 4.4.2) included excavation and off-yard disposal of contaminated soil, construction of a 2-foot-thick soil cover system over the area where waste material remains below 2 feet bgs at the waste disposal area, LUCs, and groundwater and sediment accumulation monitoring. Remedial Action construction has been completed, LUC inspections are performed annually, and groundwater and sediment accumulation monitoring was initiated in Fiscal Year 2017. There are no analytical or operational data to review relative to the OU2 remedy as groundwater sampling will not commence until summer 2017.

###### *Technical Evaluation*

Based on review of historical and recent documents and the site visit on 7 December 2016, the OU2 remedy is functioning as intended by the ROD, as summarized in the technical evaluation for Question A in Table 4-2.

Table 4-2  
 Operable Unit 2 (Sites 6 and 29)

Question	Summary
Remedial Action Performance	Remedial Action construction was completed in August 2014. LUCRD was finalized in 2012 and revised in 2016. Annual LUC inspections have been completed since 2013, and LUCs have been successful in preventing unacceptable levels of exposure to site-related contaminants.
Systems Operation/ Operation and Maintenance	Cover at Site 29, pavement, and shoreline controls are in place and observed to be in good condition. A "Digging Prohibited" sign as described in the LTMgt Plan was installed in 2016.
Opportunities for Optimization	Not applicable.
Implementation of LUCs and	LUCs are in place and operating in accordance with the LUCRD for OU2. Revision 1 to the

Question	Summary
Institutional/ Engineering Controls	March 2012 LUCRD was made to reflect the LUC boundary based on the completion of construction activities and preparation of the Long-Term Management (LTMgt) Plan for OU2. The Final LUCRD Revision 1 is included within the Final LTMgt Plan. The revisions were reviewed and approved by USEPA and MEDEP.
Early Indicators of Potential Remedy Problems	The 2015 LUC inspection recommended use of weight dissipation pads or pallets when storing heavy items on the paved areas in order to protect the asphalt cover. During the 2016 site inspection, it was noted that some grassy areas needed to be repaired.

4.5.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives used at the time of the remedy selection still valid?

*Risk Summary*

The 2011 ROD assumed that land at OU2 would continue to be used for industrial purposes. There have been no changes in land use since the ROD or Remedial Action was completed. The Remedial Action for the waste disposal area removed contaminated surface soils (0 to 2 ft bgs) that exceeded risk-based cleanup levels identified for construction, occupation, and recreational exposures and installed a soil cover to prevent exposure to underlying contamination.

The Remedial Action for the DRMO Area excavated contaminated soils greater than risk-based cleanup levels identified for the construction worker scenario. Post-remedial average concentrations were below risk-based concentrations protective of the construction worker, occupational worker, and recreational user. LUCs are required as part of the remedy for OU2 to maintain the WDA soil cover and DRMO site features to prevent erosion and prevent residential development. Default exposure assumptions for adult body weight and skin surface area have been updated since the 2011 ROD (US EPA, 2011; US EPA, 2014). Default adult body weight has increased from 70 kilograms (kg) to 80 kg. An increased body weight would result in similar or lower calculated risks. Default skin surface area for exposure to groundwater has decreased for construction workers (5,400 to 3,527 cm<sup>2</sup>). Default skin surface area for occupational and construction workers and child residents exposed to soils have decreased (5,700 to 3,527 cm<sup>2</sup> and 2,800 to 2,373 cm<sup>2</sup>, respectively). Decreased skin surface area would result in similar or lower calculated risks. Default skin surface area for the adult resident and recreator has increased (5,700 to 6,032 cm<sup>2</sup>). Increased skin surface area has the potential to increase risks; however, the current LUC prevents residential development. While cleanup levels for antimony for the recreational user may be slightly lower than that presented above (Section 4.4.1), it would not be lower than the most conservative cleanup level used during the remedial action in the DRMO Area (for the construction worker).

The residential cleanup level for antimony was recalculated using US EPA's Regional Screening Level calculator (US EPA, 2016) using updated residential exposure assumptions for a target risk of  $5 \times 10^{-6}$  and a hazard index of 1, consistent with the 2011 ROD. A cleanup level for antimony was originally calculated as 73 milligrams per kilogram (mg/kg), which assumes a soil exposure frequency of 150 days per year. This value was a US EPA Region 1 recommendation, accounting for those days of the year when snow and ice limit contact (US EPA, 1994) and is no longer considered applicable. Using the current US EPA default exposure frequency of 350 days per year (US EPA, 2016), a cleanup level of 31 mg/kg would be calculated for antimony. A LUC is in place which protects against future potential residential exposures to antimony in soil. Therefore, the remedy is still considered protective.

The selected cleanup value for lead (2,000 mg/kg) was calculated using the Adult Lead Model based on construction worker exposures (US EPA, 2016). The previous model included a geometric standard deviation PbB of 2.0, a baseline PbB of 2.0, a soil ingestion rate of 0.1 grams per day and an exposure frequency of 60 days per year. Updated assumptions include a geometric standard deviation PbB of 1.74 and a baseline PbB of 0.73 (US EPA, 2016). Assuming the exposure frequency 60 days per year (construction worker) the updated cleanup values for lead is 4,737 mg/kg (see Appendix C). Assuming updated parameters, a cleanup value of 10,931 mg/kg is calculated for adult recreational users. Thus, the remedy is still protective of potential exposures to lead in soils. It should be noted that EPA is considering lowering the recommended allowable blood lead level used during modeling, along with changes to other exposure parameters. Application of these changes will need to be performed when these values are finalized to determine if there would be any change in protectiveness.

Revised toxicity values have been established for benzo(a)pyrene since the previous Five-Year Review. These toxicity values would result in higher cleanup levels than those presented in the ROD, thereby maintaining protectiveness. There have not been any other changes to toxicity data that would affect the calculated cleanup levels since the 2011 ROD or Remedial Action.

### *Technical Evaluation*

The technical evaluation for Question B is in Table 4-3.

### *Conclusions*

The RAOs outlined in the ROD for OU2 have been achieved and OU2 is Response Complete. The final Remedial Action Completion Report (RACR) for OU2 was signed by the Navy in September 2016. Potentially unacceptable risks for construction, occupational, and recreation users have been eliminated through Remedial Action excavation, off-site disposal, and construction of protective

cover at Site 29. The ROD-specified remedy mitigates exposure to contaminants in surface and subsurface soil by human and ecological receptors at Sites 6 and 29 by implementing the LUCs as outlined in the OU2 LUCRD. LUCs are operating as designed and include measures that mitigate or reduce exposure and corresponding risks. The remedy implemented at OU2 is protective of human health and the environment. While OU2 is Response Complete as RAOs have been achieved, Sites 6 and 29 will not achieve site closure because contamination remains above levels acceptable for UU/UE.

Table 4-3  
 Operable Unit 2 (Sites 6 and 29)  
 Technical Evaluation – Question B

Question	Summary
Changes in Applicable or Relevant and Appropriate Requirements (ARARs) or To-Be-Considered (TBC) Criteria	The ARARs and TBC criteria listed in the ROD for OU2 are shown in Appendix B. As the soil excavation and cover placement work has been completed, many of the action-specific ARARs and TBCs pertaining to water management, waste characterization and disposal, and air emissions have been met. Many of the location-specific and action-specific-ARARs identified in the ROD remain applicable to any future maintenance of the soil cover system. While some of the ARARs have been amended since the ROD, no changes were identified that would call into question the protectiveness of the remedy. The ROD included chemical-specific TBCs that were used in assessing human health risk and developing risk-based soil remedial goals for COCs in waste disposal area and DRMO Area soils. A review of changes in toxicity and risk assessment methodology is provided below.
Expected Progress towards Meeting Remedial Action Objectives (RAOs)	Remedial Action excavation and installation of protective cover completed to reduce unacceptable risks for construction, occupational, and recreational users. LUCs are in place to prevent future residential usage. Groundwater and sediment accumulation monitoring will be implemented per the LTMgt Plan starting in Fiscal Year 2017.
Changes in Exposure Pathways	No changes in exposure pathways were identified during this five-year review.
Changes in Land Use	No changes in land use have been identified in annual LUC inspections and checklists, from input from Navy, or during site visits. The OU2 LUCRD requires regulatory notification of proposed land use changes; the 2012 to 2017 Amended Site Management Plans, 2013 to 2016 Annual LUC Checklists do not indicate proposed land use changes.
New/Emerging Contaminants and Contaminant Sources	No new or emerging contaminants or contaminant sources have been identified at OU2.
Changes in Toxicity, Risk Assessment Methods, and Cleanup Levels	Post-Remedial Action, LUCs prevent exposure to effectively mitigate risks to subsurface soils which preclude unlimited use/unrestricted exposure, so the focus is preventing exposure and enforcing those controls to ensure protectiveness. While there has been a change to residential exposure duration which would result in a lower residential cleanup level for antimony if developed currently, the established LUC limits residential exposures, thereby maintaining protectiveness. Changes in toxicity, risk assessment methods, exposure models, and cleanup levels have no effect on remedy protectiveness on human health and the environment which focuses on prevention of exposure to contaminated soil in Sites 6 and 29. As long as the cover materials are maintained and LUCs are enforced to eliminate the direct and indirect contact pathways, the remedies remain protective.



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

No other information has come to light that could call into question the protectiveness of the remedy.

4.6 Issues, Recommendations, and Follow-Up Actions

This five-year review did not identify issues for which follow-up actions are recommended.

4.7 Protectiveness Statement

The remedy implemented at OU2 is protective of human health and the environment. RAOs have been met and exposure to soil that could result in unacceptable risks at Sites 6 and 29 is prevented through LUCs. Sediment accumulation and groundwater monitoring as well as inspections confirm that the waste disposal area cover system, shoreline stabilization measures, and other site features that are relied upon to prevent exposure to underlying contamination and prevent erosion into the offshore environment are intact.

## 5.0 OPERABLE UNIT 3, SITE 8

OU3 consists of Site 8, the Jamaica Island Landfill (JILF) and is located in the eastern portion of PNS along the Piscataqua River. See Figure 1-2 for the location of Site 8 within PNS. The OU3 ROD was signed in August 2001. OU3, Site 8 is included in this five-year review because the Site 8 remedy required LUCs to protect the integrity of the landfill cover and because contaminants remain in soil/fill at concentrations that do not allow for UU/UE. OU3 also included Sites 9 and 11, however, as documented in the RACR (Tetra Tech, 2015), no further action is required for Sites 9 and 11 to meet the RAOs for OU3.

### 5.1 Site History and Background

Table 5-1 summarizes the chronology of events at Site 8. Figure 5-1 shows the boundary of Site 8.

Site 8 is the landfill (JILF), and Sites 9 and 11 were located within the JILF boundary. The JILF is one of the initial sites identified in the 1983 IAS. The Navy used the JILF, which previously consisted of tidal mudflats, as a disposal area from 1945 to 1978 for disposal of general refuse, trash, construction rubble, dredged sediment, and various industrial wastes. The boundary of OU3 is defined by the boundary of the landfill. Prior to the OU3 remedy, the landfill was 25 acres; however, landfill material from 3 acres adjacent to Jamaica Cove was excavated as part of the remedy, and this area was removed from the landfill footprint. Site 9 Mercury Burial (MB) vaults (poured concrete blocks and precast concrete pipes containing mercury-contaminated wastes) were placed in two locations (MBI and MBII) within the landfill in the 1970s and then removed (intact) and disposed of offsite in the 1990s/early 2000. There was no indication that mercury from the vaults contaminated surrounding soil or groundwater. The waste oil tanks at Site 11, which were used from 1943 to 1989, were removed intact along with surrounding soil in 1989. Soil contamination remaining in the vicinity of Site 11 appears to be landfill material (Site 8) mixed with petroleum that may have originated from spills during filling of the tanks formerly at Site 11. Therefore, the soil contamination remaining in the vicinity of Site 11 was considered Site 8 contamination.

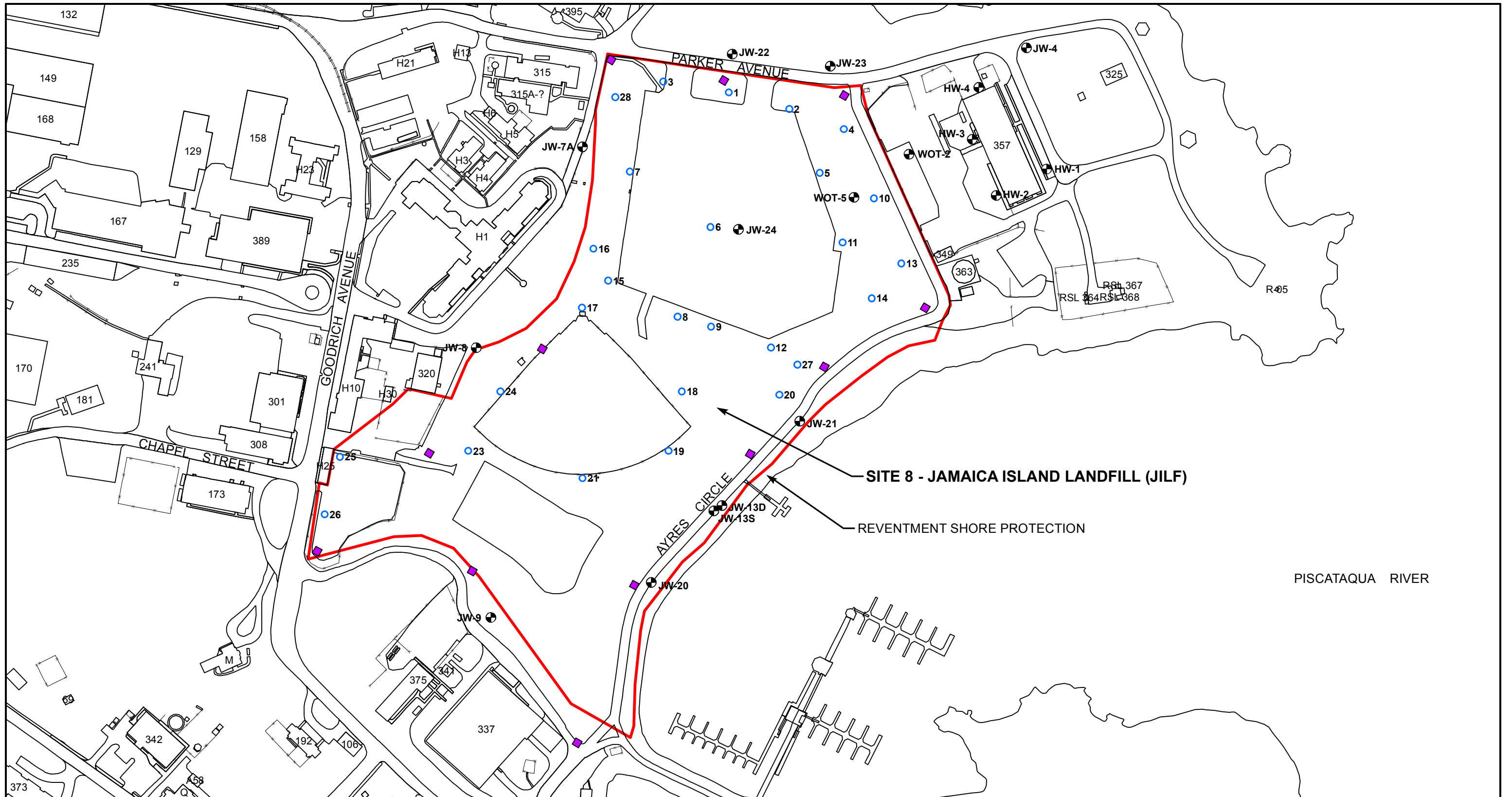
As discussed in the OU3 ROD (Navy, August 2001), OU3 is characterized as containing a large volume of low-level hazardous materials. Soil and groundwater data indicate similar chemical contamination throughout the area of the landfill. A variety of organic and inorganic constituents were detected in soil and groundwater, including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), PCBs, pesticides, metals, and petroleum hydrocarbons.

**Table 5-1  
 Operable Unit 3 (Site 8) – Site Chronology**

Date	Event	Description
1984 to 1997	FCS, RCRA RFI, RFI Data Gap Investigation, Groundwater and Seep and Sediment Monitoring	Environmental samples were collected at Sites 8, 9, and 11 as part of various investigations, and the data were used to evaluate the nature and extent of contamination and human health risks for OU3. Investigations began with the FCS in 1984. From 1989 to 1992, as part of the RFI, surface and subsurface soil, groundwater (bailer sampling method), and seep samples were collected from the sites within OU3. During the RFI Data Gap investigation conducted in 1994, hydrogeology and tidal influences were further investigated. In 1996/1997, four rounds of groundwater monitoring (low-flow sampling method) were conducted for the OU3 monitoring wells, and four rounds of seep and sediment monitoring were conducted from locations in the OU3 intertidal area.
1989	Tank Closure for Site 11	The tanks at Site 11 were inspected twice during operations (in 1979 and 1986), and there was no evidence of any releases. In 1986 both tanks were tightness tested and found to be sound. As part of closure of the tanks in 1989, the tanks were excavated and removed according to state regulations and inspections (State of Maine Notice of Underground Oil Storage Tank Removal Registration Number 118630-6 and 11863-7). Upon removal, both tanks appeared sound and neither tank showed signs of leakage or deterioration. Following tank removal, sampling was conducted by PNS and Maine Department of Environmental Protection (MEDEP). Soil contamination was noted and was believed to have occurred from spillage during filling. As a result of the elevated levels of lead and other contaminants, 332 tons of soil were excavated and disposed of in an offsite, RCRA-permitted land disposal facility.
1992	Onshore Ecological Risk Assessment	This risk assessment was conducted for three areas at PNS including the JILF to determine risks to onshore ecological receptors. Specific activities included vegetation population survey, vegetation tissue sampling, small mammal population survey, rodent tissue sampling, and bird population survey. The assessment concluded that the ecological habitat and communities present were representative of disturbed settings. The vegetation observed at the JILF did not appear to be stressed and was considered representative of that typically found in a natural field in primary succession. No onshore ecological risks were attributed to the JILF.
1998-2000	Geophysical survey and test pit investigation	Geophysical surveying was conducted in 1998 to determine whether there were buried metallic objects in the landfill. Test pitting within portions of the JILF was conducted in 2000 at 25 locations selected based on survey results to investigate the possibility of the presence of a large number (nearly 10,000) 55-gallon (or similar capacity) drums reportedly buried above the water table in the landfill between 1945 and 1965. Forty-one drums containing non-hazardous material were located, 40 of these drums were removed from one location and disposed of offsite and one of these drums, containing a Portland cement-type material, from another location was replaced in the landfill. Subsurface soil samples were collected as part of the investigation and used to support the understanding of the nature and extent of contamination.
1994-2000	Removal Actions for Site 9	The concrete vaults at Mercury Burial Sites I and II were removed (portions of Mercury Burial Site I in 1994 and the rest in 1997 and Mercury Burial Site II in 2000). All the contents were disposed of properly at a licensed offsite disposal facility and no exceedances of regulatory criteria for mercury were found in the excavated soil around the vaults. The areas were backfilled and seeded.

Date	Event	Description
1996-1999	Contaminant Fate and Transport Modeling	Modeling was conducted to evaluate migration of onshore contaminants to the offshore environment. Two phases of modeling were conducted, with the second phase conducted to refine the input parameters used in the first phase. Model results were used to support initial understanding of contaminant fate and transport at OU3.
2000	Revised Risk Assessment	This risk assessment calculated and evaluated human health risks for different land use scenarios for Sites 8, 9, and 11 using data collected since the initial risk assessment that used only RFI data. OU3 media (soil/fill material and groundwater) were evaluated for onshore exposure. Risks were acceptable for human exposure to brackish/saline groundwater at OU3 (based on construction worker exposure scenario); therefore, no COCs were identified for brackish/saline groundwater for source control. Onshore ecological risks were acceptable; therefore, no COCs were identified for onshore ecological exposure. Potentially unacceptable risks for all site users were identified for soil/fill material COCs including PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene), arsenic, and lead. Potentially unacceptable risks were identified for freshwater groundwater (if used for drinking), and the COCs identified were antimony, arsenic, 1,4- dichlorobenzene, benzene, cadmium, lead, nickel, and thallium.
2000	FS Report	The FS was conducted to develop and evaluate potential cleanup alternatives to address exposure to materials within the JILF boundary. Because future residential exposure to drinking water (freshwater groundwater) is a highly unlikely scenario (most of the groundwater at OU3 is brackish or saline and only pockets of freshwater groundwater are present), active remediation of groundwater was not evaluated.
2001	Proposed Plan	The Proposed Plan presented the Navy's Preferred Alternative to address contamination. A 30-day public comment period was held from January 31 to March 1, 2001. No modification to the proposed remedy was necessary based on comments received during the public comment period.
2001	OU3 ROD	The ROD was signed in August 2001. The selected remedy included installation of a hazardous waste landfill cap and implementation of LUCs, erosion controls, and monitoring.
2003 and 2005	OU3 Explanation of Significant Differences (ESD) Documents	An ESD was signed in September 2003 and described the addition of excavation and consolidation of material within the limits of the JILF, which was completed in 2002, and construction of a wetland within the excavated area, which was completed in 2003. After it was determined that management of migration of groundwater offshore of the JILF (OU6) was being addressed by the OU3 (source control) remedy, a second ESD was issued in October 2005 to recombine management of groundwater migration (formerly OU6) with the source control remedy (OU3).
2002-2004	Remedial Action	The Remedial Action was conducted in two phases. Phase I included excavation of the portion of the landfill adjacent to Jamaica Cove and consolidation within other portions of the landfill and construction of a salt marsh wetland within the excavated area. Phase II included landfill cap construction. Remedy construction was completed in 2004, and the Remedial Action Report was completed in 2006.

Date	Event	Description
2006-present	Post-Remedial OM&M Program	The OM&M program for OU3, which included groundwater and landfill gas monitoring, landfill inspections, and maintenance, is being conducted in accordance with the OM&M Plan. The program was initiated in 2006 and was modified based on evaluation of data in 2009, 2011, and 2012. Modifications include 1) reduction of groundwater monitoring from semiannually to annually and then to every 5 years for PAHs and metals, 2) discontinuing landfill gas monitoring; and 3) reduction of inspections from semi-annually to annually. Annual wetland inspections, required for the first five years, were completed in 2010.
2011	LUCRD	The OU3 LUCRD provides the necessary implementation actions for LUCs for OU3 and is an attachment to the OM&M Plan.
2015	RACR	Documents selected remedy has been implemented and is in place, RAOs have been met, and implementation of LUCs will ensure RAOs will continue to be met and that status is Response Complete at OU3.



**SITE 8 - JAMAICA ISLAND LANDFILL (JILF)**

REVENTMENT SHORE PROTECTION

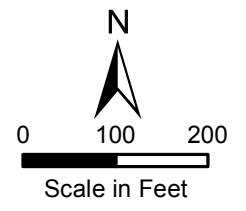
PISCATAQUA RIVER



- Legend**
- OU3 Boundary
  - Monitoring Well
  - Gas Vent
  - Excavation Warning Sign

Drawn: HJ 02/24/2017  
 Approved: PD 02/24/2017  
 Project #: 60342342

Note  
 Excavation Warning Sign Locations are Approximate.  
 Abandoned Wells and Gas Probes Not Shown.



**FIGURE 5-1**  
**OPERABLE UNIT 3, SITE 8**  
**LAND USE CONTROL BOUNDARY**

**PORTSMOUTH NAVAL SHIPYARD**  
**KITTERY, MAINE**

## **5.2 Conceptual Site Model**

The primary contaminant sources at OU3 are historic disposal of general refuse, trash, construction rubble, dredged sediment, and various industrial wastes. OU3 is characterized as containing a large volume of low-level hazardous materials. Soil and groundwater data indicate similar chemical contamination throughout the area of the landfill. A variety of organic and inorganic constituents were detected in soil and groundwater, including VOCs, SVOCs, PCBs, pesticides, metals, and petroleum hydrocarbons. Soil and groundwater data for OU3 show similar chemical contamination throughout the area of the landfill. There have been no changes in land use during the five-year review period that would affect the conceptual site model.

## **5.3 Basis for Taking Action**

As provided in Table 5-1, contaminated soil and waste material are present within the JILF that represents a potential unacceptable risk to human receptors if they are exposed to soil and waste material. Potentially unacceptable risks to human receptors were identified for fresh groundwater under a potential drinking water scenario. Potentially unacceptable risks may be present for humans and/or biota exposed to unacceptable levels of COCs in groundwater exiting the JILF in the intertidal area. Potentially unacceptable risks to human health and the environment may be present from erosion of contaminated material from the JILF.

## **5.4 Remedial Actions**

The ROD for OU3 was signed in August 2001 and Explanation of Significant Differences (ESD) documents were signed in 2003 and 2005 to modify the remedy. The RAOs, remedial components, remedy implementation, and progress since the previous five-year review are described below.

### **5.4.1 Remedial Action Objectives**

The RAOs for OU3 include

- Prevent human exposure through ingestion, inhalation, and dermal contact with contaminated soil and/or waste within the landfill at unacceptable levels.
- Prevent human exposure through ingestion of contaminated groundwater at unacceptable levels.
- Prevent erosion of contaminated soil and/or waste on the edge of the landfill to the Piscataqua River or the Back Channel.

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- Provide for JILF's current and future uses (organized and unorganized sports, equipment storage, and parking) while providing sufficient protection of human health and the environment.
  - Ensure that the migration of groundwater contaminants does not adversely impact the offshore environment.

#### **5.4.2 Remedy Selection**

The selected remedy described in the ROD as modified by the ESDs includes the following components to meet the RAOs:

- Excavation of contaminated soil/waste north of Parker Avenue (Jamaica Cove) and consolidation of the excavated material within the limits of the JILF south of Parker Avenue to reduce the landfill cap area.
- A multiple-layer cap over the landfill surface to prevent receptors on the surface from coming into contact with contaminated soil and/or waste and to minimize infiltration of water (e.g., rain and other surface water runoff) through the cover to the landfill material. Portions of the JILF that have buildings and structures were not covered by the hazardous waste landfill cap.
- Shoreline erosion controls, including rip-rap and/or wetlands created along the shoreline, to minimize the potential for washing away of soil and/or waste materials from the edge of the JILF.
- LUCs to restrict land and freshwater groundwater uses within the JILF boundary to prevent unacceptable human exposure to site contaminants. LUCs are also used to prevent unrestricted disturbance of the hazardous waste landfill cap, shoreline erosion controls, and buildings and structures within the boundary of the JILF.
- Monitoring of site media to assess the effectiveness of the remedy over the long term.
- Routine inspections and maintenance of the cap, shoreline erosion controls, and LUCs to ensure continued effectiveness.
- Five-year site reviews to confirm that RAOs are being achieved and that the remedy remains protective.

The selected remedy addressed source control for OU3 (i.e., soil and groundwater within the boundary of the JILF) through installation of a hazardous waste landfill cap and implementation of LUCs, erosion controls, and monitoring. In addition, the ESD signed in October 2005 modified the



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ROD by adding an RAO regarding management of migration (formerly the purpose of OU6) and an ARAR to address groundwater migration (Navy, October 2005).

An earlier 2003 ESD (Navy, September 2003) modified the remedy by reducing the area over which the landfill cover was installed, and required the following: (1) excavation of contaminated soil/waste from an approximately 2.6-acre area bounded by Parker Avenue, Stephenson Road, and Jamaica Cove; (2) consolidation of the excavated material within the limits of the JILF south of Parker Avenue; and (3) construction of wetlands within the excavated area. In addition, it was determined that the waste in the area of the Automotive Hobby Shop was to be removed to the groundwater table, and the excavation area was to be backfilled with clean material and paved with asphalt. This area was not included under the landfill cover; however, a geotextile separates the clean fill from any waste present beneath the water table in this area.

### **5.4.3 Remedy Implementation**

The source areas at Sites 9 and 11 were removed and disposed of off-site during removal actions conducted prior to the ROD for OU3. The concrete vaults at Mercury Burial Sites I and II were removed during removal actions conducted in 1994, 1997, and 2000 (Halliburton NUS, November 1995 and FWENC September 1997 and June 2001). The tanks at Site 11 were removed as part of tank closure in 1989 (McLaren/Hart, August 1991). Therefore, the Remedial Action activities associated with the OU3 remedy focused on addressing contamination within the JILF (Site 8). No further action is required specifically for Site 9 and Site 11 to meet RAOs as documented in the ROD and Final OU3 RACR Navy, February 2015). The ROD concluded that there were no remaining chemicals of concern or contaminated media associated with Site 9 after the vaults were removed and that after the storage tanks and surrounding soil were removed at Site 11 the remaining petroleum contamination in the soil and groundwater from Site 11 operations is being addressed as part of Site 8 because of its close proximity and similar nature to JILF contamination.

Remedial action construction activities were conducted from 2002 to 2004. The Remedial Action construction activities included soil excavation, wetlands construction, and placement of the multiple-layer cap and shoreline erosion controls. Details of the Remedial Action construction are provided in the Remedial Action Report for Jamaica Island Landfill (Tetra Tech EC, May 2006). During the construction activities, waste material found in the offshore area of Clark Cove was also removed and disposed of off- site. The OM&M Plan was completed in 2006 and revised in 2011 (Tetra Tech, December 2011). The OM&M program, initiated in 2006, included groundwater and landfill gas monitoring, landfill inspections and maintenance, and LUC inspections. The LUCRD was finalized in August 2011. Annual landfill and LUC inspections are performed. Annual monitoring of

#### **5.4.4 Five-Year Review Process**

The following documents were reviewed as part of the Five Year Review process for OU3.

- Feasibility Study Report (Tetra Tech, November 2000)
- ROD (Navy, August 2001)
- LUCRD (Navy, August 2011)
- Post Remedial Operation, Maintenance, and Monitoring Plan, Revision 1, Volume 1 and Volume 2 (Tetra Tech, December 2011)
- Second Five Year Review Report for PNS (Tetra Tech, May 2012)
- Round 10 Data Package for Post Remedial Operation, Maintenance, and Monitoring Program for OU3 (Tetra Tech, July 2011b), including summaries of previous rounds.
- Round 11 Data Package for Post Remedial Operation, Maintenance, and Monitoring Program for OU3 (Tetra Tech, September 2011)
- Round 12 Data Package for Post Remedial Operation, Maintenance, and Monitoring Program for OU3 (Service Disabled Contracting Group, Inc., June 2014)
- Round 13 Data Package for Post Remedial Operation, Maintenance, and Monitoring Program for OU3 (Service Disabled Contracting Group, Inc., January 2015)
- Technical Memorandum for Discontinuing Annual Groundwater Monitoring at OU3 Post Remedial Operation, Maintenance, and Monitoring Program (Tetra Tech, August 2013)
- Round 14 Inspection and Maintenance Summary Report (SDC Group, July 2015)
- RACR (Navy, February 2015)
- LUC Inspection Checklists
- SAP for Long-Term Groundwater Monitoring (Resolution Consultants, May 2016)
- Draft Round 15 Inspection and Maintenance Summary Report (Resolution Consultants, January 2017)

#### **5.4.5 OM&M Data Collection and Review**

Annual OM&M has continued since the 2012 five-year review, including annual inspections and environmental sampling.

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**Landfill Inspections.** Annual inspections are conducted at the JILF for the following components:

- Vegetated and Paved Cover Systems
- Ditches, Channel Chutes, and Culverts/Manholes
- Gas Vents and Gas Monitoring Probes
- Monitoring Wells
- Land Use Controls
- Shoreline Protection
- Long Term Stability and Settlement

The 2012 five-year review identified two issues related to site conditions: 1) tilted gas vents and possible minor slope movement upslope of the access road east of the JILF parking area and 2) damage to the internal drainage pipe in at least one place within the cap.

The 2012 five-year review concluded that neither issue was determined to affect the protectiveness of the remedy. The tilt of gas vents has been inspected during each annual landfill inspection. None (25 of 27 gas vents; Gas Vents #2 and #3 were damaged during winter 2014-2015) were noted to be leaning at angles greater than approximately 15 degrees from vertical, and most observed leanings were no more than five degrees from vertical. Observed leaning of these landfill gas vents was determined to be consistent with the construction of the vents (i.e. angles of PVC fittings and connections) and/or the slope of the surrounding landfill cap. Consistent with recommendations of the last Five Year Review report, additional inspections were conducted in the vicinity of the damaged internal drainage pipes. Neither unstable soil or ponding for extended periods of time have been observed, and no further evaluation has been taken.

In 2016, a survey was conducted to evaluate changes in elevation at OU3 with particular focus on the two areas identified for further investigation: the area immediately west of East Road and an area near the eastern side of the jogging path (west of Access Road along Clarks Cove) as shown on Figure 5-2, which presents results of the 2016 survey with elevations compared with 2011. The survey included elevation measurements at six designated settlement disks, six gas vents, and four additional locations. The 2016 elevation readings were compared to elevation measurements from 2011. Insignificant or no change in elevation (1 inch or less) was recorded at all locations, with the exception of the area near Gas Vent #14. The area and slope surrounding this gas vent should continue to be evaluated.

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Annual landfill inspections have also observed maintenance issues for the landfill cover.

- The corner of Parker Avenue and East Road is not paved and shows signs of vehicular traffic such as rutting, compaction, and dead grass where the pavement ends. East Road is a narrow road and the right turn from Parker Road onto East Road is sharp. It is evident that vehicles are driving off of the pavement in order to make the turn. Ongoing erosion/rutting due to vehicular traffic at this location is resulting in the need for frequent maintenance to avoid damaging the integrity of the landfill cap. The damaged area is approximately 500 square feet.

Damage to the vegetative cover along the western edge of East Road has been observed in multiple locations. The vegetative cover is sparse and the erosion control mat is visible in certain locations. The cause of this damage is primarily due to snowplowing efforts and vehicular traffic driving off the road. Water is ponding at specific locations in the damaged area which encourages erosion, and two locations show more significant signs of erosion. The first location is to the north by Gas Vent 4. The water damage at the northern location is less severe and extends approximately 9 feet towards the drainage swale. The second location is to the south near Gas Vent 13 and the road salt/sand storage area. The water damage at the southern location is more severe and has resulted in the formation of an approximate 20-inch wide erosion rill running from the road to the drainage swale. Water pools approximately three feet south of this area. Salt staining has been observed, which is also likely inhibiting grass growth in this area.

- Two gas vents (Gas Vent 2 and Gas Vent 3 located at the northern edge of OU3 near the entrances to the parking lot) have been damaged. Gas Vent 2 has extensive damage with the vertical riser and goose neck broken and the base is visibly damaged. Gas Vent 3 has a damaged polyvinyl chloride (PVC) coupling and goose neck.
- A LUC measure includes 12 "Digging Prohibited" signs located around the landfill. Damage to the signs has been observed primarily due to high winds and/or snow plows.

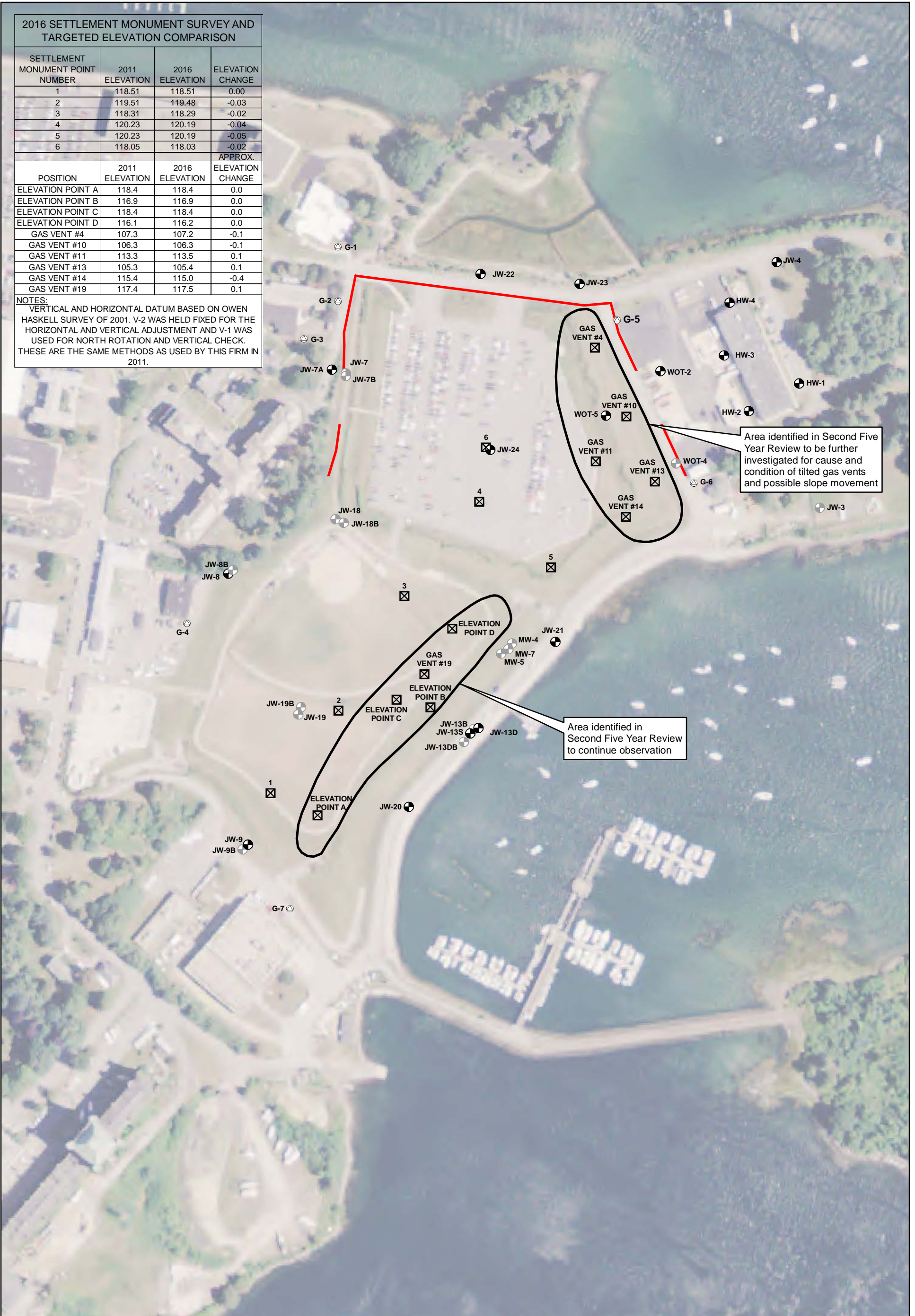
2016 SETTLEMENT MONUMENT SURVEY AND TARGETED ELEVATION COMPARISON

SETTLEMENT MONUMENT POINT NUMBER	2011 ELEVATION	2016 ELEVATION	ELEVATION CHANGE
1	118.51	118.51	0.00
2	119.51	119.48	-0.03
3	118.31	118.29	-0.02
4	120.23	120.19	-0.04
5	120.23	120.19	-0.05
6	118.05	118.03	-0.02


POSITION	2011 ELEVATION	2016 ELEVATION	APPROX. ELEVATION CHANGE
ELEVATION POINT A	118.4	118.4	0.0
ELEVATION POINT B	116.9	116.9	0.0
ELEVATION POINT C	118.4	118.4	0.0
ELEVATION POINT D	116.1	116.2	0.0
GAS VENT #4	107.3	107.2	-0.1
GAS VENT #10	106.3	106.3	-0.1
GAS VENT #11	113.3	113.5	0.1
GAS VENT #13	105.3	105.4	0.1
GAS VENT #14	115.4	115.0	-0.4
GAS VENT #19	117.4	117.5	0.1

NOTES:  
 VERTICAL AND HORIZONTAL DATUM BASED ON OWEN HASKELL SURVEY OF 2001. V-2 WAS HELD FIXED FOR THE HORIZONTAL AND VERTICAL ADJUSTMENT AND V-1 WAS USED FOR NORTH ROTATION AND VERTICAL CHECK. THESE ARE THE SAME METHODS AS USED BY THIS FIRM IN 2011.



Area identified in Second Five Year Review to be further investigated for cause and condition of tilted gas vents and possible slope movement

Area identified in Second Five Year Review to continue observation

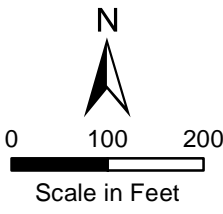


Drawn: JB 10/07/2016  
 Approved: PD 10/07/2016  
 Project #: 60342342

Legend

- Elevation Location
- Monitoring Well
- Abandoned Monitoring Well
- Gas Probe

Aerial Photo Source: 2011 NAIP.



Scale in Feet

FIGURE 5-2  
 2016 SETTLEMENT MONUMENT SURVEY AND TARGETED ELEVATION COMPARISON LOCATIONS  
 PORTSMOUTH NAVAL SHIPYARD  
 KITTERY, MAINE

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The Navy has prepared a landfill repairs design report with recommended repairs to the above mentioned items. The report was submitted for regulatory review in fall 2016 with repairs proposed to protect the landfill cap and reduce future maintenance concerns in 2017.

**Groundwater Sampling.** Round 11 in 2012 included groundwater sampling, and following Round 11 annual groundwater sampling was agreed by Navy, U.S. EPA, and MEDEP to be reduced to every five years (Tetra Tech, August 2013). Groundwater samples collected as part of Round 11 had a reduced analytical list (total and dissolved arsenic and total suspended solids). Round 15, completed in 2016, included groundwater sampling and a larger suite of laboratory analyses (select VOCs, PAHs, total and dissolved metals, total suspended solids for OM&M and the additional analytes PFOS, PFOA, and PFBS). Groundwater sampling results from Round 15 indicate VOCs and PAHs were not detected or were detected at low concentrations. Some chlorinated compounds were detected at low levels in monitoring wells JW-9, JW-13B, and HW-3. PAHs were only detected in well JW-20. Groundwater results were compared to the chronic ecological screening level and human health screening level, as presented on Table 5-2. Based on this comparison to screening levels, no groundwater results detected in Round 15 triggered any actions. The acute ecological screening levels were not used for comparison purposes because no recognizable seeps were observed during the OU3 inspection that would constitute a discharge point for acute ecological risk.

Following Round 10 and historical results, arsenic was identified as a contaminant of concern to continue monitoring for in Round 11. From the Round 15 groundwater sampling, arsenic was detected in six wells sampled. All detections of total and dissolved arsenic were below the project action limit for OU3 (49  $\mu\text{g/L}$ ), and all detections were also below the federal maximum contaminant level (MCL, 10  $\mu\text{g/L}$ ) except total arsenic in well JW-13D which only slightly exceeded the MCL (13  $\mu\text{g/L}$ ; dissolved arsenic concentration was 8.8  $\mu\text{g/L}$ ).

Four monitoring wells (JW-20, JW-21, JW-22, and HW-3) were also sampled for PFAS compounds (i.e. perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), and perfluorobutanesulfonic acid (PFBS)) based on disposal of materials that may have contained perfluorinated chemicals at JILF, including plating sludges, dredged sediment from Berth 6 that received electroplating wastewater, firefighting chemicals, and other consumer products (i.e., carpet and fabric, surfactants, food packaging, and personal care products) PFOA and PFOS concentrations were compared to MEDEP's Remedial Action Guidelines (RAG) for residential (0.13 and 0.56  $\mu\text{g/L}$ , respectively)<sup>1</sup> and construction worker (0.22 and 5.3  $\mu\text{g/L}$ , respectively), which were

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<sup>1</sup> The MEDEP RAG for residential groundwater is intended for comparison to groundwater used as drinking water in a residential exposure scenario. Since institutional land use controls prevent future residential development and preclude

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recently updated by MEDEP on February 5, 2016 (MEDEP, 2016). PFOA and PFOS concentrations were also compared to the USEPA Lifetime Health Advisory level of 0.07 µg/L<sup>2</sup> (USEPA, 2016a and 2016b). There is no promulgated standard for PFBS. The Maine RAGs (which include screening levels for PFOS and PFOA related to construction worker exposures) are in the process of being updated related to PFOS and PFOA. Future sampling will need to account for achieving potentially lower screening levels, as appropriate.

PFAS compounds were not detected above the MEDEP RAGs or USEPA Lifetime Health Advisory level in any well except one well (HW-3). PFOA was detected in well HW-3 at a concentration (0.098 µg/L) slightly above the USEPA Lifetime Health Advisory level of 0.07 µg/L, but below the MEDEP RAG for residential and construction worker. PFOS was detected in well HW-3 at a concentration (1.3 µg/L) above the USEPA Lifetime Health Advisory level of 0.07 µg/L and MEDEP RAG for residential use, but below the MEDEP RAG for construction worker. However, as part of the remedy for OU3, LUCs prevent using any fresh water for drinking within the JILF boundary. Therefore, there is currently no potential exposure pathway of concern for detected PFOS and PFOA. Since the USEPA Lifetime Health Advisory level and MEDEP RAG for residential use are not appropriate as actionable standards in OU3, no groundwater results detected in Round 15 triggered any actions.

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groundwater withdrawal for drinking water purposes in OU3, the MEDEP RAG for residential groundwater is not appropriate, but used for comparison to groundwater results for informational purposes only.

<sup>2</sup> The USEPA Lifetime Health Advisory value of 0.07 µg/L is a guidance value provided to drinking water operators for comparison to potable drinking water. Since groundwater is non-potable and not used for drinking water, the USEPA Lifetime Health Advisory value is not appropriate, but used for comparison to groundwater results for informational purposes only.





**Table 5-2  
Round 15 Groundwater Data  
Portsmouth Naval Shipyard, Operable Unit 3  
Kittery, ME**

Location Sample ID Sample Date Zone	Acute Ecological Screening Levels	Chronic Ecological Screening Level	Human Health Screening Level	HW-2	HW-3	JW-7A	JW-8	JW-9	JW-13B	JW-13D	JW-20	JW-21	JW-22	JW-23
				OU03-HW2-072716	OU03-HW3-072716	OU03-JW7A-072516	OU03-JW8-072516	OU03-JW9-072616	OU03-JW13B-072616	OU03-JW13D-072616	OU03-JW20-072616	OU03-JW21-072816	OU03-JW22-072616	OU03-JW23-072516
				7/27/2016 ZONE 3B	7/27/2016 ZONE 5	7/25/2016 ZONE 3A / 4	7/25/2016 ZONE 2	7/26/2016 ZONE 1	7/26/2016 ZONE 2	7/26/2016 ZONE 2	7/26/2016 ZONE 1	7/28/2016 ZONE 3A / 3B	7/26/2016 ZONE 4	7/25/2016 ZONE 5
Cobalt	1,500	8625	390	10.9	1 U	1 U	1 U	0.93 J	--	2 U	3.68	2 U	2 U	2 U
Copper	4.8	1163	52,000	4.68	1.4 J	3 U	12	24.9	--	11.3	90.3	12.6	9.2	9.46
Iron	--	375,000	910,000	3920	69.9 J	326	9.4 J	55 J	--	100 J	2430	130	418 J	140 J
Lead	210	3038	455	2.82	0.35 J	0.39 J	0.4 J	18.7	--	0.53 J	49.4	0.6 J	0.91 J	0.79 J
Magnesium	--	--	--	15400	29200	9520	4780	613000	--	969000	697000	1120000	557000	975000
Manganese	2,300	45000	11,200	912	2 U	31.9	1.1 J	931	--	44.2	524	28.3	39	4.6
Mercury	1.8	353	200	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	--	0.2 U	0.032 J	0.2 U	0.2 U	0.2 U
Nickel	74	3075	20,100	13.1	2.43	2.61	1.2 J	23.5	--	9.23	39	26.4	10.8	7.87
Potassium	--	--	--	12300	7650	8240	5590	222000	--	366000	268000	391000	207000	366000
Selenium	290	26625	6500	2.64 J	1.4 J	0.39 J	0.46 J	10 U	--	10 U	10 U	20 U	10 U	10 U
Silver	1.9	71.3	3190	0.056 J	1 U	1 U	1 U	2 U	--	0.21 J	0.26 J	0.2 J	0.21 J	0.14 J
Sodium	--	--	--	268000	362000	488000	254000	5570000	--	9080000	5680000	9640000	5230000	9300000
Thallium	213	6375	--	1 U	1 U	1 U	1 U	2 U	--	2 U	2 U	0.18 J	2 U	2 U
Vanadium	280	7500	6500	5 U	5 U	5 U	5 U	10 U	--	10 U	10 U	10 U	10 U	10 U
Zinc	90	30375	402,000	35	10 U	42.8	20	22	--	28	215	46	32	27
<b>Dissolved Metals (ug/L)</b>														
Aluminum	750	32625	1300000	65 J	300 U	300 U	23 J	1500 U	--	1500 U	91 J	300 U	80 J	1500 U
Antimony	1,500	187500	366	1 U	1 U	1 U	1 U	2 U	--	2 U	2 U	2 U	2 U	2 U
Arsenic	69	13500	49	5.1	5 U	5 U	5 U	5.2 J	--	8.8 J	6.7 J	6.1 J	10 U	6.8 J
Barium	1,000	75,000	131,000	6.38	92 J	87.4	39.1	82.8	--	22.7	111	28.6	140	42.5
Beryllium	1,500	37500	226	1 U	1 U	1 U	1 U	2 U	--	0.12 J	2 U	2 U	2 U	2 U
Cadmium	33	7.9	270	1 U	1 U	1 U	1 U	2 U	--	2 U	2 U	0.23 J	2 U	2 U
Calcium	--	--	--	37000	202000	104000	44400	238000	--	377000	284000	367000	290000	352000
Chromium	1,100	18750	569	5 U	5 U	5 U	5 U	10 U	--	10 U	10 U	10 U	10 U	10 U
Cobalt	1,500	8625	390	2.3	0.47 J	1 U	1 U	2 U	--	2 U	2 U	2 U	2 U	2 U
Copper	4.8	1163	52,000	3 U	3 U	3 U	3.21	16.3	--	9.61	23	22.8 J	12.9	13.8
Iron	--	375,000	910,000	3020	11 J	100 U	100 U	500 U	--	500 U	500 U	32 J	500 U	500 U
Lead	210	3038	455	0.66 J	0.24 J	1 U	0.12 J	1.4 J	--	0.18 J	3.1	0.21 J	2 U	0.25 J
Magnesium	--	--	--	14300	28700	9570	4840	606000	--	1110000	685000	1150000	610000	960000
Manganese	2,300	45000	11,200	853	1.5 J	4.74	2 U	80.2	--	39.6	30.5	12.9	34	4 U
Mercury	1.8	353	200	0.2 U	0.2 U	0.2 U	0.1 U	0.2 U	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	74	3075	20,100	4.69	2.32	2 U	2 U	9.1	--	9.45	15.8	26.4	12.9	7.77
Potassium	--	--	--	10700	7680	8490	5400	220000	--	390000	261000	418000	234000	363000
Selenium	290	26625	6500	5 U	5 U	5 U	5 U	10 U	--	10 U	10 U	20 U	10 U	10 U
Silver	1.9	71.3	3190	1 U	0.053 J	1 U	1 U	2 U	--	2 U	0.18 J	0.27 J	0.27 J	0.16 J
Sodium	--	--	--	244000	367000	492000	261000	5360000	--	8680000	6380000	9920000	5820000	8960000
Thallium	213	6375	--	1 U	1 U	1 U	1 U	2 U	--	2 U	2 U	2 U	2 U	2 U
Vanadium	280	7500	6500	5 U	5 U	5 U	5 U	10 U	--	10 U	10 U	10 U	10 U	10 U
Zinc	90	30375	402,000	10	10 U	10	16	19 J	--	22	101	47	36	27
<b>PFAS (ug/L)</b>														
Perfluorooctane Sulfonate (PFOS)	0.56 <sup>a</sup>	5.3 <sup>b</sup>	0.07 <sup>c</sup>	--	1.3	--	--	--	--	--	0.035	0.017 U	0.054	--
Perfluorooctanoic acid (PFOA)	0.13 <sup>a</sup>	0.22 <sup>b</sup>	0.07 <sup>c</sup>	--	0.098	--	--	--	--	--	0.014 J	0.018 U	0.0096 J	--
Perfluorobutanesulfonic acid (PFBS)	--	--	--	--	0.056	--	--	--	--	--	0.017 U	0.016 U	0.016 U	--
<b>Miscellaneous Parameters</b>														
Total Suspended Solids (mg/L)	--	--	--	24	4 U	11	4 U	6.8	--	10	80	5.6	7.2	8.8
<b>Field Parameters</b>														
Dissolved Oxygen (mg/L)	--	--	--	0.36	0.57	3.34	3.10	1.55	3.79	4.21	0.46	6.13	2.75	2.57
Oxidation Reduction Potential (mV)	--	--	--	-79.9	-47.5	134.9	-32.9	122.7	91.5	103.7	50.7	113.0	95.4	61.5
pH (PH)	--	--	--	6.95	6.98	7.13	6.89	6.89	6.45	7.28	7.64	6.09	6.75	7.67
Specific Conductivity (µs/cm)	--	--	--	1270	3060	2965	1259	32520	20293	44915	29394	41223	22885	44757
Temperature (°C)	--	--	--	16.79	17.18	13.37	17.07	16.65	18.50	18.10	13.93	18.01	15.00	17.48
Turbidity (NTU)	--	--	--	0.32	3.11	3.61	0.03	1.20	463	3.11	10.3	0.36	9.67	1.40

**Notes:**

Screening levels presented reflect risk-based values in Final Second Five-Year Review Report.

<sup>a</sup>Maine RAG Residential

<sup>b</sup>Maine RAG Construction Worker

<sup>c</sup>USEPA Lifetime Health Advisory, USEPA Lifetime Health Advisory is a guidance value provided to drinking water operators. Under this advisory the sum of PFOS and PFOA should be less than 0.07 ug/L.

J - Indicates that the chemical was detected. However, the associated numerical result is not a precise representation of the amount that is actually present in the sample. The laboratory reported concentration is considered to be an estimate of the true concentration.

U - Indicates that the chemical was not detected at the numerical detection limit (sample-specific quantitation limit) noted. This qualifier is added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.

UJ - Indicates that the chemical was not detected. However, the detection limit (sample-specific quantitation limit) is considered to be estimated based on problems encountered during laboratory analysis. The associated numerical detection limit is regarded as inaccurate or imprecise.

Other laboratory analyses from Round 15 were all below OU3 project action limits.

**Landfill Gas Monitoring.** Measuring of landfill gas from gas monitoring probes was conducted over 11 rounds of monitoring. Landfill gas was not measured above threshold criteria in any of the sampling rounds, and methane was often not detected above background (0.0 percent volume in air) in any other gas probe. Based on historic gas concentrations, landfill gas probes were abandoned in July 2014 in accordance with the Gas Monitoring Probe Abandonment Plan (SDC Group, February 2015).

#### **5.4.6 Progress Since the Last Five-Year Review**

The 2012 five-year review identified no deficiencies or issues related to site operations, conditions, or activities that prevented the OU3 remedy from being protective in the short or long term. The 2012 five-year review report stated the remedy at OU3 is protective of human health and the environment.

The two issues related to site conditions identified in the 2012 five-year review (tilted gas vents and possible minor slope movement upslope of the access road east of the JILF parking area and damage to the internal drainage pipe in at least one place within the cap) have been further investigated. These issues are not affecting protectiveness or effectiveness of the remedy. Gas Vent #2 was destroyed, however, landfill gas readings collected in January 2016 indicated that venting concentrations are similar to ambient air so it was recommended that this gas vent be decommissioned. Gas Vent #3 was observed to have a damaged polyvinyl chloride (PVC) coupling and goose neck. Repairs consisting of replacement of the PVC coupling, vent tip, and associated screen were recommended. Of the twenty-five remaining landfill gas vents, none were noted to be leaning at angles greater than approximately 15 degrees from vertical, and most observed leanings were no more than five degrees from vertical. Observed leaning of these landfill gas vents was determined to be consistent with the construction of the vents (i.e. angles of PVC fittings and connections) and/or the slope of the surrounding landfill cap. No evaluation is recommended related to the internal drainage pipe as well as tilted gas vents. Minor settling on the slope surrounding gas vent #14 should continue to be evaluated.

### **5.5 Technical Assessment**

#### **5.5.1 Question A: Is the Remedy Functioning as Intended by Decision Documents?**

##### *Remedy Summary*

Remedial Action included soil excavation, wetlands construction, placement of the multiple-layer cap and shoreline erosion controls, OM&M, and LUCs. Remedial components have been in place for

more than 10 years. In accordance with the LUCRD for OU3 (Navy, August 2011), annual and periodic visual inspections are conducted to verify that the required controls have been implemented and are being properly maintained.

*Technical Evaluation*

Based on review of historical and recent documents and the site visit on 15 July 2016, the OU3 remedy is functioning as intended by the ROD as modified by the 2003 and 2005 ESDs as summarized in the technical evaluation for Question A in Table 5-2.

**Table 5-3**  
**Operable Unit 3 (Site 8)**  
**Technical Evaluation – Question A**

Question	Summary
Remedial Action Performance	Remedial Action construction was completed in 2004. Operations, maintenance, and monitoring have been performed since Remedial Action, including inspections, groundwater sampling, and gas monitoring (gas probes abandoned in 2014 based on monitoring results). LUCs are in place to prevent future residential and potable water usage. Therefore, the Remedial Action is operating and functioning as designed.
Systems Operation/ Operation and Maintenance	Landfill cap consists of pavement and vegetative covers. A network of gas vents is in place to vent landfill gas if created. Shoreline erosion controls, including rip-rap and created wetlands, are in place to minimize the potential for washing away of soil and/or waste materials from the landfill. All features effective as are inspected annually.
Opportunities for Optimization	Opportunities to optimize O&M have been implemented during this review period. Groundwater monitoring was reduced to once every five years (Tetra Tech, August 2013). Gas probes were abandoned based on historic monitoring (SDC Group, February 2015).
Implementation of LUCs and Institutional/ Engineering Controls	LUCs are in place and operating in accordance with the LUCRD for OU3. No changes have been made to the LUCs developed for OU3 during this review period.
Early Indicators of Potential Remedy Problems	Tire rutting, salt staining, and erosion channels have been observed along the landfill side of east road. These observations can contribute to further erosion, which over time can expose the cap components and lead to future damage.

**5.5.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives used at the time of the remedy selection still valid?**

*Risk Summary*

Calculated human health risks for construction workers, occupational workers, and recreational users were below or within the acceptable risk range for exposure to soils. Unacceptable risks were calculated for the hypothetical future resident. The selected remedy included capping of

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contaminated materials in place and was designed and implemented to allow continued use for parking and recreational purposes. ICs were established that prevent disturbance of the cover materials and potable use of groundwater. There have been no changes in land use since the ROD or Remedial Action was completed. Default exposure assumptions for adult body weight, soil ingestion rate, and skin surface area have been updated since the 2001 ROD (US EPA, 2011; US EPA, 2014). Default adult body weight has increased from 70 kilograms (kg) to 80 kg. Default soil ingestion rates have decreased for the construction worker [480 to 330 milligrams per day (mg/day)]. Default skin surface area for exposure to soil has decreased for construction workers (5,800 to 3,527 cm<sup>2</sup>), industrial workers (5,800 to 3,527 cm<sup>2</sup>), and child recreational users. Default skin surface area has increased for residents and adult recreational users (5,800 to 6,032 cm<sup>2</sup>). While there have been changes to exposure parameters since the HHRA, they do not affect the protectiveness of the remedy (capping in place) related to all receptors.

Screening levels and action levels were recalculated for potential recreator exposure to intertidal surface water. Exposure assumptions for adult body weight and skin surface area were updated. Adult body weight increased from 70 to 80 kg. Recreator skin surface area increased for the adult (4,500 to 5,021 cm<sup>2</sup>) and adolescent (4,290 to 4,406 cm<sup>2</sup>) and decreased for the child (4,000 to 3,805 cm<sup>2</sup>). Updated skin surface area followed previous methodology using the 25<sup>th</sup>, 33<sup>rd</sup>, and 50<sup>th</sup> percent of whole body exposures for the adult, adolescent, and child, respectively. The child recreator was assumed to be aged 4 to 6 as younger children are unlikely to play in seeps due to the rocky shore. Action levels were developed using a target risk of  $1 \times 10^{-5}$  and a hazard of 1. Screening levels were developed using a target risk of  $1 \times 10^{-6}$  and a hazard of 0.1. Screening levels were developed for generic use across the shipyard. Recalculated action levels and screening levels for groundwater are presented in Appendix C. Refer to Section 5.4.5 for a discussion of data as compared to the updated screening and action levels. As there were no exceedances of screening or action levels, the remedy remains protective.

### *Technical Evaluation*

The technical evaluation for Question B is in Table 5-4.

### *Conclusions*

The RAOs outlined in the ROD for OU3 as modified by the 2005 ESD have been achieved and OU3 is Response Complete.

PFOS and PFOA were detected in three of four monitoring wells sampled in 2016. Detections of these analytes in two of these wells (JW-20 and JW-22) were below the USEPA Lifetime Health

Advisory Level and the MEDEP residential Remedial Action Guidelines (RAGs). The concentrations at well HW-3 (located upgradient of OU3) are above the EPA HAL and Maine residential criteria but below the Maine construction worker RAG (although changes to the RAGs are ongoing).

**Table 5-4**  
**Operable Unit 3 (Site 8)**  
**Technical Evaluation – Question B**

Question	Summary
Changes in Applicable or Relevant and Appropriate Requirements (ARARs) or To-Be-Considered (TBC) Criteria	<p>The ARARs and TBC criteria listed in the ROD and 2005 ESD for OU3 are shown in Appendix B. Because the cover and erosion controls have been constructed, the only changes in ARARs and TBCs that could affect the remedy are related to the OM&amp;M components of the remedy. The ROD included chemical-specific TBCs that were used in assessing human health risk and developing risk-based soil remedial goals. The 2005 ESD added ARARs based on the addition of management of migration to the remedy, which included: Clean Water Act, Section 304(a), National Recommended Water Quality Criteria and Main Surface Water Toxics Control Program, Chapter 530.5, Statewide Water Quality Criteria. These criteria have been used as guidance for developing action levels for the groundwater monitoring program as part of the OU3 OM&amp;M Plan. The previous five-year review included a review of the human health and ecological action levels and screening criteria and identified updates to certain criteria due to changes in ARARs or TBCs, including toxicity criteria. For this five-year review, the action levels were further reviewed to identify updates based on changes in standards and for ARARs or TBCs. Since the previous five-year review and the 2011 OM&amp;M Plan, the cadmium acute and chronic values from the aquatic life National Recommended Water Quality Criteria were updated and the ecological action levels for cadmium should be modified to 33 ug/l for the acute value (previously 40 ug/l) and 7.9 ug/l for the chronic value (previously 8.8 ug/l). Otherwise, the ecological action levels and screening levels do not require any updates since the previous five-year review. Human health action levels and screening levels were also reviewed and a comparison of the updated action and screening levels to the previous levels is included in Appendix C. Updates were identified based on changes in toxicity values for some chemicals. None of the criteria changes affect protectiveness as long as the landfill cap remains in place and uncompromised, eliminating the chance of exposure.</p> <p>Note that the 2001 ROD includes Executive Order 11988 and Appendix A of 40 CFR 6 as applicable floodplain management and wetland protection requirements. This provision of the CFR no longer exists. The current provision is a FEMA regulation codified at 44 CFR 9 (Floodplain Management and Protection of Wetlands). Since the remedy has been constructed and will continued to be maintained, including the landfill cover and shoreline erosion controls, there are no concerns with the protectiveness of the remedy.</p>
Expected Progress towards Meeting Remedial Action Objectives (RAOs)	Remedial Action construction was completed in 2004. Operations, maintenance, and monitoring have been performed since Remedial Action, including inspections, groundwater sampling, and gas monitoring. LUCs are in place to prevent future residential and potable water usage. LUCs are also used to prevent unrestricted disturbance of the hazardous waste landfill cap, shoreline erosion controls, and buildings and structures within the boundary of the JILF.
Changes in Exposure Pathways	No changes in exposure pathways were identified during this five-year review.
Changes in Land Use	No changes in land use have been identified in Annual LUC inspections. The OU3 LUCs require regulatory notification of proposed land use changes; the 2012 to 2016

Question	Summary
	Site Management Plans, 2013 to 2016 LUC checklists do not indicate proposed land use changes.
New/Emerging Contaminants and Contaminant Sources	An evaluation was completed of use of PFASs base-wide for PNS. Round 15 groundwater sampling included laboratory analysis of PFOS, PFOA, and PFBS based on disposal of materials that may have contained PFAS at JILF, including plating sludges, dredged sediment from Berth 6 that received electroplating wastewater, firefighting chemicals, and other consumer products (i.e., carpet and fabric, surfactants, food packaging, and personal care products). PFOS and PFOA were detected in three of four monitoring wells sampled in 2016. All concentrations of PFOS and PFOA are below Maine RAG for Construction Worker RAG (although changes to the RAGs are ongoing). The concentrations at well HW-3 (located upgradient of OU3) are above the EPA HAL and Maine Residential RAG. As part of the remedy for OU3, LUCs prevent using any fresh water for drinking within the JILF boundary. Therefore, there is currently no potential exposure pathway of concern for detected PFOS and PFOA.
Changes in Toxicity, Risk Assessment Methods, and Cleanup Levels	Post-Remedial Action, LUCs prevent exposure to effectively mitigate risks to landfill wastes and soils which preclude UU/UE, so the focus is preventing exposure and enforcing those controls to ensure protectiveness. Changes in toxicity, risk assessment methods, and exposure models have no effect on remedy protectiveness on human health and the environment which focuses on prevention of exposure to contaminated soil in Site 8. As long as the landfill cover and shoreline erosion control structures are maintained and LUCs are enforced to eliminate the direct and indirect contact pathways, the remedies remain protective.

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

No other information has come to light that could call into question the protectiveness of the remedy.

### 5.6 Issues, Recommendations, and Follow-Up Actions

Based on the results of the site inspection and review, the following recommendation is made for OU3:

Issue	Affect Protectiveness		Recommendations	Implementing Party	Oversight Agency	Milestone Date
	Current	Future				
Potential settling at slope surrounding gas vent #14	No	Yes	Continue to monitor cap elevation (including changes) to evaluate settling	Navy	USEPA and MEDEP	2018

## **5.7 Protectiveness Statement**

The remedy implemented at OU3 is currently protective of human health and the environment. RAOs have been achieved and exposure to media that could result in unacceptable risks at Site 8 is prevented through LUCs and O&M and monitoring. Continued cap elevation evaluation as part of the O&M program to address the identified issue (Section 5.6) will maintain the effectiveness of the remedy into the future.

## **6.0 OPERABLE UNIT 7, SITE 32**

OU7 consists of Site 32, the Topeka Pier Site and encompasses approximately 17 acres of filled land on the northern shore of PNS, along the Back Channel of the Piscataqua River, from just west of Building 162 to east of former Building H29 and from the Back Channel south to Building 129. See Figure 1-2 for the location of Site 32 within PNS. The OU7 ROD was signed in September 2013. OU7, Site 32 is included in this five-year review because after Remedial Action, contaminants remain in surface soil at concentrations that do not allow for UU/UE and the remedy required LUCs to prevent residential land use, to enforce appropriate management of excavated soil, and to inspect and maintain shoreline controls.

### **6.1 Site History and Background**

Table 6-1 summarizes the chronology of events at Site 32. Figure 6-1 shows the boundary of Site 32.

OU7 is a tidal area that was filled from approximately 1900 to 1945 to allow use for various industrial activities in support of Shipyard operations. Past industrial activities included storing and milling of lumber, storing and seasoning wood (in the Former Timber Basin), storing coal and scrap iron, and storing combustibles including paints and oils. Materials used to fill the area consisted mostly of rock and soil, with some debris and scrap material. In the area filled before 1910 in the vicinity of Building 237, the fill material is mostly rock with some soil and no debris. Disposal of combustible material (possibly paint and oil) in the Former Timber Basin area reportedly began in 1939. By 1945, all filling and possible disposal at OU7 had ceased. A boat pier (Topeka Pier) was constructed along the shoreline in the western portion of the site around 1905.

### **6.2 Conceptual Site Model**

The primary contaminant sources at OU7 are associated with the fill material and past industrial uses of the site. Soil contaminants identified at OU7 are metals (e.g., antimony, copper, iron, and lead), dioxins/furans, PCBs, and carcinogenic PAHs. In general, chemical concentrations greater than conservative levels that indicate a potential for human health risks (i.e., residential risk-based screening levels) were found in areas filled after 1910. Concentrations were lower in the area filled before 1910 in the vicinity of former Building 237, where the fill material consisted mostly of rock and soil with no debris. There have been no changes in land use during the five-year review period that would affect the conceptual site model.

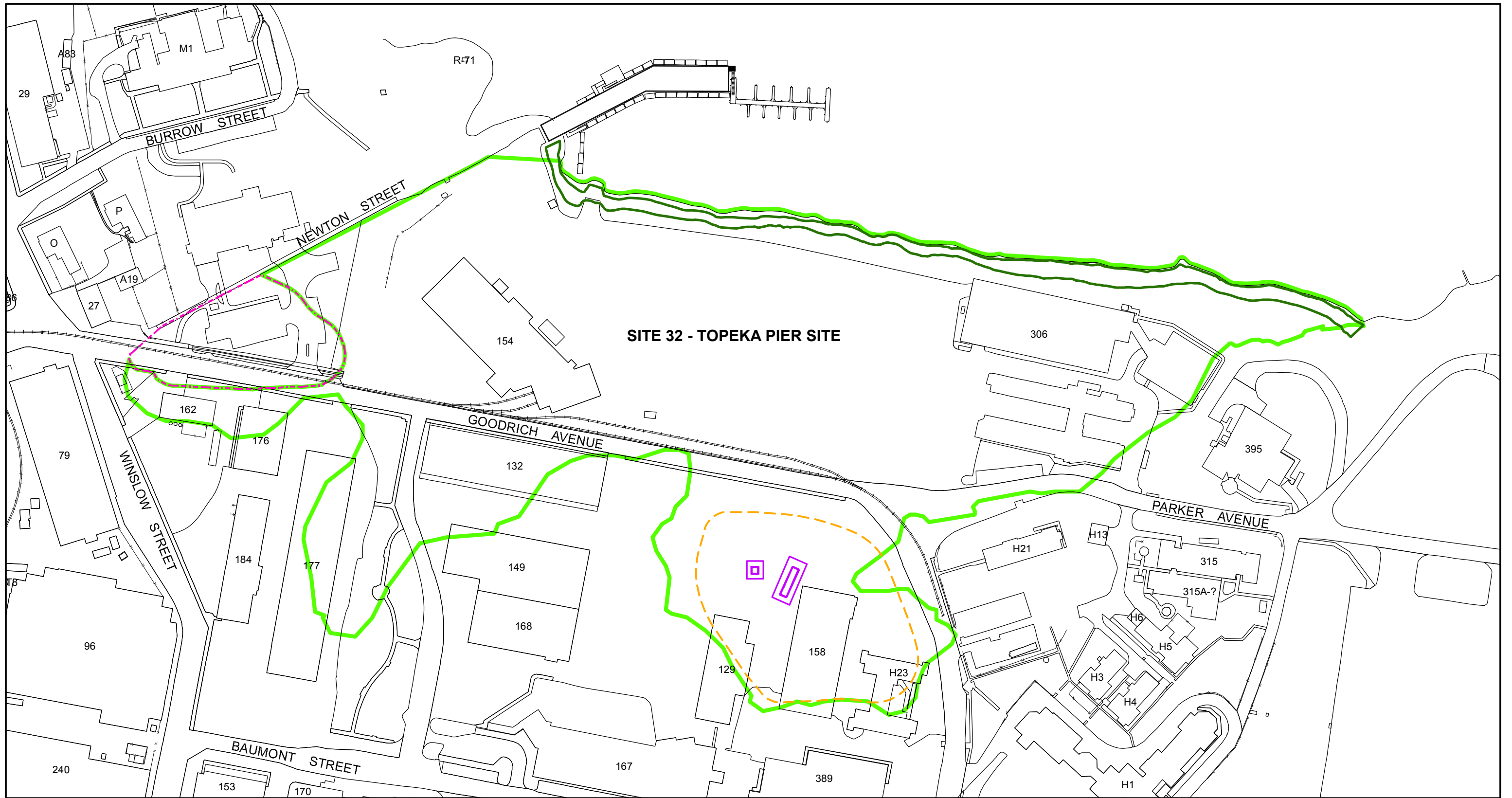


**Table 6-1**  
**Operable Unit 7 (Site 32) – Site Chronology**

Date	Event	Description
1994-1997	RCRA RFI Data Gap Investigation and Groundwater and Seep and Sediment Monitoring	Prior to the Site Screening Investigation (SSI) for OU7, several environmental investigations at PNS, including sampling within what is now the OU7 area, were completed. In 1994, the investigation conducted to resolve data gaps to address deficiencies in the RFI included installation of a non-site-related monitoring well cluster (the FA monitoring well cluster) in what was later identified as OU7. From 1996 to 1997, a facility-wide groundwater monitoring program was conducted to resolve data gaps in the RFI by providing a snapshot of overall groundwater quality at PNS based on four rounds of quarterly data from monitoring wells at PNS. The FA well cluster was included in this monitoring program. Monitoring of seep water and collocated sediment in several intertidal areas of PNS (i.e., areas exposed during low tide and submerged during high tide) was conducted along with groundwater monitoring to provide data for use in contaminant fate and transport modeling. Four locations were sampled in the OU7 intertidal area. Data from the FA well cluster and seep and sediment monitoring were later used as part of data evaluation activities for the OU7 Remedial Investigation (RI).
1998	Site Screening Investigation (SSI)	The SSI for OU7 was conducted to document the release or potential release of hazardous substances that may be present, to make recommendations for further action (e.g., an RI), and to eliminate from further investigation those portions of the site that may pose no appreciable risk to the environment or human health. The sampling and analyses targeted potential source areas at OU7 and provided soil and groundwater data for the site. Additionally, the SSI provided geological and hydrogeological information that was combined with other geological and hydrogeological information for the site to understand site conditions including contaminant fate and transport. Based on chemical concentrations in surface and subsurface soil and groundwater samples, the SSI concluded that an RI was necessary. The SSI Report was finalized in 2000.
1998	Multi-Sensor Towed Array Detection System (MTADS)	This investigation was conducted to generate geophysical maps of Jamaica Island (OU3, located east of OU7) and OU7 to identify ferrous or steel-reinforced concrete containers that may have been used to dispose of materials. The survey was conducted on the approximately one-fourth to one-third of OU7 that was accessible to identify magnetic and electromagnetic anomalies. The portions of the site not surveyed were inaccessible because of equipment, fenced laydown areas, railroad tracks, and other structures. The MTADS showed buried utility lines throughout the OU7 area, but an anomaly in the southeastern corner of the survey area did not correlate to site features (e.g., utilities). Based on historical figures, a railroad previously ran near the location of the anomaly (north of Goodrich Avenue), and utilities were previously located around the anomaly. Although it was likely that this anomaly was associated with former railroad tracks or utilities, the exact nature of the anomaly was unknown. The anomaly was investigated further during the RI; no drums were found. The MTDAS report was finalized in 2001.

Date	Event	Description
1999-2010	Interim Offshore Monitoring	Interim offshore monitoring for OU4 was conducted to provide current data on the offshore areas to evaluate whether onshore Remedial Actions, natural processes, and/or other sources have affected chemical concentrations at OU4. Sediment at the two monitoring stations located in the offshore area of OU7 (MS-03 and MS-04) were sampled during the first seven rounds of the Interim Offshore Monitoring Program. Copper, nickel, and PAH sediment contamination was found. The copper and nickel were from foundry slag in the OU7 offshore area. The sediment data were used as part of data evaluation activities for the OU7 RI.
2003 and 2008	Phases I and II RI Field Work	Soil, sediment, groundwater, and intertidal surface water (outfalls and nearby surface water) samples were collected at OU7 to support evaluation of the nature and extent of contamination and risk assessment. During Phase I, approximately 70 soil samples, 10 groundwater samples, and six surface water samples were collected and analyzed for OU7 potential contaminants. Approximately 70 sediment samples were collected and analyzed for nickel and copper. A wetlands functions and values assessment of the intertidal area was also conducted. Based on evaluation of Phase I data, it was recommended that Phase II include one round of groundwater sampling, soil sampling in select areas to define the extent of high chemical concentrations, and exploratory borings to define the extent of potential petroleum contamination. The Phase II field work included collection of approximately 50 additional soil samples, 10 additional groundwater samples from OU7 wells and upgradient wells (at Site 30), and approximately 40 sediment samples from the intertidal areas. Data were determined to sufficiently fill the data gaps identified after the Phase I RI sampling event.
2006	Removal Action for Site 32 Shoreline Stabilization	In June 2006, the Navy conducted an emergency removal action along the OU7 shoreline to address erosion north of Building 306. Based on the presence of eroding debris, including foundry slag, the Navy removed surface debris and placed a shoreline erosion control (revetment) structure along the entire OU7 shoreline (approximately 1,200 linear feet) to prevent further erosion. The controls cover the high- to mid-tide portion of the shoreline and consist of a peastone layer to create the necessary grade for an 8-ounce, non-woven, geotextile fabric followed by two layers of graded rock. Granite blocks are at the toe of the slope at the mid-tide elevation.
2011	RI Report	The RI Report was prepared to characterize the nature and extent of contamination, evaluate potential risks to human receptors, and determine the potential for OU7 contamination to adversely impact the offshore area. Potential onshore ecological risks were not evaluated because OU7 is in an industrial area with no onshore ecological habitats. The RI indicated that the nature and extent of contamination was sufficiently defined. Potentially unacceptable risks were estimated for current and future exposure to soil at OU7. Exposure to groundwater, surface water, and sediment does not pose unacceptable risks for human receptors. The area filled before 1910 without debris (in the vicinity of former Building 237) was evaluated separately from the rest of the site, and risks were acceptable for all receptors exposed to soil in this area. Groundwater, surface water, sediment, and soil data from OU7 and modeling conclusions showed that migration of contaminants in groundwater from OU7 to the offshore does not pose a current unacceptable risk and would not pose a future unacceptable risk. Evaluation of the existing shoreline erosion controls indicated that no further erosion is occurring; however, these controls need to be maintained to ensure that future erosion of contaminated fill does not occur and impact the offshore environment.
2013	FS Report	Based on the nature and extent of soil contamination determined during the RI, an FS was conducted to develop and

Date	Event	Description
		evaluate soil remedial alternatives.
2013	Proposed Plan	The Proposed Plan presented the Navy's Preferred Alternative to address contamination. A 30-day public comment period was held from July 16 to August 15, 2013. No modification to the proposed remedy was necessary based on comments received during the public comment period.
2013	ROD	The ROD was signed in September 2013, and the selected remedy includes excavation of soil associated with potentially unacceptable risks to industrial workers and LUCs to prohibit residential land use, require management of excavated subsurface soil, and require LTMgt of the existing shoreline erosion controls at OU7. Based on the selected remedy, the area filled before 1910 without debris is no longer within the OU7 boundary.
2014	LUCRD	The LUCRD provides the necessary implementation actions for LUCs for OU7.
2015	Remedial Action Construction	Remedial Action activities, including pre-excavation confirmation sampling, soil excavation, and site restoration were conducted for two excavation areas (EA-1 and EA-2) within the former timber basin area per the 2015 Remedial Action Work Plan. Pre-excavation confirmation sampling was conducted in May and July 2015, and excavation was conducted in August and September 2015.
2016	LTMgt Plan	The LTMgt Plan was prepared to guide site personnel in performing inspection, maintenance, and associated recordkeeping and reporting for the LUC component of the OU7 remedy, which includes restrictions on land use and inspection and maintenance of erosion controls along the shoreline of OU7.
2016	RACR	Documents selected remedy has been implemented and is in place, RAOs have been met, and implementation of LUCs will ensure RAOs will continue to be met and that status is Response Complete at OU7.



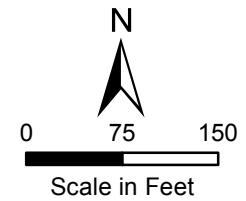
**SITE 32 - TOPEKA PIER SITE**



**Legend**

- OU7 Boundary
- Excavation Area
- Former Timber Basin
- Area Filled Before 1910 with No Debris
- Shoreline Erosion Control

Drawn: JB 02/24/2017  
 Approved: PD 02/24/2017  
 Project #: 60342342



**FIGURE 6-1  
 OPERABLE UNIT 7, SITE 32  
 LAND USE CONTROL BOUNDARY**

**PORTSMOUTH NAVAL SHIPYARD  
 KITTERY, MAINE**

Human health risk associated with direct contact with subsurface soil was limited prior to the remedial action because most of the site was covered with asphalt/pavement and risk is prevented through LUCs. Since the remedial action was completed, soil was excavated and disposed of offsite. The excavated areas were restored and LUCs are still in place.

### **6.3 Basis for Taking Action**

Potentially unacceptable risks were estimated for current and future exposure to soil at OU7 as concluded by the RI and summarized in Table 6-1. Identified human health risks included hypothetical future residential exposure to lead in surface soil and subsurface soil containing antimony, copper, dioxins/furans, iron, lead, carcinogenic PAH, and PCBs and current and future industrial workers (construction and occupational exposures) to subsurface soil containing dioxins/furans and PCB concentrations exceeding industrial cleanup levels.

### **6.4 Remedial Actions**

The ROD for OU7 was signed 1 September 2013 during this Five Year Review period (Navy, September 2013a). The RAOs, remedial components, remedy implementation, and progress since the previous five-year review are described below.

#### **6.4.1 Remedial Action Objectives**

The RAOs for Site 32 to protect human health and the environment include:

- Prevent residential exposure through ingestion of, inhalation of, and dermal contact with surface soil containing lead and subsurface soil containing antimony, copper, dioxins/furans, iron, lead, carcinogenic PAH, and PCB concentrations exceeding residential cleanup levels.
- Prevent industrial worker (construction and occupational) exposure through ingestion of, inhalation of, and dermal contact with subsurface soil containing dioxins/furans and PCB concentrations exceeding industrial cleanup levels.
- Protect the offshore environment from erosion of contaminated soil from the OU7 shoreline.

To achieve these RAOs, the following remedial cleanup levels were established in the ROD for soil at OU7.

Receptor	Media	Contaminant	Cleanup LEVEL (mg/kg)	Basis
Industrial worker (construction & occupational)	Subsurface Soil (Area 1)	Dioxins/furans (based on TCDD TEQs)	0.0006	Site-specific non-cancer risk
	Subsurface Soil (Area 2)	Total PCBs	7.4	Site-specific cancer risk
Future Hypothetical Resident	Surface Soil	Lead	400	USEPA OSWER Directive 9355.4-12 (residential)
	Subsurface Soil	Carcinogenic PAHs	0.5	Site-specific cancer risk
		Dioxins/furans (based on TCDD TEQs)	0.000051	Site-specific non-cancer risk
		Total PCBs	7.3	Site-specific cancer risk
		Antimony	31	Site-specific non-cancer risk
		Copper	1,500	Site-specific non-cancer risk
		Iron	27,000	Site-specific non-cancer risk
Lead	400	USEPA OSWER Directive 9355.4-12 (residential)		

#### 6.4.2 Remedy Selection

The selected remedy described in the ROD includes the following components to meet the RAOs:

- Excavation and offsite disposal of soil associated with potentially unacceptable risks to current and future industrial workers. Two areas in the southeastern portion of the site (within the former timber basin area) were identified with exceedances of industrial cleanup levels.
- Restoration of excavated areas to pre-construction conditions to allow for continued industrial use.
- Implementation of LUCs via a LUCRD to prohibit residential use of the site, require management of excavated subsurface soil, and require LTMgt of the existing shoreline erosion controls at OU7.
- Five-year site reviews to ensure that the remedy remains protective of human health and the environment.

### **6.4.3 Remedy Implementation**

Remedial construction activities were conducted per the Remedial Action Work Plan for OU7 (AGVIQ, April 2015) as discussed in the Construction Complete Report for OU7 (AGVIQ, April 2016). Major activities associated with Remedial Action construction included confirmation sampling, soil excavation and offsite disposal, and site restoration.

Pre-excavation confirmation samples were collected in May 2015 and July 2015 to refine the lateral and vertical extent of excavation for the two excavation areas (EA-1 and EA-2). The final excavation areas and depths are documented in the Construction Completion Report and RACR. Excavation of EA-1, EA-2 North, and EA-2 Central was completed in August 2015, and excavation of EA-2 South was completed in September 2015. Excavated material from EA-1 and EA-2 North were transported to an offsite non-hazardous waste disposal facility. EA-2 Central and EA-2 South encompassed the locations with PCBs at concentrations exceeding the TSCA level, and excavated materials from these two areas were transported to an offsite TSCA-regulated waste disposal facility. During excavation in EA-2 South, an unknown and unmarked 18-inch terra cotta pipe was discovered running north-south through the southeastern corner of the excavation area. The terra cotta pipe was found to contain two 1-inch steel pipes wrapped in suspected asbestos-containing material (ACM). A separate work plan for removal of the ACM and piping within EA-2 South was prepared (AGVIQ, September 2015), and the ACM and piping were subsequently removed and transported to the PNS Hazardous Waste Facility for disposal with other ACM waste from PNS. After the ACM and piping were removed, soil excavation in the southeastern corner of EA-2 South was completed. Backfilling consisted of placement of a geotextile layer at the bottom of each excavation area, an approximate 3-foot layer of 3/8-inch stone covered by another geotextile layer, followed by a 1.5-inch Type A road base placed to within 3 inches of the ground surface. The excavation areas were then asphalted.

The OU7 LUCRD was completed in September 2014 and provides the required LUC implementation activities to comply with the remedy (Navy, September 2014b). LUCs for OU7 prohibit residential land use, require proper management of excavated subsurface soil, and require inspection and maintenance of existing shoreline erosion controls to prevent erosion of contaminated fill along the shoreline to the offshore area. LUC inspections have been conducted in October 2014, October 2015, and June 2016. The LTMgt Plan was completed in March 2016 and details the requirements for inspection, maintenance, and associated reporting for the OU7 remedy (Tetra Tech, March 2016b). LTMgt Inspection to inspect shoreline controls was performed in June 2016, which indicated that the shoreline revetment structure is in good condition (Resolution Consultants, November 2016).

#### **6.4.4 Five-Year Review Process**

The following documents were reviewed as part of the Five Year Review process for OU7.

- Remedial Investigation (Tetra Tech, July 2011a)
- ROD (Navy, September 2013a)
- LUCRD (Navy, September 2014b)
- Long Term Management Plan (Tetra Tech, March 2016b)
- LUC Inspection Checklists
- RACR (Tetra Tech, August 2016b)
- Long Term Management Report (Resolution Consultants, November 2016)

Annual LUC inspections have been conducted since 2014. Consistent with the LUCRD, annual LUC inspections have looked for changes in land use and for any evidence of damage or activity that may adversely impact the existing shoreline erosion controls within the OU7 LUC boundary. A LTMgt inspection completed in June 2016 included a thorough site assessment of the shoreline erosion controls consistent with the checklist included in the LTMgt Plan (Tetra Tech, March 2016b). The annual LUC inspections and LTMgt inspection have not identified any deficiencies or issues related to site operations, conditions, or activities that prevented the OU7 remedy from being protective in the short or long term.

#### **6.4.5 Progress Since the Last Five-Year Review**

OU7 was not included in the 2012 five-year review because a remedy had not yet been selected for this OU.

### **6.5 Technical Assessment**

#### **6.5.1 Question A: Is the Remedy Functioning as Intended by Decision Documents?**

##### *Remedy Summary*

The selected remedy for OU7 was soil excavation and LUCs. Post-excavation confirmation soil samples met cleanup levels. There are no analytical or operational data to review relative to the OU7 remedy.

In accordance with the LUCRD for OU7 (Navy, September 2014b), annual visual inspections are being conducted at OU7 to verify that the required controls have been implemented and are being



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properly maintained. Annual LUC inspection checklists and the shoreline controls checklist confirmed that LUCs were in place and effective at preventing unacceptable levels of exposure to site-related contaminants at Site 32.

#### *Technical Evaluation*

Based on review of historical and recent documents and the site visit on 14 June 2016, the OU7 remedy is functioning as intended by the ROD as summarized in the technical evaluation for Question A in Table 6-2.

### **6.5.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives used at the time of the remedy selection still valid?**

#### *Risk Summary*

The 2013 ROD assumed that land at OU7 would continue to be used for industrial purposes as well as parking. There have been no changes in land use since the ROD or Remedial Action was completed. The Remedial Action removed soil associated with potentially unacceptable risks to industrial workers from exposure to dioxins/furans and PCBs. Excavation reduced concentrations of dioxin/furans and PCBs to levels below the calculated risk-based cleanup levels for the industrial worker and residential scenarios. The excavation also reduced the concentration of lead in soil to less than residential cleanup levels. However, concentrations of the contaminants for residential exposure to subsurface soil remain greater than current residential cleanup levels, and therefore residential LUCs as part of the OU7 remedy are still required. Exposure assumptions for hypothetical future residents used an exposure frequency of 350 days per year. While this is the default US EPA value for residential scenarios, it is inconsistent with previous OU risk assessments utilizing the region-specific value of 150 days per year to account for snow and ice cover. Default exposure assumptions for adult body weight, skin surface area, and soil adherence have been updated since the 2013 ROD (US EPA, 2011; US EPA, 2014). Default adult body weight has increased from 70 kilograms (kg) to 80 kg. Default skin surface area for exposure to soil has decreased for child residents (2,800 to 2,373 cm<sup>2</sup>). Default skin surface area for exposure to soil (all receptors) and sediment (recreator) has increased for construction workers (3,300 to 3,527 cm<sup>2</sup>), industrial workers (3,300 to 3,527 cm<sup>2</sup>), and adult residents and recreational users (5,700 to 6,032 cm<sup>2</sup>). The worker soil adherence factor has decreased from 0.2 to 0.12 milligrams per square centimeter (mg/cm<sup>2</sup>). Revised toxicity values have been established for benzo(a)pyrene since the previous Five-Year Review. There have not been any other changes to toxicity data related to site COCs since the 2013 ROD or Remedial Action. To determine protectiveness of the remedy, cleanup values were recalculated using updated exposure assumptions for a target cancer

risk of  $1 \times 10^{-5}$  and a hazard of one for the industrial worker (consistent with the 2013 ROD) using the US EPA

**Table 6-2**  
**Operable Unit 7 (Site 32)**  
**Technical Evaluation – Question A**

Question	Summary
Remedial Action Performance	Remedial Action (excavation with off-yard disposal) was completed in 2015. LUCs are in place and operating in accordance with the LUCRD for OU7. The Remedial Action has been implemented and has been successful in preventing unacceptable levels of exposure to site-related contaminants to meet RAOs.
Systems Operation/ Operation and Maintenance	Shoreline controls are in place and observed to be in good condition at OU7.
Opportunities for Optimization	Not applicable.
Implementation of LUCs and Institutional/ Engineering Controls	LUCs are in place and operating in accordance with the LUCRD for OU7. No changes have been made to the LUCs developed for OU7.
Early Indicators of Potential Remedy Problems	None identified.

Regional Screening Level Calculator (US EPA, 2016). Calculator outputs are presented in Appendix C. Cleanup levels developed for the industrial worker using updated exposure assumptions were calculated as 9.42 mg/kg for total PCBs and  $2.16 \times 10^{-4}$  for TCDD equivalents. Cleanup levels for the resident using updated exposure assumptions (and the updated benzo(a)pyrene toxicity values) were recalculated using the US EPA Regional Screening Level Calculator (US EPA, 2016) using target risk levels and hazards presented in the 2013 ROD (Navy, 2013). Calculator outputs are presented in Appendix C. The results are 31 mg/kg for antimony (target HQ of 1),  $1.56 \times 10^3$  mg/kg for copper (target HQ of 0.5),  $2.74 \times 10^4$  mg/kg for iron (target HQ of 0.5), 3.79 mg/kg for benzo(a)pyrene equivalents (target cancer risk of  $3.3 \times 10^{-5}$ ), 7.51 mg/kg for total PCBs (target cancer risk of  $3.3 \times 10^{-5}$ ) and  $5.11 \times 10^{-5}$  mg/kg for TCDD equivalents (target cancer risk of  $3.3 \times 10^{-5}$ , target HQ of 1). Cleanup values for lead provided in the 2013 ROD are consistent with US EPA Office of Solid Waste and Emergency Response (OSWER) directive 9355.4-12 soil screening level for residential land use. It should be noted that EPA is considering lowering the recommended allowable blood lead level used during modeling, along with changes to other exposure parameters. However, as lead is only of concern for potential residential exposures at OU7 and there is a LUC limiting residential exposures, changes to the residential cleanup level would not impact remedy protectiveness.

Of the re-calculated cleanup levels presented above, only the TCDD equivalents value for the industrial worker was lower than the ROD cleanup level. The remedy includes a LUC limiting residential exposures, so the changes to the residential cleanup levels do not impact remedy protectiveness. In addition, the industrial worker PCB ROD cleanup level was achieved during the excavation portion of the remedy, so a higher cleanup level does not change the remedy protectiveness. With respect to the lower TCDD cleanup level for the industrial worker, a review of the confirmatory samples collected during the remedial action showed that the residential cleanup level (0.000051 mg/kg) was achieved (Navy, August 2016b), which is well below the re-calculated cleanup level, thereby showing that the remedy is still considered protective.

*Technical Evaluation*

The technical evaluation for Question B is in Table 6-3.

**Table 6-3**  
**Operable Unit 7 (Site 32)**  
**Technical Evaluation – Question B**

Question	Summary
Changes in Applicable or Relevant and Appropriate Requirements (ARARs) or To-Be-Considered (TBC) Criteria	The ARARs and TBC criteria listed in the ROD for OU7 are shown in Appendix B. As the soil excavation work has been completed, many of the action-specific ARARs and TBCs pertaining to water management, waste characterization and disposal, and air emissions have been met. Many of the location-specific and action-specific-ARARs identified in the ROD remain applicable to any future maintenance activities as part of long-term management of shoreline erosion controls. There are no new or modified requirements that would call into question the protectiveness of the remedy. In 2015, the 40 CFR 230 was updated to clarify the definition of "waters of the United States"; however, a subsequent stay of the 2015 Clean Water Rule resulted in no change to how the definition applies and therefore, there is no impact on the protectiveness of the remedy. Certain definitions within the federal endangered species regulations have been updated; however, they do not change the action identified in the ROD, which states that future maintenance activities as part of long-term management of the shoreline erosion controls will be conducted so as to avoid any adverse effect under the act to short-nosed and Atlantic sturgeon present in the Piscataqua River. Also, the Northern Long-Eared Bat was identified as a Threatened species in 2015; however, future maintenance of shoreline erosion controls would not involve tree clearing or be expected to impact any potential bat hibernacula. Therefore, none of the changes impact the ongoing components of the remedy. The ROD included chemical-specific TBCs that were used in assessing human health risk and developing risk-based soil remedial goals. A review of changes in toxicity and risk assessment methodology is provided below.
Expected Progress towards Meeting Remedial Action Objectives (RAOs)	Remedial Action excavation completed to reduce unacceptable risks for construction, occupational, and recreation users. LUCs are in place to prevent future residential usage. RAOs are being met.
Changes in Exposure Pathways	No changes in exposure pathways were identified during this five-year review.
Changes in Land Use	No changes in land use have been identified in annual LUC inspections and checklists,

Question	Summary
	from input from Navy, or during site visits. The OU7 LUCRD requires regulatory notification of proposed land use changes; the 2012 to 2017 Site Management Plans, 2015 and 2016 Annual LUC Inspection Checklists do not indicate proposed land use changes.
New/Emerging Contaminants and Contaminant Sources	No new or emerging contaminants or contaminant sources have been identified at OU7. An evaluation of use of PFASs base-wide for PNS, and no potential uses or sources were identified at OU7.
Changes in Toxicity, Risk Assessment Methods, and Cleanup Levels	Post-Remedial Action, LUCs prevent exposure to effectively mitigate risks to soils which preclude UU/UE, so the focus is preventing exposure and enforcing those controls to ensure protectiveness. Changes in toxicity, risk assessment methods, exposure models, and cleanup levels have no effect on remedy protectiveness on human health and the environment which focuses on prevention of exposure to residual waste in subsurface soils. As long as the LUCs are enforced to eliminate the direct and indirect contact pathways, the remedies remain protective.

### Conclusions

Potentially unacceptable risks to industrial workers (construction and occupational exposures) have been eliminated through excavation and off-yard disposal. Potentially unacceptable risks to hypothetical future residents have been eliminated through LUCs. LUCs are operating as designed and include measures that mitigate or reduce exposure and corresponding risks. The remedy implemented at Site 32 is protective of human health and the environment. The RACR for OU7 documents that Remedial Action activities for contaminated soil have been implemented and are in place. RAOs have been met for OU7, and implementation of LUCs, including site inspection and shoreline erosion control inspection and maintenance, will ensure that RAOs will continue to be met. Therefore, the status for OU7 is Response Complete (RC). Site 32 will not achieve site closure because contamination remains above levels acceptable for UU/UE.

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

No other information has come to light that could call into question the protectiveness of the remedy.

#### 6.6 Issues, Recommendations, and Follow-Up Actions

This five-year review did not identify issues for which follow-up actions are recommended.

#### 6.7 Protectiveness Statement

The remedy implemented at OU7 is protective of human health and the environment. RAOs have been met and exposure to soil that could result in unacceptable risks at Site 32 is prevented

through LUCs. Based on the completion of Remedial Action excavations and implementation of LUCs in accordance with the LUC RD, the RAO of the OU7 ROD is achieved. Inspections confirm that the shoreline controls to prevent erosion into the offshore environment are intact, that the site is not used for residential purposes, and that excavated subsurface soil is managed appropriately.

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## **7.0 OPERABLE UNIT 9, SITE 34**

OU9 includes Site 34, the Former Oil Gasification Plant which is located in the area of Building 62, the Building 62 Annex, and along the Piscataqua River in the central portion of PNS. See Figure 1-2 for the location of Site 34 within the PNS. The OU9 ROD was signed in September 2013. OU9 is included in this five-year review because the OU9, Site 34 remedy included the implementation of LUCs, which require a five-year review. The LUCs address contaminants that remain in soil below the Building 62 Annex foundation and in an adjacent area at concentrations that do not allow for UU/UE.

### **7.1 Site History and Background**

The buildings at and in the vicinity of OU9 are currently used for industrial uses. Building 62 and Building 62 Annex currently are used for temporary storage of non-hazardous materials by the PNS Public Works Department and as a mini-bulldozer shop. Paved areas are used for parking. OU9 is in a historic district at PNS, and buildings at and near the site are considered contributing elements to the national registry district. There is a small, relatively flat grassy area within OU9. The area slopes north towards the roadway and then to the water's edge. Access to the shoreline from the site is difficult because of the rapid changes in terrain at the shoreline.

The majority of the OU9 area has been used for industrial activities since the late 1800s. Industrial activities at OU9 included oil gasification plant operations, blacksmith operations, and storage. Coal was used to provide heat for oil gasification operations in Building 62 from the 1870s to the early 1900s. From 1915 to 1930, Building 62 was used as a blacksmith shop. Ash was generated from the oil gasification process and blacksmith shop.

Investigations have taken place on this site to identify, characterize and remove contamination associated with past uses since 1998. Table 7-1 summarizes the chronology of events at Site 34 and OU9. Figure 7-1 shows the boundary of Site 34.

### **7.2 Conceptual Site Model**

Ash was stockpiled primarily north of Building 62 as a result of the oil gasification process and was removed in 2007. In addition, during environmental investigations, ash/burnt material was found under asphalted areas around Buildings 62 and 62 Annex, and under the foundation of former Building 63, which was located east of Building 62 and demolished in July 2005 with its foundation removed in 2007 as part of a removal action. The majority of ash/burnt material was removed during the 2007 removal action, but minor amounts of ash/burnt material remain in the subsurface. No ash/burnt material was found under Building 62; however, soil beneath Building 62 Annex, built

after operations had ended at Building 62, has not been investigated. Based on site use and the presence of ash/burnt material beneath the foundation of former Building 63, ash/burnt material is presumed to be present beneath the foundation of Building 62 Annex. Pesticide storage activities were also historically conducted in Building 62. High concentrations of PAHs and metals are associated with the presence of ash in site samples. Concentrations of PAHs and metals are typically low in samples without ash.

The visual presence of ash was used to define the approximate extent of contamination as part of the 2004 investigation. The depth to the bottom of the deepest ash layer was five feet below grade, and typically significant reductions in concentrations were observed with depth beneath the deepest ash layer. Based on data from temporary wells, no overburden groundwater is present at the site. The depth to bedrock varies from five to twelve feet.

The majority of ash/burnt material was removed during the 2007 removal action, but minor amounts of ash/burnt material remain in the subsurface. A pocket of ash/burnt material was found in the subsurface in an area north of Building 62 under or around a main water line.

### **7.3 Basis for Taking Action**

As provided in Table 7-1, concentrations of carcinogenic PAHs (as evaluated collectively in terms of the benzo(a)pyrene (BaP) toxicity equivalency quotient (TEQ)) were elevated at greater than 10 mg/kg in subsurface soil within the pocket of ash/burnt material located north of Building 62. No ash/burnt material was found under Building 62. However, it is presumed that ash/burnt material is present beneath the foundation of the Building 62 Annex due to site use and the presence of ash/burnt material beneath the foundation of former Building 63 (as previously discussed in Section 7.2). Human health risk associated with direct contact with subsurface soils is limited because the remaining contaminated soils are located below paved areas or building foundations (except for an area of subsurface contaminated soil (with corresponding LUCs) north of Building 62 that is unpaved).

### **7.4 Remedial Actions**

The ROD for OU9 was signed in September 2013. The RAOs, remedial components, remedy implementation, and progress since the previous five-year review are described below.

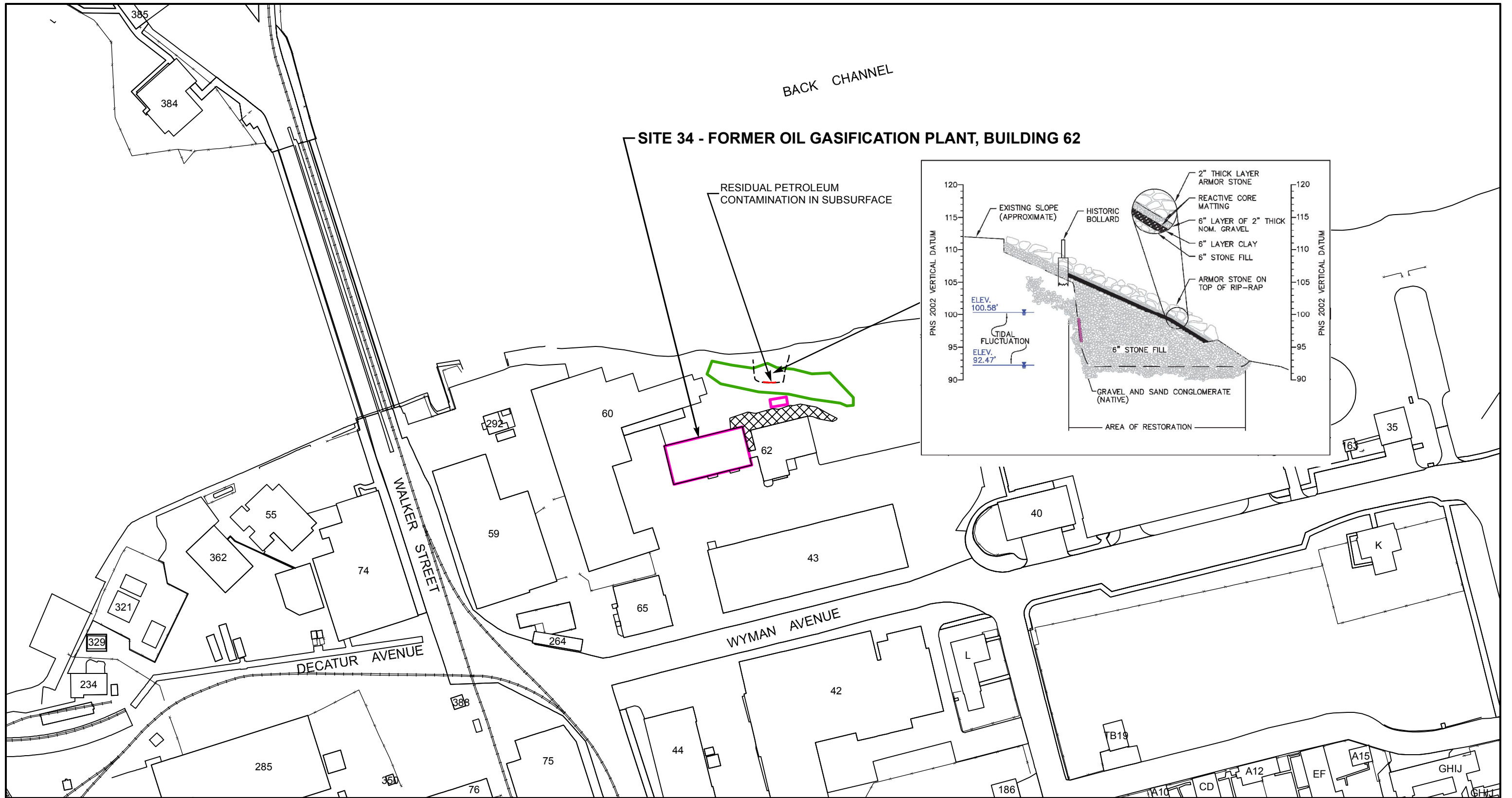
**Table 7-1**  
**Operable Unit 9 – Site Chronology**

Event	Date	Description
Soil and Sediment Sampling	1998	Site 34 was identified as a potentially contaminated site when ash/burnt material was observed in a vegetated pile on the northern side of Building 62. The Navy collected soil and sediment samples in 1998 to support further investigation. One soil sample from the ash/burnt material pile, one soil sample near the ash/burnt material pile, and two sediment samples in the intertidal offshore area were collected and analyzed. Based on the sampling results, additional investigation was recommended.
Limited Ash Excavation	1999	Ash/burnt material was excavated from the vegetated pile on the northern side of Building 62; however, excavation was terminated when the volume of ash/burnt material encountered exceeded the estimated two 55-gallon drums.
Site Screening Investigation (SSI)	2003	<p>Soil (including ash/burnt material) and sediment sampling was conducted to determine whether site operations may have impacted soil or sediment. Temporary monitoring wells were installed in several borings; however, groundwater was not present in overburden soil, and the wells were subsequently abandoned. Chemical fractions analyzed in soil and ash/burnt material included Target Compound List (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, and polychlorinated biphenyls (PCBs), Target Analyte List (TAL) metals, cyanide, and dioxin/furans. Sediment samples collected from a wash pad catch basin and near storm water outfall OF-49 were analyzed for pesticides.</p> <p>The SSI concluded that PAHs, antimony, lead, and mercury be retained as chemicals of potential concern (COPCs) associated with ash/burnt material at OU9 and that by removing the ash/burnt material, the majority of site risks would be addressed. The SSI Report indicated that contamination had not migrated from the ash/burnt material to underlying soil, and the SSI recommended that pesticides not be retained. The SSI Report recommended that a Remedial Investigation (RI) be performed after a removal action to remove ash/burnt material to evaluate potential residual risks from site operations. Additional investigation to delineate the extent of ash/burnt material to support the removal action also was recommended.</p>
Ash Extent Evaluation	2004	The visual presence of ash/burnt material was used to determine the approximate extent of ash/burnt material to support a non-time-critical removal action. Gray to off-white ash/burnt material was only observed inside the ash/burnt material pile. Ash/burnt material outside the ash/burnt material pile was mostly fine- to coarse-grained sands and clinkers.
Engineering Evaluation/Cost Analysis (EE/CA)	2005	The EE/CA documented the results of the 2004 ash extent evaluation and was conducted to develop and evaluate non-time-critical removal action alternatives to reduce potential risks to human health from exposure to ash and to reduce potential future erosion of ash at OU9. The recommended alternative was removal of the majority of ash from the site.



Event	Date	Description
Action Memorandum: Non-Time Critical Removal Action	2006	The purpose of the Action Memorandum was to request and document Navy approval of a non-time critical removal action consisting of excavation and landfill disposal of the ash pile and ash exposed at ledge areas.
Non-Time-Critical Removal Action	2007	A non-time-critical removal action was conducted per an EE/CA and Action Memorandum. The non-time-critical removal action included removal of ash/burnt material across most of the site. Ash/burnt material was excavated, and the excavation area was backfilled with fill from an off-base borrow source. As part of the removal action, ash/burnt material and soil mixed with ash/burnt material were removed by excavating from the surface until native material with no ash/burnt material was observed. Native and non-native materials were identified based on their color. Most areas were excavated to 2 to 4 feet below ground surface (bgs); the ash/burnt material pile area was excavated to 6 to 7 feet bgs. As part of the removal of the foundation of former Building 63 (located east of Building 62), a thin layer of ash/burnt material found under the foundation was removed. Although minor ash/burnt material is present in the grassy area northeast of Building 62, no excavation was conducted to preserve large oak trees in this area (see Figure 1-2). A minor amount of ash/burnt material was also not removed under the storm water line to Outfall 50, located northeast of Building 62.
RI	2009 and 2010	<p>The RI was conducted to determine the nature and extent of contamination and to evaluate potential risks to human receptors after the 2007 removal action. Borings were drilled below the floor of Building 62 to determine whether ash/burnt material or tar was present. Outside the buildings, soil samples were collected from areas where ash/burnt material was previously excavated and from unexcavated areas of the site. A pocket of ash/burnt material in the subsurface was discovered beneath the excavated area north of Building 62 by a main water line. Minor amounts of ash/burnt material remain in the subsurface elsewhere at the site, including under the storm water line to Outfall 50 and in the area with large oak trees. Tar and ash/burnt material suspected to be under the floor of Building 62 were not found. A total of 57 soil samples were collected and analyzed for antimony, lead, mercury, and PAHs. Carcinogenic PAHs were identified as the main contaminants and are generally associated with residual ash/burnt material. Antimony, lead, and mercury were detected at low concentrations. Sufficient ecological habitat was not identified at OU9, and an ecological risk assessment was not conducted.</p> <p>The RI Report (completed in 2012) concluded that with the removal of the majority of ash/burnt material in 2007, there was no longer a risk for migration of contamination at OU9 to offshore sediment. Sediment contamination from past releases to sediment in the offshore area is being addressed as part of OU4 (offshore OU). Potential unacceptable risks were estimated for future residential exposure to subsurface soil with elevated PAH concentrations by the main water line. The minor amount of ash/burnt material found in the subsurface elsewhere at the site does not pose an unacceptable risk. The subsurface beneath the foundation of Building 62 Annex was not investigated; however, based on site history, ash/burnt material with concentrations of PAHs similar to those in ash/burnt material samples collected around Building 62 Annex is presumed to be present beneath the foundation of Building 62 Annex. If present, this material would pose potential unacceptable risks to current and future site users if the foundation of</p>

Event	Date	Description
		Building 62 Annex was removed exposing the material.
FS	2013	An FS was conducted to develop and evaluate potential cleanup alternatives for OU9. The potential cleanup alternatives were: No Action (Alternative 1); LUCs for Elevated PAH Area and Building 62 Annex (Alternative 2); Excavation of Elevated PAH Area and Building 62 Annex LUCs (Alternative 3); and In-Situ Chemical Oxidation (ISCO) Treatment of Elevated PAH Area and Building 62 Annex LUCs (Alternative 4).
Proposed Plan	2013	The Proposed Plan presented the Navy's Preferred Alternative to address contamination, which was LUCs for Elevated PAH Area and Building 62 Annex (Alternative 2). A 30-day public comment period was held from July 16 to August 14, 2013. No modification to the proposed remedy was necessary based on comments received during the public comment period.
ROD	2013	The ROD was signed in September 2013, and the selected remedy includes LUCs for soil in the area north of Building 62 and for soil under Building 62 Annex.
LUCRD	2014	The OU9 LUCRD provides the necessary implementation actions for LUCs for OU9.
Remedial Action Construction for OU4	2015	Remedial Action for OU4 included sediment dredging and disposal from MW-01, adjacent to OU9. Contaminated debris and soil on the slope adjacent to MS-01 was also removed, and the shoreline erosion controls in the disturbed portion of the slope were restored. MS-01 remedial action was performed adjacent to OU9 and does not affect the protectiveness of the OU9 remedy.

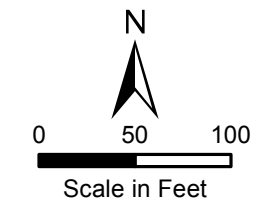


**FIGURE 7-1**  
**OPERABLE UNIT 9, SITE 34**  
**LAND USE CONTROL BOUNDARY**

**PORTSMOUTH NAVAL SHIPYARD**  
**KITTERY, MAINE**



- Legend**
- OU9 LUC Boundary
  - Rip Rap
  - Excavation Area
  - Residual Petroleum Contamination in Subsurface
  - Crushed Stone



Drawn: HJ 05/01/2017

Approved: PD 05/01/2017

Project #: 60342342

### 7.4.1 Remedial Action Objectives

The RAOs for Site 34 to protect human health and the environment include:

- Prevent hypothetical future residential exposure through ingestion of, inhalation of, and dermal contact with subsurface soil containing carcinogenic PAH concentrations exceeding the residential cleanup level.
- Prevent potential future exposure to carcinogenic PAHs in ash/burnt material that may be present under the floor of Building 62 Annex.

To achieve these RAOs, the following remedial goals were established in the ROD.

Media	Contaminant	Value	Receptor	Basis
Subsurface Soil	Carcinogenic (based on BAP TEQ)	1.5 mg/kg	Future Resident	Human Health Risk Based (cancer)

**Note that this remedial goal is based on a cancer risk level of  $1 \times 10^{-4}$ . Refer to Section 7.5.2 for further discussion.**

### 7.4.2 Remedy Selection

The selected remedy described in the ROD includes the following components to meet the RAOs:

- Implementation of LUCs to prohibit residential land use and specify requirements for management of excavated soil as part of any future construction activity within the LUC boundary.
- Implementation of LUCs to prohibit unrestricted contact with soil underneath Building 62 Annex, prohibit residential land use, and specify requirements for management of excavated soil as part of any future construction activity within the LUC boundary
- Five-year site reviews to ensure that the remedy remains protective of human health and the environment.

### 7.4.3 Remedy Implementation

The OU9 LUCRD was completed in September 2014 and provides the required LUC implementation activities to comply with the remedy (Navy, September 2014c). LUCs for OU9 restrict residential land use, require management of excavated subsurface soil, and prevent unrestricted access to the

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subsurface soil beneath the foundation of Building 62 Annex. LUC inspections were conducted in October 2014, June 2015, and June 2016.

#### **7.4.4 Five-Year Review Process**

The following documents were reviewed as part of the Five Year Review process for OU9.

- Remedial Investigation (Tetra Tech, June 2012)
- ROD (Navy, September 2013b)
- LUCRD (Navy, September 2014c)
- LUC Inspection Checklists (October 2014, June 2015, June 2016)

Annual LUC inspections have been conducted since 2014. Consistent with the LUCRD, annual LUC inspections have looked for changes in land use and that current site features including the Building 62 Annex remain in place to prevent exposure to underlying potentially contaminated soil. The annual LUC inspections have not identified any deficiencies or issues related to site operations, conditions, or activities that prevented the OU9 selected remedy from being protective in the short or long term.

During dredging at MS-01 as part of OU4 Remedial Action, an area of petroleum-contaminated debris extending from the intertidal area into the shoreline to the south of the sediment removal area was identified. An onshore excavation was conducted from September to October 2015 to remove the contaminated debris and affected soil in the slope adjacent to MS-01, and shoreline erosion controls on the slope were restored (AGVIQ, August 2016). The shoreline and slope adjacent to MS-01 is part of the onshore ER Program Site 34 (OU9). Excavation was performed as far into the shoreline as possible (from toe of slope nearly to historic bollard) considering the shoreline slope stability and adjacent building. Some additional residual staining was visually observed. Following shoreline excavation at MS-01, adjacent to OU9, a reactive core matting (RCM) was installed along the shoreline to minimize additional discharge of any contamination left in place. The RCM is a 0.5-inch thick multi-layered and engineered geocomposite mat that consists of three layers of polypropylene non-woven geotextile with activated carbon bound between the layers. The activated carbon physically adsorbs to the organic contaminants (like PAHs and petroleum hydrocarbons) and prevents migration into the surrounding environment. No further visible sheen has been observed during low tide following installation of the RCM. The embankment slope was restored to the original grade. Additional details of the excavation and

shoreline restoration are presented in the OU4 CCR (AGVIQ, August 2016). MS-01 remedial action was performed adjacent to OU9 and does not affect the protectiveness of the OU9 remedy.

#### 7.4.5 Progress Since the Last Five-Year Review

OU9 was not included in the 2011 five-year review because a remedy had not yet been selected for this OU.

### 7.5 Technical Assessment

#### 7.5.1 Question A: Is the Remedy Functioning as Intended by Decision Documents?

Following Removal Action to remove ash-containing soil, the selected remedy for OU9 is LUCs. The OU9 LUCRD was completed in September 2014. LUC inspections were conducted in October 2014, June 2015, and June 2016.

#### *Technical Evaluation*

Based on review of historical and recent documents and the site visit on 14 June 2016, the OU9 remedy is functioning as intended by the ROD as summarized in the technical evaluation for Question A in Table 7-2.

**Table 7-2  
 Technical Evaluation – Question A**

Question	Summary
Remedial Action Performance	The LUCRD was finalized in 2014. Annual LUC inspections have been completed since 2014, and LUCs have been successful in preventing unacceptable levels of exposure to site-related contaminants.
Systems Operation/ Operation and Maintenance	Not applicable.
Opportunities for Optimization	Not applicable.
Implementation of LUCs and Institutional/ Engineering Controls	No changes have been made to the LUCs developed for OU9. A LUCRD was developed to address LUC implementation in accordance with the OU9 ROD.
Early Indicators of Potential Remedy Problems	No early indicators identified for problems with the existing remedy for OU9.

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## **7.5.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives used at the time of the remedy selection still valid?**

### *Risk Summary*

The 2013 ROD assumed that land at OU9 would continue to be used for industrial purposes. There have been no changes in land use since the ROD or LUCRD was completed. The majority of ash/burnt material was removed during the 2007 removal action. Human health risk associated with direct contact with subsurface soils is limited because the remaining contaminated soils are located below paved areas or building foundations (except for an area of subsurface contaminated soil (with corresponding LUCs) north of Building 62 that is unpaved). Default exposure assumptions for adult body weight and skin surface area have been updated since the 2013 ROD (US EPA, 2011; US EPA, 2014). Default adult body weight has increased from 70 kilograms (kg) to 80 kg. Default skin surface area for exposure to soil has decreased for child residents (2,800 to 2,373 cm<sup>2</sup>). Default skin surface area for exposure to soil (all receptors) and sediment (recreator) has increased for construction workers (3,300 to 3,527 cm<sup>2</sup>), industrial workers (3,300 to 3,527 cm<sup>2</sup>), and adult residents and recreational users (5,700 to 6,032 cm<sup>2</sup>). The use of updated exposure assumptions would have negligible effect on the calculated risks. LUCs are in place to prevent future residential use of the property and prevent industrial exposure to the subsurface. Unacceptable human health risks may be encountered if materials are exposed in the future. A site-specific cleanup level of 1.5 mg/kg was calculated for benzo(a)pyrene equivalents for residential exposures. Revised toxicity values have been established for benzo(a)pyrene since the previous Five-Year Review. To determine protectiveness of the remedy, cleanup values were recalculated using updated exposure assumptions and toxicity values using the US EPA Regional Screening Level Calculator (US EPA, 2016). The Regional Screening Level Calculator output is provided in Appendix C. The resulting cleanup level for residential exposure to benzo(a)pyrene equivalents using updated exposure assumptions and a target risk level of  $1 \times 10^{-4}$  (consistent with the 2013 ROD) is calculated as 11.5 mg/kg. Thus, the remedy is still protective related to soil exposures as long as LUCs are maintained.

A vapor intrusion evaluation was conducted using the Johnson and Ettinger Model in 2012 and it was concluded that there was no unacceptable risk. Concentrations of contaminants in subsurface soil were input to model a potential indoor air concentration corresponding to risk. The model used is generally known to be conservative, yet the risk was still considered acceptable. USEPA has since released updated guidance and evaluation tools to address both residential and nonresidential buildings that may be impacted by vapor intrusion from subsurface vapor sources (USEPA, June 2015). While subsurface soil concentrations are no longer considered an acceptable media from

which to model concentrations in indoor air, the previous use of a conservative model is a line of evidence showing that the PAH-contaminated material is not anticipated to result in an unacceptable risk. PAH contaminated materials (ash) were not observed beneath Building 62. Thus, a complete exposure pathway for vapor intrusion does not exist for potential receptors in Building 62, and no further assessment is warranted. PAHs are currently conservatively assumed to be present under Building 62 Annex. However, as there have been no borings below the Building 62 Annex, this cannot be definitively stated and it is unclear if there is a complete exposure pathway related to vapor intrusion associated with the Building 62 Annex. Updates in vapor intrusion assessment methodology necessitate the collection of soil gas data beneath Building 62 Annex to determine protectiveness of the remedy to potential human receptors.

*Technical Evaluation*

The technical evaluation for Question B is in Table 7-3.

**Table 7-3**  
**Operable Unit 9**  
**Technical Evaluation – Question B**

Question	Summary
Changes in Applicable or Relevant and Appropriate Requirements (ARARs) or To-Be-Considered (TBC) Criteria	No Location-Specific or Action-Specific ARARs or TBCs were identified in the OU9 ROD, since the OU9 remedy includes LUCs only and no active remediation. The ROD included only chemical-specific TBCs that were used in assessing human health risk and developing risk-based soil remedial goals for PAHs. A review of changes in toxicity and risk assessment methodology is provided below.
Expected Progress towards Meeting Remedial Action Objectives (RAOs)	Factors establishing progress toward meeting RAOs are qualitative, based on compliance with controls in the LUCRD for OU9, and have been implemented in accordance with the OU9 Record of Decision.
Changes in Exposure Pathways	No changes in exposure pathways were identified during this five-year review.
Changes in Land Use	No changes in land use have been identified in annual LUC inspections and checklists, from input from Navy, or during site visits. The OU9 LUCRD requires regulatory notification of proposed land use changes; the 2012 to 2017 Site Management Plans, 2015 to 2016 Annual LUC Compliance Certifications, and 2016 Annual LUC Compliance Certification Checklist do not indicate proposed land use changes.



Question	Summary
New/Emerging Contaminants and Contaminant Sources	<p>During OU4 Remedial Action (dredging at MS-01) an area of petroleum-contaminated debris was observed along the shoreline adjacent to OU9 (Section 8.5.3). An onshore excavation was conducted from September to October 2015 to remove the contaminated debris and affected soil in the slope adjacent to MS-01. Excavation was performed as far into the shoreline as possible (from toe of slope nearly to historic bollard); however, some additional residual staining was visually observed. Following shoreline excavation at MS-01, adjacent to OU9, a reactive core matting (RCM) was installed along the shoreline to minimize additional discharge of any contamination left in place to the environment. No further visible sheen has been observed during low tide following installation of the RCM.</p> <p>No emerging contaminants have been identified at OU9. An evaluation on the base-wide use of PFASs was performed, and no potential uses or sources were identified at OU9.</p>
Changes in Toxicity, Risk Assessment Methods, and Cleanup Levels	<p>Through implementation of LUCs, exposure is prevented to effectively mitigate risks to soils which preclude unlimited use/unrestricted exposure, so the focus is preventing exposure and enforcing those controls to ensure protectiveness. Changes in toxicity, risk assessment methods, exposure models, and cleanup levels have no effect on remedy protectiveness on human health and the environment which focuses on prevention of exposure to residual wastes subsurface soils. As long as the LUCs are enforced to eliminate the direct and indirect contact pathways, the remedies remain protective.</p>

### Conclusions

The majority of ash/burnt material was removed during the 2007 removal action, but minor amounts of ash/burnt material remain in the subsurface. Human health risk associated with direct contact with subsurface soils is limited because the remaining contaminated soils are located below paved areas or building foundations (except for an area of subsurface contaminated soil (with corresponding LUCs) north of Building 62 that is unpaved). Potentially unacceptable risks to hypothetical future residents have been eliminated through LUCs. LUCs are operating as designed and include measures that mitigate or reduce exposure and corresponding risks. It is unclear if there is a complete exposure pathway related to vapor intrusion in Building 62 Annex. Additional data collection (i.e. soil borings) below Building 62 Annex is recommended to reaffirm protectiveness of the remedy.

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

The remedy remains protective for all on-shore exposures and is meeting RAOs identified in the ROD.

## 7.6 Issues, Recommendations, and Follow-Up Actions

Residual petroleum hydrocarbon impacts observed during shoreline excavation performed as part of OU4 remediation will be addressed as part of OU9. The potential impact of the excavation on shoreline slope and residual contamination migration to surface water described in Section 8.5.3 will be evaluated through inspections to be conducted under OU9. Based on assessment of residual contamination at the OU9 shoreline at area MS-01, Navy, EPA, and MEDEP agreed in May 2016 to expand the LUC boundary and monitoring/inspection of the OU9 shoreline. Follow-up actions will include Navy preparing an Explanation of Significant Difference (ESD) in Fiscal Year 2017 to document these modifications to the remedy. In addition, Navy will prepare a LTMgt plan for OU9 to include annual inspections for petroleum sheen and the stabilization of the slope. Updates in vapor intrusion assessment methodology necessitate the collection of soil gas data beneath Building 62 Annex to determine protectiveness of the remedy to potential human receptors.

Issue	Affect Protectiveness		Recommendations	Implementing Party	Oversight Agency	Milestone Date
	Current	Future				
Residual petroleum hydrocarbon contamination within OU9 shoreline	No	No	Explanation of Significant Difference to modify selected remedy to expand OU9 LUC boundary and establish monitoring of the OU9 shoreline	Navy	USEPA and MEDEP	2017
			LTMgt Plan and LUCRD Revision	Navy	USEPA and MEDEP	2017
			Conduct inspections of the OU9 shoreline	Navy	USEPA and MEDEP	2017 through 2021
It is unclear if there is a complete exposure pathway related to vapor intrusion in Building 62 Annex.	No	Yes	Additional data collection (i.e. soil borings) recommended to reaffirm protectiveness of the remedy.	Navy	USEPA and MEDEP	2018

## 7.7 Protectiveness Statement

The remedy implemented at OU9 is currently protective of human health and the environment. However, to be protective in the long-term, additional data collection (i.e. soil borings) beneath

Building 62 Annex is recommended to reaffirm protectiveness of the remedy associated with vapor intrusion. Exposure to soil that could result in unacceptable risks at Site 34 is prevented through LUCs. The shoreline excavation and placement of RCM has prevented further release of hydrocarbons to the environment into the Piscataqua River.

## 8.0 BASEWIDE CONCLUSIONS

The base-wide conclusions and recommendations from the Third Five Year Review are presented below. The third five-year review shows that the Navy is meeting the requirements of the ROD for OU1, OU2, OU3, and OU7. The review confirmed that the Remedial Actions at these OUs at PNS remain protective of human health and the environment. Additional assessment is recommended at OU9 to determine protectiveness of the remedy. In the future, if remedy conditions change, then ARARS will be evaluated.

### 8.1 Issues, Recommendations, and Follow-Up Actions

There were no issues, recommendations, or follow-up actions for OUs 1, 2, or 7. Issues, recommendations, and/or follow-up actions for OU3 and OU9 were summarized in tabular form in Section 5.6 and Section 7.6, respectively.

### 8.2 Continued Review

This report represents the third five-year Review conducted at PNS. The next five-year review will be required within 5 years of the signature date of this review, May 2, 2022.

Five-year reviews are required by statute under CERCLA for Site 10 (OU1), Sites 6 and 29 (OU2), Site 8 (OU3), Site 32 (OU7) and Site 34 (OU9), because Remedial Actions were conducted at these OUs that allow hazardous substances, pollutants, or contaminants to remain on site in excess of levels that allow for unlimited use and unrestricted exposure. The next review will provide updated discussions of the Remedial Actions and status of their implementation for all OUs that have RODs that allow hazardous substances, pollutants, or contaminants to remain on site in excess of levels that allow for UU/UE at that time. A summary of the anticipated requirements for the next five-year review is presented in Table 8-1.

**Table 8-1**  
**Anticipated Requirements of Fourth Five Year Review**

<b>Anticipated Requirement</b>	<b>Milestone Date</b>
Evaluation of LUC requirements and inspections for OU1, OU2, OU3, OU7, and OU9.	Fourth Five-Year Review (May 2, 2022)
An evaluation of any groundwater monitoring results at OU2 and OU3	Fourth Five-Year Review (May 2, 2022)
A review of the recommendations listed in the Third Five-Year Review.	Fourth Five-Year Review (May 2, 2022)
A review of sites within OUs where a remedy that does not allow	Fourth Five-Year Review (May 2,

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UU/UE is selected subsequent to the Third Five-Year Review (OU8).	2022)
Modifications made to the ROD for OU9 via an ESD	2017

**8.2.1 Discontinued Review**

Sites 9 and 11 (as part of OU3) have been removed from the ERP through the OU3 Remedial Action Completion Report (RACR) in February 2015.

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## Appendix A

### Site Inspection Checklists

<b>I. SITE INFORMATION</b>													
<b>Site name:</b> Operable Unit 1	<b>Date of inspection:</b> 6/14/16												
<b>Location and Region:</b> Portsmouth Naval Shipyard, EPA Region 1	<b>EPA ID:</b> ME7170022019												
<b>Agency, office, or company leading the five-year review:</b> Navy	<b>Weather/temperature:</b> Partly Cloudy/65°F												
<b>Remedy Includes:</b> (Check all that apply) <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Landfill cover/containment</td> <td><input type="checkbox"/> Monitored natural attenuation</td> </tr> <tr> <td><input type="checkbox"/> Access controls</td> <td><input type="checkbox"/> Groundwater containment</td> </tr> <tr> <td><input checked="" type="checkbox"/> Institutional controls</td> <td><input type="checkbox"/> Vertical barrier walls</td> </tr> <tr> <td><input type="checkbox"/> Groundwater pump and treatment</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Surface water collection and treatment</td> <td></td> </tr> <tr> <td colspan="2"><input checked="" type="checkbox"/> Other: <u>Selected Remedy included groundwater monitoring to confirm lack of impacts from soil removal. Groundwater sampling discontinued after two rounds of sampling in</u></td> </tr> </table>		<input type="checkbox"/> Landfill cover/containment	<input type="checkbox"/> Monitored natural attenuation	<input type="checkbox"/> Access controls	<input type="checkbox"/> Groundwater containment	<input checked="" type="checkbox"/> Institutional controls	<input type="checkbox"/> Vertical barrier walls	<input type="checkbox"/> Groundwater pump and treatment		<input type="checkbox"/> Surface water collection and treatment		<input checked="" type="checkbox"/> Other: <u>Selected Remedy included groundwater monitoring to confirm lack of impacts from soil removal. Groundwater sampling discontinued after two rounds of sampling in</u>	
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<input type="checkbox"/> Access controls	<input type="checkbox"/> Groundwater containment												
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<input type="checkbox"/> Groundwater pump and treatment													
<input type="checkbox"/> Surface water collection and treatment													
<input checked="" type="checkbox"/> Other: <u>Selected Remedy included groundwater monitoring to confirm lack of impacts from soil removal. Groundwater sampling discontinued after two rounds of sampling in</u>													
<b>Attachments:</b> <input checked="" type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached													
<b>II. INTERVIEWS (Check all that apply)</b>													
<b>1. O&amp;M site manager</b> _____ <table style="width: 100%; border: none; margin-top: 5px;"> <tr> <td style="text-align: center;">Name</td> <td style="text-align: center;">Title</td> <td style="text-align: center;">Date</td> </tr> <tr> <td colspan="3">Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____</td> </tr> <tr> <td colspan="3">Problems, suggestions; <input type="checkbox"/> Report attached _____</td> </tr> <tr> <td colspan="3">_____</td> </tr> </table>		Name	Title	Date	Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____			Problems, suggestions; <input type="checkbox"/> Report attached _____			_____		
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<b>2. O&amp;M staff</b> _____ <table style="width: 100%; border: none; margin-top: 5px;"> <tr> <td style="text-align: center;">Name</td> <td style="text-align: center;">Title</td> <td style="text-align: center;">Date</td> </tr> <tr> <td colspan="3">Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____</td> </tr> <tr> <td colspan="3">Problems, suggestions; <input type="checkbox"/> Report attached _____</td> </tr> <tr> <td colspan="3">_____</td> </tr> </table>		Name	Title	Date	Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____			Problems, suggestions; <input type="checkbox"/> Report attached _____			_____		
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Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____													
Problems, suggestions; <input type="checkbox"/> Report attached _____													
_____													

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency USEPA  
Contact Matthew R. Audet USEPA Remedial Project Manager 617-918-1449  
Name Title Date Phone no.

Problems; suggestions;  Report attached EPA provides input through review and comment on draft and draft final reports.

Agency MEDEP  
Contact Iver McLeod MEDEP Remedial Project Manager 207-592-2981  
Name Title Date Phone no.

Problems; suggestions;  Report attached MEDEP provides input through review and comment draft and draft final reports.

Agency \_\_\_\_\_  
Contact \_\_\_\_\_  
Name Title Date Phone no.

Problems; suggestions;  Report attached \_\_\_\_\_

Agency \_\_\_\_\_  
Contact \_\_\_\_\_  
Name Title Date Phone no.

Problems; suggestions;  Report attached \_\_\_\_\_

4. **Other interviews (optional)**  Report attached.

Community members have the opportunity to provide input at RAB meeting.

Empty table rows for recording community input.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1.	<b>O&amp;M Documents</b> <input checked="" type="checkbox"/> O&M manual <input type="checkbox"/> As-built drawings <input type="checkbox"/> Maintenance logs Remarks <u>LUCRD for OU1 was finalized in January 2012.</u> <u>Revision 1 of LUCRD for OU1 was finalized in December 2014.</u>	<input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
2.	<b>Site-Specific Health and Safety Plan</b> <input type="checkbox"/> Contingency plan/emergency response plan Remarks _____	<input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
3.	<b>O&amp;M and OSHA Training Records</b> Remarks <u>Kept by company that performs the LUC inspections.</u>	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A
4.	<b>Permits and Service Agreements</b> <input type="checkbox"/> Air discharge permit <input type="checkbox"/> Effluent discharge <input type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Other permits _____ Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
5.	<b>Gas Generation Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
6.	<b>Settlement Monument Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
7.	<b>Groundwater Monitoring Records</b> Remarks <u>Final Post-Remediation Groundwater Monitoring Report for OU1 (July 2013)</u> <u>AR 002864</u>	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A
8.	<b>Leachate Extraction Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
9.	<b>Discharge Compliance Records</b> <input type="checkbox"/> Air <input type="checkbox"/> Water (effluent) Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
10.	<b>Daily Access/Security Logs</b> Remarks <u>Access to PNS is restricted. OU1 is located within the Controlled Industrial Area</u> <u>with further restricted access. Access to OU1 within CIA at PNS is not restricted.</u>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A

<b>IV. O&amp;M COSTS</b>																																			
1.	<b>O&amp;M Organization</b>	<input type="checkbox"/> State in-house <input type="checkbox"/> PRP in-house <input type="checkbox"/> Federal Facility in-house <input type="checkbox"/> Other _____	<input type="checkbox"/> Contractor for State <input type="checkbox"/> Contractor for PRP <input checked="" type="checkbox"/> Contractor for Federal Facility																																
2.	<b>O&amp;M Cost Records</b>	<input type="checkbox"/> Readily available <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> Funding mechanism/agreement in place Original O&M cost estimate _____ <input type="checkbox"/> Breakdown attached  Total annual cost by year for review period if available  <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">From _____</td> <td style="width: 15%;">To _____</td> <td style="width: 40%;"></td> <td style="width: 30%; text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td style="text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td style="text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td style="text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> </tr> </table>		From _____	To _____		<input type="checkbox"/> Breakdown attached	Date	Date	Total cost		From _____	To _____		<input type="checkbox"/> Breakdown attached	Date	Date	Total cost		From _____	To _____		<input type="checkbox"/> Breakdown attached	Date	Date	Total cost		From _____	To _____		<input type="checkbox"/> Breakdown attached	Date	Date	Total cost	
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Date	Date	Total cost																																	
3.	<b>Unanticipated or Unusually High O&amp;M Costs During Review Period</b> Describe costs and reasons: <u>None</u> _____ _____ _____ _____																																		
<b>V. ACCESS AND INSTITUTIONAL CONTROLS</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A																																			
<b>A. Fencing</b>																																			
1.	<b>Fencing damaged</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Gates secured <input checked="" type="checkbox"/> N/A																																
Remarks _____																																			
<b>B. Other Access Restrictions</b>																																			
1.	<b>Signs and other security measures</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A																																
Remarks _____																																			



<b>C. Institutional Controls (ICs)</b>				
1.	<b>Implementation and enforcement</b>			
	Site conditions imply ICs not properly implemented	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
	Site conditions imply ICs not being fully enforced	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
	Type of monitoring (e.g., self-reporting, drive by)	Inspection		
	Frequency	Annually		
	Responsible party/agency	Navy, NAVFAC Mid-Atlantic		
	Contact	Linda Cole	RPM	
		Name	Title	Date
	Reporting is up-to-date	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
	Reports are verified by the lead agency	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
	Specific requirements in deed or decision documents have been met	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
	Violations have been reported	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
	Other problems or suggestions:	<input type="checkbox"/> Report attached		
2.	<b>Adequacy</b>	<input checked="" type="checkbox"/> ICs are adequate	<input type="checkbox"/> ICs are inadequate	<input type="checkbox"/> N/A
	Remarks			
<b>D. General</b>				
1.	<b>Vandalism/trespassing</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No vandalism evident	
	Remarks			
2.	<b>Land use changes on site</b>	<input type="checkbox"/> N/A		
	Remarks	None		
3.	<b>Land use changes off site</b>	<input checked="" type="checkbox"/> N/A		
	Remarks			
<b>VI. GENERAL SITE CONDITIONS</b>				
<b>A. Roads</b>	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A		
1.	<b>Roads damaged</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Roads adequate <input checked="" type="checkbox"/> N/A	
	Remarks			

<b>B. Other Site Conditions</b>			
Remarks <u>No change in site use (industrial). No major areas of exposed soil are present.</u>			
_____			
_____			
_____			
_____			
_____			
<b>VII. LANDFILL COVERS</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
<b>A. Landfill Surface</b>			
1.	<b>Settlement (Low spots)</b> Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input type="checkbox"/> Settlement not evident
2.	<b>Cracks</b> Lengths _____   Widths _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depths _____	<input type="checkbox"/> Cracking not evident
3.	<b>Erosion</b> Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input type="checkbox"/> Erosion not evident
4.	<b>Holes</b> Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input type="checkbox"/> Holes not evident
5.	<b>Vegetative Cover</b> <input type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram) Remarks _____	<input type="checkbox"/> Grass <input type="checkbox"/> Cover properly established	<input type="checkbox"/> No signs of stress
6.	<b>Alternative Cover (armored rock, concrete, etc.)</b> Remarks _____	<input type="checkbox"/> N/A	
7.	<b>Bulges</b> Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Height _____	<input type="checkbox"/> Bulges not evident

8.	<b>Wet Areas/Water Damage</b> <input type="checkbox"/> Wet areas <input type="checkbox"/> Ponding <input type="checkbox"/> Seeps <input type="checkbox"/> Soft subgrade Remarks _____ _____	<input type="checkbox"/> Wet areas/water damage not evident <input type="checkbox"/> Location shown on site map    Areal extent _____ <input type="checkbox"/> Location shown on site map    Areal extent _____ <input type="checkbox"/> Location shown on site map    Areal extent _____ <input type="checkbox"/> Location shown on site map    Areal extent _____
9.	<b>Slope Instability</b> Areal extent _____ Remarks _____ _____	<input type="checkbox"/> Slides <input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of slope instability
<b>B. Benches</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	<b>Flows Bypass Bench</b> Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A or okay
2.	<b>Bench Breached</b> Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A or okay
3.	<b>Bench Overtopped</b> Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A or okay
<b>C. Letdown Channels</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
1.	<b>Settlement</b> Areal extent _____    Depth _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of settlement
2.	<b>Material Degradation</b> Material type _____    Areal extent _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of degradation
3.	<b>Erosion</b> Areal extent _____    Depth _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of erosion

4.	<b>Undercutting</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of undercutting
	Areal extent _____	Depth _____	
	Remarks _____		
<hr/>			
5.	<b>Obstructions</b>	Type _____	<input type="checkbox"/> No obstructions
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Size _____		
	Remarks _____		
<hr/>			
6.	<b>Excessive Vegetative Growth</b>	Type _____	
	<input type="checkbox"/> No evidence of excessive growth		
	<input type="checkbox"/> Vegetation in channels does not obstruct flow		
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Remarks _____		
<hr/>			
<b>D. Cover Penetrations</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A			
<hr/>			
1.	<b>Gas Vents</b>	<input type="checkbox"/> Active <input type="checkbox"/> Passive	
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	
	<input type="checkbox"/> N/A		
	Remarks _____		
<hr/>			
2.	<b>Gas Monitoring Probes</b>		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
<hr/>			
3.	<b>Monitoring Wells (within surface area of landfill)</b>		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
<hr/>			
4.	<b>Leachate Extraction Wells</b>		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
<hr/>			
5.	<b>Settlement Monuments</b>	<input type="checkbox"/> Located	<input type="checkbox"/> Routinely surveyed <input type="checkbox"/> N/A
	Remarks _____		
<hr/>			

<b>E. Gas Collection and Treatment</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	<b>Gas Treatment Facilities</b> <input type="checkbox"/> Flaring <input type="checkbox"/> Thermal destruction <input type="checkbox"/> Collection for reuse <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____	
2.	<b>Gas Collection Wells, Manifolds and Piping</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____	
3.	<b>Gas Monitoring Facilities</b> (e.g., gas monitoring of adjacent homes or buildings) <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____	
<b>F. Cover Drainage Layer</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A		
1.	<b>Outlet Pipes Inspected</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
2.	<b>Outlet Rock Inspected</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
<b>G. Detention/Sedimentation Ponds</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A		
1.	<b>Siltation</b> Areal extent _____      Depth _____ <input type="checkbox"/> N/A <input type="checkbox"/> Siltation not evident Remarks _____ _____	
2.	<b>Erosion</b> Areal extent _____      Depth _____ <input type="checkbox"/> Erosion not evident Remarks _____ _____	
3.	<b>Outlet Works</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
4.	<b>Dam</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	

<b>H. Retaining Walls</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Deformations</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Deformation not evident
	Horizontal displacement _____	Vertical displacement _____	
	Rotational displacement _____		
	Remarks _____		
<hr/>			
2.	<b>Degradation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Degradation not evident
	Remarks _____		
<hr/>			
<b>I. Perimeter Ditches/Off-Site Discharge</b>		<input type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	<b>Siltation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Siltation not evident
	Areal extent _____	Depth _____	
	Remarks _____		
<hr/>			
2.	<b>Vegetative Growth</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
	<input type="checkbox"/> Vegetation does not impede flow		
	Areal extent _____	Type _____	
	Remarks _____		
<hr/>			
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Erosion not evident
	Areal extent _____	Depth _____	
	Remarks _____		
<hr/>			
4.	<b>Discharge Structure</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks _____		
<hr/>			
<b>VIII. VERTICAL BARRIER WALLS</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Settlement</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Settlement not evident
	Areal extent _____	Depth _____	
	Remarks _____		
<hr/>			
2.	<b>Performance Monitoring</b>	Type of monitoring _____	
	<input type="checkbox"/> Performance not monitored		
	Frequency _____	<input type="checkbox"/> Evidence of breaching	
	Head differential _____		
	Remarks _____		
<hr/>			

<b>IX. GROUNDWATER/SURFACE WATER REMEDIES</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
<b>A. Groundwater Extraction Wells, Pumps, and Pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	<b>Pumps, Wellhead Plumbing, and Electrical</b> <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____ _____
2.	<b>Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____
<b>B. Surface Water Collection Structures, Pumps, and Pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	<b>Collection Structures, Pumps, and Electrical</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
2.	<b>Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____

<b>C. Treatment System</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Treatment Train</b> (Check components that apply)		
	<input type="checkbox"/> Metals removal	<input type="checkbox"/> Oil/water separation	<input type="checkbox"/> Bioremediation
	<input type="checkbox"/> Air stripping	<input type="checkbox"/> Carbon adsorbers	
	<input type="checkbox"/> Filters _____		
	<input type="checkbox"/> Additive (e.g., chelation agent, flocculent) _____		
	<input type="checkbox"/> Others _____		
	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance	
	<input type="checkbox"/> Sampling ports properly marked and functional		
	<input type="checkbox"/> Sampling/maintenance log displayed and up to date		
	<input type="checkbox"/> Equipment properly identified		
	<input type="checkbox"/> Quantity of groundwater treated annually _____		
	<input type="checkbox"/> Quantity of surface water treated annually _____		
	Remarks _____		
	_____		
2.	<b>Electrical Enclosures and Panels</b> (properly rated and functional)		
	<input type="checkbox"/> N/A	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance
	Remarks _____		
	_____		
3.	<b>Tanks, Vaults, Storage Vessels</b>		
	<input type="checkbox"/> N/A	<input type="checkbox"/> Good condition	<input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance
	Remarks _____		
	_____		
4.	<b>Discharge Structure and Appurtenances</b>		
	<input type="checkbox"/> N/A	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance
	Remarks _____		
	_____		
5.	<b>Treatment Building(s)</b>		
	<input type="checkbox"/> N/A	<input type="checkbox"/> Good condition (esp. roof and doorways)	<input type="checkbox"/> Needs repair
	<input type="checkbox"/> Chemicals and equipment properly stored		
	Remarks _____		
	_____		
6.	<b>Monitoring Wells</b> (pump and treatment remedy)		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> All required wells located	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
	_____		
<b>D. Monitoring Data</b>			
1.	<b>Monitoring Data</b>		
	<input type="checkbox"/> Is routinely submitted on time	<input checked="" type="checkbox"/> Is of acceptable quality	
2.	<b>Monitoring data suggests:</b>		
	<input type="checkbox"/> Groundwater plume is effectively contained	<input type="checkbox"/> Contaminant concentrations are declining	



<b>D. Monitored Natural Attenuation</b>			
1.	<b>Monitoring Wells</b> (natural attenuation remedy)		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled
	<input type="checkbox"/> All required wells located	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> Good condition
	Remarks _____		
<b>X. OTHER REMEDIES</b>			
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.			
<b>XI. OVERALL OBSERVATIONS</b>			
<b>A. Implementation of the Remedy</b>			
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).			
The remedy is intended to prevent contact with contaminated soil. An asphalt cover is in place at OU1 to prevent exposure to contaminated soil.			
The remedy currently appears to be functioning as designed. The asphalt cover prevents contact. No indication of disturbance of the asphalt cover to a degree that could potentially affect protectiveness was evident. Overall, exposure to site contaminants appears to be effectively prevented by the remedy.			
Post-Remediation Groundwater Monitoring results indicated that all lead concentrations in groundwater are less than Project Action Levels. No further groundwater sampling is required and wells abandoned in Fall 2016.			
<b>B. Adequacy of O&amp;M</b>			
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.			
Overall, the condition of the asphalt cover is good. Annual LUC inspections are adequate to confirm protectiveness of the remedy.			
_____			
_____			
_____			
_____			
_____			
_____			
_____			

**C. Early Indicators of Potential Remedy Problems**

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

None

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**D. Opportunities for Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None

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I. SITE INFORMATION													
Site name: Operable Unit 2	Date of inspection: 10/27/15												
Location and Region: Portsmouth Naval Shipyard, EPA Region 1	EPA ID: ME7170022019												
Agency, office, or company leading the five-year review: Navy	Weather/temperature: Cloudy/35°F												
<b>Remedy Includes:</b> (Check all that apply) <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Landfill cover/containment</td> <td><input type="checkbox"/> Monitored natural attenuation</td> </tr> <tr> <td><input type="checkbox"/> Access controls</td> <td><input type="checkbox"/> Groundwater containment</td> </tr> <tr> <td><input checked="" type="checkbox"/> Institutional controls</td> <td><input type="checkbox"/> Vertical barrier walls</td> </tr> <tr> <td><input type="checkbox"/> Groundwater pump and treatment</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Surface water collection and treatment</td> <td></td> </tr> <tr> <td colspan="2"><input checked="" type="checkbox"/> Other Groundwater Monitoring, Soil Cover/Containment, Sediment Accumulation Monitoring</td> </tr> </table>		<input type="checkbox"/> Landfill cover/containment	<input type="checkbox"/> Monitored natural attenuation	<input type="checkbox"/> Access controls	<input type="checkbox"/> Groundwater containment	<input checked="" type="checkbox"/> Institutional controls	<input type="checkbox"/> Vertical barrier walls	<input type="checkbox"/> Groundwater pump and treatment		<input type="checkbox"/> Surface water collection and treatment		<input checked="" type="checkbox"/> Other Groundwater Monitoring, Soil Cover/Containment, Sediment Accumulation Monitoring	
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<input type="checkbox"/> Surface water collection and treatment													
<input checked="" type="checkbox"/> Other Groundwater Monitoring, Soil Cover/Containment, Sediment Accumulation Monitoring													
<b>Attachments:</b> <input checked="" type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached													
II. INTERVIEWS (Check all that apply)													
<b>1. O&amp;M site manager</b> _____ <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">Name</td> <td style="text-align: center;">Title</td> <td style="text-align: center;">Date</td> </tr> <tr> <td colspan="3">Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____</td> </tr> <tr> <td colspan="3">Problems, suggestions; <input type="checkbox"/> Report attached _____</td> </tr> <tr> <td colspan="3">_____</td> </tr> </table>		Name	Title	Date	Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____			Problems, suggestions; <input type="checkbox"/> Report attached _____			_____		
Name	Title	Date											
Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____													
Problems, suggestions; <input type="checkbox"/> Report attached _____													
_____													
<b>2. O&amp;M staff</b> _____ <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">Name</td> <td style="text-align: center;">Title</td> <td style="text-align: center;">Date</td> </tr> <tr> <td colspan="3">Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____</td> </tr> <tr> <td colspan="3">Problems, suggestions; <input type="checkbox"/> Report attached _____</td> </tr> <tr> <td colspan="3">_____</td> </tr> </table>		Name	Title	Date	Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____			Problems, suggestions; <input type="checkbox"/> Report attached _____			_____		
Name	Title	Date											
Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____													
Problems, suggestions; <input type="checkbox"/> Report attached _____													
_____													



<b>III. ON-SITE DOCUMENTS &amp; RECORDS VERIFIED</b> (Check all that apply)			
1.	<b>O&amp;M Documents</b> <input checked="" type="checkbox"/> O&M manual <input type="checkbox"/> As-built drawings <input type="checkbox"/> Maintenance logs Remarks <u>LUCRD for OU2 finalized in March 2012. Long Term Management Plan for OU2 finalized in March 2016.</u>	<input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
2.	<b>Site-Specific Health and Safety Plan</b> <input type="checkbox"/> Contingency plan/emergency response plan Remarks _____	<input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
3.	<b>O&amp;M and OSHA Training Records</b> Remarks <u>Kept by company that performs the O&amp;M</u>	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A
4.	<b>Permits and Service Agreements</b> <input type="checkbox"/> Air discharge permit <input type="checkbox"/> Effluent discharge <input type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Other permits _____ Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
5.	<b>Gas Generation Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
6.	<b>Settlement Monument Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
7.	<b>Groundwater Monitoring Records</b> Remarks <u>Groundwater monitoring related to the long-term management of OU2 will begin in FY2017.</u>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
8.	<b>Leachate Extraction Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
9.	<b>Discharge Compliance Records</b> <input type="checkbox"/> Air <input type="checkbox"/> Water (effluent) Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
10.	<b>Daily Access/Security Logs</b> Remarks <u>Access to PNS is restricted, but access to Operable Unit 2 area is not restricted within PNS.</u>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A

<b>IV. O&amp;M COSTS</b>			
<b>1.</b>	<b>O&amp;M Organization</b>		
	<input type="checkbox"/> State in-house	<input type="checkbox"/> Contractor for State	
	<input type="checkbox"/> PRP in-house	<input type="checkbox"/> Contractor for PRP	
	<input type="checkbox"/> Federal Facility in-house	<input checked="" type="checkbox"/> Contractor for Federal Facility	
	<input type="checkbox"/> Other _____		
<hr/>			
<b>2.</b>	<b>O&amp;M Cost Records</b>		
	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	
	<input checked="" type="checkbox"/> Funding mechanism/agreement in place		
	Original O&M cost estimate _____		<input type="checkbox"/> Breakdown attached
	Total annual cost by year for review period if available		
	From _____ To _____	_____	<input type="checkbox"/> Breakdown attached
	Date                      Date	Total cost	
	From _____ To _____	_____	<input type="checkbox"/> Breakdown attached
	Date                      Date	Total cost	
	From _____ To _____	_____	<input type="checkbox"/> Breakdown attached
	Date                      Date	Total cost	
	From _____ To _____	_____	<input type="checkbox"/> Breakdown attached
	Date                      Date	Total cost	
<hr/>			
<b>3.</b>	<b>Unanticipated or Unusually High O&amp;M Costs During Review Period</b>		
	Describe costs and reasons: <u>None</u>		
	_____		
	_____		
	_____		
	_____		
<hr/>			
<b>V. ACCESS AND INSTITUTIONAL CONTROLS</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A			
<b>A. Fencing</b>			
<b>1.</b>	<b>Fencing damaged</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Gates secured <input checked="" type="checkbox"/> N/A
	Remarks _____		
	_____		
<hr/>			
<b>B. Other Access Restrictions</b>			
<b>1.</b>	<b>Signs and other security measures</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A
	Remarks A "Digging Prohibited" sign as described in the LTMgt Plan will be installed in 2016.		
	_____		

<b>C. Institutional Controls (ICs)</b>				
1.	<b>Implementation and enforcement</b>			
	Site conditions imply ICs not properly implemented	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Site conditions imply ICs not being fully enforced	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Type of monitoring (e.g., self-reporting, drive by)	Inspection		
	Frequency	Annually		
	Responsible party/agency	Navy, NAVFAC Mid-Atlantic		
	Contact	Linda Cole	RPM	
		Name	Title	Date
	Reporting is up-to-date	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Reports are verified by the lead agency	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Specific requirements in deed or decision documents have been met	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Violations have been reported	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Other problems or suggestions:	<input type="checkbox"/> Report attached		
	_____			
	_____			
	_____			
2.	<b>Adequacy</b>	<input checked="" type="checkbox"/> ICs are adequate	<input type="checkbox"/> ICs are inadequate	<input type="checkbox"/> N/A
	Remarks	_____		
	_____			
<b>D. General</b>				
1.	<b>Vandalism/trespassing</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No vandalism evident	
	Remarks	_____		
	_____			
2.	<b>Land use changes on site</b>	<input type="checkbox"/> N/A		
	Remarks	None		
	_____			
3.	<b>Land use changes off site</b>	<input checked="" type="checkbox"/> N/A		
	Remarks	_____		
	_____			
<b>VI. GENERAL SITE CONDITIONS</b>				
A. Roads	<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A		
1.	<b>Roads damaged</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Roads adequate <input type="checkbox"/> N/A	
	Remarks	_____		
	_____			

<b>B. Other Site Conditions</b>			
Remarks <u>Shoreline stabilization structure, including geotextile and rip rap, placed along shore at Site 6 and Site 29 to prevent erosion of contaminated soil from the OU2 shoreline.</u> <u>Shoreline structures in good condition.</u> <u>For the waste disposal area, soil cover system (2 feet cover) in place over residual, deeper contaminated material with COC concentrations that exceed cleanup levels. Building 310 and its outbuildings are present to prevent exposure to underlying contaminated material.</u>			
<b>VII. LANDFILL COVERS</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
<b>A. Landfill Surface</b>			
1.	<b>Settlement (Low spots)</b> Areal extent _____ Depth _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Settlement not evident	
2.	<b>Cracks</b> Lengths _____ Widths _____ Depths _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Cracking not evident	
3.	<b>Erosion</b> Areal extent _____ Depth _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Erosion not evident	
4.	<b>Holes</b> Areal extent _____ Depth _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Holes not evident	
5.	<b>Vegetative Cover</b> <input type="checkbox"/> Grass <input type="checkbox"/> Cover properly established <input type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram) Remarks _____	<input type="checkbox"/> No signs of stress	
6.	<b>Alternative Cover (armored rock, concrete, etc.)</b> Remarks _____	<input type="checkbox"/> N/A	
7.	<b>Bulges</b> Areal extent _____ Height _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Bulges not evident	



8.	<b>Wet Areas/Water Damage</b>	<input type="checkbox"/> Wet areas/water damage not evident	
	<input type="checkbox"/> Wet areas	<input type="checkbox"/> Location shown on site map	Areal extent _____
	<input type="checkbox"/> Ponding	<input type="checkbox"/> Location shown on site map	Areal extent _____
	<input type="checkbox"/> Seeps	<input type="checkbox"/> Location shown on site map	Areal extent _____
	<input type="checkbox"/> Soft subgrade	<input type="checkbox"/> Location shown on site map	Areal extent _____
	Remarks _____		
<hr/>			
9.	<b>Slope Instability</b>	<input type="checkbox"/> Slides	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of slope instability
	Areal extent _____		
	Remarks _____		
<hr/>			
<b>B. Benches</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
<hr/>			
1.	<b>Flows Bypass Bench</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
	Remarks _____		
<hr/>			
2.	<b>Bench Breached</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
	Remarks _____		
<hr/>			
3.	<b>Bench Overtopped</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
	Remarks _____		
<hr/>			
<b>C. Letdown Channels</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
<hr/>			
1.	<b>Settlement</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of settlement
	Areal extent _____	Depth _____	
	Remarks _____		
<hr/>			
2.	<b>Material Degradation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of degradation
	Material type _____	Areal extent _____	
	Remarks _____		
<hr/>			
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of erosion
	Areal extent _____	Depth _____	
	Remarks _____		
<hr/>			

4.	<b>Undercutting</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of undercutting
	Areal extent _____	Depth _____	
	Remarks _____		
5.	<b>Obstructions</b>	Type _____	<input type="checkbox"/> No obstructions
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Size _____		
	Remarks _____		
6.	<b>Excessive Vegetative Growth</b>	Type _____	
	<input type="checkbox"/> No evidence of excessive growth		
	<input type="checkbox"/> Vegetation in channels does not obstruct flow		
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Remarks _____		
<b>D. Cover Penetrations</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1.	<b>Gas Vents</b>	<input type="checkbox"/> Active <input type="checkbox"/> Passive	
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	
	<input type="checkbox"/> N/A		
	Remarks _____		
2.	<b>Gas Monitoring Probes</b>	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition	
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A
	<input type="checkbox"/> Evidence of leakage at penetration		
	Remarks _____		
3.	<b>Monitoring Wells (within surface area of landfill)</b>		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
4.	<b>Leachate Extraction Wells</b>	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition	
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A
	<input type="checkbox"/> Evidence of leakage at penetration		
	Remarks _____		
5.	<b>Settlement Monuments</b>	<input type="checkbox"/> Located	<input type="checkbox"/> Routinely surveyed <input type="checkbox"/> N/A
	Remarks _____		

<b>E. Gas Collection and Treatment</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	<b>Gas Treatment Facilities</b> <input type="checkbox"/> Flaring <input type="checkbox"/> Thermal destruction <input type="checkbox"/> Collection for reuse <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____	
2.	<b>Gas Collection Wells, Manifolds and Piping</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____	
3.	<b>Gas Monitoring Facilities</b> (e.g., gas monitoring of adjacent homes or buildings) <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____	
<b>F. Cover Drainage Layer</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	<b>Outlet Pipes Inspected</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
2.	<b>Outlet Rock Inspected</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
<b>G. Detention/Sedimentation Ponds</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	<b>Siltation</b> Areal extent _____      Depth _____ <input type="checkbox"/> N/A <input type="checkbox"/> Siltation not evident Remarks _____ _____	
2.	<b>Erosion</b> Areal extent _____      Depth _____ <input type="checkbox"/> Erosion not evident Remarks _____ _____	
3.	<b>Outlet Works</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
4.	<b>Dam</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	

<b>H. Retaining Walls</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Deformations</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Deformation not evident
	Horizontal displacement _____	Vertical displacement _____	
	Rotational displacement _____		
	Remarks _____		
2.	<b>Degradation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Degradation not evident
	Remarks _____		
<b>I. Perimeter Ditches/Off-Site Discharge</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Siltation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Siltation not evident
	Areal extent _____	Depth _____	
	Remarks _____		
2.	<b>Vegetative Growth</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
	<input type="checkbox"/> Vegetation does not impede flow		
	Areal extent _____	Type _____	
	Remarks _____		
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Erosion not evident
	Areal extent _____	Depth _____	
	Remarks _____		
4.	<b>Discharge Structure</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks _____		
<b>VIII. VERTICAL BARRIER WALLS</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Settlement</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Settlement not evident
	Areal extent _____	Depth _____	
	Remarks _____		
2.	<b>Performance Monitoring</b>	Type of monitoring _____	
	<input type="checkbox"/> Performance not monitored		
	Frequency _____	<input type="checkbox"/> Evidence of breaching	
	Head differential _____		
	Remarks _____		

<b>IX. GROUNDWATER/SURFACE WATER REMEDIES</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
<b>A. Groundwater Extraction Wells, Pumps, and Pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	<b>Pumps, Wellhead Plumbing, and Electrical</b> <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____ _____
2.	<b>Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____
<b>B. Surface Water Collection Structures, Pumps, and Pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	<b>Collection Structures, Pumps, and Electrical</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
2.	<b>Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____

<b>C. Treatment System</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Treatment Train (Check components that apply)</b>		
	<input type="checkbox"/> Metals removal	<input type="checkbox"/> Oil/water separation	<input type="checkbox"/> Bioremediation
	<input type="checkbox"/> Air stripping	<input type="checkbox"/> Carbon adsorbers	
	<input type="checkbox"/> Filters _____		
	<input type="checkbox"/> Additive (e.g., chelation agent, flocculent) _____		
	<input type="checkbox"/> Others _____		
	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance	
	<input type="checkbox"/> Sampling ports properly marked and functional		
	<input type="checkbox"/> Sampling/maintenance log displayed and up to date		
	<input type="checkbox"/> Equipment properly identified		
	<input type="checkbox"/> Quantity of groundwater treated annually _____		
	<input type="checkbox"/> Quantity of surface water treated annually _____		
	Remarks _____		
2.	<b>Electrical Enclosures and Panels (properly rated and functional)</b>		
	<input type="checkbox"/> N/A	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance
	Remarks _____		
3.	<b>Tanks, Vaults, Storage Vessels</b>		
	<input type="checkbox"/> N/A	<input type="checkbox"/> Good condition	<input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance
	Remarks _____		
4.	<b>Discharge Structure and Appurtenances</b>		
	<input type="checkbox"/> N/A	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance
	Remarks _____		
5.	<b>Treatment Building(s)</b>		
	<input type="checkbox"/> N/A	<input type="checkbox"/> Good condition (esp. roof and doorways)	<input type="checkbox"/> Needs repair
	<input type="checkbox"/> Chemicals and equipment properly stored		
	Remarks _____		
6.	<b>Monitoring Wells (pump and treatment remedy)</b>		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> All required wells located	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
<b>D. Monitoring Data</b>			
1.	<b>Monitoring Data</b>		
	<input type="checkbox"/> Is routinely submitted on time	<input type="checkbox"/> Is of acceptable quality	
2.	<b>Monitoring data suggests:</b>		
	<input type="checkbox"/> Groundwater plume is effectively contained	<input type="checkbox"/> Contaminant concentrations are declining	

<b>D. Monitored Natural Attenuation</b>			
1.	<b>Monitoring Wells</b> (natural attenuation remedy)		
<input type="checkbox"/>	Properly secured/locked	<input type="checkbox"/>	Functioning
<input type="checkbox"/>	All required wells located	<input type="checkbox"/>	Routinely sampled
<input type="checkbox"/>		<input type="checkbox"/>	Good condition
<input type="checkbox"/>		<input type="checkbox"/>	Needs Maintenance
		<input checked="" type="checkbox"/>	N/A
Remarks _____			
_____			
<b>X. OTHER REMEDIES</b>			
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.			
<b>XI. OVERALL OBSERVATIONS</b>			
<b>A. Implementation of the Remedy</b>			
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).			
The remedy is intended to prevent contact with contaminated soil. Excavations performed 2013-2014.			
A soil cover was placed at OU2 to prevent exposure to contaminated soil. Institutional controls are to restrict land uses within the OU2 boundary to prevent unacceptable human exposure to site contaminants.			
The remedy currently appears to be functioning as designed. The soil cover prevents contact.			
A sign to prevent digging needs to be placed at OU2. No indication of disturbance of the soil cover to a degree that could potentially affect protectiveness was evident. Overall, exposure to site contaminants appears to be effectively prevented by the remedy.			
Post-remediation groundwater and sediment accumulation monitoring are being conducted as outlined in the LTMgt Plan for OU2.			
_____			
_____			
<b>B. Adequacy of O&amp;M</b>			
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.			
Overall, the condition of the soil cover and shoreline structures is good.			
Annual LUC/LTMgt inspections are adequate to confirm protectiveness of the remedy.			
_____			
_____			
_____			
_____			
_____			
_____			
_____			

**C. Early Indicators of Potential Remedy Problems**

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

None

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**D. Opportunities for Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None

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<b>I. SITE INFORMATION</b>													
Site name: Operable Unit 3	Date of inspection: 7/15/16												
Location and Region: Portsmouth Naval Shipyard, EPA Region 1	EPA ID: ME7170022019												
Agency, office, or company leading the five-year review: Navy	Weather/temperature: Cloudy/85°F												
<b>Remedy Includes:</b> (Check all that apply) <table style="width: 100%; border: none;"> <tr> <td><input checked="" type="checkbox"/> Landfill cover/containment</td> <td><input type="checkbox"/> Monitored natural attenuation</td> </tr> <tr> <td><input type="checkbox"/> Access controls</td> <td><input type="checkbox"/> Groundwater containment</td> </tr> <tr> <td><input checked="" type="checkbox"/> Institutional controls</td> <td><input type="checkbox"/> Vertical barrier walls</td> </tr> <tr> <td><input type="checkbox"/> Groundwater pump and treatment</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Surface water collection and treatment</td> <td></td> </tr> <tr> <td colspan="2"><input checked="" type="checkbox"/> Other <u>Routine inspections and maintenance of the cap, shoreline erosion controls, &amp; LUCs. Periodic groundwater monitoring (every five years)</u></td> </tr> </table>		<input checked="" type="checkbox"/> Landfill cover/containment	<input type="checkbox"/> Monitored natural attenuation	<input type="checkbox"/> Access controls	<input type="checkbox"/> Groundwater containment	<input checked="" type="checkbox"/> Institutional controls	<input type="checkbox"/> Vertical barrier walls	<input type="checkbox"/> Groundwater pump and treatment		<input type="checkbox"/> Surface water collection and treatment		<input checked="" type="checkbox"/> Other <u>Routine inspections and maintenance of the cap, shoreline erosion controls, &amp; LUCs. Periodic groundwater monitoring (every five years)</u>	
<input checked="" type="checkbox"/> Landfill cover/containment	<input type="checkbox"/> Monitored natural attenuation												
<input type="checkbox"/> Access controls	<input type="checkbox"/> Groundwater containment												
<input checked="" type="checkbox"/> Institutional controls	<input type="checkbox"/> Vertical barrier walls												
<input type="checkbox"/> Groundwater pump and treatment													
<input type="checkbox"/> Surface water collection and treatment													
<input checked="" type="checkbox"/> Other <u>Routine inspections and maintenance of the cap, shoreline erosion controls, &amp; LUCs. Periodic groundwater monitoring (every five years)</u>													
<b>Attachments:</b> <input checked="" type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached													
<b>II. INTERVIEWS</b> (Check all that apply)													
1. O&M site manager <u>Frederick Thyng</u> <u>PWD-ME Environment</u> <u>6/28/2016</u> <div style="display: flex; justify-content: space-between; margin-left: 100px;"> <span>Name</span> <span>Title</span> <span>Date</span> </div> Interviewed <input checked="" type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone   Phone no. _____ Problems, suggestions; <input type="checkbox"/> Report attached _____ _____													
2. O&M staff _____ <div style="display: flex; justify-content: space-between; margin-left: 100px;"> <span>Name</span> <span>Title</span> <span>Date</span> </div> Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone   Phone no. _____ Problems, suggestions; <input type="checkbox"/> Report attached _____ _____													

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency USEPA  
 Contact Matthew R. Audet USEPA Remedial Project Manager 617-918-1449  
 Name Title Date Phone no.  
 Problems; suggestions;  Report attached EPA provides input through review and comment on draft and draft final reports.

Agency MEDEP  
 Contact Iver McLeod MEDEP Remedial Project Manager 207-592-2981  
 Name Title Date Phone no.  
 Problems; suggestions;  Report attached MEDEP provides input through review and comment draft and draft final reports.

Agency \_\_\_\_\_  
 Contact \_\_\_\_\_  
 Name Title Date Phone no.  
 Problems; suggestions;  Report attached \_\_\_\_\_

Agency \_\_\_\_\_  
 Contact \_\_\_\_\_  
 Name Title Date Phone no.  
 Problems; suggestions;  Report attached \_\_\_\_\_

4. **Other interviews** (optional)  Report attached.

Community members have the opportunity to provide input at RAB meeting


III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1.	<b>O&amp;M Documents</b> <input checked="" type="checkbox"/> O&M manual <input checked="" type="checkbox"/> As-built drawings <input checked="" type="checkbox"/> Maintenance logs Remarks _____	<input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A <input type="checkbox"/> N/A <input type="checkbox"/> N/A
2.	<b>Site-Specific Health and Safety Plan</b> <input type="checkbox"/> Contingency plan/emergency response plan Remarks _____	<input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
3.	<b>O&amp;M and OSHA Training Records</b> Remarks <u>Kept by company that performs the O&amp;M</u>	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A
4.	<b>Permits and Service Agreements</b> <input type="checkbox"/> Air discharge permit <input type="checkbox"/> Effluent discharge <input type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Other permits _____ Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
5.	<b>Gas Generation Records</b> Remarks <u>Navy discontinued the landfill gas monitoring program in December 2012. Abandonment of 7 landfill gas probes at the Site was completed in July 2014.</u>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
6.	<b>Settlement Monument Records</b> Remarks <u>Survey completed of 6 settlement markers in August 2011. Elevations compared to 2011 with negligible change</u>	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A
7.	<b>Groundwater Monitoring Records</b> Remarks _____	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A
8.	<b>Leachate Extraction Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
9.	<b>Discharge Compliance Records</b> <input type="checkbox"/> Air <input type="checkbox"/> Water (effluent) Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
10.	<b>Daily Access/Security Logs</b> Remarks <u>Access to PNS is restricted. Access to Jamaica Island Landfill (OU3) within PNS is not restricted.</u>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A

<b>IV. O&amp;M COSTS</b>																																									
1.	<p><b>O&amp;M Organization</b></p> <p> <input type="checkbox"/> State in-house                      <input type="checkbox"/> Contractor for State  <input type="checkbox"/> PRP in-house                         <input type="checkbox"/> Contractor for PRP  <input type="checkbox"/> Federal Facility in-house         <input checked="" type="checkbox"/> Contractor for Federal Facility  <input type="checkbox"/> Other _____                 </p>																																								
2.	<p><b>O&amp;M Cost Records</b></p> <p> <input type="checkbox"/> Readily available            <input type="checkbox"/> Up to date  <input checked="" type="checkbox"/> Funding mechanism/agreement in place                      Original O&amp;M cost estimate _____ <input type="checkbox"/> Breakdown attached                 </p> <p style="text-align: center;">Total annual cost by year for review period if available</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">From _____</td> <td style="width: 15%;">To _____</td> <td style="width: 30%;"></td> <td style="width: 15%;"></td> <td style="width: 25%;"></td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> <td style="text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td></td> <td style="text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> <td style="text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td></td> <td style="text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> <td style="text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td></td> <td style="text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> <td style="text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> </table>	From _____	To _____				Date	Date	Total cost		<input type="checkbox"/> Breakdown attached	From _____	To _____			<input type="checkbox"/> Breakdown attached	Date	Date	Total cost		<input type="checkbox"/> Breakdown attached	From _____	To _____			<input type="checkbox"/> Breakdown attached	Date	Date	Total cost		<input type="checkbox"/> Breakdown attached	From _____	To _____			<input type="checkbox"/> Breakdown attached	Date	Date	Total cost		<input type="checkbox"/> Breakdown attached
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Date	Date	Total cost		<input type="checkbox"/> Breakdown attached																																					
3.	<p><b>Unanticipated or Unusually High O&amp;M Costs During Review Period</b></p> <p>Describe costs and reasons: <u>None</u></p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>																																								
<b>V. ACCESS AND INSTITUTIONAL CONTROLS</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A																																									
<b>A. Fencing</b>																																									
1.	<p><b>Fencing damaged</b>            <input type="checkbox"/> Location shown on site map    <input type="checkbox"/> Gates secured            <input checked="" type="checkbox"/> N/A</p> <p>Remarks <u>Access to enter the shipyard is restricted, but OU3 site access is not restricted within the shipyard.</u></p>																																								
<b>B. Other Access Restrictions</b>																																									
1.	<p><b>Signs and other security measures</b>            <input checked="" type="checkbox"/> Location shown on site map    <input type="checkbox"/> N/A</p> <p>Remarks <u>Signs restricting digging were installed by Navy. Two signs have been damaged by plows and/or wind. Signs planned to be replaced by Navy during FY2017</u></p>																																								

<b>C. Institutional Controls (ICs)</b>				
1.	<b>Implementation and enforcement</b>			
	Site conditions imply ICs not properly implemented	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
	Site conditions imply ICs not being fully enforced	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
	Type of monitoring (e.g., self-reporting, drive by) <u>Inspection during O&amp;M rounds</u>			
	Frequency <u>Annually and after episodic storms</u>			
	Responsible party/agency <u>Navy, NAVFAC Mid-Atlantic</u>			
	Contact <u>Linda Cole</u>	<u>RPM</u>		
	Name	Title	Date	Phone no.
	Reporting is up-to-date	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
	Reports are verified by the lead agency	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
	Specific requirements in deed or decision documents have been met	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
	Violations have been reported	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
	Other problems or suggestions: <input type="checkbox"/> Report attached			
	_____			
	_____			
	_____			
2.	<b>Adequacy</b>	<input checked="" type="checkbox"/> ICs are adequate	<input type="checkbox"/> ICs are inadequate	<input type="checkbox"/> N/A
	Remarks	_____		
	_____			
	_____			
<b>D. General</b>				
1.	<b>Vandalism/trespassing</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No vandalism evident	
	Remarks	_____		
	_____			
2.	<b>Land use changes on site</b>	<input checked="" type="checkbox"/> N/A		
	Remarks	<u>None</u>		
	_____			
3.	<b>Land use changes off site</b>	<input checked="" type="checkbox"/> N/A		
	Remarks	_____		
	_____			
<b>VI. GENERAL SITE CONDITIONS</b>				
<b>A. Roads</b>				
	<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A		
1.	<b>Roads damaged</b>	<input checked="" type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Roads adequate <input type="checkbox"/> N/A	
	Remarks <u>Corner of East Rd. and Parker Ave., along western edge of East Road, Access Rd. at southeast corner of landfill - identified partially damaged paving</u>			
	_____			

<b>B. Other Site Conditions</b>	
Remarks _____ _____ _____ _____ _____	
<b>VII. LANDFILL COVERS</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A	
<b>A. Landfill Surface</b>	
1.	<b>Settlement</b> (Low spots) <input checked="" type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Settlement not evident Areal extent _____                      Depth _____ Remarks <u>Survey of 6 settlement disks and other points completed in August 2016, with elevations compared to 2011.</u>
2.	<b>Cracks</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Cracking not evident Lengths _____                      Widths _____                      Depths _____ Remarks <u>No cracking observed in paved cover areas. Parking lot repaved in 2016.</u>
3.	<b>Erosion</b> <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Erosion not evident Areal extent <u>200 sq. ft.</u> Depth <u>&lt;3 in.</u> Remarks <u>Several areas were found where cover had been damaged by vehicles.</u>
4.	<b>Holes</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Holes not evident Areal extent _____                      Depth _____ Remarks <u>Holes caused by burrowing animals no observed on landfill cover in 2016, although observed during past annual inspections</u>
5.	<b>Vegetative Cover</b> <input checked="" type="checkbox"/> Grass <input checked="" type="checkbox"/> Cover properly established <input type="checkbox"/> No signs of stress <input type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram) Remarks <u>Overall grass cover in good condition. Thinner grass, and exposed mesh to limited extent, observed at some boundaries of road and grass (East Rd, Access Rd)</u>
6.	<b>Alternative Cover (armored rock, concrete, etc.)</b> <input type="checkbox"/> N/A Remarks <u>Shoreline protection revetment stone in good condition.</u>
7.	<b>Bulges</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Bulges not evident Areal extent _____                      Height _____ Remarks _____

8.	<b>Wet Areas/Water Damage</b>	<input type="checkbox"/> Wet areas/water damage not evident	Areal extent _____
	<input checked="" type="checkbox"/> Wet areas	<input type="checkbox"/> Location shown on site map	Areal extent _____
	<input checked="" type="checkbox"/> Ponding	<input checked="" type="checkbox"/> Location shown on site map	Areal extent _____
	<input type="checkbox"/> Seeps	<input type="checkbox"/> Location shown on site map	Areal extent _____
	<input type="checkbox"/> Soft subgrade	<input type="checkbox"/> Location shown on site map	Areal extent _____
Remarks <u>Standing water not observed on the day of the inspection. Although standing water observed in the northwest corner of parking lot (near gas vent #3) on 6/28/2016</u>			
9.	<b>Slope Instability</b>	<input type="checkbox"/> Slides	<input type="checkbox"/> Location shown on site map
	<input checked="" type="checkbox"/> No evidence of slope instability		
	Areal extent _____		
Remarks <u>No visual signs of slope instability. Survey elevations with no difference 2011-2016 Titled gas vents inspected annually. No significant tilting or change in tilting over time.</u>			
<b>B. Benches</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	<b>Flows Bypass Bench</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
	Remarks _____		
2.	<b>Bench Breached</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
	Remarks _____		
3.	<b>Bench Overtopped</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
	Remarks _____		
<b>C. Letdown Channels</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	<b>Settlement</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of settlement
	Areal extent _____	Depth _____	
	Remarks _____		
2.	<b>Material Degradation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of degradation
	Material type _____	Areal extent _____	
	Remarks _____		
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of erosion
	Areal extent _____	Depth _____	
	Remarks _____		

4.	<b>Undercutting</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of undercutting
	Areal extent _____	Depth _____	
	Remarks _____		
<hr/>			
5.	<b>Obstructions</b>	Type _____	<input type="checkbox"/> No obstructions
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Size _____		
	Remarks _____		
<hr/>			
6.	<b>Excessive Vegetative Growth</b>	Type _____	
	<input type="checkbox"/> No evidence of excessive growth		
	<input type="checkbox"/> Vegetation in channels does not obstruct flow		
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Remarks _____		
<hr/>			
<b>D. Cover Penetrations</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
1.	<b>Gas Vents</b>	<input type="checkbox"/> Active <input checked="" type="checkbox"/> Passive	
	<input checked="" type="checkbox"/> Properly secured/locked	<input checked="" type="checkbox"/> Functioning	<input checked="" type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input checked="" type="checkbox"/> Needs Maintenance	
	<input type="checkbox"/> N/A		
	Remarks Gas vents #2 and #3 observed to be damaged and requiring maintenance. Remaining 25 gas vents in good condition and functioning as designed.		
<hr/>			
2.	<b>Gas Monitoring Probes</b>		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input checked="" type="checkbox"/> N/A
	Remarks Abandonment of 7 landfill gas probes at the Site was completed in July 2014.		
<hr/>			
3.	<b>Monitoring Wells</b> (within surface area of landfill)		
	<input checked="" type="checkbox"/> Properly secured/locked	<input checked="" type="checkbox"/> Functioning	<input checked="" type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input checked="" type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks Monitoring wells sampled July 2016. Damaged/corroded locks replaced where needed. Repair to well cap on WOT-5 to be completed in FY2017		
<hr/>			
4.	<b>Leachate Extraction Wells</b>		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input checked="" type="checkbox"/> N/A
	Remarks _____		
<hr/>			
5.	<b>Settlement Monuments</b>	<input checked="" type="checkbox"/> Located	<input checked="" type="checkbox"/> Routinely surveyed <input type="checkbox"/> N/A
	Remarks Six settlement markers surveyed in 2016.		
<hr/>			



<b>E. Gas Collection and Treatment</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1.	<b>Gas Treatment Facilities</b>	<input type="checkbox"/> Flaring <input type="checkbox"/> Thermal destruction <input type="checkbox"/> Collection for reuse	<input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance
Remarks _____ _____			
2.	<b>Gas Collection Wells, Manifolds and Piping</b>	<input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance	
Remarks _____ _____			
3.	<b>Gas Monitoring Facilities</b> (e.g., gas monitoring of adjacent homes or buildings)	<input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A	
Remarks _____ _____			
<b>F. Cover Drainage Layer</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1.	<b>Outlet Pipes Inspected</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
Remarks _____ _____			
2.	<b>Outlet Rock Inspected</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
Remarks _____ _____			
<b>G. Detention/Sedimentation Ponds</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1.	<b>Siltation</b> Areal extent _____	Depth _____	<input type="checkbox"/> N/A
<input type="checkbox"/> Siltation not evident			
Remarks _____ _____			
2.	<b>Erosion</b> Areal extent _____	Depth _____	
<input type="checkbox"/> Erosion not evident			
Remarks _____ _____			
3.	<b>Outlet Works</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
Remarks _____ _____			
4.	<b>Dam</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
Remarks _____ _____			

<b>H. Retaining Walls</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Deformations</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Deformation not evident
	Horizontal displacement _____	Vertical displacement _____	
	Rotational displacement _____		
	Remarks _____		
<hr/>			
2.	<b>Degradation</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Degradation not evident
	Remarks _____		
<hr/>			
<b>I. Perimeter Ditches/Off-Site Discharge</b>		<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	<b>Siltation</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Siltation not evident
	Areal extent _____	Depth _____	
	Remarks _____		
<hr/>			
2.	<b>Vegetative Growth</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
	<input checked="" type="checkbox"/> Vegetation does not impede flow		
	Areal extent _____	Type _____	
	Remarks _____		
<hr/>			
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Erosion not evident
	Areal extent _____	Depth _____	
	Remarks _____		
<hr/>			
4.	<b>Discharge Structure</b>	<input checked="" type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks Accumulated grass and reeds observed in some culverts. Periodic cleaning recommended _____		
<hr/>			
<b>VIII. VERTICAL BARRIER WALLS</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Settlement</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Settlement not evident
	Areal extent _____	Depth _____	
	Remarks _____		
<hr/>			
2.	<b>Performance Monitoring</b>	Type of monitoring _____	
	<input type="checkbox"/> Performance not monitored		
	Frequency _____	<input type="checkbox"/> Evidence of breaching	
	Head differential _____		
	Remarks _____		
<hr/>			

<b>IX. GROUNDWATER/SURFACE WATER REMEDIES</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A	
<b>A. Groundwater Extraction Wells, Pumps, and Pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	<b>Pumps, Wellhead Plumbing, and Electrical</b> <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____ _____
2.	<b>Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____
<b>B. Surface Water Collection Structures, Pumps, and Pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	<b>Collection Structures, Pumps, and Electrical</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
2.	<b>Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____

<b>C. Treatment System</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Treatment Train</b> (Check components that apply) <input type="checkbox"/> Metals removal <input type="checkbox"/> Oil/water separation <input type="checkbox"/> Bioremediation <input type="checkbox"/> Air stripping <input type="checkbox"/> Carbon adsorbers <input type="checkbox"/> Filters _____ <input type="checkbox"/> Additive (e.g., chelation agent, flocculent) _____ <input type="checkbox"/> Others _____ <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> Sampling ports properly marked and functional <input type="checkbox"/> Sampling/maintenance log displayed and up to date <input type="checkbox"/> Equipment properly identified <input type="checkbox"/> Quantity of groundwater treated annually _____ <input type="checkbox"/> Quantity of surface water treated annually _____ Remarks _____ _____		
2.	<b>Electrical Enclosures and Panels</b> (properly rated and functional) <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
3.	<b>Tanks, Vaults, Storage Vessels</b> <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
4.	<b>Discharge Structure and Appurtenances</b> <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
5.	<b>Treatment Building(s)</b> <input type="checkbox"/> N/A <input type="checkbox"/> Good condition (esp. roof and doorways) <input type="checkbox"/> Needs repair <input type="checkbox"/> Chemicals and equipment properly stored Remarks _____ _____		
6.	<b>Monitoring Wells</b> (pump and treatment remedy) <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____		
<b>D. Monitoring Data</b>			
1.	Monitoring Data <input checked="" type="checkbox"/> Is routinely submitted on time <input checked="" type="checkbox"/> Is of acceptable quality		
2.	Monitoring data suggests: <input checked="" type="checkbox"/> Groundwater plume is effectively contained <input checked="" type="checkbox"/> Contaminant concentrations are declining		

<b>D. Monitored Natural Attenuation</b>			
1.	<b>Monitoring Wells</b> (natural attenuation remedy)	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning
		<input type="checkbox"/> All required wells located	<input type="checkbox"/> Needs Maintenance
		<input type="checkbox"/> Routinely sampled	<input type="checkbox"/> Good condition
			<input checked="" type="checkbox"/> N/A
Remarks <u>MNA not part of OU3 selected remedy. Long term monitoring of groundwater being conducted, with frequency reduced from annual to every 5 years in 2012</u>			
<b>X. OTHER REMEDIES</b>			
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.			
<b>XI. OVERALL OBSERVATIONS</b>			
<b>A. Implementation of the Remedy</b>			
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).			
<u>The remedy is intended to prevent contact with contaminated soil and/or waste. The cover also minimizes infiltration of water to the landfill material. Institutional controls are to restrict land use and groundwater uses within the JILF boundary to prevent unacceptable human exposure to site contaminants. Institutional controls prevent unrestricted disturbance of the hazardous waste landfill cover and shoreline erosion controls. The remedy currently appears to be functioning as designed.</u>			
<u>The cap prevents contact and infiltration. Two signs to prevent digging needs to be repaired/ replaced. No indication of disturbance of the landfill cover or erosion controls, to a degree that could potentially affect protectiveness, was evident. Overall, exposure to site contaminants appears to be effectively prevented by the remedy.</u>			
<hr/> <hr/> <hr/> <hr/> <hr/>			
<b>B. Adequacy of O&amp;M</b>			
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.			
<u>Overall, the condition of the asphalt, Clark Cove rip-rap revetment, and Jamaica Cove wetland, condition of the gas vents (with exception of 2 noted) is good. Minor issues have been identified as requiring maintenance, but nothing has been identified that would affect protectiveness at this time.</u>			
<hr/> <hr/> <hr/> <hr/> <hr/>			

**C. Early Indicators of Potential Remedy Problems**

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Possible slope movement was identified as an item to monitored for in the 2nd Five Year Review.

Monitoring of settlement, tilted vents, or other signs of slope movement will continue to be monitored during annual inspections.

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**D. Opportunities for Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Navy has prepared a Landfill Repair Design Report to implement repairs for items identified during annual landfill inspections. Repairs including paving corner of Parker Ave/East Rd., installation of sidewalk along East Rd, and reinforced warning signs (no digging).

Further discussed in Section 5.0 of Five Year Review

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<b>I. SITE INFORMATION</b>													
<b>Site name:</b> Operable Unit 7	<b>Date of inspection:</b> 6/14/2016												
<b>Location and Region:</b> Portsmouth Naval Shipyard, EPA Region 1	<b>EPA ID:</b> ME7170022019												
<b>Agency, office, or company leading the five-year review:</b> Navy	<b>Weather/temperature:</b> Sunny/75°F												
<b>Remedy Includes:</b> (Check all that apply) <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Landfill cover/containment</td> <td><input type="checkbox"/> Monitored natural attenuation</td> </tr> <tr> <td><input type="checkbox"/> Access controls</td> <td><input type="checkbox"/> Groundwater containment</td> </tr> <tr> <td><input checked="" type="checkbox"/> Institutional controls</td> <td><input type="checkbox"/> Vertical barrier walls</td> </tr> <tr> <td><input type="checkbox"/> Groundwater pump and treatment</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Surface water collection and treatment</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Other LTMgt of the existing shoreline erosion controls</td> <td></td> </tr> </table>		<input type="checkbox"/> Landfill cover/containment	<input type="checkbox"/> Monitored natural attenuation	<input type="checkbox"/> Access controls	<input type="checkbox"/> Groundwater containment	<input checked="" type="checkbox"/> Institutional controls	<input type="checkbox"/> Vertical barrier walls	<input type="checkbox"/> Groundwater pump and treatment		<input type="checkbox"/> Surface water collection and treatment		<input checked="" type="checkbox"/> Other LTMgt of the existing shoreline erosion controls	
<input type="checkbox"/> Landfill cover/containment	<input type="checkbox"/> Monitored natural attenuation												
<input type="checkbox"/> Access controls	<input type="checkbox"/> Groundwater containment												
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<input type="checkbox"/> Groundwater pump and treatment													
<input type="checkbox"/> Surface water collection and treatment													
<input checked="" type="checkbox"/> Other LTMgt of the existing shoreline erosion controls													
<b>Attachments:</b> <input checked="" type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached													
<b>II. INTERVIEWS</b> (Check all that apply)													
1. O&M site manager <u>Frederick Thyng</u> <u>PWD-ME Environment</u> <u>6/28/2016</u> <div style="display: flex; justify-content: space-between; margin-left: 100px;"> <span>Name</span> <span>Title</span> <span>Date</span> </div> Interviewed <input checked="" type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone   Phone no. _____ Problems, suggestions; <input type="checkbox"/> Report attached _____ <u>Shoreline controls in good condition. Took photographs for baseline LTMgt Report</u>													
2. O&M staff _____                                      _____                                      _____ <div style="display: flex; justify-content: space-between; margin-left: 100px;"> <span>Name</span> <span>Title</span> <span>Date</span> </div> Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone   Phone no. _____ Problems, suggestions; <input type="checkbox"/> Report attached _____ _____													

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency USEPA  
 Contact Matthew R. Audet USEPA Remedial Project Manager 617-918-1449  
 Name Title Date Phone no.  
 Problems; suggestions;  Report attached EPA provides input through review and comment on draft and draft final reports.

Agency MEDEP  
 Contact Iver McLeod MEDEP Remedial Project Manager 207-592-2981  
 Name Title Date Phone no.  
 Problems; suggestions;  Report attached MEDEP provides input through review and comment draft and draft final reports.

Agency \_\_\_\_\_  
 Contact \_\_\_\_\_  
 Name Title Date Phone no.  
 Problems; suggestions;  Report attached \_\_\_\_\_

Agency \_\_\_\_\_  
 Contact \_\_\_\_\_  
 Name Title Date Phone no.  
 Problems; suggestions;  Report attached \_\_\_\_\_

4. **Other interviews** (optional)  Report attached.

Community members will have the opportunity to provide input at RAB meeting.




<b>III. ON-SITE DOCUMENTS &amp; RECORDS VERIFIED</b> (Check all that apply)			
1.	<b>O&amp;M Documents</b> <input checked="" type="checkbox"/> O&M manual <input checked="" type="checkbox"/> As-built drawings <input type="checkbox"/> Maintenance logs Remarks <u>LUCRD for OU7 finalized in September 2014. Long Term Management Plan for OU7 finalized in March 2016.</u>	<input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
2.	<b>Site-Specific Health and Safety Plan</b> <input type="checkbox"/> Contingency plan/emergency response plan Remarks _____	<input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
3.	<b>O&amp;M and OSHA Training Records</b> Remarks <u>Kept by company that performs the O&amp;M</u>	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A
4.	<b>Permits and Service Agreements</b> <input type="checkbox"/> Air discharge permit <input type="checkbox"/> Effluent discharge <input type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Other permits _____ Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
5.	<b>Gas Generation Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
6.	<b>Settlement Monument Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
7.	<b>Groundwater Monitoring Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
8.	<b>Leachate Extraction Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
9.	<b>Discharge Compliance Records</b> <input type="checkbox"/> Air <input type="checkbox"/> Water (effluent) Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
10.	<b>Daily Access/Security Logs</b> Remarks <u>Access to PNS is restricted, but access to Operable Unit 7 area is not restricted within PNS.</u>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A

<b>IV. O&amp;M COSTS</b>																																																	
<b>1.</b>	<p><b>O&amp;M Organization</b></p> <p><input type="checkbox"/> State in-house                      <input type="checkbox"/> Contractor for State</p> <p><input type="checkbox"/> PRP in-house                         <input type="checkbox"/> Contractor for PRP</p> <p><input type="checkbox"/> Federal Facility in-house         <input checked="" type="checkbox"/> Contractor for Federal Facility</p> <p><input type="checkbox"/> Other _____</p>																																																
<b>2.</b>	<p><b>O&amp;M Cost Records</b></p> <p><input type="checkbox"/> Readily available            <input type="checkbox"/> Up to date</p> <p><input checked="" type="checkbox"/> Funding mechanism/agreement in place</p> <p>Original O&amp;M cost estimate _____ <input type="checkbox"/> Breakdown attached</p> <p style="text-align: center;">Total annual cost by year for review period if available</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">From _____</td> <td style="width: 10%;">To _____</td> <td style="width: 40%;"></td> <td style="width: 20%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> <td><input type="checkbox"/> Breakdown attached</td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> <td><input type="checkbox"/> Breakdown attached</td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> <td><input type="checkbox"/> Breakdown attached</td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> <td><input type="checkbox"/> Breakdown attached</td> <td></td> </tr> </table>	From _____	To _____					Date	Date	Total cost		<input type="checkbox"/> Breakdown attached		From _____	To _____					Date	Date	Total cost		<input type="checkbox"/> Breakdown attached		From _____	To _____					Date	Date	Total cost		<input type="checkbox"/> Breakdown attached		From _____	To _____					Date	Date	Total cost		<input type="checkbox"/> Breakdown attached	
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<b>3.</b>	<p><b>Unanticipated or Unusually High O&amp;M Costs During Review Period</b></p> <p>Describe costs and reasons: <u>None</u></p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>																																																
<b>V. ACCESS AND INSTITUTIONAL CONTROLS</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A																																																	
<b>A. Fencing</b>																																																	
<b>1.</b>	<p><b>Fencing damaged</b>            <input type="checkbox"/> Location shown on site map    <input type="checkbox"/> Gates secured            <input checked="" type="checkbox"/> N/A</p> <p>Remarks _____</p> <p>_____</p>																																																
<b>B. Other Access Restrictions</b>																																																	
<b>1.</b>	<p><b>Signs and other security measures</b>            <input type="checkbox"/> Location shown on site map    <input checked="" type="checkbox"/> N/A</p> <p>Remarks _____</p> <p>_____</p>																																																

<b>C. Institutional Controls (ICs)</b>				
1.	<b>Implementation and enforcement</b>			
	Site conditions imply ICs not properly implemented	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Site conditions imply ICs not being fully enforced	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Type of monitoring (e.g., self-reporting, drive by) <u>Inspection</u>			
	Frequency <u>Annually</u>			
	Responsible party/agency <u>Navy, NAVFAC Mid-Atlantic</u>			
	Contact <u>Linda Cole</u>	<u>RPM</u>		
	Name	Title	Date	Phone no.
	Reporting is up-to-date	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Reports are verified by the lead agency	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Specific requirements in deed or decision documents have been met	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Violations have been reported	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Other problems or suggestions: <input checked="" type="checkbox"/> Report attached			
	<u>LTMgt Checklist attached</u>			
	_____			
	_____			
	_____			
2.	<b>Adequacy</b>	<input checked="" type="checkbox"/> ICs are adequate	<input type="checkbox"/> ICs are inadequate	<input type="checkbox"/> N/A
	Remarks _____			
	_____			
	_____			
<b>D. General</b>				
1.	<b>Vandalism/trespassing</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No vandalism evident	
	Remarks _____			
	_____			
2.	<b>Land use changes on site</b>	<input checked="" type="checkbox"/> N/A		
	Remarks <u>None</u>			
	_____			
3.	<b>Land use changes off site</b>	<input checked="" type="checkbox"/> N/A		
	Remarks _____			
	_____			
<b>VI. GENERAL SITE CONDITIONS</b>				
<b>A. Roads</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A				
1.	<b>Roads damaged</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Roads adequate	<input type="checkbox"/> N/A
	Remarks <u>Large parking lot at OU7 recently repaved</u>			
	_____			

<b>B. Other Site Conditions</b>			
Remarks <u>Shoreline stabilization structure, including geotextile and rip rap, placed along shore at OU7 to prevent erosion of contaminated soil from the OU7 shoreline.</u> <u>Shoreline structures in good condition.</u> _____ _____ _____			
<b>VII. LANDFILL COVERS</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
<b>A. Landfill Surface</b>			
1.	<b>Settlement</b> (Low spots) Areal extent _____ Depth _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Settlement not evident	
2.	<b>Cracks</b> Lengths _____    Widths _____    Depths _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Cracking not evident	
3.	<b>Erosion</b> Areal extent _____ Depth _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Erosion not evident	
4.	<b>Holes</b> Areal extent _____ Depth _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Holes not evident	
5.	<b>Vegetative Cover</b> <input type="checkbox"/> Grass <input type="checkbox"/> Cover properly established <input type="checkbox"/> No signs of stress <input type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram) Remarks _____ _____		
6.	<b>Alternative Cover (armored rock, concrete, etc.)</b> <input type="checkbox"/> N/A Remarks _____ _____		
7.	<b>Bulges</b> Areal extent _____ Height _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Bulges not evident	

8.	<b>Wet Areas/Water Damage</b> <input type="checkbox"/> Wet areas <input type="checkbox"/> Ponding <input type="checkbox"/> Seeps <input type="checkbox"/> Soft subgrade Remarks _____ _____	<input type="checkbox"/> Wet areas/water damage not evident <input type="checkbox"/> Location shown on site map      Areal extent _____ <input type="checkbox"/> Location shown on site map      Areal extent _____ <input type="checkbox"/> Location shown on site map      Areal extent _____ <input type="checkbox"/> Location shown on site map      Areal extent _____	
9.	<b>Slope Instability</b> <input type="checkbox"/> Slides <input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of slope instability Areal extent _____ Remarks _____ _____		
<b>B. Benches</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	<b>Flows Bypass Bench</b> <input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A or okay Remarks _____ _____		
2.	<b>Bench Breached</b> <input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A or okay Remarks _____ _____		
3.	<b>Bench Overtopped</b> <input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A or okay Remarks _____ _____		
<b>C. Letdown Channels</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	<b>Settlement</b> <input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of settlement Areal extent _____      Depth _____ Remarks _____ _____		
2.	<b>Material Degradation</b> <input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of degradation Material type _____      Areal extent _____ Remarks _____ _____		
3.	<b>Erosion</b> <input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of erosion Areal extent _____      Depth _____ Remarks _____ _____		

4.	<b>Undercutting</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of undercutting
	Areal extent _____	Depth _____	
	Remarks _____		
5.	<b>Obstructions</b>	Type _____	<input type="checkbox"/> No obstructions
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Size _____		
	Remarks _____		
6.	<b>Excessive Vegetative Growth</b>	Type _____	
	<input type="checkbox"/> No evidence of excessive growth		
	<input type="checkbox"/> Vegetation in channels does not obstruct flow		
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Remarks _____		
<b>D. Cover Penetrations</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1.	<b>Gas Vents</b>	<input type="checkbox"/> Active <input type="checkbox"/> Passive	
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration		<input type="checkbox"/> Needs Maintenance
	<input type="checkbox"/> N/A		
	Remarks _____		
2.	<b>Gas Monitoring Probes</b>		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration		<input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A
	Remarks _____		
3.	<b>Monitoring Wells (within surface area of landfill)</b>		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration		<input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A
	Remarks _____		
4.	<b>Leachate Extraction Wells</b>		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration		<input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A
	Remarks _____		
5.	<b>Settlement Monuments</b>	<input type="checkbox"/> Located	<input type="checkbox"/> Routinely surveyed <input type="checkbox"/> N/A
	Remarks _____		

<b>E. Gas Collection and Treatment</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	<b>Gas Treatment Facilities</b> <input type="checkbox"/> Flaring <input type="checkbox"/> Thermal destruction <input type="checkbox"/> Collection for reuse <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____	
2.	<b>Gas Collection Wells, Manifolds and Piping</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____	
3.	<b>Gas Monitoring Facilities</b> ( <i>e.g.</i> , gas monitoring of adjacent homes or buildings) <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____	
<b>F. Cover Drainage Layer</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	<b>Outlet Pipes Inspected</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
2.	<b>Outlet Rock Inspected</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
<b>G. Detention/Sedimentation Ponds</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	<b>Siltation</b> Areal extent _____      Depth _____ <input type="checkbox"/> N/A <input type="checkbox"/> Siltation not evident Remarks _____ _____	
2.	<b>Erosion</b> Areal extent _____      Depth _____ <input type="checkbox"/> Erosion not evident Remarks _____ _____	
3.	<b>Outlet Works</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
4.	<b>Dam</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	

<b>H. Retaining Walls</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Deformations</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Deformation not evident
	Horizontal displacement _____	Vertical displacement _____	
	Rotational displacement _____		
	Remarks _____		
<hr/>			
2.	<b>Degradation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Degradation not evident
	Remarks _____		
<hr/>			
<b>I. Perimeter Ditches/Off-Site Discharge</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Siltation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Siltation not evident
	Areal extent _____	Depth _____	
	Remarks _____		
<hr/>			
2.	<b>Vegetative Growth</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
	<input type="checkbox"/> Vegetation does not impede flow		
	Areal extent _____	Type _____	
	Remarks _____		
<hr/>			
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Erosion not evident
	Areal extent _____	Depth _____	
	Remarks _____		
<hr/>			
4.	<b>Discharge Structure</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks _____		
<hr/>			
<b>VIII. VERTICAL BARRIER WALLS</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Settlement</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Settlement not evident
	Areal extent _____	Depth _____	
	Remarks _____		
<hr/>			
2.	<b>Performance Monitoring</b> Type of monitoring _____		
	<input type="checkbox"/> Performance not monitored		
	Frequency _____	<input type="checkbox"/> Evidence of breaching	
	Head differential _____		
	Remarks _____		
<hr/>			



<b>IX. GROUNDWATER/SURFACE WATER REMEDIES</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
<b>A. Groundwater Extraction Wells, Pumps, and Pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	<b>Pumps, Wellhead Plumbing, and Electrical</b> <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____ _____
2.	<b>Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____
<b>B. Surface Water Collection Structures, Pumps, and Pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	<b>Collection Structures, Pumps, and Electrical</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
2.	<b>Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____

<b>C. Treatment System</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Treatment Train</b> (Check components that apply)		
	<input type="checkbox"/> Metals removal	<input type="checkbox"/> Oil/water separation	<input type="checkbox"/> Bioremediation
	<input type="checkbox"/> Air stripping	<input type="checkbox"/> Carbon adsorbers	
	<input type="checkbox"/> Filters _____		
	<input type="checkbox"/> Additive (e.g., chelation agent, flocculent) _____		
	<input type="checkbox"/> Others _____		
	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance	
	<input type="checkbox"/> Sampling ports properly marked and functional		
	<input type="checkbox"/> Sampling/maintenance log displayed and up to date		
	<input type="checkbox"/> Equipment properly identified		
	<input type="checkbox"/> Quantity of groundwater treated annually _____		
	<input type="checkbox"/> Quantity of surface water treated annually _____		
	Remarks _____		
2.	<b>Electrical Enclosures and Panels</b> (properly rated and functional)		
	<input type="checkbox"/> N/A	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance
	Remarks _____		
3.	<b>Tanks, Vaults, Storage Vessels</b>		
	<input type="checkbox"/> N/A	<input type="checkbox"/> Good condition	<input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance
	Remarks _____		
4.	<b>Discharge Structure and Appurtenances</b>		
	<input type="checkbox"/> N/A	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance
	Remarks _____		
5.	<b>Treatment Building(s)</b>		
	<input type="checkbox"/> N/A	<input type="checkbox"/> Good condition (esp. roof and doorways)	<input type="checkbox"/> Needs repair
	<input type="checkbox"/> Chemicals and equipment properly stored		
	Remarks _____		
6.	<b>Monitoring Wells</b> (pump and treatment remedy)		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> All required wells located	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
<b>D. Monitoring Data</b>			
1.	<b>Monitoring Data</b>		
	<input type="checkbox"/> Is routinely submitted on time	<input type="checkbox"/> Is of acceptable quality	
2.	<b>Monitoring data suggests:</b>		
	<input type="checkbox"/> Groundwater plume is effectively contained	<input type="checkbox"/> Contaminant concentrations are declining	

<b>D. Monitored Natural Attenuation</b>			
1.	<b>Monitoring Wells</b> (natural attenuation remedy)		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled
	<input type="checkbox"/> All required wells located	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> Good condition
	<input checked="" type="checkbox"/> N/A Remarks _____ _____		
<b>X. OTHER REMEDIES</b>			
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.			
<b>XI. OVERALL OBSERVATIONS</b>			
<b>A. Implementation of the Remedy</b>			
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.). The remedy is intended to prevent contact with contaminated soil. Excavation completed in 2015. Institutional controls are to restrict land use within the OU7 boundary to prevent unacceptable human exposure to site contaminants. The remedy currently appears to be functioning as designed. The shoreline protection structure observed to be in good condition. Overall, exposure to site contaminants appears to be effectively prevented by the remedy.			
<b>B. Adequacy of O&amp;M</b>			
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. Overall, the condition of the shoreline structures is good. LUCs restrict land use. Annual LUC/LTMgt inspections are adequate to confirm protectiveness of the remedy.			

**C. Early Indicators of Potential Remedy Problems**

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

None

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**D. Opportunities for Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None

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<b>I. SITE INFORMATION</b>													
<b>Site name:</b> Operable Unit 9	<b>Date of inspection:</b> 6/14/2016												
<b>Location and Region:</b> Portsmouth Naval Shipyard, EPA Region 1	<b>EPA ID:</b> ME7170022019												
<b>Agency, office, or company leading the five-year review:</b> Navy	<b>Weather/temperature:</b> Sunny/75°F												
<b>Remedy Includes:</b> (Check all that apply) <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Landfill cover/containment</td> <td><input type="checkbox"/> Monitored natural attenuation</td> </tr> <tr> <td><input type="checkbox"/> Access controls</td> <td><input type="checkbox"/> Groundwater containment</td> </tr> <tr> <td><input checked="" type="checkbox"/> Institutional controls</td> <td><input type="checkbox"/> Vertical barrier walls</td> </tr> <tr> <td><input type="checkbox"/> Groundwater pump and treatment</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Surface water collection and treatment</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Other _____</td> <td></td> </tr> </table>		<input type="checkbox"/> Landfill cover/containment	<input type="checkbox"/> Monitored natural attenuation	<input type="checkbox"/> Access controls	<input type="checkbox"/> Groundwater containment	<input checked="" type="checkbox"/> Institutional controls	<input type="checkbox"/> Vertical barrier walls	<input type="checkbox"/> Groundwater pump and treatment		<input type="checkbox"/> Surface water collection and treatment		<input type="checkbox"/> Other _____	
<input type="checkbox"/> Landfill cover/containment	<input type="checkbox"/> Monitored natural attenuation												
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<input checked="" type="checkbox"/> Institutional controls	<input type="checkbox"/> Vertical barrier walls												
<input type="checkbox"/> Groundwater pump and treatment													
<input type="checkbox"/> Surface water collection and treatment													
<input type="checkbox"/> Other _____													
<b>Attachments:</b> <input checked="" type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached													
<b>II. INTERVIEWS</b> (Check all that apply)													
<b>1. O&amp;M site manager</b> _____ <table style="width: 100%; border: none; margin-top: 5px;"> <tr> <td style="width: 40%; text-align: center;">Name</td> <td style="width: 30%; text-align: center;">Title</td> <td style="width: 30%; text-align: center;">Date</td> </tr> <tr> <td colspan="3">           Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____         </td> </tr> <tr> <td colspan="3">           Problems, suggestions; <input type="checkbox"/> Report attached _____         </td> </tr> <tr> <td colspan="3">           _____         </td> </tr> </table>		Name	Title	Date	Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____			Problems, suggestions; <input type="checkbox"/> Report attached _____			_____		
Name	Title	Date											
Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____													
Problems, suggestions; <input type="checkbox"/> Report attached _____													
_____													
<b>2. O&amp;M staff</b> _____ <table style="width: 100%; border: none; margin-top: 5px;"> <tr> <td style="width: 40%; text-align: center;">Name</td> <td style="width: 30%; text-align: center;">Title</td> <td style="width: 30%; text-align: center;">Date</td> </tr> <tr> <td colspan="3">           Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____         </td> </tr> <tr> <td colspan="3">           Problems, suggestions; <input type="checkbox"/> Report attached _____         </td> </tr> <tr> <td colspan="3">           _____         </td> </tr> </table>		Name	Title	Date	Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____			Problems, suggestions; <input type="checkbox"/> Report attached _____			_____		
Name	Title	Date											
Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone no. _____													
Problems, suggestions; <input type="checkbox"/> Report attached _____													
_____													

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency USEPA  
 Contact Matthew R. Audet USEPA Remedial Project Manager 617-918-1449  
 Name Title Date Phone no.  
 Problems; suggestions;  Report attached EPA provides input through review and comment on draft and draft final reports.

Agency MEDEP  
 Contact Iver McLeod MEDEP Remedial Project Manager 207-592-2981  
 Name Title Date Phone no.  
 Problems; suggestions;  Report attached MEDEP provides input through review and comment draft and draft final reports.

Agency \_\_\_\_\_  
 Contact \_\_\_\_\_  
 Name Title Date Phone no.  
 Problems; suggestions;  Report attached \_\_\_\_\_

Agency \_\_\_\_\_  
 Contact \_\_\_\_\_  
 Name Title Date Phone no.  
 Problems; suggestions;  Report attached \_\_\_\_\_

4. **Other interviews** (optional)  Report attached.

Community members will have the opportunity to provide input at RAB meeting.


<b>III. ON-SITE DOCUMENTS &amp; RECORDS VERIFIED</b> (Check all that apply)			
1.	<b>O&amp;M Documents</b> <input checked="" type="checkbox"/> O&M manual <input type="checkbox"/> As-built drawings <input type="checkbox"/> Maintenance logs Remarks <u>LUCRD for OU9 finalized in September 2014.</u>	<input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
2.	<b>Site-Specific Health and Safety Plan</b> <input type="checkbox"/> Contingency plan/emergency response plan Remarks _____	<input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
3.	<b>O&amp;M and OSHA Training Records</b> Remarks <u>Kept by company that performs the O&amp;M</u>	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A
4.	<b>Permits and Service Agreements</b> <input type="checkbox"/> Air discharge permit <input type="checkbox"/> Effluent discharge <input type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Other permits _____ Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
5.	<b>Gas Generation Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
6.	<b>Settlement Monument Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
7.	<b>Groundwater Monitoring Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
8.	<b>Leachate Extraction Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
9.	<b>Discharge Compliance Records</b> <input type="checkbox"/> Air <input type="checkbox"/> Water (effluent) Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
10.	<b>Daily Access/Security Logs</b> Remarks <u>Access to PNS is restricted, but access to Operable Unit 9 area is not restricted within PNS.</u>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A

<b>IV. O&amp;M COSTS</b>																																																													
1.	<p><b>O&amp;M Organization</b></p> <p><input type="checkbox"/> State in-house                      <input type="checkbox"/> Contractor for State</p> <p><input type="checkbox"/> PRP in-house                         <input type="checkbox"/> Contractor for PRP</p> <p><input type="checkbox"/> Federal Facility in-house         <input checked="" type="checkbox"/> Contractor for Federal Facility</p> <p><input type="checkbox"/> Other _____</p>																																																												
2.	<p><b>O&amp;M Cost Records</b></p> <p><input type="checkbox"/> Readily available         <input type="checkbox"/> Up to date</p> <p><input checked="" type="checkbox"/> Funding mechanism/agreement in place</p> <p>Original O&amp;M cost estimate _____ <input type="checkbox"/> Breakdown attached</p> <p style="text-align: center;">Total annual cost by year for review period if available</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">From _____</td> <td style="width: 15%;">To _____</td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 20%;"></td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">Total cost</td> <td></td> <td><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td>Total cost</td> <td></td> <td><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td>Total cost</td> <td></td> <td><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td>Total cost</td> <td></td> <td><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td>Total cost</td> <td></td> <td><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	From _____	To _____					Date	Date	_____	Total cost		<input type="checkbox"/> Breakdown attached	From _____	To _____		Total cost		<input type="checkbox"/> Breakdown attached	Date	Date					From _____	To _____		Total cost		<input type="checkbox"/> Breakdown attached	Date	Date					From _____	To _____		Total cost		<input type="checkbox"/> Breakdown attached	Date	Date					From _____	To _____		Total cost		<input type="checkbox"/> Breakdown attached	Date	Date				
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Date	Date																																																												
3.	<p><b>Unanticipated or Unusually High O&amp;M Costs During Review Period</b></p> <p>Describe costs and reasons: <u>None</u></p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>																																																												
<b>V. ACCESS AND INSTITUTIONAL CONTROLS</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A																																																													
<b>A. Fencing</b>																																																													
1.	<p><b>Fencing damaged</b>            <input type="checkbox"/> Location shown on site map    <input type="checkbox"/> Gates secured            <input checked="" type="checkbox"/> N/A</p> <p>Remarks _____</p> <p>_____</p>																																																												
<b>B. Other Access Restrictions</b>																																																													
1.	<p><b>Signs and other security measures</b>            <input type="checkbox"/> Location shown on site map    <input checked="" type="checkbox"/> N/A</p> <p>Remarks _____</p> <p>_____</p>																																																												



<b>C. Institutional Controls (ICs)</b>				
1.	<b>Implementation and enforcement</b>			
	Site conditions imply ICs not properly implemented	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
	Site conditions imply ICs not being fully enforced	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
	Type of monitoring (e.g., self-reporting, drive by) <u>Inspection</u>			
	Frequency <u>Annually</u>			
	Responsible party/agency <u>Navy, NAVFAC Mid-Atlantic</u>			
	Contact <u>Linda Cole</u> <u>RPM</u>			
	Name	Title	Date	Phone no.
	Reporting is up-to-date	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
	Reports are verified by the lead agency	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
	Specific requirements in deed or decision documents have been met	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
	Violations have been reported	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
	Other problems or suggestions: <input type="checkbox"/> Report attached			
	_____			
	_____			
	_____			
2.	<b>Adequacy</b>	<input checked="" type="checkbox"/> ICs are adequate	<input type="checkbox"/> ICs are inadequate	<input type="checkbox"/> N/A
	Remarks <u>The remedy remains protective for all on-shore exposures.</u>			
	_____			
	_____			
<b>D. General</b>				
1.	<b>Vandalism/trespassing</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No vandalism evident	
	Remarks _____			
	_____			
2.	<b>Land use changes on site</b>	<input checked="" type="checkbox"/> N/A		
	Remarks <u>None</u>			
	_____			
3.	<b>Land use changes off site</b>	<input checked="" type="checkbox"/> N/A		
	Remarks _____			
	_____			
<b>VI. GENERAL SITE CONDITIONS</b>				
<b>A. Roads</b>				
	<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A		
1.	<b>Roads damaged</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Roads adequate <input checked="" type="checkbox"/> N/A	
	Remarks _____			
	_____			

<b>B. Other Site Conditions</b>			
Remarks <u>Shoreline remedial activities associated with OU4-MS01 were performed in</u> <u>September 2015. The shoreline and slope at OU9 appear in good condition.</u> <u>No visible sheen at low tide, as was observed prior to shoreline excavation.</u> _____ _____ _____			
<b>VII. LANDFILL COVERS</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
<b>A. Landfill Surface</b>			
1.	<b>Settlement (Low spots)</b> Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input type="checkbox"/> Settlement not evident
2.	<b>Cracks</b> Lengths _____    Widths _____    Depths _____ Remarks _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Cracking not evident
3.	<b>Erosion</b> Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input type="checkbox"/> Erosion not evident
4.	<b>Holes</b> Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input type="checkbox"/> Holes not evident
5.	<b>Vegetative Cover</b> <input type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram)	<input type="checkbox"/> Grass <input type="checkbox"/> Cover properly established	<input type="checkbox"/> No signs of stress
6.	<b>Alternative Cover (armored rock, concrete, etc.)</b> Remarks _____	<input type="checkbox"/> N/A	
7.	<b>Bulges</b> Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Height _____	<input type="checkbox"/> Bulges not evident

8.	<b>Wet Areas/Water Damage</b>	<input type="checkbox"/> Wet areas/water damage not evident	
	<input type="checkbox"/> Wet areas	<input type="checkbox"/> Location shown on site map	Areal extent _____
	<input type="checkbox"/> Ponding	<input type="checkbox"/> Location shown on site map	Areal extent _____
	<input type="checkbox"/> Seeps	<input type="checkbox"/> Location shown on site map	Areal extent _____
	<input type="checkbox"/> Soft subgrade	<input type="checkbox"/> Location shown on site map	Areal extent _____
	Remarks _____		
<hr/>			
9.	<b>Slope Instability</b>	<input type="checkbox"/> Slides	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of slope instability
	Areal extent _____		
	Remarks _____		
<hr/>			
<b>B. Benches</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
<hr/>			
1.	<b>Flows Bypass Bench</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
	Remarks _____		
<hr/>			
2.	<b>Bench Breached</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
	Remarks _____		
<hr/>			
3.	<b>Bench Overtopped</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
	Remarks _____		
<hr/>			
<b>C. Letdown Channels</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
<hr/>			
1.	<b>Settlement</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of settlement
	Areal extent _____	Depth _____	
	Remarks _____		
<hr/>			
2.	<b>Material Degradation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of degradation
	Material type _____	Areal extent _____	
	Remarks _____		
<hr/>			
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of erosion
	Areal extent _____	Depth _____	
	Remarks _____		
<hr/>			

4.	<b>Undercutting</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of undercutting
	Areal extent _____	Depth _____	
	Remarks _____		
5.	<b>Obstructions</b>	Type _____	<input type="checkbox"/> No obstructions
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Size _____		
	Remarks _____		
6.	<b>Excessive Vegetative Growth</b>	Type _____	
	<input type="checkbox"/> No evidence of excessive growth		
	<input type="checkbox"/> Vegetation in channels does not obstruct flow		
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Remarks _____		
<b>D. Cover Penetrations</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1.	<b>Gas Vents</b>	<input type="checkbox"/> Active <input type="checkbox"/> Passive	
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	
	<input type="checkbox"/> N/A		
	Remarks _____		
2.	<b>Gas Monitoring Probes</b>	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
3.	<b>Monitoring Wells (within surface area of landfill)</b>	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
4.	<b>Leachate Extraction Wells</b>	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
5.	<b>Settlement Monuments</b>	<input type="checkbox"/> Located	<input type="checkbox"/> Routinely surveyed <input type="checkbox"/> N/A
	Remarks _____		

<b>E. Gas Collection and Treatment</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	<b>Gas Treatment Facilities</b> <input type="checkbox"/> Flaring <input type="checkbox"/> Thermal destruction <input type="checkbox"/> Collection for reuse <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____	
2.	<b>Gas Collection Wells, Manifolds and Piping</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____	
3.	<b>Gas Monitoring Facilities</b> ( <i>e.g.</i> , gas monitoring of adjacent homes or buildings) <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____	
<b>F. Cover Drainage Layer</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	<b>Outlet Pipes Inspected</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
2.	<b>Outlet Rock Inspected</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
<b>G. Detention/Sedimentation Ponds</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	<b>Siltation</b> Areal extent _____      Depth _____ <input type="checkbox"/> N/A <input type="checkbox"/> Siltation not evident Remarks _____ _____	
2.	<b>Erosion</b> Areal extent _____      Depth _____ <input type="checkbox"/> Erosion not evident Remarks _____ _____	
3.	<b>Outlet Works</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
4.	<b>Dam</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	

<b>H. Retaining Walls</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Deformations</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Deformation not evident
	Horizontal displacement _____	Vertical displacement _____	
	Rotational displacement _____		
	Remarks _____		
2.	<b>Degradation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Degradation not evident
	Remarks _____		
<b>I. Perimeter Ditches/Off-Site Discharge</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Siltation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Siltation not evident
	Areal extent _____	Depth _____	
	Remarks _____		
2.	<b>Vegetative Growth</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
	<input type="checkbox"/> Vegetation does not impede flow		
	Areal extent _____	Type _____	
	Remarks _____		
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Erosion not evident
	Areal extent _____	Depth _____	
	Remarks _____		
4.	<b>Discharge Structure</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks _____		
<b>VIII. VERTICAL BARRIER WALLS</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Settlement</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Settlement not evident
	Areal extent _____	Depth _____	
	Remarks _____		
2.	<b>Performance Monitoring</b>	Type of monitoring _____	
	<input type="checkbox"/> Performance not monitored		
	Frequency _____	<input type="checkbox"/> Evidence of breaching	
	Head differential _____		
	Remarks _____		

<b>IX. GROUNDWATER/SURFACE WATER REMEDIES</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
<b>A. Groundwater Extraction Wells, Pumps, and Pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	<b>Pumps, Wellhead Plumbing, and Electrical</b> <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____ _____
2.	<b>Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____
<b>B. Surface Water Collection Structures, Pumps, and Pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	<b>Collection Structures, Pumps, and Electrical</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
2.	<b>Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____

<b>C. Treatment System</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Treatment Train</b> (Check components that apply)		
	<input type="checkbox"/> Metals removal	<input type="checkbox"/> Oil/water separation	<input type="checkbox"/> Bioremediation
	<input type="checkbox"/> Air stripping	<input type="checkbox"/> Carbon adsorbers	
	<input type="checkbox"/> Filters _____		
	<input type="checkbox"/> Additive (e.g., chelation agent, flocculent) _____		
	<input type="checkbox"/> Others _____		
	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance	
	<input type="checkbox"/> Sampling ports properly marked and functional		
	<input type="checkbox"/> Sampling/maintenance log displayed and up to date		
	<input type="checkbox"/> Equipment properly identified		
	<input type="checkbox"/> Quantity of groundwater treated annually _____		
	<input type="checkbox"/> Quantity of surface water treated annually _____		
	Remarks _____		
2.	<b>Electrical Enclosures and Panels</b> (properly rated and functional)		
	<input type="checkbox"/> N/A	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance
	Remarks _____		
3.	<b>Tanks, Vaults, Storage Vessels</b>		
	<input type="checkbox"/> N/A	<input type="checkbox"/> Good condition	<input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance
	Remarks _____		
4.	<b>Discharge Structure and Appurtenances</b>		
	<input type="checkbox"/> N/A	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance
	Remarks _____		
5.	<b>Treatment Building(s)</b>		
	<input type="checkbox"/> N/A	<input type="checkbox"/> Good condition (esp. roof and doorways)	<input type="checkbox"/> Needs repair
	<input type="checkbox"/> Chemicals and equipment properly stored		
	Remarks _____		
6.	<b>Monitoring Wells</b> (pump and treatment remedy)		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> All required wells located	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
<b>D. Monitoring Data</b>			
1.	<b>Monitoring Data</b>		
	<input type="checkbox"/> Is routinely submitted on time	<input type="checkbox"/> Is of acceptable quality	
2.	<b>Monitoring data suggests:</b>		
	<input type="checkbox"/> Groundwater plume is effectively contained	<input type="checkbox"/> Contaminant concentrations are declining	



<b>D. Monitored Natural Attenuation</b>			
1.	<b>Monitoring Wells</b> (natural attenuation remedy)		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled
	<input type="checkbox"/> All required wells located	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> Good condition
	Remarks _____		<input checked="" type="checkbox"/> N/A
<b>X. OTHER REMEDIES</b>			
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.			
<b>XI. OVERALL OBSERVATIONS</b>			
<b>A. Implementation of the Remedy</b>			
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).			
The remedy is intended to restrict residential land use, require management of excavated subsurface soils, and to prevent unrestricted access to the subsurface soil beneath the foundation of the Building 62 Annex. The remedy currently appears to be functioning as designed with exposure to contaminants effectively prevented.			
_____			
_____			
_____			
_____			
_____			
_____			
<b>B. Adequacy of O&amp;M</b>			
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. LUCs restrict land use and prevent unrestricted access to subsurface soil that may contain site contaminants. Annual LUC inspections are adequate to confirm protectiveness of the remedy.			
_____			
_____			
_____			
_____			
_____			
_____			

**C. Early Indicators of Potential Remedy Problems**

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

Petroleum-contaminated debris was observed extending from the intertidal shoreline adjacent to OU9 during dredging for OU4. Onshore excavation was conducted in 2015. Excavation performed as far into the shoreline as possible; some residual staining was visually observed. Following shoreline excavation, a reactive core material (RCM) mat was installed along the shoreline to minimize additional discharge of any contamination left in place. No further visible sheen has been observed during low tide following installation of the RCM.

**D. Opportunities for Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Future inspections for petroleum sheen and the slope of the shoreline are recommended

Appendix B

ARARs Tables

OU1

TABLE E-1

LIMITED EXCAVATION AND DISPOSAL WITH LAND USE CONTROLS AND MONITORING  
 CHEMICAL, LOCATION, AND ACTION-SPECIFIC ARARs AND TBCs  
 OPERABLE UNIT 1 - FEASIBILITY STUDY REPORT  
 PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE  
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Medium/Activity	Requirement/ Citation	Status	Synopsis	Evaluation/Action To Be Taken
<b>FEDERAL CHEMICAL-SPECIFIC TBCs</b>				
Soil/Risk Assessment	OSWER Directive 9355.4-12	TBC	USEPA has provided recommended methodology for assessing risk caused by exposure to lead in surface soil under residential scenarios.	This remedy will meet the guideline for residential exposure by establishing land use controls that will prevent residential exposure to soil at OU1 with concentrations greater than the residential remediation goal.
Soil/Risk Assessment	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. (USEPA, January 2003)	TBC	USEPA has provided recommended methodology for assessing risks to adult receptors caused by exposure to lead in soil under residential and commercial/industrial scenarios.	The guideline was used to develop site-specific remediation goals for adult current and future receptors. The remedy will meet the remediation goals by excavating lead-contaminated soil within the crawl space to reduce lead concentrations to less than the remediation goals.
Soil/Risk Assessment	USEPA Risk RfDs from IRIS	TBC	RfDs are estimates of daily exposure for human populations (including sensitive subpopulations) considered unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure over a lifetime.	The RfD for antimony was used to develop the remediation goal for residential exposure to antimony. Excavating lead-contaminated soil within the crawl space will also remove antimony-contaminated soil to reduce antimony concentrations to less than the residential remediation goal.

**STATE CHEMICAL-SPECIFIC ARARs and TBCs: No ARARs or TBCs**

TABLE E-1

LIMITED EXCAVATION AND DISPOSAL WITH LAND USE CONTROLS AND MONITORING  
 CHEMICAL, LOCATION, AND ACTION-SPECIFIC ARARs AND TBCs  
 OPERABLE UNIT 1 - FEASIBILITY STUDY REPORT  
 PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE  
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Medium/Activity	Requirement/ Citation	Status	Synopsis	Evaluation/Action To Be Taken
<b>FEDERAL LOCATION-SPECIFIC ARARs and TBCs</b>				
Coastal Zone	Coastal Zone Management Act (16 USC 1451 et seq.)	Applicable	This act provides for the preservation and protection of coastal zone areas. Federal activities that are in or directly affecting the coastal zone must be consistent, to the maximum extent practicable, with a federally approved state management program.	Excavation within the crawl space will not impact the coastal zone. Activities associated with LUCs (e.g., land use restrictions, posting of signs) and monitoring will also not impact the coastal zone. MEDEP will review remedial design and work plans to meet the substantive requirements of this act.
Historic Preservation	National Historic Preservation Act (16 USC 470 et seq., 36 CFR 800)	Applicable	Provides requirements relating to potential loss or destruction of significant scientific, historical, or archaeological data due to remedial actions at a site.	Prehistoric and historical archeological resource sensitivity for OU1 is low. Placement of surface cover and LUCs will not impact resources of historical value.
<b>STATE LOCATION-SPECIFIC ARARs and TBCs: No ARARs or TBCs</b>				
<b>FEDERAL ACTION-SPECIFIC ARARs and TBCs:</b>				
Hazardous Waste	RCRA Subtitle C, RCRA Regulations for Identification and Listing of Hazardous Water (40 CFR 261), and Standards Applicable to Generators of Hazardous Waste (40 CFR 262)	Applicable	RCRA regulations govern the generation transportation and disposal of hazardous waste. The State of Maine has RCRA delegation, and the Maine Hazardous Waste Management Rules provide references to the federal RCRA regulations where appropriate.	Excavated material will be analyzed to determine whether it is RCRA characteristic hazardous waste. If it is determined to be hazardous, the material will be managed, transported, treated, disposed, or stored in accordance with RCRA requirements. Based on the levels of lead in soil in the remediation areas, the excavated material is likely to be hazardous based on toxicity.

TABLE E-1

LIMITED EXCAVATION AND DISPOSAL WITH LAND USE CONTROLS AND MONITORING  
 CHEMICAL, LOCATION, AND ACTION-SPECIFIC ARARs AND TBCs  
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Medium/Activity	Requirement/ Citation	Status	Synopsis	Evaluation/Action To Be Taken
<b>STATE ACTION-SPECIFIC ARARs and TBCs</b>				
Hazardous Waste	Maine Hazardous Waste Management Rules (06-096 CMR 800-801, 850 – 853, 857)	Applicable	These regulations provide standards for the generation, transportation, treatment, storage, and disposal of hazardous waste. They set forth the state definition and criteria for establishing whether waste materials are hazardous and subject to associated hazardous waste regulations. They also provide standards for detailing groundwater monitoring requirements for hazardous waste facilities.	Excavation, staging, and disposal of hazardous wastes at OU1 will comply with these standards.
Waste	Maine Solid Waste Management Regulations (06-096 CMR 400, 411)	Applicable	Provides standards for generation, transportation, treatment, storage, and disposal of solid and special wastes. Also provides closure and post-closure maintenance standards.	Wastes generated during remedial actions will be disposed at appropriately licensed and permitted facilities.
Erosion	Erosion and Sedimentation Control (38 MRSA 420-C)	Applicable	Erosion control measures must be in place before activities such as filling, displacing, or exposing soil or other earthen materials occur. Prior MEDEP approval is required if the disturbed area is in the direct watershed of a body of water most at risk for erosion or sedimentation.	The remedial action design and work plans will address erosion and sedimentation controls necessary during excavation and staging activities.
Stormwater	Stormwater Management (38 MRSA 420-D; 06-096 CMR 500)	Applicable	Stormwater management measures must be in place before activities such as filling, displacing, or exposing soil or other earthen materials occur.	The remedial action design and work plans will address stormwater management controls necessary during excavation and staging activities.

TABLE E-1

LIMITED EXCAVATION AND DISPOSAL WITH LAND USE CONTROLS AND MONITORING  
 CHEMICAL, LOCATION, AND ACTION-SPECIFIC ARARs AND TBCs  
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Medium/Activity	Requirement/ Citation	Status	Synopsis	Evaluation/Action To Be Taken
<b>STATE ACTION-SPECIFIC ARARs and TBCs (continued)</b>				
Air Emissions	Visible Emissions Regulation (38 MRSA 584; 06-096 CMR 101).	TBC	These regulations establish opacity limits for emissions from several categories of air contaminant sources, including general construction activities.	Excavation will be conducted so that opacity limits would not be impacted. Any measures need to ensure compliance with these standards will be discussed in the remedial design and work plans.

ARAR – Applicable or Relevant and Appropriate Requirement  
 CMR - Code of Maine Rules  
 FR – Federal Register  
 MRSA - Maine Revised Statutes Annotated  
 TBC- To Be Considered  
 USC – United States Code

CFR - Code of Federal Regulations.  
 CWA – Clean Water Act  
 MEDEP - Maine Department of Environmental Protection  
 RCRA - Resource Conservation and Recovery Act  
 TSD – Treatment, storage, and disposal



OU2

TABLE E-1

**ALTERNATIVE WDA-3: SURFACE SOIL REMOVAL AND SOIL COVER WITH LAND USE CONTROLS AND MONITORING  
 CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs  
 OPERABLE UNIT 2 - RECORD OF DECISION  
 PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE  
 PAGE 1 OF 7**

Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
<b>FEDERAL CHEMICAL-SPECIFIC ARARs</b>				
Soil/Risk Assessment	Office of Solid Waste and Emergency Response (OSWER) Directive 9355.4-12	To be considered (TBC)	United States Environmental Protection Agency (USEPA) has provided recommended methodology for assessing risk caused by exposure to lead in surface soil under residential scenarios.	The remedy will meet the guideline for residential exposure by establishing land use controls (LUCs) that will prevent residential exposure to soil in the waste disposal area at OU2 with concentrations greater than the residential remediation goal (400 mg/kg).
	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. (USEPA, January 2003)	TBC	USEPA has provided recommended methodology for assessing risks to adult receptors caused by exposure to lead in soil under residential and commercial/industrial scenarios.	Guidelines were used to develop risk-based cleanup levels for lead in soil for adult current and future receptors. The remedy will meet the remediation goals by excavating surface soil contaminated with lead, constructing a soil cover, and implementing LUCs to reduce exposure to acceptable levels.
	USEPA Risk Reference Doses (RfDs) from Integrated Risk Information System (IRIS)	TBC	RfDs are estimates of daily exposure for human populations (including sensitive subpopulations) considered unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure over a lifetime.	RfDs were used to develop risk-based soil cleanup levels for non-carcinogenic chemicals of concern (COCs) including antimony, copper, nickel, and polychlorinated biphenyls (PCBs).
	USEPA Human Health Assessment Group Cancer Slope Factors (CSFs) from IRIS	TBC	CSFs present the most up-to-date information on cancer risk potency for known and suspected carcinogens.	CSFs were used to develop risk-based soil cleanup levels for carcinogenic COCs including polycyclic aromatic hydrocarbons (PAHs) and PCBs.

TABLE E-1

ALTERNATIVE WDA-3: SURFACE SOIL REMOVAL AND SOIL COVER WITH LAND USE CONTROLS AND MONITORING  
 CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs  
 OPERABLE UNIT 2 - RECORD OF DECISION  
 PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE  
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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
	Guidelines for Carcinogen Risk Assessment EPA/630/P-03/001F (March 2005)	TBC	These guidelines are used to perform Human Health Risk Assessment (HHRA). They provide a framework for assessing possible cancer risks from exposures to pollutants or other agents in the environment.	These guidelines were used to develop risk-based soil cleanup goals for carcinogenic COCs including PAHs and PCBs
	Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens EPA/630/R-03/003F (March 2005)	TBC	These guidelines are used to perform HHRA and address a number of issues pertaining to cancer risks associated with early-life exposures in general and provide specific guidance on potency adjustment for carcinogens acting through a mutagenic mode of action.	This guidance was used to develop risk-based soil cleanup goals for carcinogenic COCs including PAHs and PCBs.

**NO STATE CHEMICAL-SPECIFIC ARARs**

**FEDERAL LOCATION-SPECIFIC ARARs**

Coastal Zone Management	Coastal Zone Management Act [16 United States Code (USC) 1451 <i>et seq.</i> ]	Applicable	This act provides for the preservation and protection of coastal zone areas. Federal activities that are in or directly affecting the coastal zone must be consistent, to the maximum extent practicable, with a federally approved state management program.	Remedial activities, such as excavation and cover placement, that will take place in the coastal zone will be controlled according to the requirements of the Maine Department of Environmental Protection (MEDEP) program. MEDEP will review the Remedial Design and work plans to ensure that they meet the substantive requirements of this act. The requirements of the act will continue to apply during the operation and maintenance of the remedy.
Floodplain Management	44 CFR 9	Relevant and Appropriate	Federal Emergency Management Agency regulations that set forth the policy, procedure and responsibilities to implement and enforce Executive Order 11988, Floodplain Management.	Remedial activities conducted within the 100-year floodplain of the Piscataqua River will be implemented in compliance with these standards.

TABLE E-1

ALTERNATIVE WDA-3: SURFACE SOIL REMOVAL AND SOIL COVER WITH LAND USE CONTROLS AND MONITORING  
 CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs  
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 PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE  
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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
Wetlands and US Waters	Clean Water Act (CWA) Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material [40 Code of Federal Regulations (CFR) Part 230; 33 CFR Parts 320 and 323]	Applicable	These regulations outline the requirements for the discharge of dredged or fill material into US waters, including wetlands. No activity that adversely affects a US waters is permitted if a practicable alternative that has less effect is available. If there is no other practicable alternative, impacts must be mitigated.	Excavation of soil at the waste disposal area will be performed so as to not discharge excavated material to the offshore area. The requirements of the act will continue to apply during the operation and maintenance of the remedy.
Other Natural Resources	The Endangered Species Act of 1973 (16 USC 1531 <i>et seq.</i> ; 50 CFR Parts 17 and 402)	Applicable	Provides for consideration of the impacts on endangered and threatened species and their critical habitats. Requires federal agencies to ensure that any action carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or adversely affect its critical habitat. The entire State of Maine is considered a habitat of the federally listed endangered short-nosed sturgeon.	Remedial activities including excavation, construction of a soil cover, LUCs, and monitoring will be conducted so as to avoid any adverse effect under the act to the short-nosed sturgeon. The requirements of the act will continue to apply during the operation and maintenance of the remedy.
	Fish and Wildlife Coordination Act (16 USC 661 <i>et seq.</i> )	Applicable	This act requires any federal agency proposing to modify a body of water to coordinate with the United States Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) and appropriate state agencies if alteration of a body of water, including discharge of pollutants into a wetland or construction in a wetland, will occur as a result of remedial activities.	Although the Selected Remedy does not affect the shoreline revetment or wetlands, the Navy will coordinate with USFWS in the event that the final design disturbs the revetment or wetlands. The requirements of the act will continue to apply during the operation and maintenance of the remedy.

TABLE E-1

ALTERNATIVE WDA-3: SURFACE SOIL REMOVAL AND SOIL COVER WITH LAND USE CONTROLS AND MONITORING  
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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
<b>STATE LOCATION-SPECIFIC ARARs</b>				
Natural Resources	Maine Natural Resources Protection Act Permit by Rule Standards [38 Maine Revised Statutes Annotated (MRSA) 480 et seq.; 06-096 Code of Maine Rules (CMR) Part 305, 1, 2, and 8]	Applicable	This act regulates activity conducted in, on, or over any protected natural resource or any activity conducted adjacent to and operated in such a way that material or soil may be washed into any freshwater or coastal wetland, great pond, river, stream or brook.	Excavation near the shoreline of the waste disposal area will be conducted so as to avoid washing any soil into the nearby Piscataqua River or adjacent wetlands. Stormwater management and erosion control practices will be used to prevent sediment from entering the river or adjacent wetlands during construction. The requirements of the act will continue to apply during the operation and maintenance of the remedy.
Wetlands	Maine Wetland Protection Rules (06-096 CMR Part 310)	Applicable	Standards are provided for protection of wetlands, as defined in MEDEP Chapter 1000 Guidelines for Municipal Shoreline Zoning Ordinances. Jurisdiction under the rules includes the area adjacent to the wetlands, which is the area within 75 feet of the normal high-water line. Activities that have an unreasonable impact on wetlands are prohibited.	A wetlands functions and values assessment was conducted that will be used to guide restorative efforts for adjacent wetlands that may be adversely impacted by remedial activities. Excavation activities will be conducted to avoid impacts to wetlands and coastal wetlands, which include tidal and subtidal lands. The requirements of the act will continue to apply during the operation and maintenance of the remedy.

TABLE E-1

ALTERNATIVE WDA-3: SURFACE SOIL REMOVAL AND SOIL COVER WITH LAND USE CONTROLS AND MONITORING  
 CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs  
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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
Coastal Zone	Maine Coastal Management Policies (38 MRSA 1801 <i>et seq.</i> ) (06-096 CMR Chapter 1000)	Applicable	Regulates activities near great ponds, rivers and larger streams, coastal areas, and wetlands. Regulates shoreland activities and development, including (but not limited to) water pollution prevention and control, wildlife habitat protection, and freshwater and coastal wetlands protection. The law is administered at the local government level. Shoreland areas include areas within 250 feet of the normal high-water line of any river or saltwater body and areas within 75 feet of the high-water line of a stream.	Remedial activities such as excavation and backfilling that may affect storm water runoff, erosion and sedimentation, and surface water quality will be controlled according to these regulations. The requirements of the act will continue to apply during the operation and maintenance of the remedy.

**FEDERAL ACTION-SPECIFIC ARARs**

Surface Water	CWA [33 USC § 1251 <i>et seq.</i> ]; National Recommended Water Quality Criteria (NRWQC)	Relevant and Appropriate	These criteria are used to establish water quality standards for the protection of aquatic life.	Remedial activities will be conducted to reduce adverse impacts to the Piscataqua River. Stormwater management and erosion control practices will be used to prevent sediment and contaminants from entering the river during construction.
Water Management	CWA Section 402 National Pollutant Discharge Elimination System (NPDES) (40 CFR 122.26)	Applicable	CWA Section 402 requires NPDES permits for stormwater discharges to navigable waters.	Stormwater management will be implemented to minimize discharges of contaminants to the Piscataqua River and meet the substantive requirements of this act.

TABLE E-1

ALTERNATIVE WDA-3: SURFACE SOIL REMOVAL AND SOIL COVER WITH LAND USE CONTROLS AND MONITORING  
 CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs  
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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
<b>STATE ACTION-SPECIFIC ARARs</b>				
Hazardous Waste	Identification of Hazardous Wastes 06-096 Part 850	Applicable	These standards establish requirements for determining whether wastes are hazardous based on either characteristic or listing. Wastes with PCB concentrations greater than or equal to 50 ppm are hazardous wastes in Maine.	Wastes generated during remedial actions will be analyzed to determine whether they are RCRA characteristic hazardous wastes. If determined to be hazardous waste, then the waste will be managed in accordance with regulatory requirements.
	Standards for Generators of Hazardous Waste (38 MRSA 1301 <i>et seq.</i> , 06-096 Part 851)	Applicable	These regulations contain requirements for the generators of hazardous waste.	Waste determined to be hazardous will be managed on site according to the regulation until disposed of off site.
Erosion and Sedimentation Control	Erosion and Sedimentation Control (38 MRSA Part 420-C)	Applicable	Erosion control measures must be in place before activities such as filling, displacing, or exposing soil or other earthen materials occur. Prior MEDEP approval is required if the disturbed area is in the direct watershed of a body of water most at risk for erosion or sedimentation.	These controls will be applicable to excavation and soil cover placement. Applicable plans will be coordinated with MEDEP before implementation.
Storm Water Management	Storm Water Management (38 MRSA Part 420-D; 06-096 CMR Part 500)	Applicable	Storm water management measures must be in place before activities such as filling, displacing, or exposing soil or other earthen material occur on land greater than or equal to 1 acre.	These regulations apply to earth disturbance activities equal to or greater than 1 acre and will be applicable to runoff resulting from earth disturbance activities. Although the area for excavation under Alternative WDA-3 is less than 1 acre, the combined area for the OU2 remedial action will be greater than 1 acre. Applicable plans will be coordinated with MEDEP before implementation.

**TABLE E-1**

**ALTERNATIVE WDA-3: SURFACE SOIL REMOVAL AND SOIL COVER WITH LAND USE CONTROLS AND MONITORING  
CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs  
OPERABLE UNIT 2 - RECORD OF DECISION  
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE  
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<b>Requirement</b>	<b>Citation</b>	<b>Status</b>	<b>Synopsis</b>	<b>Evaluation/Action To Be Taken</b>
Air Emissions	Visible Emissions Regulation (38 MRSA Part 584; 06-096 CMR Part 101)	TBC	These regulations establish opacity limits for emissions from several categories of air contaminant sources, including fugitive emissions.	These regulations will be met for excavation and soil cover placement. Emission of particulate matter and fugitive matter (e.g., dust generation) during excavation of surface soil or placement of the soil cover will be controlled.



TABLE E-2

ALTERNATIVE DRMO-4: CONSTRUCTION WORKER EXCAVATION WITH OFF-YARD DISPOSAL,  
 LAND USE CONTROLS, AND MONITORING  
 CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs  
 OPERABLE UNIT 2 - RECORD OF DECISION  
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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
<b>FEDERAL CHEMICAL-SPECIFIC ARARs</b>				
Soil/Risk Assessment	Office of Solid Waste and Emergency Response (OSWER) Directive 9355.4-12	To be considered (TBC)	United States Environmental Protection Agency (USEPA) has provided recommended methodology for assessing risk caused by exposure to lead in surface soil under residential scenarios.	The remedy will meet the guideline for residential exposure by establishing land use controls (LUCs) that will prevent residential exposure to soil in the Defense Reutilization and Marketing Office (DRMO) area of OU2 with concentrations greater than the residential remediation goal (400 mg/kg).
	Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. (USEPA, January 2003)	TBC	USEPA has provided recommended methodology for assessing risks to adult receptors caused by exposure to lead in soil under residential and commercial/industrial scenarios.	Guidelines were used to develop risk-based cleanup levels for lead in soil for adult current and future receptors. The remedy will meet the remediation goals by excavating soil contaminated with lead down to the rock fragment fill layer and implementing LUCs to prevent residential exposure.
	USEPA Risk Reference Doses (RfDs) from Integrated Risk Information System (IRIS)	TBC	RfDs are estimates of daily exposure for human populations (including sensitive subpopulations) considered unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure over a lifetime.	RfDs were used to develop risk-based soil cleanup levels for non-carcinogenic chemicals of concern (COCs) including antimony, copper, nickel, and polychlorinated biphenyls (PCBs).
	USEPA Human Health Assessment Group Cancer Slope Factors (CSFs) from IRIS	TBC	CSFs present the most up-to-date information on cancer risk potency for known and suspected carcinogens.	CSFs were used to develop risk-based soil cleanup levels for carcinogenic COCs including polycyclic aromatic hydrocarbons (PAHs) and PCBs.

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<b>Requirement</b>	<b>Citation</b>	<b>Status</b>	<b>Synopsis</b>	<b>Evaluation/Action To Be Taken</b>
	Guidelines for Carcinogen Risk Assessment EPA/630/P-03/001F (March 2005)	TBC	These guidelines are used to perform Human Health Risk Assessment (HHRA). They provide a framework for assessing possible cancer risks from exposures to pollutants or other agents in the environment.	These guidelines were used to develop risk-based soil cleanup goals for carcinogenic COCs including PAHs and PCBs.
	Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens EPA/630/R-03/003F (March 2005)	TBC	These guidelines are used to perform HHRA and address a number of issues pertaining to cancer risks associated with early-life exposures in general and provide specific guidance on potency adjustment for carcinogens acting through a mutagenic mode of action.	This guidance was used to develop risk-based soil cleanup goals for carcinogenic COCs including PAHs and PCBs.

**NO STATE CHEMICAL-SPECIFIC ARARs**

**FEDERAL LOCATION-SPECIFIC ARARs**

Coastal Zone Management	Coastal Zone Management Act [16 United States Code (USC) 1451 <i>et seq.</i> ]	Applicable	This act provides for the preservation and protection of coastal zone areas. Federal activities that are in or directly affecting the coastal zone must be consistent, to the maximum extent practicable, with a federally approved state management program.	Remedial activities, such as excavation and backfilling, that will take place in the coastal zone will be controlled according to the requirements of the Maine Department of Environmental Protection (MEDEP) program. MEDEP will review the Remedial Design and work plans to ensure that they meet the substantive requirements of this act. The requirements of the act will continue to apply during the operation and maintenance of the remedy.
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<b>Requirement</b>	<b>Citation</b>	<b>Status</b>	<b>Synopsis</b>	<b>Evaluation/Action To Be Taken</b>
Floodplain Management	44 CFR 9	Relevant and Appropriate	Federal Emergency Management Agency regulations that set forth the policy, procedure and responsibilities to implement and enforce Executive Order 11988, Floodplain Management.	Remedial activities conducted within the 100-year floodplain of the Piscataqua River will be implemented in compliance with these standards.
Wetlands and US Waters	Clean Water Act (CWA) Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material [40 Code of Federal Regulations (CFR) Part 230; 33 CFR Parts 320 and 323]	Applicable	These regulations outline the requirements for the discharge of dredged or fill material into US waters, including wetlands. No activity that adversely affects a US waters is permitted if a practicable alternative that has less effect is available. If there is no other practicable alternative, impacts must be mitigated.	Excavation of soil at the DRMO area will be performed so as to not discharge excavated material to the offshore area. The requirements of the act will continue to apply during the operation and maintenance of the remedy.
Other Natural Resources	The Endangered Species Act of 1973 (16 USC 1531 <i>et seq.</i> ; 50 CFR Parts 17 and 402)	Applicable	Provides for consideration of the impacts on endangered and threatened species and their critical habitats. Requires federal agencies to ensure that any action carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or adversely affect its critical habitat. The entire State of Maine is considered a habitat of the federally listed endangered short-nosed sturgeon.	Remedial activities including excavation and disposal, LUCs, and monitoring will be conducted so as to avoid any adverse effect under the act to the short-nosed sturgeon. The requirements of the act will continue to apply during the operation and maintenance of the remedy.

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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
	Fish and Wildlife Coordination Act (16 USC 661 <i>et seq.</i> )	Applicable	This act requires any federal agency proposing to modify a body of water to coordinate with the United States Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) and appropriate state agencies if alteration of a body of water, including discharge of pollutants into a wetland or construction in a wetland, will occur as a result of remedial activities.	Excavation of soil along the shoreline will require removal and replacement of the upper portion (above high tide) of the revetment. Remedial activities will be conducted to prevent discharge to the Piscataqua River. The Navy will coordinate with USFWS during the design. The requirements of the act will continue to apply during the operation and maintenance of the remedy.
Historic Preservation	National Historic Preservation Act (16 USC 470 <i>et seq.</i> ; 36 CFR Part 800)	Applicable	Provides requirements relating to potential loss or destruction of significant scientific, historic, or archaeological data due to remedial actions at a site.	Based on the Portsmouth Naval Shipyard land use map, a portion of the DRMO area has archeological potential. This area is identified as being on the original island; however, borings indicate fill material and not native soil. The Navy will contact the State Historic Preservation Officer (SHPO) to determine the necessary actions, if any, to meet the substantive requirements of this act. The requirements of the act will continue to apply during the operation and maintenance of the remedy.

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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
<b>STATE LOCATION-SPECIFIC ARARs</b>				
Natural Resources	Maine Natural Resources Protection Act Permit by Rule Standards [38 Maine Revised Statutes Annotated (MRSA) 480 <i>et seq.</i> ; 06-096 Code of Maine Rules (CMR) Part 305, 1, 2, and 8]	Applicable	This act regulates activity conducted in, on, or over any protected natural resource or any activity conducted adjacent to and operated in such a way that material or soil may be washed into any freshwater or coastal wetland, great pond, river, stream or brook.	Excavation near to shoreline of the DRMO area will be conducted so as to avoid washing any soil into the nearby Piscataqua River or adjacent wetlands. Stormwater management and erosion control practices will be used to prevent sediment from entering the river or adjacent wetlands during construction. The requirements of the act will continue to apply during the operation and maintenance of the remedy.
Wetlands	Maine Wetland Protection Rules (06-096 CMR Part 310)	Applicable	Standards are provided for protection of wetlands, as defined in MEDEP Chapter 1000 Guidelines for Municipal Shoreline Zoning Ordinances. Jurisdiction under the rules includes the area adjacent to the wetlands, which is the area within 75 feet of the normal high-water line. Activities that have an unreasonable impact on wetlands are prohibited.	A wetlands functions and values assessment was conducted that will be used to guide restorative efforts for adjacent wetlands that may be adversely impacted by remedial activities. Excavation activities will be conducted to avoid impacts to wetlands and coastal wetlands which include tidal and subtidal lands. The requirements of the act will continue to apply during the operation and maintenance of the remedy.

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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
Coastal Zone	Maine Coastal Management Policies (38 MRS 1801 <i>et seq.</i> ) (06-096 CMR Chapter 1000)	Applicable	Regulates activities near great ponds, rivers and larger streams, coastal areas, and wetlands. Regulates shoreland activities and development, including (but not limited to) water pollution prevention and control, wildlife habitat protection, and freshwater and coastal wetlands protection. The law is administered at the local government level. Shoreland areas include areas within 250 feet of the normal high-water line of any river or saltwater body and areas within 75 feet of the high-water line of a stream.	Remedial activities such as excavation and backfilling that may affect storm water runoff, erosion and sedimentation, and surface water quality will be controlled according to these regulations. The requirements of the act will continue to apply during the operation and maintenance of the remedy.

FEDERAL ACTION-SPECIFIC ARARs

Surface Water	CWA [33 USC § 1251 <i>et seq.</i> ]; National Recommended Water Quality Criteria (NRWQC)	Relevant and Appropriate	These criteria are used to establish water quality standards for the protection of aquatic life.	Remedial activities will be conducted to reduce adverse impacts to the Piscataqua River. Stormwater management and erosion control practices will be used to prevent sediment and contamination from entering the river during construction.
Water Management	CWA Section 402 National Pollutant Discharge Elimination System (NPDES) (40 CFR, 122.26)	Applicable	CWA Section 402 requires NPDES permits for stormwater discharges to navigable waters.	Stormwater management will be implemented to minimize discharges of contaminants to the Piscataqua River and meet the substantive requirements of this act.

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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
<b>STATE ACTION-SPECIFIC ARARs</b>				
Hazardous Waste	Identification of Hazardous Wastes 06-096 Part 850	Applicable	These standards establish requirements for determining whether wastes are hazardous based on either characteristic or listing. Wastes with PCB concentrations greater than or equal to 50 ppm are hazardous wastes in Maine.	Wastes generated during remedial activities will be analyzed to determine whether they are RCRA characteristic hazardous wastes. If determined to be hazardous, then the waste will be managed in accordance with regulatory requirements.
	Standards for Generators of Hazardous Waste (38 MRSA 1301 <i>et seq.</i> , 06-096 Part 851)	Applicable	These regulations contain requirements for the generators of hazardous waste.	Waste determined to be hazardous will be managed on site according to the regulation until disposed of off site.
Water Management	Maine Discharge Licenses (38 MRSA 413 <i>et seq.</i> ) and Waste Discharge Permitting Program (06-096 CMR 520-629)	Applicable	These standards regulate the discharge of pollutants from point sources	These regulations are applicable to water management during soil excavation and discharges of treated water to a surface water body, if required. The substantive requirements will be met if any discharges of treated water to surface water bodies are required during the remedial action.
Erosion and Sedimentation Control	Erosion and Sedimentation Control (38 MRSA Part 420-C)	Applicable	Erosion control measures must be in place before activities such as filling, displacing, or exposing soil or other earthen materials occur. Prior MEDEP approval is required if the disturbed area is in the direct watershed of a body of water most at risk for erosion or sedimentation.	These controls will be applicable to excavation. Applicable plans will be coordinated with MEDEP before implementation.

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Storm Water Management	Storm Water Management (38 MRSA Part 420-D; 06-096 CMR Part 500)	Applicable	Storm water management measures must be in place before activities such as filling, displacing, or exposing soil or other earthen material occur on land greater than or equal to 1 acre.	These regulations apply to earth disturbance activities equal to or greater than 1 acre and will be applicable to runoff resulting from earth disturbance activities. Although the area for excavation under Alternative DRMO-4 is less than 1 acre, the combined area for the OU2 remedial action will be greater than 1 acre. Applicable plans will be coordinated with MEDEP before implementation.
Waste Management	Additional Standards Applicable to Waste Facilities Located in a Flood Plain (06-096 CMR 854.16)	Relevant and Appropriate	Any facility located or to be located within 300 feet of a 100-year flood zone must be constructed, operated, and maintained to prevent wash-out of any hazardous waste by a 100-year flood or have procedures in place which will cause the waste to be removed to a location where the waste will not be vulnerable to flood waters and to a location that is authorized to manage hazardous waste safely before flood water can reach the facility.	Portions of the DRMO area are within 300 feet of the 100-year flood zone of the Piscataqua River. Waste managed within 300 feet of the 100-year flood zone will be managed in compliance with these standards.
Air Emissions	Visible Emissions Regulation (38 MRSA Part 584; 06-096 CMR Part 101)	TBC	These regulations establish opacity limits for emissions from several categories of air contaminant sources, including general fugitive emissions.	These regulations will be considered for excavation. Emission of particulate matter and fugitive matter (e.g., dust generation) during excavation will be controlled.



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<b>Federal Chemical-Specific:</b>				
Groundwater	Health Advisories, EPA Office of Drinking Water	To Be Considered	These advisories establishes short-term, long-term, and lifetime exposure limits for children and adults.	These advisories were used to document contaminant exceedances in groundwater (as part of the OU3 risk assessment).
Risk Assessment	EPA Risk Reference Doses (RfDs)	To Be Considered	RfDs are the concentrations considered unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure over a lifetime.	RfDs were used to estimate noncarcinogenic risks as part of the OU3 risk assessment.
Risk Assessment	EPA Human Health Assessment Group Cancer Slope Factors (CSFs)	To Be Considered	CSFs present the most up-to-date information on cancer risk potency for known and suspected carcinogens.	CSFs were used to estimate carcinogenic risks as part of the OU3 risk assessment.
<b>State of Maine Chemical-Specific:</b>				
Soil/Ground-water	Guidance Manual for Human Health Risk Assessments at Hazardous Substance Sites, June 1994	To Be Considered	This guidance manual prepared by the MEDEP and the Maine Department of Human Resources provides acceptable carcinogenic and noncarcinogenic risk levels ( $1 \times 10^{-5}$ and 1, respectively).	This guidance manual was considered in determining acceptable risk levels for RAOs related to the protection of human health.

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<b>Federal Location-Specific:</b>				
Other Natural Resources	Fish and Wildlife Coordination Act (16 USC 661 et seq.;33 CFR 320; 40 CFR 6.302)	Relevant and Appropriate	This act requires any federal agency proposing to modify a body of water to consult with the U.S. Fish and Wildlife Service or National Marine Fisheries Service and appropriate state agencies if alteration of a body of water, including discharges of pollutants into a wetland or construction in a wetland, will occur as a result of off-site remedial activities. Consultation is strongly recommended for on-site actions.	Precautions will be taken to minimize the potential effect on fish and wildlife during construction and maintenance of the shoreline erosion controls.
Floodplains	Floodplain Management, Executive Order 11988 (40 CFR 6, Appendix A)	Applicable	Appendix A includes the federal policy on floodplain management. Under this order, federal agencies are required to avoid long-term and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid support of floodplain development wherever there is a practicable alternative. If no practicable alternative exists to performing cleanup in a floodplain, potential harm must be mitigated and actions taken to preserve the beneficial value of the floodplain.	Implementation of this alternative will include construction in the floodplain. No practicable alternative to this construction exists. However, best management practices will be used during remedial activities to reduce any adverse impacts to the floodplain. The shoreline erosion controls will be constructed so that they do not adversely affect the floodplain and will ensure the bank is sufficiently stabilized to contain the waste materials.

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Medium/Activity	Requirement/ Citation	Status	Synopsis	Action To Be Taken
Floodplains	RCRA Floodplain Restrictions for Hazardous Waste Facilities (40 CFR 264.18(b))	Relevant and Appropriate	A hazardous waste facility located in a 100-year floodplain must be designed, constructed, operated, and maintained to prevent washout of any hazardous waste by a 100-year flood or result in no adverse effects on human health and the environment if washout were to occur.	The landfill cap will be designed, constructed, operated, and maintained to prevent washout of any hazardous waste by a 100-year flood and to result in no adverse effects on human health or the environment if washout were to occur.
Wetlands	Federal Protection of Wetlands, Executive Order 11990 (40 CFR 6, Appendix A)	Applicable	Appendix A includes the federal policy on wetlands protection. Under this order, federal agencies are required to minimize the destruction, loss, or degradation of wetlands and preserve and enhance natural and beneficial values of wetlands. If no practicable alternative exists to remedial activity that may adversely affect a wetland, impacts from implementing the chosen alternative must be mitigated.	Implementation of this alternative will include construction in tidal wetlands. No practicable alternative to this construction exists. However, best management practices will be used during remedial activities to reduce any adverse impacts to wetlands. The shoreline erosion controls will be constructed so that they do not adversely affect wetlands and will ensure the bank is sufficiently stabilized to contain the waste materials.
Wetlands	CWA Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR 230; 33 CFR 320-330)	Applicable	Section 404 of the CWA regulates the discharge of dredged or fill material into U.S. waters, including wetlands. The purpose of Section 404 is to ensure that proposed discharges are evaluated with respect to impacts on the aquatic ecosystem. No activity that adversely effects a wetland is permitted if a practicable alternative that has less effect is available. If there is no practicable alternative, impacts must be mitigated.	Remedial activities will involve dredged or fill material discharge to a tidal wetland. There is no practicable alternative to such discharge. However, the construction will be conducted to comply with these requirements.

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Medium/Activity	Requirement/ Citation	Status	Synopsis	Action To Be Taken
Wetlands	Coastal Zone Management Act (16 USC 1451 et seq.)	Applicable	This act provides for the preservation and protection of coastal zone areas. Federal activities that are in or directly affecting the coastal zone must be consistent to the maximum extent practicable with a federally approved state management program.	Implementation of this alternative will include construction in the coastal zone. However, best management practices will be used during remedial activities to reduce any adverse impacts to the coastal zone. The remedial action will be consistent with Maine Coastal Management Policies. The shoreline erosion controls will ensure the bank is sufficiently stabilized to contain the waste material.
Navigable Waters	River and Harbors Act (33 USC 403; 33 CFR 320-323)	Applicable	Section 10 of the River and Harbors Act prohibits unauthorized obstruction or alteration of navigable waters. Activities involving excavation or deposition of materials in navigable waters or affecting such waters must serve the public interest, and benefits must outweigh adverse impacts on natural resources, aesthetics, and navigation.	The shoreline erosion control work in the Piscataqua River (at OU3) will meet the substantive requirements of Section 10 of the Act to prevent obstruction or alteration of navigable waters.

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<b>State of Maine Location-Specific:</b>				
Wetlands	Maine Site Location of Development Law (38 MRSA 481 et seq.; 06-096 CMR 371-377)	Applicable	This statute and the related regulations prohibit any development from adversely affecting existing uses, scenic character or existing natural resources in or near a community. Remediation activities must not have adverse effect on the natural environment, historic sites, unusual natural areas, and wildlife and fisheries. Also, this act requires that activities shall not interfere with existing uses of the site.	Because the landfill cover will be more than 3 acres, this alternative will need to meet the substantive requirements of the statute and regulations. However, no adverse effects on the existing uses, scenic character, or existing natural resources will occur due to the construction of the cover.
Wetlands	Maine Natural Resources Protection Act (NRPA) Permit by Rule Standards (38 MRSA 480 et seq.; 06-096 CMR 305)	Relevant and Appropriate	This act requires a permit for any activity conducted in, on, or over any protected natural resource or any activity conducted on land adjacent to and operates in such a way that material or soil may be washed into any freshwater or coastal wetland, great pond, river, stream or brook.	Implementation of this alternative will include construction in tidal wetlands or the offshore. Remedial activities (grading/capping) will be performed in compliance with substantive requirements. Erosion and sediment controls will be included during implementation of the alternative. There will be little to no net loss of naturally vegetated areas after implementation of this alternative.
Wetlands	Maine Wetland Protection Rules (06-096 CMR 310)	Applicable	Standards are provided for wetlands protection. Activities that have an unreasonable impact on the wetlands are prohibited.	Implementation of this alternative will include construction in wetlands. However, the shoreline erosion controls will not adversely affect wetlands and will ensure the banks are sufficiently stabilized to contain the waste materials.

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<b>Medium/Activity</b>	<b>Requirement/ Citation</b>	<b>Status</b>	<b>Synopsis</b>	<b>Action To Be Taken</b>
Coastal Zone	Maine Coastal Management Policies (38 MSRA 1801 et seq.)	Applicable	These policies provide for the regulation, conservation, beneficial use, and management of coastal resources.	The remedial action will be consistent with these policies. The shoreline reconstruction will ensure the bank is sufficiently stabilized to contain the waste materials.
Other Natural Resources	Maine Endangered Species Act (12 MRSA 7751 et seq.)	To Be Considered	The state of Maine has authority to research, list, and protect any species deemed endangered or threatened. The Maine Department of Inland Fisheries and Wildlife determines appropriate use(s) of various habitats on a case-by-case basis. The Maine lists may differ from the federal lists of endangered species.	No known endangered or threatened species or critical habitats are present at OU3. However, to prevent flushing of birds from their nests on Clark's Island, guidance from the Maine Department of Inland Fisheries and Wildlife to refrain from remedial activities from April 1 to August 15 within 0.25 miles of a nesting habitat will be considered.
Other Natural Resources	Maine Significant Wildlife Habitat Rules (06-096 CMR 335)	To Be Considered	These rules outline requirements associated with a NRPA permit for an activity impacting significant wildlife habitat, including certain seabird nesting islands.	No known endangered or threatened species or critical habitats are present at OU3. However, to prevent flushing of birds from their nests at Clark's Island, guidance from the Maine Department of Inland Fisheries and Wildlife to refrain from remedial activities from April 1 to August 15 within 0.25 miles of a nesting habitat will be considered.
<b>Federal Action-Specific:</b>				
Hazardous Waste	RCRA Subtitle C Standards for Owners and Operators of TSD Facilities (40 CFR 264)	Relevant and Appropriate	These regulations outline specifications and standards for design, operation, closure, and monitoring of performance for hazardous waste storage, treatment, and disposal facilities.	These regulations are relevant and appropriate, not applicable, because disposal of wastes at this site ceased prior to the promulgation of RCRA in 1980. However, substantive requirements will be met and adhered to on site.

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Hazardous Waste	RCRA Subtitle C, Subpart F – Releases from Solid Waste Management Units (40 CFR 264.90-264.101)	Relevant and Appropriate	These regulations detail groundwater monitoring requirements for hazardous waste facilities. These regulations outline general groundwater monitoring standards, as well as standards for detection monitoring, compliance monitoring, and corrective action monitoring.	These regulations are relevant and appropriate, not applicable, because disposal activities at this site ceased prior to the promulgation of RCRA in 1980. However, the alternative will meet the substantive requirements of these regulations.
Hazardous Waste	RCRA Subtitle C, Subpart G – Closure and Post-Closure (40 CFR 264.110-264.120)	Relevant and Appropriate	These regulations detail general requirements for closure and post-closure of hazardous waste facilities, including installation of a groundwater monitoring program.	These regulations are relevant and appropriate, not applicable, because disposal activities at this site ceased prior to the promulgation of RCRA in 1980. However, design, monitoring, maintenance, and post-closure care will meet the substantive requirements of these regulations.
Hazardous Waste	RCRA Subtitle C, Subpart N – Landfills (40 CFR 264.310)	Relevant and Appropriate	This regulation contains closure and post-closure requirements for Subtitle C landfills.	This regulation is relevant and appropriate, not applicable, because disposal of wastes at this site ceased prior to the promulgation of RCRA in 1980. However, this alternative will meet the substantive requirements of this regulation with regard to cap design, monitoring, maintenance, and post-closure care.
Capping	Alternative Cap Design Guidance Proposed for Unlined, Hazardous Waste Landfills in the EPA Region I (memo dated 9/30/97)	To Be Considered	Guidance for design of a cover or cap for unlined, hazardous waste landfills in EPA Region I.	This guidance will be followed for design of the cap.



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Medium/Activity	Requirement/ Citation	Status	Synopsis	Action To Be Taken
Capping	Amendment to Recommended Long Term Hydraulic Performance Criteria of the Geocomposite Drainage Layer in Landfill Cap Applications (memo dated 3/23/99)	To Be Considered	Guidance for testing long-term performance characteristics of a geocomposite drainage layer.	This guidance will be followed for design of the cap.
Groundwater	Safe Drinking Water Act (SDWA), Maximum Contaminant Levels (MCLs) (40 CFR 141.11-141.16 and 141.60-141.65)	Relevant and Appropriate	MCLs have been promulgated for many common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers used for drinking water.	MCLs were used to document contaminant exceedances in groundwater (as part of the OU3 risk assessment). Until contaminant concentrations in the groundwater are below MCLs, a restriction on the use of groundwater within the OU3 compliance boundary will be established and maintained, and an appropriate monitoring program will be conducted.
Groundwater	SDWA Maximum Contaminant Level Goals (MCLGs) (40 CFR 141.50-141.51)	Relevant and Appropriate	MCLGs have been promulgated for many common organic and inorganic contaminants. These concentrations indicate the level of contaminants in drinking water at which no known or anticipated adverse effect on the health effect of a person would occur, allowing for an adequate margin of safety. MCLGs are non-enforceable public health goals.	Where MCLs have not been established, non-zero MCLGs were used to document contaminant exceedances in groundwater (as part of the OU3 risk assessment). Until contaminant concentrations in the groundwater are below non-zero MCLGs, a restriction on the use of groundwater within the OU3 compliance boundary will be established and maintained, and an appropriate monitoring program will be conducted.

**ALTERNATIVE-SPECIFIC ARARS AND TBCS  
 ALTERNATIVE 3 – COVER WITH COMPOSITE LINER AND ENHANCED DRAINAGE LAYER,  
 INSTITUTIONAL CONTROLS, EROSION CONTROLS, AND MONITORING  
 PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE  
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Medium/Activity	Requirement/ Citation	Status	Synopsis	Action To Be Taken
Emissions	Air/Superfund National Technical Guidance (EPA/450/1-89/001 through 004)	To Be Considered	This guidance describes methodologies for predicting risks due to air release at a Superfund site.	Releases to air will be minimized by fugitive dust controls. Emissions of hazardous air pollutants are not anticipated.
<b>State of Maine Action-Specific:</b>				
Hazardous Waste	Maine Hazardous Waste Management Rules (06-096 CMR 800-802, 850, 851, 853-857)	Relevant and Appropriate	These regulations provide standards for the generation, transportation, treatment, storage, and disposal of hazardous waste. They set forth the state definition and criteria for establishing whether waste materials are hazardous and subject to associated hazardous regulations. They also provide standards for the location of facilities in a floodplain or within 300 feet of the floodplain and detail groundwater monitoring requirements for hazardous waste facilities. The regulations outline general groundwater monitoring standards, as well as standards for detection monitoring, compliance monitoring, and corrective action monitoring.	State requirements more stringent than federal requirements take precedence. At the completion of the remedial action, these remedial standards will be met under this alternative.
Emissions	Maine Air Pollution Control Law – Classification of Air Quality Control Regions (38 MSRA 583; 06-096 CMR 114)	Relevant and Appropriate	Air quality regions and classification of each region and ambient air quality and emission standards are established.	Emissions of criteria pollutants will be minimized by fugitive dust control during excavation, grading, and capping activities. Emissions of hazardous air pollutants are not anticipated during implementation of this alternative.

**ALTERNATIVE-SPECIFIC ARARS AND TBCS  
 ALTERNATIVE 3 – COVER WITH COMPOSITE LINER AND ENHANCED DRAINAGE LAYER,  
 INSTITUTIONAL CONTROLS, EROSION CONTROLS, AND MONITORING  
 PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE  
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Medium/Activity	Requirement/ Citation	Status	Synopsis	Action To Be Taken
Emissions	Maine Ambient Air Quality Standards (38 MSRA 584; 06-096 CMR 110)	Relevant and Appropriate	Ambient air quality standards are established for particulate matter, sulfur dioxide, carbon monoxide, ozone, hydrocarbon, nitrogen dioxide, lead, and total chromium. Ambient increments that define the maximum ambient increase of a particular pollutant, which can be permitted for a given area, are defined.	Emissions of criteria air pollutants will be minimized by fugitive dust control during excavation, grading, and capping activities
Emissions	Maine Air Pollution Control Laws – Maine Emission License Regulations (38 MSRA 585 and 590; 06-096 CMR 115)	Relevant and Appropriate	Requires new sources of air emissions to demonstrate that its emissions do not violate ambient air quality standards. New sources must meet preconstruction monitoring and post-construction monitoring requirements.	Emissions of criteria air pollutants will be minimized by fugitive dust control during excavation, grading, and capping activities.
Groundwater	Maine Department of Human Services Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144E CMR 233, Appendix C)	Relevant and Appropriate	Maximum Exposure Guidelines (MEGs) are contained in Appendix C to these rules. MEGs include health advisories, which are maximum allowable concentrations of contaminants in drinking water.	Until contaminant concentrations in the groundwater are below MEGs, a restriction on the use of groundwater within the OU3 compliance boundary will be established and maintained, and an appropriate monitoring program will be conducted.

**ALTERNATIVE-SPECIFIC ARARS AND TBCS  
ALTERNATIVE 3 – COVER WITH COMPOSITE LINER AND ENHANCED DRAINAGE LAYER,  
INSTITUTIONAL CONTROLS, EROSION CONTROLS, AND MONITORING  
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE  
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Medium/Activity	Requirement/ Citation	Status	Synopsis	Action To Be Taken
Groundwater	Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)	Relevant and Appropriate	This requirements outlines the State of Maine's rules relating to establishing, constructing, altering, and operating certain types of hazardous waste units.	Until contaminant concentrations in the groundwater are below MEGs, a restriction on the use of groundwater within the OU3 compliance boundary will be established and maintained, and an appropriate monitoring program will be conducted.
Groundwater	Maine Department of Human Services Rules Relating to Drinking Water (10-144E CMR 231-233)	Relevant and Appropriate	Maine's primary drinking water standards are similar to federal MCLs as drinking water standards under the Maine Safe Drinking Water Rules. When state standards are more stringent than federal standards, and have been legally and constantly applied, the state levels shall be used.	Until contaminant concentrations in the groundwater are below Maine MCLs, a restriction on the use of groundwater within the OU3 compliance boundary will be established and maintained, and an appropriate monitoring program will be conducted.
Erosion	Erosion and Sedimentation Control (38 MRSA 420-C) and Stormwater Management (38 MSRA 420-D; 06-096 CMR 500 and 502)	Applicable	Erosion control measures must be in place before activities, such as filling, displacing, or exposing soil or other earthen materials occur. Prior MEDEP approval is required if the disturbed area is in the direct watershed of a water body most at risk.	Appropriate controls will be implemented to address erosion, sedimentation, and storm water and applicable plans will be coordinated with the MEDEP before implementation.
Waste	Maine Solid Waste Management Regulations (06-096 CMR 400-411)	To be Considered	Provides standards for generation, transportation, treatment, storage, and disposal of solid and special wastes. Also provides closure and post-closure maintenance standards.	Not applicable for a facility established before 1973. Capping performance standards are TBC for the conceptual cover design. The specific design standards are not appropriate for a landfill that has been closed since 1978.

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sediment monitoring for the area offshore of OU3 is included in the Interim Offshore Monitoring for OU4.

### Description of the Significant Difference

This ESD documents a modification to the OU3 ROD that significantly changes, but does not fundamentally alter, the selected remedy. The change to the remedy for the OU3 does not alter the decision to install a hazardous waste landfill cover or implement institutional controls, erosion controls, and monitoring. The OU3 remedy is modified to include management of migration as part of OU3. The remedy for OU3 with modifications based on the September 2003 ESD will meet the Applicable and Relevant and Appropriate Requirements (ARARs) and the RAO for groundwater migration from the JILF. The monitoring component of the OU3 remedy is affected by the addition of the ARARs and RAO for groundwater migration from the JILF.

The following ARARs are included in the OU3 remedy based on the addition of management of migration:

- > Clean Water Act, Section 304(a). National Recommended Water Quality Criteria (33 USC 1251 et seq; 40 CFR 122.44; 40 CFR 131) (Relevant and Appropriate). These are non-enforceable guidelines developed for pollutants in surface water. States must develop water quality standards based on Ambient Water Quality Criteria (AWQC) to protect existing and attainable uses of surface waters that receive discharges of pollutants. These are health-based criteria developed for carcinogenic and noncarcinogenic compounds and water quality parameters. AWQC are set at levels that are guidelines for pollutants in surface water. AWQC are available for the protection of human health from exposure to contaminants in drinking water, ingestion of aquatic biota, and for protection of freshwater and saltwater aquatic life. These criteria are used as guidance for developing action levels for the monitoring program as part of the OU3 OM&M Plan.

- > Maine Environmental Evaluation: Surface Water Toxics Control Program, Chapter 530.5 (38 MRSA 420 and 464, 06-096 CMR 530) (Applicable). This rule promulgates chemical standards for surface water, referred to as Maine Statewide Water Quality Criteria (SWQC) and procedures necessary to control levels of toxic pollutants in surface water. Maine SWQC are set at federal AWQC levels. The criteria are used for developing action levels for the monitoring program as part of the OU3 OM&M Plan. ...

The following RAO is added to the OU3 remedy based on the addition of management of migration:

- > Ensure that the migration of groundwater contaminants does not adversely impact the offshore environment.

The post-remedial monitoring program for OU3 addresses the ARARs and RAO for groundwater migration and provides for the collection and evaluation of groundwater data to determine whether additional investigation and/or evaluation is needed to ensure that human health and the environment are protected from migration of groundwater from the JILF. As provided in the OU3 OM&M Plan, chemicals in the landfill may enter the groundwater and subsequently discharge offshore at levels that may pose unacceptable risks to human and ecological receptors. To maintain the effectiveness of the OU3 remedy, the Navy needs to ensure that chemicals from the landfill are not in the groundwater at concentrations that will adversely impact human health and the environment after the groundwater discharges to the offshore. Action levels to initiate additional evaluation or investigation are based on protection of offshore and intertidal receptors. The decisions for monitoring were developed to meet the RAOs for source control and for migration of OU3 groundwater offshore.

The OM&M Plan provides decision trees that consider whether chemical concentrations in groundwater are greater than action levels and provide for evaluation of risks to determine

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**TABLE E-1  
 ALTERNATIVE 3: LIMITED EXCAVATION IN FORMER TIMBER BASIN AREA, RESIDENTIAL LAND USE CONTROLS, AND LONG-TERM  
 MANAGEMENT OF SHORELINE CONTROLS  
 CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs  
 OPERABLE UNIT 7 RECORD OF DECISION  
 PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE  
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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
<b>FEDERAL CHEMICAL-SPECIFIC ARARs and TBCs</b>				
Soil/Risk Assessment	United States Environmental Protection Agency (USEPA) Office of Solid Waste and Emergency Response (OSWER) Directive 9355.4-12	To be considered (TBC)	USEPA has provided recommended methodology for assessing risk caused by exposure to lead in surface soil under residential scenarios.	Guidelines were used to develop residential risk-based cleanup goals for lead in soil.
	USEPA Risk Reference Doses (RfDs) from Integrated Risk Information System (IRIS)	TBC	RfDs are estimates of daily exposure for human populations (including sensitive subpopulations) considered unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure over a lifetime.	RfDs were used to develop risk-based soil cleanup goals for antimony, copper, dioxins/furans, and iron.
	USEPA Human Health Assessment Group Cancer Slope Factors (CSFs) from IRIS	TBC	CSFs present the most up-to-date information on cancer risk potency for known and suspected carcinogens.	CSFs were used to develop risk-based soil cleanup goals for polychlorinated biphenyls (PCBs) and carcinogenic polycyclic aromatic hydrocarbons (PAHs).
	Guidelines for Carcinogen Risk Assessment EPA/630/P-03/001F (2005a)	TBC	These guidelines are used to perform Human Health Risk Assessment (HHRA). They provide a framework for assessing possible cancer risks from exposures to pollutants or other agents in the environment.	These guidelines were used to develop risk-based soil cleanup goals for PCBs and PAHs.
	Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens EPA/630/R-03/003F (2005b)	TBC	These guidelines are used to perform HHRA and address a number of issues pertaining to cancer risks associated with early-life exposures in general and provide specific guidance on potency adjustment for carcinogens acting through a mutagenic mode of action.	This guidance was used to develop risk-based soil cleanup goals for PCBs and PAHs.

**TABLE E-1  
 ALTERNATIVE 3: LIMITED EXCAVATION IN FORMER TIMBER BASIN AREA, RESIDENTIAL LAND USE CONTROLS, AND LONG-TERM  
 MANAGEMENT OF SHORELINE CONTROLS  
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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
<b>STATE CHEMICAL-SPECIFIC ARARs and TBCs: No ARARs or TBCs</b>				
<b>FEDERAL LOCATION-SPECIFIC ARARs and TBCs</b>				
Coastal Zone Management	Coastal Zone Management Act [16 United States Code (USC) 1451 <i>et seq</i> ]	Applicable	This act provides for the preservation and protection of coastal zone areas. Federal activities that are in or directly affecting the coastal zone must be consistent, to the maximum extent practicable, with a federally approved state management program.	Future maintenance activities as part of long-term management of shoreline erosion controls that may take place in the coastal zone will be controlled according to the requirements of the MEDEP program. MEDEP will review the long-term management plan and work plans associated with shoreline control maintenance activities to ensure that they meet the substantive requirements of this act. The requirements of the act will continue to apply during the operation and maintenance of the remedy.
Wetlands and US Waters	Clean Water Act (CWA) Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material [40 Code of Federal Regulations (CFR) 230; 33 CFR 320, 322, and 323]	Applicable	These regulations outline the requirements for the discharge of dredged or fill material into US waters, including wetlands. No activity that adversely affects a US waters is permitted if a practicable alternative that has less effect is available. If there is no other practicable alternative, impacts must be mitigated.	Future maintenance activities as part of long-term management of shoreline erosion controls will be performed so as to not impact the offshore area.



**TABLE E-1**  
**ALTERNATIVE 3: LIMITED EXCAVATION IN FORMER TIMBER BASIN AREA, RESIDENTIAL LAND USE CONTROLS, AND LONG-TERM**  
**MANAGEMENT OF SHORELINE CONTROLS**  
**CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs**  
**OPERABLE UNIT 7 RECORD OF DECISION**  
**PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE**  
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<b>Requirement</b>	<b>Citation</b>	<b>Status</b>	<b>Synopsis</b>	<b>Evaluation/Action To Be Taken</b>
Other Natural Resources	The Endangered Species Act of 1973 (16 USC 1531 <i>et seq.</i> ; 50 CFR Parts 17 and 402)	Applicable	Provides for consideration of the impacts on endangered and threatened species and their critical habitats. Requires federal agencies to ensure that any action carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or adversely affect its critical habitat. The entire state of Maine is considered a habitat of the federally-listed endangered short-nosed sturgeon. The Gulf of Maine population of Atlantic sturgeon is listed as a threatened species.	There are no known endangered, threatened, or protected species or critical habitats within the boundaries of PNS. However short-nosed and Atlantic sturgeon are present in the Piscataqua River. Future maintenance activities as part of long-term management of the shoreline erosion controls will be conducted so as to avoid any adverse effect under the act to these sturgeon.
	Fish and Wildlife Coordination Act (16 USC 661 <i>et seq.</i> )	Applicable	This act requires any federal agency proposing to modify a body of water to coordinate with the United States Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) and appropriate state agencies if alteration of a body of water, including discharge of pollutants into a wetland or construction in a wetland, will occur as a result of offsite remedial activities.	The Navy will coordinate with USFWS in the event that future maintenance activities as part of long-term management of shoreline erosion controls may impact the coastal floodplain and river.
Floodplain Management and Protection of Wetlands	44 CFR 9	Relevant and Appropriate	FEMA regulations that set forth the policy, procedure, and responsibilities to implement and enforce Executive Order 11988, Floodplain Management, and Executive Order 11990, Protection of Wetlands.	Future maintenance activities as part of long-term management of shoreline erosion controls within the 100-year floodplain of the Piscataqua River or federal jurisdictional wetlands will be implemented in compliance with these standards.

**TABLE E-1**  
**ALTERNATIVE 3: LIMITED EXCAVATION IN FORMER TIMBER BASIN AREA, RESIDENTIAL LAND USE CONTROLS, AND LONG-TERM**  
**MANAGEMENT OF SHORELINE CONTROLS**  
**CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs**  
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**PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE**  
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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
<b>STATE LOCATION-SPECIFIC ARARs and TBCs</b>				
Other Natural Resources	Maine Natural Resources Protection Act Permit by Rule Standards [38 Maine Revised Statutes Annotated (MRSA) 480 <i>et seq.</i> ; 06-096 Code of Maine Rules (CMR) Part 305, 1, 2, and 8]	Applicable	This act regulates activity conducted in, on, or over any protected natural resource or any activity conducted adjacent to and operated in such a way that material or soil may be washed into any freshwater or coastal wetland, great pond, river, stream or brook.	Future maintenance activities as part of long-term management of shoreline erosion controls will be conducted so as to avoid washing any soil into the nearby Piscataqua River or adjacent wetlands. Stormwater management and erosion control practices will be used to prevent sediment from entering the river or adjacent wetlands during remedial activities.
Wetlands	Maine Wetland Protection Rules(06-096 CMR Part 310)	Applicable	Standards are provided for protection of wetlands, as defined in MEDEP Ch. 1000 Guidelines for Municipal Shoreline Zoning Ordinances. Jurisdiction under the Rules includes the area adjacent to the wetlands, which is the area within 75 feet of the normal high water line. Activities that have an unreasonable impact on wetlands are prohibited.	Future maintenance activities as part of long-term management of shoreline erosion controls will be conducted to avoid impacts to wetlands and coastal wetlands, which include tidal and subtidal lands.
Coastal Zone	Maine Coastal Management Policies (38 MRSA 1801 <i>et seq.</i> ) (06-096 CMR Chapter 1000)	Applicable	Regulates activities near great ponds, rivers and larger streams, coastal areas, and wetlands. Regulates shoreland activities and development, including (but not limited to) water pollution prevention and control, wildlife habitat protection, and freshwater and coastal wetlands protection. The law is administered at the local government level. Shoreland areas include areas within 250 feet of the normal high-water line of any river or saltwater body and areas within 75 feet of the high-water line of a stream.	Future maintenance activities as part of long-term management of shoreline erosion controls that may affect storm water runoff, erosion and sedimentation, and surface water quality will be controlled according to these regulations.

**TABLE E-1**  
**ALTERNATIVE 3: LIMITED EXCAVATION IN FORMER TIMBER BASIN AREA, RESIDENTIAL LAND USE CONTROLS, AND LONG-TERM**  
**MANAGEMENT OF SHORELINE CONTROLS**  
**CHEMICAL, LOCATION AND ACTION-SPECIFIC ARARs**  
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**PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE**  
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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
<b>FEDERAL ACTION-SPECIFIC ARARs and TBCs</b>				
Surface Water	CWA [33 USC § 1251 <i>et seq.</i> ]; National Recommended Water Quality Criteria (NRWQC) (40 CFR Part 122.44)	Relevant and Appropriate	These criteria are used to establish water quality standards for the protection of aquatic life.	Future maintenance activities as part of long-term management of shoreline erosion controls will be conducted to reduce adverse impacts to the Piscataqua River. Stormwater management and erosion control practices will be used to prevent soil and contamination from entering the river during maintenance of shoreline controls.
Water Management	CWA Section 402 National Pollutant Discharge Elimination System (NPDES) (40 CFR 122.26)	Applicable	CWA Section 402 requires NPDES permits for stormwater discharges to navigable waters.	Stormwater management would be implemented during excavation and maintenance of shoreline erosion controls to minimize discharges of contaminants to the Piscataqua River and meet the substantive requirements of this act.
<b>STATE ACTION-SPECIFIC ARARs and TBCs</b>				
Hazardous Waste	Identification of Hazardous Wastes 06-096 Part 850	Applicable	These standards establish requirements for determining whether wastes are hazardous based on either characteristic or listing. Wastes with PCB concentrations greater than or equal to 50 ppm are hazardous wastes in Maine.	Wastes generated during excavation will be analyzed to determine whether they are RCRA characteristic hazardous wastes. If determined to be hazardous, then the waste will be managed in accordance with regulatory requirements.
	Standards for Generators of Hazardous Waste (38 MRSA 1301 <i>et seq.</i> , 06-096 Part 851)	Applicable	These regulations contain requirements for the generators of hazardous waste.	Wastes generated during remedial activities that are determined to be hazardous waste will be managed in accordance with regulatory requirements.

**TABLE E-1**  
**ALTERNATIVE 3: LIMITED EXCAVATION IN FORMER TIMBER BASIN AREA, RESIDENTIAL LAND USE CONTROLS, AND LONG-TERM**  
**MANAGEMENT OF SHORELINE CONTROLS**  
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**PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE**  
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<b>Requirement</b>	<b>Citation</b>	<b>Status</b>	<b>Synopsis</b>	<b>Evaluation/Action To Be Taken</b>
Hazardous Waste	Standards for Hazardous Waste Facilities Additional Standards Applicable to Miscellaneous Units (06-096 Part 854.15)	Applicable	These standards provide requirements for treatment of hazardous wastes.	Soil in the excavation areas at OU7 characterized as hazardous for lead based on Toxicity Characteristic Leaching Procedure (TCLP) for lead may be stabilized prior to offsite disposal to render the soil nonhazardous for lead.
Water Management	Maine Discharge Licenses (38 MRSA 413 <i>et seq.</i> ) and Waste Discharge Permitting Program (06-096 CMR 520-629)	Applicable	These standards regulate the discharge of pollutants from point sources.	These regulations are applicable to water management during soil excavation and discharges of treated water to a surface water body, if required. The substantive requirements will be met if any discharges of treated water to surface water bodies are required during the remedial action.
Waste Management	Additional Standards Applicable to Waste Facilities Located in a Flood Plain (06-096 CMR 854.16)	Relevant and Appropriate	Any facility located or to be located within 300 feet of a 100 year flood zone must be constructed, operated, and maintained to prevent wash-out of any hazardous waste by a 100 year flood or have procedures in place which will cause the waste to be removed to a location where the waste will not be vulnerable to flood waters and to a location which is authorized to manage hazardous waste safely before flood water can reach the facility.	Future maintenance activities as part of long-term management of shoreline erosion controls conducted within 300 feet of the 100-year flood zone will be conducted in compliance with these standards.
Erosion	Erosion and Sedimentation Control (38 MRSA Part 420-C)	Applicable	Erosion control measures must be in place before activities such as filling, displacing, or exposing soil or other earthen materials occur. Prior MEDEP approval is required if the disturbed area is in the direct watershed of a body of water most at risk for erosion or sedimentation.	These controls will be applicable to remedial activities that need to address erosion and sedimentation. Applicable plans will be coordinated with MEDEP before implementation.

**TABLE E-1**  
**ALTERNATIVE 3: LIMITED EXCAVATION IN FORMER TIMBER BASIN AREA, RESIDENTIAL LAND USE CONTROLS, AND LONG-TERM**  
**MANAGEMENT OF SHORELINE CONTROLS**  
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**PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE**  
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Requirement	Citation	Status	Synopsis	Evaluation/Action To Be Taken
Air Emissions	Visible Emissions Regulation (38 MRSA Part 584; 06-096 CMR Part 101)	TBC	These regulations establish opacity limits for emissions from several categories of air contaminant sources, including general fugitive emissions.	These regulations will be considered for excavation and backfilling activities. These standards will be met if any of the activities result in emission of particulate matter and fugitive matter to the atmosphere (e.g., dust generation).

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**TABLE E-1**

**ALTERNATIVE 2: LUCs FOR ELEVATED PAH AREA AND BUILDING 62 ANNEX  
 CHEMICAL-, LOCATION-, AND ACTION-SPECIFIC ARARs  
 OPERABLE UNIT 9 RECORD OF DECISION  
 PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE**

<b>REQUIREMENT</b>	<b>CITATION</b>	<b>STATUS</b>	<b>SYNOPSIS</b>	<b>EVALUATION/ACTION TO BE TAKEN</b>
<b>FEDERAL CHEMICAL-SPECIFIC ARARs AND TBCs</b>				
Soil/Risk Assessment	USEPA Human Health Assessment Group Cancer Slope Factors (CSFs) from Integrated Risk Information System (IRIS)	TBC	CSFs present the most up-to-date information on cancer risk potency for known and suspected carcinogens.	CSFs were used to develop risk-based soil cleanup goals for carcinogenic polycyclic aromatic hydrocarbons (PAHs).
	Guidelines for Carcinogen Risk Assessment EPA/630/P-03/001F (2005a)	TBC	These guidelines are used to perform the Human Health Risk Assessment (HHRA). They provide a framework for assessing possible cancer risks from exposures to pollutants or other agents in the environment.	These guidelines were used to develop risk-based soil cleanup goals for carcinogenic PAHs.
	Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens EPA/630/R-03/003F (2005b)	TBC	These guidelines are used to perform the HHRA and address a number of issues pertaining to cancer risks associated with early-life exposures in general and provide specific guidance on potency adjustment for carcinogens acting through a mutagenic mode of action.	This guidance was used to develop risk-based soil cleanup goals for carcinogenic PAHs.
<b>STATE CHEMICAL-SPECIFIC ARARs AND TBCs: No ARARs or TBCs</b>				
<b>FEDERAL LOCATION-SPECIFIC ARARs AND TBCs: No ARARs or TBCs</b>				
<b>STATE LOCATION-SPECIFIC ARARs AND TBCs: No ARARs or TBCs</b>				
<b>FEDERAL ACTION-SPECIFIC ARARs AND TBCs: No ARARs or TBCs</b>				
<b>STATE ACTION-SPECIFIC ARARs AND TBCs: No ARARs or TBCs</b>				

## **Appendix C**

### **Human Health Risk Calculations, Including Project Action Level and Screening Level Updates**



OU1

## Calculations of Preliminary Remediation Goals (PRGs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 6/21/09

### Occupational Worker Exposures

Variable	Description of Variable	Units	GSDi and PbBo from OLEM Directive 9285.6-55 (August 2016)
$PbB_{fetal, 0.95}$	95 <sup>th</sup> percentile PbB in fetus	ug/dL	10
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4
$GSD_i$	Geometric standard deviation PbB	--	1.74
$PbB_0$	Baseline PbB	ug/dL	0.73
$IR_S$	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050
$AF_{S, D}$	Absorption fraction (same for soil and dust)	--	0.12
$EF_{S, D}$	Exposure frequency (same for soil and dust)	days/yr	150
$AT_{S, D}$	Averaging time (same for soil and dust)	days/yr	365
<b>PRG</b>		<b>ppm</b>	<b>3,789</b>

OLEM Directive 9285.6-55. Transmittal of Update to the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters. August 2, 2016.

## Calculations of Preliminary Remediation Goals (PRGs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 6/21/09

### Adult Recreator Exposures

Variable	Description of Variable	Units	GSDi and PbBo from OLEM Directive 9285.6-55 (August 2016)
$PbB_{fetal, 0.95}$	95 <sup>th</sup> percentile PbB in fetus	ug/dL	10
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4
$GSD_i$	Geometric standard deviation PbB	--	1.74
$PbB_0$	Baseline PbB	ug/dL	0.73
$IR_S$	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050
$AF_{S, D}$	Absorption fraction (same for soil and dust)	--	0.12
$EF_{S, D}$	Exposure frequency (same for soil and dust)	days/yr	52
$AT_{S, D}$	Averaging time (same for soil and dust)	days/yr	365
<b>PRG</b>		<b>ppm</b>	<b>10,931</b>

OLEM Directive 9285.6-55. Transmittal of Update to the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters. August 2, 2016.

OU2

## Calculations of Preliminary Remediation Goals (PRGs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 6/21/09

### Construction Worker Exposures

Variable	Description of Variable	Units	GSD <sub>i</sub> and PbB <sub>0</sub> from OLEM Directive 9285.6-55 (August 2016)
PbB <sub>fetal, 0.95</sub>	95 <sup>th</sup> percentile PbB in fetus	ug/dL	10
R <sub>fetal/maternal</sub>	Fetal/maternal PbB ratio	--	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4
GSD <sub>i</sub>	Geometric standard deviation PbB	--	1.74
PbB <sub>0</sub>	Baseline PbB	ug/dL	0.73
IR <sub>S</sub>	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.100
AF <sub>S, D</sub>	Absorption fraction (same for soil and dust)	--	0.12
EF <sub>S, D</sub>	Exposure frequency (same for soil and dust)	days/yr	60
AT <sub>S, D</sub>	Averaging time (same for soil and dust)	days/yr	365
<b>PRG</b>		<b>ppm</b>	<b>4,737</b>

OLEM Directive 9285.6-55. Transmittal of Update to the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters. August 2, 2016.

## Calculations of Preliminary Remediation Goals (PRGs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 6/21/09

### Adult Recreator Exposures

Variable	Description of Variable	Units	GSDi and PbBo from OLEM Directive 9285.6-55 (August 2016)
$PbB_{fetal, 0.95}$	95 <sup>th</sup> percentile PbB in fetus	ug/dL	10
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4
$GSD_i$	Geometric standard deviation PbB	--	1.74
$PbB_0$	Baseline PbB	ug/dL	0.73
$IR_S$	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050
$AF_{S, D}$	Absorption fraction (same for soil and dust)	--	0.12
$EF_{S, D}$	Exposure frequency (same for soil and dust)	days/yr	52
$AT_{S, D}$	Averaging time (same for soil and dust)	days/yr	365
<b>PRG</b>		<b>ppm</b>	<b>10,931</b>

OLEM Directive 9285.6-55. Transmittal of Update to the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters. August 2, 2016.

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Table C-1  
Exposure Parameters  
Third Five-Year Review Report  
Portsmouth Naval Shipyard  
Kittery, Maine

Receptor Age = (1)	2011			2016		
	Adult	Adolescent	Child	Adult	Adolescent	Child
DAevent =	calculated	calculated	calculated	calculated	calculated	calculated
EV =	1	1	1	1	1	1
ED =	17	10	3	17	10	3
EF =	26	26	26	26	26	26
SA = (2)	4500	4290	4000	5021	4406	3805
BW =	70	45	20	80	45	20
ATc =	25550	25550	25550	25550	25550	25550
ATnc =	6205	3650	1095	6205	3650	1095
IRgw =	0.05	0.05	0.05	0.05	0.05	0.05
ET =	4	4	4	4	4	4
Action Level Target Risk =	1.00E-05					
Action Level Target Hazard =	1					
Screening Level Target Risk =	1.00E-06					
Screening Level Target Hazard =	0.1					

Denotes updated value.

(1) - Child aged 4 to 6 consistent with the previous evaluation. Younger children are unlikely to play in seeps due to rocky shore.

(2) - Skin surface area calculated as 25, 33, and 50 percent, respectively, of the total skin surface area using updated default skin surface area (EPA, 2011).

(3) - Updated default adult body weight (EPA, 2011).

U.S. EPA. 2011. Exposure Factors Handbook 2011 Edition (Final). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-09/052F.

Tetra Tech. 2012. Final Second Five-Year Review Report Portsmouth Naval Shipyard Kittery Maine. Revision 0. May.



Table C-2  
Project Action Level Changes Summary  
Third Five-Year Review Report  
Portsmouth Naval Shipyard  
Kittery, Maine

Analyte	Cas Number	Human Health Action Levels <sup>(4)</sup>			Basis <sup>(5)</sup>
		2006	2011	2016	C/N
<b>Polycyclic Aromatic Hydrocarbons</b>					
2-METHYLNAPHTHALENE	91-57-6	590	590	600	N
ACENAPHTHENE	83-32-9	8800	8800	9300	N
ACENAPHTHYLENE	208-96-8	7200	7200	8800	N
ANTHRACENE	120-12-7	24000	24000	25900	N
BENZ[A]ANTHRACENE (1)	56-55-3	50	50	300	C
BENZO[A]PYRENE (1)	50-32-8	5	5	30	C
BENZO[B]FLUORANTHENE (1)	205-99-2	50	50	300	C
BENZO[G,H,I]PERYLENE (2)	191-24-2	160	42000	173	N
BENZO[K]FLUORANTHENE	207-08-9	500	500	20	C
CHRYSENE (1)	218-01-9	5000	5000	30300	C
DIBENZ[A,H]ANTHRACENE (1)	53-70-3	5	5	30	C
FLUORANTHENE	206-44-0	1800	1800	1400	N
FLUORENE	86-73-7	4300	4300	4700	N
INDENO[1,2,3-CD]PYRENE (1)	193-39-5	50	50	303	C
NAPHTHALENE	91-20-3	5300	5300	5500	N
PHENANTHRENE (2)	85-01-8	2400	2400	2600	N
PYRENE	129-00-0	1600	1600	1600	N
<b>Inorganics</b>					
ALUMINUM	7429-90-5	1300000	1300000	1300000	N
ANTIMONY	7440-36-0	366	366	370	N
ARSENIC	7440-38-2	49	49	135	C
BARIUM	7440-39-3	131000	131000	130000	N
BERYLLIUM	7440-41-7	226	226	240	N
CADMIUM	7440-43-9	270	270	350	N
CALCIUM	7440-70-2	NA	NA	NA	C
CHROMIUM, total (2)	7440-47-3	569	569	92	C
COBALT	7440-48-4	390	390	410	N
COPPER	7440-50-8	52000	52000	52200	N
IRON	7439-89-6	910000	910000	913000	N
LEAD (3)	7439-92-1	950	455	NA	C
MAGNESIUM	7439-95-4	NA	NA	NA	C
MANGANESE (2)	7439-96-5	11200	11200	180000	N
MERCURY (2)	7487-94-7	200	200	200	N
NICKEL	7440-02-0	20100	20100	20300	N
POTASSIUM	9/7/7440	NA	NA	NA	C
SELENIUM	7782-49-2	6500	6500	6500	N
SILVER	7440-22-4	3190	3190	3300	N
SODIUM	7440-23-5	NA	NA	NA	C
THALLIUM	7440-28-0	84	NA	NA	C

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 Kittery, Maine

Analyte	Cas Number	Human Health Action Levels <sup>(4)</sup>			Basis <sup>(5)</sup>
		2006	2011	2016	C/N
VANADIUM	7440-62-2	6500	6500	1800	N
ZINC	7440-66-6	402000	402000	403000	N

(1) - Compounds with permeability coefficients outside of the effective prediction domain. Action Levels based on ingestion only.

(2) - The following surrogate values were used:

Pyrene was used for benzo(g,h,i)perylene.

Pyrene was used for phenanthrene.

Hexavalent chromium was used for total chromium.

Manganese (non-diet) was used for manganese.

Mercuric chloride was used for mercury.

(3) - Lead screening values were calculated using the lead IEUBK model.

(4) - Human Health Action Levels reported in Tetra Tech (2012). Calculated 2016 Action Levels based on a target cancer risk of 1E-05 and a target hazard of 1.

(5) - Action Level based on carcinogen (C) or noncarcinogen (N).

Tetra Tech. 2012. Final Second Five-Year Review Report Portsmouth Naval Shipyard Kittery Maine. Revision 0. May.

Table C-3  
 Project Screening Level Changes Summary  
 Third Five-Year Review Report  
 Portsmouth Naval Shipyard  
 Kittery, Maine

Analyte	Cas Number	Human Health Screening Levels <sup>(3)</sup>			Basis <sup>(4)</sup>
		2006	2011	2016	C/N
Volatile Organic Compounds					
1,1,1-TRICHLOROETHANE	71-55-6	17000	120000	100000	N
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	1300000	1300000	1000000	N
1,1,2,2-TETRACHLOROETHANE	79-34-5	21	21	58	C
1,1,2-TRICHLOROETHANE	79-00-5	82	82	250	C
1,1-DICHLOROETHANE	75-34-3	17000	830	2300	C
1,1-DICHLOROETHENE	75-35-4	3400	3400	3500	N
1,2,3-TRICHLOROBENZENE	87-61-6	NA	14	10	N
1,2,4-TRICHLOROBENZENE	120-82-1	160	29	70	C
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	3	4.5	12	C
1,2-DIBROMOETHANE	106-93-4	2.9	2.9	8.0	C
1,2-DICHLOROETHANE	107-06-2	62	62	170	C
1,2-DICHLOROBENZENE	95-50-1	2400	2400	2400	N
1,2-DICHLOROPROPANE	78-87-5	65	120	340	C
1,3-DICHLOROBENZENE (1)	541-73-1	63	NA*	570	C
1,4-DICHLOROBENZENE	106-46-7	60	270	640	C
2-BUTANONE	78-93-3	77000	77000	80000	N
2-HEXANONE	591-78-6	NA	560	500	N
4-METHYL-2-PENTANONE	108-10-1	NA	9000	NA	C
ACETONE	67-64-1	120000	120000	100000	N
BENZENE	71-43-2	60	60	160	C
BROMOCHLOROMETHANE	74-97-5	NA	NA	NA	C
BROMODICHLOROMETHANE	75-27-4	82	82	240	C
BROMOFORM	75-25-2	700	700	1900	C
BROMOMETHANE	74-83-9	160	160	200	N
CARBON DISULFIDE	75-15-0	5600	5600	7200	N
CARBON TETRACHLORIDE	56-23-5	21	40	100	C
CHLOROBENZENE	108-90-7	780	780	800	N
CHLOROETHANE	75-00-3	1700	NA*	NA	C
CHLOROFORM	67-66-3	840	150	410	C
CHLOROMETHANE	74-87-3	NA	NA	NA	C
CIS-1,2-DICHLOROETHENE	156-59-2	700	140	100	N
CIS-1,3-DICHLOROPROPENE (1)	10061-01-5	44	44	120	C
CYCLOHEXANE	110-82-7	NA	NA	NA	C
DIBROMOCHLOROMETHANE	124-48-1	64	64	180	C
DICHLORODIFLUOROMETHANE	75-71-8	15000	15000	20000	N
ETHYLBENZENE	100-41-4	2700	130	330	C
ISOPROPYLBENZENE	98-82-8	1700	1700	1700	N
METHYL ACETATE	79-20-9	130000	130000	100000	N
METHYLCYCLOHEXANE (1)	108-87-2	NA	NA	NA	C

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Analyte	Cas Number	Human Health Screening Levels <sup>(3)</sup>			Basis <sup>(4)</sup>
		2006	2011	2016	C/N
METHYLENE CHLORIDE	75-09-2	790	790	600	N
METHYL TERT-BUTYL ETHER	1634-04-4	1600	3500	10100	C
STYRENE NA	100-42-5	6500	6500	6800	N
TETRACHLOROETHENE	127-18-4	3	3	200	N
TOLUENE	108-88-3	3000	3000	3100	N
TOTAL 1,2-DICHLOROETHENE (1)	540-59-0	NA	140	100	N
TRANS-1,2-DICHLOROETHENE	156-60-5	1600	1600	1400	N
TRANS-1,3-DICHLOROPROPENE (1)	10061-02-6	55	55	120	C
TRICHLOROETHENE (2)	79-01-6	9	14	31	C
TRICHLOROFLUOROMETHANE	75-69-4	18000	18000	20000	N
VINYL CHLORIDE (2)	75-01-4	4	4	0.1	C
O-XYLENES	95-47-6	NA	5700	5700	N
TOTAL XYLENES	1330-20-7	5600	5600	5500	N

(1) - The following surrogates were used:

1,4-dichlorobenzene was used for 1,3-dichlorobenzene.

1,3-dichloropropene was used for cis-1,3-dichloropropene.

Cyclohexane was used for methylcyclohexane.

cis-1,2-dichloroethylene was used for total 1,2-dichloroethene.

1,3-dichloropropene was used for trans-1,3-dichloropropene.

(2) - Mutagenic mode of action considered for trichloroethene and vinyl chloride.

(3) - Human Health Screening Levels reported in Tetra Tech (2012). Calculated 2016 Screening Levels based on a target cancer risk of 1E-06 and a target hazard of 0.1 to account for potential additive effects.

(4) - Screening Level based on carcinogen (C) or noncarcinogen (N).

Tetra Tech. 2012. Final Second Five-Year Review Report Portsmouth Naval Shipyard Kittery Maine. Revision 0. May.

BACKUP FOR SCREENING/ACTION LEVEL CALCULATIONS

Analyte	Cas Number	Surrogate	Mut?	RfDo	Glabs	RfDd	CSFo	CSFd	Noncancer									
									Child (3 to 6 years)			Adolescent			Adult			Min
									Ing	Derm	Total SL	Ing	Derm	Total SL	Ing	Derm	Total SL	SL
2-METHYLNAPHTHALENE	91-57-6		--	0.004	1	0.004	--	--	5.62E+03	6.94E+02	6.18E+02	1.26E+04	1.35E+03	1.22E+03	2.25E+04	2.10E+03	1.92E+03	6.18E+02
ACENAPHTHENE	83-32-9		--	0.06	1	0.06	--	--	8.42E+04	1.04E+04	9.26E+03	1.90E+05	2.02E+04	1.83E+04	3.37E+05	3.15E+04	2.88E+04	9.26E+03
ACENAPHTHYLENE	208-96-8	83-32-9	--	0.06	1	0.06	--	--	8.42E+04	9.86E+03	8.83E+03	1.90E+05	1.92E+04	1.74E+04	3.37E+05	2.99E+04	2.75E+04	8.83E+03
ANTHRACENE	120-12-7		--	0.3	1	0.3	--	--	4.21E+05	2.76E+04	2.59E+04	9.48E+05	5.36E+04	5.07E+04	1.68E+06	8.35E+04	7.96E+04	2.59E+04
BENZ[A]ANTHRACENE	56-55-3		M	--	1	--	0.73	0.73	--	--	--	--	--	--	--	--	--	--
BENZO[A]PYRENE	50-32-8		M	--	1	--	7.3	7.3	--	--	--	--	--	--	--	--	--	--
BENZO[B]FLUORANTHENE	205-99-2		M	--	1	--	0.73	0.73	--	--	--	--	--	--	--	--	--	--
BENZO[G,H,I]PERYLENE	191-24-2	129-00-0	--	0.03	1	0.03	--	--	4.21E+04	1.73E+02	1.73E+02	9.48E+04	3.37E+02	3.36E+02	1.68E+05	5.26E+02	5.24E+02	1.73E+02
BENZO[K]FLUORANTHENE	207-08-9		M	--	1	--	0.073	0.073	--	--	--	--	--	--	--	--	--	--
CHRYSENE	218-01-9		M	--	1	--	0.0073	0.0073	--	--	--	--	--	--	--	--	--	--
DIBENZ[A,H]ANTHRACENE	53-70-3		M	--	1	--	7.3	7.3	--	--	--	--	--	--	--	--	--	--
FLUORANTHENE	206-44-0		--	0.04	1	0.04	--	--	5.62E+04	1.45E+03	1.41E+03	1.26E+05	2.82E+03	2.76E+03	2.25E+05	4.40E+03	4.31E+03	1.41E+03
FLUORENE	86-73-7		--	0.04	1	0.04	--	--	5.62E+04	5.12E+03	4.69E+03	1.26E+05	9.95E+03	9.23E+03	2.25E+05	1.55E+04	1.45E+04	4.69E+03
INDENO[1,2,3-CD]PYRENE	193-39-5		M	--	1	--	0.73	0.73	--	--	--	--	--	--	--	--	--	--
NAPHTHALENE	91-20-3		--	0.02	1	0.02	--	--	2.81E+04	6.83E+03	5.49E+03	6.32E+04	1.33E+04	1.10E+04	1.12E+05	2.07E+04	1.75E+04	5.49E+03
PHENANTHRENE	85-01-8	129-00-0	--	0.03	1	0.03	--	--	4.21E+04	2.72E+03	2.55E+03	9.48E+04	5.29E+03	5.01E+03	1.68E+05	8.24E+03	7.86E+03	2.55E+03
PYRENE	129-00-0		--	0.03	1	0.03	--	--	4.21E+04	1.67E+03	1.60E+03	9.48E+04	3.24E+03	3.13E+03	1.68E+05	5.05E+03	4.91E+03	1.60E+03
ALUMINUM	7429-90-5		--	1	1	1	--	--	1.40E+06	1.84E+07	1.30E+06	3.16E+06	3.58E+07	2.90E+06	5.62E+06	5.59E+07	5.10E+06	1.30E+06
ANTIMONY	7440-36-0		--	0.0004	0.15	0.00006	--	--	5.62E+02	1.11E+03	3.73E+02	1.26E+03	2.15E+03	7.96E+02	2.25E+03	3.35E+03	1.35E+03	3.73E+02
ARSENIC, inorganic	7440-38-2		--	0.0003	1	0.0003	1.5	1.5	4.21E+02	5.53E+03	3.91E+02	9.48E+02	1.08E+04	8.71E+02	1.68E+03	1.68E+04	1.53E+03	3.91E+02
BARIUM	7440-39-3		--	0.2	0.07	0.014	--	--	2.81E+05	2.58E+05	1.35E+05	6.32E+05	5.02E+05	2.80E+05	1.12E+06	7.83E+05	4.61E+05	1.35E+05
BERYLLIUM and compounds	7440-41-7		--	0.002	0.007	0.000014	--	--	2.81E+03	2.58E+02	2.37E+02	6.32E+03	5.02E+02	4.65E+02	1.12E+04	7.83E+02	7.32E+02	2.37E+02
CADMIUM (diet)	7440-43-9		--	0.001	0.025	0.000025	--	--	1.40E+03	4.61E+02	3.47E+02	3.16E+03	8.96E+02	6.98E+02	5.62E+03	1.40E+03	1.12E+03	3.47E+02
CALCIUM	7440-70-2	EN	--				--	--	--	--	--	--	--	--	--	--	--	--
CHROMIUM, total	18540-29-9		--	0.003	0.025	0.000075	0.5	20	4.21E+03	1.38E+03	1.04E+03	9.48E+03	2.69E+03	2.09E+03	1.68E+04	4.19E+03	3.36E+03	1.04E+03
COBALT	7440-48-4		--	0.0003	1	0.0003	--	--	4.21E+02	1.38E+04	4.09E+02	9.48E+02	2.69E+04	9.15E+02	1.68E+03	4.19E+04	1.62E+03	4.09E+02
COPPER	7440-50-8		--	0.04	1	0.04	--	--	5.62E+04	7.38E+05	5.22E+04	1.26E+05	1.43E+06	1.16E+05	2.25E+05	2.24E+06	2.04E+05	5.22E+04
IRON	7439-89-6		--	0.7	1	0.7	--	--	9.83E+05	1.29E+07	9.13E+05	2.21E+06	2.51E+07	2.03E+06	3.93E+06	3.91E+07	3.57E+06	9.13E+05
LEAD and compounds	7439-92-1		--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--
MAGNESIUM	7439-95-4	EN	--				--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE (non-diet)	7439-96-5		--	0.14	1	0.14	--	--	1.97E+05	2.58E+06	1.83E+05	4.42E+05	5.02E+06	4.06E+05	7.86E+05	7.83E+06	7.14E+05	1.83E+05
MERCURY	7487-94-7		--	0.0003	0.07	0.000021	--	--	4.21E+02	3.87E+02	2.02E+02	9.48E+02	7.53E+02	4.20E+02	1.68E+03	1.17E+03	6.92E+02	2.02E+02
NICKEL	7440-02-0		--	0.02	0.04	0.0008	--	--	2.81E+04	7.38E+04	2.03E+04	6.32E+04	1.43E+05	4.39E+04	1.12E+05	2.24E+05	7.48E+04	2.03E+04
POTASSIUM	9/7/7440	EN	--				--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM	7782-49-2		--	0.005	1	0.005	--	--	7.02E+03	9.22E+04	6.52E+03	1.58E+04	1.79E+05	1.45E+04	2.81E+04	2.80E+05	2.55E+04	6.52E+03
SILVER	7440-22-4		--	0.005	0.04	0.0002	--	--	7.02E+03	6.15E+03	3.28E+03	1.58E+04	1.19E+04	6.80E+03	2.81E+04	1.86E+04	1.12E+04	3.28E+03
SODIUM	7440-23-5	EN	--				--	--	--	--	--	--	--	--	--	--	--	--
THALLIUM	7440-28-0		--	0.00001	1	0.00001	--	--	1.40E+01	1.84E+02	1.30E+01	3.16E+01	3.58E+02	2.90E+01	5.62E+01	5.59E+02	5.10E+01	1.30E+01
VANADIUM	7440-62-2		--	0.005	0.026	0.00013	--	--	7.02E+03	2.40E+03	1.79E+03	1.58E+04	4.66E+03	3.60E+03	2.81E+04	7.27E+03	5.77E+03	1.79E+03
ZINC	7440-66-6		--	0.3	1	0.3	--	--	4.21E+05	9.22E+06	4.03E+05	9.48E+05	1.79E+07	9.00E+05	1.68E+06	2.80E+07	1.59E+06	4.03E+05
1,1,1-TRICHLOROETHANE	71-55-6		--	2	1	2	--	--	2.81E+05	2.33E+05	1.27E+05	6.32E+05	4.53E+05	2.64E+05	1.12E+06	7.06E+05	4.34E+05	1.27E+05
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1		--	30	1	30	--	--	4.21E+06	2.03E+06	1.37E+06	9.48E+06	3.94E+06	2.78E+06	1.68E+07	6.15E+06	4.51E+06	1.37E+06
1,1,2,2-TETRACHLOROETHANE	79-34-5		--	0.02	1	0.02	0.2	0.2	2.81E+03	3.69E+03	1.59E+03	6.32E+03	7.17E+03	3.36E+03	1.12E+04	1.12E+04	5.60E+03	1.59E+03
1,1,2-TRICHLOROETHANE	79-00-5		--	0.004	1	0.004	0.057	0.057	5.62E+02	1.15E+03	3.77E+02	1.26E+03	2.23E+03	8.06E+02	2.25E+03	3.47E+03	1.36E+03	3.77E+02
1,1-DICHLOROETHANE	75-34-3		--	0.2	1	0.2	0.0057	0.0057	2.81E+04	4.68E+04	1.75E+04	6.32E+04	9.09E+04	3.73E+04	1.12E+05	1.42E+05	6.27E+04	1.75E+04
1,1-DICHLOROETHENE	75-35-4		--	0.05	1	0.05	--	--	7.02E+03	6.86E+03	3.47E+03	1.58E+04	1.33E+04	7.23E+03	2.81E+04	2.08E+04	1.19E+04	3.47E+03

Analyte	Cas Number	Surrogate	Mut?	RfDo	Glabs	RfDd	CSFo	CSFd	Noncancer									
									Child (3 to 6 years)			Adolescent			Adult			Min
									Ing	Derm	Total SL	Ing	Derm	Total SL	Ing	Derm	Total SL	SL
1,2,3-TRICHLOROBENZENE	87-61-6		--	0.0008	1	0.0008	--	--	1.12E+02	1.37E+01	1.22E+01	2.53E+02	2.66E+01	2.41E+01	4.49E+02	4.15E+01	3.80E+01	1.22E+01
1,2,4-TRICHLOROBENZENE	120-82-1		--	0.01	1	0.01	0.029	0.029	1.40E+03	1.79E+02	1.59E+02	3.16E+03	3.48E+02	3.13E+02	5.62E+03	5.42E+02	4.94E+02	1.59E+02
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8		M	0.0002	1	0.0002	0.8	0.8	2.81E+01	2.62E+01	1.36E+01	6.32E+01	5.09E+01	2.82E+01	1.12E+02	7.94E+01	4.65E+01	1.36E+01
1,2-DIBROMOETHANE	106-93-4		--	0.009	1	0.009	2	2	1.26E+03	3.76E+03	9.46E+02	2.84E+03	7.31E+03	2.05E+03	5.05E+03	1.14E+04	3.50E+03	9.46E+02
1,2-DICHLOROETHANE	107-06-2		--	0.006	1	0.006	0.091	0.091	8.42E+02	2.24E+03	6.12E+02	1.90E+03	4.36E+03	1.32E+03	3.37E+03	6.80E+03	2.25E+03	6.12E+02
1,2-DICHLOROBENZENE	95-50-1		--	0.09	1	0.09	--	--	1.26E+04	2.98E+03	2.41E+03	2.84E+04	5.79E+03	4.81E+03	5.05E+04	9.04E+03	7.67E+03	2.41E+03
1,2-DICHLOROPROPANE	78-87-5		--	0.09	1	0.09	0.036	0.036	1.26E+04	1.83E+04	7.48E+03	2.84E+04	3.56E+04	1.58E+04	5.05E+04	5.56E+04	2.65E+04	7.48E+03
1,3-DICHLOROBENZENE	541-73-1	106-46-7	--	0.07	1	0.07	0.0054	0.0054	9.83E+03	2.01E+03	1.67E+03	2.21E+04	3.91E+03	3.32E+03	3.93E+04	6.09E+03	5.27E+03	1.67E+03
1,4-DICHLOROBENZENE	106-46-7		--	0.07	1	0.07	0.0054	0.0054	9.83E+03	2.29E+03	1.85E+03	2.21E+04	4.44E+03	3.70E+03	3.93E+04	6.93E+03	5.89E+03	1.85E+03
2-BUTANONE	78-93-3		--	0.6	1	0.6	--	--	8.42E+04	1.02E+06	7.78E+04	1.90E+05	1.98E+06	1.73E+05	3.37E+05	3.08E+06	3.04E+05	7.78E+04
2-HEXANONE	591-78-6		--	0.005	1	0.005	--	--	7.02E+02	2.20E+03	5.32E+02	1.58E+03	4.28E+03	1.15E+03	2.81E+03	6.67E+03	1.98E+03	5.32E+02
4-METHYL-2-PENTANONE	108-10-1		--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETONE	67-64-1		--	0.9	1	0.9	--	--	1.26E+05	2.92E+06	1.21E+05	2.84E+05	5.68E+06	2.71E+05	5.05E+05	8.86E+06	4.78E+05	1.21E+05
BENZENE	71-43-2		--	0.004	1	0.004	0.055	0.055	5.62E+02	4.49E+02	2.49E+02	1.26E+03	8.72E+02	5.16E+02	2.25E+03	1.36E+03	8.47E+02	2.49E+02
BROMOCHLOROMETHANE	74-97-5		--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE	75-27-4		--	0.02	1	0.02	0.062	0.062	2.81E+03	6.45E+03	1.96E+03	6.32E+03	1.25E+04	4.20E+03	1.12E+04	1.95E+04	7.13E+03	1.96E+03
BROMOFORM	75-25-2		--	0.02	1	0.02	0.0079	0.0079	2.81E+03	6.87E+03	1.99E+03	6.32E+03	1.33E+04	4.29E+03	1.12E+04	2.08E+04	7.30E+03	1.99E+03
BROMOMETHANE	74-83-9		--	0.0014	1	0.0014	--	--	1.97E+02	7.77E+02	1.57E+02	4.42E+02	1.51E+03	3.42E+02	7.86E+02	2.36E+03	5.89E+02	1.57E+02
CARBON DISULFIDE	75-15-0		--	0.1	1	0.1	--	--	1.40E+04	1.46E+04	7.16E+03	3.16E+04	2.84E+04	1.49E+04	5.62E+04	4.42E+04	2.47E+04	7.16E+03
CARBON TETRACHLORIDE	56-23-5		--	0.004	1	0.004	0.07	0.07	5.62E+02	3.38E+02	2.11E+02	1.26E+03	6.57E+02	4.32E+02	2.25E+03	1.02E+03	7.04E+02	2.11E+02
CHLOROBENZENE	108-90-7		--	0.02	1	0.02	--	--	2.81E+03	1.14E+03	8.11E+02	6.32E+03	2.22E+03	1.64E+03	1.12E+04	3.46E+03	2.64E+03	8.11E+02
CHLOROETHANE	75-00-3		--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--
CHLOROFORM	67-66-3		--	0.01	1	0.01	0.031	0.031	1.40E+03	2.21E+03	8.58E+02	3.16E+03	4.29E+03	1.82E+03	5.62E+03	6.69E+03	3.05E+03	8.58E+02
CHLOROMETHANE	74-87-3		--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--
CIS-1,2-DICHLOROETHENE	156-59-2		--	0.002	1	0.002	--	--	2.81E+02	2.91E+02	1.43E+02	6.32E+02	5.66E+02	2.99E+02	1.12E+03	8.83E+02	4.94E+02	1.43E+02
CIS-1,3-DICHLOROPROPENE	10061-01-5	542-75-6	--	0.03	1	0.03	0.1	0.1	4.21E+03	5.56E+03	2.40E+03	9.48E+03	1.08E+04	5.05E+03	1.68E+04	1.68E+04	8.42E+03	2.40E+03
CYCLOHEXANE	110-82-7		--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--
DIBROMOCHLOROMETHANE	124-48-1		--	0.02	1	0.02	0.084	0.084	2.81E+03	7.22E+03	2.02E+03	6.32E+03	1.40E+04	4.36E+03	1.12E+04	2.19E+04	7.42E+03	2.02E+03
DICHLORODIFLUOROMETHANE	75-71-8		--	0.2	1	0.2	--	--	2.81E+04	3.37E+04	1.53E+04	6.32E+04	6.55E+04	3.22E+04	1.12E+05	1.02E+05	5.35E+04	1.53E+04
ETHYLBENZENE	100-41-4		--	0.1	1	0.1	0.011	0.011	1.40E+04	3.46E+03	2.77E+03	3.16E+04	6.72E+03	5.54E+03	5.62E+04	1.05E+04	8.83E+03	2.77E+03
ISOPROPYLBENZENE	98-82-8		--	0.1	1	0.1	--	--	1.40E+04	1.94E+03	1.70E+03	3.16E+04	3.77E+03	3.37E+03	5.62E+04	5.88E+03	5.32E+03	1.70E+03
METHYL ACETATE	79-20-9		--	1	1	1	--	--	1.40E+05	2.05E+06	1.31E+05	3.16E+05	3.99E+06	2.93E+05	5.62E+05	6.22E+06	5.15E+05	1.31E+05
METHYLCYCLOHEXANE	108-87-2	110-82-7	--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYLENE CHLORIDE	75-09-2		M	0.006	1	0.006	0.002	0.002	8.42E+02	2.73E+03	6.44E+02	1.90E+03	5.30E+03	1.40E+03	3.37E+03	8.26E+03	2.39E+03	6.44E+02
METHYL TERT-BUTYL ETHER	1634-04-4		--	--	1	--	0.0018	0.0018	--	--	--	--	--	--	--	--	--	--
STYRENE NA	100-42-5		--	0.2	1	0.2	--	--	2.81E+04	8.99E+03	6.81E+03	6.32E+04	1.75E+04	1.37E+04	1.12E+05	2.73E+04	2.19E+04	6.81E+03
TETRACHLOROETHENE	127-18-4		--	0.006	1	0.006	0.0021	0.0021	8.42E+02	2.41E+02	1.87E+02	1.90E+03	4.68E+02	3.75E+02	3.37E+03	7.30E+02	6.00E+02	1.87E+02
TOLUENE	108-88-3		--	0.08	1	0.08	--	--	1.12E+04	4.36E+03	3.14E+03	2.53E+04	8.47E+03	6.34E+03	4.49E+04	1.32E+04	1.02E+04	3.14E+03
TOTAL 1,2-DICHLOROETHENE	540-59-0	156-59-2	--	0.002	1	0.002	--	--	2.81E+02	2.91E+02	1.43E+02	6.32E+02	5.66E+02	2.99E+02	1.12E+03	8.83E+02	4.94E+02	1.43E+02
TRANS-1,2-DICHLOROETHENE	156-60-5		--	0.02	1	0.02	--	--	2.81E+03	2.91E+03	1.43E+03	6.32E+03	5.66E+03	2.99E+03	1.12E+04	8.83E+03	4.94E+03	1.43E+03
TRANS-1,3-DICHLOROPROPENE	10061-02-6	542-75-6	--	0.03	1	0.03	0.1	0.1	4.21E+03	5.56E+03	2.40E+03	9.48E+03	1.08E+04	5.05E+03	1.68E+04	1.68E+04	8.42E+03	2.40E+03
TRICHLOROETHENE	79-01-6		M	0.0005	1	0.0005	0.046	0.046	7.02E+01	6.35E+01	3.33E+01	1.58E+02	1.23E+02	6.93E+01	2.81E+02	1.92E+02	1.14E+02	3.33E+01
TRICHLOROFUOROMETHANE	75-69-4		--	0.3	1	0.3	--	--	4.21E+04	3.42E+04	1.89E+04	9.48E+04	6.65E+04	3.91E+04	1.68E+05	1.04E+05	6.42E+04	1.89E+04
VINYL CHLORIDE	75-01-4		M	0.003	1	0.003	0.72	0.72	4.21E+02	6.03E+02	2.48E+02	9.48E+02	1.17E+03	5.24E+02	1.68E+03	1.83E+03	8.76E+02	2.48E+02
O-XYLENES	95-47-6		--	0.2	1	0.2	--	--	2.81E+04	7.21E+03	5.73E+03	6.32E+04	1.40E+04	1.15E+04	1.12E+05	2.18E+04	1.83E+04	5.73E+03
TOTAL XYLENES	1330-20-7		--	0.2	1	0.2	--	--	2.81E+04	6.82E+03	5.49E+03	6.32E+04	1.33E+04	1.10E+04	1.12E+05	2.07E+04	1.75E+04	5.49E+03

Mutagens - note TCE and vinyl chloride have special MMOA equations.





Analyte	Cancer									
	Child (3 to 6 years)			Adolescent			Adult			Min
	Ing	Derm	Total SL	Ing	Derm	Total SL	Ing	Derm	Total SL	SL
1,2,3-TRICHLOROBENZENE	--	--	--	--	--	--	--	--	--	--
1,2,4-TRICHLOROBENZENE	1.13E+03	1.44E+02	1.28E+02	7.62E+02	8.39E+01	7.56E+01	7.97E+02	7.70E+01	7.02E+01	7.02E+01
1,2-DIBROMO-3-CHLOROPROPANE	4.09E+01	3.82E+01	1.98E+01	2.76E+01	2.23E+01	1.23E+01	2.89E+01	2.04E+01	1.20E+01	1.20E+01
1,2-DIBROMOETHANE	1.64E+01	4.88E+01	1.23E+01	1.11E+01	2.84E+01	7.96E+00	1.16E+01	2.61E+01	8.01E+00	7.96E+00
1,2-DICHLOROETHANE	3.60E+02	9.58E+02	2.62E+02	2.43E+02	5.59E+02	1.69E+02	2.54E+02	5.12E+02	1.70E+02	1.69E+02
1,2-DICHLOROBENZENE	--	--	--	--	--	--	--	--	--	--
1,2-DICHLOROPROPANE	9.10E+02	1.32E+03	5.39E+02	6.14E+02	7.70E+02	3.42E+02	6.42E+02	7.06E+02	3.36E+02	3.36E+02
1,3-DICHLOROBENZENE	6.07E+03	1.24E+03	1.03E+03	4.09E+03	7.23E+02	6.15E+02	4.28E+03	6.64E+02	5.74E+02	5.74E+02
1,4-DICHLOROBENZENE	6.07E+03	1.41E+03	1.14E+03	4.09E+03	8.22E+02	6.85E+02	4.28E+03	7.55E+02	6.42E+02	6.42E+02
2-BUTANONE	--	--	--	--	--	--	--	--	--	--
2-HEXANONE	--	--	--	--	--	--	--	--	--	--
4-METHYL-2-PENTANONE	--	--	--	--	--	--	--	--	--	--
ACETONE	--	--	--	--	--	--	--	--	--	--
BENZENE	5.96E+02	4.76E+02	2.65E+02	4.02E+02	2.78E+02	1.64E+02	4.20E+02	2.55E+02	1.59E+02	1.59E+02
BROMOCHLOROMETHANE	--	--	--	--	--	--	--	--	--	--
BROMODICHLOROMETHANE	5.28E+02	1.21E+03	3.68E+02	3.57E+02	7.07E+02	2.37E+02	3.73E+02	6.49E+02	2.37E+02	2.37E+02
BROMOFORM	4.15E+03	1.01E+04	2.94E+03	2.80E+03	5.91E+03	1.90E+03	2.93E+03	5.43E+03	1.90E+03	1.90E+03
BROMOMETHANE	--	--	--	--	--	--	--	--	--	--
CARBON DISULFIDE	--	--	--	--	--	--	--	--	--	--
CARBON TETRACHLORIDE	4.68E+02	2.82E+02	1.76E+02	3.16E+02	1.64E+02	1.08E+02	3.30E+02	1.51E+02	1.03E+02	1.03E+02
CHLOROBENZENE	--	--	--	--	--	--	--	--	--	--
CHLOROETHANE	--	--	--	--	--	--	--	--	--	--
CHLOROFORM	1.06E+03	1.66E+03	6.46E+02	7.13E+02	9.68E+02	4.11E+02	7.46E+02	8.88E+02	4.05E+02	4.05E+02
CHLOROMETHANE	--	--	--	--	--	--	--	--	--	--
CIS-1,2-DICHLOROETHENE	--	--	--	--	--	--	--	--	--	--
CIS-1,3-DICHLOROPROPENE	3.28E+02	4.32E+02	1.86E+02	2.21E+02	2.52E+02	1.18E+02	2.31E+02	2.31E+02	1.16E+02	1.16E+02
CYCLOHEXANE	--	--	--	--	--	--	--	--	--	--
DIBROMOCHLOROMETHANE	3.90E+02	1.00E+03	2.81E+02	2.63E+02	5.85E+02	1.82E+02	2.75E+02	5.37E+02	1.82E+02	1.82E+02
DICHLORODIFLUOROMETHANE	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE	2.98E+03	7.33E+02	5.88E+02	2.01E+03	4.27E+02	3.52E+02	2.10E+03	3.92E+02	3.31E+02	3.31E+02
ISOPROPYLBENZENE	--	--	--	--	--	--	--	--	--	--
METHYL ACETATE	--	--	--	--	--	--	--	--	--	--
METHYLCYCLOHEXANE	--	--	--	--	--	--	--	--	--	--
METHYLENE CHLORIDE	1.64E+04	5.30E+04	1.25E+04	1.11E+04	3.09E+04	8.14E+03	1.16E+04	2.84E+04	8.21E+03	8.14E+03
METHYL TERT-BUTYL ETHER	1.82E+04	9.79E+04	1.53E+04	1.23E+04	5.71E+04	1.01E+04	1.28E+04	5.24E+04	1.03E+04	1.01E+04
STYRENE NA	--	--	--	--	--	--	--	--	--	--
TETRACHLOROETHENE	1.56E+04	4.46E+03	3.47E+03	1.05E+04	2.60E+03	2.08E+03	1.10E+04	2.38E+03	1.96E+03	1.96E+03
TOLUENE	--	--	--	--	--	--	--	--	--	--
TOTAL 1,2-DICHLOROETHENE	--	--	--	--	--	--	--	--	--	--
TRANS-1,2-DICHLOROETHENE	--	--	--	--	--	--	--	--	--	--
TRANS-1,3-DICHLOROPROPENE	3.28E+02	4.32E+02	1.86E+02	2.21E+02	2.52E+02	1.18E+02	2.31E+02	2.31E+02	1.16E+02	1.16E+02
TRICHLOROETHENE	5.09E+01	4.57E+02	4.58E+01	3.44E+01	3.08E+02	3.09E+01	5.03E+02	3.45E+02	2.04E+02	3.09E+01
TRICHLOROFUOROMETHANE	--	--	--	--	--	--	--	--	--	--
VINYL CHLORIDE	1.38E-01	5.18E+01	1.38E-01	3.07E+01	3.80E+01	1.70E+01	3.21E+01	3.48E+01	1.67E+01	1.38E-01
O-XYLENES	--	--	--	--	--	--	--	--	--	--
TOTAL XYLENES	--	--	--	--	--	--	--	--	--	--

Mutagens - note TCE and vinyl chloride have spe

		Key: I=IRIS; P=PPRTV; A=ATSDR; C=CalEPA; X=APPENDIX PPRTV SCREEN (See FAQ#27); H=HEAST; F=See FAQ; J=New Jersey; O=EPA Office of Water; E=see user guide Section 2.3.5;												
		L=see user guide on lead; M=mutagen; S=see user guide Section 5; V=volatile; R=RBA Applied (See User Guide for Arsenic notice); c=cancer; n=noncancer; * =where nSL<100xcSL;												
		**=where nSL<10xcSL; SSL values are based on DAF=1; m=Concentration may exceed ceiling limit (See User Guide); s=Concentration may exceed Csat (See User Guide)												
Contaminant		Toxicity and Chemical-specific Information												
Analyte	CAS No.	SFO(mg/	key	IUR(ug/n	key	RfD <sub>c</sub> (mg/	key	RfC <sub>i</sub> (mg/n	key	vol	muta-gen	GIABS	ABS	C <sub>sat</sub> (mg/l
Acephate	30560-19-1	8.7E-03	I	--	--	4.0E-03	I	--	--	--	--	1	0.1	--
Acetaldehyde	75-07-0	--	--	2.2E-06	I	--	--	9.0E-03	I	V	--	1	--	1.1E+05
Acetochlor	34256-82-1	--	--	--	--	2.0E-02	I	--	--	--	--	1	0.1	--
Acetone	67-64-1	--	--	--	--	9.0E-01	I	3.1E+01	A	V	--	1	--	1.1E+05
Acetone Cyanohydrin	75-86-5	--	--	--	--	--	--	2.0E-03	X	--	--	1	0.1	--
Acetonitrile	75-05-8	--	--	--	--	--	--	6.0E-02	I	V	--	1	--	1.3E+05
Acetophenone	98-86-2	--	--	--	--	1.0E-01	I	--	--	V	--	1	--	2.5E+03
Acetylaminofluorene, 2-	53-96-3	3.8E+00	C	1.3E-03	C	--	--	--	--	--	--	1	0.1	--
Acrolein	107-02-8	--	--	--	--	5.0E-04	I	2.0E-05	I	V	--	1	--	2.3E+04
Acrylamide	79-06-1	5.0E-01	I	1.0E-04	I	2.0E-03	I	6.0E-03	I	--	M	1	0.1	--
Acrylic Acid	79-10-7	--	--	--	--	5.0E-01	I	1.0E-03	I	V	--	1	--	1.1E+05
Acrylonitrile	107-13-1	5.4E-01	I	6.8E-05	I	4.0E-02	A	2.0E-03	I	V	--	1	--	1.1E+04
Adiponitrile	111-69-3	--	--	--	--	--	--	6.0E-03	P	--	--	1	0.1	--
Alachlor	15972-60-8	5.6E-02	C	--	--	1.0E-02	I	--	--	--	--	1	0.1	--
Aldicarb	116-06-3	--	--	--	--	1.0E-03	I	--	--	--	--	1	0.1	--
Aldicarb Sulfone	1646-88-4	--	--	--	--	1.0E-03	I	--	--	--	--	1	0.1	--
Aldicarb sulfoxide	1646-87-3	--	--	--	--	--	--	--	--	--	--	1	0.1	--
Aldrin	309-00-2	1.7E+01	I	4.9E-03	I	3.0E-05	I	--	--	V	--	1	--	--
Allyl Alcohol	107-18-6	--	--	--	--	5.0E-03	I	1.0E-04	X	V	--	1	--	1.1E+05
Allyl Chloride	107-05-1	2.1E-02	C	6.0E-06	C	--	--	1.0E-03	I	V	--	1	--	1.4E+03
Aluminum	7429-90-5	--	--	--	--	1.0E+00	P	5.0E-03	P	--	--	1	--	--
Aluminum Phosphide	20859-73-8	--	--	--	--	4.0E-04	I	--	--	--	--	1	--	--
Ametryn	834-12-8	--	--	--	--	9.0E-03	I	--	--	--	--	1	0.1	--
Aminobiphenyl, 4-	92-67-1	2.1E+01	C	6.0E-03	C	--	--	--	--	--	--	1	0.1	--
Aminophenol, m-	591-27-5	--	--	--	--	8.0E-02	P	--	--	--	--	1	0.1	--
Aminophenol, p-	123-30-8	--	--	--	--	2.0E-02	P	--	--	--	--	1	0.1	--
Amitraz	33089-61-1	--	--	--	--	2.5E-03	I	--	--	--	--	1	0.1	--
Ammonia	7664-41-7	--	--	--	--	--	--	1.0E-01	I	V	--	1	--	--
Ammonium Sulfamate	7773-06-0	--	--	--	--	2.0E-01	I	--	--	--	--	1	--	--
Amyl Alcohol, tert-	75-85-4	--	--	--	--	--	--	3.0E-03	X	V	--	1	--	1.4E+04
Aniline	62-53-3	5.7E-03	I	1.6E-06	C	7.0E-03	P	1.0E-03	I	--	--	1	0.1	--
Anthraquinone, 9,10-	84-65-1	4.0E-02	P	--	--	2.0E-03	X	--	--	--	--	1	0.1	--
Antimony	7440-36-0	--	--	--	--	4.0E-04	I	--	--	--	--	0.15	--	--
Antimony Pentoxide	1314-60-9	--	--	--	--	5.0E-04	H	--	--	--	--	0.15	--	--
Antimony Tetroxide	1332-81-6	--	--	--	--	4.0E-04	H	--	--	--	--	0.15	--	--
Antimony Trioxide	1309-64-4	--	--	--	--	--	--	2.0E-04	I	--	--	0.15	--	--
Arsenic, Inorganic	7440-38-2	1.5E+00	I	4.3E-03	I	3.0E-04	I	1.5E-05	C	--	--	1	0.03	--
Arsine	7784-42-1	--	--	--	--	3.5E-06	C	5.0E-05	I	--	--	1	--	--
Asulam	3337-71-1	--	--	--	--	5.0E-02	I	--	--	--	--	1	0.1	--
Atrazine	1912-24-9	2.3E-01	C	--	--	3.5E-02	I	--	--	--	--	1	0.1	--
Auramine	492-80-8	8.8E-01	C	2.5E-04	C	--	--	--	--	--	--	1	0.1	--
Avermectin B1	65195-55-3	--	--	--	--	4.0E-04	I	--	--	--	--	1	0.1	--
Azinphos-methyl	86-50-0	--	--	--	--	3.0E-03	A	1.0E-02	A	--	--	1	0.1	--
Azobenzene	103-33-3	1.1E-01	I	3.1E-05	I	--	--	--	--	V	--	1	--	--
Azodicarbonamide	123-77-3	--	--	--	--	1.0E+00	P	7.0E-06	P	--	--	1	0.1	--
Barium	7440-39-3	--	--	--	--	2.0E-01	I	5.0E-04	H	--	--	0.07	--	--
Barium Chromate	10294-40-3	5.0E-01	C	1.5E-01	C	2.0E-02	C	2.0E-04	C	--	M	0.025	--	--
Benfluralin	1861-40-1	--	--	--	--	3.0E-01	I	--	--	V	--	1	--	--
Benomyl	17804-35-2	--	--	--	--	5.0E-02	I	--	--	--	--	1	0.1	--
Bensulfuron-methyl	83055-99-6	--	--	--	--	2.0E-01	I	--	--	--	--	1	0.1	--
Bentazon	25057-89-0	--	--	--	--	3.0E-02	I	--	--	--	--	1	0.1	--
Benzaldehyde	100-52-7	4.0E-03	P	--	--	1.0E-01	I	--	--	V	--	1	--	1.2E+03
Benzene	71-43-2	5.5E-02	I	7.8E-06	I	4.0E-03	I	3.0E-02	I	V	--	1	--	1.8E+03

		Key:I=IRIS;P=PPRTV;A=ATSDR;C=CalEPA;X=APPENDIXPPRTV/SCREEN(SeeFAQ#27);H=HEAST;F=SeeFAQ;J=NewJersey;O=EPAOfficeofWater;E=seeuserguideSection2.3.5;												
		L=seeuserguideonlead;M=mutagen;S=seeuserguideSection5;V=volatile;R=RBAApplied(SeeUserGuideforArsenicnotice);c=cancer;n=noncancer;*=where:nSL<100XcSL;												
		**=where:nSL<10XcSL;SSLvaluesarebasedonDAF=1;m=Concentrationmayexceedceilinglimit(SeeUserGuide);s=ConcentrationmayexceedCsat(SeeUserGuide)												
Contaminant		ToxicityandChemical-specificInformation												
Analyte	CAS No.	SFO(mg/	key	IUR(ug/n	key	RfD <sub>c</sub> (mg/	key	RfC <sub>c</sub> (mg/n	key	vol	muta-gen	GIABS	ABS	C <sub>sat</sub> (mg/l
Benzenediamine-2-methyl sulfate, 1, 6369-59-1		1.0E-01	X	--	--	3.0E-04	X	--	--	--	--	1	0.1	--
Benzenethiol	108-98-5	--	--	--	--	1.0E-03	P	--	--	V	--	1	--	1.3E+03
Benzidine	92-87-5	2.3E+02	I	6.7E-02	I	3.0E-03	I	--	--	--	M	1	0.1	--
Benzoic Acid	65-85-0	--	--	--	--	4.0E+00	I	--	--	--	--	1	0.1	--
Benzotrichloride	98-07-7	1.3E+01	I	--	--	--	--	--	--	V	--	1	--	3.2E+02
Benzyl Alcohol	100-51-6	--	--	--	--	1.0E-01	P	--	--	--	--	1	0.1	--
Benzyl Chloride	100-44-7	1.7E-01	I	4.9E-05	C	2.0E-03	P	1.0E-03	P	V	--	1	--	1.5E+03
Beryllium and compounds	7440-41-7	--	--	2.4E-03	I	2.0E-03	I	2.0E-05	I	--	--	0.007	--	--
Bifenox	42576-02-3	--	--	--	--	9.0E-03	P	--	--	--	--	1	0.1	--
Biphenrin	82657-04-3	--	--	--	--	1.5E-02	I	--	--	--	--	1	0.1	--
Biphenyl, 1,1'-	92-52-4	8.0E-03	I	--	--	5.0E-01	I	4.0E-04	X	V	--	1	--	--
Bis(2-chloro-1-methylethyl) ether	108-60-1	--	--	--	--	4.0E-02	I	--	--	V	--	1	--	1.0E+03
Bis(2-chloroethoxy)methane	111-91-1	--	--	--	--	3.0E-03	P	--	--	--	--	1	0.1	--
Bis(2-chloroethyl)ether	111-44-4	1.1E+00	I	3.3E-04	I	--	--	--	--	V	--	1	--	5.1E+03
Bis(chloromethyl)ether	542-88-1	2.2E+02	I	6.2E-02	I	--	--	--	--	V	--	1	--	4.2E+03
Bisphenol A	80-05-7	--	--	--	--	5.0E-02	I	--	--	--	--	1	0.1	--
Boron And Borates Only	7440-42-8	--	--	--	--	2.0E-01	I	2.0E-02	H	--	--	1	--	--
Boron Trichloride	10294-34-5	--	--	--	--	2.0E+00	P	2.0E-02	P	V	--	1	--	--
Boron Trifluoride	7637-07-2	--	--	--	--	4.0E-02	C	1.3E-02	C	V	--	1	--	--
Bromate	15541-45-4	7.0E-01	I	--	--	4.0E-03	I	--	--	--	--	1	--	--
Bromo-2-chloroethane, 1-	107-04-0	2.0E+00	X	6.0E-04	X	--	--	--	--	V	--	1	--	2.4E+03
Bromobenzene	108-86-1	--	--	--	--	8.0E-03	I	6.0E-02	I	V	--	1	--	6.8E+02
Bromochloromethane	74-97-5	--	--	--	--	--	--	4.0E-02	X	V	--	1	--	4.0E+03
Bromodichloromethane	75-27-4	6.2E-02	I	3.7E-05	C	2.0E-02	I	--	--	V	--	1	--	9.3E+02
Bromoform	75-25-2	7.9E-03	I	1.1E-06	I	2.0E-02	I	--	--	V	--	1	--	9.2E+02
Bromomethane	74-83-9	--	--	--	--	1.4E-03	I	5.0E-03	I	V	--	1	--	3.6E+03
Bromophos	2104-96-3	--	--	--	--	5.0E-03	H	--	--	V	--	1	--	--
Bromoxynil	1689-84-5	--	--	--	--	2.0E-02	I	--	--	--	--	1	0.1	--
Bromoxynil Octanoate	1689-99-2	--	--	--	--	2.0E-02	I	--	--	V	--	1	--	--
Butadiene, 1,3-	106-99-0	3.4E+00	C	3.0E-05	I	--	--	2.0E-03	I	V	--	1	--	6.7E+02
Butanol, N-	71-36-3	--	--	--	--	1.0E-01	I	--	--	V	--	1	--	7.6E+03
Butyl alcohol, sec-	78-92-2	--	--	--	--	2.0E+00	P	3.0E+01	P	V	--	1	--	2.1E+04
Butylate	2008-41-5	--	--	--	--	5.0E-02	I	--	--	V	--	1	--	--
Butylated hydroxyanisole	25013-16-5	2.0E-04	C	5.7E-08	C	--	--	--	--	--	--	1	0.1	--
Butylated hydroxytoluene	128-37-0	3.6E-03	P	--	--	3.0E-01	P	--	--	--	--	1	0.1	--
Butylbenzene, n-	104-51-8	--	--	--	--	5.0E-02	P	--	--	V	--	1	--	1.1E+02
Butylbenzene, sec-	135-98-8	--	--	--	--	1.0E-01	X	--	--	V	--	1	--	1.5E+02
Butylbenzene, tert-	98-06-6	--	--	--	--	1.0E-01	X	--	--	V	--	1	--	1.8E+02
Cacodylic Acid	75-60-5	--	--	--	--	2.0E-02	A	--	--	--	--	1	0.1	--
Cadmium (Diet)	7440-43-9	--	--	1.8E-03	I	1.0E-03	I	1.0E-05	A	--	--	0.025	0.001	--
Cadmium (Water)	7440-43-9	--	--	1.8E-03	I	5.0E-04	I	1.0E-05	A	--	--	0.05	0.001	--
Calcium Chromate	13765-19-0	5.0E-01	C	1.5E-01	C	2.0E-02	C	2.0E-04	C	--	M	0.025	--	--
Caprolactam	105-60-2	--	--	--	--	5.0E-01	I	2.2E-03	C	--	--	1	0.1	--
Captafol	2425-06-1	1.5E-01	C	4.3E-05	C	2.0E-03	I	--	--	--	--	1	0.1	--
Captan	133-06-2	2.3E-03	C	6.6E-07	C	1.3E-01	I	--	--	--	--	1	0.1	--
Carbaryl	63-25-2	--	--	--	--	1.0E-01	I	--	--	--	--	1	0.1	--
Carbofuran	1563-66-2	--	--	--	--	5.0E-03	I	--	--	--	--	1	0.1	--
Carbon Disulfide	75-15-0	--	--	--	--	1.0E-01	I	7.0E-01	I	V	--	1	--	7.4E+02
Carbon Tetrachloride	56-23-5	7.0E-02	I	6.0E-06	I	4.0E-03	I	1.0E-01	I	V	--	1	--	4.6E+02
Carbonyl Sulfide	463-58-1	--	--	--	--	--	--	1.0E-01	P	V	--	1	--	5.9E+03
Carbosulfan	55285-14-8	--	--	--	--	1.0E-02	I	--	--	--	--	1	0.1	--
Carboxin	5234-68-4	--	--	--	--	1.0E-01	I	--	--	--	--	1	0.1	--
Ceric oxide	1306-38-3	--	--	--	--	--	--	9.0E-04	I	--	--	1	--	--

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		L=seeuserguideonlead; M=mutagen; S=seeuserguideSection5; V=volatile; R=RBAApplied(SeeUserGuideforArsenicnotice); c=cancer; n=noncancer; * =where:nSL<100XcSL;												
		**=where:nSL<10XcSL; SSLvaluesarebasedonDAF=1; m=Concentrationmayexceedceilinglimit(SeeUserGuide); s=ConcentrationmayexceedCsat(SeeUserGuide)												
Contaminant		ToxicityandChemical-specificInformation												
Analyte	CAS No.	SFO(mg/	key	IUR(ug/n	key	RfD <sub>o</sub> (mg/	key	RfC <sub>i</sub> (mg/n	key	vol	muta-gen	GIABS	ABS	C <sub>sat</sub> (mg/l
Chloral Hydrate	302-17-0	--	--	--	--	1.0E-01	I	--	--	V	--	1	--	--
Chloramben	133-90-4	--	--	--	--	1.5E-02	I	--	--	--	--	1	0.1	--
Chloranil	118-75-2	4.0E-01	H	--	--	--	--	--	--	--	--	1	0.1	--
Chlordane	12789-03-6	3.5E-01	I	1.0E-04	I	5.0E-04	I	7.0E-04	I	V	--	1	0.04	--
Chlordecone (Kepone)	143-50-0	1.0E+01	I	4.6E-03	C	3.0E-04	I	--	--	--	--	1	0.1	--
Chlorfenvinphos	470-90-6	--	--	--	--	7.0E-04	A	--	--	--	--	1	0.1	--
Chlorimuron, Ethyl-	90982-32-4	--	--	--	--	2.0E-02	I	--	--	--	--	1	0.1	--
Chlorine	7782-50-5	--	--	--	--	1.0E-01	I	1.5E-04	A	V	--	1	--	2.8E+03
Chlorine Dioxide	10049-04-4	--	--	--	--	3.0E-02	I	2.0E-04	I	V	--	1	--	--
Chlorite (Sodium Salt)	7758-19-2	--	--	--	--	3.0E-02	I	--	--	--	--	1	--	--
Chloro-1,1-difluoroethane, 1-	75-68-3	--	--	--	--	--	--	5.0E+01	I	V	--	1	--	1.2E+03
Chloro-1,3-butadiene, 2-	126-99-8	--	--	3.0E-04	I	2.0E-02	H	2.0E-02	I	V	--	1	--	7.9E+02
Chloro-2-methylaniline HCl, 4-	3165-93-3	4.6E-01	H	--	--	--	--	--	--	--	--	1	0.1	--
Chloro-2-methylaniline, 4-	95-69-2	1.0E-01	P	7.7E-05	C	3.0E-03	X	--	--	--	--	1	0.1	--
Chloroacetaldehyde, 2-	107-20-0	2.7E-01	X	--	--	--	--	--	--	V	--	1	--	1.2E+04
Chloroacetic Acid	79-11-8	--	--	--	--	--	--	--	--	--	--	1	0.1	--
Chloroacetophenone, 2-	532-27-4	--	--	--	--	--	--	3.0E-05	I	--	--	1	0.1	--
Chloroaniline, p-	106-47-8	2.0E-01	P	--	--	4.0E-03	I	--	--	--	--	1	0.1	--
Chlorobenzene	108-90-7	--	--	--	--	2.0E-02	I	5.0E-02	P	V	--	1	--	7.6E+02
Chlorobenzilate	510-15-6	1.1E-01	C	3.1E-05	C	2.0E-02	I	--	--	--	--	1	0.1	--
Chlorobenzoic Acid, p-	74-11-3	--	--	--	--	3.0E-02	X	--	--	--	--	1	0.1	--
Chlorobenzotrifluoride, 4-	98-56-6	--	--	--	--	3.0E-03	P	3.0E-01	P	V	--	1	--	2.9E+02
Chlorobutane, 1-	109-69-3	--	--	--	--	4.0E-02	P	--	--	V	--	1	--	7.3E+02
Chlorodifluoromethane	75-45-6	--	--	--	--	--	--	5.0E+01	I	V	--	1	--	1.7E+03
Chloroethanol, 2-	107-07-3	--	--	--	--	2.0E-02	P	--	--	V	--	1	--	1.1E+05
Chloroform	67-66-3	3.1E-02	C	2.3E-05	I	1.0E-02	I	9.8E-02	A	V	--	1	--	2.5E+03
Chloromethane	74-87-3	--	--	--	--	--	--	9.0E-02	I	V	--	1	--	1.3E+03
Chloromethyl Methyl Ether	107-30-2	2.4E+00	C	6.9E-04	C	--	--	--	--	V	--	1	--	9.3E+03
Chloronitrobenzene, o-	88-73-3	3.0E-01	P	--	--	3.0E-03	P	1.0E-05	X	--	--	1	0.1	--
Chloronitrobenzene, p-	100-00-5	6.0E-02	P	--	--	7.0E-04	P	2.0E-03	P	--	--	1	0.1	--
Chlorophenol, 2-	95-57-8	--	--	--	--	5.0E-03	I	--	--	V	--	1	--	2.7E+04
Chloropicrin	76-06-2	--	--	--	--	--	--	4.0E-04	C	V	--	1	--	6.2E+02
Chlorothalonil	1897-45-6	3.1E-03	C	8.9E-07	C	1.5E-02	I	--	--	--	--	1	0.1	--
Chlorotoluene, o-	95-49-8	--	--	--	--	2.0E-02	I	--	--	V	--	1	--	9.1E+02
Chlorotoluene, p-	106-43-4	--	--	--	--	2.0E-02	X	--	--	V	--	1	--	2.5E+02
Chlorozotocin	54749-90-5	2.4E+02	C	6.9E-02	C	--	--	--	--	--	--	1	0.1	--
Chlorpropham	101-21-3	--	--	--	--	2.0E-01	I	--	--	--	--	1	0.1	--
Chlorpyrifos	2921-88-2	--	--	--	--	1.0E-03	A	--	--	--	--	1	0.1	--
Chlorpyrifos Methyl	5598-13-0	--	--	--	--	1.0E-02	H	--	--	--	--	1	0.1	--
Chlorsulfuron	64902-72-3	--	--	--	--	5.0E-02	I	--	--	--	--	1	0.1	--
Chlorthal-dimethyl	1861-32-1	--	--	--	--	1.0E-02	I	--	--	--	--	1	0.1	--
Chlorthiophos	60238-56-4	--	--	--	--	8.0E-04	H	--	--	--	--	1	0.1	--
Chromium(III), Insoluble Salts	16065-83-1	--	--	--	--	1.5E+00	I	--	--	--	--	0.013	--	--
Chromium(VI)	18540-29-9	5.0E-01	J	8.4E-02	S	3.0E-03	I	1.0E-04	I	--	M	0.025	--	--
Chromium, Total	7440-47-3	--	--	--	--	--	--	--	--	--	--	0.013	--	--
Clofentazine	74115-24-5	--	--	--	--	1.3E-02	I	--	--	--	--	1	0.1	--
Cobalt	7440-48-4	--	--	9.0E-03	P	3.0E-04	P	6.0E-06	P	--	--	1	--	--
Coke Oven Emissions	8007-45-2	--	--	6.2E-04	I	--	--	--	--	V	M	1	--	--
Copper	7440-50-8	--	--	--	--	4.0E-02	H	--	--	--	--	1	--	--
Cresol, m-	108-39-4	--	--	--	--	5.0E-02	I	6.0E-01	C	--	--	1	0.1	--
Cresol, o-	95-48-7	--	--	--	--	5.0E-02	I	6.0E-01	C	--	--	1	0.1	--
Cresol, p-	106-44-5	--	--	--	--	1.0E-01	A	6.0E-01	C	--	--	1	0.1	--
Cresol, p-chloro-m-	59-50-7	--	--	--	--	1.0E-01	A	--	--	--	--	1	0.1	--

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		L=seeuserguideSection5;M=mutagen;S=seeuserguideSection5;V=volatile;R=RBAApplied(SeeUserGuideforArsenicnotice);c=cancer;n=noncancer;*=where:nSL<100XcSL;												
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Contaminant		ToxicityandChemical-specificInformation												
Analyte	CAS No.	SFO(mg/	key	IUR(ug/n	key	RfD <sub>c</sub> (mg/	key	RfC <sub>i</sub> (mg/n	key	vol	muta-gen	GIABS	ABS	C <sub>sat</sub> (mg/l
Cresols	1319-77-3	--	--	--	--	1.0E-01	A	6.0E-01	C	--	--	1	0.1	--
Crotonaldehyde, trans-	123-73-9	1.9E+00	H	--	--	1.0E-03	P	--	--	V	--	1	--	1.7E+04
Cumene	98-82-8	--	--	--	--	1.0E-01	I	4.0E-01	I	V	--	1	--	2.7E+02
Cupferron	135-20-6	2.2E-01	C	6.3E-05	C	--	--	--	--	--	--	1	0.1	--
Cyanazine	21725-46-2	8.4E-01	H	--	--	2.0E-03	H	--	--	--	--	1	0.1	--
Cyanides		--	--	--	--	--	--	--	--	--	--	--	--	--
-Calcium Cyanide	592-01-8	--	--	--	--	1.0E-03	I	--	--	--	--	1	--	--
-Copper Cyanide	544-92-3	--	--	--	--	5.0E-03	I	--	--	--	--	1	--	--
-Cyanide (CN-)	57-12-5	--	--	--	--	6.0E-04	I	8.0E-04	S	V	--	1	--	9.5E+05
-Cyanogen	460-19-5	--	--	--	--	1.0E-03	I	--	--	V	--	1	--	--
-Cyanogen Bromide	506-68-3	--	--	--	--	9.0E-02	I	--	--	V	--	1	--	--
-Cyanogen Chloride	506-77-4	--	--	--	--	5.0E-02	I	--	--	V	--	1	--	--
-Hydrogen Cyanide	74-90-8	--	--	--	--	6.0E-04	I	8.0E-04	I	V	--	1	--	1.0E+07
-Potassium Cyanide	151-50-8	--	--	--	--	2.0E-03	I	--	--	--	--	1	--	--
-Potassium Silver Cyanide	506-61-6	--	--	--	--	5.0E-03	I	--	--	--	--	0.04	--	--
-Silver Cyanide	506-64-9	--	--	--	--	1.0E-01	I	--	--	--	--	0.04	--	--
-Sodium Cyanide	143-33-9	--	--	--	--	1.0E-03	I	--	--	--	--	1	--	--
-Thiocyanates	NA	--	--	--	--	2.0E-04	P	--	--	--	--	1	--	--
-Thiocyanic Acid	463-56-9	--	--	--	--	2.0E-04	X	--	--	V	--	1	--	--
-Zinc Cyanide	557-21-1	--	--	--	--	5.0E-02	I	--	--	--	--	1	--	--
Cyclohexane	110-82-7	--	--	--	--	--	--	6.0E+00	I	V	--	1	--	1.2E+02
Cyclohexane, 1,2,3,4,5-pentabromo-	87-84-3	2.3E-02	H	--	--	--	--	--	--	--	--	1	0.1	--
Cyclohexanone	108-94-1	--	--	--	--	5.0E+00	I	7.0E-01	P	V	--	1	--	5.1E+03
Cyclohexene	110-83-8	--	--	--	--	5.0E-03	P	1.0E+00	X	V	--	1	--	2.8E+02
Cyclohexylamine	108-91-8	--	--	--	--	2.0E-01	I	--	--	V	--	1	--	2.9E+05
Cyfluthrin	68359-37-5	--	--	--	--	2.5E-02	I	--	--	--	--	1	0.1	--
Cyhalothrin	68085-85-8	--	--	--	--	5.0E-03	I	--	--	--	--	1	0.1	--
Cypermethrin	52315-07-8	--	--	--	--	1.0E-02	I	--	--	--	--	1	0.1	--
Cyromazine	66215-27-8	--	--	--	--	7.5E-03	I	--	--	--	--	1	0.1	--
DDD	72-54-8	2.4E-01	I	6.9E-05	C	--	--	--	--	--	--	1	0.1	--
DDE, p,p'-	72-55-9	3.4E-01	I	9.7E-05	C	--	--	--	--	V	--	1	--	--
DDT	50-29-3	3.4E-01	I	9.7E-05	I	5.0E-04	I	--	--	--	--	1	0.03	--
Dalapon	75-99-0	--	--	--	--	3.0E-02	I	--	--	--	--	1	0.1	--
Daminozide	1596-84-5	1.8E-02	C	5.1E-06	C	1.5E-01	I	--	--	--	--	1	0.1	--
Decabromodiphenyl ether, 2,2',3,3',4	1163-19-5	7.0E-04	I	--	--	7.0E-03	I	--	--	--	--	1	0.1	--
Demeton	8065-48-3	--	--	--	--	4.0E-05	I	--	--	--	--	1	0.1	--
Di(2-ethylhexyl)adipate	103-23-1	1.2E-03	I	--	--	6.0E-01	I	--	--	--	--	1	0.1	--
Diallate	2303-16-4	6.1E-02	H	--	--	--	--	--	--	--	--	1	0.1	--
Diazinon	333-41-5	--	--	--	--	7.0E-04	A	--	--	--	--	1	0.1	--
Dibenzothiophene	132-65-0	--	--	--	--	1.0E-02	X	--	--	V	--	1	--	--
Dibromo-3-chloropropane, 1,2-	96-12-8	8.0E-01	P	6.0E-03	P	2.0E-04	P	2.0E-04	I	V	M	1	--	9.8E+02
Dibromobenzene, 1,3-	108-36-1	--	--	--	--	4.0E-04	X	--	--	V	--	1	--	1.6E+02
Dibromobenzene, 1,4-	106-37-6	--	--	--	--	1.0E-02	I	--	--	V	--	1	--	--
Dibromochloromethane	124-48-1	8.4E-02	I	--	--	2.0E-02	I	--	--	V	--	1	--	8.0E+02
Dibromoethane, 1,2-	106-93-4	2.0E+00	I	6.0E-04	I	9.0E-03	I	9.0E-03	I	V	--	1	--	1.3E+03
Dibromomethane (Methylene Bromic	74-95-3	--	--	--	--	--	--	4.0E-03	X	V	--	1	--	2.8E+03
Dibutyltin Compounds	NA	--	--	--	--	3.0E-04	P	--	--	--	--	1	0.1	--
Dicamba	1918-00-9	--	--	--	--	3.0E-02	I	--	--	--	--	1	0.1	--
Dichloro-2-butene, 1,4-	764-41-0	--	--	4.2E-03	P	--	--	--	--	V	--	1	--	5.5E+02
Dichloro-2-butene, cis-1,4-	1476-11-5	--	--	4.2E-03	P	--	--	--	--	V	--	1	--	5.2E+02
Dichloro-2-butene, trans-1,4-	110-57-6	--	--	4.2E-03	P	--	--	--	--	V	--	1	--	7.6E+02
Dichloroacetic Acid	79-43-6	5.0E-02	I	--	--	4.0E-03	I	--	--	--	--	1	0.1	--
Dichlorobenzene, 1,2-	95-50-1	--	--	--	--	9.0E-02	I	2.0E-01	H	V	--	1	--	3.8E+02

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Contaminant		ToxicityandChemical-specificInformation													
Analyte	CAS No.	SFO(mg/	key	IUR(ug/n	key	RfD <sub>c</sub> (mg/	key	RfC <sub>i</sub> (mg/n	key	vol	muta-gen	GIABS	ABS	C <sub>sat</sub> (mg/l	
Dichlorobenzene, 1,4-	106-46-7	5.4E-03	C	1.1E-05	C	7.0E-02	A	8.0E-01	I	V	--	1	--	--	
Dichlorobenzidine, 3,3'-	91-94-1	4.5E-01	I	3.4E-04	C	--	--	--	--	--	--	1	0.1	--	
Dichlorobenzophenone, 4,4'-	90-98-2	--	--	--	--	9.0E-03	X	--	--	--	--	1	0.1	--	
Dichlorodifluoromethane	75-71-8	--	--	--	--	2.0E-01	I	1.0E-01	X	V	--	1	--	8.5E+02	
Dichloroethane, 1,1-	75-34-3	5.7E-03	C	1.6E-06	C	2.0E-01	P	--	--	V	--	1	--	1.7E+03	
Dichloroethane, 1,2-	107-06-2	9.1E-02	I	2.6E-05	I	6.0E-03	X	7.0E-03	P	V	--	1	--	3.0E+03	
Dichloroethylene, 1,1-	75-35-4	--	--	--	--	5.0E-02	I	2.0E-01	I	V	--	1	--	1.2E+03	
Dichloroethylene, 1,2-cis-	156-59-2	--	--	--	--	2.0E-03	I	--	--	V	--	1	--	2.4E+03	
Dichloroethylene, 1,2-trans-	156-60-5	--	--	--	--	2.0E-02	I	--	--	V	--	1	--	1.9E+03	
Dichlorophenol, 2,4-	120-83-2	--	--	--	--	3.0E-03	I	--	--	--	--	1	0.1	--	
Dichlorophenoxy Acetic Acid, 2,4-	94-75-7	--	--	--	--	1.0E-02	I	--	--	--	--	1	0.05	--	
Dichlorophenoxybutyric Acid, 4-(2,4	94-82-6	--	--	--	--	8.0E-03	I	--	--	--	--	1	0.1	--	
Dichloropropane, 1,2-	78-87-5	3.6E-02	C	1.0E-05	C	9.0E-02	A	4.0E-03	I	V	--	1	--	1.4E+03	
Dichloropropane, 1,3-	142-28-9	--	--	--	--	2.0E-02	P	--	--	V	--	1	--	1.5E+03	
Dichloropropanol, 2,3-	616-23-9	--	--	--	--	3.0E-03	I	--	--	--	--	1	0.1	--	
Dichloropropene, 1,3-	542-75-6	1.0E-01	I	4.0E-06	I	3.0E-02	I	2.0E-02	I	V	--	1	--	1.6E+03	
Dichlorvos	62-73-7	2.9E-01	I	8.3E-05	C	5.0E-04	I	5.0E-04	I	--	--	1	0.1	--	
Dicrotophos	141-66-2	--	--	--	--	1.0E-04	I	--	--	--	--	1	0.1	--	
Dicyclopentadiene	77-73-6	--	--	--	--	8.0E-02	P	3.0E-04	X	V	--	1	--	2.6E+02	
Dieldrin	60-57-1	1.6E+01	I	4.6E-03	I	5.0E-05	I	--	--	--	--	1	0.1	--	
Diesel Engine Exhaust	NA	--	--	3.0E-04	C	--	--	5.0E-03	I	--	--	1	0.1	--	
Diethanolamine	111-42-2	--	--	--	--	2.0E-03	P	2.0E-04	P	--	--	1	0.1	--	
Diethylene Glycol Monobutyl Ether	112-34-5	--	--	--	--	3.0E-02	P	1.0E-04	P	--	--	1	0.1	--	
Diethylene Glycol Monoethyl Ether	111-90-0	--	--	--	--	6.0E-02	P	3.0E-04	P	--	--	1	0.1	--	
Diethylformamide	617-84-5	--	--	--	--	1.0E-03	P	--	--	V	--	1	--	1.1E+05	
Diethylstilbestrol	56-53-1	3.5E+02	C	1.0E-01	C	--	--	--	--	--	--	1	0.1	--	
Difenzoquat	43222-48-6	--	--	--	--	8.0E-02	I	--	--	--	--	1	0.1	--	
Diflubenzuron	35367-38-5	--	--	--	--	2.0E-02	I	--	--	--	--	1	0.1	--	
Difluoroethane, 1,1-	75-37-6	--	--	--	--	--	--	4.0E+01	I	V	--	1	--	1.4E+03	
Dihydrosafrole	94-58-6	4.4E-02	C	1.3E-05	C	--	--	--	--	V	--	1	--	--	
Diisopropyl Ether	108-20-3	--	--	--	--	--	--	7.0E-01	P	V	--	1	--	2.3E+03	
Diisopropyl Methylphosphonate	1445-75-6	--	--	--	--	8.0E-02	I	--	--	V	--	1	--	5.3E+02	
Dimethipin	55290-64-7	--	--	--	--	2.0E-02	I	--	--	--	--	1	0.1	--	
Dimethoate	60-51-5	--	--	--	--	2.0E-04	I	--	--	--	--	1	0.1	--	
Dimethoxybenzidine, 3,3'-	119-90-4	1.6E+00	P	--	--	--	--	--	--	--	--	1	0.1	--	
Dimethyl methylphosphonate	756-79-6	1.7E-03	P	--	--	6.0E-02	P	--	--	--	--	1	0.1	--	
Dimethylamino azobenzene [p-]	60-11-7	4.6E+00	C	1.3E-03	C	--	--	--	--	--	--	1	0.1	--	
Dimethylaniline HCl, 2,4-	21436-96-4	5.8E-01	H	--	--	--	--	--	--	--	--	1	0.1	--	
Dimethylaniline, 2,4-	95-68-1	2.0E-01	P	--	--	2.0E-03	X	--	--	--	--	1	0.1	--	
Dimethylaniline, N,N-	121-69-7	--	--	--	--	2.0E-03	I	--	--	V	--	1	--	8.3E+02	
Dimethylbenzidine, 3,3'-	119-93-7	1.1E+01	P	--	--	--	--	--	--	--	--	1	0.1	--	
Dimethylformamide	68-12-2	--	--	--	--	1.0E-01	P	3.0E-02	I	V	--	1	--	1.1E+05	
Dimethylhydrazine, 1,1-	57-14-7	--	--	--	--	1.0E-04	X	2.0E-06	X	V	--	1	--	1.7E+05	
Dimethylhydrazine, 1,2-	540-73-8	5.5E+02	C	1.6E-01	C	--	--	--	--	V	--	1	--	1.9E+05	
Dimethylphenol, 2,4-	105-67-9	--	--	--	--	2.0E-02	I	--	--	--	--	1	0.1	--	
Dimethylphenol, 2,6-	576-26-1	--	--	--	--	6.0E-04	I	--	--	--	--	1	0.1	--	
Dimethylphenol, 3,4-	95-65-8	--	--	--	--	1.0E-03	I	--	--	--	--	1	0.1	--	
Dimethylvinylchloride	513-37-1	4.5E-02	C	1.3E-05	C	--	--	--	--	V	--	1	--	4.7E+02	
Dinitro-o-cresol, 4,6-	534-52-1	--	--	--	--	8.0E-05	X	--	--	--	--	1	0.1	--	
Dinitro-o-cyclohexyl Phenol, 4,6-	131-89-5	--	--	--	--	2.0E-03	I	--	--	--	--	1	0.1	--	
Dinitrobenzene, 1,2-	528-29-0	--	--	--	--	1.0E-04	P	--	--	--	--	1	0.1	--	
Dinitrobenzene, 1,3-	99-65-0	--	--	--	--	1.0E-04	I	--	--	--	--	1	0.1	--	
Dinitrobenzene, 1,4-	100-25-4	--	--	--	--	1.0E-04	P	--	--	--	--	1	0.1	--	

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		L=seeuserguideonlead; M=mutagen; S=seeuserguideSection5; V=volatile; R=RBAApplied(SeeUserGuideforArsenicnotice); c=cancer; n=noncancer; * =where:nSL<100XcSL;												
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Contaminant		ToxicityandChemical-specificInformation												
Analyte	CAS No.	SFO(mg/	key	IUR(ug/n	key	RfD <sub>c</sub> (mg/	key	RfC <sub>c</sub> (mg/n	key	vol	muta-gen	GIABS	ABS	C <sub>sat</sub> (mg/l
Dinitrophenol, 2,4-	51-28-5	--	--	--	--	2.0E-03	I	--	--	--	--	1	0.1	--
Dinitrotoluene Mixture, 2,4/2,6-	NA	6.8E-01	I	--	--	--	--	--	--	--	--	1	0.1	--
Dinitrotoluene, 2,4-	121-14-2	3.1E-01	C	8.9E-05	C	2.0E-03	I	--	--	--	--	1	0.102	--
Dinitrotoluene, 2,6-	606-20-2	1.5E+00	P	--	--	3.0E-04	X	--	--	--	--	1	0.099	--
Dinitrotoluene, 2-Amino-4,6-	35572-78-2	--	--	--	--	2.0E-03	S	--	--	--	--	1	0.006	--
Dinitrotoluene, 4-Amino-2,6-	19406-51-0	--	--	--	--	2.0E-03	S	--	--	--	--	1	0.009	--
Dinitrotoluene, Technical grade	25321-14-6	4.5E-01	X	--	--	9.0E-04	X	--	--	--	--	1	0.1	--
Dinoseb	88-85-7	--	--	--	--	1.0E-03	I	--	--	--	--	1	0.1	--
Dioxane, 1,4-	123-91-1	1.0E-01	I	5.0E-06	I	3.0E-02	I	3.0E-02	I	V	--	1	--	1.2E+05
Dioxins		--	--	--	--	--	--	--	--	--	--	--	--	--
-Hexachlorodibenzo-p-dioxin, Mixtur NA		6.2E+03	I	1.3E+00	I	--	--	--	--	--	--	1	0.03	--
-TCDD, 2,3,7,8-	1746-01-6	1.3E+05	C	3.8E+01	C	7.0E-10	I	4.0E-08	C	V	--	1	0.03	--
Diphenamid	957-51-7	--	--	--	--	3.0E-02	I	--	--	--	--	1	0.1	--
Diphenyl Sulfone	127-63-9	--	--	--	--	8.0E-04	X	--	--	--	--	1	0.1	--
Diphenylamine	122-39-4	--	--	--	--	2.5E-02	I	--	--	--	--	1	0.1	--
Diphenylhydrazine, 1,2-	122-66-7	8.0E-01	I	2.2E-04	I	--	--	--	--	--	--	1	0.1	--
Diquat	85-00-7	--	--	--	--	2.2E-03	I	--	--	--	--	1	0.1	--
Direct Black 38	1937-37-7	7.1E+00	C	1.4E-01	C	--	--	--	--	--	--	1	0.1	--
Direct Blue 6	2602-46-2	7.4E+00	C	1.4E-01	C	--	--	--	--	--	--	1	0.1	--
Direct Brown 95	16071-86-6	6.7E+00	C	1.4E-01	C	--	--	--	--	--	--	1	0.1	--
Disulfoton	298-04-4	--	--	--	--	4.0E-05	I	--	--	--	--	1	0.1	--
Dithiane, 1,4-	505-29-3	--	--	--	--	1.0E-02	I	--	--	V	--	1	--	--
Diuron	330-54-1	--	--	--	--	2.0E-03	I	--	--	--	--	1	0.1	--
Dodine	2439-10-3	--	--	--	--	4.0E-03	I	--	--	--	--	1	0.1	--
EPTC	759-94-4	--	--	--	--	2.5E-02	I	--	--	V	--	1	--	--
Endosulfan	115-29-7	--	--	--	--	6.0E-03	I	--	--	V	--	1	--	--
Endothall	145-73-3	--	--	--	--	2.0E-02	I	--	--	--	--	1	0.1	--
Endrin	72-20-8	--	--	--	--	3.0E-04	I	--	--	--	--	1	0.1	--
Epichlorohydrin	106-89-8	9.9E-03	I	1.2E-06	I	6.0E-03	P	1.0E-03	I	V	--	1	--	1.1E+04
Epoxybutane, 1,2-	106-88-7	--	--	--	--	--	--	2.0E-02	I	V	--	1	--	1.5E+04
Ethanol, 2-(2-methoxyethoxy)-	111-77-3	--	--	--	--	4.0E-02	P	--	--	--	--	1	0.1	--
Ethephon	16672-87-0	--	--	--	--	5.0E-03	I	--	--	--	--	1	0.1	--
Ethion	563-12-2	--	--	--	--	5.0E-04	I	--	--	--	--	1	0.1	--
Ethoxyethanol Acetate, 2-	111-15-9	--	--	--	--	1.0E-01	P	6.0E-02	P	V	--	1	--	2.4E+04
Ethoxyethanol, 2-	110-80-5	--	--	--	--	9.0E-02	P	2.0E-01	I	V	--	1	--	1.1E+05
Ethyl Acetate	141-78-6	--	--	--	--	9.0E-01	I	7.0E-02	P	V	--	1	--	1.1E+04
Ethyl Acrylate	140-88-5	--	--	--	--	5.0E-03	P	8.0E-03	P	V	--	1	--	2.5E+03
Ethyl Chloride (Chloroethane)	75-00-3	--	--	--	--	--	--	1.0E+01	I	V	--	1	--	2.1E+03
Ethyl Ether	60-29-7	--	--	--	--	2.0E-01	I	--	--	V	--	1	--	1.0E+04
Ethyl Methacrylate	97-63-2	--	--	--	--	--	--	3.0E-01	P	V	--	1	--	1.1E+03
Ethyl-p-nitrophenyl Phosphonate	2104-64-5	--	--	--	--	1.0E-05	I	--	--	--	--	1	0.1	--
Ethylbenzene	100-41-4	1.1E-02	C	2.5E-06	C	1.0E-01	I	1.0E+00	I	V	--	1	--	4.8E+02
Ethylene Cyanohydrin	109-78-4	--	--	--	--	7.0E-02	P	--	--	--	--	1	0.1	--
Ethylene Diamine	107-15-3	--	--	--	--	9.0E-02	P	--	--	V	--	1	--	1.9E+05
Ethylene Glycol	107-21-1	--	--	--	--	2.0E+00	I	4.0E-01	C	--	--	1	0.1	--
Ethylene Glycol Monobutyl Ether	111-76-2	--	--	--	--	1.0E-01	I	1.6E+00	I	--	--	1	0.1	--
Ethylene Oxide	75-21-8	3.1E-01	C	8.8E-05	C	--	--	3.0E-02	C	V	--	1	--	1.2E+05
Ethylene Thiourea	96-45-7	4.5E-02	C	1.3E-05	C	8.0E-05	I	--	--	--	--	1	0.1	--
Ethyleneimine	151-56-4	6.5E+01	C	1.9E-02	C	--	--	--	--	V	--	1	--	1.5E+05
Ethylphthalyl Ethyl Glycolate	84-72-0	--	--	--	--	3.0E+00	I	--	--	--	--	1	0.1	--
Fenamiphos	22224-92-6	--	--	--	--	2.5E-04	I	--	--	--	--	1	0.1	--
Fenpropathrin	39515-41-8	--	--	--	--	2.5E-02	I	--	--	--	--	1	0.1	--
Fenvalerate	51630-58-1	--	--	--	--	2.5E-02	I	--	--	--	--	1	0.1	--

Contaminant		Toxicity and Chemical-specific Information												
Analyte	CAS No.	SFO(mg/	key	IUR(ug/n	key	RfD <sub>o</sub> (mg/	key	RfC <sub>i</sub> (mg/n	key	vol	muta-gen	GIABS	ABS	C <sub>sat</sub> (mg/l
Fluometuron	2164-17-2	--	--	--	--	1.3E-02	I	--	--	--	--	1	0.1	--
Fluoride	16984-48-8	--	--	--	--	4.0E-02	C	1.3E-02	C	--	--	1	--	--
Fluorine (Soluble Fluoride)	7782-41-4	--	--	--	--	6.0E-02	I	1.3E-02	C	--	--	1	--	--
Fluridone	59756-60-4	--	--	--	--	8.0E-02	I	--	--	--	--	1	0.1	--
Flurprimidol	56425-91-3	--	--	--	--	2.0E-02	I	--	--	--	--	1	0.1	--
Flusilazole	85509-19-9	--	--	--	--	7.0E-04	I	--	--	--	--	1	0.1	--
Flutolanil	66332-96-5	--	--	--	--	6.0E-02	I	--	--	--	--	1	0.1	--
Fluvalinate	69409-94-5	--	--	--	--	1.0E-02	I	--	--	--	--	1	0.1	--
Folpet	133-07-3	3.5E-03	I	--	--	1.0E-01	I	--	--	--	--	1	0.1	--
Fomesafen	72178-02-0	1.9E-01	I	--	--	--	--	--	--	--	--	1	0.1	--
Fonofos	944-22-9	--	--	--	--	2.0E-03	I	--	--	--	--	1	0.1	--
Formaldehyde	50-00-0	--	--	1.3E-05	I	2.0E-01	I	9.8E-03	A	V	--	1	--	4.2E+04
Formic Acid	64-18-6	--	--	--	--	9.0E-01	P	3.0E-04	X	V	--	1	--	1.1E+05
Fosetyl-AL	39148-24-8	--	--	--	--	3.0E+00	I	--	--	--	--	1	0.1	--
Furans		--	--	--	--	--	--	--	--	--	--	--	--	--
-Dibenzofuran	132-64-9	--	--	--	--	1.0E-03	X	--	--	V	--	1	0.03	--
-Furan	110-00-9	--	--	--	--	1.0E-03	I	--	--	V	--	1	0.03	6.2E+03
-Tetrahydrofuran	109-99-9	--	--	--	--	9.0E-01	I	2.0E+00	I	V	--	1	0.03	1.7E+05
Furazolidone	67-45-8	3.8E+00	H	--	--	--	--	--	--	--	--	1	0.1	--
Furfural	98-01-1	--	--	--	--	3.0E-03	I	5.0E-02	H	V	--	1	--	1.0E+04
Furium	531-82-8	1.5E+00	C	4.3E-04	C	--	--	--	--	--	--	1	0.1	--
Furmecyclo	60568-05-0	3.0E-02	I	8.6E-06	C	--	--	--	--	--	--	1	0.1	--
Glufosinate, Ammonium	77182-82-2	--	--	--	--	4.0E-04	I	--	--	--	--	1	0.1	--
Glutaraldehyde	111-30-8	--	--	--	--	--	--	8.0E-05	C	--	--	1	0.1	--
Glycidyl	765-34-4	--	--	--	--	4.0E-04	I	1.0E-03	H	V	--	1	--	1.1E+05
Glyphosate	1071-83-6	--	--	--	--	1.0E-01	I	--	--	--	--	1	0.1	--
Guanidine	113-00-8	--	--	--	--	1.0E-02	X	--	--	V	--	1	--	--
Guanidine Chloride	50-01-1	--	--	--	--	2.0E-02	P	--	--	--	--	1	0.1	--
Haloxypop, Methyl	69806-40-2	--	--	--	--	5.0E-05	I	--	--	--	--	1	0.1	--
Heptachlor	76-44-8	4.5E+00	I	1.3E-03	I	5.0E-04	I	--	--	V	--	1	--	--
Heptachlor Epoxide	1024-57-3	9.1E+00	I	2.6E-03	I	1.3E-05	I	--	--	V	--	1	--	--
Hexabromobenzene	87-82-1	--	--	--	--	2.0E-03	I	--	--	V	--	1	--	--
Hexabromodiphenyl ether, 2,2',4,4',5,6	68631-49-2	--	--	--	--	2.0E-04	I	--	--	--	--	1	0.1	--
Hexachlorobenzene	118-74-1	1.6E+00	I	4.6E-04	I	8.0E-04	I	--	--	V	--	1	--	--
Hexachlorobutadiene	87-68-3	7.8E-02	I	2.2E-05	I	1.0E-03	P	--	--	V	--	1	--	1.7E+01
Hexachlorocyclohexane, Alpha-	319-84-6	6.3E+00	I	1.8E-03	I	8.0E-03	A	--	--	--	--	1	0.1	--
Hexachlorocyclohexane, Beta-	319-85-7	1.8E+00	I	5.3E-04	I	--	--	--	--	--	--	1	0.1	--
Hexachlorocyclohexane, Gamma- (L)	58-89-9	1.1E+00	C	3.1E-04	C	3.0E-04	I	--	--	--	--	1	0.04	--
Hexachlorocyclohexane, Technical	608-73-1	1.8E+00	I	5.1E-04	I	--	--	--	--	--	--	1	0.1	--
Hexachlorocyclopentadiene	77-47-4	--	--	--	--	6.0E-03	I	2.0E-04	I	V	--	1	--	1.6E+01
Hexachloroethane	67-72-1	4.0E-02	I	1.1E-05	C	7.0E-04	I	3.0E-02	I	V	--	1	--	--
Hexachlorophene	70-30-4	--	--	--	--	3.0E-04	I	--	--	--	--	1	0.1	--
Hexahydro-1,3,5-trinitro-1,3,5-triazin	121-82-4	1.1E-01	I	--	--	3.0E-03	I	--	--	--	--	1	0.015	--
Hexamethylene Diisocyanate, 1,6-	822-06-0	--	--	--	--	--	--	1.0E-05	I	V	--	1	--	3.4E+03
Hexamethylphosphoramide	680-31-9	--	--	--	--	4.0E-04	P	--	--	--	--	1	0.1	--
Hexane, N-	110-54-3	--	--	--	--	--	--	7.0E-01	I	V	--	1	--	1.4E+02
Hexanedioic Acid	124-04-9	--	--	--	--	2.0E+00	P	--	--	--	--	1	0.1	--
Hexanone, 2-	591-78-6	--	--	--	--	5.0E-03	I	3.0E-02	I	V	--	1	--	3.3E+03
Hexazinone	51235-04-2	--	--	--	--	3.3E-02	I	--	--	--	--	1	0.1	--
Hexythiazox	78587-05-0	--	--	--	--	2.5E-02	I	--	--	--	--	1	0.1	--
Hydramethylnon	67485-29-4	--	--	--	--	3.0E-04	I	--	--	--	--	1	0.1	--
Hydrazine	302-01-2	3.0E+00	I	4.9E-03	I	--	--	3.0E-05	P	V	--	1	--	--
Hydrazine Sulfate	10034-93-2	3.0E+00	I	4.9E-03	I	--	--	--	--	--	--	1	--	--



		Key: I=IRIS; P=PPRTV; A=ATSDR; C=CalEPA; X=APPENDIXPPRTV/SCREEN(SeeFAQ#27); H=HEAST; F=SeeFAQ; J=NewJersey; O=EPAOfficeofWater; E=seeuserguideSection2.3.5;												
		L=seeuserguideonlead; M=mutagen; S=seeuserguideSection5; V=volatile; R=RBAapplied(SeeUserGuideforArsenicnotice); c=cancer; n=noncancer; * =where:nSL<100XcSL;												
		**=where:nSL<10XcSL; SSLvaluesarebasedonDAF=1; m=Concentrationmayexceedceilinglimit(SeeUserGuide); s=ConcentrationmayexceedCsat(SeeUserGuide)												
Contaminant		ToxicityandChemical-specificInformation												
Analyte	CAS No.	SFO(mg/	key	IUR(ug/n	key	RfD <sub>c</sub> (mg/	key	RfC <sub>c</sub> (mg/n	key	vol	muta-gen	GIABS	ABS	C <sub>sat</sub> (mg/l
Hydrogen Chloride	7647-01-0	--	--	--	--	--	--	2.0E-02	I	V	--	1	--	--
Hydrogen Fluoride	7664-39-3	--	--	--	--	4.0E-02	C	1.4E-02	C	V	--	1	--	--
Hydrogen Sulfide	7783-06-4	--	--	--	--	--	--	2.0E-03	I	V	--	1	--	--
Hydroquinone	123-31-9	6.0E-02	P	--	--	4.0E-02	P	--	--	--	--	1	0.1	--
Imazail	35554-44-0	--	--	--	--	1.3E-02	I	--	--	--	--	1	0.1	--
Imazaquin	81335-37-7	--	--	--	--	2.5E-01	I	--	--	--	--	1	0.1	--
Imazethapyr	81335-77-5	--	--	--	--	2.5E-01	I	--	--	--	--	1	0.1	--
Iodine	7553-56-2	--	--	--	--	1.0E-02	A	--	--	--	--	1	--	--
Iprodione	36734-19-7	--	--	--	--	4.0E-02	I	--	--	--	--	1	0.1	--
Iron	7439-89-6	--	--	--	--	7.0E-01	P	--	--	--	--	1	--	--
Isobutyl Alcohol	78-83-1	--	--	--	--	3.0E-01	I	--	--	V	--	1	--	1.0E+04
Isophorone	78-59-1	9.5E-04	I	--	--	2.0E-01	I	2.0E+00	C	--	--	1	0.1	--
Isopropalin	33820-53-0	--	--	--	--	1.5E-02	I	--	--	V	--	1	--	--
Isopropanol	67-63-0	--	--	--	--	2.0E+00	P	2.0E-01	P	V	--	1	--	1.1E+05
Isopropyl Methyl Phosphonic Acid	1832-54-8	--	--	--	--	1.0E-01	I	--	--	--	--	1	0.1	--
Isoxaben	82558-50-7	--	--	--	--	5.0E-02	I	--	--	--	--	1	0.1	--
JP-7	NA	--	--	--	--	--	--	3.0E-01	A	V	--	1	--	--
Lactofen	77501-63-4	--	--	--	--	2.0E-03	I	--	--	--	--	1	0.1	--
Lead Compounds		--	--	--	--	--	--	--	--	--	--	--	--	--
-Lead Chromate	7758-97-6	5.0E-01	C	1.5E-01	C	2.0E-02	C	2.0E-04	C	--	M	0.025	--	--
-Lead Phosphate	7446-27-7	8.5E-03	C	1.2E-05	C	--	--	--	--	--	--	1	--	--
-Lead acetate	301-04-2	8.5E-03	C	1.2E-05	C	--	--	--	--	--	--	1	0.1	--
Lead and Compounds	7439-92-1	--	--	--	--	--	--	--	--	--	--	1	--	--
-Lead subacetate	1335-32-6	8.5E-03	C	1.2E-05	C	--	--	--	--	--	--	1	0.1	--
-Tetraethyl Lead	78-00-2	--	--	--	--	1.0E-07	I	--	--	V	--	1	--	2.4E+00
Lewisite	541-25-3	--	--	--	--	5.0E-06	P	--	--	V	--	1	--	3.8E+02
Linuron	330-55-2	--	--	--	--	2.0E-03	I	--	--	--	--	1	0.1	--
Lithium	7439-93-2	--	--	--	--	2.0E-03	P	--	--	--	--	1	--	--
MCPA	94-74-6	--	--	--	--	5.0E-04	I	--	--	--	--	1	0.1	--
MCPB	94-81-5	--	--	--	--	1.0E-02	I	--	--	--	--	1	0.1	--
MCPP	93-65-2	--	--	--	--	1.0E-03	I	--	--	--	--	1	0.1	--
Malathion	121-75-5	--	--	--	--	2.0E-02	I	--	--	--	--	1	0.1	--
Maleic Anhydride	108-31-6	--	--	--	--	1.0E-01	I	7.0E-04	C	--	--	1	0.1	--
Maleic Hydrazide	123-33-1	--	--	--	--	5.0E-01	I	--	--	--	--	1	0.1	--
Malononitrile	109-77-3	--	--	--	--	1.0E-04	P	--	--	--	--	1	0.1	--
Mancozeb	8018-01-7	--	--	--	--	3.0E-02	H	--	--	--	--	1	0.1	--
Maneb	12427-38-2	--	--	--	--	5.0E-03	I	--	--	--	--	1	0.1	--
Manganese (Diet)	7439-96-5	--	--	--	--	1.4E-01	I	5.0E-05	I	--	--	1	--	--
Manganese (Non-diet)	7439-96-5	--	--	--	--	2.4E-02	S	5.0E-05	I	--	--	0.04	--	--
Mephosfolan	950-10-7	--	--	--	--	9.0E-05	H	--	--	--	--	1	0.1	--
Mepiquat Chloride	24307-26-4	--	--	--	--	3.0E-02	I	--	--	--	--	1	0.1	--
Mercury Compounds		--	--	--	--	--	--	--	--	--	--	--	--	--
-Mercuric Chloride (and other Mercl	7487-94-7	--	--	--	--	3.0E-04	I	3.0E-04	S	--	--	0.07	--	--
-Mercury (elemental)	7439-97-6	--	--	--	--	--	--	3.0E-04	I	V	--	1	--	3.1E+00
-Methyl Mercury	22967-92-6	--	--	--	--	1.0E-04	I	--	--	--	--	1	--	--
-Phenylmercuric Acetate	62-38-4	--	--	--	--	8.0E-05	I	--	--	--	--	1	0.1	--
Merphos	150-50-5	--	--	--	--	3.0E-05	I	--	--	V	--	1	--	--
Merphos Oxide	78-48-8	--	--	--	--	3.0E-05	I	--	--	--	--	1	0.1	--
Metalaxyl	57837-19-1	--	--	--	--	6.0E-02	I	--	--	--	--	1	0.1	--
Methacrylonitrile	126-98-7	--	--	--	--	1.0E-04	I	3.0E-02	P	V	--	1	--	4.6E+03
Methamidophos	10265-92-6	--	--	--	--	5.0E-05	I	--	--	--	--	1	0.1	--
Methanol	67-56-1	--	--	--	--	2.0E+00	I	2.0E+01	I	V	--	1	--	1.1E+05
Methodathion	950-37-8	--	--	--	--	1.0E-03	I	--	--	--	--	1	0.1	--

Contaminant		Toxicity and Chemical-specific Information												
Analyte	CAS No.	SFO(mg/)	key	IUR(ug/n)	key	RfD <sub>o</sub> (mg/)	key	RfC <sub>i</sub> (mg/n <sup>3</sup> )	key	vol	muta-gen	GIABS	ABS	C <sub>sat</sub> (mg/l)
Methomyl	16752-77-5	--	--	--	--	2.5E-02	I	--	--	--	--	1	0.1	--
Methoxy-5-nitroaniline, 2-	99-59-2	4.9E-02	C	1.4E-05	C	--	--	--	--	--	--	1	0.1	--
Methoxychlor	72-43-5	--	--	--	--	5.0E-03	I	--	--	--	--	1	0.1	--
Methoxyethanol Acetate, 2-	110-49-6	--	--	--	--	8.0E-03	P	1.0E-03	P	V	--	1	--	1.2E+05
Methoxyethanol, 2-	109-86-4	--	--	--	--	5.0E-03	P	2.0E-02	I	V	--	1	--	1.1E+05
Methyl Acetate	79-20-9	--	--	--	--	1.0E+00	X	--	--	V	--	1	--	2.9E+04
Methyl Acrylate	96-33-3	--	--	--	--	--	--	2.0E-02	P	V	--	1	--	6.8E+03
Methyl Ethyl Ketone (2-Butanone)	78-93-3	--	--	--	--	6.0E-01	I	5.0E+00	I	V	--	1	--	2.8E+04
Methyl Hydrazine	60-34-4	--	--	1.0E-03	X	1.0E-03	P	2.0E-05	X	V	--	1	--	1.8E+05
Methyl Isobutyl Ketone (4-methyl-2-pentanone)	108-10-1	--	--	--	--	--	--	3.0E+00	I	V	--	1	--	3.4E+03
Methyl Isocyanate	624-83-9	--	--	--	--	--	--	1.0E-03	C	V	--	1	--	1.0E+04
Methyl Methacrylate	80-62-6	--	--	--	--	1.4E+00	I	7.0E-01	I	V	--	1	--	2.4E+03
Methyl Parathion	298-00-0	--	--	--	--	2.5E-04	I	--	--	--	--	1	0.1	--
Methyl Phosphonic Acid	993-13-5	--	--	--	--	6.0E-02	X	--	--	--	--	1	0.1	--
Methyl Styrene (Mixed Isomers)	25013-15-4	--	--	--	--	6.0E-03	H	4.0E-02	H	V	--	1	--	3.9E+02
Methyl methanesulfonate	66-27-3	9.9E-02	C	2.8E-05	C	--	--	--	--	--	--	1	0.1	--
Methyl tert-Butyl Ether (MTBE)	1634-04-4	1.8E-03	C	2.6E-07	C	--	--	3.0E+00	I	V	--	1	--	8.9E+03
Methyl-1,4-benzenediamine dihydrochloride	615-45-2	--	--	--	--	3.0E-04	X	--	--	--	--	1	0.1	--
Methyl-5-Nitroaniline, 2-	99-55-8	9.0E-03	P	--	--	2.0E-02	X	--	--	--	--	1	0.1	--
Methyl-N-nitro-N-nitrosoguanidine, N	70-25-7	8.3E+00	C	2.4E-03	C	--	--	--	--	--	--	1	0.1	--
Methylaniline Hydrochloride, 2-	636-21-5	1.3E-01	C	3.7E-05	C	--	--	--	--	--	--	1	0.1	--
Methylarsonic acid	124-58-3	--	--	--	--	1.0E-02	A	--	--	--	--	1	0.1	--
Methylbenzene,1,4-diamine monohydrochloride	74612-12-7	--	--	--	--	2.0E-04	X	--	--	--	--	1	0.1	--
Methylbenzene-1,4-diamine sulfate, dihydrochloride	615-50-9	1.0E-01	X	--	--	3.0E-04	X	--	--	--	--	1	0.1	--
Methylcholanthrene, 3-	56-49-5	2.2E+01	C	6.3E-03	C	--	--	--	--	--	M	1	0.1	--
Methylene Chloride	75-09-2	2.0E-03	I	1.0E-08	I	6.0E-03	I	6.0E-01	I	V	M	1	--	3.3E+03
Methylene-bis(2-chloroaniline), 4,4'	101-14-4	1.0E-01	P	4.3E-04	C	2.0E-03	P	--	--	--	M	1	0.1	--
Methylene-bis(N,N-dimethyl) Aniline,	101-61-1	4.6E-02	I	1.3E-05	C	--	--	--	--	--	--	1	0.1	--
Methylenebisbenzenamine, 4,4'	101-77-9	1.6E+00	C	4.6E-04	C	--	--	2.0E-02	C	--	--	1	0.1	--
Methylenediphenyl Diisocyanate	101-68-8	--	--	--	--	--	--	6.0E-04	I	--	--	1	0.1	--
Methylstyrene, Alpha-	98-83-9	--	--	--	--	7.0E-02	H	--	--	V	--	1	--	5.0E+02
Metolachlor	51218-45-2	--	--	--	--	1.5E-01	I	--	--	--	--	1	0.1	--
Metribuzin	21087-64-9	--	--	--	--	2.5E-02	I	--	--	--	--	1	0.1	--
Metsulfuron-methyl	74223-64-6	--	--	--	--	2.5E-01	I	--	--	--	--	1	0.1	--
Mineral oils	8012-95-1	--	--	--	--	3.0E+00	P	--	--	V	--	1	--	3.4E-01
Mirex	2385-85-5	1.8E+01	C	5.1E-03	C	2.0E-04	I	--	--	V	--	1	--	--
Molinate	2212-67-1	--	--	--	--	2.0E-03	I	--	--	--	--	1	0.1	--
Molybdenum	7439-98-7	--	--	--	--	5.0E-03	I	--	--	--	--	1	--	--
Monochloramine	10599-90-3	--	--	--	--	1.0E-01	I	--	--	--	--	1	--	--
Monomethylaniline	100-61-8	--	--	--	--	2.0E-03	P	--	--	--	--	1	0.1	--
Myclobutanil	88671-89-0	--	--	--	--	2.5E-02	I	--	--	--	--	1	0.1	--
N,N'-Diphenyl-1,4-benzenediamine	74-31-7	--	--	--	--	3.0E-04	X	--	--	--	--	1	0.1	--
Naled	300-76-5	--	--	--	--	2.0E-03	I	--	--	V	--	1	--	--
Naphtha, High Flash Aromatic (HFA)	64742-95-6	--	--	--	--	3.0E-02	X	1.0E-01	P	V	--	1	--	--
Naphthylamine, 2-	91-59-8	1.8E+00	C	0.0E+00	C	--	--	--	--	--	--	1	0.1	--
Napropamide	15299-99-7	--	--	--	--	1.0E-01	I	--	--	--	--	1	0.1	--
Nickel Acetate	373-02-4	--	--	2.6E-04	C	1.1E-02	C	1.4E-05	C	--	--	1	0.1	--
Nickel Carbonate	3333-67-3	--	--	2.6E-04	C	1.1E-02	C	1.4E-05	C	--	--	1	0.1	--
Nickel Carbonyl	13463-39-3	--	--	2.6E-04	C	1.1E-02	C	1.4E-05	C	V	--	1	--	--
Nickel Hydroxide	12054-48-7	--	--	2.6E-04	C	1.1E-02	C	1.4E-05	C	--	--	0.04	--	--
Nickel Oxide	1313-99-1	--	--	2.6E-04	C	1.1E-02	C	2.0E-05	C	--	--	0.04	--	--
Nickel Refinery Dust	NA	--	--	2.4E-04	I	1.1E-02	C	1.4E-05	C	--	--	0.04	--	--
Nickel Soluble Salts	7440-02-0	--	--	2.6E-04	C	2.0E-02	I	9.0E-05	A	--	--	0.04	--	--



		Key: I=IRIS; P=PPRTV; A=ATSDR; C=CalEPA; X=APPENDIXPPRTVSCREEN(SeeFAQ#27); H=HEAST; F=SeeFAQ; J=NewJersey; O=EPAOfficeofWater; E=seeuserguideSection2.3.5;												
		L=seeuserguideonlead; M=mutagen; S=seeuserguideSection5; V=volatile; R=RBAApplied(SeeUserGuideforArsenicnotice); c=cancer; n=noncancer; * =where:nSL<100XcSL;												
		**=where:nSL<10XcSL; SSLvaluesarebasedonDAF=1; m=Concentrationmayexceedceilinglimit(SeeUserGuide); s=ConcentrationmayexceedCsat(SeeUserGuide)												
Contaminant		ToxicityandChemical-specificInformation												
Analyte	CAS No.	SFO(mg/	key	IUR(ug/n	key	RfD <sub>c</sub> (mg/	key	RfC <sub>c</sub> (mg/n	key	vol	muta-gen	GIABS	ABS	C <sub>sat</sub> (mg/l
~Ammonium Perchlorate	7790-98-9	--	--	--	--	7.0E-04	I	--	--	--	--	1	--	--
~Lithium Perchlorate	7791-03-9	--	--	--	--	7.0E-04	I	--	--	--	--	1	--	--
~Perchlorate and Perchlorate Salts	14797-73-0	--	--	--	--	7.0E-04	I	--	--	--	--	1	--	--
~Potassium Perchlorate	7778-74-7	--	--	--	--	7.0E-04	I	--	--	--	--	1	--	--
~Sodium Perchlorate	7601-89-0	--	--	--	--	7.0E-04	I	--	--	--	--	1	--	--
Perfluorobutane Sulfonate	375-73-5	--	--	--	--	2.0E-02	P	--	--	V	--	1	--	--
Permethrin	52645-53-1	--	--	--	--	5.0E-02	I	--	--	--	--	1	0.1	--
Phenacetin	62-44-2	2.2E-03	C	6.3E-07	C	--	--	--	--	--	--	1	0.1	--
Phenmedipham	13684-63-4	--	--	--	--	2.5E-01	I	--	--	--	--	1	0.1	--
Phenol	108-95-2	--	--	--	--	3.0E-01	I	2.0E-01	C	--	--	1	0.1	--
Phenol, 2-(1-methylethoxy)-, methyl	114-26-1	--	--	--	--	4.0E-03	I	--	--	--	--	1	0.1	--
Phenothiazine	92-84-2	--	--	--	--	5.0E-04	X	--	--	--	--	1	0.1	--
Phenylenediamine, m-	108-45-2	--	--	--	--	6.0E-03	I	--	--	--	--	1	0.1	--
Phenylenediamine, o-	95-54-5	4.7E-02	H	--	--	--	--	--	--	--	--	1	0.1	--
Phenylenediamine, p-	106-50-3	--	--	--	--	1.9E-01	H	--	--	--	--	1	0.1	--
Phenylphenol, 2-	90-43-7	1.9E-03	H	--	--	--	--	--	--	--	--	1	0.1	--
Phorate	298-02-2	--	--	--	--	2.0E-04	H	--	--	--	--	1	0.1	--
Phosgene	75-44-5	--	--	--	--	--	--	3.0E-04	I	V	--	1	--	1.6E+03
Phosmet	732-11-6	--	--	--	--	2.0E-02	I	--	--	--	--	1	0.1	--
Phosphates, Inorganic		--	--	--	--	--	--	--	--	--	--	--	--	--
~Aluminum metaphosphate	13776-88-0	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Ammonium polyphosphate	68333-79-9	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Calcium pyrophosphate	7790-76-3	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Diammonium phosphate	7783-28-0	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Dicalcium phosphate	7757-93-9	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Dimagnesium phosphate	7782-75-4	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Dipotassium phosphate	7758-11-4	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Disodium phosphate	7558-79-4	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Monoaluminum phosphate	13530-50-2	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Monoammonium phosphate	7722-76-1	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Monocalcium phosphate	7758-23-8	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Monomagnesium phosphate	7757-86-0	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Monopotassium phosphate	7778-77-0	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Monosodium phosphate	7558-80-7	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Polyphosphoric acid	8017-16-1	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Potassium triphosphate	13845-36-8	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Sodium acid pyrophosphate	7758-16-9	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Sodium aluminum phosphate (acidi	7785-88-8	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Sodium aluminum phosphate (anhy	10279-59-1	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Sodium aluminum phosphate (tetra	10305-76-7	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Sodium hexametaphosphate	10124-56-8	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Sodium polyphosphate	68915-31-1	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Sodium trimetaphosphate	7785-84-4	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Sodium triphosphate	7758-29-4	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Tetrapotassium phosphate	7320-34-5	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Tetrasodium pyrophosphate	7722-88-5	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Trialuminum sodium tetra decahydri	15136-87-5	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Tricalcium phosphate	7758-87-4	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Trimagnesium phosphate	7757-87-1	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Tripotassium phosphate	7778-53-2	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
~Trisodium phosphate	7601-54-9	--	--	--	--	4.9E+01	P	--	--	--	--	1	--	--
Phosphine	7803-51-2	--	--	--	--	3.0E-04	I	3.0E-04	I	V	--	1	--	--
Phosphoric Acid	7664-38-2	--	--	--	--	4.9E+01	P	1.0E-02	I	--	--	1	--	--

		Key: I=IRIS; P=PPRTV; A=ATSDR; C=CalEPA; X=APPENDIX PPRTV SCREEN (See FAQ#27); H=HEAST; F=See FAQ; J=New Jersey; O=EPA Office of Water; E=see user guide Section 2.3.5;												
		L=see user guide on lead; M=mutagen; S=see user guide Section 5; V=volatile; R=RBA Applied (See User Guide for Arsenic notice); c=cancer; n=noncancer; * =where nSL<100XcSL;												
		**=where nSL<10XcSL; SSL values are based on DAF=1; m=Concentration may exceed ceiling limit (See User Guide); s=Concentration may exceed Csat (See User Guide)												
Contaminant		Toxicity and Chemical-specific Information												
Analyte	CAS No.	SFO(mg)	key	IUR(ug/n)	key	RfD <sub>o</sub> (mg)	key	RfC <sub>i</sub> (mg/n <sup>3</sup> )	key	vol	muta-gen	GIABS	ABS	C <sub>sat</sub> (mg/l)
Phosphorus, White	7723-14-0	--	--	--	--	2.0E-05	I	--	--	V	--	1	--	--
Phthalates		--	--	--	--	--	--	--	--	--	--	--	--	--
-Bis(2-ethylhexyl)phthalate	117-81-7	1.4E-02	I	2.4E-06	C	2.0E-02	I	--	--	--	--	1	0.1	--
-Butyl Benzyl Phthalate	85-68-7	1.9E-03	P	--	--	2.0E-01	I	--	--	--	--	1	0.1	--
-Butylphthalyl Butylglycolate	85-70-1	--	--	--	--	1.0E+00	I	--	--	--	--	1	0.1	--
-Dibutyl Phthalate	84-74-2	--	--	--	--	1.0E-01	I	--	--	--	--	1	0.1	--
-Diethyl Phthalate	84-66-2	--	--	--	--	8.0E-01	I	--	--	--	--	1	0.1	--
-Dimethylterephthalate	120-61-6	--	--	--	--	1.0E-01	I	--	--	V	--	1	--	--
-Octyl Phthalate, di-N-	117-84-0	--	--	--	--	1.0E-02	P	--	--	--	--	1	0.1	--
-Phthalic Acid, P-	100-21-0	--	--	--	--	1.0E+00	H	--	--	--	--	1	0.1	--
-Phthalic Anhydride	85-44-9	--	--	--	--	2.0E+00	I	2.0E-02	C	--	--	1	0.1	--
Picloram	1918-02-1	--	--	--	--	7.0E-02	I	--	--	--	--	1	0.1	--
Picramic Acid (2-Amino-4,6-dinitrophenol)	96-91-3	--	--	--	--	1.0E-04	X	--	--	--	--	1	0.1	--
Picric Acid (2,4,6-Trinitrophenol)	88-89-1	--	--	--	--	9.0E-04	X	--	--	--	--	1	0.1	--
Pirimiphos, Methyl	29232-93-7	--	--	--	--	1.0E-02	I	--	--	--	--	1	0.1	--
Polybrominated Biphenyls	59536-65-1	3.0E+01	C	8.6E-03	C	7.0E-06	H	--	--	--	--	1	0.1	--
Polychlorinated Biphenyls (PCBs)		--	--	--	--	--	--	--	--	--	--	--	--	--
-Aroclor 1016	12674-11-2	7.0E-02	S	2.0E-05	S	7.0E-05	I	--	--	V	--	1	0.14	--
-Aroclor 1221	11104-28-2	2.0E+00	S	5.7E-04	S	--	--	--	--	V	--	1	0.14	--
-Aroclor 1232	11141-16-5	2.0E+00	S	5.7E-04	S	--	--	--	--	V	--	1	0.14	--
-Aroclor 1242	53469-21-9	2.0E+00	S	5.7E-04	S	--	--	--	--	V	--	1	0.14	--
-Aroclor 1248	12672-29-6	2.0E+00	S	5.7E-04	S	--	--	--	--	V	--	1	0.14	--
-Aroclor 1254	11097-69-1	2.0E+00	S	5.7E-04	S	2.0E-05	I	--	--	V	--	1	0.14	--
-Aroclor 1260	11096-82-5	2.0E+00	S	5.7E-04	S	--	--	--	--	V	--	1	0.14	--
-Aroclor 5460	11126-42-4	--	--	--	--	6.0E-04	X	--	--	V	--	1	0.14	--
-Heptachlorobiphenyl, 2,3,3',4,4',5,5'	39635-31-9	3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V	--	1	0.14	--
-Hexachlorobiphenyl, 2,3',4,4',5,5'	52663-72-6	3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V	--	1	0.14	--
-Hexachlorobiphenyl, 2,3,3',4,4',5,5'	69782-90-7	3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V	--	1	0.14	--
-Hexachlorobiphenyl, 2,3,3',4,4',5,5'	138380-08-4	3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V	--	1	0.14	--
-Hexachlorobiphenyl, 3,3',4,4',5,5'	32774-16-6	3.9E+03	E	1.1E+00	E	2.3E-08	E	1.3E-06	E	V	--	1	0.14	--
-Pentachlorobiphenyl, 2',3,4,4',5-	65510-44-3	3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V	--	1	0.14	--
-Pentachlorobiphenyl, 2,3',4,4',5-	31508-00-6	3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V	--	1	0.14	--
-Pentachlorobiphenyl, 2,3,3',4,4'	32598-14-4	3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V	--	1	0.14	--
-Pentachlorobiphenyl, 2,3,4,4',5-	74472-37-0	3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V	--	1	0.14	--
-Pentachlorobiphenyl, 3,3',4,4',5-	57465-28-8	1.3E+04	E	3.8E+00	E	7.0E-09	E	4.0E-07	E	V	--	1	0.14	--
-Polychlorinated Biphenyls (high risk)	1336-36-3	2.0E+00	I	5.7E-04	I	--	--	--	--	V	--	1	0.14	--
-Polychlorinated Biphenyls (low risk)	1336-36-3	4.0E-01	I	1.0E-04	I	--	--	--	--	V	--	1	0.14	--
-Polychlorinated Biphenyls (lowest ri)	1336-36-3	7.0E-02	I	2.0E-05	I	--	--	--	--	V	--	1	0.14	--
-Tetrachlorobiphenyl, 3,3',4,4'	32598-13-3	1.3E+01	E	3.8E-03	E	7.0E-06	E	4.0E-04	E	--	--	1	0.14	--
-Tetrachlorobiphenyl, 3,4,4',5-	70362-50-4	3.9E+01	E	1.1E-02	E	2.3E-06	E	1.3E-04	E	V	--	1	0.14	--
Polymeric Methylene Diphenyl Diisocyanate	9016-87-9	--	--	--	--	--	--	6.0E-04	I	--	--	1	0.1	--
Polynuclear Aromatic Hydrocarbons		--	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthene	83-32-9	--	--	--	--	6.0E-02	I	--	--	V	--	1	0.13	--
Anthracene	120-12-7	--	--	--	--	3.0E-01	I	--	--	V	--	1	0.13	--
Benz[a]anthracene	56-55-3	7.3E-01	E	1.1E-04	C	--	--	--	--	V	M	1	0.13	--
Benzo[j]fluoranthene	205-82-3	1.2E+00	C	1.1E-04	C	--	--	--	--	--	--	1	0.13	--
Benzo[a]pyrene	50-32-8	7.3E+00	I	1.1E-03	C	--	--	--	--	--	M	1	0.13	--
Benzo[b]fluoranthene	205-99-2	7.3E-01	E	1.1E-04	C	--	--	--	--	--	M	1	0.13	--
Benzo[k]fluoranthene	207-08-9	7.3E-02	E	1.1E-04	C	--	--	--	--	--	M	1	0.13	--
Chloronaphthalene, Beta-	91-58-7	--	--	--	--	8.0E-02	I	--	--	V	--	1	0.13	--
Chrysene	218-01-9	7.3E-03	E	1.1E-05	C	--	--	--	--	--	M	1	0.13	--
Dibenz[a,h]anthracene	53-70-3	7.3E+00	E	1.2E-03	C	--	--	--	--	--	M	1	0.13	--
Dibenzo[a,e]pyrene	192-65-4	1.2E+01	C	1.1E-03	C	--	--	--	--	--	--	1	0.13	--

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		L=see user guide on lead; M=mutagen; S=see user guide Section 5; V=volatile; R=RBA Applied (See User Guide for Arsenic notice); c=cancer; n=noncancer; * =where nSL<100XcSL;													
		**=where nSL<10XcSL; SSL values are based on DAF=1; m=Concentration may exceed ceiling limit (See User Guide); s=Concentration may exceed Csat (See User Guide)													
Contaminant		Toxicity and Chemical-specific Information													
Analyte	CAS No.	SFO(mg/l)	key	IUR(ug/n)	key	RfD <sub>c</sub> (mg)	key	RfC <sub>c</sub> (mg/n <sup>3</sup> )	key	vol	muta-gen	GIABS	ABS	C <sub>sat</sub> (mg/l)	
Dimethylbenz(a)anthracene, 7,12-	57-97-6	2.5E+02	C	7.1E-02	C	--	--	--	--	--	M	1	0.13	--	
Fluoranthene	206-44-0	--	--	--	--	4.0E-02	I	--	--	--	--	1	0.13	--	
Fluorene	86-73-7	--	--	--	--	4.0E-02	I	--	--	V	--	1	0.13	--	
Indeno[1,2,3-cd]pyrene	193-39-5	7.3E-01	E	1.1E-04	C	--	--	--	--	--	M	1	0.13	--	
Methylnaphthalene, 1-	90-12-0	2.9E-02	P	--	--	7.0E-02	A	--	--	V	--	1	0.13	3.9E+02	
2-Methylnaphthalene	91-57-6	--	--	--	--	4.0E-03	I	--	--	V	--	1	0.13	--	
Naphthalene	91-20-3	--	--	3.4E-05	C	2.0E-02	I	3.0E-03	I	V	--	1	0.13	--	
-Nitropyrene, 4-	57835-92-4	1.2E+00	C	1.1E-04	C	--	--	--	--	--	--	1	0.13	--	
Pyrene	129-00-0	--	--	--	--	3.0E-02	I	--	--	V	--	1	0.13	--	
Potassium Perfluorobutane Sulfonate	29420-49-3	--	--	--	--	2.0E-02	P	--	--	--	--	1	0.1	--	
Prochloraz	67747-09-5	1.5E-01	I	--	--	9.0E-03	I	--	--	--	--	1	0.1	--	
Profluralin	26399-36-0	--	--	--	--	6.0E-03	H	--	--	V	--	1	--	--	
Prometon	1610-18-0	--	--	--	--	1.5E-02	I	--	--	--	--	1	0.1	--	
Prometryn	7287-19-6	--	--	--	--	4.0E-03	I	--	--	--	--	1	0.1	--	
Propachlor	1918-16-7	--	--	--	--	1.3E-02	I	--	--	--	--	1	0.1	--	
Propanil	709-98-8	--	--	--	--	5.0E-03	I	--	--	--	--	1	0.1	--	
Propargite	2312-35-8	--	--	--	--	2.0E-02	I	--	--	--	--	1	0.1	--	
Propargyl Alcohol	107-19-7	--	--	--	--	2.0E-03	I	--	--	V	--	1	--	1.1E+05	
Propazine	139-40-2	--	--	--	--	2.0E-02	I	--	--	--	--	1	0.1	--	
Propham	122-42-9	--	--	--	--	2.0E-02	I	--	--	--	--	1	0.1	--	
Propiconazole	60207-90-1	--	--	--	--	1.3E-02	I	--	--	--	--	1	0.1	--	
Propionaldehyde	123-38-6	--	--	--	--	--	--	8.0E-03	I	V	--	1	--	3.3E+04	
Propyl benzene	103-65-1	--	--	--	--	1.0E-01	X	1.0E+00	X	V	--	1	--	2.6E+02	
Propylene	115-07-1	--	--	--	--	--	--	3.0E+00	C	V	--	1	--	3.5E+02	
Propylene Glycol	57-55-6	--	--	--	--	2.0E+01	P	--	--	--	--	1	0.1	--	
Propylene Glycol Dinitrate	6423-43-4	--	--	--	--	--	--	2.7E-04	A	--	--	1	0.1	--	
Propylene Glycol Monomethyl Ether	107-98-2	--	--	--	--	7.0E-01	H	2.0E+00	I	V	--	1	--	1.1E+05	
Propylene Oxide	75-56-9	2.4E-01	I	3.7E-06	I	--	--	3.0E-02	I	V	--	1	--	7.8E+04	
Propyzamide	23950-58-5	--	--	--	--	7.5E-02	I	--	--	--	--	1	0.1	--	
Pyridine	110-86-1	--	--	--	--	1.0E-03	I	--	--	V	--	1	--	5.3E+05	
Quinalphos	13593-03-8	--	--	--	--	5.0E-04	I	--	--	--	--	1	0.1	--	
Quinoline	91-22-5	3.0E+00	I	--	--	--	--	--	--	--	--	1	0.1	--	
Quizalofop-ethyl	76578-14-8	--	--	--	--	9.0E-03	I	--	--	--	--	1	0.1	--	
Refractory Ceramic Fibers	NA	--	--	--	--	--	--	3.0E-02	A	--	--	1	--	--	
Resmethrin	10453-86-8	--	--	--	--	3.0E-02	I	--	--	--	--	1	0.1	--	
Ronnel	299-84-3	--	--	--	--	5.0E-02	H	--	--	V	--	1	--	--	
Rotenone	83-79-4	--	--	--	--	4.0E-03	I	--	--	--	--	1	0.1	--	
Safrole	94-59-7	2.2E-01	C	6.3E-05	C	--	--	--	--	--	M	1	0.1	--	
Selenious Acid	7783-00-8	--	--	--	--	5.0E-03	I	--	--	--	--	1	--	--	
Selenium	7782-49-2	--	--	--	--	5.0E-03	I	2.0E-02	C	--	--	1	--	--	
Selenium Sulfide	7446-34-6	--	--	--	--	5.0E-03	C	2.0E-02	C	--	--	1	--	--	
Sethoxydim	74051-80-2	--	--	--	--	9.0E-02	I	--	--	--	--	1	0.1	--	
Silica (crystalline, respirable)	7631-86-9	--	--	--	--	--	--	3.0E-03	C	--	--	1	--	--	
Silver	7440-22-4	--	--	--	--	5.0E-03	I	--	--	--	--	0.04	--	--	
Simazine	122-34-9	1.2E-01	H	--	--	5.0E-03	I	--	--	--	--	1	0.1	--	
Sodium Acifluorfen	62476-59-9	--	--	--	--	1.3E-02	I	--	--	--	--	1	0.1	--	
Sodium Azide	26628-22-8	--	--	--	--	4.0E-03	I	--	--	--	--	1	--	--	
Sodium Dichromate	10588-01-9	5.0E-01	C	1.5E-01	C	2.0E-02	C	2.0E-04	C	--	M	0.025	--	--	
Sodium Diethyldithiocarbamate	148-18-5	2.7E-01	H	--	--	3.0E-02	I	--	--	--	--	1	0.1	--	
Sodium Fluoride	7681-49-4	--	--	--	--	5.0E-02	A	1.3E-02	C	--	--	1	--	--	
Sodium Fluoroacetate	62-74-8	--	--	--	--	2.0E-05	I	--	--	--	--	1	0.1	--	
Sodium Metavanadate	13718-26-8	--	--	--	--	1.0E-03	H	--	--	--	--	1	--	--	
Sodium Tungstate	13472-45-2	--	--	--	--	8.0E-04	P	--	--	--	--	1	--	--	

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		L=seeuserguideonlead; M=mutagen; S=seeuserguideSection5; V=volatile; R=RBAapplied(SeeUserGuideforArsenicnotice); c=cancer; n=noncancer; * =where:nSL<100XcSL;												
		**=where:nSL<10XcSL; SSLvaluesarebasedonDAF=1; m=Concentrationmayexceedceilinglimit(SeeUserGuide); s=ConcentrationmayexceedCsat(SeeUserGuide)												
Contaminant		ToxicityandChemical-specificInformation												
Analyte	CAS No.	SFO(mg/	key	IUR(ug/n	key	RfD <sub>c</sub> (mg/	key	RfC <sub>c</sub> (mg/n	key	vol	muta-gen	GIABS	ABS	C <sub>sat</sub> (mg/l
Sodium Tungstate Dihydrate	10213-10-2	-- --		-- --		8.0E-04	P	-- --		-- --		1	--	--
Stirofos (Tetrachlorovinphos)	961-11-5	2.4E-02	H	-- --		3.0E-02	I	-- --		-- --		1	0.1	--
Strontium Chromate	7789-06-2	5.0E-01	C	1.5E-01	C	2.0E-02	C	2.0E-04	C	--	M	0.025	--	--
Strontium, Stable	7440-24-6	-- --		-- --		6.0E-01	I	-- --		-- --		1	--	--
Strychnine	57-24-9	-- --		-- --		3.0E-04	I	-- --		-- --		1	0.1	--
Styrene	100-42-5	-- --		-- --		2.0E-01	I	1.0E+00	I	V	--	1	--	8.7E+02
Styrene-Acrylonitrile (SAN) Trimer	NA	-- --		-- --		3.0E-03	P	-- --		-- --		1	0.1	--
Sulfolane	126-33-0	-- --		-- --		1.0E-03	P	2.0E-03	X	-- --		1	0.1	--
Sulfonylbis(4-chlorobenzene), 1,1'-	80-07-9	-- --		-- --		8.0E-04	P	-- --		-- --		1	0.1	--
Sulfur Trioxide	7446-11-9	-- --		-- --		-- --		1.0E-03	C	V	--	1	--	--
Sulfuric Acid	7664-93-9	-- --		-- --		-- --		1.0E-03	C	-- --		1	--	--
Sulfurous acid, 2-chloroethyl 2-[4-(1,	140-57-8	2.5E-02	I	7.1E-06	I	5.0E-02	H	-- --		-- --		1	0.1	--
TCMTB	21564-17-0	-- --		-- --		3.0E-02	H	-- --		-- --		1	0.1	--
Tebuthiuron	34014-18-1	-- --		-- --		7.0E-02	I	-- --		-- --		1	0.1	--
Temephos	3383-96-8	-- --		-- --		2.0E-02	H	-- --		-- --		1	0.1	--
Terbacil	5902-51-2	-- --		-- --		1.3E-02	I	-- --		-- --		1	0.1	--
Terbufos	13071-79-9	-- --		-- --		2.5E-05	H	-- --		V	--	1	--	3.1E+01
Terbutryn	886-50-0	-- --		-- --		1.0E-03	I	-- --		-- --		1	0.1	--
Tetrabromodiphenyl ether, 2,2',4,4'-	5436-43-1	-- --		-- --		1.0E-04	I	-- --		-- --		1	0.1	--
Tetrachlorobenzene, 1,2,4,5-	95-94-3	-- --		-- --		3.0E-04	I	-- --		V	--	1	--	--
Tetrachloroethane, 1,1,1,2-	630-20-6	2.6E-02	I	7.4E-06	I	3.0E-02	I	-- --		V	--	1	--	6.8E+02
Tetrachloroethane, 1,1,2,2-	79-34-5	2.0E-01	I	5.8E-05	C	2.0E-02	I	-- --		V	--	1	--	1.9E+03
Tetrachloroethylene	127-18-4	2.1E-03	I	2.6E-07	I	6.0E-03	I	4.0E-02	I	V	--	1	--	1.7E+02
Tetrachlorophenol, 2,3,4,6-	58-90-2	-- --		-- --		3.0E-02	I	-- --		-- --		1	0.1	--
Tetrachlorotoluene, p- alpha, alpha,	5216-25-1	2.0E+01	H	-- --		-- --		-- --		V	--	1	--	--
Tetraethyl Dithiopyrophosphate	3689-24-5	-- --		-- --		5.0E-04	I	-- --		-- --		1	0.1	--
Tetrafluoroethane, 1,1,1,2-	811-97-2	-- --		-- --		-- --		8.0E+01	I	V	--	1	--	2.1E+03
Tetryl (Trinitrophenylmethylnitramine	479-45-8	-- --		-- --		2.0E-03	P	-- --		-- --		1	0.00065	--
Thallic Oxide	1314-32-5	-- --		-- --		2.0E-05	S	-- --		-- --		1	--	--
Thallium (I) Nitrate	10102-45-1	-- --		-- --		1.0E-05	X	-- --		-- --		1	--	--
Thallium (Soluble Salts)	7440-28-0	-- --		-- --		1.0E-05	X	-- --		-- --		1	--	--
Thallium Acetate	563-68-8	-- --		-- --		1.0E-05	X	-- --		V	--	1	--	--
Thallium Carbonate	6533-73-9	-- --		-- --		2.0E-05	X	-- --		V	--	1	--	--
Thallium Chloride	7791-12-0	-- --		-- --		1.0E-05	X	-- --		-- --		1	--	--
Thallium Selenite	12039-52-0	-- --		-- --		1.0E-05	S	-- --		-- --		1	--	--
Thallium Sulfate	7446-18-6	-- --		-- --		2.0E-05	X	-- --		-- --		1	--	--
Thifensulfuron-methyl	79277-27-3	-- --		-- --		1.3E-02	I	-- --		-- --		1	0.1	--
Thiobencarb	28249-77-6	-- --		-- --		1.0E-02	I	-- --		-- --		1	0.1	--
Thiodiglycol	111-48-8	-- --		-- --		7.0E-02	X	-- --		-- --		1	0.0075	--
Thiofanox	39196-18-4	-- --		-- --		3.0E-04	H	-- --		-- --		1	0.1	--
Thiophanate, Methyl	23564-05-8	-- --		-- --		8.0E-02	I	-- --		-- --		1	0.1	--
Thiram	137-26-8	-- --		-- --		5.0E-03	I	-- --		-- --		1	0.1	--
Tin	7440-31-5	-- --		-- --		6.0E-01	H	-- --		-- --		1	--	--
Titanium Tetrachloride	7550-45-0	-- --		-- --		-- --		1.0E-04	A	V	--	1	--	--
Toluene	108-88-3	-- --		-- --		8.0E-02	I	5.0E+00	I	V	--	1	--	8.2E+02
Toluene-2,4-diisocyanate	584-84-9	-- --		1.1E-05	C	-- --		8.0E-06	C	V	--	1	--	--
Toluene-2,5-diamine	95-70-5	1.8E-01	X	-- --		2.0E-04	X	-- --		-- --		1	0.1	--
Toluene-2,6-diisocyanate	91-08-7	-- --		1.1E-05	C	-- --		8.0E-06	C	V	--	1	--	1.7E+03
Toluidine, o- (Methylaniline, 2-)	95-53-4	1.6E-02	P	5.1E-05	C	-- --		-- --		-- --		1	0.1	--
Toluidine, p-	106-49-0	3.0E-02	P	-- --		4.0E-03	X	-- --		-- --		1	0.1	--
Total Petroleum Hydrocarbons (Alipi NA		-- --		-- --		3.0E+00	P	-- --		V	--	1	--	3.4E-01
Total Petroleum Hydrocarbons (Alipi NA		-- --		-- --		-- --		6.0E-01	P	V	--	1	--	1.4E+02
Total Petroleum Hydrocarbons (Alipi NA		-- --		-- --		1.0E-02	X	1.0E-01	P	V	--	1	--	6.9E+00

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		L=seeuserguideonlead; M=mutagen; S=seeuserguideSection5; V=volatile; R=RBAApplied(SeeUserGuideforArsenicnotice); c=cancer; n=noncancer; * =where:nSL<100XcSL;												
		**=where:nSL<10XcSL; SSLvaluesarebasedonDAF=1; m=Concentrationmayexceedceilinglimit(SeeUserGuide); s=ConcentrationmayexceedCsat(SeeUserGuide)												
Contaminant		ToxicityandChemical-specificInformation												
Analyte	CAS No.	SFO(mg/	key	IUR(ug/n	key	RfD <sub>c</sub> (mg/	key	RfC <sub>i</sub> (mg/n	key	vol	muta-gen	GIABS	ABS	C <sub>sat</sub> (mg/l
Total Petroleum Hydrocarbons (Aror NA		--	--	--	--	4.0E-02	P	--	--	--	--	1	0.1	--
Total Petroleum Hydrocarbons (Aror NA		--	--	--	--	4.0E-03	P	3.0E-02	P	V	--	1	--	1.8E+03
Total Petroleum Hydrocarbons (Aror NA		--	--	--	--	4.0E-03	P	3.0E-03	P	V	--	1	--	--
Toxaphene	8001-35-2	1.1E+00	I	3.2E-04	I	--	--	--	--	--	--	1	0.1	--
Tralomethrin	66841-25-6	--	--	--	--	7.5E-03	I	--	--	--	--	1	0.1	--
Tri-n-butyltin	688-73-3	--	--	--	--	3.0E-04	A	--	--	V	--	1	--	--
Triacetin	102-76-1	--	--	--	--	8.0E+01	X	--	--	--	--	1	0.1	--
Triadimefon	43121-43-3	--	--	--	--	3.0E-02	I	--	--	--	--	1	0.1	--
Triallate	2303-17-5	--	--	--	--	1.3E-02	I	--	--	V	--	1	--	--
Triasulfuron	82097-50-5	--	--	--	--	1.0E-02	I	--	--	--	--	1	0.1	--
Tribenuron-methyl	101200-48-0	--	--	--	--	8.0E-03	I	--	--	--	--	1	0.1	--
Tribromobenzene, 1,2,4-	615-54-3	--	--	--	--	5.0E-03	I	--	--	V	--	1	--	--
Tributyl Phosphate	126-73-8	9.0E-03	P	--	--	1.0E-02	P	--	--	--	--	1	0.1	--
Tributyltin Compounds	NA	--	--	--	--	3.0E-04	P	--	--	--	--	1	0.1	--
Tributyltin Oxide	56-35-9	--	--	--	--	3.0E-04	I	--	--	--	--	1	0.1	--
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	--	--	--	--	3.0E+01	I	3.0E+01	H	V	--	1	--	9.1E+02
Trichloroacetic Acid	76-03-9	7.0E-02	I	--	--	2.0E-02	I	--	--	--	--	1	0.1	--
Trichloroaniline HCl, 2,4,6-	33663-50-2	2.9E-02	H	--	--	--	--	--	--	--	--	1	0.1	--
Trichloroaniline, 2,4,6-	634-93-5	7.0E-03	X	--	--	3.0E-05	X	--	--	--	--	1	0.1	--
Trichlorobenzene, 1,2,3-	87-61-6	--	--	--	--	8.0E-04	X	--	--	V	--	1	--	--
Trichlorobenzene, 1,2,4-	120-82-1	2.9E-02	P	--	--	1.0E-02	I	2.0E-03	P	V	--	1	--	4.0E+02
Trichloroethane, 1,1,1-	71-55-6	--	--	--	--	2.0E+00	I	5.0E+00	I	V	--	1	--	6.4E+02
Trichloroethane, 1,1,2-	79-00-5	5.7E-02	I	1.6E-05	I	4.0E-03	I	2.0E-04	X	V	--	1	--	2.2E+03
Trichloroethylene	79-01-6	4.6E-02	I	4.1E-06	I	5.0E-04	I	2.0E-03	I	V	M	1	--	6.9E+02
Trichlorofluoromethane	75-69-4	--	--	--	--	3.0E-01	I	--	--	V	--	1	--	1.2E+03
Trichlorophenol, 2,4,5-	95-95-4	--	--	--	--	1.0E-01	I	--	--	--	--	1	0.1	--
Trichlorophenol, 2,4,6-	88-06-2	1.1E-02	I	3.1E-06	I	1.0E-03	P	--	--	--	--	1	0.1	--
Trichlorophenoxyacetic Acid, 2,4,5-	93-76-5	--	--	--	--	1.0E-02	I	--	--	--	--	1	0.1	--
Trichlorophenoxypropionic acid, -2,4	93-72-1	--	--	--	--	8.0E-03	I	--	--	--	--	1	0.1	--
Trichloropropane, 1,1,2-	598-77-6	--	--	--	--	5.0E-03	I	--	--	V	--	1	--	1.3E+03
Trichloropropane, 1,2,3-	96-18-4	3.0E+01	I	--	--	4.0E-03	I	3.0E-04	I	V	M	1	--	1.4E+03
Trichloropropene, 1,2,3-	96-19-5	--	--	--	--	3.0E-03	X	3.0E-04	P	V	--	1	--	3.1E+02
Tricresyl Phosphate (TCP)	1330-78-5	--	--	--	--	2.0E-02	A	--	--	--	--	1	0.1	--
Tridiphane	58138-08-2	--	--	--	--	3.0E-03	I	--	--	--	--	1	0.1	--
Triethylamine	121-44-8	--	--	--	--	--	--	7.0E-03	I	V	--	1	--	2.8E+04
Triethylene Glycol	112-27-6	--	--	--	--	2.0E+00	P	--	--	--	--	1	0.1	--
Trifluoroethane, 1,1,1-	420-46-2	--	--	--	--	--	--	2.0E+01	P	V	--	1	--	4.8E+03
Trifluralin	1582-09-8	7.7E-03	I	--	--	7.5E-03	I	--	--	V	--	1	--	--
Trimethyl Phosphate	512-56-1	2.0E-02	P	--	--	1.0E-02	P	--	--	--	--	1	0.1	--
Trimethylbenzene, 1,2,3-	526-73-8	--	--	--	--	--	--	5.0E-03	P	V	--	1	--	2.9E+02
Trimethylbenzene, 1,2,4-	95-63-6	--	--	--	--	--	--	7.0E-03	P	V	--	1	--	2.2E+02
Trimethylbenzene, 1,3,5-	108-67-8	--	--	--	--	1.0E-02	X	--	--	V	--	1	--	1.8E+02
Trimethylpentene, 2,4,4-	25167-70-8	--	--	--	--	1.0E-02	X	--	--	V	--	1	--	3.0E+01
Trinitrobenzene, 1,3,5-	99-35-4	--	--	--	--	3.0E-02	I	--	--	--	--	1	0.019	--
Trinitrotoluene, 2,4,6-	118-96-7	3.0E-02	I	--	--	5.0E-04	I	--	--	--	--	1	0.032	--
Triphenylphosphine Oxide	791-28-6	--	--	--	--	2.0E-02	P	--	--	--	--	1	0.1	--
Tris(1,3-Dichloro-2-propyl) Phosphat	13674-87-8	--	--	--	--	2.0E-02	A	--	--	--	--	1	0.1	--
Tris(1-chloro-2-propyl)phosphate	13674-84-5	--	--	--	--	1.0E-02	X	--	--	--	--	1	0.1	--
Tris(2,3-dibromopropyl)phosphate	126-72-7	2.3E+00	C	6.6E-04	C	--	--	--	--	V	--	1	--	4.7E+02
Tris(2-chloroethyl)phosphate	115-96-8	2.0E-02	P	--	--	7.0E-03	P	--	--	--	--	1	0.1	--
Tris(2-ethylhexyl)phosphate	78-42-2	3.2E-03	P	--	--	1.0E-01	P	--	--	--	--	1	0.1	--
Tungsten	7440-33-7	--	--	--	--	8.0E-04	P	--	--	--	--	1	--	--
Uranium (Soluble Salts)	NA	--	--	--	--	3.0E-03	I	4.0E-05	A	--	--	1	--	--



		Key: I=IRIS; P=PPRTV; A=ATSDR; C=CalEPA; X=APPENDIXPPRTV/SCREEN(SeeFAQ#27); H=HEAST; F=SeeFAQ; J=NewJersey; O=EPAOfficeofWater; E=seeuserguideSection2.3.5;													
		L=seeuserguideonlead; M=mutagen; S=seeuserguideSection5; V=volatile; R=RBAApplied(SeeUserGuideforArsenicnotice); c=cancer; n=noncancer; * =where:nSL<100XcSL;													
		**=where:nSL<10XcSL; SSLvaluesarebasedonDAF=1; m=Concentrationmayexceedceilinglimit(SeeUserGuide); s=ConcentrationmayexceedCsat(SeeUserGuide)													
Contaminant		ToxicityandChemical-specificInformation													
Analyte	CAS No.	SFO(mg/	key	IUR(ug/n	key	RfD <sub>c</sub> (mg/	key	RfC <sub>i</sub> (mg/n	key	vol	muta-gen	GIABS	ABS	C <sub>sat</sub> (mg/l	
Urethane	51-79-6	1.0E+00	C	2.9E-04	C	--	--	--	--	--	M	1	0.1	--	
Vanadium Pentoxide	1314-62-1	--	--	8.3E-03	P	9.0E-03	I	7.0E-06	P	--	--	0.026	--	--	
Vanadium and Compounds	7440-62-2	--	--	--	--	5.0E-03	S	1.0E-04	A	--	--	0.026	--	--	
Vernolate	1929-77-7	--	--	--	--	1.0E-03	I	--	--	V	--	1	--	--	
Vinclozolin	50471-44-8	--	--	--	--	2.5E-02	I	--	--	--	--	1	0.1	--	
Vinyl Acetate	108-05-4	--	--	--	--	1.0E+00	H	2.0E-01	I	V	--	1	--	2.8E+03	
Vinyl Bromide	593-60-2	--	--	3.2E-05	H	--	--	3.0E-03	I	V	--	1	--	2.5E+03	
Vinyl Chloride	75-01-4	7.2E-01	I	4.4E-06	I	3.0E-03	I	1.0E-01	I	V	M	1	--	3.9E+03	
Warfarin	81-81-2	--	--	--	--	3.0E-04	I	--	--	--	--	1	0.1	--	
Xylene, P-	106-42-3	--	--	--	--	2.0E-01	S	1.0E-01	S	V	--	1	--	3.9E+02	
Xylene, m-	108-38-3	--	--	--	--	2.0E-01	S	1.0E-01	S	V	--	1	--	3.9E+02	
Xylene, o-	95-47-6	--	--	--	--	2.0E-01	S	1.0E-01	S	V	--	1	--	4.3E+02	
Xylenes	1330-20-7	--	--	--	--	2.0E-01	I	1.0E-01	I	V	--	1	--	2.6E+02	
Zinc Phosphide	1314-84-7	--	--	--	--	3.0E-04	I	--	--	--	--	1	--	--	
Zinc and Compounds	7440-66-6	--	--	--	--	3.0E-01	I	--	--	--	--	1	--	--	
Zineb	12122-67-7	--	--	--	--	5.0E-02	I	--	--	--	--	1	0.1	--	
Zirconium	7440-67-7	--	--	--	--	8.0E-05	X	--	--	--	--	1	--	--	

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Acephate	30560-19-1	1.8E+02	PHYSP ROP	2.0E-11	5.0E-13	EPI	1.7E-06	PHYSP ROP	8.8E+01	PHYSP ROP	1.4E+00	CRC89	3.7E-02	8.0E-06	WATER 9			1.0E+01	EPI	-8.5E-01	PHYSP ROP	8.2E+05	PHYSP ROP	2.1E-04	1.1E+00	2.7E+00	4.0E-05	EPI
Acetaldehyde	75-07-0	4.4E+01	PHYSP ROP	2.7E-03	6.7E-05	PHYSP ROP	9.0E+02	PHYSP ROP	-1.2E+02	PHYSP PubChe	7.8E-01	CRC89 PubChe	1.3E-01	1.4E-05	WATER 9			1.0E+00	EPI	-3.4E-01	PHYSP ROP	1.0E+06	PHYSP ROP	1.3E-03	1.9E-01	4.5E-01	5.3E-04	EPI
Acetochlor	34256-82-1	2.7E+02	PHYSP ROP	9.1E-07	2.2E-08	PHYSP ROP	2.8E-05	PHYSP ROP	1.1E+01	PHYSP m	1.1E+00	m	2.2E-02	5.6E-06	WATER 9			3.0E+02	EPI	3.0E+00	PHYSP ROP	2.2E+02	PHYSP ROP	3.1E-02	3.4E+00	8.2E+00	5.0E-03	EPI
Acetone	67-64-1	5.8E+01	PHYSP ROP	1.4E-03	3.5E-05	PHYSP ROP	2.3E+02	PHYSP ROP	-9.5E+01	PHYSP ROP	7.8E-01	CRC89	1.1E-01	1.2E-05	WATER 9			2.4E+00	EPI	-2.4E-01	PHYSP ROP	1.0E+06	PHYSP ROP	1.5E-03	2.2E-01	5.3E-01	5.1E-04	EPI
Acetone Cyanohydrin	75-86-5	8.5E+01	PHYSP ROP	8.1E-08	2.0E-09	PHYSP ROP	3.4E-01	PHYSP ROP	-1.9E+01	PHYSP ROP	9.3E-01	CRC89	8.6E-02	1.0E-05	WATER 9			1.0E+00	EPI	-3.0E-02	PHYSP ROP	1.0E+06	PHYSP ROP	1.8E-03	3.2E-01	7.6E-01	5.0E-04	EPI
Acetonitrile	75-05-8	4.1E+01	PHYSP ROP	1.4E-03	3.5E-05	PHYSP ROP	8.9E+01	PHYSP ROP	-4.4E+01	PHYSP ROP	7.9E-01	CRC89	1.3E-01	1.4E-05	WATER 9			4.7E+00	EPI	-3.4E-01	PHYSP ROP	1.0E+06	PHYSP ROP	1.4E-03	1.8E-01	4.3E-01	5.5E-04	EPI
Acetophenone	98-86-2	1.2E+02	PHYSP ROP	4.3E-04	1.0E-05	PHYSP ROP	4.0E-01	PHYSP ROP	2.0E+01	PHYSP ROP	1.0E+00	CRC89	6.5E-02	8.7E-06	WATER 9			5.2E+01	EPI	1.6E+00	PHYSP ROP	6.1E+03	PHYSP ROP	1.6E-02	5.0E-01	1.2E+00	3.7E-03	EPI
Acetylaminofluorene, 2-	53-96-3	2.2E+02	PHYSP ROP	7.8E-09	1.9E-10	PHYSP ROP	9.4E-08	PHYSP ROP	1.9E+02	PHYSP ROP			5.2E-02	6.0E-06	WATER 9			2.2E+03	EPI	3.1E+00	PHYSP ROP	5.5E+00	PHYSP ROP	7.2E-02	1.9E+00	4.5E+00	1.2E-02	RAGSE
Acrolein	107-02-8	5.6E+01	PHYSP ROP	5.0E-03	1.2E-04	PHYSP ROP	2.7E+02	PHYSP ROP	-8.8E+01	PHYSP ROP	8.4E-01	CRC89	1.1E-01	1.2E-05	WATER 9			1.0E+00	EPI	-1.0E-02	PHYSP ROP	2.1E+05	PHYSP ROP	2.2E-03	2.2E-01	5.2E-01	7.5E-04	EPI
Acrylamide	79-06-1	7.1E+01	PHYSP ROP	7.0E-08	1.7E-09	EPI	7.0E-03	PHYSP ROP	8.5E+01	PHYSP ROP	1.2E+00	LANGE	1.1E-01	1.3E-05	WATER 9			5.7E+00	EPI	-6.7E-01	PHYSP ROP	3.9E+05	PHYSP ROP	7.3E-04	2.6E-01	6.3E-01	2.2E-04	EPI
Acrylic Acid	79-10-7	7.2E+01	PHYSP ROP	1.5E-05	3.7E-07	EPI	4.0E+00	PHYSP ROP	1.3E+01	PHYSP ROP	1.1E+00	CRC89	1.0E-01	1.2E-05	WATER 9			1.4E+00	EPI	3.5E-01	PHYSP ROP	1.0E+06	PHYSP ROP	3.4E-03	2.7E-01	6.4E-01	1.1E-03	EPI
Acrylonitrile	107-13-1	5.3E+01	PHYSP ROP	5.6E-03	1.4E-04	PHYSP ROP	1.1E+02	PHYSP ROP	-8.4E+01	PHYSP ROP	8.0E-01	CRC89	1.1E-01	1.2E-05	WATER 9			8.5E+00	EPI	2.5E-01	PHYSP ROP	7.5E+04	PHYSP ROP	3.3E-03	2.1E-01	5.0E-01	1.2E-03	EPI
Adiponitrile	111-69-3	1.1E+02	PHYSP ROP	4.9E-08	1.2E-09	EPI	6.8E-04	PHYSP ROP	1.0E+00	PHYSP ROP	9.7E-01	CRC89	7.1E-02	9.0E-06	WATER 9			2.0E+01	EPI	-3.2E-01	PHYSP ROP	8.0E+04	PHYSP ROP	9.5E-04	4.2E-01	1.0E+00	2.4E-04	EPI
Alachlor	15972-60-8	2.7E+02	PHYSP ROP	3.4E-07	8.3E-09	PHYSP ROP	2.2E-05	PHYSP ROP	4.0E+01	PHYSP ROP	1.1E+00	CRC89	2.3E-02	5.7E-06	WATER 9			3.1E+02	EPI	3.5E+00	PHYSP ROP	2.4E+02	PHYSP ROP	6.6E-02	3.4E+00	8.2E+00	1.1E-02	EPI
Aldicarb	116-06-3	1.9E+02	PHYSP ROP	5.9E-08	1.4E-09	EPI	3.5E-05	PHYSP ROP	9.9E+01	PHYSP ROP	1.2E+00	CRC89	3.2E-02	7.2E-06	WATER 9			2.5E+01	EPI	1.1E+00	PHYSP ROP	6.0E+03	PHYSP ROP	4.0E-03	1.2E+00	2.9E+00	7.6E-04	EPI
Aldicarb Sulfone	1646-88-4	2.2E+02	PHYSP ROP	1.4E-07	3.4E-09	EPI	9.0E-05	PHYSP ROP	1.4E+02	PHYSP ROP			5.2E-02	6.1E-06	WATER 9			1.0E+01	EPI	-5.7E-01	PHYSP ROP	1.0E+04	PHYSP ROP	2.1E-04	1.8E+00	4.4E+00	3.7E-05	EPI
Aldicarb sulfoxide	1646-87-3	2.1E+02	PHYSP ROP	4.0E-08	9.7E-10	EPI	1.0E-04	PHYSP ROP	7.8E+01	EPI PHYSP		PubChe	5.4E-02	6.4E-06	WATER 9			1.0E+01	EPI	-7.8E-01	PHYSP ROP	2.8E+04	PHYSP ROP	1.8E-04	1.5E+00	3.6E+00	3.3E-05	EPI
Aldrin	309-00-2	3.6E+02	PHYSP ROP	1.8E-03	4.4E-05	PHYSP ROP	1.2E-04	PHYSP ROP	1.0E+02	PHYSP ROP	1.6E+00	m	2.3E-02	5.8E-06	WATER 9			8.2E+04	EPI	6.5E+00	PHYSP ROP	1.7E-02	PHYSP ROP	2.2E+00	1.2E+01	4.8E+01	2.9E-01	EPI
Allyl Alcohol	107-18-6	5.8E+01	PHYSP ROP	2.0E-04	5.0E-06	PHYSP ROP	2.6E+01	PHYSP ROP	-1.3E+02	PHYSP ROP	8.5E-01	CRC89	1.1E-01	1.2E-05	WATER 9			1.9E+00	EPI	1.7E-01	PHYSP ROP	1.0E+06	PHYSP ROP	2.8E-03	2.2E-01	5.3E-01	9.6E-04	EPI
Allyl Chloride	107-05-1	7.7E+01	PHYSP ROP	4.5E-01	1.1E-02	EPI	3.7E+02	PHYSP ROP	-1.3E+02	PHYSP ROP	9.4E-01	CRC89	9.4E-02	1.1E-05	WATER 9			4.0E+01	EPI	1.9E+00	PHYSP ROP	3.4E+03	PHYSP ROP	3.8E-02	2.8E-01	6.8E-01	1.1E-02	EPI
Aluminum	7429-90-5	2.7E+01	CRC89				0.0E+00	NIOSH	6.6E+02	CRC89	2.7E+00	CRC89				1.5E+03	BAES							2.0E-03	1.5E-01	3.6E-01	1.0E-03	RAGSE
Aluminum Phosphide	20859-73-8	5.8E+01	PHYSP ROP						2.6E+03	CRC89	2.4E+00	CRC89												2.9E-03	2.2E-01	5.3E-01	1.0E-03	RAGSE
Ametryn	834-12-8	2.3E+02	PHYSP ROP	9.9E-08	2.4E-09	EPI	2.7E-06	PHYSP ROP	8.8E+01	PHYSP ROP			5.1E-02	6.0E-06	WATER 9			4.3E+02	EPI	3.0E+00	PHYSP ROP	2.1E+02	PHYSP ROP	4.6E-02	2.0E+00	4.7E+00	7.9E-03	EPI
Aminobiphenyl, 4-	92-67-1	1.7E+02	PHYSP ROP	6.0E-06	1.5E-07	PHYSP ROP	1.2E-04	PHYSP ROP	5.4E+01	PHYSP ROP			6.2E-02	7.3E-06	WATER 9			2.5E+03	EPI	2.9E+00	PHYSP ROP	2.2E+02	PHYSP ROP	7.0E-02	9.3E-01	2.2E+00	1.4E-02	EPI
Aminophenol, m-	591-27-5	1.1E+02	PHYSP ROP	8.1E-09	2.0E-10	PHYSP ROP	9.6E-03	PHYSP ROP	1.2E+02	PHYSP ROP			8.3E-02	9.7E-06	WATER 9			9.0E+01	EPI	2.1E-01	PHYSP ROP	2.7E+04	PHYSP ROP	2.1E-03	4.3E-01	1.0E+00	5.3E-04	EPI
Aminophenol, p-	123-30-8	1.1E+02	PHYSP ROP	1.5E-08	3.6E-10	EPI PHYSP	4.0E-05	EPI PHYSP	1.9E+02	PHYSP ROP			8.3E-02	9.7E-06	WATER 9			9.0E+01	EPI	4.0E-02	PHYSP ROP	1.6E+04	PHYSP ROP	1.6E-03	4.3E-01	1.0E+00	4.1E-04	EPI
Amitraz	33089-61-1	2.9E+02	PHYSP ROP	4.0E-04	9.9E-06	PHYSP ROP	2.0E-06	PHYSP ROP	8.6E+01	PHYSP ROP	1.1E+00	CRC89	2.2E-02	5.4E-06	WATER 9			2.6E+05	EPI	5.5E+00	PHYSP ROP	1.0E+00	PHYSP ROP	1.1E+00	4.6E+00	1.8E+01	1.6E-01	EPI
Ammonia	7664-41-7	1.7E+01	PHYSP ROP	6.6E-04	1.6E-05	PHYSP ROP	7.5E+03	PHYSP ROP	-7.8E+01	PHYSP ROP	7.0E-01	CRC89	2.3E-01	2.2E-05	WATER 9					2.3E-01	OTHER	4.8E+05	PHYSP ROP	1.6E-03	1.3E-01	3.1E-01	1.0E-03	RAGSE

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters						
Analyte	CAS No.	MW	MW Ref	H <sup>*</sup> (unitless)	HLC (atm-m <sup>3</sup> /mole)	H <sup>*</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref	
Ammonium Sulfamate	7773-06-0	1.1E+02	CRC89				0.0E+00	NIOSH	1.3E+02	CRC89	1.8E+00	PubChem											1.3E+06	PERRY	4.1E-03	4.6E-01	1.1E+00	1.0E-03	RAGSE
Amyl Alcohol, tert-	75-85-4	8.8E+01	PHYSP ROP	5.6E-04	1.4E-05	PHYSP ROP	1.7E+01	PHYSP ROP	-9.1E+00	PHYSP ROP	8.1E-01	CRC89	7.9E-02	9.1E-06	9			4.1E+00	EPI	8.9E-01	PHYSP ROP	1.1E+05	PHYSP ROP	7.1E-03	3.3E-01	7.9E-01	2.0E-03	EPI	
Aniline	62-53-3	9.3E+01	PHYSP ROP	8.3E-05	2.0E-06	PHYSP ROP	6.7E-01	PHYSP ROP	-6.0E+00	PHYSP ROP	1.0E+00	CRC89	8.3E-02	1.0E-05	9			7.0E+01	EPI	9.0E-01	PHYSP ROP	3.6E+04	PHYSP ROP	6.9E-03	3.5E-01	8.4E-01	1.9E-03	EPI	
Anthraquinone, 9,10-	84-65-1	2.1E+02	PHYSP ROP	9.6E-07	2.4E-08	EPI	1.2E-07	PHYSP ROP	2.9E+02	PHYSP ROP			5.4E-02	6.3E-06	9			5.0E+03	EPI	3.4E+00	PHYSP ROP	1.4E+00	PHYSP ROP	1.1E-01	1.5E+00	3.7E+00	1.9E-02	EPI	
Antimony (metallic)	7440-36-0	1.2E+02	PHYSP ROP				0.0E+00	NIOSH	6.3E+02	PHYSP ROP	6.7E+00	CRC89				4.5E+01	SSL							4.3E-03	5.3E-01	1.3E+00	1.0E-03	RAGSE	
Antimony Pentoxide	1314-60-9	3.2E+02	CRC89								3.8E+00	CRC89											3.0E+03	CRC89	6.9E-03	6.8E+00	1.6E+01	1.0E-03	RAGSE
Antimony Tetroxide	1332-81-6	3.1E+02	EPI								6.6E+00	CRC89													6.7E-03	5.5E+00	1.3E+01	1.0E-03	RAGSE
Antimony Trioxide	1309-64-4	2.9E+02	EPI						5.7E+02	CRC89	5.6E+00	CRC89													6.6E-03	4.5E+00	1.1E+01	1.0E-03	RAGSE
Arsenic, Inorganic	7440-38-2	7.8E+01	PHYSP ROP						2.7E+02	CRC89	4.9E+00	CRC89				2.9E+01	SSL								3.4E-03	2.9E-01	6.9E-01	1.0E-03	RAGSE
Arsine	7784-42-1	7.8E+01	PHYSP ROP						-1.2E+02	PHYSP ROP	3.2E+00	CRC89										2.0E+05	PERRY PHYSP ROP	3.4E-03	2.9E-01	6.9E-01	1.0E-03	RAGSE	
Asulam	3337-71-1	2.3E+02	PHYSP ROP	7.0E-11	1.7E-12	PHYSP ROP	1.4E-06	PHYSP ROP	1.4E+02	PHYSP ROP			5.1E-02	5.9E-06	9			2.8E+01	EPI	-2.7E-01	PHYSP ROP	5.0E+03	PHYSP ROP	3.1E-04	2.0E+00	4.9E+00	5.3E-05	EPI	
Atrazine	1912-24-9	2.2E+02	PHYSP ROP	9.6E-08	2.4E-09	EPI	2.9E-07	PHYSP ROP	1.7E+02	PHYSP ROP	1.2E+00	PubChem	2.6E-02	6.8E-06	9			2.2E+02	EPI	2.6E+00	PHYSP ROP	3.5E+01	PHYSP ROP	3.0E-02	1.7E+00	4.1E+00	5.2E-03	EPI	
Auramine	492-80-8	2.7E+02	PHYSP ROP	1.5E-07	3.6E-09	PHYSP ROP	1.3E-06	PHYSP ROP	1.4E+02	PHYSP ROP			4.6E-02	5.3E-06	9			4.5E+03	EPI	3.0E+00	PHYSP ROP	5.4E+01	PHYSP ROP	7.0E-02	3.3E+00	7.9E+00	1.1E-02	RAGSE	
Avermectin B1	65195-55-3	8.8E+02	PHYSP ROP	5.4E-26	1.3E-27	PHYSP ROP	1.5E-30	PHYSP ROP	3.5E+02	EPI			2.1E-02	2.4E-06	9			8.8E+05	EPI	4.5E+00	PHYSP ROP	3.5E-04	PHYSP ROP	2.1E-04	8.4E+03	2.0E+04	1.8E-05	EPI	
Azinphos-methyl	86-50-0	3.2E+02	PHYSP ROP	9.8E-07	2.4E-08	EPI	1.6E-06	PHYSP ROP	7.3E+01	PHYSP ROP	1.4E+00	CRC89	2.3E-02	6.0E-06	9			5.2E+01	EPI	2.8E+00	PHYSP ROP	2.1E+01	PHYSP ROP	1.2E-02	6.3E+00	1.5E+01	1.8E-03	EPI	
Azobenzene	103-33-3	1.8E+02	PHYSP ROP	5.5E-04	1.4E-05	EPI	3.6E-04	PHYSP ROP	6.8E+01	PHYSP ROP	1.2E+00	PERRY	3.6E-02	7.5E-06	9			3.8E+03	EPI	3.8E+00	PHYSP ROP	6.4E+00	PHYSP ROP	2.7E-01	1.1E+00	2.6E+00	5.1E-02	EPI	
Azodicarbonamide	123-77-3	1.2E+02	PHYSP ROP	3.4E-11	8.2E-13	EPI	1.9E-10	PHYSP ROP	2.1E+02	EPI	1.7E+00	GuideChem	8.3E-02	1.2E-05	9			7.0E+01	EPI	-1.7E+00	PHYSP ROP	3.5E+01	PHYSP ROP	1.1E-04	4.7E-01	1.1E+00	2.6E-05	EPI	
Barium	7440-39-3	1.4E+02	PHYSP ROP						7.1E+02	PHYSP ROP	3.6E+00	CRC89				4.1E+01	SSL								4.5E-03	6.3E-01	1.5E+00	1.0E-03	RAGSE
Barium Chromate	10294-40-3	2.5E+02	CRC89 PHYSP						1.4E+03	CRC89 PHYSP	4.5E+00	CRC89 ChemN										2.6E+00	CRC89 PHYSP	6.1E-03	2.8E+00	6.6E+00	1.0E-03	RAGSE	
Benfluralin	1861-40-1	3.4E+02	PHYSP ROP	1.2E-02	2.9E-04	EPI	6.5E-05	PHYSP ROP	6.6E+01	PHYSP ROP	1.3E+00	et	2.2E-02	5.5E-06	9			1.6E+04	EPI	5.3E+00	PHYSP ROP	1.0E-01	PHYSP ROP	4.8E-01	7.9E+00	1.9E+01	6.8E-02	EPI	
Benomyl	17804-35-2	2.9E+02	PHYSP ROP	2.0E-10	4.9E-12	PHYSP ROP	3.7E-09	PHYSP ROP	1.4E+02	EPI			4.3E-02	5.1E-06	9			3.4E+02	EPI	2.1E+00	PHYSP ROP	3.8E+00	PHYSP ROP	6.2E-03	4.4E+00	1.1E+01	9.4E-04	EPI	
Bensulfuron-methyl	83055-99-6	4.1E+02	PHYSP ROP	1.5E-13	3.8E-15	EPI	2.1E-14	PHYSP ROP	1.9E+02	PHYSP ROP			3.4E-02	4.0E-06	9			2.8E+01	EPI	2.2E+00	PHYSP ROP	1.2E+02	PHYSP ROP	1.7E-03	2.1E+01	5.0E+01	2.2E-04	EPI	
Bentazon	25057-89-0	2.4E+02	PHYSP ROP	8.9E-08	2.2E-09	EPI	3.5E-06	PHYSP ROP	1.4E+02	PHYSP ROP			4.9E-02	5.7E-06	9			1.0E+01	EPI	2.3E+00	PHYSP ROP	5.0E+02	PHYSP ROP	1.5E-02	2.3E+00	5.6E+00	2.5E-03	EPI	

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HL (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Benzaldehyde	100-52-7	1.1E+02	PHYSP ROP	1.1E-03	2.7E-05	PHYSP ROP	1.3E+00	PHYSP ROP	-2.6E+01	PHYSP ROP	1.0E+00	CRC89	7.4E-02	9.5E-06	WATER 9			1.1E+01	EPI	1.5E+00	PHYSP ROP	7.0E+03	PHYSP ROP	1.5E-02	4.1E-01	9.9E-01	3.8E-03	EPI
Benzene	71-43-2	7.8E+01	PHYSP ROP	2.3E-01	5.6E-03	PHYSP ROP	9.5E+01	PHYSP ROP	5.5E+00	PHYSP ROP	8.8E-01	CRC89	9.0E-02	1.0E-05	WATER 9			1.5E+02	EPI	2.1E+00	PHYSP ROP	1.8E+03	PHYSP ROP	5.1E-02	2.9E-01	6.9E-01	1.5E-02	EPI
Benzenediamine-2-methyl sulfate, 1,4-	6369-59-1	2.2E+02	EPI	8.9E-22	2.2E-23	EPI	2.9E-14	EPI	2.4E+02	EPI			5.2E-02	6.1E-06	WATER 9			3.8E+01	EPI	-3.7E+00	EPI	1.0E+06	EPI	1.7E-06	1.8E+00	4.3E+00	3.0E-07	EPI
Benzenethiol	108-98-5	1.1E+02	PHYSP ROP	1.4E-02	3.4E-04	EPI PHYSP	1.9E+00	PHYSP ROP	-1.5E+01	PHYSP ROP	1.1E+00	CRC89	7.3E-02	9.5E-06	WATER 9			2.3E+02	EPI	2.5E+00	PHYSP ROP	8.4E+02	PHYSP ROP	7.2E-02	4.4E-01	1.0E+00	1.8E-02	EPI
Benzdine	92-87-5	1.8E+02	PHYSP ROP	2.1E-09	5.2E-11	ROP	9.0E-07	ROP	1.2E+02	ROP	1.2E+00	2008	3.5E-02	7.5E-06	WATER 9			1.2E+03	EPI	1.3E+00	ROP PHYSP	3.2E+02	ROP PHYSP	5.9E-03	1.1E+00	2.7E+00	1.1E-03	EPI
Benzoic Acid	65-85-0	1.2E+02	PHYSP ROP	1.6E-06	3.8E-08	EPI	7.0E-04	ROP	1.2E+02	ROP	1.3E+00	CRC89	7.0E-02	9.8E-06	WATER 9			6.0E-01	SSL	1.9E+00	ROP PHYSP	3.4E+03	ROP PHYSP	2.4E-02	5.1E-01	1.2E+00	5.7E-03	EPI
Benzotrichloride	98-07-7	2.0E+02	PHYSP ROP	1.1E-02	2.6E-04	ROP PHYSP	4.1E-01	EPI PHYSP	-5.0E+00	PHYSP ROP	1.4E+00	CRC89	3.1E-02	7.7E-06	WATER 9			1.0E+03	EPI	3.9E+00	PHYSP ROP	5.3E+01	PHYSP ROP	2.6E-01	1.3E+00	3.1E+00	4.9E-02	EPI
Benzyl Alcohol	100-51-6	1.1E+02	PHYSP ROP	1.4E-05	3.4E-07	ROP	9.4E-02	ROP	-1.5E+01	ROP	1.0E+00	CRC89	7.3E-02	9.4E-06	WATER 9			2.1E+01	EPI	1.1E+00	ROP PHYSP	4.3E+04	ROP PHYSP	8.4E-03	4.2E-01	1.0E+00	2.1E-03	EPI
Benzyl Chloride	100-44-7	1.3E+02	PHYSP ROP	1.7E-02	4.1E-04	EPI	1.2E+00	ROP	-4.5E+01	ROP	1.1E+00	CRC89	6.3E-02	8.8E-06	WATER 9			4.5E+02	EPI	2.3E+00	PHYSP ROP	5.3E+02	ROP PHYSP	4.5E-02	5.4E-01	1.3E+00	1.0E-02	EPI
Beryllium and compounds	7440-41-7	1.1E+01	PHYSP ROP				0.0E+00	NIOSH PHYSP	9.9E+02	PHYSP ROP	1.9E+00	CRC89			WATER 9	7.9E+02	SSL				PHYSP ROP		PHYSP ROP	1.3E-03	1.2E-01	2.9E-01	1.0E-03	RAGSE
Bifenox	42576-02-3	3.4E+02	PHYSP ROP	4.4E-06	1.1E-07	EPI	1.0E-07	ROP PHYSP	8.5E+01	ROP PHYSP	1.2E+00	PubChe m	2.0E-02	5.0E-06	WATER 9			3.7E+03	EPI	4.5E+00	PHYSP ROP	4.0E-01	PHYSP ROP	1.3E-01	8.7E+00	2.1E+01	1.8E-02	EPI
Biphenthrin	82657-04-3	4.2E+02	PHYSP ROP	4.1E-05	1.0E-06	EPI	1.8E-07	ROP	6.9E+01	ROP	1.2E+00	CRC89	1.8E-02	4.5E-06	WATER 9			2.3E+06	EPI	6.0E+00	ROP PHYSP	1.0E-03	ROP PHYSP	1.4E+01	2.5E+01	1.1E+02	1.7E+00	EPI
Biphenyl, 1,1'-	92-52-4	1.5E+02	PHYSP ROP	1.3E-02	3.1E-04	ROP PHYSP	8.9E-03	ROP	6.9E+01	ROP	1.0E+00	CRC89	4.7E-02	7.6E-06	WATER 9			5.1E+03	EPI	4.0E+00	PHYSP ROP	7.5E+00	PHYSP ROP	4.5E-01	7.7E-01	1.8E+00	9.4E-02	EPI
Bis(2-chloro-1-methylethyl) ether	108-60-1	1.7E+02	PHYSP ROP	3.0E-03	7.4E-05	EPI	5.6E-01	PHYSP ROP	-9.7E+01	PHYSP ROP	1.1E+00	CRC89	4.0E-02	7.4E-06	WATER 9			8.3E+01	EPI	2.5E+00	PHYSP ROP	1.7E+03	PHYSP ROP	3.8E-02	9.5E-01	2.3E+00	7.6E-03	EPI
Bis(2-chloroethoxy)methane	111-91-1	1.7E+02	PHYSP ROP	1.6E-04	3.9E-06	EPI	1.3E-01	EPI	-3.2E+01	PHYSP ROP			6.1E-02	7.1E-06	WATER 9			1.4E+01	EPI	1.3E+00	PHYSP ROP	7.8E+03	PHYSP ROP	6.2E-03	9.8E-01	2.4E+00	1.2E-03	EPI
Bis(2-chloroethyl)ether	111-44-4	1.4E+02	PHYSP ROP	7.0E-04	1.7E-05	EPI	1.6E+00	PHYSP ROP	-5.2E+01	PHYSP ROP	1.2E+00	CRC89	5.7E-02	8.7E-06	WATER 9			3.2E+01	EPI	1.3E+00	PHYSP ROP	1.7E+04	PHYSP ROP	8.2E-03	6.6E-01	1.6E+00	1.8E-03	EPI
Bis(chloromethyl)ether	542-88-1	1.1E+02	PHYSP ROP	1.8E-01	4.4E-03	EPI PHYSP	2.9E+01	PHYSP ROP	-4.2E+01	PHYSP ROP	1.3E+00	CRC89	7.6E-02	1.0E-05	WATER 9			9.7E+00	EPI	5.7E-01	PHYSP ROP	2.2E+04	PHYSP ROP	3.5E-03	4.6E-01	1.1E+00	8.6E-04	EPI
Bisphenol A	80-05-7	2.3E+02	PHYSP ROP	4.1E-10	1.0E-11	ROP	3.9E-07	ROP	1.5E+02	ROP	1.2E+00	PubChe m	2.5E-02	6.5E-06	WATER 9			3.8E+04	EPI	3.3E+00	PHYSP ROP	1.2E+02	PHYSP ROP	7.7E-02	2.0E+00	4.8E+00	1.3E-02	EPI
Boron And Borates Only	7440-42-8	1.4E+01	EPI						2.1E+03	CRC89	2.3E+00	CRC89				3.0E+00	BAES							1.4E-03	1.3E-01	3.0E-01	1.0E-03	RAGSE
Boron Trichloride	10294-34-5	1.2E+02	PHYSP ROP	7.5E-01	1.8E-02		1.0E+00	PHYSP ROP	-1.1E+02	PHYSP ROP	4.8E+00	CRC89	1.2E-01	2.2E-05	WATER 9					1.2E+00	OTHER			4.2E-03	4.8E-01	1.1E+00	1.0E-03	RAGSE
Boron Trifluoride	7637-07-2	6.8E+01	PHYSP ROP				3.7E+04	PHYSP ROP	-1.3E+02	PHYSP ROP	2.8E+00	CRC89	1.6E-01	2.2E-05	WATER 9					2.2E-01	OTHER	3.3E+06	PHYSP ROP	3.2E-03	2.5E-01	6.1E-01	1.0E-03	RAGSE
Bromate	15541-45-4	8.0E+01	EPI													7.5E+00	BAES							3.4E-03	2.9E-01	7.1E-01	1.0E-03	RAGSE

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HL (atm- m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Bromo-2-chloroethane, 1-	107-04-0	1.4E+02	PHYSP ROP	3.7E-02	9.1E-04	PHYSP	3.3E+01	PHYSP	-1.7E+01	PHYSP	1.7E+00	CRC89	6.6E-02	1.1E-05	9			4.0E+01	EPI	1.9E+00	PHYSP ROP	6.9E+03	PHYSP ROP	2.1E-02	6.7E-01	1.6E+00	4.6E-03	EPI
Bromobenzene	108-86-1	1.6E+02	PHYSP ROP	1.0E-01	2.5E-03	PHYSP	4.2E+00	PHYSP	-3.1E+01	PHYSP	1.5E+00	CRC89	5.4E-02	9.3E-06	9			2.3E+02	EPI	3.0E+00	PHYSP ROP	4.5E+02	PHYSP ROP	9.6E-02	8.0E-01	1.9E+00	2.0E-02	EPI
Bromochloromethane	74-97-5	1.3E+02	PHYSP ROP	6.0E-02	1.5E-03	EPI	1.4E+02	PHYSP	-8.8E+01	PHYSP	1.9E+00	CRC89	7.9E-02	1.2E-05	9			2.2E+01	EPI	1.4E+00	PHYSP ROP	1.7E+04	PHYSP ROP	1.1E-02	5.6E-01	1.3E+00	2.6E-03	EPI
Bromodichloromethane	75-27-4	1.6E+02	PHYSP ROP	8.7E-02	2.1E-03	PHYSP	5.0E+01	PHYSP	-5.7E+01	PHYSP	2.0E+00	CRC89	5.6E-02	1.1E-05	9			3.2E+01	EPI	2.0E+00	PHYSP ROP	3.0E+03	PHYSP ROP	2.0E-02	8.7E-01	2.1E+00	4.0E-03	EPI
Bromoform	75-25-2	2.5E+02	PHYSP ROP	2.2E-02	5.4E-04	PHYSP	5.4E+00	EPI	8.0E+00	PHYSP	2.9E+00	CRC89	3.6E-02	1.0E-05	9			3.2E+01	EPI	2.4E+00	PHYSP ROP	3.1E+03	PHYSP ROP	1.4E-02	2.7E+00	6.6E+00	2.4E-03	EPI
Bromomethane	74-83-9	9.5E+01	PHYSP ROP	3.0E-01	7.3E-03	PHYSP	1.6E+03	PHYSP	-9.4E+01	PHYSP	1.7E+00	CRC89	1.0E-01	1.4E-05	9			1.3E+01	EPI	1.2E+00	PHYSP ROP	1.5E+04	PHYSP ROP	1.1E-02	3.6E-01	8.6E-01	2.8E-03	EPI
Bromophos	2104-96-3	3.7E+02	PHYSP ROP	8.4E-03	2.1E-04	EPI	1.3E-04	PHYSP	5.4E+01	PHYSP	1.7E+00	em	2.3E-02	6.1E-06	9			2.0E+03	EPI	5.2E+00	PHYSP ROP	3.0E-01	PHYSP ROP	3.0E-01	1.2E+01	2.8E+01	4.0E-02	EPI
Bromoxynil	1689-84-5	2.8E+02	PHYSP ROP	5.4E-09	1.3E-10	EPI	4.7E-08	PHYSP	1.9E+02	PHYSP			4.5E-02	5.2E-06	9			3.3E+02	EPI	2.8E+00	PHYSP ROP	1.3E+02	PHYSP ROP	5.0E-02	3.7E+00	9.0E+00	7.8E-03	EPI
Bromoxynil Octanoate	1689-99-2	4.0E+02	PHYSP ROP	1.3E-03	3.2E-05	EPI	4.8E-06	PHYSP	4.6E+01	PHYSP	1.5E+00	LookCh em	2.1E-02	5.4E-06	9			4.3E+03	EPI	5.4E+00	PHYSP ROP	8.0E-02	PHYSP ROP	2.6E-01	1.9E+01	4.6E+01	3.3E-02	EPI
Butadiene, 1,3-	106-99-0	5.4E+01	PHYSP ROP	3.0E+00	7.4E-02	EPI	2.1E+03	PHYSP	-1.1E+02	PHYSP	6.1E-01	CRC89	1.0E-01	1.0E-05	9			4.0E+01	EPI	2.0E+00	PHYSP ROP	7.4E+02	PHYSP ROP	4.6E-02	2.1E-01	5.1E-01	1.6E-02	EPI
Butanol, N-	71-36-3	7.4E+01	PHYSP ROP	3.6E-04	8.8E-06	PHYSP	6.7E+00	PHYSP	-9.0E+01	PHYSP	8.1E-01	CRC89	9.0E-02	1.0E-05	9			3.5E+00	EPI	8.8E-01	PHYSP ROP	6.3E+04	PHYSP ROP	7.6E-03	2.7E-01	6.6E-01	2.3E-03	EPI
Butyl alcohol, sec-	78-92-2	7.4E+01	PHYSP ROP	3.7E-04	9.1E-06	PHYSP	1.8E+01	PHYSP	-1.1E+02	PHYSP	8.1E-01	CRC89	9.0E-02	1.0E-05	9			2.9E+00	EPI	6.1E-01	PHYSP ROP	1.8E+05	PHYSP ROP	5.1E-03	2.7E-01	6.6E-01	1.5E-03	EPI
Butylate	2008-41-5	2.2E+02	PHYSP ROP	3.5E-03	8.5E-05	EPI	1.3E-02	PHYSP	6.0E+01	EPI	9.4E-01	CRC89	2.3E-02	5.8E-06	9			3.9E+02	EPI	4.2E+00	PHYSP ROP	4.5E+01	PHYSP ROP	3.1E-01	1.7E+00	4.2E+00	5.4E-02	EPI
Butylated hydroxyanisole	25013-16-5	3.6E+02	PHYSP ROP	4.8E-05	1.2E-06	PHYSP	2.5E-03	PHYSP	5.1E+01	PHYSP			3.8E-02	4.4E-06	9			8.4E+02	EPI	3.5E+00	PHYSP ROP	2.1E+02	PHYSP ROP	2.4E-01	1.1E+01	2.6E+01	3.3E-02	EPI
Butylated hydroxytoluene	128-37-0	2.2E+02	PHYSP ROP	1.7E-04	4.1E-06	PHYSP	5.2E-03	EPI	7.1E+01	PHYSP	8.9E-01	CRC89	2.3E-02	5.6E-06	9			1.5E+04	EPI	5.1E+00	PHYSP ROP	6.0E-01	PHYSP ROP	1.3E+00	1.8E+00	7.1E+00	2.2E-01	EPI
Butylbenzene, n-	104-51-8	1.3E+02	PHYSP ROP	6.5E-01	1.6E-02	EPI	1.1E+00	PHYSP	-8.8E+01	PHYSP	8.6E-01	CRC89	5.3E-02	7.3E-06	9			1.5E+03	EPI	4.4E+00	PHYSP ROP	1.2E+01	PHYSP ROP	1.0E+00	5.9E-01	2.3E+00	2.3E-01	EPI
Butylbenzene, sec-	135-98-8	1.3E+02	PHYSP ROP	7.2E-01	1.8E-02	EPI	1.8E+00	PHYSP	-8.3E+01	PHYSP	8.6E-01	LANGE	5.3E-02	7.3E-06	9			1.3E+03	EPI	4.6E+00	PHYSP ROP	1.8E+01	PHYSP ROP	1.3E+00	5.9E-01	2.3E+00	3.0E-01	EPI
Butylbenzene, tert-	98-06-6	1.3E+02	PHYSP ROP	5.4E-01	1.3E-02	EPI	2.2E+00	PHYSP	-5.8E+01	PHYSP	8.7E-01	CRC89	5.3E-02	7.4E-06	9			1.0E+03	EPI	4.1E+00	PHYSP ROP	3.0E+01	PHYSP ROP	6.6E-01	5.9E-01	2.3E+00	1.5E-01	EPI
Cacodylic Acid	75-60-5	1.4E+02	PHYSP ROP	7.4E-13	1.8E-14	PHYSP	1.0E-07	PHYSP	2.0E+02	PHYSP			7.1E-02	8.3E-06	9			4.4E+01	EPI	3.6E-01	PHYSP ROP	2.0E+06	PHYSP ROP	2.1E-03	6.2E-01	1.5E+00	4.6E-04	EPI
Cadmium (Diet)	7440-43-9	1.1E+02	PHYSP ROP				0.0E+00	NIOSH	3.2E+02	PHYSP ROP	8.7E+00	CRC89				7.5E+01	SSL							4.1E-03	4.5E-01	1.1E+00	1.0E-03	RAGSE
Cadmium (Water)	7440-43-9	1.1E+02	PHYSP ROP				0.0E+00	NIOSH	3.2E+02	PHYSP ROP	8.7E+00	CRC89				7.5E+01	SSL							4.1E-03	4.5E-01	1.1E+00	1.0E-03	RAGSE
Calcium Chromate	13765-19-0	1.6E+02	CRC89						1.0E+03	CRC89														4.8E-03	7.9E-01	1.9E+00	1.0E-03	RAGSE

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm- m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	Dia and Diw Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Caprolactam	105-60-2	1.1E+02	PHYSP ROP	1.0E-06	2.5E-08	PHYSP ROP	1.6E-03	EPI	6.9E+01	PHYSP ROP	1.0E+00	LANGE	6.9E-02	9.0E-06	9			2.5E+01	EPI	-1.9E-01	YAWS	7.7E+05	PHYSP ROP	4.1E-03	4.5E-01	1.1E+00	1.0E-03	EPI
Captafol	2425-06-1	3.5E+02	PHYSP ROP	2.0E-07	4.9E-09	EPI	1.5E-08	EPI	1.6E+02	PHYSP ROP			3.8E-02	4.5E-06	9			7.8E+02	EPI	3.8E+00	PHYSP ROP	1.4E+00	PHYSP ROP	4.1E-02	9.5E+00	2.3E+01	5.8E-03	EPI
Captan	133-06-2	3.0E+02	PHYSP ROP	2.9E-07	7.0E-09	EPI	9.0E-08	PHYSP ROP	1.8E+02	PHYSP ROP	1.7E+00	CRC89	2.6E-02	6.9E-06	9			2.5E+02	EPI	2.8E+00	PHYSP ROP	5.1E+00	PHYSP ROP	1.6E-02	5.1E+00	1.2E+01	2.3E-03	EPI
Carbaryl	63-25-2	2.0E+02	PHYSP ROP	1.3E-07	3.3E-09	EPI	1.4E-06	PHYSP ROP	1.5E+02	PHYSP ROP	1.2E+00	CRC89	2.7E-02	7.1E-06	9			3.5E+02	EPI	2.4E+00	PHYSP ROP	1.1E+02	PHYSP ROP	2.4E-02	1.4E+00	3.4E+00	4.3E-03	EPI
Carbofuran	1563-66-2	2.2E+02	PHYSP ROP	1.3E-07	3.1E-09	EPI	4.9E-06	PHYSP ROP	1.5E+02	PHYSP ROP	1.2E+00	CRC89	2.6E-02	6.6E-06	9			9.5E+01	EPI	2.3E+00	PHYSP ROP	3.2E+02	PHYSP ROP	1.8E-02	1.8E+00	4.4E+00	3.1E-03	EPI
Carbon Disulfide	75-15-0	7.6E+01	PHYSP ROP	5.9E-01	1.4E-02	PHYSP ROP	3.6E+02	PHYSP ROP	-1.1E+02	PHYSP ROP	1.3E+00	CRC89	1.1E-01	1.3E-05	9			2.2E+01	EPI	1.9E+00	PHYSP ROP	2.2E+03	PHYSP ROP	3.8E-02	2.8E-01	6.7E-01	1.1E-02	EPI
Carbon Tetrachloride	56-23-5	1.5E+02	PHYSP ROP	1.1E+00	2.8E-02	PHYSP ROP	1.2E+02	PHYSP ROP	-2.3E+01	PHYSP ROP	1.6E+00	CRC89	5.7E-02	9.8E-06	9			4.4E+01	EPI	2.8E+00	PHYSP ROP	7.9E+02	PHYSP ROP	7.8E-02	7.6E-01	1.8E+00	1.6E-02	EPI
Carbonyl Sulfide	463-58-1	6.0E+01	PHYSP ROP	2.5E+01	6.1E-01	EPI	9.4E+03	PHYSP ROP	-1.4E+02	PHYSP ROP	1.0E+00	CRC89	1.2E-01	1.3E-05	9			1.0E+00	EPI	-1.3E+00	PHYSP ROP	1.2E+03	PHYSP ROP	2.8E-04	2.3E-01	5.5E-01	9.4E-05	EPI
Carbosulfan	55285-14-8	3.8E+02	PHYSP ROP	2.1E-05	5.1E-07	EPI	3.1E-07	PHYSP ROP	1.8E+02	EPI	1.1E+00	CRC89	1.8E-02	4.4E-06	9			1.2E+04	EPI	5.6E+00	PHYSP ROP	3.0E-01	PHYSP ROP	4.3E-01	1.4E+01	3.4E+01	5.8E-02	EPI
Carboxin	5234-68-4	2.4E+02	PHYSP ROP	1.3E-08	3.2E-10	EPI	1.5E-07	PHYSP ROP	9.2E+01	PHYSP ROP			5.0E-02	5.8E-06	9			1.7E+02	EPI	2.1E+00	PHYSP ROP	1.5E+02	PHYSP ROP	1.2E-02	2.2E+00	5.2E+00	2.0E-03	EPI
Ceric oxide	1306-38-3	1.7E+02	CRC89 PHYSP					PHYSP	2.5E+03	CRC89 PHYSP	7.2E+00	CRC89												5.0E-03	9.7E-01	2.3E+00	1.0E-03	RAGSE
Chloral Hydrate	302-17-0	1.7E+02	PHYSP ROP	2.3E-07	5.7E-09	PHYSP ROP	1.5E+01	PHYSP ROP	5.7E+01	PHYSP ROP	1.9E+00	CRC89	5.4E-02	1.0E-05	9			1.0E+00	EPI	9.9E-01	PHYSP ROP	7.9E+05	PHYSP ROP	4.2E-03	8.9E-01	2.1E+00	8.4E-04	EPI
Chloramben	133-90-4	2.1E+02	PHYSP ROP	1.6E-09	3.9E-11	EPI	1.0E-07	PHYSP ROP	2.0E+02	PHYSP ROP			5.4E-02	6.4E-06	9			2.1E+01	EPI	1.9E+00	PHYSP ROP	7.0E+02	PHYSP ROP	1.1E-02	1.5E+00	3.6E+00	2.0E-03	EPI
Chloranil	118-75-2	2.5E+02	PHYSP ROP	1.3E-08	3.3E-10	PHYSP ROP	2.3E-06	PHYSP ROP	2.9E+02	PHYSP ROP			4.8E-02	5.7E-06	9			3.1E+02	EPI	2.2E+00	PHYSP ROP	2.5E+02	PHYSP ROP	1.2E-02	2.5E+00	6.0E+00	1.9E-03	EPI
Chlordane	12789-03-6	4.1E+02	PHYSP ROP	2.0E-03	4.9E-05	EPI	1.0E-05	PHYSP ROP	1.1E+02	EPI	1.6E+00	CRC89	2.1E-02	5.4E-06	9			6.8E+04	EPI	6.2E+00	EPI	5.6E-02	EPI	8.3E-01	2.1E+01	8.0E+01	1.1E-01	EPI
Chlordecone (Kepone)	143-50-0	4.9E+02	PHYSP ROP	2.2E-06	5.4E-08	EPI	2.3E-07	PHYSP ROP	3.5E+02	EPI	1.6E+00	CRC89	2.0E-02	4.9E-06	9			1.8E+04	EPI	5.4E+00	PHYSP ROP	2.7E+00	PHYSP ROP	9.3E-02	5.9E+01	1.4E+02	1.1E-02	EPI
Chlorfenvinphos	470-90-6	3.6E+02	PHYSP ROP	1.2E-06	2.9E-08	EPI	7.5E-06	PHYSP ROP	-2.0E+01	PHYSP ROP			3.8E-02	4.4E-06	9			1.3E+03	EPI	3.8E+00	PHYSP ROP	1.2E+02	PHYSP ROP	3.7E-02	1.1E+01	2.6E+01	5.1E-03	EPI
Chlorimuron, Ethyl-	90982-32-4	4.1E+02	PHYSP ROP	7.4E-14	1.8E-15	EPI	4.0E-12	PHYSP ROP	1.8E+02	PHYSP ROP			3.4E-02	4.0E-06	9			7.2E+01	EPI	2.5E+00	PHYSP ROP	1.2E+03	PHYSP ROP	2.6E-03	2.2E+01	5.3E+01	3.4E-04	EPI
Chlorine	7782-50-5	7.1E+01	PHYSP ROP	4.8E-01	1.2E-02	PHYSP ROP	5.9E+03	PHYSP ROP	-1.0E+02	PHYSP ROP	2.9E+00	CRC89	1.5E-01	2.2E-05	9	2.5E-01	BAES			8.5E-01	OTHER	6.3E+03	PHYSP ROP	3.2E-03	2.6E-01	6.3E-01	1.0E-03	RAGSE
Chlorine Dioxide	10049-04-4	6.7E+01	EPI	1.6E+00	4.0E-02	Toxnet HSDB	7.6E+02	Toxnet HSDB	-5.9E+01	CRC89	2.8E+00	CRC89	1.6E-01	2.2E-05	9									3.2E-03	2.5E-01	6.0E-01	1.0E-03	RAGSE
Chlorite (Sodium Salt)	7758-19-2	9.0E+01	EPI						1.8E+02	CRC89												6.4E+05	CRC89	3.7E-03	3.4E-01	8.1E-01	1.0E-03	RAGSE
Chloro-1,1-difluoroethane, 1-	75-68-3	1.0E+02	PHYSP ROP	2.4E+00	5.9E-02	PHYSP ROP	2.5E+03	PHYSP ROP	-1.3E+02	PHYSP ROP	1.1E+00	CRC89	8.0E-02	1.0E-05	9			4.4E+01	EPI	2.1E+00	PHYSP ROP	1.4E+03	PHYSP ROP	3.8E-02	3.8E-01	9.2E-01	9.9E-03	EPI
Chloro-1,3-butadiene, 2-	126-99-8	8.9E+01	PHYSP ROP	2.3E+00	5.6E-02	PHYSP ROP	2.2E+02	PHYSP ROP	-1.3E+02	PHYSP ROP	9.6E-01	CRC89	8.4E-02	1.0E-05	9			6.1E+01	EPI	2.5E+00	PHYSP ROP	8.7E+02	PHYSP ROP	8.6E-02	3.3E-01	7.9E-01	2.4E-02	EPI
Chloro-2-methylaniline HCl, 4-	3165-93-3	1.8E+02	PHYSP ROP	6.4E-05	1.6E-06	PHYSP ROP	4.1E-02	PHYSP ROP	1.6E+02	EPI			6.0E-02	7.0E-06	9			3.5E+02	EPI	2.3E+00	PHYSP ROP	9.5E+02	PHYSP ROP	9.2E-05	1.0E+00	2.5E+00	1.8E-05	EPI

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	FLC (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Chloro-2-methylaniline, 4-	95-69-2	1.4E+02	PHYSP ROP	8.1E-05	2.0E-06	PHYSP ROP	4.1E-02	PHYSP ROP	3.0E+01	PHYSP ROP			7.0E-02	8.2E-06	9			1.8E+02	EPI	2.3E+00	PHYSP ROP	9.5E+02	PHYSP ROP	3.7E-02	6.5E-01	1.6E+00	8.1E-03	EPI
Chloroacetaldehyde, 2-	107-20-0	7.8E+01	PHYSP ROP	9.8E-04	2.4E-05	PHYSP ROP	6.4E+01	PHYSP ROP	-1.6E+01	PHYSP ROP	1.2E+00	CRC89	1.0E-01	1.2E-05	9			1.0E+00	EPI	9.0E-02	PHYSP ROP	1.1E+05	PHYSP ROP	2.2E-03	2.9E-01	6.9E-01	6.5E-04	EPI
Chloroacetic Acid	79-11-8	9.4E+01	PHYSP ROP	3.8E-07	9.3E-09	PHYSP ROP	6.5E-02	PHYSP ROP	6.3E+01	PHYSP ROP	1.4E+00	CRC89	9.4E-02	1.2E-05	9			1.4E+00	EPI	2.2E-01	PHYSP ROP	8.6E+05	PHYSP ROP	2.4E-03	3.6E-01	8.5E-01	6.5E-04	EPI
Chloroacetophenone, 2-	532-27-4	1.5E+02	PHYSP ROP	1.4E-04	3.5E-06	PHYSP ROP	5.4E-03	PHYSP ROP	5.7E+01	PHYSP ROP	1.3E+00	CRC89	5.2E-02	8.7E-06	9			9.9E+01	EPI	1.9E+00	PHYSP ROP	1.1E+03	PERRY	1.9E-02	7.7E-01	1.9E+00	4.1E-03	EPI
Chloroaniline, p-	106-47-8	1.3E+02	PHYSP ROP	4.7E-05	1.2E-06	EPI PHYSP	2.7E-02	PHYSP ROP	7.3E+01	PHYSP ROP	1.4E+00	CRC89	7.0E-02	1.0E-05	9			1.1E+02	EPI	1.8E+00	PHYSP ROP	3.9E+03	PHYSP ROP	2.2E-02	5.4E-01	1.3E+00	5.0E-03	EPI
Chlorobenzene	108-90-7	1.1E+02	PHYSP ROP	1.3E-01	3.1E-03	PHYSP ROP	1.2E+01	PHYSP ROP	-4.5E+01	PHYSP ROP	1.1E+00	CRC89	7.2E-02	9.5E-06	9			2.3E+02	EPI	2.8E+00	PHYSP ROP	5.0E+02	PHYSP ROP	1.2E-01	4.5E-01	1.1E+00	2.8E-02	EPI
Chlorobenzilate	510-15-6	3.3E+02	PHYSP ROP	3.0E-06	7.2E-08	EPI	2.2E-06	PHYSP ROP	3.7E+01	PHYSP ROP	1.3E+00	CRC89	2.2E-02	5.5E-06	9			1.5E+03	EPI	4.7E+00	PHYSP ROP	1.3E+01	PHYSP ROP	2.3E-01	7.0E+00	1.7E+01	3.3E-02	EPI
Chlorobenzoic Acid, p-	74-11-3	1.6E+02	PHYSP ROP	3.3E-06	8.0E-08	PHYSP ROP	2.3E-03	PHYSP ROP	2.4E+02	PHYSP ROP	1.5E+00	PERRY	5.5E-02	9.5E-06	9			2.7E+01	EPI	2.7E+00	PHYSP ROP	7.2E+01	PHYSP ROP	5.8E-02	7.9E-01	1.9E+00	1.2E-02	EPI
Chlorobenzotrifluoride, 4-	98-56-6	1.8E+02	PHYSP ROP	1.4E+00	3.5E-02	PHYSP ROP	7.6E+00	PHYSP ROP	-3.3E+01	PHYSP ROP	1.3E+00	CRC89	3.8E-02	8.0E-06	9			1.6E+03	EPI	3.6E+00	PHYSP ROP	2.9E+01	PHYSP ROP	1.9E-01	1.1E+00	2.6E+00	3.8E-02	EPI
Chlorobutane, 1-	109-69-3	9.3E+01	PHYSP ROP	6.8E-01	1.7E-02	PHYSP ROP	1.0E+02	PHYSP ROP	-1.2E+02	PHYSP ROP	8.9E-01	CRC89	7.8E-02	9.3E-06	9			7.2E+01	EPI	2.6E+00	PHYSP ROP	1.1E+03	PHYSP ROP	1.0E-01	3.5E-01	8.3E-01	2.7E-02	EPI
Chlorodifluoromethane	75-45-6	8.6E+01	PHYSP ROP	1.7E+00	4.1E-02	PHYSP ROP	7.3E+03	PHYSP ROP	-1.6E+02	PHYSP ROP	1.5E+00	CRC89	1.0E-01	1.3E-05	9			3.2E+01	EPI	1.1E+00	PHYSP ROP	2.8E+03	PHYSP ROP	9.6E-03	3.2E-01	7.7E-01	2.7E-03	EPI
Chloroethanol, 2-	107-07-3	8.1E+01	PHYSP ROP	3.1E-05	7.6E-07	EPI PHYSP	7.2E+00	PHYSP ROP	-6.8E+01	PHYSP ROP	1.2E+00	CRC89	1.0E-01	1.2E-05	9			1.9E+00	EPI	3.0E-02	PHYSP ROP	1.0E+06	PHYSP ROP	2.0E-03	3.0E-01	7.1E-01	5.8E-04	EPI
Chloroform	67-66-3	1.2E+02	PHYSP ROP	1.5E-01	3.7E-03	PHYSP ROP	2.0E+02	PHYSP ROP	-6.4E+01	PHYSP ROP	1.5E+00	CRC89	7.7E-02	1.1E-05	9			3.2E+01	EPI	2.0E+00	PHYSP ROP	8.0E+03	PHYSP ROP	2.9E-02	4.9E-01	1.2E+00	6.8E-03	EPI
Chloromethane	74-87-3	5.0E+01	PHYSP ROP	3.6E-01	8.8E-03	PHYSP ROP	4.3E+03	PHYSP ROP	-9.8E+01	PHYSP ROP	9.1E-01	CRC89	1.2E-01	1.4E-05	9			1.3E+01	EPI	9.1E-01	PHYSP ROP	5.3E+03	PHYSP ROP	9.0E-03	2.0E-01	4.8E-01	3.3E-03	EPI
Chloromethyl Methyl Ether	107-30-2	8.1E+01	PHYSP ROP	1.2E-02	3.0E-04	PHYSP ROP	3.0E+01	PHYSP ROP	-1.0E+02	PHYSP ROP	1.1E+00	CRC89	9.5E-02	1.1E-05	9			5.3E+00	EPI	3.2E-01	PHYSP ROP	6.9E+04	PHYSP ROP	3.1E-03	3.0E-01	7.1E-01	9.1E-04	EPI
Chloronitrobenzene, o-	88-73-3	1.6E+02	PHYSP ROP	3.8E-04	9.3E-06	PHYSP ROP	1.8E-02	EPI	3.3E+01	PHYSP ROP	1.4E+00	CRC89	5.1E-02	8.8E-06	9			3.7E+02	EPI	2.2E+00	PHYSP ROP	4.4E+02	PHYSP ROP	3.0E-02	8.0E-01	1.9E+00	6.3E-03	EPI
Chloronitrobenzene, p-	100-00-5	1.6E+02	PHYSP ROP	2.0E-04	4.9E-06	PHYSP ROP	2.2E-02	EPI PHYSP	8.4E+01	PHYSP ROP	1.3E+00	CRC89	5.0E-02	8.5E-06	9			3.6E+02	EPI	2.4E+00	PHYSP ROP	2.3E+02	PHYSP ROP	3.8E-02	8.0E-01	1.9E+00	7.9E-03	EPI
Chlorophenol, 2-	95-57-8	1.3E+02	PHYSP ROP	4.6E-04	1.1E-05	PHYSP ROP	2.5E+00	PHYSP ROP	9.8E+00	PHYSP ROP	1.3E+00	CRC89	6.6E-02	9.5E-06	9			3.9E+02	SSL	2.2E+00	PHYSP ROP	1.1E+04	PHYSP ROP	3.5E-02	5.5E-01	1.3E+00	8.0E-03	EPI
Chloropicrin	76-06-2	1.6E+02	PHYSP ROP	8.4E-02	2.1E-03	PHYSP ROP	2.4E+01	PHYSP ROP	-6.4E+01	PHYSP ROP	1.7E+00	CRC89	5.2E-02	9.6E-06	9			4.4E+01	EPI	2.1E+00	PHYSP ROP	1.6E+03	PHYSP ROP	2.3E-02	8.8E-01	2.1E+00	4.6E-03	EPI
Chlorothalonil	1897-45-6	2.7E+02	PHYSP ROP	8.2E-05	2.0E-06	PHYSP ROP	5.7E-07	PHYSP ROP	2.5E+02	PHYSP ROP	1.7E+00	CRC89	2.8E-02	7.3E-06	9			1.0E+03	EPI	3.1E+00	PHYSP ROP	8.1E-01	PHYSP ROP	3.4E-02	3.2E+00	7.8E+00	5.4E-03	EPI
Chlorotoluene, o-	95-49-8	1.3E+02	PHYSP ROP	1.5E-01	3.6E-03	PHYSP ROP	3.4E+00	PHYSP ROP	-3.6E+01	PHYSP ROP	1.1E+00	CRC89	6.3E-02	8.7E-06	9			3.8E+02	EPI	3.4E+00	PHYSP ROP	3.7E+02	PHYSP ROP	2.5E-01	5.4E-01	1.3E+00	5.7E-02	EPI
Chlorotoluene, p-	106-43-4	1.3E+02	PHYSP ROP	1.8E-01	4.4E-03	EPI	2.7E+00	PHYSP ROP	7.5E+00	PHYSP ROP	1.1E+00	CRC89	6.3E-02	8.7E-06	9			3.8E+02	EPI	3.3E+00	PHYSP ROP	1.1E+02	PHYSP ROP	2.2E-01	5.4E-01	1.3E+00	5.0E-02	EPI
Chlorozotocin	54749-90-5	2.7E+02	PHYSP ROP	1.5E-20	3.7E-22	PHYSP ROP	4.0E-14	PHYSP ROP	1.5E+02	EPI			4.6E-02	5.4E-06	9			1.0E+01	EPI	-1.0E+00	PHYSP ROP	1.8E+03	PHYSP ROP	6.2E-05	3.2E+00	7.8E+00	9.9E-06	EPI

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Chlorpropham	101-21-3	2.1E+02	PHYSP ROP	2.3E-05	5.7E-07	EPI	1.8E-04	PHYSP ROP	4.1E+01	PHYSP ROP	1.2E+00	CRC89	2.6E-02	6.7E-06	9			3.5E+02	EPI	3.5E+00	PHYSP ROP	8.9E+01	PHYSP ROP	1.2E-01	1.7E+00	4.0E+00	2.1E-02	EPI
Chlorpyrifos	2921-88-2	3.5E+02	PHYSP ROP	1.2E-04	2.9E-06	PHYSP ROP	2.0E-05	PHYSP ROP	4.2E+01	PHYSP ROP			3.8E-02	4.5E-06	9			7.3E+03	EPI	5.0E+00	PHYSP ROP	1.1E+00	PHYSP ROP	2.4E-01	9.7E+00	2.3E+01	3.3E-02	EPI
Chlorpyrifos Methyl	5598-13-0	3.2E+02	PHYSP ROP	1.5E-04	3.8E-06	EPI	4.2E-05	PHYSP ROP	4.3E+01	PHYSP ROP			4.0E-02	4.7E-06	9			2.2E+03	EPI	4.3E+00	PHYSP ROP	4.8E+00	PHYSP ROP	1.2E-01	6.7E+00	1.6E+01	1.8E-02	EPI
Chlorsulfuron	64902-72-3	3.6E+02	PHYSP ROP	1.4E-14	3.4E-16	EPI	2.3E-11	PHYSP ROP	1.8E+02	PHYSP ROP			3.8E-02	4.4E-06	9			3.2E+02	EPI	2.0E+00	PHYSP ROP	3.1E+04	PHYSP ROP	2.4E-03	1.1E+01	2.5E+01	3.3E-04	EPI
Chlorthal-dimethyl	1861-32-1	3.3E+02	PHYSP ROP	8.9E-05	2.2E-06	EPI	2.5E-06	PHYSP ROP	1.6E+02	PHYSP ROP			4.0E-02	4.6E-06	9			5.1E+02	EPI	4.3E+00	PHYSP ROP	5.0E-01	PHYSP ROP	1.1E-01	7.6E+00	1.8E+01	1.5E-02	EPI
Chlorthiophos	60238-56-4	3.6E+02	PHYSP ROP	4.9E-05	1.2E-06	PHYSP ROP	4.0E-01	PHYSP ROP	8.6E+01	EPI			3.7E-02	4.4E-06	9			1.3E+04	EPI	5.8E+00	PHYSP ROP	3.0E-01	PHYSP ROP	7.7E-01	1.1E+01	4.3E+01	1.1E-01	EPI
Chromium(III), Insoluble Salts	16065-83-1	5.2E+01	EPI								5.2E+00	CRC89				1.8E+06	SSL							2.8E-03	2.1E-01	4.9E-01	1.0E-03	RAGSE
Chromium(VI)	18540-29-9	5.2E+01	EPI													1.9E+01	SSL							5.5E-03	2.1E-01	4.9E-01	2.0E-03	RAGSE
Chromium, Total	7440-47-3	5.2E+01	PHYSP ROP						1.9E+03	PHYSP ROP	7.2E+00	CRC89				1.8E+06	SSL							2.8E-03	2.1E-01	4.9E-01	1.0E-03	RAGSE
Clofentezine	74115-24-5	3.0E+02	PHYSP ROP	1.6E-08	3.9E-10	EPI	9.8E-10	PHYSP ROP	1.8E+02	PHYSP ROP			4.2E-02	4.9E-06	9			3.0E+04	EPI	3.1E+00	PHYSP ROP	1.0E+00	PHYSP ROP	2.4E-02	5.2E+00	1.3E+01	3.6E-03	EPI
Cobalt	7440-48-4	5.9E+01	EPI				0.0E+00	NIOSH	1.5E+03	CRC89	8.9E+00	CRC89				4.5E+01	BAES							1.2E-03	2.2E-01	5.4E-01	4.0E-04	RAGSE
Coke Oven Emissions	8007-45-2			4.5E-01	1.1E-02	Toxnet HSDB	9.5E+01	Toxnet HSDB					1.0E-01	1.2E-05	9			1.6E+04										
Copper	7440-50-8	6.4E+01	PHYSP ROP PHYSP				0.0E+00	NIOSH PHYSP	1.1E+03	PHYSP ROP PHYSP	9.0E+00	CRC89				3.5E+01	BAES							3.1E-03	2.4E-01	5.7E-01	1.0E-03	RAGSE
Cresol, m-	108-39-4	1.1E+02	PHYSP ROP	3.5E-05	8.6E-07	PHYSP ROP	1.1E-01	PHYSP ROP	1.2E+01	PHYSP ROP	1.0E+00	CRC89	7.3E-02	9.3E-06	9			3.0E+02	EPI	2.0E+00	PHYSP ROP	2.3E+04	PHYSP ROP	3.1E-02	4.2E-01	1.0E+00	7.8E-03	EPI
Cresol, o-	95-48-7	1.1E+02	PHYSP ROP	4.9E-05	1.2E-06	PHYSP ROP	3.0E-01	EPI PHYSP	3.0E+01	PHYSP ROP	1.0E+00	CRC89	7.3E-02	9.3E-06	9			3.1E+02	EPI	2.0E+00	PHYSP ROP	2.6E+04	PHYSP ROP	3.1E-02	4.2E-01	1.0E+00	7.7E-03	EPI
Cresol, p-	106-44-5	1.1E+02	PHYSP ROP	4.1E-05	1.0E-06	PHYSP ROP	1.1E-01	PHYSP ROP	3.6E+01	PHYSP ROP	1.0E+00	CRC89	7.2E-02	9.2E-06	9			3.0E+02	EPI	1.9E+00	PHYSP ROP	2.2E+04	PHYSP ROP	3.0E-02	4.2E-01	1.0E+00	7.5E-03	EPI
Cresol, p-chloro-m-	59-50-7	1.4E+02	PHYSP ROP	1.0E-04	2.5E-06	EPI	5.0E-02	PHYSP ROP	6.7E+01	PHYSP ROP			7.0E-02	8.1E-06	9			4.9E+02	EPI	3.1E+00	PHYSP ROP	3.8E+03	PHYSP ROP	1.3E-01	6.6E-01	1.6E+00	2.9E-02	EPI
Cresols	1319-77-3	3.2E+02	PHYSP ROP	2.5E-05	6.2E-07	PHYSP ROP	1.7E-01	PHYSP ROP	3.0E+01	EPI			4.0E-02	4.7E-06	9			3.1E+02	EPI	2.0E+00	PHYSP ROP	9.1E+03	PHYSP ROP	5.3E-02	6.9E+00	1.7E+01	7.7E-03	EPI
Crotonaldehyde, trans-	123-73-9	7.0E+01	PHYSP ROP	7.9E-04	1.9E-05	PHYSP ROP	3.0E+01	PHYSP ROP	-7.6E+01	PHYSP ROP	8.5E-01	CRC89	9.6E-02	1.1E-05	9			1.8E+00	EPI	6.0E-01	PHYSP ROP	1.5E+05	PHYSP ROP	5.1E-03	2.6E-01	6.2E-01	1.6E-03	EPI
Cumene	98-82-8	1.2E+02	PHYSP ROP	4.7E-01	1.2E-02	PHYSP ROP	4.5E+00	PHYSP ROP	-9.6E+01	PHYSP ROP	8.6E-01	CRC89	6.0E-02	7.9E-06	9			7.0E+02	EPI	3.7E+00	PHYSP ROP	6.1E+01	PHYSP ROP	3.8E-01	5.0E-01	1.2E+00	9.0E-02	EPI
Cupferron	135-20-6	1.6E+02	PHYSP ROP	1.5E-07	3.6E-09	PHYSP ROP	6.3E-05	PHYSP ROP	1.6E+02	PHYSP ROP			6.6E-02	7.7E-06	9			7.6E+02	EPI	-1.7E+00	PHYSP ROP	6.1E+05	PHYSP ROP	8.0E-06	7.8E-01	1.9E+00	1.7E-06	EPI
Cyanazine	21725-46-2	2.4E+02	PHYSP ROP	1.1E-10	2.6E-12	EPI	1.4E-07	PHYSP ROP	1.7E+02	PHYSP ROP			4.9E-02	5.7E-06	9			1.3E+02	EPI	2.2E+00	PHYSP ROP	1.7E+02	PHYSP ROP	1.2E-02	2.3E+00	5.6E+00	2.1E-03	EPI
Cyanides																												
~Calcium Cyanide	592-01-8	9.2E+01	PHYSP ROP																					3.7E-03	3.4E-01	8.3E-01	1.0E-03	RAGSE
~Copper Cyanide	544-92-3	9.0E+01	PHYSP ROP						4.7E+02	PHYSP ROP	2.9E+00	CRC89												3.6E-03	3.3E-01	8.0E-01	1.0E-03	RAGSE



Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm- m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	Dia and Diw Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
~Cyanide (CN-)	57-12-5	2.6E+01	PHYSP ROP	4.2E-03	1.0E-04	Ma et al 2010	3.1E+02	PHYSP ROP			7.0E-01	CHEM GUIDE	2.1E-01	2.5E-05	9	9.9E+00	SSL					9.5E+04	PHYSP ROP	2.0E-03	1.5E-01	3.5E-01	1.0E-03	RAGSE
~Cyanogen	460-19-5	5.2E+01	PHYSP ROP	2.2E-01	5.4E-03	EPI	4.3E+03	PHYSP ROP	-2.8E+01	PHYSP ROP	9.5E-01	CRC89	1.2E-01	1.4E-05	9					7.0E-02	PHYSP ROP	8.0E+03	CRC89	2.5E-03	2.1E-01	4.9E-01	8.9E-04	RAGSE
~Cyanogen Bromide	506-68-3	1.1E+02	PHYSP ROP	1.0E+00	2.5E-02	EPI	1.2E+02	PHYSP ROP	5.2E+01	PHYSP ROP	2.0E+00	CRC89	9.8E-02	1.4E-05	9									1.0E-03	4.1E-01	9.9E-01	2.6E-04	RAGSE
~Cyanogen Chloride	506-77-4	6.1E+01	PHYSP ROP	7.9E-02	1.9E-03	YAWS	1.2E+03	PHYSP ROP	-6.6E+00	PHYSP ROP	1.2E+00	CRC89	1.2E-01	1.4E-05	9							6.0E+04	PHYSP ROP	1.2E-03	2.3E-01	5.6E-01	3.9E-04	RAGSE
~Hydrogen Cyanide	74-90-8	2.7E+01	PHYSP ROP	5.4E-03	1.3E-04	PHYSP ROP	7.4E+02	PHYSP ROP	-1.3E+01	PHYSP ROP	6.9E-01	CRC89	1.7E-01	1.7E-05	9	9.9E+00	SSL			-2.5E-01	PHYSP ROP	1.0E+06	PHYSP ROP	2.0E-03	1.5E-01	3.6E-01	1.0E-03	RAGSE
~Potassium Cyanide	151-50-8	6.5E+01	PHYSP ROP				0.0E+00	NIOSH	6.3E+02	PHYSP ROP	1.6E+00	CRC89									7.2E+05	PHYSP ROP	6.2E-03	2.4E-01	5.8E-01	2.0E-03	RAGSE	
~Potassium Silver Cyanide	506-61-6	2.0E+02	PHYSP ROP																				1.1E-02	1.4E+00	3.3E+00	2.0E-03	RAGSE	
~Silver Cyanide	506-64-9	1.3E+02	PHYSP ROP						3.2E+02	PHYSP ROP	4.0E+00	CRC89									2.3E+01	PHYSP ROP	4.5E-03	5.9E-01	1.4E+00	1.0E-03	RAGSE	
~Sodium Cyanide	143-33-9	4.9E+01	PHYSP ROP				0.0E+00	NIOSH	5.6E+02	PHYSP ROP	1.6E+00	CRC89									5.8E+05	CRC89	2.7E-03	2.0E-01	4.7E-01	1.0E-03	RAGSE	
~Thiocyanates	NA																										1.0E-03	RAGSE
~Thiocyanic Acid	463-56-9	5.9E+01	PHYSP ROP				4.7E+00	PPRTV	5.0E+00	PPRTV	1.1E+00	PPRTV	1.2E-01	1.4E-05	9					5.8E-01	OTHER			3.0E-03	2.3E-01	5.4E-01	1.0E-03	RAGSE
~Zinc Cyanide	557-21-1	1.2E+02	PHYSP ROP						8.0E+01	PERRY PHYSP	1.9E+00	CRC89										4.7E+00	CRC89 PHYSP	2.5E-03	4.8E-01	1.1E+00	6.0E-04	RAGSE
Cyclohexane	110-82-7	8.4E+01	PHYSP ROP	6.1E+00	1.5E-01	PHYSP ROP	9.7E+01	PHYSP ROP	6.6E+00	PHYSP ROP	7.7E-01	CRC89	8.0E-02	9.1E-06	9			1.5E+02	EPI	3.4E+00	PHYSP ROP	5.5E+01	PHYSP ROP	3.6E-01	3.1E-01	7.5E-01	1.0E-01	EPI
Cyclohexane, 1,2,3,4,5-pentabromo-6-chloro-	87-84-3	5.1E+02	PHYSP ROP	3.9E-05	9.6E-07	PHYSP ROP	3.5E-06	PHYSP ROP	2.0E+02	CRC89			3.0E-02	3.5E-06	9			2.8E+03	EPI	4.7E+00	PHYSP ROP	5.5E-02	PHYSP ROP	2.5E-02	7.9E+01	1.9E+02	2.8E-03	EPI
Cyclohexanone	108-94-1	9.8E+01	PHYSP ROP	3.7E-04	9.0E-06	PHYSP ROP	4.3E+00	PHYSP ROP	-3.1E+01	PHYSP ROP	9.5E-01	CRC89	7.7E-02	9.4E-06	9			1.7E+01	EPI	8.1E-01	PHYSP ROP	2.5E+04	PHYSP ROP	5.8E-03	3.7E-01	8.9E-01	1.5E-03	EPI
Cyclohexene	110-83-8	8.2E+01	PHYSP ROP	1.9E+00	4.6E-02	PHYSP ROP	8.9E+01	PHYSP ROP	-1.0E+02	PHYSP ROP	8.1E-01	NIOSH	8.3E-02	9.5E-06	9			1.5E+02	EPI	2.9E+00	PHYSP ROP	2.1E+02	PHYSP ROP	1.5E-01	3.0E-01	7.3E-01	4.3E-02	EPI
Cyclohexylamine	108-91-8	9.9E+01	PHYSP ROP	1.7E-04	4.2E-06	PHYSP ROP	1.0E+01	PHYSP ROP	-1.8E+01	PHYSP ROP	8.2E-01	CRC89	7.1E-02	8.5E-06	9			3.2E+01	EPI	1.5E+00	PHYSP ROP	1.0E+06	PHYSP ROP	1.6E-02	3.8E-01	9.1E-01	4.3E-03	EPI
Cyfluthrin	68359-37-5	4.3E+02	PHYSP ROP	1.2E-06	2.9E-08	EPI	1.5E-10	PHYSP ROP	6.0E+01	PHYSP ROP			3.3E-02	3.9E-06	9			1.3E+05	EPI	6.0E+00	PHYSP ROP	3.0E-03	PHYSP ROP	4.1E-01	2.8E+01	6.8E+01	5.2E-02	EPI
Cyhalothrin	68085-85-8	4.5E+02	PHYSP ROP	6.1E-05	1.5E-06	EPI	1.5E-09	PHYSP ROP	4.9E+01	PHYSP ROP			3.2E-02	3.8E-06	9			3.4E+05	EPI	6.9E+00	PHYSP ROP	5.0E-03	PHYSP ROP	1.7E+00	3.5E+01	1.4E+02	2.1E-01	EPI
Cypermethrin	52315-07-8	4.2E+02	PHYSP ROP	1.7E-05	4.2E-07	EPI	3.1E-09	PHYSP ROP	8.1E+01	PHYSP ROP	1.3E+00	CRC89	1.9E-02	4.7E-06	9			8.0E+04	EPI	6.6E+00	PHYSP ROP	4.0E-03	PHYSP ROP	6.0E-01	2.3E+01	9.1E+01	7.7E-02	EPI
Cyromazine	66215-27-8	1.7E+02	PHYSP ROP	2.3E-12	5.7E-14	EPI	3.4E-09	PHYSP ROP	2.2E+02	PHYSP ROP			6.3E-02	7.3E-06	9			2.9E+01	EPI	-6.1E-02	PHYSP ROP	1.3E+04	PHYSP ROP	4.0E-03	9.0E-01	2.2E+00	8.0E-04	EPI

Contaminant		Molecular Weight		Volatility Parameters				Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters						
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
DDD	72-54-8	3.2E+02	PHYSP ROP	2.7E-04	6.6E-06	PHYSP ROP	1.4E-06	PHYSP ROP	1.1E+02	PHYSP ROP			4.1E-02	4.7E-06	WATER 9			1.2E+05	EPI	6.0E+00	PHYSP ROP	9.0E-02	PHYSP ROP	1.7E+00	6.5E+00	2.6E+01	2.5E-01	EPI
DDE, p,p'	72-55-9	3.2E+02	PHYSP ROP	1.7E-03	4.2E-05	PHYSP ROP	6.0E-06	EPI PHYSP	8.9E+01	PHYSP ROP	1.4E+00	LookCh em	2.3E-02	5.9E-06	WATER 9			1.2E+05	EPI	6.5E+00	PHYSP ROP	4.0E-02	PHYSP ROP	3.7E+00	6.4E+00	2.7E+01	5.5E-01	EPI
DDT	50-29-3	3.5E+02	PHYSP ROP	3.4E-04	8.3E-06	PHYSP ROP	1.6E-07	PHYSP ROP	1.1E+02	PHYSP ROP			3.8E-02	4.4E-06	WATER 9			1.7E+05	EPI	6.9E+00	PHYSP ROP	5.5E-03	PHYSP ROP	4.5E+00	1.0E+01	4.4E+01	6.3E-01	EPI
Dalapon	75-99-0	1.4E+02	PHYSP ROP	2.3E-06	5.7E-08	EPI	1.5E-01	EPI	-5.0E+00	PHYSP ROP	1.4E+00	CRC89	6.0E-02	9.4E-06	WATER 9			3.2E+00	EPI	7.8E-01	PHYSP ROP	5.0E+05	PHYSP ROP	3.7E-03	6.6E-01	1.6E+00	8.2E-04	EPI
Daminozide	1596-84-5	1.6E+02	PHYSP ROP	1.7E-08	4.2E-10	EPI	2.0E-04	PHYSP ROP	1.5E+02	PHYSP ROP			6.4E-02	7.5E-06	WATER 9			1.0E+01	EPI	-1.5E+00	PHYSP ROP	1.0E+05	PHYSP ROP	9.7E-05	8.3E-01	2.0E+00	2.0E-05	EPI
Decabromodiphenyl ether, 2,2',3,3',4,4',5,5',6,6'- (BDE-209)	1163-19-5	9.6E+02	PHYSP ROP	4.9E-07	1.2E-08	PHYSP ROP	4.7E-12	PHYSP ROP	3.1E+02	PHYSP ROP	3.0E+00	IRIS Profile	1.9E-02	4.8E-06	WATER 9			2.8E+05	EPI	1.2E+01	PHYSP ROP	1.0E-04	PHYSP ROP	8.6E+00	2.5E+04	1.1E+05	7.3E-01	EPI
Demeton	8065-48-3	5.2E+02	PHYSP ROP	1.6E-04	3.8E-06	PHYSP ROP	3.4E-04	PHYSP ROP			1.1E+00	PubChe m	1.6E-02	3.8E-06	WATER 9					3.2E+00	PHYSP ROP	6.7E+02	PHYSP ROP	6.6E-02	8.2E+01	2.0E+02	7.6E-03	RAGSE
Di(2-ethylhexyl)adipate	103-23-1	3.7E+02	PHYSP ROP	1.8E-05	4.3E-07	PHYSP ROP	8.5E-07	PHYSP ROP	-6.8E+01	PHYSP ROP	9.2E-01	CRC89	1.7E-02	4.2E-06	WATER 9			3.6E+04	EPI	6.1E+00	PHYSP ROP	7.8E-01	PHYSP ROP	2.4E+01	1.3E+01	5.8E+01	3.2E+00	EPI
Diallate	2303-16-4	2.7E+02	PHYSP ROP	1.6E-04	3.8E-06	EPI PHYSP	1.5E-04	PHYSP ROP	2.5E+01	PHYSP ROP			4.5E-02	5.3E-06	WATER 9			6.4E+02	EPI	4.5E+00	PHYSP ROP	1.4E+01	PHYSP ROP	2.9E-01	3.4E+00	8.2E+00	4.6E-02	EPI
Diazinon	333-41-5	3.0E+02	PHYSP ROP	4.6E-06	1.1E-07	PHYSP ROP	9.0E-05	PHYSP ROP	8.8E+01	EPI	1.1E+00	CRC89	2.1E-02	5.2E-06	WATER 9			3.0E+03	EPI	3.8E+00	PHYSP ROP	4.0E+01	PHYSP ROP	7.0E-02	5.3E+00	1.3E+01	1.0E-02	EPI
Dibenzothiophene	132-65-0	1.8E+02	PHYSP ROP	1.4E-03	3.4E-05	EPI	2.1E-04	EPI	9.7E+01	PHYSP ROP	1.3E+00	ChemN et	3.6E-02	7.6E-06	WATER 9			9.2E+03	EPI	4.4E+00	PHYSP ROP	1.5E+00	PHYSP ROP	6.2E-01	1.1E+00	4.5E+00	1.2E-01	EPI
Dibromo-3-chloropropane, 1,2-	96-12-8	2.4E+02	PHYSP ROP	6.0E-03	1.5E-04	EPI	5.8E-01	PHYSP ROP	6.0E+00	PHYSP ROP	2.1E+00	CRC89	3.2E-02	8.9E-06	WATER 9			1.2E+02	EPI	3.0E+00	PHYSP ROP	1.2E+03	PHYSP ROP	4.1E-02	2.2E+00	5.3E+00	6.9E-03	EPI
Dibromobenzene, 1,3-	108-36-1	2.4E+02	PHYSP ROP	5.1E-02	1.2E-03	EPI	2.7E-01	PHYSP ROP	-7.0E+00	PHYSP ROP	2.0E+00	CRC89	3.1E-02	8.5E-06	WATER 9			3.8E+02	EPI	3.8E+00	PHYSP ROP	6.8E+01	PHYSP ROP	1.4E-01	2.2E+00	5.3E+00	2.3E-02	EPI
Dibromobenzene, 1,4-	106-37-6	2.4E+02	PHYSP ROP	3.7E-02	8.9E-04	EPI	5.8E-02	PHYSP ROP	8.7E+01	PHYSP ROP	2.3E+00	CRC89	3.3E-02	9.3E-06	WATER 9			3.8E+02	EPI	3.8E+00	PHYSP ROP	2.0E+01	PHYSP ROP	1.4E-01	2.2E+00	5.3E+00	2.5E-02	EPI
Dibromochloromethane	124-48-1	2.1E+02	PHYSP ROP	3.2E-02	7.8E-04	PHYSP ROP	5.5E+00	PHYSP ROP	-2.0E+01	PHYSP ROP	2.5E+00	CRC89	3.7E-02	1.1E-05	WATER 9			3.2E+01	EPI	2.2E+00	PHYSP ROP	2.7E+03	PHYSP ROP	1.6E-02	1.5E+00	3.7E+00	2.9E-03	EPI
Dibromoethane, 1,2-	106-93-4	1.9E+02	PHYSP ROP	2.7E-02	6.5E-04	PHYSP ROP	1.1E+01	PHYSP ROP	9.9E+00	PHYSP ROP	2.2E+00	CRC89	4.3E-02	1.0E-05	WATER 9			4.0E+01	EPI	2.0E+00	PHYSP ROP	3.9E+03	PHYSP ROP	1.5E-02	1.2E+00	2.8E+00	2.8E-03	EPI
Dibromomethane (Methylene Bromide)	74-95-3	1.7E+02	PHYSP ROP	3.4E-02	8.2E-04	PHYSP ROP	4.4E+01	PHYSP ROP	-5.3E+01	PHYSP ROP	2.5E+00	CRC89	5.5E-02	1.2E-05	WATER 9			2.2E+01	EPI	1.7E+00	PHYSP ROP	1.2E+04	PHYSP ROP	1.1E-02	9.9E-01	2.4E+00	2.2E-03	EPI
Dibutyltin Compounds	NA																											
Dicamba	1918-00-9	2.2E+02	PHYSP ROP	8.9E-08	2.2E-09	EPI	1.3E-05	PHYSP ROP	1.2E+02	PHYSP ROP	1.6E+00	CRC89	2.9E-02	7.8E-06	WATER 9			2.9E+01	EPI	2.2E+00	PHYSP ROP	8.3E+03	PHYSP ROP	1.5E-02	1.8E+00	4.4E+00	2.7E-03	EPI

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HL (atm- m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event t)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Dichloro-2-butene, 1,4-	764-41-0	1.3E+02	PHYSP ROP	3.5E-01	8.5E-03	PHYSP ROP	3.0E+00	EPI	3.5E+00	PHYSP ROP	1.2E+00	LANGE	6.7E-02	9.3E-06	9			1.3E+02	EPI	2.6E+00	PHYSP ROP	5.8E+02	PHYSP ROP	7.1E-02	5.3E-01	1.3E+00	1.7E-02	EPI
Dichloro-2-butene, cis-1,4-	1476-11-5	1.3E+02	PHYSP ROP	2.7E-02	6.6E-04	EPI	4.1E+00	PHYSP ROP	-4.8E+01	PHYSP ROP	1.2E+00	CRC89	6.7E-02	9.3E-06	9			1.3E+02	EPI	2.6E+00	PHYSP ROP	5.8E+02	PHYSP ROP	7.1E-02	5.3E-01	1.3E+00	1.7E-02	EPI
Dichloro-2-butene, trans-1,4-	110-57-6	1.3E+02	PHYSP ROP	2.7E-02	6.6E-04	EPI	3.4E+00	PHYSP ROP	2.0E+00	PHYSP ROP	1.2E+00	CRC89	6.6E-02	9.3E-06	9			1.3E+02	EPI	2.6E+00	PHYSP ROP	8.5E+02	PHYSP ROP	7.1E-02	5.3E-01	1.3E+00	1.7E-02	EPI
Dichloroacetic Acid	79-43-6	1.3E+02	PHYSP ROP	3.4E-07	8.4E-09	PHYSP ROP	1.8E-01	PHYSP ROP	1.4E+01	PHYSP ROP	1.6E+00	CRC89	7.2E-02	1.1E-05	9			2.3E+00	EPI	9.2E-01	PHYSP ROP	1.0E+06	PHYSP ROP	5.3E-03	5.5E-01	1.3E+00	1.2E-03	EPI
Dichlorobenzene, 1,2-	95-50-1	1.5E+02	PHYSP ROP	7.8E-02	1.9E-03	PHYSP ROP	1.4E+00	PHYSP ROP	-1.7E+01	PHYSP ROP	1.3E+00	CRC89	5.6E-02	8.9E-06	9			3.8E+02	EPI	3.4E+00	PHYSP ROP	1.6E+02	PHYSP ROP	2.1E-01	7.0E-01	1.7E+00	4.5E-02	EPI
Dichlorobenzene, 1,4-	106-46-7	1.5E+02	PHYSP ROP	9.9E-02	2.4E-03	PHYSP ROP	1.7E+00	PHYSP ROP	5.2E+01	PHYSP ROP	1.2E+00	CRC89	5.5E-02	8.7E-06	9			3.8E+02	EPI	3.4E+00	PHYSP ROP	8.1E+01	PHYSP ROP	2.1E-01	7.0E-01	1.7E+00	4.5E-02	EPI
Dichlorobenzidine, 3,3'-	91-94-1	2.5E+02	PHYSP ROP	1.2E-09	2.8E-11	PHYSP ROP	2.6E-07	PHYSP ROP	1.3E+02	PHYSP ROP			4.7E-02	5.5E-06	9			3.2E+03	EPI	3.5E+00	PHYSP ROP	3.1E+00	PHYSP ROP	7.8E-02	2.8E+00	6.6E+00	1.3E-02	EPI
Dichlorobenzophenone, 4,4'-	90-98-2	2.5E+02	PHYSP ROP	4.4E-05	1.1E-06	PHYSP ROP	6.4E-06	PHYSP ROP	1.5E+02	PHYSP ROP	1.5E+00	CRC89	2.6E-02	6.9E-06	9			2.9E+03	EPI	4.4E+00	PHYSP ROP	8.3E-01	PHYSP ROP	3.3E-01	2.7E+00	6.4E+00	5.4E-02	EPI
Dichlorodifluoromethane	75-71-8	1.2E+02	PHYSP ROP	1.4E+01	3.4E-01	PHYSP ROP	4.8E+03	PHYSP ROP	-1.6E+02	PHYSP ROP	1.5E+00	PERRY	7.6E-02	1.1E-05	9			4.4E+01	EPI	2.2E+00	PHYSP ROP	2.8E+02	PHYSP ROP	3.8E-02	5.0E-01	1.2E+00	9.0E-03	EPI
Dichloroethane, 1,1-	75-34-3	9.9E+01	PHYSP ROP	2.3E-01	5.6E-03	PHYSP ROP	2.3E+02	PHYSP ROP	-9.7E+01	PHYSP ROP	1.2E+00	CRC89	8.4E-02	1.1E-05	9			3.2E+01	EPI	1.8E+00	PHYSP ROP	5.0E+03	PHYSP ROP	2.6E-02	3.8E-01	9.0E-01	6.8E-03	EPI
Dichloroethane, 1,2-	107-06-2	9.9E+01	PHYSP ROP	4.8E-02	1.2E-03	PHYSP ROP	7.9E+01	PHYSP ROP	-3.6E+01	PHYSP ROP	1.2E+00	CRC89	8.6E-02	1.1E-05	9			4.0E+01	EPI	1.5E+00	PHYSP ROP	8.6E+03	PHYSP ROP	1.6E-02	3.8E-01	9.0E-01	4.2E-03	EPI
Dichloroethylene, 1,1-	75-35-4	9.7E+01	PHYSP ROP	1.1E+00	2.6E-02	PHYSP ROP	6.0E+02	PHYSP ROP	-1.2E+02	PHYSP ROP	1.2E+00	CRC89	8.6E-02	1.1E-05	9			3.2E+01	EPI	2.1E+00	PHYSP ROP	2.4E+03	PHYSP ROP	4.4E-02	3.7E-01	8.8E-01	1.2E-02	EPI
Dichloroethylene, 1,2-cis-	156-59-2	9.7E+01	PHYSP ROP	1.7E-01	4.1E-03	PHYSP ROP	2.0E+02	PHYSP ROP	-8.0E+01	PHYSP ROP	1.3E+00	CRC89	8.8E-02	1.1E-05	9			4.0E+01	EPI	1.9E+00	PHYSP ROP	6.4E+03	PHYSP ROP	4.2E-02	3.7E-01	8.8E-01	1.1E-02	EPI
Dichloroethylene, 1,2-trans-	156-60-5	9.7E+01	PHYSP ROP	3.8E-01	9.4E-03	PHYSP ROP	3.3E+02	EPI	-5.0E+01	PHYSP ROP	1.3E+00	CRC89	8.8E-02	1.1E-05	9			4.0E+01	EPI	2.1E+00	PHYSP ROP	4.5E+03	PHYSP ROP	4.2E-02	3.7E-01	8.8E-01	1.1E-02	EPI
Dichlorophenol, 2,4-	120-83-2	1.6E+02	PHYSP ROP	1.8E-04	4.3E-06	EPI	9.0E-02	PHYSP ROP	4.5E+01	PHYSP ROP	1.4E+00	PERRY	4.9E-02	8.7E-06	9			1.5E+02	SSL	3.1E+00	PHYSP ROP	5.6E+03	PHYSP ROP	1.0E-01	8.6E-01	2.1E+00	2.1E-02	EPI
Dichlorophenoxy Acetic Acid, 2,4-	94-75-7	2.2E+02	PHYSP ROP	1.4E-06	3.5E-08	EPI	8.3E-05	PHYSP ROP	1.4E+02	PHYSP ROP	1.4E+00	PubChe m	2.8E-02	7.3E-06	9			3.0E+01	EPI	2.8E+00	PHYSP ROP	6.8E+02	PHYSP ROP	3.8E-02	1.8E+00	4.4E+00	6.6E-03	EPI
Dichlorophenoxy)butyric Acid, 4-(2,4-	94-82-6	2.5E+02	PHYSP ROP	9.4E-08	2.3E-09	PHYSP ROP	1.1E-05	PHYSP ROP	1.2E+02	PHYSP ROP	1.4E+00	ChemN et	2.6E-02	6.7E-06	9			3.7E+02	PubChe m	3.5E+00	PHYSP ROP	4.6E+01	PHYSP ROP	8.4E-02	2.6E+00	6.3E+00	1.4E-02	EPI

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters						
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref	
Dichloropropane, 1,2-	78-87-5	1.1E+02	PHYSP ROP	1.2E-01	2.8E-03	PHYSP ROP	5.3E+01	PHYSP ROP	-1.0E+02	PHYSP ROP	1.2E+00	PERRY	7.3E-02	9.7E-06	WATER 9			6.1E+01	EPI	2.0E+00	PHYSP ROP	2.8E+03	PHYSP ROP	3.1E-02	4.5E-01	1.1E+00	7.5E-03	EPI	
Dichloropropane, 1,3-	142-28-9	1.1E+02	PHYSP ROP	4.0E-02	9.8E-04	PHYSP ROP	1.8E+01	PHYSP ROP	-1.0E+02	PHYSP ROP	1.2E+00	CRC89	7.4E-02	9.8E-06	WATER 9			7.2E+01	EPI	2.0E+00	PHYSP ROP	2.8E+03	PHYSP ROP	3.2E-02	4.5E-01	1.1E+00	7.8E-03	EPI	
Dichloropropanol, 2,3-	616-23-9	1.3E+02	PHYSP ROP	1.5E-07	3.6E-09	PHYSP ROP	1.8E-01	PHYSP ROP	-2.5E+01	EPI	1.4E+00	CRC89	6.8E-02	9.9E-06	WATER 9			5.6E+00	EPI	7.8E-01	PHYSP ROP	6.4E+04	PHYSP ROP	4.3E-03	5.5E-01	1.3E+00	9.8E-04	EPI	
Dichloropropene, 1,3-	542-75-6	1.1E+02	PHYSP ROP	1.5E-01	3.6E-03	PHYSP ROP	3.4E+01	PHYSP ROP	-5.0E+01	PHYSP ROP	1.2E+00	LANGE	7.6E-02	1.0E-05	WATER 9			7.2E+01	EPI	2.0E+00	PHYSP ROP	2.8E+03	PHYSP ROP	3.4E-02	4.4E-01	1.1E+00	8.3E-03	EPI	
Dichlorvos	62-73-7	2.2E+02	PHYSP ROP	2.4E-05	5.7E-07	EPI PHYSP ROP	1.6E-02	PHYSP ROP	-6.0E+01	PHYSP ROP	1.4E+00	CRC89	2.8E-02	7.3E-06	WATER 9			5.4E+01	EPI	1.4E+00	PHYSP ROP	8.0E+03	PHYSP ROP	4.6E-03	1.8E+00	4.4E+00	8.0E-04	EPI	
Dicrotophos	141-66-2	2.4E+02	PHYSP ROP	2.1E-09	5.0E-11	PHYSP ROP	1.6E-04	PHYSP ROP	7.9E+01	EPI	1.2E+00	CRC89	2.5E-02	6.4E-06	WATER 9			1.7E+01	EPI	0.0E+00	PHYSP ROP	1.0E+06	PHYSP ROP	4.3E-04	2.2E+00	5.4E+00	7.3E-05	EPI	
Dicyclopentadiene	77-73-6	1.3E+02	PHYSP ROP	2.6E+00	6.3E-02	PHYSP ROP	2.3E+00	EPI	-1.0E+00	PHYSP ROP	9.3E-01	LANGE	5.6E-02	7.8E-06	WATER 9			1.5E+03	EPI	3.2E+00	PHYSP ROP	2.6E+01	PHYSP ROP	1.6E-01	5.8E-01	1.4E+00	3.6E-02	EPI	
Dieldrin	60-57-1	3.8E+02	PHYSP ROP	4.1E-04	1.0E-05	PHYSP ROP	5.9E-06	PHYSP ROP	1.8E+02	PHYSP ROP	1.8E+00	CRC89	2.3E-02	6.0E-06	WATER 9			2.0E+04	EPI	5.4E+00	PHYSP ROP	2.0E-01	PHYSP ROP	2.4E-01	1.4E+01	3.4E+01	3.3E-02	EPI	
Diesel Engine Exhaust	NA																												
Diethanolamine	111-42-2	1.1E+02	PHYSP ROP	1.6E-09	3.9E-11	EPI	2.8E-04	PHYSP ROP	2.8E+01	PHYSP ROP	1.1E+00	CRC89	7.7E-02	9.8E-06	WATER 9			1.0E+00	EPI	-1.4E+00	PHYSP ROP	1.0E+06	PHYSP ROP	1.8E-04	4.1E-01	9.8E-01	4.5E-05	EPI	
Diethylene Glycol Monobutyl Ether	112-34-5	1.6E+02	PHYSP ROP	2.9E-07	7.2E-09	PHYSP ROP	2.2E-02	PHYSP ROP	-6.8E+01	PHYSP ROP	9.6E-01	CRC89	4.1E-02	7.0E-06	WATER 9			1.0E+01	EPI	5.6E-01	PHYSP ROP	1.0E+06	PHYSP ROP	2.2E-03	8.5E-01	2.0E+00	4.5E-04	EPI	
Diethylene Glycol Monoethyl Ether	111-90-0	1.3E+02	PHYSP ROP	9.1E-07	2.2E-08	EPI	1.3E-01	PHYSP ROP	-7.6E+01	PHYSP ROP	9.9E-01	CRC89	5.6E-02	8.0E-06	WATER 9			1.0E+00	EPI	-5.4E-01	PHYSP ROP	1.0E+06	PHYSP ROP	5.4E-04	5.9E-01	1.4E+00	1.2E-04	EPI	
Diethylformamide	617-84-5	1.0E+02	PHYSP ROP	5.3E-06	1.3E-07	PHYSP ROP	1.2E+00	EPI	-7.6E+00	EPI	9.1E-01	CRC89	7.3E-02	9.0E-06	WATER 9			2.1E+00	EPI	5.0E-02	PHYSP ROP	1.0E+06	PHYSP ROP	1.8E-03	3.9E-01	9.3E-01	4.6E-04	EPI	
Diethylstilbestrol	56-53-1	2.7E+02	PHYSP ROP	2.4E-10	5.8E-12	PHYSP ROP	1.4E-08	PHYSP ROP	1.7E+02	PHYSP ROP			4.6E-02	5.3E-06	WATER 9			2.7E+05	EPI	5.1E+00	PHYSP ROP	1.2E+01	PHYSP ROP	7.2E-01	3.3E+00	1.3E+01	1.1E-01	EPI	
Difenzoquat	43222-48-6	3.6E+02	PHYSP ROP				4.1E-12	PHYSP ROP	1.6E+02	PHYSP ROP			3.8E-02	4.4E-06	WATER 9			7.8E+04	EPI	6.5E-01	PHYSP ROP	8.2E+05	PHYSP ROP	2.9E-04	1.1E+01	2.6E+01	4.0E-05	EPI	
Diflubenzuron	35367-38-5	3.1E+02	PHYSP ROP	1.9E-07	4.6E-09	EPI	9.0E-10	PHYSP ROP	2.4E+02	PHYSP ROP			4.1E-02	4.8E-06	WATER 9			4.6E+02	EPI	3.9E+00	PHYSP ROP	8.0E-02	PHYSP ROP	7.3E-02	5.8E+00	1.4E+01	1.1E-02	EPI	
Difluoroethane, 1,1-	75-37-6	6.6E+01	PHYSP ROP	8.3E-01	2.0E-02	PHYSP ROP	4.6E+03	PHYSP ROP	-1.2E+02	PHYSP ROP	9.0E-01	CRC89	1.0E-01	1.2E-05	WATER 9			3.2E+01	EPI	7.5E-01	PHYSP ROP	3.2E+03	PHYSP ROP	6.6E-03	2.5E-01	5.9E-01	2.1E-03	EPI	
Dihydrosafrole	94-58-6	1.6E+02	PHYSP ROP	5.0E-04	1.2E-05	PHYSP ROP	5.6E-02	PHYSP ROP	4.4E+01	EPI	1.1E+00	PubChe m	4.3E-02	7.4E-06	WATER 9			2.1E+02	EPI	3.6E+00	PHYSP ROP	5.7E+01	PHYSP ROP	2.2E-01	8.7E-01	2.1E+00	4.5E-02	EPI	
Diisopropyl Ether	108-20-3	1.0E+02	PHYSP ROP	1.0E-01	2.6E-03	PHYSP ROP	1.5E+02	PHYSP ROP	-8.7E+01	PHYSP ROP	7.2E-01	CRC89	6.5E-02	7.8E-06	WATER 9			2.3E+01	EPI	1.5E+00	PHYSP ROP	8.8E+03	PHYSP ROP	1.7E-02	3.9E-01	9.4E-01	4.3E-03	EPI	
Diisopropyl Methylphosphonate	1445-75-6	1.8E+02	PHYSP ROP	1.8E-03	4.4E-05	EPI	2.3E-01	PHYSP ROP	-2.4E+01	EPI	9.8E-01	ATSDR Profile	3.4E-02	6.6E-06	WATER 9			4.2E+01	EPI	1.0E+00	PHYSP ROP	1.5E+03	PHYSP ROP	3.8E-03	1.1E+00	2.6E+00	7.4E-04	EPI	
Dimethipin	55290-64-7	2.1E+02	PHYSP ROP	9.4E-10	2.3E-11	EPI	3.8E-07	PHYSP ROP	1.7E+02	PHYSP ROP			5.4E-02	6.3E-06	WATER 9			1.0E+01	EPI	-1.7E-01	PHYSP ROP	4.6E+03	PHYSP ROP	4.5E-04	1.6E+00	3.8E+00	8.0E-05	EPI	
Dimethoate	60-51-5	2.3E+02	PHYSP ROP	9.9E-09	2.4E-10	EPI	1.9E-05	PHYSP ROP	5.2E+01	PHYSP ROP	1.3E+00	CRC89	2.6E-02	6.7E-06	WATER 9			1.3E+01	EPI	7.8E-01	PHYSP ROP	2.3E+04	PHYSP ROP	1.6E-03	2.0E+00	4.9E+00	2.7E-04	EPI	

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm- m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	Dia and Diw Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Dimethoxybenzidine, 3,3'-	119-90-4	2.4E+02	PHYSP ROP	1.9E-09	4.7E-11	PHYSP ROP	1.3E-07	PHYSP ROP	1.4E+02	PHYSP ROP			4.9E-02	5.7E-06	9			5.1E+02	EPI	1.8E+00	PHYSP ROP	6.0E+01	PHYSP ROP	6.4E-03	2.5E+00	5.9E+00	1.1E-03	EPI
Dimethyl methylphosphonate	756-79-6	1.2E+02	PHYSP ROP	5.6E-06	1.4E-07	PHYSP ROP	8.3E-01	PHYSP ROP	-4.8E+01	EPI	1.2E+00	CRC89	6.7E-02	9.2E-06	9			5.4E+00	EPI	-6.1E-01	PHYSP ROP	1.0E+06	PHYSP ROP	5.3E-04	5.2E-01	1.2E+00	1.2E-04	EPI
Dimethylamino azobenzene [p-]	60-11-7	2.3E+02	PHYSP ROP	1.6E-08	4.0E-10	PHYSP ROP	7.0E-08	EPI	1.2E+02	PHYSP ROP			5.1E-02	6.0E-06	9			2.0E+03	EPI	4.6E+00	PHYSP ROP	2.3E-01	PHYSP ROP	5.4E-01	1.9E+00	4.6E+00	9.4E-02	EPI
Dimethylaniline HCl, 2,4-	21436-96-4	1.2E+02	PHYSP ROP	9.5E-05	2.3E-06	PHYSP ROP	1.8E-01	PHYSP ROP	1.6E+02	EPI			7.8E-02	9.1E-06	9			3.5E+02	EPI	2.2E+00	PHYSP ROP	3.7E+03	PHYSP ROP	8.6E-05	5.0E-01	1.2E+00	2.0E-05	EPI
Dimethylaniline, 2,4-	95-68-1	1.2E+02	PHYSP ROP	1.0E-04	2.5E-06	PHYSP ROP	1.3E-01	PHYSP ROP	-1.4E+01	PHYSP ROP	9.7E-01	CRC89	6.3E-02	8.4E-06	9			1.8E+02	EPI	1.7E+00	PHYSP ROP	6.1E+03	PHYSP ROP	1.8E-02	5.0E-01	1.2E+00	4.3E-03	EPI
Dimethylaniline, N,N-	121-69-7	1.2E+02	PHYSP ROP	2.3E-03	5.7E-05	EPI	7.0E-01	PHYSP ROP	2.5E+00	PHYSP ROP	9.6E-01	CRC89	6.3E-02	8.3E-06	9			7.9E+01	EPI	2.3E+00	PHYSP ROP	1.5E+03	PHYSP ROP	4.7E-02	5.0E-01	1.2E+00	1.1E-02	EPI
Dimethylbenzidine, 3,3'-	119-93-7	2.1E+02	PHYSP ROP	2.6E-09	6.3E-11	PHYSP ROP	6.9E-07	PHYSP ROP	1.3E+02	PHYSP ROP			5.3E-02	6.2E-06	9			3.2E+03	EPI	2.3E+00	PHYSP ROP	1.3E+03	PHYSP ROP	2.0E-02	1.6E+00	3.9E+00	3.6E-03	EPI
Dimethylformamide	68-12-2	7.3E+01	PHYSP ROP	3.0E-06	7.4E-08	PHYSP ROP	3.9E+00	PHYSP ROP	-6.0E+01	PHYSP ROP	9.4E-01	CRC89	9.7E-02	1.1E-05	9			1.0E+00	EPI	-1.0E+00	PHYSP ROP	1.0E+06	PHYSP ROP	4.3E-04	2.7E-01	6.5E-01	1.3E-04	EPI
Dimethylhydrazine, 1,1-	57-14-7	6.0E+01	PHYSP ROP	5.3E-04	1.3E-05	PHYSP ROP	1.6E+02	PHYSP ROP	-5.8E+01	PHYSP ROP	7.9E-01	CRC89	1.0E-01	1.1E-05	9			1.2E+01	EPI	-1.2E+00	PHYSP ROP	1.0E+06	PHYSP ROP	2.2E-04	2.3E-01	5.5E-01	7.3E-05	RAGSE
Dimethylhydrazine, 1,2-	540-73-8	6.0E+01	PHYSP ROP	2.8E-06	7.0E-08	PHYSP ROP	7.0E+01	PHYSP ROP	-9.0E+00	PHYSP ROP	8.3E-01	CRC89	1.1E-01	1.2E-05	9			1.5E+01	EPI	-5.4E-01	PHYSP ROP	1.0E+06	PHYSP ROP	9.5E-04	2.3E-01	5.5E-01	3.2E-04	EPI
Dimethylphenol, 2,4-	105-67-9	1.2E+02	PHYSP ROP	3.9E-05	9.5E-07	PHYSP ROP	1.0E-01	PHYSP ROP	2.5E+01	PHYSP ROP	9.7E-01	CRC89	6.2E-02	8.3E-06	9			4.9E+02	EPI	2.3E+00	PHYSP ROP	7.9E+03	PHYSP ROP	4.6E-02	5.1E-01	1.2E+00	1.1E-02	EPI
Dimethylphenol, 2,6-	576-26-1	1.2E+02	PHYSP ROP	2.7E-04	6.7E-06	PHYSP ROP	1.7E-01	EPI	4.6E+01	PHYSP ROP			7.7E-02	9.0E-06	9			5.0E+02	EPI	2.4E+00	PHYSP ROP	6.1E+03	PHYSP ROP	5.1E-02	5.1E-01	1.2E+00	1.2E-02	EPI
Dimethylphenol, 3,4-	95-65-8	1.2E+02	PHYSP ROP	1.7E-05	4.2E-07	PHYSP ROP	3.6E-02	EPI	6.1E+01	PHYSP ROP	9.8E-01	CRC89	6.3E-02	8.4E-06	9			4.9E+02	EPI	2.2E+00	PHYSP ROP	4.8E+03	PHYSP ROP	4.2E-02	5.1E-01	1.2E+00	9.8E-03	EPI
Dimethylvinylchloride	513-37-1	9.1E+01	PHYSP ROP	4.8E-02	1.2E-03	CRC89	2.1E+02	PHYSP ROP	-1.0E+02	EPI	9.2E-01	CRC89	8.1E-02	9.7E-06	9			6.1E+01	EPI	2.6E+00	PHYSP ROP	1.0E+03	PHYSP ROP	9.3E-02	3.4E-01	8.1E-01	2.5E-02	EPI
Dinitro-o-cresol, 4,6-	534-52-1	2.0E+02	PHYSP ROP	5.7E-05	1.4E-06	PHYSP ROP	1.2E-04	PHYSP ROP	8.7E+01	PHYSP ROP			5.6E-02	6.5E-06	9			7.5E+02	EPI	2.1E+00	PHYSP ROP	2.0E+02	PHYSP ROP	1.7E-02	1.4E+00	3.2E+00	3.2E-03	EPI
Dinitro-o-cyclohexyl Phenol, 4,6-	131-89-5	2.7E+02	PHYSP ROP	2.3E-06	5.5E-08	PHYSP ROP	4.2E-08	PHYSP ROP	1.1E+02	PHYSP ROP			4.6E-02	5.4E-06	9			1.7E+04	EPI	4.1E+00	PHYSP ROP	1.5E+01	PHYSP ROP	1.7E-01	3.3E+00	7.8E+00	2.8E-02	EPI
Dinitrobenzene, 1,2-	528-29-0	1.7E+02	PHYSP ROP	2.2E-06	5.3E-08	EPI	4.6E-05	EPI	1.2E+02	PHYSP ROP	1.3E+00	CRC89	4.5E-02	8.3E-06	9			3.6E+02	EPI	1.7E+00	PHYSP ROP	1.3E+02	PHYSP ROP	1.2E-02	9.2E-01	2.2E+00	2.4E-03	EPI
Dinitrobenzene, 1,3-	99-65-0	1.7E+02	PHYSP ROP	2.0E-06	4.9E-08	PHYSP ROP	9.0E-04	EPI	9.0E+01	PHYSP ROP	1.6E+00	CRC89	4.8E-02	9.2E-06	9			3.5E+02	EPI	1.5E+00	PHYSP ROP	5.3E+02	PHYSP ROP	8.7E-03	9.2E-01	2.2E+00	1.7E-03	EPI

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm- m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event t)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Dinitrobenzene, 1,4-	100-25-4	1.7E+02	PHYSP ROP	3.4E-06	8.4E-08	PHYSP ROP	2.6E-05	PHYSP ROP	1.7E+02	PHYSP ROP	1.6E+00	CRC89	4.9E-02	9.4E-06	9			3.5E+02	EPI	1.5E+00	PHYSP ROP	6.9E+01	PHYSP ROP	8.3E-03	9.2E-01	2.2E+00	1.7E-03	EPI
Dinitrophenol, 2,4-	51-28-5	1.8E+02	PHYSP ROP	3.5E-06	8.6E-08	PHYSP ROP	3.9E-04	PHYSP ROP	1.1E+02	PHYSP ROP	1.7E+00	CRC89	4.1E-02	9.1E-06	9			4.6E+02	EPI	1.7E+00	PHYSP ROP	2.8E+03	PHYSP ROP	9.8E-03	1.1E+00	2.7E+00	1.9E-03	EPI
Dinitrotoluene Mixture, 2,4/2,6-	NA	1.8E+02	EPI	1.6E-05	4.0E-07	EPI	2.2E-03	EPI	6.0E+01	EPI			5.9E-02	6.9E-06	9			5.9E+02	EPI	2.2E+00	EPI	2.7E+02	EPI	2.2E-02	1.1E+00	2.6E+00	4.2E-03	EPI
Dinitrotoluene, 2,4-	121-14-2	1.8E+02	PHYSP ROP	2.2E-06	5.4E-08	PHYSP ROP	1.5E-04	PHYSP ROP	7.1E+01	PHYSP ROP	1.3E+00	CRC89	3.8E-02	7.9E-06	9			5.8E+02	EPI	2.0E+00	PHYSP ROP	2.0E+02	PHYSP ROP	1.6E-02	1.1E+00	2.6E+00	3.1E-03	EPI
Dinitrotoluene, 2,6-	606-20-2	1.8E+02	PHYSP ROP	3.1E-05	7.5E-07	EPI	5.7E-04	PHYSP ROP	6.6E+01	PHYSP ROP	1.3E+00	CRC89	3.7E-02	7.8E-06	9			5.9E+02	EPI	2.1E+00	PHYSP ROP	1.8E+02	PHYSP ROP	1.9E-02	1.1E+00	2.6E+00	3.7E-03	EPI
Dinitrotoluene, 2-Amino-4,6-	35572-78-2	2.0E+02	PHYSP ROP	1.3E-09	3.3E-11	PHYSP ROP	1.1E-05	PHYSP ROP	1.7E+02	PHYSP ROP			5.6E-02	6.6E-06	9			2.8E+02	EPI	1.8E+00	PHYSP ROP	1.2E+03	PHYSP ROP	1.1E-02	1.3E+00	3.2E+00	2.0E-03	EPI
Dinitrotoluene, 4-Amino-2,6-	19406-51-0	2.0E+02	PHYSP ROP	1.3E-09	3.3E-11	PHYSP ROP	1.1E-05	PHYSP ROP	1.7E+02	PHYSP ROP			5.6E-02	6.6E-06	9			2.8E+02	EPI	1.8E+00	PHYSP ROP	1.2E+03	PHYSP ROP	1.1E-02	1.3E+00	3.2E+00	2.0E-03	EPI
Dinitrotoluene, Technical grade	25321-14-6	5.5E+02	PHYSP ROP PHYSP	3.8E-06	9.3E-08	PHYSP ROP	4.0E-04	PHYSP ROP	6.0E+01	EPI PHYSP			2.8E-02	3.3E-06	9			5.9E+02	EPI	2.2E+00	PHYSP ROP PHYSP	2.7E+02	PHYSP ROP PHYSP	3.7E-02	1.2E+02	2.9E+02	4.2E-03	EPI
Dinoseb	88-85-7	2.4E+02	PHYSP ROP	1.9E-05	4.6E-07	EPI	7.5E-05	PHYSP ROP	4.0E+01	PHYSP ROP	1.3E+00	CRC89	2.5E-02	6.5E-06	9			4.3E+03	EPI	3.6E+00	PHYSP ROP	5.2E+01	PHYSP ROP	9.7E-02	2.3E+00	5.6E+00	1.6E-02	EPI
Dioxane, 1,4-Dioxins	123-91-1	8.8E+01	PHYSP ROP	2.0E-04	4.8E-06	PHYSP ROP	3.8E+01	PHYSP ROP	1.2E+01	PHYSP ROP	1.0E+00	CRC89	8.7E-02	1.1E-05	9			2.6E+00	EPI	-2.7E-01	PHYSP ROP	1.0E+06	PHYSP ROP	1.2E-03	3.3E-01	7.9E-01	3.3E-04	EPI
-Hexachlorodibenzo-p-dioxin, Mixture	NA	3.9E+02	EPI	2.3E-04	5.7E-06	EPI	4.4E-11	EPI	2.5E+02	EPI			4.3E-02	4.2E-06	9			7.0E+05	EPI	8.2E+00	EPI	4.0E-06	EPI	2.2E+01	1.6E+01	7.5E+01	2.9E+00	EPI
-TCDD, 2,3,7,8-	1746-01-6	3.2E+02	PHYSP ROP	2.0E-03	5.0E-05	EPI	1.5E-09	PHYSP ROP	3.1E+02	PHYSP ROP	1.8E+00	PubChe m	4.7E-02	6.8E-06	9			2.5E+05	EPI	6.8E+00	PHYSP ROP	2.0E-04	PHYSP ROP	5.6E+00	6.7E+00	2.9E+01	8.1E-01	EPI
Diphenamid	957-51-7	2.4E+02	PHYSP ROP	1.5E-09	3.6E-11	EPI	3.0E-08	PHYSP ROP	1.4E+02	PHYSP ROP	1.2E+00	CRC89	2.4E-02	6.2E-06	9			4.8E+03	EPI	2.2E+00	PHYSP ROP	2.6E+02	PHYSP ROP	3.3E-02	2.3E+00	5.5E+00	5.6E-03	EPI
Diphenyl Sulfone	127-63-9	2.2E+02	PHYSP ROP	1.0E-05	2.5E-07	PHYSP ROP	1.5E-05	PHYSP ROP	1.3E+02	PHYSP ROP	1.3E+00	CRC89	2.7E-02	6.9E-06	9			1.1E+03	EPI	2.4E+00	PHYSP ROP	3.1E+02	PHYSP ROP	2.1E-02	1.8E+00	4.2E+00	3.7E-03	EPI
Diphenylamine	122-39-4	1.7E+02	PHYSP ROP	1.1E-04	2.7E-06	EPI	6.7E-04	PHYSP ROP	5.3E+01	PHYSP ROP	1.2E+00	CRC89	4.2E-02	7.6E-06	9			8.3E+02	EPI	3.5E+00	PHYSP ROP	5.3E+01	PHYSP ROP	1.9E-01	9.3E-01	2.2E+00	3.7E-02	EPI
Diphenylhydrazine, 1,2-	122-66-7	1.8E+02	PHYSP ROP PHYSP	2.0E-05	4.8E-07	EPI PHYSP	4.4E-04	EPI PHYSP	1.3E+02	PHYSP ROP PHYSP	1.2E+00	CRC89	3.4E-02	7.2E-06	9			1.5E+03	EPI	2.9E+00	PHYSP ROP PHYSP	2.2E+02	PHYSP ROP PHYSP	6.8E-02	1.1E+00	2.7E+00	1.3E-02	EPI
Diquat	85-00-7	3.4E+02	PHYSP ROP	5.8E-12	1.4E-13	ROP	1.8E-06	ROP	3.4E+02	ROP	1.2E+00	CRC89	2.1E-02	5.2E-06	9			9.3E+03	EPI	-4.6E+00	PHYSP ROP	7.1E+05	PHYSP ROP	1.7E-06	8.9E+00	2.1E+01	2.4E-07	EPI
Direct Black 38	1937-37-7	7.8E+02	PHYSP ROP	3.4E-38	8.2E-40	ROP	1.5E-36	ROP	3.5E+02	EPI			2.2E-02	2.6E-06	9			2.4E+08	EPI	4.9E+00	PHYSP ROP	3.0E+03	PHYSP ROP	2.2E-03	2.4E+03	5.9E+03	2.1E-04	EPI
Direct Blue 6	2602-46-2	9.3E+02	PHYSP ROP	3.7E-42	9.1E-44	ROP	9.5E-39	ROP	3.5E+02	EPI			2.0E-02	2.3E-06	9			7.9E+08	EPI	2.6E+00	PHYSP ROP	1.4E-04	PHYSP ROP	2.0E-08	1.8E+04	4.2E+04	1.7E-09	EPI
Direct Brown 95	16071-86-6	7.6E+02	PHYSP ROP				1.4E-41	ROP	3.5E+02	EPI			2.3E-02	2.7E-06	9			7.0E+06	EPI	-6.5E+00	PHYSP ROP	1.0E+06	PHYSP ROP	4.1E-11	1.9E+03	4.6E+03	3.9E-12	EPI

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm- m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Disulfoton	298-04-4	2.7E+02	PHYSP ROP	8.8E-05	2.2E-06	EPI	9.8E-05	PHYSP ROP	-2.5E+01	PHYSP ROP	1.1E+00	CRC89	2.3E-02	5.7E-06	9			8.4E+02	EPI	4.0E+00	PHYSP ROP	1.6E+01	PHYSP ROP	1.4E-01	3.6E+00	8.7E+00	2.1E-02	EPI
Dithiane, 1,4-	505-29-3	1.2E+02	PHYSP ROP	1.7E-03	4.2E-05	EPI	8.0E-02	PHYSP ROP	1.1E+02	PHYSP ROP	1.1E+00	ChemN et	6.8E-02	9.3E-06	9			1.5E+02	EPI	7.7E-01	PHYSP ROP	3.0E+03	PHYSP ROP	4.6E-03	5.0E-01	1.2E+00	1.1E-03	EPI
Diuron	330-54-1	2.3E+02	PHYSP ROP	2.1E-08	5.0E-10	EPI	6.9E-08	PHYSP ROP	1.6E+02	PHYSP ROP			5.0E-02	5.9E-06	9			1.1E+02	EPI	2.7E+00	PHYSP ROP	4.2E+01	PHYSP ROP	2.7E-02	2.1E+00	5.1E+00	4.7E-03	EPI
Dodine	2439-10-3	2.9E+02	PHYSP ROP	3.7E-09	9.0E-11	EPI	1.5E-07	PHYSP ROP	1.4E+02	PHYSP ROP			4.4E-02	5.1E-06	9			2.5E+03	EPI	1.2E+00	PHYSP ROP	6.3E+02	PHYSP ROP	1.4E-03	4.3E+00	1.0E+01	2.2E-04	EPI
EPTC	759-94-4	1.9E+02	PHYSP ROP	6.5E-04	1.6E-05	EPI	2.4E-02	PHYSP ROP	6.1E+01	EPI	9.5E-01	CRC89	2.9E-02	6.4E-06	9			1.6E+02	EPI	3.2E+00	PHYSP ROP	3.8E+02	PHYSP ROP	9.7E-02	1.2E+00	2.9E+00	1.8E-02	EPI
Endosulfan	115-29-7	4.1E+02	PHYSP ROP	2.7E-03	6.5E-05	PHYSP ROP	1.7E-07	PHYSP ROP	1.1E+02	PHYSP ROP	1.7E+00	CRC89	2.2E-02	5.8E-06	9			6.8E+03	EPI	3.8E+00	PHYSP ROP	3.3E-01	PHYSP ROP	2.2E-02	2.0E+01	4.8E+01	2.9E-03	EPI
Endothall	145-73-3	1.9E+02	PHYSP ROP	1.6E-14	3.9E-16	EPI	1.6E-10	PHYSP ROP	1.4E+02	PHYSP ROP	1.4E+00	CRC89	3.7E-02	8.2E-06	9			1.9E+01	EPI	1.9E+00	PHYSP ROP	1.0E+05	PHYSP ROP	1.4E-02	1.2E+00	2.8E+00	2.6E-03	EPI
Endrin	72-20-8	3.8E+02	PHYSP ROP	2.6E-04	6.4E-06	PHYSP ROP	3.0E-06	PHYSP ROP	2.3E+02	PHYSP ROP			3.6E-02	4.2E-06	9			2.0E+04	EPI	5.2E+00	PHYSP ROP	2.5E-01	PHYSP ROP	2.4E-01	1.4E+01	3.4E+01	3.3E-02	EPI
Epichlorohydrin	106-89-8	9.3E+01	PHYSP ROP	1.2E-03	3.0E-05	EPI	1.6E+01	PHYSP ROP	-5.7E+01	PHYSP ROP	1.2E+00	PERRY	8.9E-02	1.1E-05	9			9.9E+00	EPI	4.5E-01	PHYSP ROP	6.6E+04	PHYSP ROP	3.5E-03	3.5E-01	8.3E-01	9.4E-04	EPI
Epoxybutane, 1,2-	106-88-7	7.2E+01	PHYSP ROP	7.4E-03	1.8E-04	EPI	1.8E+02	PHYSP ROP	-1.5E+02	PHYSP ROP	8.3E-01	CRC89	9.3E-02	1.0E-05	9			9.9E+00	EPI	8.6E-01	PHYSP ROP	9.5E+04	PHYSP ROP	7.5E-03	2.7E-01	6.4E-01	2.3E-03	EPI
Ethanol, 2-(2-methoxyethoxy)-	111-77-3	1.2E+02	PHYSP ROP	6.7E-10	1.7E-11	PHYSP ROP	2.5E-01	PHYSP ROP	-1.5E+01	EPI PHYSP			7.8E-02	9.1E-06	9			1.0E+00	EPI	-1.2E+00	PHYSP ROP	1.0E+06	PHYSP ROP	7.4E-04	5.0E-01	1.2E+00	1.7E-04	RAGSE
Ethephon	16672-87-0	1.4E+02	PHYSP ROP	2.3E-10	5.7E-12	PHYSP ROP	9.8E-08	PHYSP ROP	7.4E+01	PHYSP ROP	1.2E+00	CRC89	5.5E-02	8.6E-06	9			5.0E+00	EPI	-2.2E-01	PHYSP ROP	1.0E+06	PHYSP ROP	8.0E-04	6.8E-01	1.6E+00	1.7E-04	EPI
Ethion	563-12-2	3.8E+02	PHYSP ROP	1.6E-05	3.8E-07	EPI	1.5E-06	PHYSP ROP	-1.3E+01	PHYSP ROP	1.2E+00	CRC89	1.9E-02	4.8E-06	9			8.8E+02	EPI	5.1E+00	PHYSP ROP	2.0E+00	PHYSP ROP	1.9E-01	1.5E+01	3.6E+01	2.6E-02	EPI
Ethoxyethanol Acetate, 2-	111-15-9	1.3E+02	PHYSP ROP	1.3E-04	3.2E-06	PHYSP ROP	2.0E+00	PHYSP ROP	-6.2E+01	PHYSP ROP	9.7E-01	CRC89	5.7E-02	8.0E-06	9			4.5E+00	EPI	5.9E-01	PHYSP ROP	1.9E+05	PHYSP ROP	3.1E-03	5.8E-01	1.4E+00	7.0E-04	EPI
Ethoxyethanol, 2-	110-80-5	9.0E+01	PHYSP ROP	1.9E-05	4.7E-07	PHYSP ROP	5.3E+00	PHYSP ROP	-7.0E+01	PHYSP ROP	9.3E-01	CRC89	8.2E-02	9.7E-06	9			1.0E+00	EPI	-3.2E-01	PHYSP ROP	1.0E+06	PHYSP ROP	1.1E-03	3.4E-01	8.1E-01	3.0E-04	EPI
Ethyl Acetate	141-78-6	8.8E+01	PHYSP ROP	5.5E-03	1.3E-04	PHYSP ROP	9.3E+01	PHYSP ROP	-8.4E+01	PHYSP ROP	9.0E-01	CRC89	8.2E-02	9.7E-06	9			5.6E+00	EPI	7.3E-01	PHYSP ROP	8.0E+04	PHYSP ROP	5.5E-03	3.3E-01	7.9E-01	1.5E-03	EPI
Ethyl Acrylate	140-88-5	1.0E+02	PHYSP ROP	1.4E-02	3.4E-04	EPI	3.9E+01	PHYSP ROP	-7.1E+01	PHYSP ROP	9.2E-01	CRC89	7.5E-02	9.1E-06	9			1.1E+01	EPI	1.3E+00	PHYSP ROP	1.5E+04	PHYSP ROP	1.2E-02	3.8E-01	9.2E-01	3.2E-03	EPI
Ethyl Chloride (Chloroethane)	75-00-3	6.5E+01	PHYSP ROP	4.5E-01	1.1E-02	PHYSP ROP	1.0E+03	PHYSP ROP	-1.4E+02	PHYSP ROP	8.9E-01	CRC89	1.0E-01	1.2E-05	9			2.2E+01	EPI	1.4E+00	PHYSP ROP	6.7E+03	PHYSP ROP	1.9E-02	2.4E-01	5.8E-01	6.1E-03	EPI
Ethyl Ether	60-29-7	7.4E+01	PHYSP ROP	5.0E-02	1.2E-03	PHYSP ROP	5.4E+02	PHYSP ROP	-1.2E+02	PHYSP ROP	7.1E-01	CRC89	8.5E-02	9.4E-06	9			9.7E+00	EPI	8.9E-01	PHYSP ROP	6.0E+04	PHYSP ROP	7.8E-03	2.7E-01	6.6E-01	2.4E-03	EPI
Ethyl Methacrylate	97-63-2	1.1E+02	PHYSP ROP	2.3E-02	5.7E-04	EPI	2.1E+01	PHYSP ROP	-7.5E+01	PHYSP ROP	9.1E-01	CRC89	6.5E-02	8.4E-06	9			1.7E+01	EPI	1.9E+00	PHYSP ROP	5.4E+03	PHYSP ROP	2.9E-02	4.6E-01	1.1E+00	7.0E-03	EPI
Ethyl-p-nitrophenyl Phosphonate	2104-64-5	3.2E+02	PHYSP ROP	1.8E-05	4.4E-07	EPI	9.5E-07	PHYSP ROP	3.6E+01	PHYSP ROP	1.3E+00	CRC89	2.2E-02	5.5E-06	9			1.5E+04	EPI	4.8E+00	PHYSP ROP	3.1E+00	PHYSP ROP	2.5E-01	6.8E+00	1.6E+01	3.6E-02	EPI
Ethylbenzene	100-41-4	1.1E+02	PHYSP ROP	3.2E-01	7.9E-03	PHYSP ROP	9.6E+00	PHYSP ROP	-9.5E+01	PHYSP ROP	8.6E-01	CRC89	6.8E-02	8.5E-06	9			4.5E+02	EPI	3.2E+00	PHYSP ROP	1.7E+02	PHYSP ROP	2.0E-01	4.1E-01	9.9E-01	4.9E-02	EPI
Ethylene Cyanohydrin	109-78-4	7.1E+01	PHYSP ROP	3.1E-07	7.5E-09	EPI	8.0E-02	PHYSP ROP	-4.6E+01	PHYSP ROP	1.0E+00	CRC89	1.0E-01	1.2E-05	9			1.0E+00	EPI	-9.4E-01	PHYSP ROP	1.0E+06	PHYSP ROP	4.8E-04	2.6E-01	6.3E-01	1.5E-04	EPI

Contaminant		Molecular Weight		Volatility Parameters				Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters						
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm- m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event t)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Ethylene Diamine	107-15-3	6.0E+01	PHYSP ROP	7.1E-08	1.7E-09	PHYSP ROP	1.2E+01	PHYSP ROP	1.1E+01	PHYSP ROP	9.0E-01	CRC89	1.1E-01	1.2E-05	WATER 9			1.5E+01	EPI	-2.0E+00	PHYSP ROP	1.0E+06	PHYSP ROP	9.5E-05	2.3E-01	5.5E-01	3.2E-05	EPI
Ethylene Glycol	107-21-1	6.2E+01	PHYSP ROP	2.5E-06	6.0E-08	PHYSP ROP	9.2E-02	PHYSP ROP	-1.3E+01	PHYSP ROP	1.1E+00	CRC89	1.2E-01	1.4E-05	WATER 9			1.0E+00	EPI	-1.4E+00	PHYSP ROP	1.0E+06	PHYSP ROP	2.7E-04	2.3E-01	5.6E-01	8.8E-05	EPI
Ethylene Glycol Monobutyl Ether	111-76-2	1.2E+02	PHYSP ROP	6.5E-05	1.6E-06	PHYSP ROP	8.8E-01	PHYSP ROP	-7.5E+01	PHYSP ROP	9.0E-01	CRC89	6.3E-02	8.1E-06	WATER 9			2.8E+00	EPI	8.3E-01	PHYSP ROP	1.0E+06	PHYSP ROP	5.1E-03	4.8E-01	1.2E+00	1.2E-03	EPI
Ethylene Oxide	75-21-8	4.4E+01	PHYSP ROP	6.1E-03	1.5E-04	PHYSP ROP	1.3E+03	PHYSP ROP	-1.1E+02	PHYSP ROP	8.8E-01	CRC89	1.3E-01	1.5E-05	WATER 9			3.2E+00	EPI	-3.0E-01	PHYSP ROP	1.0E+06	PHYSP ROP	1.4E-03	1.9E-01	4.5E-01	5.6E-04	EPI
Ethylene Thiourea	96-45-7	1.0E+02	PHYSP ROP	5.6E-10	1.4E-11	PHYSP ROP	2.0E-06	PHYSP ROP	2.0E+02	PHYSP ROP			8.7E-02	1.0E-05	WATER 9			1.3E+01	EPI	-6.6E-01	PHYSP ROP	2.0E+04	PHYSP ROP	5.9E-04	3.9E-01	9.4E-01	1.5E-04	EPI
Ethyleneimine	151-56-4	4.3E+01	PHYSP ROP	4.9E-04	1.2E-05	EPI	2.1E+02	PHYSP ROP	-7.8E+01	PHYSP ROP	8.3E-01	CRC89	1.3E-01	1.4E-05	WATER 9			9.0E+00	EPI	-2.8E-01	PHYSP ROP	1.0E+06	PHYSP ROP	1.5E-03	1.8E-01	4.4E-01	5.8E-04	EPI
Ethylphthalyl Ethyl Glycolate	84-72-0	2.8E+02	PHYSP ROP	2.7E-07	6.6E-09	PHYSP ROP	2.2E-04	PHYSP ROP	2.3E+01	EPI			4.4E-02	5.2E-06	WATER 9			1.0E+03	EPI	2.2E+00	PHYSP ROP	2.2E+02	PHYSP ROP	7.7E-03	3.9E+00	9.4E+00	1.2E-03	EPI
Fenamiphos	22224-92-6	3.0E+02	PHYSP ROP	4.9E-08	1.2E-09	EPI	1.0E-06	PHYSP ROP	4.9E+01	PHYSP ROP	1.2E+00	CRC89	2.1E-02	5.4E-06	WATER 9			4.0E+02	EPI	3.2E+00	PHYSP ROP	3.3E+02	PHYSP ROP	2.9E-02	5.3E+00	1.3E+01	4.4E-03	EPI
Fenpropathrin	39515-41-8	3.5E+02	PHYSP ROP	3.1E-04	7.6E-06	EPI	5.5E-06	PHYSP ROP	4.7E+01	PHYSP ROP			3.8E-02	4.5E-06	WATER 9			2.2E+04	EPI	5.7E+00	PHYSP ROP	3.3E-01	PHYSP ROP	1.2E+00	9.5E+00	3.7E+01	1.7E-01	EPI
Fenvalerate	51630-58-1	4.2E+02	PHYSP ROP	1.4E-06	3.5E-08	EPI	1.5E-09	PHYSP ROP	4.0E+01	PHYSP ROP	1.2E+00	CRC89	1.8E-02	4.4E-06	WATER 9			3.2E+05	EPI	6.2E+00	PHYSP ROP	2.4E-02	PHYSP ROP	7.4E-01	2.4E+01	9.1E+01	9.4E-02	EPI
Fluometuron	2164-17-2	2.3E+02	PHYSP ROP	1.1E-07	2.6E-09	EPI	9.4E-07	PHYSP ROP	1.6E+02	PHYSP ROP			5.0E-02	5.9E-06	WATER 9			2.9E+02	EPI	2.4E+00	PHYSP ROP	1.1E+02	PHYSP ROP	1.9E-02	2.1E+00	5.0E+00	3.2E-03	EPI
Fluoride	16984-48-8	3.8E+01	EPI						-2.2E+02	EPI						1.5E+02	BAES				1.7E+00	EPI		2.4E-03	1.7E-01	4.1E-01	1.0E-03	RAGSE
Fluorine (Soluble Fluoride)	7782-41-4	3.8E+01	PHYSP ROP						-2.2E+02	PHYSP ROP	1.6E+00	CRC89				1.5E+02	BAES				1.7E+00	PHYSP ROP		2.4E-03	1.7E-01	4.1E-01	1.0E-03	RAGSE
Fluridone	59756-60-4	3.3E+02	PHYSP ROP	3.3E-07	8.1E-09	EPI	9.8E-08	PHYSP ROP	1.5E+02	PHYSP ROP			4.0E-02	4.7E-06	WATER 9			5.7E+04	EPI	3.2E+00	PHYSP ROP	1.2E+01	PHYSP ROP	2.0E-02	7.3E+00	1.8E+01	2.8E-03	EPI
Flurprimidol	56425-91-3	3.1E+02	PHYSP ROP	5.4E-08	1.3E-09	EPI	3.6E-07	PHYSP ROP	9.5E+01	PHYSP ROP			4.1E-02	4.8E-06	WATER 9			2.2E+03	EPI	3.3E+00	PHYSP ROP	1.1E+02	PHYSP ROP	3.1E-02	5.9E+00	1.4E+01	4.6E-03	EPI
Flusilazole	85509-19-9	3.2E+02	PHYSP ROP	9.2E-08	2.3E-09	PHYSP ROP	2.9E-07	PHYSP ROP	5.4E+01	PHYSP ROP			4.1E-02	4.8E-06	WATER 9			8.1E+04	EPI	3.7E+00	PHYSP ROP	5.4E+01	PHYSP ROP	5.2E-02	6.1E+00	1.5E+01	7.7E-03	EPI
Flutolanil	66332-96-5	3.2E+02	PHYSP ROP	1.3E-07	3.2E-09	EPI	4.9E-08	PHYSP ROP	1.0E+02	PHYSP ROP			4.0E-02	4.7E-06	WATER 9			2.6E+03	EPI	3.7E+00	PHYSP ROP	6.5E+00	PHYSP ROP	4.8E-02	6.8E+00	1.6E+01	6.9E-03	EPI
Fluvalinate	69409-94-5	5.0E+02	PHYSP ROP	5.9E-07	1.5E-08	PHYSP ROP	1.0E-07	PHYSP ROP	1.6E+02	EPI			3.0E-02	3.5E-06	WATER 9			7.3E+05	EPI	6.8E+00	PHYSP ROP	5.0E-03	PHYSP ROP	6.8E-01	6.9E+01	2.7E+02	7.9E-02	EPI
Folpet	133-07-3	3.0E+02	PHYSP ROP	3.1E-06	7.7E-08	EPI	1.6E-07	PHYSP ROP	1.8E+02	EPI			4.3E-02	5.0E-06	WATER 9			1.8E+01	EPI	2.9E+00	PHYSP ROP	8.0E-01	PHYSP ROP	1.8E-02	4.8E+00	1.2E+01	2.7E-03	EPI
Fomesafen	72178-02-0	4.4E+02	PHYSP ROP	3.1E-11	7.5E-13	PHYSP ROP	7.5E-07	PHYSP ROP	2.2E+02	PHYSP ROP	1.3E+00	CRC89	1.9E-02	4.6E-06	WATER 9			1.5E+03	EPI	2.9E+00	PHYSP ROP	5.0E+01	PHYSP ROP	3.7E-03	3.0E+01	7.2E+01	4.6E-04	EPI
Fonofos	944-22-9	2.5E+02	PHYSP ROP	2.9E-04	7.0E-06	EPI	3.4E-04	PHYSP ROP	6.6E-01	EPI	1.2E+00	CRC89	2.4E-02	6.1E-06	WATER 9			8.6E+02	EPI	3.9E+00	PHYSP ROP	1.6E+01	PHYSP ROP	1.6E-01	2.5E+00	6.0E+00	2.7E-02	EPI
Formaldehyde	50-00-0	3.0E+01	PHYSP ROP	1.4E-05	3.4E-07	PHYSP ROP	3.9E+03	PHYSP ROP	-9.2E+01	PHYSP ROP	8.2E-01	CRC89	1.7E-01	1.7E-05	WATER 9			1.0E+00	EPI	3.5E-01	PHYSP ROP	4.0E+05	PHYSP ROP	3.8E-03	1.5E-01	3.7E-01	1.8E-03	EPI
Formic Acid	64-18-6	4.6E+01	PHYSP ROP	6.8E-06	1.7E-07	PHYSP ROP	4.3E+01	PHYSP ROP	8.3E+00	PHYSP ROP	1.2E+00	CRC89	1.5E-01	1.7E-05	WATER 9			1.0E+00	EPI	-5.4E-01	PHYSP ROP	1.0E+06	PHYSP ROP	9.9E-04	1.9E-01	4.6E-01	3.8E-04	EPI
Fosetyl-AL Furans	39148-24-8	3.5E+02	PHYSP ROP	1.3E-12	3.2E-14	PHYSP ROP	7.5E-11	PHYSP ROP	2.2E+02	PHYSP ROP			3.8E-02	4.4E-06	WATER 9			6.5E+03	EPI	-2.4E+00	PHYSP ROP	1.1E+05	PHYSP ROP	3.0E-06	1.0E+01	2.4E+01	4.1E-07	EPI
~Dibenzofuran	132-64-9	1.7E+02	PHYSP ROP	8.7E-03	2.1E-04	EPI	2.5E-03	PHYSP ROP	8.7E+01	PHYSP ROP	1.1E+00	CRC89	6.5E-02	7.4E-06	WATER 9			9.2E+03	EPI	4.1E+00	PHYSP ROP	3.1E+00	PHYSP ROP	4.9E-01	9.2E-01	2.2E+00	9.8E-02	EPI



Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
~Furan	110-00-9	6.8E+01	PHYSP ROP	2.2E-01	5.4E-03	EPI	6.0E+02	PHYSP ROP	-8.6E+01	PHYSP ROP	9.5E-01	CRC89	1.0E-01	1.2E-05	9			8.0E+01	EPI	1.3E+00	PHYSP ROP	1.0E+04	PHYSP ROP	1.6E-02	2.5E-01	6.1E-01	5.1E-03	EPI
~Tetrahydrofuran	109-99-9	7.2E+01	PHYSP ROP	2.9E-03	7.1E-05	PHYSP ROP	1.6E+02	PHYSP ROP	-1.1E+02	PHYSP ROP	8.8E-01	CRC89	9.9E-02	1.1E-05	9			1.1E+01	EPI	4.6E-01	PHYSP ROP	1.0E+06	PHYSP ROP	4.1E-03	2.7E-01	6.4E-01	1.3E-03	EPI
Furazolidone	67-45-8	2.3E+02	PHYSP ROP	1.3E-09	3.3E-11	PHYSP ROP	2.6E-06	PHYSP ROP	2.6E+02	PHYSP ROP			5.1E-02	6.0E-06	9			8.6E+02	EPI	-4.0E-02	PHYSP ROP	4.0E+01	PHYSP ROP	4.6E-04	1.9E+00	4.6E+00	8.0E-05	EPI
Furfural	98-01-1	9.6E+01	PHYSP ROP	1.5E-04	3.8E-06	EPI	2.2E+00	PHYSP ROP	-3.8E+01	PHYSP ROP	1.2E+00	CRC89	8.5E-02	1.1E-05	9			6.1E+00	EPI	4.1E-01	PHYSP ROP	7.4E+04	PHYSP ROP	3.2E-03	3.6E-01	8.7E-01	8.5E-04	EPI
Furium	531-82-8	2.5E+02	EPI	5.4E-14	1.3E-15	EPI	8.8E-09	EPI	1.9E+02	EPI			4.7E-02	5.5E-06	9			5.8E+02	EPI	1.8E+00	EPI	4.2E+03	EPI	5.7E-03	2.8E+00	6.6E+00	9.4E-04	EPI
Furmecycloz	60568-05-0	2.5E+02	PHYSP ROP	2.8E-07	6.9E-09	PHYSP ROP	8.4E-05	PHYSP ROP	3.3E+01	PHYSP ROP			4.8E-02	5.6E-06	9			4.3E+02	EPI	4.4E+00	PHYSP ROP	3.0E-01	PHYSP ROP	3.0E-01	2.7E+00	6.4E+00	5.0E-02	EPI
Glufosinate, Ammonium	77182-82-2	2.0E+02	PHYSP ROP	1.8E-12	4.4E-14	PHYSP ROP	9.1E-12	PHYSP ROP	2.2E+02	PHYSP ROP			5.6E-02	6.5E-06	9			1.0E+01	EPI	-4.8E+00	PHYSP ROP	1.4E+06	PHYSP ROP	1.9E-07	1.4E+00	3.2E+00	3.4E-08	EPI
Glutaraldehyde	111-30-8	1.0E+02	PHYSP ROP	1.3E-06	3.3E-08	PHYSP ROP	6.0E-01	PHYSP ROP	-3.0E+01	EPI			8.8E-02	1.0E-05	9			1.0E+00	EPI	-3.3E-01	PHYSP ROP	2.2E+05	PHYSP ROP	1.3E-03	3.8E-01	9.2E-01	3.3E-04	EPI
Glycidyl	765-34-4	7.2E+01	PHYSP ROP	2.1E-05	5.1E-07	PHYSP ROP	4.5E+01	PHYSP ROP	-6.2E+01	PHYSP ROP	1.1E+00	CRC89	1.1E-01	1.3E-05	9			1.0E+00	EPI	-1.2E-01	PHYSP ROP	1.0E+06	PHYSP ROP	1.7E-03	2.7E-01	6.4E-01	5.2E-04	EPI
Glyphosate	1071-83-6	1.7E+02	PHYSP ROP	8.6E-11	2.1E-12	EPI	9.8E-08	PHYSP ROP	1.9E+02	PHYSP ROP			6.2E-02	7.3E-06	9			2.1E+03	USDA ARS	-3.4E+00	PHYSP ROP	1.1E+04	PHYSP ROP	2.3E-07	9.3E-01	2.2E+00	4.5E-08	EPI
Guanidine	113-00-8	5.9E+01	PHYSP ROP	9.6E-10	2.3E-11	PHYSP ROP	2.2E+00	PHYSP ROP	5.0E+01	PHYSP ROP	1.6E+00	GuideC hem	1.4E-01	1.7E-05	9			1.2E+01	EPI	-1.6E+00	PHYSP ROP	1.8E+03	PHYSP ROP	1.8E-04	2.3E-01	5.4E-01	6.0E-05	EPI
Guanidine Chloride	50-01-1	9.6E+01	PHYSP ROP	8.9E-17	2.2E-18	PHYSP ROP	1.8E-06	PHYSP ROP	1.8E+02	PHYSP ROP	1.4E+00	CRC89	9.2E-02	1.2E-05	9					-3.6E+00	PHYSP ROP	1.0E+06	PHYSP ROP	1.5E-07	3.6E-01	8.7E-01	3.9E-08	EPI
Haloxypop, Methyl	69806-40-2	3.8E+02	PHYSP ROP	1.3E-05	3.2E-07	EPI	6.0E-06	PHYSP ROP	5.6E+01	PHYSP ROP			3.6E-02	4.3E-06	9			5.5E+03	EPI	4.1E+00	PHYSP ROP	9.3E+00	PHYSP ROP	4.5E-02	1.3E+01	3.2E+01	6.0E-03	EPI
Heptachlor	76-44-8	3.7E+02	PHYSP ROP	1.2E-02	2.9E-04	PHYSP ROP	4.0E-04	PHYSP ROP	9.6E+01	PHYSP ROP	1.6E+00	CRC89	2.2E-02	5.7E-06	9			4.1E+04	EPI	6.1E+00	PHYSP ROP	1.8E-01	PHYSP ROP	1.1E+00	1.3E+01	5.0E+01	1.4E-01	EPI
Heptachlor Epoxide	1024-57-3	3.9E+02	PHYSP ROP	8.6E-04	2.1E-05	PHYSP ROP	2.0E-05	PHYSP ROP	1.6E+02	PHYSP ROP	1.9E+00	LookCh em	2.4E-02	6.2E-06	9			1.0E+04	EPI	5.0E+00	PHYSP ROP	2.0E-01	PHYSP ROP	1.6E-01	1.6E+01	3.8E+01	2.1E-02	EPI
Hexabromobenzene	87-82-1	5.5E+02	PHYSP ROP	1.1E-03	2.8E-05	PHYSP ROP	1.6E-08	PHYSP ROP	3.3E+02	PHYSP ROP	3.0E+00	LookCh em	2.5E-02	6.6E-06	9			2.8E+03	EPI	6.1E+00	PHYSP ROP	1.6E-04	PHYSP ROP	1.2E-01	1.3E+02	3.1E+02	1.4E-02	EPI
Hexabromodiphenyl ether, 2,2',4,4',5,5'- (BDE-153)	68631-49-2	6.4E+02	OTHER				5.8E-06	IRIS Profile					2.5E-02	3.0E-06	9							9.0E-04	IRIS Profile			4.2E+02	1.0E+03	
Hexachlorobenzene	118-74-1	2.8E+02	PHYSP ROP	7.0E-02	1.7E-03	PHYSP ROP	1.8E-05	PHYSP ROP	2.3E+02	PHYSP ROP	2.0E+00	CRC89	2.9E-02	7.8E-06	9			6.2E+03	EPI	5.7E+00	PHYSP ROP	6.2E-03	PHYSP ROP	1.6E+00	4.1E+00	1.7E+01	2.5E-01	EPI
Hexachlorobutadiene	87-68-3	2.6E+02	PHYSP ROP	4.2E-01	1.0E-02	PHYSP ROP	2.2E-01	PHYSP ROP	-2.1E+01	PHYSP ROP	1.6E+00	CRC89	2.7E-02	7.0E-06	9			8.5E+02	EPI	4.8E+00	PHYSP ROP	3.2E+00	PHYSP ROP	5.0E-01	3.0E+00	7.3E+00	8.1E-02	EPI
Hexachlorocyclohexane, Alpha-	319-84-6	2.9E+02	PHYSP ROP	2.7E-04	6.7E-06	PHYSP ROP	3.5E-05	EPI	1.6E+02	PHYSP ROP			4.3E-02	5.1E-06	9			2.8E+03	EPI	3.8E+00	PHYSP ROP	2.0E+00	PHYSP ROP	1.4E-01	4.5E+00	1.1E+01	2.1E-02	EPI
Hexachlorocyclohexane, Beta-	319-85-7	2.9E+02	PHYSP ROP	1.8E-05	4.4E-07	PHYSP ROP	3.6E-07	PHYSP ROP	3.1E+02	PHYSP ROP	1.9E+00	CRC89	2.8E-02	7.4E-06	9			2.8E+03	EPI	3.8E+00	PHYSP ROP	2.4E-01	PHYSP ROP	1.4E-01	4.5E+00	1.1E+01	2.1E-02	EPI

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Hexachlorocyclohexane, Gamma- (Lindane)	58-89-9	2.9E+02	PHYSP ROP	2.1E-04	5.1E-06	PHYSP ROP	4.2E-05	PHYSP ROP	1.1E+02	PHYSP ROP			4.3E-02	5.1E-06	9			2.8E+03	EPI	3.7E+00	PHYSP ROP	7.3E+00	PHYSP ROP	1.4E-01	4.5E+00	1.1E+01	2.1E-02	EPI
Hexachlorocyclohexane, Technical	608-73-1	2.9E+02	PHYSP ROP	2.1E-04	5.1E-06	EPI	3.5E-05	EPI	1.1E+02	EPI			4.3E-02	5.1E-06	9			2.8E+03	EPI	4.1E+00	EPI	8.0E+00	PHYSP ROP	1.4E-01	4.5E+00	1.1E+01	2.1E-02	EPI
Hexachlorocyclopentadiene	77-47-4	2.7E+02	PHYSP ROP	1.1E+00	2.7E-02	PHYSP ROP	6.0E-02	PHYSP ROP	-9.0E+00	PHYSP ROP	1.7E+00	CRC89	2.7E-02	7.2E-06	9			1.4E+03	EPI	5.0E+00	PHYSP ROP	1.8E+00	PHYSP ROP	6.5E-01	3.5E+00	1.4E+01	1.0E-01	EPI
Hexachloroethane	67-72-1	2.4E+02	PHYSP ROP	1.6E-01	3.9E-03	PHYSP ROP	2.1E-01	PHYSP ROP	1.9E+02	PHYSP ROP	2.1E+00	CRC89	3.2E-02	8.9E-06	9			2.0E+02	EPI	4.1E+00	PHYSP ROP	5.0E+01	PHYSP ROP	2.5E-01	2.2E+00	5.3E+00	4.2E-02	EPI
Hexachlorophene	70-30-4	4.1E+02	PHYSP ROP	2.2E-11	5.5E-13	PHYSP ROP	1.0E-10	PHYSP ROP	1.7E+02	PHYSP ROP			3.5E-02	4.0E-06	9			6.7E+05	EPI	7.5E+00	PHYSP ROP	1.4E+02	PHYSP ROP	6.5E+00	2.0E+01	8.9E+01	8.4E-01	EPI
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	2.2E+02	PHYSP ROP	8.2E-10	2.0E-11	EPI	4.1E-09	EPI	2.1E+02	PHYSP ROP	1.8E+00	CRC89	3.1E-02	8.5E-06	9			8.9E+01	EPI	8.7E-01	PHYSP ROP	6.0E+01	PHYSP ROP	1.9E-03	1.8E+00	4.4E+00	3.4E-04	EPI
Hexamethylene Diisocyanate, 1,6-	822-06-0	1.7E+02	PHYSP ROP	2.0E-03	4.8E-05	PHYSP ROP	3.0E-02	PHYSP ROP	-6.7E+01	PHYSP ROP	1.1E+00	CRC89	4.0E-02	7.2E-06	9			4.8E+03	EPI	3.2E+00	PHYSP ROP	1.2E+02	PHYSP ROP	1.2E-01	9.2E-01	2.2E+00	2.4E-02	EPI
Hexamethylphosphoramide	680-31-9	1.8E+02	PHYSP ROP	8.2E-07	2.0E-08	PHYSP ROP	4.6E-02	PHYSP ROP	7.2E+00	PHYSP ROP	1.0E+00	CRC89	3.5E-02	6.9E-06	9			1.0E+01	EPI	2.8E-01	PHYSP ROP	1.0E+06	PHYSP ROP	1.2E-03	1.1E+00	2.5E+00	2.4E-04	EPI
Hexane, N-	110-54-3	8.6E+01	PHYSP ROP	7.4E+01	1.8E+00	EPI	1.5E+02	PHYSP ROP	-9.5E+01	PHYSP ROP	6.6E-01	CRC89	7.3E-02	8.2E-06	9			1.3E+02	EPI	3.9E+00	PHYSP ROP	9.5E+00	PHYSP ROP	7.2E-01	3.2E-01	1.2E+00	2.0E-01	EPI
Hexanedioic Acid	124-04-9	1.5E+02	PHYSP ROP	1.9E-10	4.7E-12	EPI	3.2E-07	EPI	1.5E+02	PHYSP ROP	1.4E+00	CRC89	5.8E-02	9.2E-06	9			2.4E+01	EPI	8.0E-02	PHYSP ROP	3.1E+04	PHYSP ROP	1.2E-03	6.9E-01	1.7E+00	2.7E-04	EPI
Hexanone, 2-	591-78-6	1.0E+02	PHYSP ROP	3.8E-03	9.3E-05	EPI	1.2E+01	PHYSP ROP	-5.6E+01	PHYSP ROP	8.1E-01	CRC89	7.0E-02	8.4E-06	9			1.5E+01	EPI	1.4E+00	PHYSP ROP	1.7E+04	PHYSP ROP	1.4E-02	3.8E-01	9.2E-01	3.6E-03	EPI
Hexazinone	51235-04-2	2.5E+02	PHYSP ROP	9.2E-11	2.3E-12	EPI	2.3E-07	EPI	1.2E+02	PHYSP ROP	1.3E+00	CRC89	2.5E-02	6.3E-06	9			1.3E+02	EPI	1.9E+00	PHYSP ROP	3.3E+04	PHYSP ROP	6.2E-03	2.7E+00	6.5E+00	1.0E-03	EPI
Hexythiazox	78587-05-0	3.5E+02	PHYSP ROP	9.7E-07	2.4E-08	EPI	2.6E-08	PHYSP ROP	1.1E+02	PHYSP ROP			3.8E-02	4.4E-06	9			2.1E+03	EPI	5.6E+00	PHYSP ROP	5.0E-01	PHYSP ROP	6.0E-01	1.0E+01	2.4E+01	8.3E-02	EPI
Hydramethylnon	67485-29-4	4.9E+02	PHYSP ROP	9.0E-05	2.2E-06	EPI	2.0E-08	PHYSP ROP	1.9E+02	PHYSP ROP			3.0E-02	3.6E-06	9			1.8E+08	EPI	2.3E+00	PHYSP ROP	6.0E-03	PHYSP ROP	7.7E-04	6.2E+01	1.5E+02	9.0E-05	EPI
Hydrazine	302-01-2	3.2E+01	PHYSP ROP	2.5E-05	6.1E-07	PubChem	1.4E+01	PHYSP ROP	2.0E+00	PHYSP ROP	1.0E+00	CRC89	1.7E-01	1.9E-05	9					-2.1E+00	PHYSP ROP	1.0E+06	PHYSP ROP	9.5E-05	1.6E-01	3.8E-01	4.4E-05	RAGSE
Hydrazine Sulfate	10034-93-2	1.3E+02	EPI						2.5E+02	CRC89	1.4E+00	CRC89										3.1E+04	PERRY	4.4E-03	5.5E-01	1.3E+00	1.0E-03	RAGSE
Hydrogen Chloride	7647-01-0	3.5E+01	EPI	8.3E+07	2.0E+06	Toxnet HSDB	3.5E+04	PubChem	-1.1E+02	CRC89	1.5E+00	CRC89	1.9E-01	2.3E-05	9							6.7E+05	Toxnet HSDB	2.3E-03	1.7E-01	4.0E-01	1.0E-03	RAGSE

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	Dia and Diw Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Hydrogen Fluoride	7664-39-3	2.0E+01	PHYSP ROP	4.3E-03	1.0E-04	PHYSP ROP	9.2E+02	ROP	-8.4E+01	PHYSP ROP	8.2E-01	CRC89	2.2E-01	2.2E-05	WATER 9					2.3E-01	OTHER	1.0E+06	PHYSP ROP	1.7E-03	1.4E-01	3.3E-01	1.0E-03	RAGSE
Hydrogen Sulfide	7783-06-4	3.4E+01	PHYSP ROP	3.5E-01	8.6E-03	PhysPro p	1.6E+04	PHYSP ROP	-8.5E+01	PHYSP ROP	1.4E+00	CRC89	1.9E-01	2.2E-05	WATER 9					2.3E-01	OTHER PHYSP	3.7E+03	PHYSP ROP	2.2E-03	1.6E-01	3.9E-01	1.0E-03	RAGSE
Hydroquinone	123-31-9	1.1E+02	PHYSP ROP	1.9E-09	4.7E-11	EPI	2.4E-05	EPI	1.7E+02	PHYSP ROP	1.3E+00	CRC89	8.0E-02	1.1E-05	WATER 9			2.4E+02	EPI	5.9E-01	ROP	7.2E+04	PHYSP ROP	3.8E-03	4.3E-01	1.0E+00	9.3E-04	EPI
Imazalil	35554-44-0	3.0E+02	PHYSP ROP	1.1E-07	2.6E-09	EPI	1.2E-06	ROP	5.3E+01	PHYSP ROP	1.2E+00	CRC89	2.2E-02	5.7E-06	WATER 9			8.5E+03	EPI	3.8E+00	PHYSP ROP	1.8E+02	PHYSP ROP	7.7E-02	4.9E+00	1.2E+01	1.2E-02	EPI
Imazaquin	81335-37-7	3.1E+02	PHYSP ROP	2.8E-16	6.9E-18	PHYSP ROP	1.0E-13	ROP	2.2E+02	PHYSP ROP			4.1E-02	4.8E-06	WATER 9			2.4E+03	EPI	1.9E+00	PHYSP ROP	9.0E+01	PHYSP ROP	3.3E-03	5.8E+00	1.4E+01	4.8E-04	EPI
Imazethapyr	81335-77-5	2.9E+02	PHYSP ROP	4.3E-15	1.0E-16	PHYSP ROP	2.2E-11	ROP	1.7E+02	PHYSP ROP			4.3E-02	5.1E-06	WATER 9			3.4E+02	EPI	1.5E+00	PHYSP ROP	1.4E+03	PHYSP ROP	1.3E-02	4.4E+00	1.1E+01	2.0E-03	EPI
Iodine	7553-56-2	2.5E+02	PHYSP ROP				2.3E-01	PHYSP ROP	1.1E+02	PHYSP ROP	4.9E+00	CRC89			WATER 9	6.0E+01	BAES			2.5E+00	PHYSP ROP	3.3E+02	PHYSP ROP	6.1E-03	2.8E+00	6.7E+00	1.0E-03	RAGSE
Iprodione	36734-19-7	3.3E+02	PHYSP ROP	1.3E-07	3.1E-09	PHYSP ROP	3.8E-09	ROP	1.4E+02	PHYSP ROP			4.0E-02	4.6E-06	WATER 9			5.3E+01	EPI	3.0E+00	PHYSP ROP	1.4E+01	PHYSP ROP	1.5E-02	7.4E+00	1.8E+01	2.2E-03	EPI
Iron	7439-89-6	5.6E+01	PHYSP ROP				0.0E+00	NIOSH	1.5E+03	CRC89	7.9E+00	CRC89			WATER 9	2.5E+01	BAES							2.9E-03	2.2E-01	5.2E-01	1.0E-03	RAGSE
Isobutyl Alcohol	78-83-1	7.4E+01	PHYSP ROP	4.0E-04	9.8E-06	PHYSP ROP	1.0E+01	ROP	-1.1E+02	PHYSP ROP	8.0E-01	CRC89	9.0E-02	1.0E-05	WATER 9			2.9E+00	EPI	7.6E-01	PHYSP ROP	8.5E+04	PHYSP ROP	6.4E-03	2.7E-01	6.6E-01	1.9E-03	EPI
Isophorone	78-59-1	1.4E+02	PHYSP ROP	2.7E-04	6.6E-06	EPI	4.4E-01	ROP	-8.1E+00	PHYSP ROP	9.3E-01	CRC89 ChemN	5.3E-02	7.5E-06	WATER 9			6.5E+01	EPI	1.7E+00	PHYSP ROP	1.2E+04	PHYSP ROP	1.6E-02	6.2E-01	1.5E+00	3.5E-03	EPI
Isopropalin	33820-53-0	3.1E+02	PHYSP ROP	4.5E-03	1.1E-04	EPI	3.0E-05	ROP	1.5E+02	PHYSP ROP	1.2E+00	et	2.1E-02	5.3E-06	WATER 9			1.1E+04	EPI	5.8E+00	PHYSP ROP	1.1E-01	PHYSP ROP	1.4E+00	5.7E+00	2.2E+01	2.1E-01	EPI
Isopropanol	67-63-0	6.0E+01	PHYSP ROP	3.3E-04	8.1E-06	PHYSP ROP	4.5E+01	ROP	-9.0E+01	PHYSP ROP	7.8E-01	CRC89	1.0E-01	1.1E-05	WATER 9			1.5E+00	EPI	5.0E-02	PHYSP ROP	1.0E+06	PHYSP ROP	2.3E-03	2.3E-01	5.5E-01	7.8E-04	EPI
Isopropyl Methyl Phosphonic Acid	1832-54-8	1.4E+02	PHYSP ROP	2.8E-07	6.9E-09	PHYSP ROP	1.2E-02	ROP	-8.1E+00	EPI			7.1E-02	8.3E-06	WATER 9			7.7E+00	EPI	2.7E-01	PHYSP ROP	5.0E+04	PHYSP ROP	1.8E-03	6.2E-01	1.5E+00	4.0E-04	EPI
Isoxaben	82558-50-7	3.3E+02	PHYSP ROP	5.2E-08	1.3E-09	EPI	4.1E-09	ROP	1.8E+02	PHYSP ROP			4.0E-02	4.6E-06	WATER 9			1.3E+03	EPI	3.9E+00	PHYSP ROP	1.4E+00	PHYSP ROP	6.2E-02	7.6E+00	1.8E+01	8.9E-03	EPI
JP-7	NA					EPA HCD		EPA PHYSP		EPA HCD PHYSP		ATSDR Profile			WATER 9					8.0E+00	OTHER PHYSP	1.0E+01	EPA HCD PHYSP					
Lactofen	77501-63-4	4.6E+02	PHYSP ROP	4.1E-01	1.0E-02	HCD EPI	1.1E+01	ROP	-5.5E+01	PHYSP ROP	7.8E-01		3.2E-02	3.7E-06	WATER 9			2.3E+04	EPI	4.8E+00	PHYSP ROP	1.0E-01	PHYSP ROP	5.2E-02	4.1E+01	9.7E+01	6.3E-03	EPI
Lead Compounds																												
~Lead Chromate	7758-97-6	3.2E+02	CRC89						8.4E+02	CRC89	6.1E+00	CRC89										1.7E-01	CRC89	6.9E-03	6.8E+00	1.6E+01	1.0E-03	RAGSE
~Lead Phosphate	7446-27-7	8.1E+02	PHYSP ROP					PHYSP	1.0E+03	PHYSP ROP	7.0E+00	CRC89			WATER 9							0.0E+00	CRC89 PHYSP	1.1E-02	3.7E+03	8.8E+03	1.0E-03	RAGSE
~Lead acetate	301-04-2	3.3E+02	PHYSP ROP				7.2E-04	ROP	3.3E+02	PHYSP ROP	3.3E+00	CRC89	3.3E-02	9.5E-06	WATER 9			1.0E+00	EPI	-8.0E-02	PHYSP ROP	1.6E+03	PHYSP ROP	1.4E-04	7.2E+00	1.7E+01	2.1E-05	EPI
~Lead and Compounds	7439-92-1	2.1E+02	EPI				0.0E+00	NIOSH	3.3E+02	EPI	1.1E+01	CRC89				9.0E+02	BAES							5.5E-04	1.5E+00	3.7E+00	1.0E-04	RAGSE
~Lead subacetate	1335-32-6	8.1E+02	PHYSP ROP				3.0E-10	ROP	1.6E+02	EPI			2.2E-02	2.6E-06	WATER 9			1.0E+01	EPI	-4.0E+00	PHYSP ROP	6.3E+04	PHYSP ROP	1.1E-09	3.4E+03	8.2E+03	1.0E-10	EPI
~Tetraethyl Lead	78-00-2	3.2E+02	PHYSP ROP	2.3E+01	5.7E-01	PHYSP ROP	2.6E-01	ROP	-1.3E+02	PHYSP ROP	1.7E+00	CRC89	2.5E-02	6.4E-06	WATER 9			6.5E+02	EPI	4.2E+00	PHYSP ROP	2.9E-01	PHYSP ROP	9.5E-02	6.8E+00	1.6E+01	1.4E-02	EPI
Lewisite	541-25-3	2.1E+02	PHYSP ROP	8.9E-03	2.2E-04	EPI	5.8E-01	ROP	1.0E-01	PHYSP ROP	1.9E+00	CRC89	3.3E-02	9.1E-06	WATER 9			1.1E+02	EPI	2.6E+00	PHYSP ROP	5.0E+02	PHYSP ROP	3.0E-02	1.5E+00	3.7E+00	5.4E-03	EPI

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters						
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm- m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref	
Linuron	330-55-2	2.5E+02	PHYSP ROP	2.6E-07	6.3E-09	EPI	1.4E-06	PHYSP ROP	9.3E+01	PHYSP ROP			4.8E-02	5.6E-06	9			3.4E+02	EPI	3.2E+00	PHYSP ROP	7.5E+01	PHYSP ROP	5.1E-02	2.6E+00	6.3E+00	8.4E-03	EPI	
Lithium	7439-93-2	6.9E+00	EPI						1.8E+02	CRC89	5.3E-01	CRC89				3.0E+02	BAES							1.0E-03	1.2E-01	2.8E-01	1.0E-03	RAGSE	
MCPA	94-74-6	2.0E+02	PHYSP ROP	5.4E-08	1.3E-09	EPI	5.9E-06	PHYSP ROP	1.2E+02	PHYSP ROP	1.6E+00	PubChe m	3.1E-02	8.2E-06	9			3.0E+01	EPI	3.3E+00	PHYSP ROP	6.3E+02	PHYSP ROP	9.2E-02	1.4E+00	3.4E+00	1.7E-02	EPI	
MCPB	94-81-5	2.3E+02	PHYSP ROP	1.1E-07	2.7E-09	EPI	4.3E-07	PHYSP ROP	1.0E+02	PHYSP ROP			5.1E-02	5.9E-06	9			9.8E+01	EPI	2.8E+00	PHYSP ROP	4.8E+01	PHYSP ROP	1.0E-01	2.0E+00	4.8E+00	1.7E-02	EPI	
MCPP	93-65-2	2.1E+02	PHYSP ROP	7.4E-07	1.8E-08	PHYSP ROP	7.5E-07	PHYSP ROP	9.5E+01	PHYSP ROP	1.3E+00	PubChe m	2.7E-02	7.0E-06	9			4.9E+01	EPI	3.1E+00	PHYSP ROP	6.2E+02	PHYSP ROP	7.4E-02	1.7E+00	4.0E+00	1.3E-02	EPI	
Malathion	121-75-5	3.3E+02	PHYSP ROP	2.0E-07	4.9E-09	PHYSP ROP	3.4E-06	PHYSP ROP	2.8E+00	PHYSP ROP	1.2E+00	CRC89	2.1E-02	5.2E-06	9			3.1E+01	EPI	2.4E+00	PHYSP ROP	1.4E+02	PHYSP ROP	5.7E-03	7.4E+00	1.8E+01	8.1E-04	EPI	
Maleic Anhydride	108-31-6	9.8E+01	PHYSP ROP	1.6E-04	3.9E-06	PHYSP ROP	2.5E-01	EPI	5.3E+01	PHYSP ROP	1.3E+00	CRC89	8.8E-02	1.1E-05	9			1.0E+00	EPI	1.6E+00	PHYSP ROP	1.6E+05	PERRY	2.0E-02	3.7E-01	8.9E-01	5.3E-03	EPI	
Maleic Hydrazide	123-33-1	1.1E+02	PHYSP ROP	1.1E-09	2.7E-11	PHYSP ROP	2.8E-06	PHYSP ROP	3.1E+02	PHYSP ROP			8.2E-02	9.5E-06	9			3.3E+00	EPI	-8.4E-01	PHYSP ROP	4.5E+03	PHYSP ROP	4.2E-04	4.5E-01	1.1E+00	1.0E-04	EPI	
Malononitrile	109-77-3	6.6E+01	PHYSP ROP	5.4E-06	1.3E-07	EPI	2.0E-01	EPI	3.2E+01	PHYSP ROP	1.2E+00	CRC89	1.2E-01	1.4E-05	9			3.3E+00	EPI	-6.0E-01	PHYSP ROP	1.3E+05	PHYSP ROP	8.3E-04	2.5E-01	5.9E-01	2.7E-04	EPI	
Mancozeb	8018-01-7	5.4E+02	PHYSP ROP	6.2E-10	1.5E-11	PHYSP ROP	1.3E-10	PHYSP ROP	1.7E+02	PhysPro p	1.9E+00	PubChe m	2.0E-02	5.1E-06	9			6.1E+02	EPI	1.3E+00	PHYSP ROP	6.2E+00	PHYSP ROP	6.9E-03	1.1E+02	2.7E+02	7.7E-04	EPI	
Maneb	12427-38-2	3.0E+02	PHYSP ROP	2.0E-07	4.9E-09	PHYSP ROP	7.5E-08	PHYSP ROP	2.0E+02	EPI			4.3E-02	5.0E-06	9			6.1E+02	EPI	6.2E-01	PHYSP ROP	6.0E+00	PHYSP ROP	5.1E-03	4.7E+00	1.1E+01	7.7E-04	EPI	
Manganese (Diet)	7439-96-5	5.5E+01	PHYSP ROP				0.0E+00	NIOSH	1.2E+03	PHYSP ROP	7.3E+00	CRC89				6.5E+01	BAES							2.9E-03	2.1E-01	5.1E-01	1.0E-03	RAGSE	
Manganese (Non-diet)	7439-96-5	5.5E+01	PHYSP ROP				0.0E+00	NIOSH	1.2E+03	PHYSP ROP	7.3E+00	CRC89				6.5E+01	BAES							2.9E-03	2.1E-01	5.1E-01	1.0E-03	RAGSE	
Mephosfolan	950-10-7	2.7E+02	PHYSP ROP	4.9E-09	1.2E-10	PHYSP ROP	3.2E-05	PHYSP ROP	8.4E+01	EPI			4.6E-02	5.3E-06	9			6.4E+02	EPI	1.0E+00	PHYSP ROP	5.7E+01	PHYSP ROP	1.5E-03	3.4E+00	8.1E+00	2.4E-04	EPI	
Mepiquat Chloride	24307-26-4	1.5E+02	PHYSP ROP	1.8E-10	4.3E-12	PHYSP ROP	3.7E-07	PHYSP ROP	2.2E+02	PHYSP ROP			6.7E-02	7.9E-06	9			6.6E+01	EPI	-2.8E+00	PHYSP ROP	5.0E+05	PHYSP ROP	1.4E-05	7.2E-01	1.7E+00	3.0E-06	EPI	
Mercury Compounds																													
~Mercuric Chloride (and other Mercury salts)	7487-94-7	2.7E+02	PHYSP ROP						2.8E+02	PHYSP ROP	5.6E+00	CRC89								-2.2E-01	PHYSP ROP	6.9E+04	PHYSP ROP	6.3E-03	3.5E+00	8.4E+00	1.0E-03	RAGSE	
~Mercury (elemental)	7439-97-6	2.0E+02	PHYSP ROP	3.5E-01	8.6E-03	PHYSP VP/S	2.0E-03	PHYSP ROP	-3.9E+01	PHYSP ROP	1.4E+01	CRC89	3.1E-02	6.3E-06	9	5.2E+01	SSL			6.2E-01	PHYSP ROP	6.0E-02	PHYSP ROP	5.4E-03	1.4E+00	3.4E+00	1.0E-03	RAGSE	
~Methyl Mercury	22967-92-6	2.2E+02	OTHER																					5.7E-03	1.7E+00	4.1E+00	1.0E-03	RAGSE	
~Phenylmercuric Acetate	62-38-4	3.4E+02	PHYSP ROP	2.3E-08	5.7E-10	EPI	6.0E-06	PHYSP ROP	1.5E+02	PHYSP ROP			3.9E-02	4.6E-06	9			5.6E+01	EPI	7.1E-01	PHYSP ROP	4.4E+03	PHYSP ROP	4.2E-04	8.1E+00	1.9E+01	6.0E-05	EPI	
Merphos	150-50-5	3.0E+02	PHYSP ROP	9.3E-04	2.3E-05	PHYSP ROP	2.0E-05	PHYSP ROP	1.0E+02	PHYSP ROP	1.0E+00	CRC89	2.0E-02	5.0E-06	9			4.9E+04	EPI	7.7E+00	PHYSP ROP	3.5E-03	PHYSP ROP	2.8E+01	4.9E+00	2.3E+01	4.2E+00	EPI	
Merphos Oxide	78-48-8	3.1E+02	PHYSP ROP	1.2E-05	2.9E-07	PHYSP ROP	5.3E-06	PHYSP ROP	-2.5E+01	CRC89	1.1E+00	CRC89	2.0E-02	5.0E-06	9			2.4E+03	EPI	5.7E+00	PHYSP ROP	2.3E+00	PHYSP ROP	1.1E+00	6.1E+00	2.4E+01	1.7E-01	EPI	
Metalaxyl	57837-19-1	2.8E+02	PHYSP ROP	1.2E-07	3.0E-09	EPI	5.6E-06	PHYSP ROP	7.1E+01	PHYSP ROP			4.4E-02	5.2E-06	9			3.9E+01	EPI	1.7E+00	PHYSP ROP	8.4E+03	PHYSP ROP	3.7E-03	3.9E+00	9.3E+00	5.8E-04	EPI	

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm- m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Methacrylonitrile	126-98-7	6.7E+01	PHYSP ROP	1.0E-02	2.5E-04	EPI	7.1E+01	PHYSP ROP	-3.6E+01	PHYSP ROP	8.0E-01	CRC89	9.6E-02	1.1E-05	9			1.3E+01	EPI	6.8E-01	PHYSP ROP	2.5E+04	PHYSP ROP	5.9E-03	2.5E-01	6.0E-01	1.9E-03	EPI
Methamidophos	10265-92-6	1.4E+02	PHYSP ROP	3.5E-08	8.7E-10	PHYSP ROP	3.5E-05	PHYSP ROP	4.6E+01	PHYSP ROP	1.3E+00	CRC89	6.0E-02	9.2E-06	9			5.4E+00	EPI	-8.0E-01	PHYSP ROP	1.0E+06	PHYSP ROP	3.4E-04	6.5E-01	1.6E+00	7.4E-05	EPI
Methanol	67-56-1	3.2E+01	PHYSP ROP	1.9E-04	4.6E-06	PHYSP ROP	1.3E+02	PHYSP ROP	-9.8E+01	PHYSP ROP	7.9E-01	CRC89	1.6E-01	1.7E-05	9			1.0E+00	EPI	-7.7E-01	PHYSP ROP	1.0E+06	PHYSP ROP	6.9E-04	1.6E-01	3.8E-01	3.2E-04	EPI
Methidathion	950-37-8	3.0E+02	PHYSP ROP	2.9E-07	7.2E-09	EPI	3.4E-06	PHYSP ROP	3.9E+01	PHYSP ROP			4.2E-02	4.9E-06	9			2.1E+01	EPI	2.2E+00	PHYSP ROP	1.9E+02	PHYSP ROP	6.1E-03	5.2E+00	1.2E+01	9.1E-04	EPI
Methomyl	16752-77-5	1.6E+02	PHYSP ROP	8.1E-10	2.0E-11	EPI	5.4E-06	PHYSP ROP	7.8E+01	PHYSP ROP	1.3E+00	CRC89	4.8E-02	8.4E-06	9			1.0E+01	EPI	6.0E-01	PHYSP ROP	5.8E+04	PHYSP ROP	2.4E-03	8.5E-01	2.0E+00	4.8E-04	EPI
Methoxy-5-nitroaniline, 2-	99-59-2	1.7E+02	PHYSP ROP	5.1E-07	1.3E-08	PHYSP ROP	3.2E-04	PHYSP ROP	1.2E+02	PHYSP ROP	1.2E+00	CRC89	4.3E-02	7.8E-06	9			7.1E+01	EPI	1.5E+00	PHYSP ROP	1.2E+02	PHYSP ROP	8.4E-03	9.2E-01	2.2E+00	1.7E-03	EPI
Methoxychlor	72-43-5	3.5E+02	PHYSP ROP	8.3E-06	2.0E-07	PHYSP ROP	2.6E-06	PHYSP ROP	8.7E+01	PHYSP ROP	1.4E+00	CRC89	2.2E-02	5.6E-06	9			2.7E+04	EPI	5.1E+00	PHYSP ROP	1.0E-01	PHYSP ROP	3.1E-01	9.1E+00	2.2E+01	4.3E-02	EPI
Methoxyethanol Acetate, 2-	110-49-6	1.2E+02	PHYSP ROP	1.3E-05	3.1E-07	EPI	7.0E+00	PHYSP ROP	-6.5E+01	PHYSP ROP	1.0E+00	CRC89	6.6E-02	8.7E-06	9			2.5E+00	EPI	1.0E-01	PHYSP ROP	1.0E+06	PHYSP ROP	1.7E-03	4.8E-01	1.2E+00	4.0E-04	EPI
Methoxyethanol, 2-	109-86-4	7.6E+01	PHYSP ROP	1.4E-05	3.3E-07	PHYSP ROP	9.5E+00	PHYSP ROP	-8.5E+01	PHYSP ROP	9.6E-01	CRC89	9.5E-02	1.1E-05	9			1.0E+00	EPI	-7.7E-01	PHYSP ROP	1.0E+06	PHYSP ROP	6.0E-04	2.8E-01	6.7E-01	1.8E-04	EPI
Methyl Acetate	79-20-9	7.4E+01	PHYSP ROP	4.7E-03	1.2E-04	PHYSP ROP	2.2E+02	PHYSP ROP	-9.8E+01	PHYSP ROP	9.3E-01	CRC89	9.6E-02	1.1E-05	9			3.1E+00	EPI	1.8E-01	PHYSP ROP	2.4E+05	PHYSP ROP	2.6E-03	2.7E-01	6.6E-01	7.9E-04	EPI
Methyl Acrylate	96-33-3	8.6E+01	PHYSP ROP	8.1E-03	2.0E-04	EPI	8.7E+01	PHYSP ROP	-7.7E+01	PHYSP ROP	9.5E-01	CRC89	8.6E-02	1.0E-05	9			5.8E+00	EPI	8.0E-01	PHYSP ROP	4.9E+04	PHYSP ROP	6.2E-03	3.2E-01	7.7E-01	1.8E-03	EPI
Methyl Ethyl Ketone (2-Butanone)	78-93-3	7.2E+01	PHYSP ROP	2.3E-03	5.7E-05	PHYSP ROP	9.1E+01	PHYSP ROP	-8.7E+01	PHYSP ROP	8.0E-01	CRC89	9.1E-02	1.0E-05	9			4.5E+00	EPI	2.9E-01	PHYSP ROP	2.2E+05	PHYSP ROP	3.1E-03	2.7E-01	6.4E-01	9.6E-04	EPI
Methyl Hydrazine	60-34-4	4.6E+01	PHYSP ROP	1.2E-04	3.0E-06	PHYSP ROP	5.0E+01	PHYSP ROP	-5.2E+01	PHYSP ROP	8.7E-01	LANGE	1.3E-01	1.4E-05	9			1.3E+01	EPI	-1.1E+00	PHYSP ROP	1.0E+06	PHYSP ROP	4.5E-04	1.9E-01	4.6E-01	1.7E-04	EPI
Methyl Isobutyl Ketone (4-methyl-2-pentanone)	108-10-1	1.0E+02	PHYSP ROP	5.6E-03	1.4E-04	EPI	2.0E+01	PHYSP ROP	-8.4E+01	PHYSP ROP	8.0E-01	CRC89	7.0E-02	8.3E-06	9			1.3E+01	EPI	1.3E+00	PHYSP ROP	1.9E+04	PHYSP ROP	1.2E-02	3.8E-01	9.2E-01	3.2E-03	EPI
Methyl Isocyanate	624-83-9	5.7E+01	PHYSP ROP	3.8E-02	9.3E-04	PHYSP ROP	3.5E+02	PHYSP ROP	-4.5E+01	PHYSP ROP	9.6E-01	CRC89	1.2E-01	1.3E-05	9			4.0E+01	EPI	7.9E-01	PHYSP ROP	2.9E+04	PHYSP ROP	7.3E-03	2.2E-01	5.3E-01	2.5E-03	EPI
Methyl Methacrylate	80-62-6	1.0E+02	PHYSP ROP	1.3E-02	3.2E-04	EPI	3.9E+01	PHYSP ROP	-4.8E+01	PHYSP ROP	9.4E-01	CRC89	7.5E-02	9.2E-06	9			9.1E+00	EPI	1.4E+00	PHYSP ROP	1.5E+04	PHYSP ROP	1.4E-02	3.8E-01	9.2E-01	3.6E-03	EPI
Methyl Parathion	298-00-0	2.6E+02	PHYSP ROP	4.1E-06	1.0E-07	PHYSP ROP	3.5E-06	PHYSP ROP	3.6E+01	PHYSP ROP	1.4E+00	CRC89	2.5E-02	6.4E-06	9			7.3E+02	EPI	2.9E+00	PHYSP ROP	3.8E+01	PHYSP ROP	2.6E-02	3.1E+00	7.5E+00	4.2E-03	EPI
Methyl Phosphonic Acid	993-13-5	9.6E+01	PHYSP ROP	5.0E-10	1.2E-11	PHYSP ROP	3.3E-04	EPI	1.1E+02	PHYSP ROP			9.1E-02	1.1E-05	9			1.4E+00	EPI	-7.0E-01	PHYSP ROP	2.0E+04	PHYSP ROP	3.7E-04	3.6E-01	8.7E-01	9.8E-05	EPI
Methyl Styrene (Mixed Isomers)	25013-15-4	3.5E+02	PHYSP ROP	1.1E-01	2.6E-03	PHYSP ROP	1.5E+00	PHYSP ROP	-8.6E+01	EPI	8.9E-01	HSDB	1.7E-02	4.2E-06	9			7.2E+02	EPI	3.4E+00	PHYSP ROP	8.9E+01	PHYSP ROP	4.8E-01	1.0E+01	2.4E+01	6.6E-02	EPI

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Methyl methanesulfonate	66-27-3	1.1E+02	PHYSP ROP	1.6E-04	4.0E-06	PHYSP ROP	3.1E-01	PHYSP ROP	2.0E+01	PHYSP ROP	1.3E+00	CRC89	7.9E-02	1.1E-05	WATER 9			4.3E+00	EPI	-6.6E-01	PHYSP ROP	2.0E+05	LANGE	5.6E-04	4.4E-01	1.0E+00	1.4E-04	EPI
Methyl tert-Butyl Ether (MTBE)	1634-04-4	8.8E+01	PHYSP ROP	2.4E-02	5.9E-04	PHYSP ROP	2.5E+02	PHYSP ROP	-1.1E+02	PHYSP ROP	7.4E-01	CRC89	7.5E-02	8.6E-06	WATER 9			1.2E+01	EPI	9.4E-01	PHYSP ROP	5.1E+04	PHYSP ROP	7.6E-03	3.3E-01	7.9E-01	2.1E-03	EPI
Methyl-1,4-benzenediamine dihydrochloride, 2-	615-45-2	2.0E+02	PHYSP ROP	2.6E-16	6.4E-18	PHYSP ROP	4.1E-12	PHYSP ROP	2.4E+02	EPI			5.6E-02	6.6E-06	WATER 9			2.0E+02	EPI	-2.1E+00	PHYSP ROP	1.0E+06	PHYSP ROP	2.9E-05	1.3E+00	3.1E+00	5.4E-06	EPI
Methyl-5-Nitroaniline, 2-	99-55-8	1.5E+02	PHYSP ROP	3.4E-07	8.3E-09	PHYSP ROP	9.8E-04	PHYSP ROP	1.1E+02	PHYSP ROP			6.7E-02	7.8E-06	WATER 9			1.8E+02	EPI	1.9E+00	PHYSP ROP	1.0E+04	PHYSP ROP	1.8E-02	7.5E-01	1.8E+00	3.8E-03	EPI
Methyl-N-nitro-N-nitrosoguanidine, N-	70-25-7	1.5E+02	PHYSP ROP	5.0E-11	1.2E-12	PHYSP ROP	1.2E-04	PHYSP ROP	1.2E+02	EPI			6.8E-02	8.0E-06	WATER 9			7.2E+01	EPI	-9.2E-01	PHYSP ROP	2.7E+05	PHYSP ROP	2.7E-04	7.0E-01	1.7E+00	5.7E-05	EPI
Methylaniline Hydrochloride, 2-	636-21-5	1.4E+02	PHYSP ROP	8.6E-05	2.1E-06	PHYSP ROP	2.9E-01	PHYSP ROP	2.2E+02	PHYSP ROP			6.9E-02	8.1E-06	WATER 9			1.2E+02	EPI	1.6E+00	PHYSP ROP	8.3E+03	PHYSP ROP	4.8E-05	6.7E-01	1.6E+00	1.1E-05	EPI
Methylarsonic acid	124-58-3	1.4E+02	PHYSP ROP				1.6E-03	PHYSP ROP	1.6E+02	PHYSP ROP			7.0E-02	8.2E-06	WATER 9			4.4E+01	EPI	-1.2E+00	PHYSP ROP	2.6E+05	PHYSP ROP	1.9E-04	6.4E-01	1.5E+00	4.2E-05	EPI
Methylbenzene,1-4-diamine monohydrochloride, 2-	74612-12-7	1.6E+02	OTHER										6.5E-02	7.6E-06	WATER 9										8.1E-01	2.0E+00		
Methylbenzene-1,4-diamine sulfate, 2-	615-50-9	2.2E+02	OTHER										5.2E-02	6.1E-06	WATER 9										1.8E+00	4.3E+00		
Methylcholanthrene, 3-	56-49-5	2.7E+02	PHYSP ROP	2.1E-04	5.2E-06	EPI	4.3E-08	EPI	1.8E+02	PHYSP ROP	1.3E+00	CRC89	2.4E-02	6.1E-06	WATER 9			9.6E+05	EPI	6.4E+00	PHYSP ROP	2.9E-03	PHYSP ROP	5.7E+00	3.3E+00	1.5E+01	9.0E-01	EPI
Methylene Chloride	75-09-2	8.5E+01	PHYSP ROP	1.3E-01	3.3E-03	PHYSP ROP	4.4E+02	PHYSP ROP	-9.5E+01	PHYSP ROP	1.3E+00	CRC89	1.0E-01	1.3E-05	WATER 9			2.2E+01	EPI	1.3E+00	PHYSP ROP	1.3E+04	PHYSP ROP	1.3E-02	3.1E-01	7.5E-01	3.5E-03	EPI
Methylene-bis(2-chloroaniline), 4,4'-	101-14-4	2.7E+02	PHYSP ROP	1.7E-09	4.1E-11	PHYSP ROP	2.9E-07	PHYSP ROP	1.1E+02	PHYSP ROP			4.6E-02	5.4E-06	WATER 9			5.7E+03	EPI	3.9E+00	PHYSP ROP	1.4E+01	PHYSP ROP	1.2E-01	3.3E+00	7.9E+00	2.0E-02	EPI

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLV (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Methylene-bis(N,N-dimethyl-Aniline, 4,4'-	101-61-1	2.5E+02	PHYSP ROP	4.4E-08	1.1E-09	PHYSP ROP	1.8E-05	PHYSP ROP	9.2E+01	PHYSP ROP			4.7E-02	5.5E-06	9			2.7E+03	EPI	4.4E+00	PHYSP ROP	4.1E+00	PHYSP ROP	5.2E-01	2.8E+00	6.7E+00	8.4E-02	RAGSE
Methylenebisbenzenamine, 4,4'-	101-77-9	2.0E+02	PHYSP ROP	2.2E-09	5.3E-11	PHYSP ROP	2.0E-07	PHYSP ROP	9.3E+01	PHYSP ROP			5.6E-02	6.5E-06	9			2.1E+03	EPI	1.6E+00	PHYSP ROP	1.0E+03	PHYSP ROP	7.5E-03	1.4E+00	3.3E+00	1.4E-03	EPI
Methylenediphenyl Diisocyanate	101-68-8	2.5E+02	PHYSP ROP	3.7E-05	9.0E-07	PHYSP ROP	5.0E-06	PHYSP ROP	3.8E+01	PHYSP ROP	1.2E+00	CRC89	2.4E-02	6.2E-06	9			2.8E+05	EPI	5.2E+00	PHYSP ROP	8.3E-01	PHYSP ROP	1.1E+00	2.7E+00	1.0E+01	1.8E-01	EPI
Methylstyrene, Alpha-	98-83-9	1.2E+02	PHYSP ROP	1.0E-01	2.6E-03	EPI PHYSP	1.9E+00	EPI PHYSP	-2.3E+01	PHYSP ROP	9.1E-01	CRC89	6.3E-02	8.2E-06	9			7.0E+02	EPI	3.5E+00	PHYSP ROP	1.2E+02	PHYSP ROP	2.9E-01	4.8E-01	1.2E+00	7.0E-02	EPI
Metolachlor	51218-45-2	2.8E+02	PHYSP ROP	3.7E-07	9.0E-09	PHYSP ROP	3.1E-05	PHYSP ROP	-6.2E+01	PHYSP ROP	1.1E+00	CRC89	2.2E-02	5.5E-06	9			4.9E+02	EPI	3.1E+00	PHYSP ROP	5.3E+02	PHYSP ROP	2.2E-02	4.1E+00	9.8E+00	3.4E-03	EPI
Metribuzin	21087-64-9	2.1E+02	PHYSP ROP	4.8E-09	1.2E-10	EPI	4.4E-07	PHYSP ROP	1.3E+02	PHYSP ROP	1.3E+00	CRC89	2.7E-02	7.1E-06	9			5.3E+01	EPI	1.7E+00	PHYSP ROP	1.1E+03	PHYSP ROP	7.4E-03	1.7E+00	4.0E+00	1.3E-03	EPI
Metsulfuron-methyl	74223-64-6	3.8E+02	PHYSP ROP	5.4E-15	1.3E-16	EPI	2.5E-12	PHYSP ROP	1.6E+02	PHYSP ROP			3.6E-02	4.2E-06	9			9.3E+01	EPI	2.2E+00	PHYSP ROP	9.5E+03	PHYSP ROP	2.5E-03	1.4E+01	3.4E+01	3.3E-04	EPI
Mineral oils	8012-95-1	1.7E+02	EPI	3.3E+02	8.2E+00	EPI	1.4E-01	EPI	-9.6E+00	EPI	8.8E-01	ChemN et	3.6E-02	6.4E-06	9			4.8E+03	EPI	6.1E+00	EPI	3.7E-03	EPI	9.8E+00	9.5E-01	4.3E+00	2.0E+00	EPI
Mirex	2385-85-5	5.5E+02	PHYSP ROP	3.3E-02	8.1E-04	PHYSP ROP	8.0E-07	PHYSP ROP	4.9E+02	CRC89	2.3E+00	ChemN et	2.2E-02	5.6E-06	9			3.6E+05	EPI	6.9E+00	PHYSP ROP	8.5E-02	PHYSP ROP	4.6E-01	1.2E+02	2.9E+02	5.2E-02	EPI
Molinate	2212-67-1	1.9E+02	PHYSP ROP	1.7E-04	4.1E-06	PHYSP ROP	5.6E-03	PHYSP ROP	7.0E+01	EPI PHYSP	1.1E+00	CRC89	3.2E-02	6.8E-06	9			1.8E+02	EPI	3.2E+00	PHYSP ROP	9.7E+02	PHYSP ROP	9.9E-02	1.2E+00	2.8E+00	1.9E-02	EPI
Molybdenum	7439-98-7	9.6E+01	PHYSP ROP				0.0E+00	NIOSH	2.6E+03	ROP	1.0E+01	CRC89				2.0E+01	BAES							3.8E-03	3.6E-01	8.7E-01	1.0E-03	RAGSE
Monochloramine	10599-90-3	5.1E+01	EPI						-6.6E+01	CRC89														2.8E-03	2.0E-01	4.9E-01	1.0E-03	RAGSE
Monomethylaniline	100-61-8	1.1E+02	PHYSP ROP	3.6E-04	8.9E-06	PHYSP ROP	4.5E-01	PHYSP ROP	-5.7E+01	PHYSP ROP	9.9E-01	CRC89	7.2E-02	9.1E-06	9			8.2E+01	EPI	1.7E+00	PHYSP ROP	5.6E+03	PHYSP ROP	2.0E-02	4.2E-01	1.0E+00	5.0E-03	EPI
Myclobutanil	88671-89-0	2.7E+02	PHYSP ROP	1.7E-07	4.3E-09	EPI	1.6E-06	PHYSP ROP	6.6E+01	ROP			4.5E-02	5.3E-06	9			6.1E+03	EPI	2.9E+00	PHYSP ROP	1.4E+02	PHYSP ROP	2.1E-02	3.6E+00	8.7E+00	3.4E-03	EPI
N,N'-Diphenyl-1,4-benzenediamine	74-31-7	2.6E+02	PHYSP ROP	8.4E-09	2.1E-10	PHYSP ROP	6.4E-09	EPI PHYSP	1.4E+02	PHYSP ROP			4.7E-02	5.4E-06	9			5.2E+04	EPI	4.0E+00	PHYSP ROP	7.4E+00	PHYSP ROP	1.6E-01	3.0E+00	7.2E+00	2.6E-02	EPI
Naled	300-76-5	3.8E+02	PHYSP ROP	2.7E-03	6.5E-05	EPI	2.0E-04	PHYSP ROP	2.7E+01	ROP	2.0E+00	CRC89	2.5E-02	6.4E-06	9			1.3E+02	EPI	1.4E+00	PHYSP ROP	1.5E+00	PHYSP ROP	7.1E-04	1.4E+01	3.4E+01	9.4E-05	EPI
Naphtha, High Flash Aromatic (HFAN)	64742-95-6			1.8E-02	4.4E-04	EPI	8.5E-02	EPI														3.1E+01	EPI					
Naphthylamine, 2-	91-59-8	1.4E+02	PHYSP ROP	3.3E-06	8.1E-08	PHYSP ROP	2.6E-04	PHYSP ROP	1.1E+02	PHYSP ROP	1.6E+00	CRC89	6.4E-02	1.0E-05	9			2.5E+03	EPI	2.3E+00	PHYSP ROP	1.9E+02	PHYSP ROP	3.7E-02	6.7E-01	1.6E+00	8.1E-03	EPI
Napropamide	15299-99-7	2.7E+02	PHYSP ROP	3.4E-08	8.4E-10	EPI	1.7E-07	PHYSP ROP	7.5E+01	ROP			4.5E-02	5.3E-06	9			3.2E+03	EPI	3.4E+00	PHYSP ROP	7.3E+01	PHYSP ROP	5.1E-02	3.5E+00	8.3E+00	8.0E-03	EPI
Nickel Acetate	373-02-4	1.8E+02	PHYSP ROP				1.8E-05	ROP			1.8E+00	PERRY	4.6E-02	9.7E-06	9			1.0E+00	EPI	-1.4E+00	ROP	1.7E+05	ROP	9.9E-05	1.0E+00	2.5E+00	1.9E-05	EPI

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters							
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref		
Nickel Carbonate	3333-67-3	1.2E+02	PHYSP ROP										7.9E-02	9.2E-06	9								9.3E+01	PERRY	5.5E-05	4.9E-01	1.2E+00	1.3E-05	EPI	
Nickel Carbonyl	13463-39-3	1.7E+02	CRC89	2.0E+01	5.0E-01	MSDS	3.2E+02	NIOSH	-1.9E+01	CRC89	1.3E+00	CRC89	4.3E-02	8.2E-06	9								1.8E+02	PERRY		9.5E-01	2.3E+00			
Nickel Hydroxide	12054-48-7	9.3E+01	OTHER																						3.7E-03	3.5E-01	8.3E-01	1.0E-03	RAGSE	
Nickel Oxide	1313-99-1	7.5E+01	EPI						2.0E+03	CRC89	6.7E+00	CRC89													3.3E-03	2.8E-01	6.6E-01	1.0E-03	RAGSE	
Nickel Refinery Dust	NA																												2.0E-04	RAGSE
Nickel Soluble Salts	7440-02-0	5.9E+01	PHYSP ROP				0.0E+00	NIOSH	1.5E+03	CRC89	8.9E+00	CRC89				6.5E+01	SSL								5.9E-04	2.2E-01	5.4E-01	2.0E-04	RAGSE	
Nickel Subulfide	12035-72-2	2.4E+02	CRC89						7.9E+02	CRC89	5.9E+00	CRC89														1.2E-03	2.3E+00	5.6E+00	2.0E-04	RAGSE
Nickelocene	1271-28-9	1.9E+02	CRC89						1.7E+02	CRC89			5.8E-02	6.7E-06	9												1.2E+00	2.9E+00		
Nitrate	14797-55-8	6.2E+01	EPI																							3.0E-03	2.3E-01	5.6E-01	1.0E-03	RAGSE
Nitrate + Nitrite (as N)	NA																												1.0E-03	RAGSE
Nitrite	14797-65-0	4.7E+01	EPI																							2.6E-03	1.9E-01	4.6E-01	1.0E-03	RAGSE
Nitroaniline, 2-	88-74-4	1.4E+02	PHYSP ROP	2.4E-06	5.9E-08	PHYSP ROP	2.8E-03	ROP	7.1E+01	ROP	9.0E-01	CRC89	5.2E-02	7.4E-06	9			1.1E+02	EPI	1.9E+00	ROP		1.5E+03	ROP	2.0E-02	6.2E-01	1.5E+00	4.5E-03	EPI	
Nitroaniline, 4-	100-01-6	1.4E+02	PHYSP ROP	5.2E-08	1.3E-09	PHYSP ROP	3.2E-06	EPI	1.5E+02	ROP	1.4E+00	CRC89	6.4E-02	9.8E-06	9			1.1E+02	EPI	1.4E+00	ROP		7.3E+02	ROP	1.0E-02	6.2E-01	1.5E+00	2.2E-03	EPI	
Nitrobenzene	98-95-3	1.2E+02	PHYSP ROP	9.8E-04	2.4E-05	PHYSP ROP	2.5E-01	ROP	5.7E+00	ROP	1.2E+00	CRC89	6.8E-02	9.4E-06	9			2.3E+02	EPI	1.9E+00	ROP		2.1E+03	ROP	2.3E-02	5.1E-01	1.2E+00	5.4E-03	EPI	
Nitrocellulose	9004-70-0	3.9E+02	PHYSP ROP	1.3E-21	3.3E-23	PHYSP ROP	1.4E-17	ROP	2.6E+02	EPI			3.6E-02	4.2E-06	9			1.0E+01	EPI	-4.6E+00	ROP		1.0E+06	ROP	7.5E-08	1.6E+01	3.7E+01	9.9E-09	EPI	
Nitrofurantoin	67-20-9	2.4E+02	PHYSP ROP	5.4E-11	1.3E-12	PHYSP ROP	2.8E-10	ROP	2.6E+02	ROP			4.9E-02	5.8E-06	9			1.2E+02	EPI	-4.7E-01	ROP		8.0E+01	ROP	2.1E-04	2.3E+00	5.4E+00	3.5E-05	EPI	
Nitrofurazone	59-87-0	2.0E+02	PHYSP ROP	1.3E-11	3.1E-13	PHYSP ROP	4.3E-06	ROP	2.4E+02	EPI			5.6E-02	6.5E-06	9			3.5E+02	EPI	2.3E-01	ROP		2.1E+02	ROP	9.3E-04	1.4E+00	3.2E+00	1.7E-04	EPI	
Nitroglycerin	55-63-0	2.3E+02	PHYSP ROP	3.5E-06	8.7E-08	EPI	4.0E-04	EPI	1.4E+01	ROP	1.6E+00	CRC89	2.9E-02	7.7E-06	9			1.2E+02	EPI	1.6E+00	ROP		1.4E+03	ROP	5.8E-03	2.0E+00	4.7E+00	9.9E-04	EPI	
Nitroguanidine	556-88-7	1.0E+02	PHYSP ROP	1.8E-14	4.5E-16	PHYSP ROP	1.4E-11	ROP	2.4E+02	EPI	2.0E+00	ChemN et	1.0E-01	1.4E-05	9			2.1E+01	EPI	-8.9E-01	ROP		4.4E+03	ROP	4.1E-04	4.0E-01	9.7E-01	1.1E-04	EPI	
Nitromethane	75-52-5	6.1E+01	PHYSP ROP	1.2E-03	2.9E-05	PHYSP ROP	3.6E+01	ROP	-2.9E+01	ROP	1.1E+00	CRC89	1.2E-01	1.4E-05	9			1.0E+01	EPI	-3.5E-01	ROP		1.1E+05	ROP	1.3E-03	2.3E-01	5.5E-01	4.2E-04	EPI	
Nitropropane, 2-	79-46-9	8.9E+01	PHYSP ROP	4.9E-03	1.2E-04	EPI	1.7E+01	ROP	-9.1E+01	ROP	9.8E-01	CRC89	8.5E-02	1.0E-05	9			3.1E+01	EPI	9.3E-01	ROP		1.7E+04	ROP	7.5E-03	3.3E-01	8.0E-01	2.1E-03	EPI	
Nitroso-N-ethylurea, N-	759-73-9	1.2E+02	PHYSP ROP	5.4E-09	1.3E-10	PHYSP ROP	1.8E-02	ROP	9.9E+01	EPI			7.9E-02	9.3E-06	9			2.1E+01	EPI	2.3E-01	ROP		1.3E+04	ROP	2.0E-03	4.8E-01	1.1E+00	4.9E-04	EPI	
Nitroso-N-methylurea, N-	684-93-5	1.0E+02	PHYSP ROP	4.1E-09	9.9E-11	PHYSP ROP	2.9E-02	ROP	1.2E+02	EPI			8.6E-02	1.0E-05	9			1.1E+01	EPI	-3.0E-02	ROP		1.4E+04	ROP	1.5E-03	4.0E-01	9.5E-01	4.0E-04	EPI	
Nitroso-di-N-butylamine, N-	924-16-3	1.6E+02	PHYSP ROP	5.4E-04	1.3E-05	PHYSP ROP	4.7E-02	EPI	2.8E+01	EPI	9.0E-01	PubChe m	4.2E-02	6.8E-06	9			9.1E+02	EPI	2.6E+00	ROP		1.3E+03	ROP	5.5E-02	8.1E-01	1.9E+00	1.1E-02	EPI	



Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Nitroso-di-N-propylamine, N-	621-64-7	1.3E+02	PHYSP ROP	2.2E-04	5.4E-06	PHYSP ROP	8.6E-02	PHYSP ROP	6.8E+00	EPI	9.2E-01	CRC89	5.6E-02	7.8E-06	WATER 9			2.8E+02	EPI	1.4E+00	PHYSP ROP	1.3E+04	PHYSP ROP	1.0E-02	5.6E-01	1.4E+00	2.3E-03	EPI
Nitrosodiethanolamine, N-	1116-54-7	1.3E+02	PHYSP ROP	2.0E-10	4.9E-12	PHYSP ROP	5.0E-04	PHYSP ROP	8.2E+01	EPI			7.3E-02	8.5E-06	WATER 9			1.0E+00	EPI	-1.3E+00	PHYSP ROP	1.0E+06	PHYSP ROP	1.1E-04	5.9E-01	1.4E+00	2.5E-05	RAGSE
Nitrosodiethylamine, N-	55-18-5	1.0E+02	PHYSP ROP	1.5E-04	3.6E-06	PHYSP ROP	8.6E-01	PHYSP ROP	-1.6E+01	EPI	9.4E-01	CRC89	7.4E-02	9.1E-06	WATER 9			8.3E+01	EPI	4.8E-01	PHYSP ROP	1.1E+05	PHYSP ROP	3.4E-03	3.9E-01	9.4E-01	8.7E-04	EPI
Nitrosodimethylamine, N-	62-75-9	7.4E+01	PHYSP ROP	7.4E-05	1.8E-06	PHYSP ROP	2.7E+00	PHYSP ROP	-3.9E+01	EPI	1.0E+00	CRC89	9.9E-02	1.2E-05	WATER 9			2.3E+01	EPI	-5.7E-01	PHYSP ROP	1.0E+06	PHYSP ROP	8.3E-04	2.7E-01	6.6E-01	2.5E-04	EPI
Nitrosodiphenylamine, N-	86-30-6	2.0E+02	PHYSP ROP	5.0E-05	1.2E-06	PHYSP ROP	1.0E-01	PHYSP ROP	6.7E+01	PHYSP ROP			5.6E-02	6.5E-06	WATER 9			2.6E+03	EPI	3.1E+00	PHYSP ROP	3.5E+01	PHYSP ROP	7.9E-02	1.4E+00	3.3E+00	1.5E-02	EPI
Nitrosomethylethylamine, N-	10595-95-6	8.8E+01	PHYSP ROP	5.9E-05	1.4E-06	PHYSP ROP	1.1E+00	PHYSP ROP	-2.7E+01	EPI	9.4E-01	PubChe m	8.4E-02	1.0E-05	WATER 9			4.3E+01	EPI	4.0E-02	PHYSP ROP	3.0E+05	PHYSP ROP	1.9E-03	3.3E-01	7.9E-01	5.3E-04	EPI
Nitrosomorpholine [N-]	59-89-2	1.2E+02	PHYSP ROP	1.0E-06	2.5E-08	PHYSP ROP	3.6E-02	PHYSP ROP	2.9E+01	PHYSP ROP			8.0E-02	9.3E-06	WATER 9			2.3E+01	EPI	-4.4E-01	PHYSP ROP	1.0E+06	PHYSP ROP	7.4E-04	4.7E-01	1.1E+00	1.8E-04	EPI
Nitrosopiperidine [N-]	100-75-4	1.1E+02	PHYSP ROP	3.5E-05	8.4E-07	PHYSP ROP	9.2E-02	PHYSP ROP	6.8E+00	EPI	1.1E+00	CRC89	7.0E-02	9.2E-06	WATER 9			1.7E+02	EPI	3.6E-01	PHYSP ROP	7.7E+04	PHYSP ROP	2.6E-03	4.6E-01	1.1E+00	6.2E-04	EPI
Nitrosopyrrolidine, N-	930-55-2	1.0E+02	PHYSP ROP	2.0E-06	4.9E-08	PHYSP ROP	6.0E-02	PHYSP ROP	-3.1E+00	EPI	1.1E+00	CRC89	8.0E-02	1.0E-05	WATER 9			9.2E+01	EPI	-1.9E-01	PHYSP ROP	1.0E+06	PHYSP ROP	1.2E-03	3.8E-01	9.2E-01	3.2E-04	EPI
Nitrotoluene, m-	99-08-1	1.4E+02	PHYSP ROP	3.8E-04	9.3E-06	PHYSP ROP	2.1E-01	EPI	1.6E+01	PHYSP ROP	1.2E+00	CRC89	5.9E-02	8.7E-06	WATER 9			3.6E+02	EPI	2.5E+00	PHYSP ROP	5.0E+02	PHYSP ROP	5.1E-02	6.2E-01	1.5E+00	1.1E-02	EPI
Nitrotoluene, o-	88-72-2	1.4E+02	PHYSP ROP	5.1E-04	1.3E-05	PHYSP ROP	1.9E-01	EPI	-1.0E+01	PHYSP ROP	1.2E+00	CRC89	5.9E-02	8.7E-06	WATER 9			3.7E+02	EPI	2.3E+00	PHYSP ROP	6.5E+02	PHYSP ROP	4.0E-02	6.2E-01	1.5E+00	9.0E-03	EPI
Nitrotoluene, p-	99-99-0	1.4E+02	PHYSP ROP	2.3E-04	5.6E-06	PHYSP ROP	1.6E-02	EPI	5.2E+01	PHYSP ROP	1.1E+00	CRC89	5.7E-02	8.4E-06	WATER 9			3.6E+02	EPI	2.4E+00	PHYSP ROP	4.4E+02	PHYSP ROP	4.5E-02	6.2E-01	1.5E+00	1.0E-02	EPI
Nonane, n-	111-84-2	1.3E+02	PHYSP ROP	1.4E+02	3.4E+00	EPI	4.5E+00	PHYSP ROP	-5.4E+01	PHYSP ROP	7.2E-01	CRC89	5.1E-02	6.8E-06	WATER 9			8.0E+02	EPI	5.7E+00	PHYSP ROP	2.2E-01	PHYSP ROP	7.4E+00	5.5E-01	2.5E+00	1.7E+00	EPI
Norflurazon	27314-13-2	3.0E+02	PHYSP ROP	1.4E-08	3.4E-10	EPI	2.9E-08	PHYSP ROP	1.8E+02	PHYSP ROP			4.2E-02	4.9E-06	WATER 9			3.1E+03	EPI	2.3E+00	PHYSP ROP	3.4E+01	PHYSP ROP	7.0E-03	5.3E+00	1.3E+01	1.1E-03	EPI
Octabromodiphenyl Ether	32536-52-0	8.0E+02	PHYSP ROP	3.1E-06	7.5E-08	PHYSP ROP	1.3E-02	EPI	2.0E+02	PHYSP ROP			2.2E-02	2.6E-06	WATER 9			9.9E+04	EPI	8.7E+00	PHYSP ROP	1.1E-08	PHYSP ROP	3.3E-01	3.2E+03	7.8E+03	3.1E-02	EPI
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0	3.0E+02	PHYSP ROP	3.5E-08	8.7E-10	PHYSP ROP	3.3E-14	PHYSP ROP	2.9E+02	CRC89			4.3E-02	5.0E-06	WATER 9			5.3E+02	EPI	1.6E-01	PHYSP ROP	5.0E+00	PHYSP ROP	2.9E-04	4.8E+00	1.1E+01	4.4E-05	EPI
Octamethylpyrophosphoramidate	152-16-9	2.9E+02	PHYSP ROP	1.5E-08	3.8E-10	PHYSP ROP	1.0E-03	PHYSP ROP	1.7E+01	PHYSP ROP	1.1E+00	CRC89	2.2E-02	5.4E-06	WATER 9			2.0E+01	EPI	-1.0E+00	PHYSP ROP	1.0E+06	PHYSP ROP	5.4E-05	4.2E+00	1.0E+01	8.3E-06	EPI
Oryzalin	19044-88-3	3.5E+02	PHYSP ROP	7.8E-08	1.9E-09	PHYSP ROP	9.8E-09	PHYSP ROP	1.4E+02	PHYSP ROP			3.9E-02	4.5E-06	WATER 9			8.3E+02	EPI	3.7E+00	PHYSP ROP	2.5E+00	PHYSP ROP	3.8E-02	9.2E+00	2.2E+01	5.4E-03	EPI
Oxadiazon	19666-30-9	3.5E+02	PHYSP ROP	3.0E-06	7.3E-08	EPI	1.1E-07	PHYSP ROP	9.0E+01	PHYSP ROP			3.9E-02	4.5E-06	WATER 9			5.0E+03	EPI	4.8E+00	PHYSP ROP	7.0E-01	PHYSP ROP	2.0E-01	9.0E+00	2.2E+01	2.8E-02	EPI
Oxamyl	23135-22-0	2.2E+02	PHYSP ROP	9.7E-09	2.4E-10	EPI	2.3E-04	PHYSP ROP	1.0E+02	PHYSP ROP	9.7E-01	CRC89	2.3E-02	5.9E-06	WATER 9			1.0E+01	EPI	-4.7E-01	PHYSP ROP	2.8E+05	PHYSP ROP	2.6E-04	1.8E+00	4.3E+00	4.5E-05	EPI

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters						
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm- m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref	
Oxyfluorfen	42874-03-3	3.6E+02	PHYSP ROP	3.4E-05	8.2E-07	EPI	2.0E-07	PHYSP ROP	8.4E+01	PHYSP ROP	1.4E+00	CRC89	2.1E-02	5.3E-06	9			4.0E+04	EPI	4.7E+00	PHYSP ROP	1.2E-01	PHYSP ROP	1.5E-01	1.1E+01	2.7E+01	2.0E-02	EPI	
Paclbutrazol	76738-62-0	2.9E+02	PHYSP ROP	3.4E-09	8.3E-11	EPI	7.5E-09	PHYSP ROP	1.7E+02	PHYSP ROP	1.2E+00	CRC89	2.2E-02	5.7E-06	9			9.2E+02	EPI	3.2E+00	PHYSP ROP	2.6E+01	PHYSP ROP	3.1E-02	4.6E+00	1.1E+01	4.7E-03	EPI	
Paraquat Dichloride	1910-42-5	2.6E+02	PHYSP ROP	1.3E-11	3.2E-13	PHYSP ROP	7.5E-08	PHYSP ROP	3.0E+02	EPI PHYSP			4.7E-02	5.5E-06	9			6.8E+03	EPI	-4.5E+00	PHYSP ROP	6.2E+05	PHYSP ROP	3.6E-07	2.9E+00	7.0E+00	5.8E-08	EPI	
Parathion	56-38-2	2.9E+02	PHYSP ROP	1.2E-05	3.0E-07	ROP	6.7E-06	ROP	6.1E+00	ROP	1.3E+00	CRC89	2.3E-02	5.8E-06	9			2.4E+03	EPI	3.8E+00	ROP	1.1E+01	ROP	8.4E-02	4.5E+00	1.1E+01	1.3E-02	EPI	
Pebulate	1114-71-2	2.0E+02	PHYSP ROP	9.7E-03	2.4E-04	EPI	8.9E-02	ROP	7.1E+01	EPI	9.5E-01	CRC89	2.4E-02	6.1E-06	9			3.0E+02	EPI	3.8E+00	ROP	1.0E+02	ROP	2.2E-01	1.4E+00	3.5E+00	4.0E-02	EPI	
Pendimethalin	40487-42-1	2.8E+02	PHYSP ROP	3.5E-05	8.6E-07	EPI	1.5E-05	PHYSP ROP	5.6E+01	PHYSP ROP	1.2E+00	CRC89	2.3E-02	5.7E-06	9			5.6E+03	EPI	5.2E+00	PHYSP ROP	3.3E-01	PHYSP ROP	7.4E-01	4.0E+00	1.5E+01	1.2E-01	EPI	
Pentabromodiphenyl Ether	32534-81-9	5.6E+02	PHYSP ROP	4.4E-03	1.1E-04	PHYSP ROP	3.1E-08	EPI	-5.0E+00	PHYSP ROP			2.8E-02	3.2E-06	9			2.2E+04	EPI	6.8E+00	PHYSP ROP	2.4E-03	PHYSP ROP	3.4E-01	1.5E+02	3.7E+02	3.7E-02	EPI	
Pentabromodiphenyl ether, 2,2',4,4',5- (BDE-99)	60348-60-9	5.6E+02	PHYSP ROP	4.8E-05	1.2E-06	PHYSP ROP	3.1E-08	EPI	-5.0E+00	EPI	2.3E+00	IRIS Profile	2.2E-02	5.6E-06	9			2.2E+04	EPI	7.7E+00	PHYSP ROP	7.9E-05	PHYSP ROP	3.4E-01	1.5E+02	3.7E+02	3.7E-02	EPI	
Pentachlorobenzene	608-93-5	2.5E+02	PHYSP ROP	2.9E-02	7.0E-04	PHYSP ROP	1.0E-03	EPI	8.6E+01	PHYSP ROP	1.8E+00	CRC89	2.9E-02	7.9E-06	9			3.7E+03	EPI	5.2E+00	PHYSP ROP	8.3E-01	PHYSP ROP	1.0E+00	2.7E+00	1.0E+01	1.7E-01	EPI	
Pentachloroethane	76-01-7	2.0E+02	PHYSP ROP	7.9E-02	1.9E-03	EPI	3.5E+00	PHYSP ROP	-2.9E+01	PHYSP ROP	1.7E+00	CRC89	3.2E-02	8.6E-06	9			1.4E+02	EPI	3.2E+00	PHYSP ROP	4.9E+02	PHYSP ROP	8.6E-02	1.4E+00	3.4E+00	1.6E-02	EPI	
Pentachloronitrobenzene	82-68-8	3.0E+02	PHYSP ROP	1.8E-03	4.4E-05	EPI	5.0E-05	PHYSP ROP	1.4E+02	PHYSP ROP	1.7E+00	CRC89	2.6E-02	6.9E-06	9			6.0E+03	EPI	4.6E+00	PHYSP ROP	4.4E-01	PHYSP ROP	2.8E-01	4.7E+00	1.1E+01	4.2E-02	EPI	
Pentachlorophenol	87-86-5	2.7E+02	PHYSP ROP	1.0E-06	2.5E-08	PHYSP ROP	1.1E-04	PHYSP ROP	1.7E+02	PHYSP ROP	2.0E+00	CRC89	3.0E-02	8.0E-06	9			5.9E+02	SSL	5.1E+00	PHYSP ROP	1.4E+01	PHYSP ROP	8.0E-01	3.3E+00	1.3E+01	1.3E-01	EPI	
Pentaerythritol tetranitrate (PETN)	78-11-5	3.2E+02	PHYSP ROP	5.4E-08	1.3E-09	PHYSP ROP	5.5E-09	EPI	1.4E+02	PHYSP ROP	1.8E+00	CRC89	2.6E-02	6.8E-06	9			6.5E+02	EPI	2.4E+00	PHYSP ROP	4.3E+01	PHYSP ROP	6.9E-03	6.2E+00	1.5E+01	1.0E-03	EPI	
Pentane, n-	109-66-0	7.2E+01	PHYSP ROP	5.1E+01	1.3E+00	PHYSP ROP	5.1E+02	PHYSP ROP	-1.3E+02	PHYSP ROP	6.3E-01	CRC89	8.2E-02	8.8E-06	9			7.2E+01	EPI	3.4E+00	PHYSP ROP	3.8E+01	PHYSP ROP	3.6E-01	2.7E-01	6.4E-01	1.1E-01	EPI	
Perchlorates																													
~Ammonium Perchlorate	7790-98-9	1.2E+02	PHYSP ROP								2.0E+00	CRC89										2.5E+05	PHYSP ROP	4.2E-03	4.8E-01	1.1E+00	1.0E-03	RAGSE	
~Lithium Perchlorate	7791-03-9	1.1E+02	CRC89						2.4E+02	CRC89	2.4E+00	CRC89										5.9E+05	CRC89	4.0E-03	4.1E-01	1.0E+00	1.0E-03	RAGSE	
~Perchlorate and Perchlorate Salts	14797-73-0	1.2E+02	CRC89																			2.5E+05	CRC89	4.2E-03	4.8E-01	1.1E+00	1.0E-03	RAGSE	
~Potassium Perchlorate	7778-74-7	1.4E+02	PHYSP ROP						5.3E+02	PHYSP ROP	2.5E+00	CRC89										1.5E+04	PHYSP ROP	9.1E-03	6.3E-01	1.5E+00	2.0E-03	RAGSE	

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters						
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm- m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref	
~Sodium Perchlorate	7601-89-0	1.2E+02	PHYSP ROP						4.8E+02	EPI	2.5E+00	CRC89										2.1E+06	PHYSP ROP	4.3E-03	5.1E-01	1.2E+00	1.0E-03	RAGSE	
Perfluorobutane Sulfonate	375-73-5	3.0E+02	PHYSP ROP	5.9E-04	1.4E-05	PHYSP ROP	5.2E-02	PHYSP ROP	3.7E+01	EPI	1.8E+00	LookCh em	2.7E-02	7.2E-06	9			1.8E+02	EPI	2.4E+00	PHYSP ROP	1.1E+02	PHYSP ROP	8.7E-03	5.0E+00	1.2E+01	1.3E-03	EPI	
Permethrin	52645-53-1	3.9E+02	PHYSP ROP	7.7E-05	1.9E-06	EPI	2.2E-08	PHYSP ROP	3.4E+01	ROP	1.2E+00	CRC89	1.9E-02	4.8E-06	9			1.2E+05	EPI	6.5E+00	PHYSP ROP	6.0E-03	PHYSP ROP	1.6E+00	1.6E+01	6.5E+01	2.1E-01	EPI	
Phenacetin	62-44-2	1.8E+02	PHYSP ROP	8.7E-09	2.1E-10	EPI	6.9E-07	PHYSP ROP	1.4E+02	PHYSP ROP			6.0E-02	7.0E-06	9			4.1E+01	EPI	1.6E+00	PHYSP ROP	7.7E+02	PHYSP ROP	8.9E-03	1.1E+00	2.5E+00	1.7E-03	EPI	
Phenmedipham	13684-63-4	3.0E+02	PHYSP ROP	3.4E-11	8.4E-13	EPI	1.0E-11	PHYSP ROP	1.4E+02	PHYSP ROP			4.2E-02	5.0E-06	9			2.6E+03	EPI	3.6E+00	PHYSP ROP	4.7E+00	PHYSP ROP	5.2E-02	5.1E+00	1.2E+01	7.9E-03	EPI	
Phenol	108-95-2	9.4E+01	PHYSP ROP	1.4E-05	3.3E-07	ROP	3.5E-01	PHYSP ROP	4.1E+01	ROP	1.1E+00	CRC89	8.3E-02	1.0E-05	9			1.9E+02	EPI	1.5E+00	PHYSP ROP	8.3E+04	PHYSP ROP	1.6E-02	3.5E-01	8.5E-01	4.3E-03	EPI	
Phenol, 2-(1-methylethoxy)-, methylcarbamate	114-26-1	2.1E+02	PHYSP ROP	5.8E-08	1.4E-09	EPI	2.1E-05	PHYSP ROP	9.0E+01	PHYSP ROP	1.1E+00	CRC89	2.6E-02	6.6E-06	9			6.0E+01	EPI	1.5E+00	PHYSP ROP	1.9E+03	PHYSP ROP	6.0E-03	1.6E+00	3.7E+00	1.1E-03	EPI	
Phenothiazine	92-84-2	2.0E+02	PHYSP ROP	1.1E-06	2.8E-08	ROP	8.9E-07	PHYSP ROP	1.9E+02	ROP	1.3E+00	PubChe m	2.9E-02	7.5E-06	9			1.5E+03	EPI	4.2E+00	PHYSP ROP	1.6E+00	PHYSP ROP	3.7E-01	1.4E+00	3.3E+00	6.8E-02	EPI	
Phenylenediamine, m-	108-45-2	1.1E+02	PHYSP ROP	5.1E-08	1.3E-09	EPI	2.1E-03	EPI	6.4E+01	ROP	1.0E+00	CRC89	7.2E-02	9.2E-06	9			3.4E+01	EPI	-3.3E-01	PHYSP ROP	2.4E+05	PHYSP ROP	9.4E-04	4.2E-01	1.0E+00	2.3E-04	EPI	
Phenylenediamine, o-	95-54-5	1.1E+02	PHYSP ROP	2.9E-07	7.2E-09	EPI	2.1E-03	EPI	1.0E+02	PHYSP ROP			8.4E-02	9.8E-06	9			3.5E+01	EPI	1.5E-01	PHYSP ROP	4.0E+04	PHYSP ROP	1.9E-03	4.2E-01	1.0E+00	4.9E-04	EPI	
Phenylenediamine, p-	106-50-3	1.1E+02	PHYSP ROP	2.8E-08	6.7E-10	PHYSP ROP	5.0E-03	PHYSP ROP	1.5E+02	PHYSP ROP			8.4E-02	9.8E-06	9			3.4E+01	EPI	-3.0E-01	PHYSP ROP	3.7E+04	PHYSP ROP	9.8E-04	4.2E-01	1.0E+00	2.5E-04	EPI	
Phenylphenol, 2-	90-43-7	1.7E+02	PHYSP ROP	4.3E-05	1.1E-06	EPI	2.0E-03	EPI	5.9E+01	ROP	1.2E+00	CRC89	4.2E-02	7.8E-06	9			6.7E+03	EPI	3.1E+00	PHYSP ROP	7.0E+02	PHYSP ROP	9.8E-02	9.4E-01	2.3E+00	2.0E-02	EPI	
Phorate	298-02-2	2.6E+02	PHYSP ROP	1.8E-04	4.4E-06	EPI	6.4E-04	PHYSP ROP	-1.5E+01	CRC89 PHYSP	1.2E+00	CRC89	2.3E-02	5.9E-06	9			4.6E+02	EPI	3.6E+00	PHYSP ROP	5.0E+01	PHYSP ROP	7.8E-02	3.0E+00	7.2E+00	1.3E-02	EPI	
Phosgene	75-44-5	9.9E+01	PHYSP ROP	6.8E-01	1.7E-02	ROP	1.4E+03	PHYSP ROP	-1.2E+02	PHYSP ROP	1.4E+00	CRC89	8.9E-02	1.2E-05	9			1.0E+00	EPI	-7.1E-01	PHYSP ROP	6.8E+03	YAWS PHYSP	5.6E-04	3.8E-01	9.0E-01	1.5E-04	EPI	
Phosmet	732-11-6	3.2E+02	PHYSP ROP	3.4E-07	8.4E-09	EPI	4.9E-07	PHYSP ROP	7.2E+01	ROP			4.1E-02	4.8E-06	9			1.0E+01	EPI	2.8E+00	PHYSP ROP	2.4E+01	PHYSP ROP	1.3E-02	6.3E+00	1.5E+01	1.8E-03	EPI	
Phosphates, Inorganic																													
~Aluminum metaphosphate	13776-88-0	2.6E+02	CRC89								2.8E+00	CRC89												6.2E-03	3.2E+00	7.6E+00	1.0E-03	RAGSE	
~Ammonium polyphosphate	68333-79-9																											1.0E-03	RAGSE
~Calcium pyrophosphate	7790-76-3	2.5E+02	CRC89						1.2E+03	CRC89	3.1E+00	CRC89												6.1E-03	2.8E+00	6.7E+00	1.0E-03	RAGSE	
~Diammonium phosphate	7783-28-0	1.3E+02	EPI																					4.4E-03	5.8E-01	1.4E+00	1.0E-03	RAGSE	

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters						
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	Dia and Diw Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref	
~Dicalcium phosphate	7757-93-9	1.4E+02	EPI																						4.5E-03	6.1E-01	1.5E+00	1.0E-03	RAGSE
~Dimagnesium phosphate	7782-75-4	1.7E+02	CRC89								2.1E+00	CRC89													5.1E-03	1.0E+00	2.4E+00	1.0E-03	RAGSE
~Dipotassium phosphate	7758-11-4	1.7E+02	EPI																						5.1E-03	9.9E-01	2.4E+00	1.0E-03	RAGSE
~Disodium phosphate	7558-79-4	1.4E+02	EPI																						4.6E-03	6.6E-01	1.6E+00	1.0E-03	RAGSE
~Monoaluminum phosphate	13530-50-2	3.2E+02	CRC89																						6.9E-03	6.3E+00	1.5E+01	1.0E-03	RAGSE
~Monoammonium phosphate	7722-76-1	1.2E+02	EPI																						4.1E-03	4.6E-01	1.1E+00	1.0E-03	RAGSE
~Monocalcium phosphate	7758-23-8	2.3E+02	EPI																						5.9E-03	2.2E+00	5.2E+00	1.0E-03	RAGSE
~Monomagnesium phosphate	7757-86-0	1.2E+02	CRC89																						4.2E-03	5.0E-01	1.2E+00	1.0E-03	RAGSE
~Monopotassium phosphate	7778-77-0	1.4E+02	EPI																						4.5E-03	6.1E-01	1.5E+00	1.0E-03	RAGSE
~Monosodium phosphate	7558-80-7	1.2E+02	PHYSP ROP						6.0E+01	PHYSP ROP													4.9E+05	PHYSP ROP	4.2E-03	4.9E-01	1.2E+00	1.0E-03	RAGSE
~Polyphosphoric acid	8017-16-1	2.6E+02	EPI																						6.2E-03	2.9E+00	7.0E+00	1.0E-03	RAGSE
~Potassium tripolyphosphate	13845-36-8	4.5E+02	OTHER																						8.1E-03	3.4E+01	8.2E+01	1.0E-03	RAGSE
~Sodium acid pyrophosphate	7758-16-9	2.2E+02	EPI																						5.7E-03	1.8E+00	4.4E+00	1.0E-03	RAGSE
~Sodium aluminum phosphate (acidic)	7785-88-8	1.4E+02	OTHER																						4.6E-03	6.8E-01	1.6E+00	1.0E-03	RAGSE

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters																													
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref																								
~Sodium aluminum phosphate (anhydrous)	10279-59-1																																		1.0E-03	RAGSE																
~Sodium aluminum phosphate (tetrahydrate)	10305-76-7	9.5E+02	OTHER																						1.2E-02	2.2E+04	5.3E+04	1.0E-03	RAGSE																							
~Sodium hexametaphosphate	10124-56-8	6.1E+02	CRC89																																9.5E-03	2.8E+02	6.7E+02	1.0E-03	RAGSE													
~Sodium polyphosphate	68915-31-1	3.6E+02	EPI																																	7.3E-03	1.1E+01	2.6E+01	1.0E-03	RAGSE												
~Sodium trimetaphosphate	7785-84-4	3.1E+02	EPI																																		6.7E-03	5.4E+00	1.3E+01	1.0E-03	RAGSE											
~Sodium tripolyphosphate	7758-29-4	3.7E+02	EPI																																			7.4E-03	1.2E+01	2.9E+01	1.0E-03	RAGSE										
~Tetrapotassium phosphate	7320-34-5	3.3E+02	PHYSP ROP																																				7.0E-03	7.4E+00	1.8E+01	1.0E-03	RAGSE									
~Tetrasodium pyrophosphate	7722-88-5	2.7E+02	PHYSP ROP																																						8.1E+04	PHYSP ROP	6.3E-03	3.2E+00	7.8E+00	1.0E-03	RAGSE					
~Trialuminum sodium tetra decahydrogenoctaorthophosphate (dihydrate)	15136-87-5	8.9E+02	OTHER																																										1.1E-02	9.9E+03	2.4E+04	1.0E-03	RAGSE			
~Tricalcium phosphate	7758-87-4	3.1E+02	CRC89																																											6.8E-03	5.7E+00	1.4E+01	1.0E-03	RAGSE		
~Trimagnesium phosphate	7757-87-1	2.6E+02	CRC89																																													6.2E-03	3.1E+00	7.5E+00	1.0E-03	RAGSE

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters								
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref			
~Tripotassium phosphate	7778-53-2	2.1E+02	EPI																						5.6E-03	1.6E+00	3.9E+00	1.0E-03	RAGSE		
~Trisodium phosphate	7601-54-9	1.6E+02	PHYSP ROP						7.5E+01	PHYSP ROP															4.9E-03	8.7E-01	2.1E+00	1.0E-03	RAGSE		
Phosphine	7803-51-2	3.4E+01	ROP	1.0E+00	2.4E-02	PHYSP ROP	2.9E+04	PHYSP ROP	-1.3E+02	ROP	1.4E+00	CRC89	1.9E-01	2.2E-05	9										2.2E-03	1.6E-01	3.9E-01	1.0E-03	RAGSE		
Phosphoric Acid	7664-38-2	9.8E+01	PHYSP ROP				3.0E-02	NIOSH	4.2E+01	PHYSP ROP	1.8E+00	PERRY													5.5E+06	CRC89	3.8E-03	3.7E-01	8.9E-01	1.0E-03	RAGSE
Phosphorus, White	7723-14-0	1.2E+02	OTHER	8.6E-02	2.1E-03	ATSDR Profile	2.5E-02	ATSDR Profile	4.4E+01	ATSDR Profile	1.8E+00	ATSDR Profile	2.2E-01	2.8E-05	9	3.5E+00	BAES	1.1E+03	ATSDR Profile	3.1E+00	OTHER			3.0E+00	ATSDR Profile	4.3E-03	5.2E-01	1.2E+00	1.0E-03	RAGSE	
Phthalates																															
~Bis(2-ethylhexyl)phthalate	117-81-7	3.9E+02	PHYSP ROP	1.1E-05	2.7E-07	EPI	1.4E-07	PHYSP ROP	-5.5E+01	PHYSP ROP	9.8E-01	CRC89	1.7E-02	4.2E-06	9			1.2E+05	EPI	7.6E+00	PHYSP ROP			2.7E-01	PHYSP ROP	8.6E+00	1.6E+01	7.3E+01	1.1E+00	EPI	
~Butyl Benzyl Phthalate	85-68-7	3.1E+02	PHYSP ROP	5.2E-05	1.3E-06	EPI	8.3E-06	PHYSP ROP	-3.5E+01	PubChe m	1.1E+00	CRC89	2.1E-02	5.2E-06	9			7.2E+03	EPI	4.7E+00	PHYSP ROP			2.7E+00	PHYSP ROP	2.6E-01	5.9E+00	1.4E+01	3.9E-02	EPI	
~Butylphthalyl Butylglycolate	85-70-1	3.4E+02	PHYSP ROP	8.4E-07	2.1E-08	PHYSP ROP	7.1E-06	PHYSP ROP	-3.5E+01	PHYSP ROP	1.1E+00	LANGE	2.0E-02	4.9E-06	9			1.1E+04	EPI	4.2E+00	PHYSP ROP			8.8E+00	PHYSP ROP	8.2E-02	8.0E+00	1.9E+01	1.2E-02	EPI	
~Dibutyl Phthalate	84-74-2	2.8E+02	PHYSP ROP	7.4E-05	1.8E-06	PHYSP ROP	2.0E-05	PHYSP ROP	-3.5E+01	PHYSP ROP	1.0E+00	CRC89	2.1E-02	5.3E-06	9			1.2E+03	EPI	4.5E+00	PHYSP ROP			1.1E+01	PHYSP ROP	2.7E-01	3.8E+00	9.1E+00	4.2E-02	EPI	
~Diethyl Phthalate	84-66-2	2.2E+02	PHYSP ROP	2.5E-05	6.1E-07	EPI	2.1E-03	PHYSP ROP	-4.1E+01	PHYSP ROP	1.2E+00	CRC89	2.6E-02	6.7E-06	9			1.0E+02	EPI	2.4E+00	PHYSP ROP			1.1E+03	PHYSP ROP	2.1E-02	1.8E+00	4.4E+00	3.6E-03	EPI	
~Dimethylterephthalate	120-61-6	1.9E+02	PHYSP ROP	5.5E-03	1.3E-04	EPI	1.0E-02	PHYSP ROP	1.4E+02	PHYSP ROP	1.1E+00	CRC89	2.9E-02	6.7E-06	9			3.1E+01	EPI	2.3E+00	PHYSP ROP			1.9E+01	PHYSP ROP	2.1E-02	1.3E+00	3.1E+00	4.0E-03	EPI	
~Octyl Phthalate, di-N-	117-84-0	3.9E+02	PHYSP ROP	1.1E-04	2.6E-06	EPI	1.0E-07	PHYSP ROP	2.5E+01	PHYSP ROP			3.6E-02	4.2E-06	9			1.4E+05	EPI	8.1E+00	PHYSP ROP			2.2E-02	PHYSP ROP	1.8E+01	1.6E+01	7.5E+01	2.4E+00	EPI	
~Phthalic Acid, P-	100-21-0	1.7E+02	PHYSP ROP	1.6E-11	3.9E-13	PHYSP ROP	9.2E-06	EPI	4.0E+02	LANGE	1.5E+00	PERRY	4.9E-02	9.0E-06	9			7.9E+01	EPI	2.0E+00	PHYSP ROP			1.5E+01	PHYSP ROP	1.9E-02	9.0E-01	2.1E+00	3.9E-03	EPI	
~Phthalic Anhydride	85-44-9	1.5E+02	PHYSP ROP	6.7E-07	1.6E-08	EPI	5.2E-04	EPI	1.3E+02	PHYSP ROP	1.5E+00	CRC89	5.9E-02	9.8E-06	9			1.0E+01	EPI	1.6E+00	PHYSP ROP			6.2E+03	PHYSP ROP	1.2E-02	7.1E-01	1.7E+00	2.7E-03	EPI	
Picloram	1918-02-1	2.4E+02	PHYSP ROP	2.2E-12	5.3E-14	EPI	7.2E-11	PHYSP ROP	2.2E+02	PHYSP ROP			4.9E-02	5.7E-06	9			3.9E+01	EPI	1.9E+00	PHYSP ROP			4.3E+02	PHYSP ROP	7.6E-03	2.4E+00	5.7E+00	1.3E-03	EPI	
Picramic Acid (2-Amino-4,6-dinitrophenol)	96-91-3	2.0E+02	PHYSP ROP	4.0E-10	9.8E-12	PHYSP ROP	4.2E-07	PHYSP ROP	1.7E+02	PHYSP ROP			5.6E-02	6.5E-06	9			2.3E+02	EPI	9.3E-01	PHYSP ROP			1.4E+03	PHYSP ROP	2.7E-03	1.4E+00	3.3E+00	5.0E-04	EPI	
Picric Acid (2,4,6-Trinitrophenol)	88-89-1	2.3E+02	PHYSP ROP	7.0E-10	1.7E-11	EPI	7.5E-07	PHYSP ROP	1.2E+02	PHYSP ROP	1.8E+00	PERRY	3.0E-02	8.2E-06	9			2.3E+03	EPI	1.4E+00	PHYSP ROP			1.3E+04	PHYSP ROP	3.6E-03	2.0E+00	4.8E+00	6.2E-04	EPI	

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm- m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event t)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Pirimiphos, Methyl	29232-93-7	3.1E+02	PHYSP ROP	2.9E-05	7.0E-07	EPI	1.5E-05	PHYSP ROP	1.5E+01	PHYSP ROP	1.2E+00	CRC89	2.2E-02	5.4E-06	9			3.7E+02	EPI	4.2E+00	PHYSP ROP	8.6E+00	PHYSP ROP	1.3E-01	5.4E+00	1.3E+01	1.9E-02	EPI
Polybrominated Biphenyls	59536-65-1																											
Polychlorinated Biphenyls (PCBs)																												
~Aroclor 1016	12674-11-2	5.5E+02	PHYSP ROP	8.2E-03	2.0E-04	EPI	4.0E-04	PHYSP ROP	1.0E+02	EPI	1.4E+00	ATSDR Profile	1.7E-02	4.2E-06	9			4.8E+04	EPI	5.7E+00	PHYSP ROP	4.2E-01	PHYSP ROP	2.7E+00	1.3E+02	5.3E+02	3.1E-01	EPI
~Aroclor 1221	11104-28-2	1.9E+02	PHYSP ROP	9.3E-03	2.3E-04	ROP	6.7E-03	PHYSP ROP	3.4E+01	EPI	1.2E+00	ATSDR Profile	3.2E-02	7.2E-06	9			8.4E+03	EPI	4.7E+00	PHYSP ROP	1.5E+01	PHYSP ROP	8.9E-01	1.2E+00	4.6E+00	1.7E-01	EPI
~Aroclor 1232	11141-16-5	1.9E+02	PHYSP ROP	3.0E-02	7.4E-04	EPI	4.1E-03	PHYSP ROP	3.4E+01	EPI	1.3E+00	ATSDR Profile	3.3E-02	7.5E-06	9			8.4E+03	EPI	4.4E+00	PHYSP ROP	1.5E+00	PHYSP ROP	8.9E-01	1.2E+00	4.6E+00	1.7E-01	EPI
~Aroclor 1242	53469-21-9	2.9E+02	PHYSP ROP	1.4E-02	3.4E-04	ROP	8.6E-05	PHYSP ROP	1.2E+02	EPI	1.4E+00	ATSDR Profile	2.4E-02	6.1E-06	9			7.8E+04	EPI	6.3E+00	PHYSP ROP	2.8E-01	PHYSP ROP	3.6E+00	4.5E+00	1.9E+01	5.5E-01	EPI
~Aroclor 1248	12672-29-6	6.2E+02	PHYSP ROP	1.8E-02	4.4E-04	ROP	4.9E-04	PHYSP ROP	1.2E+02	EPI	1.4E+00	HSDB ATSDR	1.6E-02	3.9E-06	9			7.7E+04	EPI	6.2E+00	PHYSP ROP	1.0E-01	PHYSP ROP	4.5E+00	3.1E+02	1.3E+03	4.8E-01	EPI
~Aroclor 1254	11097-69-1	3.3E+02	PHYSP ROP	1.2E-02	2.8E-04	ROP	7.7E-05	PHYSP ROP	1.3E+02	EPI	1.5E+00	ATSDR Profile	2.4E-02	6.1E-06	9			1.3E+05	EPI	6.5E+00	PHYSP ROP	4.3E-02	PHYSP ROP	5.2E+00	7.1E+00	3.1E+01	7.5E-01	EPI
~Aroclor 1260	11096-82-5	4.0E+02	PHYSP ROP	1.4E-02	3.4E-04	ROP	4.1E-05	PHYSP ROP	1.6E+02	EPI	1.6E+00	ATSDR Profile	2.2E-02	5.6E-06	9			3.5E+05	EPI	7.6E+00	PHYSP ROP	1.4E-02	PHYSP ROP	7.5E+00	1.7E+01	7.7E+01	9.9E-01	EPI
~Aroclor 5460	11126-42-4	2.9E+02	PHYSP ROP	5.1E-03	1.3E-04	ROP	8.5E-06	PHYSP ROP	1.2E+02	EPI	1.6E+00	LookCh em	2.6E-02	6.8E-06	9			8.1E+04	EPI	6.3E+00	PHYSP ROP	5.3E-02	PHYSP ROP	3.8E+00	4.5E+00	2.0E+01	5.8E-01	EPI
~Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)	39635-31-9	4.0E+02	PHYSP ROP	2.1E-03	5.1E-05	PHYSP ROP	1.3E-07	PHYSP ROP	1.6E+02	EPI	1.7E+00	LookCh em	4.2E-02	5.7E-06	9			3.5E+05	EPI	8.3E+00	PHYSP ROP	7.5E-04	PHYSP ROP	2.3E+01	1.7E+01	8.0E+01	3.0E+00	EPI
~Hexachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 167)	52663-72-6	3.6E+02	PHYSP ROP	2.8E-03	6.9E-05	PHYSP ROP	5.8E-07	PHYSP ROP	1.5E+02	EPI	1.6E+00	LookCh em	4.4E-02	5.9E-06	9			2.1E+05	EPI	7.5E+00	PHYSP ROP	2.2E-03	PHYSP ROP	1.0E+01	1.1E+01	5.0E+01	1.4E+00	EPI
~Hexachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 157)	69782-90-7	3.6E+02	PHYSP ROP	6.6E-03	1.6E-04	EPI	5.8E-07	EPI	1.5E+02	EPI	1.6E+00	I	4.4E-02	5.9E-06	9			2.1E+05	EPI	7.6E+00	PHYSP ROP	1.6E-03	EPI	1.2E+01	1.1E+01	5.0E+01	1.7E+00	EPI
~Hexachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 156)	38380-08-4	3.6E+02	PHYSP ROP	5.8E-03	1.4E-04	EPI	1.6E-06	PHYSP ROP	1.5E+02	EPI	1.6E+00	LookCh em	4.4E-02	5.9E-06	9			2.1E+05	EPI	7.6E+00	PHYSP ROP	5.3E-03	PHYSP ROP	1.2E+01	1.1E+01	5.0E+01	1.7E+00	EPI
~Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)	32774-16-6	3.6E+02	PHYSP ROP	2.8E-03	6.9E-05	PHYSP ROP	5.8E-07	PHYSP ROP	1.5E+02	EPI	1.6E+00	LookCh em	4.4E-02	5.9E-06	9			2.1E+05	EPI	7.4E+00	PHYSP ROP	5.1E-04	PHYSP ROP	9.1E+00	1.1E+01	5.0E+01	1.2E+00	EPI

Contaminant		Molecular Weight		Volatility Parameters				Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters						
Analyte	CAS No.	MW	MW Ref	H <sup>*</sup> (unitless)	HLC (atm- m <sup>3</sup> /mole)	H <sup>*</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event t)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
~Pentachlorobiphenyl, 2,3,4,4',5- (PCB 123)	65510- 44-3	3.3E+02	EPI	7.8E-03	1.9E-04	EPI	5.5E-06	EPI	9.8E+01	EPI	1.5E+00	LookCh em	4.7E-02	6.1E-06	9			1.3E+05	EPI	7.0E+00	EPI	1.6E-02	EPI	6.9E+00	7.1E+00	3.2E+01	1.0E+00	EPI
~Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)	31508- 00-6	3.3E+02	PHYSP ROP	1.2E-02	2.9E-04	EPI	9.0E-06	PHYSP ROP	1.3E+02	EPI	1.5E+00	LookCh em	4.7E-02	6.1E-06	9			1.3E+05	EPI	7.1E+00	PHYSP ROP	1.3E-02	PHYSP ROP	8.6E+00	7.1E+00	3.2E+01	1.2E+00	EPI
~Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)	32598- 14-4	3.3E+02	PHYSP ROP	1.2E-02	2.8E-04	EPI	6.5E-06	PHYSP ROP	1.3E+02	EPI	1.5E+00	LookCh em	4.7E-02	6.1E-06	9			1.3E+05	EPI	6.8E+00	PHYSP ROP	3.4E-03	PHYSP ROP	5.2E+00	7.1E+00	3.1E+01	7.5E-01	EPI
~Pentachlorobiphenyl, 2,3,4,4',5-74472- (PCB 114)	37-0	3.3E+02	PHYSP ROP	3.8E-03	9.2E-05	PHYSP ROP	5.5E-06	PHYSP ROP	9.8E+01	PHYSP ROP	1.5E+00	LookCh em	4.7E-02	6.1E-06	9			1.3E+05	EPI	7.0E+00	PHYSP ROP	1.6E-02	PHYSP ROP	6.9E+00	7.1E+00	3.2E+01	1.0E+00	EPI
~Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)	57465- 28-8	3.3E+02	EPI	7.8E-03	1.9E-04	EPI	2.2E-06	EPI	1.3E+02	EPI	1.5E+00	LookCh em	4.7E-02	6.1E-06	9			1.3E+05	EPI	7.0E+00	EPI	7.3E-03	EPI	6.9E+00	7.1E+00	3.2E+01	1.0E+00	EPI
~Polychlorinated Biphenyls (high risk)	1336-36- 3	2.9E+02	PHYSP ROP	1.7E-02	4.2E-04	PHYSP ROP	4.9E-04	PHYSP ROP	1.2E+02	EPI	1.4E+00	HSDB	2.4E-02	6.3E-06	9			7.8E+04	EPI	7.1E+00	PHYSP ROP	7.0E-01	PHYSP ROP	3.6E+00	4.5E+00	1.9E+01	5.5E-01	EPI
~Polychlorinated Biphenyls (low risk)	1336-36- 3	2.9E+02	PHYSP ROP	1.7E-02	4.2E-04	PHYSP ROP	4.9E-04	PHYSP ROP	1.2E+02	EPI	1.4E+00	HSDB	2.4E-02	6.3E-06	9			7.8E+04	EPI	7.1E+00	PHYSP ROP	7.0E-01	PHYSP ROP	3.6E+00	4.5E+00	1.9E+01	5.5E-01	EPI
~Polychlorinated Biphenyls (lowest risk)	1336-36- 3	2.9E+02	PHYSP ROP	1.7E-02	4.2E-04	PHYSP ROP	4.9E-04	PHYSP ROP	1.2E+02	EPI	1.4E+00	HSDB	2.4E-02	6.3E-06	9			7.8E+04	EPI	7.1E+00	PHYSP ROP	7.0E-01	PHYSP ROP	3.6E+00	4.5E+00	1.9E+01	5.5E-01	EPI
~Tetrachlorobiphenyl, 3,3',4,4'- (PCB 77)	32598- 13-3	2.9E+02	PHYSP ROP	3.8E-04	9.4E-06	PHYSP ROP	1.6E-05	PHYSP ROP	1.8E+02	CRC89			4.9E-02	5.0E-06	9			7.8E+04	EPI	6.6E+00	PHYSP ROP	5.7E-04	PHYSP ROP	6.0E+00	4.5E+00	2.0E+01	9.2E-01	EPI



Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters						
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HL (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	Dia and Diw Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref	
~Tetrachlorobiphenyl, 3,4,4',5-(PCB 81)	70362-50-4	2.9E+02	EPI	9.1E-03	2.2E-04	EPI	8.5E-06	EPI	1.2E+02	EPI	1.4E+00	LookChem	4.9E-02	6.3E-06	9			7.8E+04	EPI	6.3E+00	EPI	3.2E-02	EPI	3.8E+00	4.5E+00	2.0E+01	5.8E-01	EPI	
Polymeric Methylene Diphenyl Diisocyanate (PMDI)	9016-87-9	5.1E+02	EPI	5.4E-10	1.3E-11	EPI	5.4E-13	EPI	2.5E+02	EPI			3.0E-02	3.5E-06	9			1.0E+10	EPI	1.0E+01	EPI	1.8E-06	EPI	1.6E+02	7.8E+01	3.7E+02	1.9E+01	EPI	
Polynuclear Aromatic Hydrocarbons (PAHs)																													
~Acenaphthene	83-32-9	1.5E+02	PHYSP ROP	7.5E-03	1.8E-04	PHYSP ROP	2.2E-03	PHYSP ROP	9.3E+01	PHYSP ROP	1.2E+00	CRC89	5.1E-02	8.3E-06	9			5.0E+03	EPI	3.9E+00	PHYSP ROP	3.9E+00	PHYSP ROP	4.1E-01	7.7E-01	1.8E+00	8.6E-02	EPI	
~Anthracene	120-12-7	1.8E+02	ROP	2.3E-03	5.6E-05	ROP	6.5E-06	EPI	2.2E+02	ROP	1.3E+00	CRC89	3.9E-02	7.9E-06	9			1.6E+04	EPI	4.5E+00	ROP	4.3E-02	ROP	7.3E-01	1.0E+00	4.1E+00	1.4E-01	EPI	
~Benz[a]anthracene	56-55-3	2.3E+02	PHYSP ROP	4.9E-04	1.2E-05	PHYSP ROP	2.1E-07	PHYSP ROP	8.4E+01	PHYSP ROP	1.3E+00	PubChem	2.6E-02	6.7E-06	9			1.8E+05	EPI	5.8E+00	PHYSP ROP	9.4E-03	PHYSP ROP	3.2E+00	2.0E+00	8.5E+00	5.5E-01	EPI	
~Benzo(j)fluoranthene	205-82-3	2.5E+02	PHYSP ROP	8.3E-06	2.0E-07	PHYSP ROP	2.6E-08	PHYSP ROP	1.7E+02	PHYSP ROP			4.8E-02	5.6E-06	9			6.0E+05	EPI	6.1E+00	PHYSP ROP	2.5E-03	PHYSP ROP	4.2E+00	2.7E+00	1.2E+01	6.9E-01	EPI	
~Benzo[a]pyrene	50-32-8	2.5E+02	PHYSP ROP	1.9E-05	4.6E-07	PHYSP ROP	5.5E-09	EPI	1.8E+02	PHYSP ROP			4.8E-02	5.6E-06	9			5.9E+05	EPI	6.1E+00	PHYSP ROP	1.6E-03	PHYSP ROP	4.4E+00	2.7E+00	1.2E+01	7.1E-01	EPI	
~Benzo[b]fluoranthene	205-99-2	2.5E+02	PHYSP ROP	2.7E-05	6.6E-07	PHYSP ROP	5.0E-07	PHYSP ROP	1.7E+02	PHYSP ROP			4.8E-02	5.6E-06	9			6.0E+05	EPI	5.8E+00	PHYSP ROP	1.5E-03	PHYSP ROP	2.5E+00	2.7E+00	1.1E+01	4.2E-01	EPI	
~Benzo[k]fluoranthene	207-08-9	2.5E+02	PHYSP ROP	2.4E-05	5.8E-07	PHYSP ROP	9.7E-10	EPI	2.2E+02	PHYSP ROP			4.8E-02	5.6E-06	9			5.9E+05	EPI	6.1E+00	PHYSP ROP	8.0E-04	PHYSP ROP	4.2E+00	2.7E+00	1.2E+01	6.9E-01	EPI	
~Chloronaphthalene, Beta-	91-58-7	1.6E+02	PHYSP ROP	1.3E-02	3.2E-04	PHYSP ROP	1.2E-02	EPI	6.1E+01	PHYSP ROP	1.1E+00	CRC89	4.5E-02	7.7E-06	9			2.5E+03	EPI	3.9E+00	PHYSP ROP	1.2E+01	PHYSP ROP	3.7E-01	8.6E-01	2.1E+00	7.5E-02	EPI	
~Chrysene	218-01-9	2.3E+02	PHYSP ROP	2.1E-04	5.2E-06	PHYSP ROP	6.2E-09	PHYSP ROP	2.6E+02	PHYSP ROP	1.3E+00	CRC89	2.6E-02	6.7E-06	9			1.8E+05	EPI	5.8E+00	PHYSP ROP	2.0E-03	PHYSP ROP	3.5E+00	2.0E+00	8.5E+00	6.0E-01	EPI	
~Dibenz[a,h]anthracene	53-70-3	2.8E+02	PHYSP ROP	5.8E-06	1.4E-07	EPI PHYSP	9.6E-10	EPI PHYSP	2.7E+02	PHYSP ROP			4.5E-02	5.2E-06	9			1.9E+06	EPI	6.8E+00	PHYSP ROP	2.5E-03	PHYSP ROP	6.1E+00	3.8E+00	1.7E+01	9.5E-01	EPI	
~Dibenzo(a,e)pyrene	192-65-4	3.0E+02	PHYSP ROP	5.8E-07	1.4E-08	PHYSP ROP	7.0E-11	PHYSP ROP	2.3E+02	PHYSP ROP			4.2E-02	4.9E-06	9			6.5E+06	EPI	7.7E+00	EPI	8.0E-05	PHYSP ROP	2.8E+01	5.2E+00	2.4E+01	4.2E+00	EPI	
~Dimethylbenz(a)anthracene, 7,12-	57-97-6	2.6E+02	PHYSP ROP	1.5E-04	3.8E-06	EPI PHYSP	6.8E-07	PHYSP ROP	1.2E+02	PHYSP ROP			4.7E-02	5.5E-06	9			4.9E+05	EPI	5.8E+00	PHYSP ROP	6.1E-02	PHYSP ROP	2.5E+00	2.9E+00	1.2E+01	4.1E-01	EPI	
~Fluoranthene	206-44-0	2.0E+02	PHYSP ROP	3.6E-04	8.9E-06	PHYSP ROP	9.2E-06	PHYSP ROP	1.1E+02	PHYSP ROP	1.3E+00	CRC89	2.8E-02	7.2E-06	9			5.5E+04	EPI	5.2E+00	PHYSP ROP	2.6E-01	PHYSP ROP	1.7E+00	1.4E+00	5.7E+00	3.1E-01	EPI	
~Fluorene	86-73-7	1.7E+02	PHYSP ROP	3.9E-03	9.6E-05	PHYSP ROP	6.0E-04	PHYSP ROP	1.1E+02	PHYSP ROP	1.2E+00	CRC89	4.4E-02	7.9E-06	9			9.2E+03	EPI	4.2E+00	PHYSP ROP	1.7E+00	PHYSP ROP	5.5E-01	9.0E-01	2.2E+00	1.1E-01	EPI	
~Indeno[1,2,3-cd]pyrene	193-39-5	2.8E+02	PHYSP ROP	1.4E-05	3.5E-07	PHYSP ROP	1.3E-10	PHYSP ROP	1.6E+02	PHYSP ROP			4.5E-02	5.2E-06	9			2.0E+06	EPI	6.7E+00	PHYSP ROP	1.9E-04	PHYSP ROP	7.9E+00	3.7E+00	1.7E+01	1.2E+00	EPI	
~Methylnaphthalene, 1-	90-12-0	1.4E+02	PHYSP ROP	2.1E-02	5.1E-04	PHYSP ROP	6.7E-02	PHYSP ROP	-3.0E+01	PHYSP ROP	1.0E+00	CRC89	5.3E-02	7.8E-06	9			2.5E+03	EPI	3.9E+00	PHYSP ROP	2.6E+01	PHYSP ROP	4.3E-01	6.6E-01	1.6E+00	9.3E-02	EPI	
~Methylnaphthalene, 2-	91-57-6	1.4E+02	PHYSP ROP	2.1E-02	5.2E-04	PHYSP ROP	5.5E-02	PHYSP ROP	3.4E+01	PHYSP ROP	1.0E+00	CRC89	5.2E-02	7.8E-06	9			2.5E+03	EPI	3.9E+00	PHYSP ROP	2.5E+01	PHYSP ROP	4.2E-01	6.6E-01	1.6E+00	9.2E-02	EPI	
~Naphthalene	91-20-3	1.3E+02	PHYSP ROP	1.8E-02	4.4E-04	PHYSP ROP	8.5E-02	PHYSP ROP	8.0E+01	PHYSP ROP	1.0E+00	CRC89	6.0E-02	8.4E-06	9			1.5E+03	EPI	3.3E+00	PHYSP ROP	3.1E+01	PHYSP ROP	2.0E-01	5.5E-01	1.3E+00	4.7E-02	EPI	
~Nitropyrene, 4-	57835-92-4	2.5E+02	PHYSP ROP	1.0E-06	2.5E-08	PHYSP ROP	5.5E-08	PHYSP ROP	1.9E+02	PHYSP ROP			4.8E-02	5.6E-06	9			8.6E+04	EPI	4.8E+00	PHYSP ROP	6.8E-02	PHYSP ROP	5.6E-01	2.6E+00	6.3E+00	9.2E-02	EPI	
~Pyrene	129-00-0	2.0E+02	PHYSP ROP	4.9E-04	1.2E-05	PHYSP ROP	4.5E-06	PHYSP ROP	1.5E+02	PHYSP ROP	1.3E+00	CRC89	2.8E-02	7.2E-06	9			5.4E+04	EPI	4.9E+00	PHYSP ROP	1.4E-01	PHYSP ROP	1.1E+00	1.4E+00	5.5E+00	2.0E-01	EPI	

Contaminant		Molecular Weight		Volatility Parameters				Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters							
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm- m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref	
Potassium Perfluorobutane Sulfonate	29420-49-3	3.4E+02	EPI				1.1E-08	EPI	1.9E+02	EPI			3.9E-02	4.6E-06	9			1.8E+02	EPI	-3.3E-01	EPI	1.4E+00	EPI	2.1E-04	8.2E+00	2.0E+01	3.0E-05	EPI	
Prochloraz	67747-09-5	3.8E+02	ROP	6.7E-07	1.6E-08	EPI	1.1E-06	ROP	4.8E+01	ROP			3.6E-02	4.3E-06	9			2.4E+03	EPI	4.1E+00	ROP	3.4E+01	ROP	4.8E-02	1.4E+01	3.2E+01	6.4E-03	EPI	
Profuralin	26399-36-0	3.5E+02	ROP	1.2E-02	2.9E-04	EPI	6.3E-05	ROP	3.2E+01	ROP	1.4E+00	HSDB	2.2E-02	5.5E-06	9			3.1E+04	EPI	5.6E+00	ROP	1.0E-01	ROP	6.5E-01	9.3E+00	3.7E+01	9.0E-02	EPI	
Prometon	1610-18-0	2.3E+02	PHYSP	3.7E-08	9.1E-10	EPI	2.3E-06	ROP	9.1E+01	ROP			5.1E-02	6.0E-06	9			1.4E+02	EPI	3.0E+00	ROP	7.5E+02	ROP	4.8E-02	1.9E+00	4.6E+00	8.3E-03	EPI	
Prometryn	7287-19-6	2.4E+02	PHYSP	4.9E-07	1.2E-08	EPI	1.2E-06	ROP	1.2E+02	ROP	1.2E+00	CRC89	2.4E-02	6.2E-06	9			6.6E+02	EPI	3.5E+00	ROP	3.3E+01	ROP	8.9E-02	2.4E+00	5.7E+00	1.5E-02	EPI	
Propachlor	1918-16-7	2.1E+02	PHYSP	1.5E-05	3.6E-07	EPI	2.3E-04	ROP	7.7E+01	ROP	1.2E+00	CRC89	2.7E-02	7.0E-06	9			2.0E+02	EPI	2.2E+00	ROP	5.8E+02	ROP	1.6E-02	1.6E+00	3.9E+00	2.9E-03	EPI	
Propanil	709-98-8	2.2E+02	PHYSP	7.0E-08	1.7E-09	EPI	9.1E-07	ROP	9.2E+01	ROP	1.3E+00	CRC89	2.7E-02	6.9E-06	9			1.8E+02	EPI	3.1E+00	ROP	1.5E+02	ROP	5.9E-02	1.8E+00	4.2E+00	1.0E-02	EPI	
Propargite	2312-35-8	3.5E+02	PHYSP	2.6E-05	6.4E-07	EPI	3.0E-07	ROP	1.7E+02	EPI	1.1E+00	CRC89	1.9E-02	4.8E-06	9			3.7E+04	EPI	5.0E+00	ROP	2.2E-01	ROP	2.6E-01	9.7E+00	2.3E+01	3.6E-02	EPI	
Propargyl Alcohol	107-19-7	5.6E+01	PHYSP	4.7E-05	1.2E-06	EPI	1.6E+01	ROP	-5.0E+01	ROP	9.5E-01	CRC89	1.2E-01	1.3E-05	9			1.9E+00	EPI	-3.8E-01	ROP	1.0E+06	ROP	1.2E-03	2.2E-01	5.2E-01	4.2E-04	EPI	
Propazine	139-40-2	2.3E+02	PHYSP	1.9E-07	4.6E-09	EPI	1.3E-07	ROP	2.1E+02	ROP	1.2E+00	CRC89	2.5E-02	6.4E-06	9			3.4E+02	EPI	2.9E+00	ROP	8.6E+00	ROP	4.2E-02	2.0E+00	4.9E+00	7.1E-03	EPI	
Propham	122-42-9	1.8E+02	PHYSP	7.5E-06	1.8E-07	EPI	1.4E-04	ROP	8.7E+01	ROP	1.1E+00	CRC89	3.6E-02	7.1E-06	9			2.2E+02	EPI	2.6E+00	ROP	1.8E+02	ROP	4.3E-02	1.1E+00	2.5E+00	8.3E-03	EPI	
Propiconazole	60207-90-1	3.4E+02	PHYSP	7.0E-08	1.7E-09	EPI	4.2E-07	ROP	1.7E+02	EPI	1.3E+00	CRC89	2.1E-02	5.3E-06	9			1.6E+03	EPI	3.7E+00	ROP	1.1E+02	ROP	4.0E-02	8.7E+00	2.1E+01	5.6E-03	EPI	
Propionaldehyde	123-38-6	5.8E+01	PHYSP	3.0E-03	7.3E-05	PHYSP	3.2E+02	ROP	-8.0E+01	ROP	8.7E-01	CRC89	1.1E-01	1.2E-05	9			1.0E+00	EPI	5.9E-01	ROP	3.1E+05	ROP	5.3E-03	2.2E-01	5.3E-01	1.8E-03	EPI	
Propyl benzene	103-65-1	1.2E+02	PHYSP	4.3E-01	1.1E-02	ROP	3.4E+00	ROP	-1.0E+02	ROP	8.6E-01	CRC89	6.0E-02	7.8E-06	9			8.1E+02	EPI	3.7E+00	ROP	5.2E+01	ROP	4.0E-01	5.0E-01	1.2E+00	9.4E-02	EPI	
Propylene	115-07-1	4.2E+01	PHYSP	8.0E+00	2.0E-01	ROP	8.7E+03	ROP	-1.9E+02	ROP	5.1E-01	CRC89	1.1E-01	1.1E-05	9			2.2E+01	EPI	1.8E+00	ROP	2.0E+02	ROP	3.4E-02	1.8E-01	4.3E-01	1.4E-02	EPI	
Propylene Glycol	57-55-6	7.6E+01	PHYSP	5.3E-07	1.3E-08	EPI	1.3E-01	ROP	-6.0E+01	ROP	1.0E+00	CRC89	9.8E-02	1.2E-05	9			1.0E+00	EPI	-9.2E-01	ROP	1.0E+06	ROP	4.8E-04	2.8E-01	6.7E-01	1.4E-04	EPI	
Propylene Glycol Dinitrate	6423-43-4	1.7E+02	PHYSP	3.9E-05	9.4E-07	PHYSP	3.8E-01	ROP	-9.6E+00	EPI			6.3E-02	7.3E-06	9			6.1E+01	EPI	1.8E+00	ROP	3.3E+03	EPI	1.0E-02	9.0E-01	2.1E+00	2.1E-03	EPI	
Propylene Glycol Monomethyl Ether	107-98-2	9.0E+01	PHYSP	3.8E-05	9.2E-07	ROP	1.3E+01	ROP	-9.5E+01	ROP	9.6E-01	CRC89	8.3E-02	1.0E-05	9			1.0E+00	EPI	-4.9E-01	ROP	1.0E+06	ROP	1.4E-03	3.4E-01	8.1E-01	3.7E-04	RAGSE	
Propylene Oxide	75-56-9	5.8E+01	PHYSP	2.8E-03	7.0E-05	EPI	5.4E+02	ROP	-1.1E+02	ROP	8.3E-01	PERRY	1.1E-01	1.2E-05	9			5.2E+00	EPI	3.0E-02	ROP	5.9E+05	ROP	2.3E-03	2.2E-01	5.3E-01	7.7E-04	EPI	
Propyzamide	23950-58-5	2.6E+02	PHYSP	4.0E-07	9.8E-09	EPI	4.4E-07	ROP	1.6E+02	ROP			4.7E-02	5.5E-06	9			4.0E+02	EPI	3.4E+00	ROP	1.5E+01	ROP	6.7E-02	2.9E+00	6.9E+00	1.1E-02	EPI	
Pyridine	110-86-1	7.9E+01	PHYSP	4.5E-04	1.1E-05	ROP	2.1E+01	ROP	-4.2E+01	ROP	9.8E-01	CRC89	9.3E-02	1.1E-05	9			7.2E+01	EPI	6.5E-01	ROP	1.0E+06	ROP	5.2E-03	2.9E-01	7.0E-01	1.5E-03	EPI	
Quinalphos	13593-03-8	3.0E+02	PHYSP	1.9E-06	4.6E-08	EPI	2.6E-06	ROP	3.2E+01	ROP			4.3E-02	5.0E-06	9			4.2E+03	EPI	4.4E+00	ROP	2.2E+01	ROP	2.0E-01	4.9E+00	1.2E+01	3.0E-02	EPI	
Quinoline	91-22-5	1.3E+02	PHYSP	6.8E-05	1.7E-06	EPI	6.0E-02	ROP	-1.5E+01	ROP	1.1E+00	CRC89	6.2E-02	8.7E-06	9			1.5E+03	EPI	2.0E+00	ROP	6.1E+03	ROP	2.9E-02	5.6E-01	1.3E+00	6.6E-03	EPI	
Quizalofop-ethyl	76578-14-8	3.7E+02	PHYSP	4.3E-07	1.1E-08	EPI	6.5E-09	ROP	9.2E+01	ROP			3.7E-02	4.3E-06	9			7.7E+03	EPI	4.3E+00	ROP	3.0E-01	ROP	6.6E-02	1.3E+01	3.1E+01	8.9E-03	EPI	
Refractory Ceramic Fibers	NA																											1.0E-03	RAGSE
Resmethrin	10453-86-8	3.4E+02	PHYSP	5.4E-06	1.3E-07	EPI	1.1E-08	ROP	5.7E+01	ROP			3.9E-02	4.6E-06	9			3.1E+05	EPI	6.1E+00	ROP	3.8E-02	ROP	1.7E+00	8.3E+00	3.3E+01	2.4E-01	EPI	
Ronnel	299-84-3	3.2E+02	PHYSP	1.3E-03	3.2E-05	EPI	7.5E-05	ROP	4.1E+01	ROP	1.4E+00	CRC89	2.3E-02	5.9E-06	9			4.5E+03	EPI	4.9E+00	ROP	1.0E+00	ROP	3.0E-01	6.6E+00	1.6E+01	4.3E-02	EPI	
Rotenone	83-79-4	3.9E+02	PHYSP	4.6E-12	1.1E-13	PHYSP	6.9E-10	ROP	1.8E+02	ROP			3.5E-02	4.1E-06	9			2.6E+05	EPI	4.1E+00	ROP	2.0E-01	ROP	3.9E-02	1.7E+01	4.1E+01	5.1E-03	EPI	
Safrole	94-59-7	1.6E+02	PHYSP	3.7E-04	9.1E-06	ROP	6.2E-02	ROP	1.1E+01	ROP	1.1E+00	CRC89	4.4E-02	7.6E-06	9			2.1E+02	EPI	3.5E+00	ROP	1.2E+02	ROP	5.5E-02	8.5E-01	2.0E+00	1.1E-02	RAGSE	
Selenious Acid	7783-00-8	1.3E+02	PHYSP						7.0E+01	EPI	3.0E+00	CRC89										9.0E+05	PERRY	4.4E-03	5.5E-01	1.3E+00	1.0E-03	RAGSE	
Selenium	7782-49-2	7.9E+01	PHYSP				1.4E-10	EPI	2.2E+02	ROP	4.8E+00	CRC89				5.0E+00	SSL							3.4E-03	2.9E-01	7.0E-01	1.0E-03	RAGSE	
Selenium Sulfide	7446-34-6	1.1E+02	EPI																					4.1E-03	4.4E-01	1.1E+00	1.0E-03	RAGSE	

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters							
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm- m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>w</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref		
Sethoxydim	74051-80-2	3.3E+02	PHYSP ROP	8.8E-10	2.2E-11	PHYSP ROP	1.6E-07	PHYSP ROP	1.6E+02	EPI	1.0E+00	CRC89	2.0E-02	4.8E-06	9			4.4E+03	EPI	4.4E+00	PHYSP ROP	2.5E+01	PHYSP ROP	1.3E-01	7.2E+00	1.7E+01	1.9E-02	EPI		
Silica (crystalline, respirable)	7631-86-9	6.0E+01	EPI						1.7E+03	PERRY PHYSP	2.3E+00	PERRY												3.0E-03	2.3E-01	5.5E-01	1.0E-03	RAGSE		
Silver	7440-22-4	1.1E+02	PHYSP ROP				0.0E+00	NIOSH PHYSP	9.6E+02	ROP PHYSP	1.1E+01	CRC89				8.3E+00	SSL							2.4E-03	4.2E-01	1.0E+00	6.0E-04	RAGSE		
Simazine	122-34-9	2.0E+02	PHYSP ROP	3.9E-08	9.4E-10	EPI	2.2E-08	ROP	2.3E+02	ROP	1.3E+00	CRC89	2.8E-02	7.4E-06	9			1.5E+02	EPI	2.2E+00	PHYSP ROP	6.2E+00	PHYSP ROP	1.8E-02	1.4E+00	3.4E+00	3.3E-03	EPI		
Sodium Acifluorfen	62476-59-9	3.8E+02	PHYSP ROP	2.5E-09	6.1E-11	PHYSP ROP	9.8E-09	EPI	2.8E+02	EPI			3.6E-02	4.2E-06	9			3.9E+03	EPI	3.7E-01	PHYSP ROP	2.5E+05	PHYSP ROP	1.5E-04	1.5E+01	3.6E+01	2.0E-05	EPI		
Sodium Azide	26628-22-8	6.5E+01	EPI						3.0E+02	CRC89	1.8E+00	CRC89												4.1E+05	CRC89	3.1E-03	2.4E-01	5.8E-01	1.0E-03	RAGSE
Sodium Dichromate	10588-01-9	2.6E+02	CRC89						3.6E+02	CRC89														1.9E+06	CRC89	6.2E-03	3.1E+00	7.4E+00	1.0E-03	RAGSE
Sodium Diethyldithiocarbamate	148-18-5	1.7E+02	PHYSP ROP				8.2E-10	PHYSP ROP	9.4E+01	ROP PHYSP			6.1E-02	7.2E-06	9			2.0E+02	EPI	-1.4E+00	PHYSP ROP	3.6E+05	PHYSP ROP	9.7E-05	9.7E-01	2.3E+00	1.9E-05	EPI		
Sodium Fluoride	7681-49-4	4.2E+01	PHYSP ROP				0.0E+00	NIOSH PHYSP	9.9E+02	ROP PHYSP	2.8E+00	CRC89												4.2E+04	PHYSP ROP	2.5E-03	1.8E-01	4.3E-01	1.0E-03	RAGSE
Sodium Fluoroacetate	62-74-8	1.0E+02	PHYSP ROP	4.5E-05	1.1E-06	PHYSP ROP	6.5E-07	ROP	2.0E+02	ROP			8.8E-02	1.0E-05	9			1.4E+00	EPI	-3.8E+00	PHYSP ROP	1.1E+06	PHYSP ROP	5.1E-06	3.8E-01	9.2E-01	1.3E-06	EPI		
Sodium Metavanadate	13718-26-8	1.2E+02	CRC89						6.3E+02	CRC89														2.1E+05	CRC89	4.2E-03	5.1E-01	1.2E+00	1.0E-03	RAGSE
Sodium Tungstate	13472-45-2	2.9E+02	CRC89						7.0E+02	CRC89	4.2E+00	CRC89												7.4E+05	CRC89	6.6E-03	4.6E+00	1.1E+01	1.0E-03	RAGSE
Sodium Tungstate Dihydrate	10213-10-2	3.3E+02	CRC89						1.0E+02	CRC89	3.3E+00	CRC89												7.4E+05	CRC89	7.0E-03	7.4E+00	1.8E+01	1.0E-03	RAGSE
Stirofos (Tetrachlorovinphos)	961-11-5	3.7E+02	PHYSP ROP	7.5E-08	1.8E-09	EPI	4.2E-08	PHYSP ROP	9.8E+01	ROP			3.7E-02	4.3E-06	9			1.4E+03	EPI	3.5E+00	PHYSP ROP	1.1E+01	PHYSP ROP	2.3E-02	1.2E+01	2.8E+01	3.1E-03	EPI		
Strontium Chromate	7789-06-2	2.0E+02	CRC89 PHYSP							PHYSP	3.9E+00	CRC89												1.1E+03	CRC89	5.5E-03	1.5E+00	3.5E+00	1.0E-03	RAGSE
Strontium, Stable	7440-24-6	8.8E+01	ROP						7.8E+02	ROP	2.6E+00	CRC89				3.5E+01	BAES									3.6E-03	3.3E-01	7.8E-01	1.0E-03	RAGSE
Strychnine	57-24-9	3.3E+02	PHYSP ROP	3.1E-12	7.6E-14	PHYSP ROP	2.9E-09	PHYSP ROP	2.9E+02	ROP PHYSP	1.4E+00	CRC89	2.2E-02	5.6E-06	9			5.4E+03	EPI	1.9E+00	PHYSP ROP	1.6E+02	PHYSP ROP	2.8E-03	7.8E+00	1.9E+01	4.0E-04	EPI		
Styrene	100-42-5	1.0E+02	PHYSP ROP	1.1E-01	2.8E-03	PHYSP ROP	6.4E+00	PHYSP ROP	-3.1E+01	ROP	9.0E-01	CRC89	7.1E-02	8.8E-06	9			4.5E+02	EPI	3.0E+00	PHYSP ROP	3.1E+02	PHYSP ROP	1.5E-01	4.0E-01	9.7E-01	3.7E-02	EPI		
Styrene-Acrylonitrile (SAN) Trimer	NA	2.1E+02	OTHER							OTHER	1.1E+00	PPRTV	2.6E-02	6.5E-06	9					3.1E+00	OTHER	8.5E+01	PPRTV	6.6E-02	1.6E+00	3.8E+00	1.2E-02	RAGSE		
Sulfolane	126-33-0	1.2E+02	PHYSP ROP	2.0E-04	4.9E-06	PHYSP ROP	4.1E-03	EPI	2.8E+01	ROP	1.3E+00	CRC89	7.2E-02	9.9E-06	9			9.1E+00	EPI	-7.7E-01	PHYSP ROP	1.0E+06	PHYSP ROP	4.3E-04	5.0E-01	1.2E+00	1.0E-04	EPI		
Sulfonylbis(4-chlorobenzene), 1,1'-	80-07-9	2.9E+02	PHYSP ROP	5.6E-06	1.4E-07	PHYSP ROP	8.1E-07	PHYSP ROP	1.5E+02	ROP PHYSP			4.4E-02	5.1E-06	9			2.9E+03	EPI	3.9E+00	PHYSP ROP	2.4E+00	PHYSP ROP	9.7E-02	4.3E+00	1.0E+01	1.5E-02	EPI		
Sulfur Trioxide	7446-11-9	8.0E+01	PHYSP ROP				2.6E+02	PHYSP ROP	1.7E+01	ROP	1.9E+00	CRC89	1.2E-01	1.6E-05	9											3.4E-03	3.0E-01	7.1E-01	1.0E-03	RAGSE
Sulfuric Acid	7664-93-9	9.8E+01	PHYSP ROP				5.9E-05	PHYSP ROP	1.0E+01	ROP	1.8E+00	CRC89												1.0E+06	PHYSP ROP	3.8E-03	3.7E-01	8.9E-01	1.0E-03	RAGSE
Sulfurous acid, 2-chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester	140-57-8	3.3E+02	PHYSP ROP	7.8E-06	1.9E-07	PHYSP ROP	2.2E-07	PHYSP ROP	-3.2E+01	ROP	1.1E+00	CRC89	2.0E-02	5.0E-06	9			5.6E+03	EPI	4.8E+00	PHYSP ROP	5.9E-01	PHYSP ROP	2.3E-01	7.9E+00	1.9E+01	3.3E-02	EPI		
TCMTB	21564-17-0	2.4E+02	PHYSP ROP	2.7E-10	6.5E-12	PHYSP ROP	3.1E-07	PHYSP ROP	1.5E+02	EPI			4.9E-02	5.8E-06	9			3.4E+03	EPI	3.3E+00	PHYSP ROP	1.3E+02	PHYSP ROP	6.7E-02	2.3E+00	5.5E+00	1.1E-02	EPI		
Tebuthiuron	34014-18-1	2.3E+02	PHYSP ROP	4.9E-09	1.2E-10	PHYSP ROP	3.0E-07	PHYSP ROP	1.6E+02	ROP			5.1E-02	5.9E-06	9			4.2E+01	EPI	1.8E+00	PHYSP ROP	2.5E+03	PHYSP ROP	7.4E-03	2.0E+00	4.8E+00	1.3E-03	EPI		
Temephos	3383-96-8	4.7E+02	PHYSP ROP	8.0E-08	2.0E-09	PHYSP ROP	7.9E-08	PHYSP ROP	3.0E+01	ROP PHYSP	1.3E+00	CRC89	1.8E-02	4.5E-06	9			9.5E+04	EPI	6.0E+00	PHYSP ROP	2.7E-01	PHYSP ROP	2.9E-01	4.3E+01	1.0E+02	3.5E-02	EPI		
Terbacil	5902-51-2	2.2E+02	PHYSP ROP	4.9E-09	1.2E-10	EPI	4.7E-07	PHYSP ROP	1.8E+02	ROP	1.3E+00	CRC89	2.7E-02	7.2E-06	9			5.0E+01	EPI	1.9E+00	PHYSP ROP	7.1E+02	PHYSP ROP	9.7E-03	1.7E+00	4.1E+00	1.7E-03	EPI		
Terbufos	13071-79-9	2.9E+02	PHYSP ROP	9.8E-04	2.4E-05	EPI	3.2E-04	PHYSP ROP	-2.9E+01	ROP PHYSP	1.1E+00	CRC89	2.2E-02	5.4E-06	9			1.0E+03	EPI	4.5E+00	PHYSP ROP	5.1E+00	PHYSP ROP	2.3E-01	4.3E+00	1.0E+01	3.6E-02	EPI		
Terbutryn	886-50-0	2.4E+02	PHYSP ROP	8.8E-07	2.2E-08	EPI PHYSP	1.7E-06	PHYSP ROP	1.0E+02	ROP	1.1E+00	CRC89	2.4E-02	6.0E-06	9			6.1E+02	EPI	3.7E+00	PHYSP ROP	2.5E+01	PHYSP ROP	1.3E-01	2.4E+00	5.7E+00	2.1E-02	EPI		
Tetrabromodiphenyl ether, 2,2',4,4'- (BDE-47)	5436-43-1	4.9E+02	PHYSP ROP	1.2E-04	3.0E-06	ROP	7.0E-08	EPI	1.6E+02	EPI			3.1E-02	3.6E-06	9			1.3E+04	EPI	6.8E+00	PHYSP ROP	1.5E-03	PHYSP ROP	7.9E-01	5.5E+01	2.1E+02	9.3E-02	EPI		
Tetrachlorobenzene, 1,2,4,5-	95-94-3	2.2E+02	PHYSP ROP	4.1E-02	1.0E-03	PHYSP ROP	5.4E-03	EPI	1.4E+02	ROP	1.9E+00	CRC89	3.2E-02	8.8E-06	9			2.2E+03	EPI	4.6E+00	PHYSP ROP	6.0E-01	PHYSP ROP	6.6E-01	1.7E+00	6.7E+00	1.2E-01	EPI		

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters							
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HL (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	Dia and Diw Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref		
Tetrachloroethane, 1,1,1,2-	630-20-6	1.7E+02	PHYSP ROP	1.0E-01	2.5E-03	PHYSP ROP	1.2E+01	ROP	-7.0E+01	ROP	1.5E+00	CRC89	4.8E-02	9.1E-06	9			8.6E+01	EPI	2.9E+00	ROP	1.1E+03	PHYSP ROP	7.9E-02	9.2E-01	2.2E+00	1.6E-02	EPI		
Tetrachloroethane, 1,1,2,2-	79-34-5	1.7E+02	PHYSP ROP	1.5E-02	3.7E-04	PHYSP ROP	4.6E+00	ROP	-4.4E+01	ROP	1.6E+00	CRC89	4.9E-02	9.3E-06	9			9.5E+01	EPI	2.4E+00	ROP	2.8E+03	PHYSP ROP	3.5E-02	9.2E-01	2.2E+00	6.9E-03	EPI		
Tetrachloroethylene	127-18-4	1.7E+02	PHYSP ROP	7.2E-01	1.8E-02	PHYSP ROP	1.9E+01	ROP	-2.2E+01	ROP	1.6E+00	CRC89	5.0E-02	9.5E-06	9			9.5E+01	EPI	3.4E+00	ROP	2.1E+02	PHYSP ROP	1.7E-01	8.9E-01	2.1E+00	3.3E-02	EPI		
Tetrachlorophenol, 2,3,4,6-	58-90-2	2.3E+02	PHYSP ROP	3.6E-04	8.8E-06	EPI PHYSP	6.7E-04	EPI	7.0E+01	ROP			5.0E-02	5.9E-06	9			2.8E+02	SSL	4.5E+00	ROP	2.3E+01	PHYSP ROP	4.2E-01	2.1E+00	5.0E+00	7.1E-02	EPI		
Tetrachlorotoluene, p- alpha, alpha-	5216-25-1	2.3E+02	PHYSP ROP	7.9E-03	1.9E-04	PHYSP ROP	3.8E-02	ROP	4.0E+01	EPI	1.4E+00	CRC89	2.8E-02	7.3E-06	9			1.6E+03	EPI	4.5E+00	ROP	4.0E+00	PHYSP ROP	4.9E-01	2.0E+00	4.9E+00	8.4E-02	EPI		
Tetraethyl Dithiopyrophosphate	3689-24-5	3.2E+02	PHYSP ROP	1.8E-04	4.5E-06	EPI PHYSP	1.1E-04	ROP	-3.2E+01	EPI	1.2E+00	CRC89	2.1E-02	5.3E-06	9			2.7E+02	EPI	4.0E+00	ROP	3.0E+01	PHYSP ROP	7.5E-02	6.7E+00	1.6E+01	1.1E-02	EPI		
Tetrafluoroethane, 1,1,1,2-	811-97-2	1.0E+02	PHYSP ROP	2.0E+00	5.0E-02	PHYSP ROP	5.0E+03	ROP	-1.0E+02	ROP	1.2E+00	CRC89	8.2E-02	1.1E-05	9			8.6E+01	EPI	1.7E+00	ROP	2.0E+03	PHYSP ROP	2.1E-02	3.9E-01	9.4E-01	5.5E-03	EPI		
Tetryl (Trinitrophenylmethylnitramine)	479-45-8	2.9E+02	PHYSP ROP	1.1E-07	2.7E-09	PHYSP ROP	5.7E-08	ROP	1.3E+02	ROP	1.6E+00	CRC89	2.6E-02	6.7E-06	9			4.6E+03	EPI	1.6E+00	ROP	7.4E+01	PHYSP ROP	3.1E-03	4.3E+00	1.0E+01	4.7E-04	EPI		
Thallic Oxide	1314-32-5	4.6E+02	CRC89 PHYSP						8.3E+02	CRC89 PHYSP	1.0E+01	CRC89												8.2E-03	3.8E+01	9.1E+01	1.0E-03	RAGSE		
Thallium (I) Nitrate	10102-45-1	2.7E+02	PHYSP ROP						2.1E+02	ROP	5.6E+00	CRC89												9.6E+04	PHYSP ROP	6.3E-03	3.3E+00	7.9E+00	1.0E-03	RAGSE
Thallium (Soluble Salts)	7440-28-0	2.1E+02	PHYSP ROP						3.0E+02	ROP	1.2E+01	CRC89				7.1E+01	SSL							5.5E-03	1.5E+00	3.6E+00	1.0E-03	RAGSE		
Thallium Acetate	563-68-8	2.6E+02	PHYSP ROP				1.5E+01	PHYSP ROP	1.3E+02	CRC89 PHYSP	3.7E+00	CRC89	3.9E-02	1.2E-05	9			1.5E+00	EPI	-1.7E-01	ROP	2.8E+04	PHYSP ROP	2.5E-04	3.1E+00	7.5E+00	4.0E-05	EPI		
Thallium Carbonate	6533-73-9	4.7E+02	PHYSP ROP				5.8E+00	PHYSP ROP	2.7E+02	ROP	7.1E+00	CRC89	3.9E-02	1.2E-05	9			2.9E+00	EPI	-8.6E-01	ROP	5.2E+04	PHYSP ROP	8.2E-06	4.4E+01	1.1E+02	9.8E-07	EPI		
Thallium Chloride	7791-12-0	2.4E+02	PHYSP ROP						4.3E+02	ROP	7.0E+00	CRC89	5.2E-02	1.8E-05	9							2.9E+03	PHYSP ROP	6.0E-03	2.3E+00	5.6E+00	1.0E-03	RAGSE		
Thallium Selenite	12039-52-0	2.8E+02	EPI PHYSP						3.3E+02	CRC89 PHYSP														6.5E-03	4.1E+00	9.7E+00	1.0E-03	RAGSE		
Thallium Sulfate	7446-18-6	5.0E+02	PHYSP ROP						6.3E+02	ROP	6.8E+00	CRC89											5.5E+04	CRC89 PHYSP	8.6E-03	7.1E+01	1.7E+02	1.0E-03	RAGSE	
Thifensulfuron-methyl	79277-27-3	3.9E+02	PHYSP ROP	1.7E-12	4.1E-14	PHYSP ROP	1.3E-10	PHYSP ROP	1.8E+02	ROP			3.6E-02	4.2E-06	9			5.1E+01	EPI	1.6E+00	PHYSP ROP	2.2E+03	CRC89 PHYSP	8.6E-04	1.6E+01	3.7E+01	1.1E-04	EPI		
Thiobencarb	28249-77-6	2.6E+02	PHYSP ROP	1.1E-05	2.7E-07	EPI PHYSP	2.2E-05	ROP	3.3E+00	ROP	1.2E+00	CRC89	2.3E-02	5.9E-06	9			1.6E+03	EPI	3.4E+00	ROP	2.8E+01	PHYSP ROP	6.3E-02	2.9E+00	7.0E+00	1.0E-02	EPI		
Thiodiglycol	111-48-8	1.2E+02	PHYSP ROP	7.6E-08	1.9E-09	PHYSP ROP	3.2E-03	ROP	-1.0E+01	ROP	1.2E+00	CRC89	6.8E-02	9.4E-06	9			1.0E+00	EPI	-6.3E-01	ROP	1.0E+06	PHYSP ROP	5.2E-04	5.1E-01	1.2E+00	1.2E-04	EPI		
Thiofanox	39196-18-4	2.2E+02	PHYSP ROP	3.8E-07	9.4E-09	EPI	1.7E-04	ROP	5.7E+01	ROP			5.2E-02	6.1E-06	9			7.2E+01	EPI	2.2E+00	ROP	5.2E+03	PHYSP ROP	3.6E-02	1.8E+00	4.2E+00	6.3E-03	EPI		
Thiophanate, Methyl	23564-05-8	3.4E+02	PHYSP ROP	4.9E-08	1.2E-09	EPI	7.1E-08	PHYSP ROP	1.7E+02	EPI			3.9E-02	4.5E-06	9			3.3E+02	EPI	1.4E+00	PHYSP ROP	2.7E+01	PHYSP ROP	1.1E-03	8.7E+00	2.1E+01	1.6E-04	EPI		
Thiram	137-26-8	2.4E+02	PHYSP ROP	7.4E-06	1.8E-07	EPI	1.7E-05	ROP	1.6E+02	ROP	1.3E+00	PERRY	2.6E-02	6.6E-06	9			6.1E+02	EPI	1.7E+00	ROP	3.0E+01	PHYSP ROP	5.9E-03	2.3E+00	5.6E+00	9.9E-04	EPI		
Tin	7440-31-5	1.2E+02	CRC89				0.0E+00	NIOSH	1.3E+01	CRC89	7.3E+00	CRC89				2.5E+02	BAES							4.2E-03	4.9E-01	1.2E+00	1.0E-03	RAGSE		
Titanium Tetrachloride	7550-45-0	1.9E+02	CRC89 PHYSP				1.0E+01	ATSDR Profile PHYSP	-2.4E+01	CRC89 PHYSP	1.7E+00	CRC89	3.8E-02	9.1E-06	9										5.3E-03	1.2E+00	2.9E+00	1.0E-03	RAGSE	
Toluene	108-88-3	9.2E+01	PHYSP ROP	2.7E-01	6.6E-03	PHYSP ROP	2.8E+01	ROP	-9.5E+01	ROP	8.6E-01	CRC89	7.8E-02	9.2E-06	9			2.3E+02	EPI	2.7E+00	ROP	5.3E+02	PHYSP ROP	1.1E-01	3.5E-01	8.3E-01	3.1E-02	EPI		
Toluene-2,4-diisocyanate	584-84-9	1.7E+02	EPI	4.5E-04	1.1E-05	EPI	8.0E-03	EPI	2.1E+01	EPI	1.2E+00	CRC89	4.0E-02	7.8E-06	9			7.4E+03	EPI	3.7E+00	EPI	3.8E+01	PHYSP EPI	2.6E+00	9.9E-01	4.1E+00	5.1E-01	EPI		
Toluene-2,5-diamine	95-70-5	1.2E+02	PHYSP ROP	3.0E-07	7.4E-09	PHYSP ROP	3.4E-03	PHYSP ROP	6.4E+01	ROP			7.7E-02	9.0E-06	9			5.5E+01	EPI	1.6E-01	ROP	7.7E+04	PHYSP ROP	1.7E-03	5.1E-01	1.2E+00	4.1E-04	EPI		
Toluene-2,6-diisocyanate	91-08-7	1.7E+02	EPI PHYSP	4.5E-04	1.1E-05	EPI PHYSP	2.1E-02	EPI PHYSP	1.8E+01	EPI PHYSP			6.1E-02	7.1E-06	9			7.6E+03	EPI	3.7E+00	EPI	3.8E+01	PHYSP EPI	2.6E-01	9.9E-01	2.4E+00	5.1E-02	EPI		
Toluidine, o- (Methylaniline, 2-)	95-53-4	1.1E+02	PHYSP ROP	8.1E-05	2.0E-06	PHYSP ROP	2.6E-01	ROP	-1.4E+01	ROP	1.0E+00	CRC89	7.2E-02	9.2E-06	9			1.2E+02	EPI	1.3E+00	ROP	1.7E+04	PHYSP ROP	1.2E-02	4.2E-01	1.0E+00	3.0E-03	EPI		
Toluidine, p-	106-49-0	1.1E+02	PHYSP ROP	8.3E-05	2.0E-06	PHYSP ROP	2.9E-01	PHYSP ROP	4.4E+01	ROP	9.6E-01	CRC89	7.1E-02	9.0E-06	9			1.1E+02	EPI	1.4E+00	PHYSP ROP	6.5E+03	PHYSP ROP	1.3E-02	4.2E-01	1.0E+00	3.3E-03	EPI		
Total Petroleum Hydrocarbons (Aliphatic High)	NA	1.7E+02	EPI	3.3E+02	8.2E+00	EPI	1.4E-01	EPI	-9.6E+00	EPI			6.2E-02	7.2E-06	9			4.8E+03	EPI	6.1E+00	EPI	3.7E-03	PHYSP EPI	9.8E+00	9.5E-01	4.3E+00	2.0E+00	EPI		
Total Petroleum Hydrocarbons (Aliphatic Low)	NA	8.6E+01	EPI	7.4E+01	1.8E+00	EPI	1.5E+02	EPI	-9.5E+01	EPI	6.6E-01	CRC89	7.3E-02	8.2E-06	9			1.3E+02	EPI	3.9E+00	EPI	9.5E+00	PHYSP EPI	7.2E-01	3.2E-01	1.2E+00	2.0E-01	EPI		

Contaminant		Molecular Weight		Volatility Parameters				Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters							
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	Dia and Diw Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref	
Total Petroleum Hydrocarbons (Aliphatic Medium)	NA	1.3E+02	EPI	1.4E+02	3.4E+00	EPI	4.5E+00	EPI	-5.4E+01	EPI	7.2E-01	CRC89	5.1E-02	6.8E-06	9			8.0E+02	EPI	5.7E+00	EPI	2.2E-01	EPI	7.4E+00	5.5E-01	2.5E+00	1.7E+00	EPI	
Total Petroleum Hydrocarbons (Aromatic High)	NA	2.0E+02	EPI	3.6E-04	8.9E-06	EPI	9.2E-06	EPI	1.1E+02	EPI	1.3E+00	CRC89	2.8E-02	7.2E-06	9			5.5E+04	EPI	5.2E+00	EPI	2.6E-01	EPI	1.7E+00	1.4E+00	5.7E+00	3.1E-01	EPI	
Total Petroleum Hydrocarbons (Aromatic Low)	NA	7.8E+01	EPI	2.3E-01	5.6E-03	EPI	9.5E+01	EPI	5.5E+00	EPI	8.8E-01	CRC89	9.0E-02	1.0E-05	9			1.5E+02	EPI	2.1E+00	EPI	1.8E+03	EPI	5.1E-02	2.9E-01	6.9E-01	1.5E-02	EPI	
Total Petroleum Hydrocarbons (Aromatic Medium)	NA	1.4E+02	EPI	2.0E-02	4.8E-04	EPI	7.0E-02	EPI	5.7E+01	EPI	1.0E+00	CRC89	5.6E-02	8.1E-06	9			2.0E+03	EPI	3.6E+00	EPI	2.8E+01	EPI	3.1E-01	6.0E-01	1.4E+00	6.9E-02	EPI	
Toxaphene	8001-35-2	4.5E+02	PHYSP	2.5E-04	6.0E-06	PHYSP	6.7E-06	PHYSP	7.7E+01	PHYSP			3.2E-02	3.8E-06	9			7.7E+04	EPI	5.9E+00	PHYSP	5.5E-01	PHYSP	4.2E-01	3.4E+01	8.2E+01	5.2E-02	EPI	
Tralomethrin	66841-25-6	6.7E+02	PHYSP	1.6E-08	3.9E-10	PHYSP	3.6E-11	PHYSP	1.4E+02	PHYSP			2.5E-02	2.9E-06	9			1.9E+05	EPI	7.6E+00	PHYSP	8.0E-02	PHYSP	3.0E-01	5.6E+02	1.3E+03	3.1E-02	EPI	
Tri-n-butyltin	688-73-3	2.9E+02	PHYSP	6.2E+01	1.5E+00	PHYSP	4.0E-02	PHYSP	2.9E+01	PHYSP	1.1E+00	CRC89	2.1E-02	5.4E-06	9			8.1E+03	EPI	4.1E+00	PHYSP	7.3E-03	PHYSP	1.3E-01	4.5E+00	1.1E+01	1.9E-02	EPI	
Triacetin	102-76-1	2.2E+02	PHYSP	5.0E-07	1.2E-08	PHYSP	2.5E-03	PHYSP	7.8E+01	PHYSP	1.2E+00	CRC89	2.6E-02	6.6E-06	9			4.1E+01	EPI	2.5E-01	PHYSP	5.8E+04	PHYSP	7.8E-04	1.8E+00	4.2E+00	1.4E-04	EPI	
Triadimefon	43121-43-3	2.9E+02	PHYSP	3.3E-09	8.1E-11	PHYSP	1.5E-08	PHYSP	8.2E+01	PHYSP	1.2E+00	CRC89	2.2E-02	5.7E-06	9			3.0E+02	EPI	2.8E+00	PHYSP	7.2E+01	PHYSP	1.6E-02	4.6E+00	1.1E+01	2.4E-03	EPI	
Triallate	2303-17-5	3.0E+02	PHYSP	4.9E-04	1.2E-05	PHYSP	1.2E-04	PHYSP	2.9E+01	PHYSP	1.3E+00	CRC89	2.2E-02	5.7E-06	9			1.0E+03	EPI	4.6E+00	PHYSP	4.0E+00	PHYSP	2.3E-01	5.3E+00	1.3E+01	3.5E-02	EPI	
Triasulfuron	82097-50-5	4.0E+02	PHYSP	1.3E-11	3.2E-13	PHYSP	5.5E-12	PHYSP	1.9E+02	PHYSP			3.5E-02	4.1E-06	9			4.3E+02	EPI	1.1E+00	PHYSP	3.2E+01	PHYSP	3.6E-04	1.9E+01	4.5E+01	4.7E-05	EPI	
Tribenuron-methyl	101200-48-0	4.0E+02	PHYSP	4.2E-12	1.0E-13	PHYSP	3.9E-10	PHYSP	1.4E+02	PHYSP			3.5E-02	4.1E-06	9			9.5E+01	EPI	7.8E-01	PHYSP	5.0E+01	PHYSP	3.6E-03	1.7E+01	4.1E+01	4.7E-04	EPI	
Tribromobenzene, 1,2,4-	615-54-3	3.1E+02	PHYSP	1.4E-02	3.4E-04	PHYSP	5.5E-03	PHYSP	4.5E+01	PHYSP	2.3E+00	ChemN et	2.9E-02	7.9E-06	9			6.1E+02	EPI	4.7E+00	PHYSP	4.9E+00	PHYSP	2.3E-01	6.1E+00	1.5E+01	3.4E-02	EPI	
Tributyl Phosphate	126-73-8	2.7E+02	PHYSP	5.8E-05	1.4E-06	PHYSP	1.1E-03	PHYSP	-7.9E+01	PHYSP	9.7E-01	CRC89	2.1E-02	5.2E-06	9			2.4E+03	EPI	4.0E+00	PHYSP	2.8E+02	PHYSP	1.4E-01	3.3E+00	7.8E+00	2.3E-02	EPI	
Tributyltin Compounds	NA																												
Tributyltin Oxide	56-35-9	6.0E+02	PHYSP	1.2E-05	3.0E-07	PHYSP	7.5E-06	PHYSP	-4.5E+01	PHYSP	1.2E+00	CRC89	1.5E-02	3.6E-06	9			2.6E+07	EPI	4.1E+00	PHYSP	2.0E+01	PHYSP	2.4E-03	2.3E+02	5.5E+02	2.5E-04	EPI	
Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1	1.9E+02	PHYSP	2.2E+01	5.3E-01	PHYSP	3.6E+02	PHYSP	-3.5E+01	PHYSP	1.6E+00	CRC89	3.8E-02	8.6E-06	9			2.0E+02	EPI	3.2E+00	PHYSP	1.7E+02	PHYSP	9.2E-02	1.2E+00	2.8E+00	1.8E-02	EPI	
Trichloroacetic Acid	76-03-9	1.6E+02	PHYSP	5.5E-07	1.4E-08	PHYSP	6.0E-02	PHYSP	5.8E+01	PHYSP	1.6E+00	CRC89	5.2E-02	9.5E-06	9			3.2E+00	EPI	1.3E+00	PHYSP	5.5E+04	PHYSP	7.1E-03	8.6E-01	2.1E+00	1.5E-03	EPI	
Trichloroaniline HCl, 2,4,6-	33663-50-2	2.3E+02	EPI	2.9E-12	7.2E-14	EPI	6.1E-08	EPI	1.8E+02	EPI			5.0E-02	5.9E-06	9			1.3E+03	EPI	-6.7E-01	EPI	2.1E+01	EPI	1.6E-04	2.1E+00	5.1E+00	2.8E-05	EPI	
Trichloroaniline, 2,4,6-	634-93-5	2.0E+02	PHYSP	5.5E-05	1.3E-06	PHYSP	4.4E-03	PHYSP	7.9E+01	PHYSP			5.6E-02	6.6E-06	9			4.4E+03	EPI	3.5E+00	PHYSP	4.0E+01	PHYSP	1.5E-01	1.3E+00	3.2E+00	2.7E-02	EPI	
Trichlorobenzene, 1,2,3-	87-61-6	1.8E+02	PHYSP	5.1E-02	1.3E-03	PHYSP	2.1E-01	PHYSP	5.4E+01	PHYSP	1.5E+00	CRC89	4.0E-02	8.4E-06	9			1.4E+03	EPI	4.1E+00	PHYSP	1.8E+01	PHYSP	3.8E-01	1.1E+00	2.6E+00	7.4E-02	EPI	
Trichlorobenzene, 1,2,4-	120-82-1	1.8E+02	PHYSP	5.8E-02	1.4E-03	PHYSP	4.6E-01	PHYSP	1.7E+01	PHYSP	1.5E+00	CRC89	4.0E-02	8.4E-06	9			1.4E+03	EPI	4.0E+00	PHYSP	4.9E+01	PHYSP	3.7E-01	1.1E+00	2.6E+00	7.1E-02	EPI	
Trichloroethane, 1,1,1-	71-55-6	1.3E+02	PHYSP	7.0E-01	1.7E-02	PHYSP	1.2E+02	PHYSP	-3.0E+01	PHYSP	1.3E+00	CRC89	6.5E-02	9.6E-06	9			4.4E+01	EPI	2.5E+00	PHYSP	1.3E+03	PHYSP	5.6E-02	5.9E-01	1.4E+00	1.3E-02	EPI	
Trichloroethane, 1,1,2-	79-00-5	1.3E+02	PHYSP	3.4E-02	8.2E-04	PHYSP	2.3E+01	PHYSP	-3.7E+01	PHYSP	1.4E+00	CRC89	6.7E-02	1.0E-05	9			6.1E+01	EPI	1.9E+00	PHYSP	4.6E+03	PHYSP	2.2E-02	5.9E-01	1.4E+00	5.0E-03	EPI	
Trichloroethylene	79-01-6	1.3E+02	PHYSP	4.0E-01	9.9E-03	PHYSP	6.9E+01	PHYSP	-8.5E+01	PHYSP	1.5E+00	CRC89	6.9E-02	1.0E-05	9			6.1E+01	EPI	2.4E+00	PHYSP	1.3E+03	PHYSP	5.1E-02	5.7E-01	1.4E+00	1.2E-02	EPI	
Trichlorofluoromethane	75-69-4	1.4E+02	PHYSP	4.0E+00	9.7E-02	PHYSP	8.0E+02	PHYSP	-1.1E+02	PHYSP	1.5E+00	CRC89	6.5E-02	1.0E-05	9			4.4E+01	EPI	2.5E+00	PHYSP	1.1E+03	PHYSP	5.7E-02	6.2E-01	1.5E+00	1.3E-02	EPI	
Trichlorophenol, 2,4,5-	95-95-4	2.0E+02	PHYSP	6.6E-05	1.6E-06	PHYSP	7.5E-03	PHYSP	6.9E+01	PHYSP	1.5E+00	PERRY	3.1E-02	8.1E-06	9			1.6E+03	SSL	3.7E+00	PHYSP	1.2E+03	PHYSP	2.0E-01	1.3E+00	3.2E+00	3.6E-02	EPI	
Trichlorophenol, 2,4,6-	88-06-2	2.0E+02	PHYSP	1.1E-04	2.6E-06	PHYSP	8.0E-03	PHYSP	6.9E+01	PHYSP	1.5E+00	CRC89	3.1E-02	8.1E-06	9			3.8E+02	SSL	3.7E+00	PHYSP	8.0E+02	PHYSP	1.9E-01	1.3E+00	3.2E+00	3.5E-02	EPI	
Trichlorophenoxyacetic Acid, 2,4,5-	93-76-5	2.6E+02	PHYSP	3.5E-07	8.7E-09	PHYSP	3.8E-05	PHYSP	1.5E+02	PHYSP	1.8E+00	PubChe m	2.9E-02	7.8E-06	9			1.1E+02	EPI	3.3E+00	PHYSP	2.8E+02	PHYSP	5.6E-02	2.8E+00	6.8E+00	9.1E-03	EPI	
Trichlorophenoxypropionic acid, -2,4,5	93-72-1	2.7E+02	PHYSP	3.7E-07	9.1E-09	PHYSP	1.0E-05	PHYSP	1.8E+02	PHYSP	1.2E+00	PubChe m	2.3E-02	5.9E-06	9			1.8E+02	EPI	3.8E+00	PHYSP	7.1E+01	PHYSP	1.0E-01	3.4E+00	8.2E+00	1.6E-02	EPI	
Trichloropropane, 1,1,2-	598-77-6	1.5E+02	PHYSP	1.3E-02	3.2E-04	PHYSP	3.1E+00	PHYSP	-6.5E+01	PHYSP	1.4E+00	CRC89	5.7E-02	9.2E-06	9			9.5E+01	EPI	2.4E+00	PHYSP	1.9E+03	PHYSP	4.5E-02	7.0E-01	1.7E+00	9.6E-03	EPI	

Contaminant		Molecular Weight		Volatility Parameters				Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters						
Analyte	CAS No.	MW	MW Ref	H <sup>+</sup> (unitless)	HLC (atm-m <sup>3</sup> /mole)	H <sup>+</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Trichloropropane, 1,2,3-	96-18-4	1.5E+02	PHYSP ROP	1.4E-02	3.4E-04	PHYSP ROP	3.7E+00	PHYSP ROP	-1.5E+01	PHYSP ROP	1.4E+00	CRC89	5.7E-02	9.2E-06	9 WATER			1.2E+02	EPI	2.3E+00	ROP	1.8E+03	PHYSP ROP	3.5E-02	7.0E-01	1.7E+00	7.5E-03	EPI
Trichloropropene, 1,2,3-	96-19-5	1.5E+02	PHYSP ROP	7.2E-01	1.8E-02	PHYSP ROP	4.4E+00	PHYSP ROP	-5.6E+01	EPI	1.4E+00	CRC89	5.9E-02	9.4E-06	9 WATER			1.2E+02	EPI	2.8E+00	ROP	3.3E+02	PHYSP ROP	7.8E-02	6.9E-01	1.6E+00	1.7E-02	EPI
Tricresyl Phosphate (TCP)	1330-78-5	3.7E+02	PHYSP ROP	3.3E-05	8.1E-07	EPI PHYSP	6.0E-07	EPI PHYSP	-3.3E+01	ROP PHYSP	1.2E+00	Yaws	1.9E-02	4.8E-06	9 WATER			4.7E+04	EPI	5.1E+00	ROP	3.6E-01	PHYSP ROP	2.5E-01	1.2E+01	2.9E+01	3.3E-02	EPI
Tridiphane	58138-08-2	3.2E+02	PHYSP ROP	1.7E-05	4.1E-07	ROP PHYSP	3.9E-04	ROP PHYSP	4.3E+01	ROP PHYSP			4.1E-02	4.7E-06	9 WATER			3.4E+03	EPI	5.2E+00	ROP	1.1E+00	PHYSP ROP	4.7E-01	6.6E+00	1.6E+01	6.9E-02	EPI
Triethylamine	121-44-8	1.0E+02	PHYSP ROP	6.1E-03	1.5E-04	ROP	5.7E+01	ROP	-1.1E+02	ROP	7.3E-01	CRC89	6.6E-02	7.9E-06	9 WATER			5.1E+01	EPI	1.5E+00	ROP	6.9E+04	PHYSP ROP	1.5E-02	3.9E-01	9.3E-01	3.9E-03	EPI
Triethylene Glycol	112-27-6	1.5E+02	PHYSP ROP	1.3E-09	3.2E-11	ROP PHYSP	1.3E-03	ROP PHYSP	-7.0E+00	ROP PHYSP	1.1E+00	CRC89	5.1E-02	8.1E-06	9 WATER			1.0E+01	EPI	-1.8E+00	ROP	1.0E+06	PHYSP ROP	7.3E-05	7.3E-01	1.8E+00	1.6E-05	EPI
Trifluoroethane, 1,1,1-	420-46-2	8.4E+01	PHYSP ROP	3.1E+01	7.7E-01	ROP PHYSP	9.5E+03	ROP PHYSP	-1.1E+02	ROP PHYSP			9.9E-02	1.2E-05	9 WATER			4.4E+01	EPI	1.7E+00	ROP	7.6E+02	PHYSP ROP	2.7E-02	3.1E-01	7.5E-01	7.6E-03	EPI
Trifluralin	1582-09-8	3.4E+02	PHYSP ROP	4.2E-03	1.0E-04	ROP	4.6E-05	ROP	4.9E+01	ROP	1.4E+00	PubChe m	2.2E-02	5.6E-06	9 WATER			1.6E+04	EPI	5.3E+00	ROP	1.8E-01	PHYSP ROP	5.1E-01	7.9E+00	1.9E+01	7.3E-02	EPI
Trimethyl Phosphate	512-56-1	1.4E+02	PHYSP ROP	2.9E-07	7.2E-09	ROP PHYSP	8.5E-01	EPI PHYSP	-4.6E+01	ROP PHYSP	1.2E+00	CRC89	5.8E-02	8.8E-06	9 WATER			1.1E+01	EPI	-6.5E-01	ROP	5.0E+05	PHYSP ROP	4.3E-04	6.4E-01	1.5E+00	9.5E-05	EPI
Trimethylbenzene, 1,2,3-	526-73-8	1.2E+02	PHYSP ROP	1.8E-01	4.4E-03	ROP PHYSP	1.7E+00	ROP PHYSP	-2.5E+01	ROP PHYSP	8.9E-01	CRC89	6.1E-02	8.0E-06	9 WATER			6.3E+02	EPI	3.7E+00	ROP	7.5E+01	PHYSP ROP	3.8E-01	5.0E-01	1.2E+00	9.0E-02	EPI
Trimethylbenzene, 1,2,4-	95-63-6	1.2E+02	PHYSP ROP	2.5E-01	6.2E-03	ROP	2.1E+00	ROP	-4.4E+01	ROP	8.8E-01	CRC89	6.1E-02	7.9E-06	9 WATER			6.1E+02	EPI	3.6E+00	ROP	5.7E+01	PHYSP ROP	3.6E-01	5.0E-01	1.2E+00	8.6E-02	EPI
Trimethylbenzene, 1,3,5-	108-67-8	1.2E+02	PHYSP ROP	3.6E-01	8.8E-03	ROP PHYSP	2.5E+00	ROP PHYSP	-4.5E+01	ROP PHYSP	8.6E-01	CRC89	6.0E-02	7.8E-06	9 WATER			6.0E+02	EPI	3.4E+00	ROP	4.8E+01	PHYSP ROP	2.6E-01	5.0E-01	1.2E+00	6.2E-02	EPI
Trimethylpentene, 2,4,4-	25167-70-8	1.1E+02	PHYSP ROP	3.0E+01	7.5E-01	ROP	7.1E+01	ROP	-8.4E+01	EPI PHYSP	7.2E-01	PubChe m	6.0E-02	7.3E-06	9 WATER			2.4E+02	EPI	4.1E+00	ROP	4.0E+00	PHYSP ROP	7.7E-01	4.5E-01	1.7E+00	1.9E-01	RAGSE
Trinitrobenzene, 1,3,5-	99-35-4	2.1E+02	PHYSP ROP	2.7E-07	6.5E-09	EPI	6.4E-06	EPI	1.2E+02	ROP	1.5E+00	CRC89	2.9E-02	7.7E-06	9 WATER			1.7E+03	EPI	1.2E+00	ROP	2.8E+02	PHYSP ROP	3.4E-03	1.6E+00	3.9E+00	6.1E-04	EPI
Trinitrotoluene, 2,4,6-	118-96-7	2.3E+02	PHYSP ROP	8.5E-07	2.1E-08	EPI PHYSP	8.0E-06	ROP	8.0E+01	ROP PHYSP	1.7E+00	CRC89	3.0E-02	7.9E-06	9 WATER			2.8E+03	EPI	1.6E+00	ROP	1.2E+02	PHYSP ROP	5.6E-03	2.0E+00	4.7E+00	9.6E-04	EPI
Triphenylphosphine Oxide	791-28-6	2.8E+02	PHYSP ROP	2.2E-08	5.3E-10	ROP PHYSP	2.6E-09	EPI PHYSP	1.6E+02	ROP PHYSP	1.2E+00	CRC89	2.3E-02	5.8E-06	9 WATER			2.0E+03	EPI	2.8E+00	ROP	6.3E+01	PHYSP ROP	2.1E-02	3.8E+00	9.1E+00	3.3E-03	EPI
Tris(1,3-Dichloro-2-propyl) Phosphate	13674-87-8	4.3E+02	PHYSP ROP	1.1E-07	2.6E-09	ROP PHYSP	7.4E-08	ROP	2.7E+01	ROP			3.3E-02	3.9E-06	9 WATER			1.1E+04	EPI	3.7E+00	ROP	7.0E+00	PHYSP ROP	1.3E-02	2.7E+01	6.5E+01	1.6E-03	EPI
Tris(1-chloro-2-propyl)phosphate	13674-84-5	3.3E+02	PHYSP ROP	2.4E-06	6.0E-08	ROP	2.0E-05	ROP	-4.0E+01	ROP			4.0E-02	4.7E-06	9 WATER			1.6E+03	EPI	2.6E+00	ROP	1.2E+03	PHYSP ROP	8.4E-03	7.2E+00	1.7E+01	1.2E-03	EPI
Tris(2,3-dibromopropyl)phosphate	126-72-7	7.0E+02	PHYSP ROP	8.9E-04	2.2E-05	EPI	1.9E-04	ROP	5.5E+00	ROP	2.3E+00	PubChe m	1.9E-02	4.9E-06	9 WATER			9.7E+03	EPI	4.3E+00	ROP	8.0E+00	PHYSP ROP	1.4E-03	8.5E+02	2.0E+03	1.4E-04	EPI
Tris(2-chloroethyl)phosphate	115-96-8	2.9E+02	PHYSP ROP	1.3E-04	3.3E-06	EPI	6.1E-02	ROP	-5.5E+01	ROP	1.4E+00	CRC89	2.4E-02	6.2E-06	9 WATER			3.9E+02	EPI	1.4E+00	ROP	7.0E+03	PHYSP ROP	2.3E-03	4.2E+00	1.0E+01	3.6E-04	EPI
Tris(2-ethylhexyl)phosphate	78-42-2	4.3E+02	PHYSP ROP	3.2E-06	7.9E-08	EPI	8.3E-08	ROP	-7.4E+01	ROP PHYSP	9.9E-01	CRC89	1.6E-02	3.9E-06	9 WATER			2.5E+06	EPI	9.5E+00	ROP	6.0E-01	PHYSP ROP	9.3E+01	2.9E+01	1.3E+02	1.2E+01	EPI
Tungsten	7440-33-7	1.8E+02	PHYSP ROP				0.0E+00	NIOSH	3.4E+03	ROP	1.9E+01	CRC89				1.5E+02	BAES						PHYSP ROP	5.2E-03	1.1E+00	2.7E+00	1.0E-03	RAGSE
Uranium (Soluble Salts)	NA	2.4E+02	CRC89				0.0E+00	NIOSH	1.1E+03	CRC89	1.9E+01	CRC89				4.5E+02	BAES						PHYSP ROP	5.9E-03	2.3E+00	5.4E+00	1.0E-03	RAGSE
Urethane	51-79-6	8.9E+01	PHYSP ROP	2.6E-06	6.4E-08	EPI	2.6E-01	EPI	4.9E+01	ROP	9.9E-01	CRC89	8.5E-02	1.0E-05	9 WATER			1.2E+01	EPI	-1.5E-01	ROP	4.8E+05	PHYSP ROP	1.4E-03	3.3E-01	8.0E-01	3.9E-04	EPI
Vanadium Pentoxide	1314-62-1	1.8E+02	EPI				0.0E+00	NIOSH	6.8E+02	CRC89	3.4E+00	CRC89										7.0E+02	CRC89	5.2E-03	1.1E+00	2.6E+00	1.0E-03	RAGSE
Vanadium and Compounds	7440-62-2	5.1E+01	EPI						1.9E+03	CRC89	6.0E+00	CRC89				1.0E+03	SSL						PHYSP ROP	2.7E-03	2.0E-01	4.9E-01	1.0E-03	RAGSE
Vernolate	1929-77-7	2.0E+02	PHYSP ROP	1.3E-03	3.1E-05	EPI	1.0E-02	ROP	7.1E+01	EPI PHYSP	9.5E-01	CRC89	2.4E-02	6.1E-06	9 WATER			3.0E+02	EPI	3.8E+00	ROP	9.0E+01	PHYSP ROP	2.2E-01	1.4E+00	3.5E+00	4.0E-02	EPI
Vinclozolin	50471-44-8	2.9E+02	PHYSP ROP	7.1E-07	1.7E-08	EPI	1.2E-07	ROP	1.1E+02	ROP PHYSP	1.5E+00	CRC89	2.5E-02	6.5E-06	9 WATER			2.8E+02	EPI	3.1E+00	ROP	2.6E+00	PHYSP ROP	2.9E-02	4.2E+00	1.0E+01	4.5E-03	EPI
Vinyl Acetate	108-05-4	8.6E+01	PHYSP ROP	2.1E-02	5.1E-04	EPI	9.0E+01	ROP	-9.3E+01	ROP	9.3E-01	CRC89	8.5E-02	1.0E-05	9 WATER			5.6E+00	EPI	7.3E-01	ROP	2.0E+04	PHYSP ROP	5.6E-03	3.2E-01	7.7E-01	1.6E-03	EPI
Vinyl Bromide	593-60-2	1.1E+02	PHYSP ROP	5.0E-01	1.2E-02	ROP PHYSP	1.0E+03	ROP	-1.4E+02	ROP PHYSP	1.5E+00	CRC89	8.6E-02	1.2E-05	9 WATER			2.2E+01	EPI	1.6E+00	ROP	7.6E+03	PHYSP ROP	1.7E-02	4.2E-01	1.0E+00	4.4E-03	EPI
Vinyl Chloride	75-01-4	6.2E+01	PHYSP ROP	1.1E+00	2.8E-02	ROP	3.0E+03	EPI PHYSP	-1.5E+02	ROP PHYSP	9.1E-01	CRC89	1.1E-01	1.2E-05	9 WATER			2.2E+01	EPI	1.4E+00	CRC89 PHYSP	8.8E+03	PHYSP ROP	2.5E-02	2.4E-01	5.7E-01	8.4E-03	EPI
Warfarin	81-81-2	3.1E+02	PHYSP ROP	1.1E-07	2.8E-09	EPI	1.2E-07	ROP	1.6E+02	ROP			4.2E-02	4.9E-06	9 WATER			4.3E+02	EPI	2.7E+00	ROP	1.7E+01	PHYSP ROP	1.2E-02	5.6E+00	1.3E+01	1.8E-03	EPI

Contaminant		Molecular Weight		Volatility Parameters					Melting Point		Density		Diffusivity in Air and Water			Partition Coefficients					Water Solubility		Tapwater Dermal Parameters					
Analyte	CAS No.	MW	MW Ref	H <sup>*</sup> (unitless)	HLC (atm- m <sup>3</sup> /mole)	H <sup>*</sup> and HLC Ref	VP	VP Ref	MP	MP Ref	Density (g/cm <sup>3</sup> )	Density Ref	Dia (cm <sup>2</sup> /s)	Diw (cm <sup>2</sup> /s)	D <sub>ia</sub> and D <sub>iw</sub> Ref	K <sub>d</sub> (L/kg)	K <sub>d</sub> Ref	K <sub>oc</sub> (L/kg)	K <sub>oc</sub> Ref	log K <sub>ow</sub> (unitless)	log K <sub>ow</sub> Ref	S (mg/L)	S Ref	B (unitless)	T <sub>event</sub> (hr/event t)	t* (hr)	K <sub>p</sub> (cm/hr)	K Ref
Xylene, P-	106-42-3	1.1E+02	PHYSP ROP	2.8E-01	6.9E-03	PHYSP ROP	8.8E+00	ROP	1.3E+01	PHYSP ROP	8.6E-01	CRC89	6.8E-02	8.4E-06	9			3.8E+02	EPI	3.2E+00	ROP	1.6E+02	PHYSP ROP	2.0E-01	4.1E-01	9.9E-01	4.9E-02	EPI
Xylene, m-	108-38-3	1.1E+02	PHYSP ROP	2.9E-01	7.2E-03	PHYSP ROP	8.3E+00	ROP	4.8E+01	PHYSP ROP	8.6E-01	CRC89	6.8E-02	8.4E-06	9			3.8E+02	EPI	3.2E+00	ROP	1.6E+02	PHYSP ROP	2.1E-01	4.1E-01	9.9E-01	5.3E-02	EPI
Xylene, o-	95-47-6	1.1E+02	PHYSP ROP	2.1E-01	5.2E-03	PHYSP ROP	6.6E+00	ROP	2.5E+01	PHYSP ROP	8.8E-01	CRC89	6.9E-02	8.5E-06	9			3.8E+02	EPI	3.1E+00	ROP	1.8E+02	PHYSP ROP	1.9E-01	4.1E-01	9.9E-01	4.7E-02	EPI
Xylenes	1330-20-7	1.1E+02	PHYSP ROP	2.7E-01	6.6E-03	PHYSP ROP	8.0E+00	ROP	2.5E+01	EPI	8.6E-01	ATSDR Profile	6.9E-02	8.5E-06	9			3.8E+02	EPI	3.2E+00	ROP	1.1E+02	PHYSP ROP	2.0E-01	4.1E-01	9.9E-01	5.0E-02	EPI
Zinc Phosphide	1314-84-7	2.6E+02	CRC89 PHYSP						1.2E+03	CRC89 PHYSP	4.6E+00	CRC89												3.7E-03	2.9E+00	7.0E+00	6.0E-04	RAGSE
Zinc and Compounds	7440-66-6	6.5E+01	PHYSP ROP						4.2E+02	ROP	7.1E+00	CRC89				6.2E+01	SSL							1.9E-03	2.4E-01	5.9E-01	6.0E-04	RAGSE
Zineb	12122-67-7	2.8E+02	PHYSP ROP	1.1E-07	2.7E-09	PHYSP ROP	7.5E-08	ROP	1.6E+02	EPI			4.5E-02	5.2E-06	9			1.3E+03	EPI	1.3E+00	ROP	1.0E+01	PHYSP ROP	2.1E-03	3.7E+00	8.8E+00	3.3E-04	EPI
Zirconium	7440-67-7	9.1E+01	EPI				0.0E+00	NIOSH	1.9E+03	CRC89	6.5E+00	CRC89				3.0E+03	BAES							3.7E-03	3.4E-01	8.2E-01	1.0E-03	RAGSE

Chemical	Cas Number	Mut?	Chemical Properties			Dermal Water Parameters									NOTE:		
			MW (f)	Kow (f)	Exposure Time	Kp	B	Lag Time	t*	FA	Tevent	< or >	b	c		DAevent	
			CAS	g/mol	unitless	(hr/event)	(cm/hr)	unitless	hr/event	hr	unitless						
2-METHYLNAPHTHALENE	91-57-6	--	91576	142.2	3.86	4	0.092	0.420577	0.657913	1.578992	1	4	Tevent>t*	0.6295004	0.6552237	4.25E-01	
ACENAPHTHENE	83-32-9	--	83329	154.21	3.92	4	0.086	0.410754	0.768112	1.84347	1	4	Tevent>t*	0.6199831	0.6470339	4.26E-01	
ACENAPHTHYLENE	208-96-8	--	208968	154.22	3.94	4	0.091	0.435126	0.767046	1.84091	1	4	Tevent>t*	0.6437803	0.6673939	4.49E-01	
ANTHRACENE	120-12-7	--	120127	178.24	4.45	4	0.142	0.729151	1.047111	4.050215	1	4	Tevent<t*	0.9815461	0.921924	8.03E-01	
BENZ[A]ANTHRACENE	56-55-3	M	56553	228.3	5.76	4	0.552	3.207884	1.996773	8.481824	1	4	Tevent<t*	7.9850734	3.2871006	4.31E+00	Out EPD
BENZO[A]PYRENE	50-32-8	M	50328	252.32	6.13	4	0.713	4.356042	2.721703	11.82211	1	4	Tevent<t*	13.84455	4.4182766	6.50E+00	Out EPD
BENZO[B]FLUORANTHENE	205-99-2	M	205992	252.32	5.78	4	0.417	2.547643	2.721703	11.34207	1	4	Tevent<t*	5.3707481	2.641602	3.80E+00	Out EPD
BENZO[G,H,I]PERYLENE	191-24-2	--	191242	276.3	6.58	4	1.200	7.671819	3.70228	16.59399	1	4	Tevent<t*	40.163831	7.7102576	1.28E+01	Pyrene surrogate
BENZO[K]FLUORANTHENE	207-08-9	M	207089	252.32	6.11	4	0.691	4.221634	2.721703	11.79716	1	4	Tevent<t*	13.072259	4.2854706	6.30E+00	
CHRYSENE	218-01-9	M	218019	228.3	5.81	4	0.596	3.463585	1.996773	8.5324	1	4	Tevent<t*	9.1454891	3.5382635	4.66E+00	Out EPD
DIBENZ[A,H]ANTHRACENE	53-70-3	M	53703	278.36	6.75	4	0.953	6.115373	3.807718	16.87857	0.6	4	Tevent<t*	26.068907	6.1622201	6.17E+00	Out EPD
FLUORANTHENE	206-44-0	--	206440	202.26	5.16	4	0.308	1.684738	1.427265	5.729798	1	4	Tevent<t*	2.7797429	1.8088966	2.03E+00	
FLUORENE	86-73-7	--	86737	166.22	4.18	4	0.110	0.545458	0.896769	2.152246	1	4	Tevent>t*	0.7593842	0.7611434	5.76E-01	
INDENO[1,2,3-CD]PYRENE	193-39-5	M	193395	276.34	6.7	4	1.240	7.92812	3.709819	16.65194	0.6	4	Tevent<t*	42.780351	7.9654552	7.92E+00	Out EPD
NAPHTHALENE	91-20-3	--	91203	128.18	3.3	4	0.047	0.202919	0.549107	1.317856	1	4	Tevent>t*	0.4411751	0.4800227	2.16E-01	
PHENANTHRENE	85-01-8	--	85018	178.234	4.46	4	0.144	0.739408	1.045441	4.038897	1	4	Tevent<t*	0.9950752	0.9310445	8.14E-01	Out EPD
PYRENE	129-00-0	--	129000	202.26	4.88	4	0.201	1.099456	1.427265	5.535307	1	4	Tevent<t*	1.5478108	1.2582269	1.33E+00	
		--															
ALUMINUM	7429-90-5	--	7429905	26.982		4	0.001	0.001998	0.148918	0.357404	1	4	Tevent>t*	0.3044995	0.3346666	4.00E-03	
ANTIMONY	7440-36-0	--	7440360	124.77		4	0.001	0.004296	0.525486	1.261165	1	4	Tevent>t*	0.305898	0.3362036	4.00E-03	
ARSENIC, inorganic	7440-38-2	--	7440382	77.946		4	0.001	0.003396	0.287307	0.689537	1	4	Tevent>t*	0.3053497	0.335601	4.00E-03	
BARIUM	7440-39-3	--	7440393	139.36		4	0.001	0.00454	0.634256	1.522215	1	4	Tevent>t*	0.3060468	0.3363671	4.00E-03	
BERYLLIUM and compounds	7440-41-7	--	7440417	11.028		4	0.001	0.001277	0.121229	0.290949	1	4	Tevent>t*	0.3040616	0.3341853	4.00E-03	
CADMIUM (diet)	7440-43-9	--	7440439	112.4		4	0.001	0.004078	0.448011	1.075227	1	4	Tevent>t*	0.3057649	0.3360573	4.00E-03	
CALCIUM	7440-70-2	--	7440702	40.078		4	0.001	0.002435	0.176046	0.42251	1	4	Tevent>t*	0.3047652	0.3349586	4.00E-03	
CHROMIUM, total	7440-47-3	--	7440473	51.996		4	0.001	0.002773	0.205602	0.493444	1	4	Tevent>t*	0.304971	0.3351848	4.00E-03	
COBALT	7440-48-4	--	7440484	58.93		4	0.000	0.001181	0.224831	0.539595	1	4	Tevent>t*	0.3040032	0.3341211	1.60E-03	
COPPER	7440-50-8	--	7440508	63.546		4	0.001	0.003066	0.23862	0.572687	1	4	Tevent>t*	0.3051491	0.3353805	4.00E-03	
IRON	7439-89-6	--	7439896	55.847		4	0.001	0.002874	0.216069	0.518565	1	4	Tevent>t*	0.3050324	0.3352523	4.00E-03	
LEAD and compounds	7439-92-1	--	7439921	207.2		4	0.000	0.000554	1.521139	3.650732	1	4	Tevent>t*	0.3036223	0.3337025	4.00E-04	
MAGNESIUM	7439-95-4	--	7439954	24.305		4	0.001	0.001896	0.143647	0.344753	1	4	Tevent>t*	0.3044377	0.3345986	4.00E-03	
MANGANESE (non-diet)	7439-96-5	--	7439965	54.938		4	0.001	0.002851	0.213551	0.512522	1	4	Tevent>t*	0.3050181	0.3352366	4.00E-03	
MERCURY	7487-94-7	--	7487947	271.5		4	0.001	0.006337	3.485369	8.364885	1	4	Tevent<t*	0.3071428	0.3375716	4.00E-03	
NICKEL	7440-02-0	--	7440020	58.71		4	0.000	0.000589	0.224194	0.538067	1	4	Tevent>t*	0.3036441	0.3337264	8.00E-04	
POTASSIUM	97/7440	--	2023695	39.1		4	0.002	0.00481	0.17384	0.417216	1	4	Tevent>t*	0.3062111	0.3365477	8.00E-03	
SELENIUM	7782-49-2	--	7782492	78.96		4	0.001	0.003418	0.291088	0.698612	1	4	Tevent>t*	0.3053631	0.3356157	4.00E-03	
SILVER	7440-22-4	--	7440224	107.87		4	0.001	0.002397	0.422592	1.01422	1	4	Tevent>t*	0.304742	0.3349331	2.40E-03	
SODIUM	7440-23-5	--	7440235	23		4	0.001	0.001845	0.14125	0.339001	1	4	Tevent>t*	0.3044063	0.3345642	4.00E-03	
THALLIUM	7440-28-0	--	7440280	205.38		4	0.001	0.005512	1.485856	3.566055	1	4	Tevent>t*	0.3066391	0.3370181	4.00E-03	
VANADIUM	7440-62-2	--	7440622	50.94		4	0.001	0.002745	0.202821	0.48677	1	4	Tevent>t*	0.3049538	0.3351659	4.00E-03	
ZINC	7440-66-6	--	7440666	65.37		4	0.001	0.001866	0.244299	0.586316	1	4	Tevent>t*	0.3044192	0.3345784	2.40E-03	
		--															
1,1,1-TRICHLOROETHANE	71-55-6	--	71556	133.41	2.49	4	0.013	0.055975	0.587415	1.409795	1	4	Tevent>t*	0.3382448	0.3716388	6.34E-02	
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	--	76131	187.38	3.16	4	0.018	0.092135	1.178085	2.827405	1	4	Tevent>t*	0.3619866	0.3973479	1.09E-01	
1,1,2,2-TETRACHLOROETHANE	79-34-5	--	79345	167.85	2.39	4	0.007	0.034582	0.915817	2.197961	1	4	Tevent>t*	0.3246388	0.3567731	4.00E-02	
1,1,2-TRICHLOROETHANE	79-00-5	--	79005	133.41	1.89	4	0.005	0.02239	0.587415	1.409795	1	4	Tevent>t*	0.3170232	0.3484234	2.58E-02	
1,1-DICHLOROETHANE	75-34-3	--	75343	98.96	1.79	4	0.007	0.025826	0.376725	0.904141	1	4	Tevent>t*	0.3191598	0.3507675	3.15E-02	
1,1-DICHLOROETHENE	75-35-4	--	75354	96.944	2.13	4	0.012	0.044307	0.367058	0.88094	1	4	Tevent>t*	0.3307851	0.363498	5.38E-02	
1,2,3-TRICHLOROBENZENE	87-61-6	--	87616	181.45	4.05	4	0.074	0.38235	1.091362	2.619268	1	4	Tevent>t*	0.5930264	0.6234856	4.32E-01	
1,2,4-TRICHLOROBENZENE	120-82-1	--	120821	181.45	4.02	4	0.071	0.365253	1.091362	2.619268	1	4	Tevent>t*	0.577198	0.6094083	4.13E-01	
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	M	96128	236.33	2.96	4	0.007	0.040502	2.214607	5.315058	1	4	Tevent<t*	0.3283727	0.3608602	5.64E-02	



	Cas Number	Mut?	Chemical Properties			Dermal Water Parameters										
				log	Exposure		Lag Time									
			MW (f)	Kow (f)	Time	Kp	B	tao	t*	FA	Tevent	< or >	b	c	DAevent	
			CAS	g/mol	(hr/event)	(cm/hr)	unitless	hr/event	hr	unitless						
1,2-DIBROMOETHANE	106-93-4	--	106934	187.86	1.96	4	0.003	0.014655	1.1854	2.844959	1	4	Tevent>t*	0.312242	0.343174	1.76E-02
1,2-DICHLOROETHANE	107-06-2	--	107062	98.96	1.48	4	0.004	0.01607	0.376725	0.904141	1	4	Tevent>t*	0.3131135	0.3441311	1.97E-02
1,2-DICHLOROBENZENE	95-50-1	--	95501	147	3.43	4	0.045	0.207979	0.699921	1.679809	1	4	Tevent>t*	0.4450423	0.4839222	2.23E-01
1,2-DICHLOROPROPANE	78-87-5	--	78875	112.99	1.98	4	0.008	0.030785	0.451432	1.083438	1	4	Tevent>t*	0.3222568	0.3541633	3.62E-02
1,3-DICHLOROBENZENE	541-73-1	--	541731	146.998	3.53	4	0.052	0.242485	0.698841	1.677217	1	4	Tevent>t*	0.4720297	0.5107649	2.57E-01
1,4-DICHLOROBENZENE	106-46-7	--	106467	147	3.44	4	0.045	0.211244	0.699921	1.679809	1	4	Tevent>t*	0.4475491	0.4864429	2.26E-01
2-BUTANONE	78-93-3	--	78933	72.108	0.29	4	0.001	0.003142	0.266473	0.639536	1	4	Tevent>t*	0.3051952	0.3354312	4.35E-03
2-HEXANONE	591-78-6	--	591786	100.16	1.38	4	0.004	0.013665	0.3826	0.91824	1	4	Tevent>t*	0.3116326	0.3425046	1.68E-02
4-METHYL-2-PENTANONE	108-10-1	--	108101	100.16	1.31	4	0.003	0.012279	0.3826	0.91824	1	4	Tevent>t*	0.3107809	0.341569	1.51E-02
ACETONE	67-64-1	--	67641	58.081	-0.24	4	0.001	0.001501	0.222383	0.53372	1	4	Tevent>t*	0.3041975	0.3343346	2.27E-03
BENZENE	71-43-2	--	71432	78.115	2.13	4	0.015	0.05065	0.287934	0.691041	1	4	Tevent>t*	0.3348287	0.367914	6.57E-02
BROMOCHLOROMETHANE	74-97-5	--	74975	129.38	1.41	4	0.003	0.011156	0.557669	1.338406	1	4	Tevent>t*	0.3100914	0.3408116	1.30E-02
BROMODICHLOROMETHANE	75-27-4	--	75274	163.83	2	4	0.004	0.01979	0.869554	2.086931	1	4	Tevent>t*	0.315412	0.3466548	2.29E-02
BROMOFORM	75-25-2	--	75252	252.73	2.4	4	0.002	0.014369	2.73613	6.566712	1	4	Tevent<t*	0.3120658	0.3429804	2.15E-02
BROMOMETHANE	74-83-9	--	74839	94.939	1.19	4	0.003	0.010643	0.35769	0.858457	1	4	Tevent>t*	0.309777	0.3404661	1.33E-02
CARBON DISULFIDE	75-15-0	--	75150	76.139	1.94	4	0.011	0.038259	0.28069	0.673656	1	4	Tevent>t*	0.3269553	0.3593093	5.06E-02
CARBON TETRACHLORIDE	56-23-5	--	56235	153.82	2.83	4	0.016	0.077754	0.764259	1.834222	1	4	Tevent>t*	0.3524286	0.3870389	8.73E-02
CHLOROBENZENE	108-90-7	--	108907	112.56	2.84	4	0.028	0.115072	0.448936	1.077447	1	4	Tevent>t*	0.3775571	0.414006	1.29E-01
CHLOROETHANE	75-00-3	--	75003	64.515	1.43	4	0.006	0.018752	0.24162	0.579888	1	4	Tevent>t*	0.3147696	0.3459497	2.68E-02
CHLOROFORM	67-66-3	--	67663	119.38	1.97	4	0.007	0.028702	0.490204	1.176489	1	4	Tevent>t*	0.3209539	0.352735	3.34E-02
CHLOROMETHANE	74-87-3	--	74873	50.488	0.91	4	0.003	0.008964	0.201642	0.483941	1	4	Tevent>t*	0.3087482	0.3393357	1.43E-02
CIS-1,2-DICHLOROETHENE	156-59-2	--	156592	96.944	1.86	4	0.011	0.041656	0.367058	0.88094	1	4	Tevent>t*	0.3291034	0.3616594	5.07E-02
CIS-1,3-DICHLOROPROPENE	10061-01-5	--	10061015	110.965	2.06	4	0.008	0.03379	0.43913	1.053912	1	4	Tevent>t*	0.3241411	0.356228	3.98E-02
CYCLOHEXANE	110-82-7	--	110827	84.163	3.44	4	0.102	0.359905	0.311287	0.74709	1	4	Tevent>t*	0.5723069	0.6050198	3.85E-01
DIBROMOCHLOROMETHANE	124-48-1	--	124481	208.28	2.16	4	0.003	0.016042	1.54247	3.701928	1	4	Tevent>t*	0.3130962	0.3441122	2.04E-02
DICHLORODIFLUOROMETHANE	75-71-8	--	75718	120.91	2.16	4	0.009	0.037851	0.499971	1.19993	1	4	Tevent>t*	0.326698	0.3590277	4.38E-02
ETHYLBENZENE	100-41-4	--	100414	106.17	3.15	4	0.049	0.195378	0.413429	0.992229	1	4	Tevent>t*	0.435454	0.4742294	2.13E-01
ISOPROPYLBENZENE	98-82-8	--	98828	120.2	3.66	4	0.090	0.378243	0.495415	1.188995	1	4	Tevent>t*	0.589197	0.6200971	3.80E-01
METHYL ACETATE	79-20-9	--	79209	74.08	0.18	4	0.001	0.002622	0.273336	0.656006	1	4	Tevent>t*	0.3048788	0.3350835	3.59E-03
METHYLCYCLOHEXANE	108-87-2	--	108872	98.189	3.61	4	0.110	0.419228	0.372433	0.893838	1	4	Tevent>t*	0.6281877	0.6540979	4.23E-01
METHYLENE CHLORIDE	75-09-2	M	75092	84.933	1.25	4	0.004	0.012548	0.314394	0.754544	1	4	Tevent>t*	0.310946	0.3417504	1.62E-02
METHYL TERT-BUTYL ETHER	1634-04-4	--	1634044	88.151	0.94	4	0.002	0.007619	0.327714	0.786512	1	4	Tevent>t*	0.3079259	0.3384321	9.77E-03
STYRENE NA	100-42-5	--	100425	104.15	2.95	4	0.037	0.146016	0.402799	0.966718	1	4	Tevent>t*	0.3992273	0.4368784	1.64E-01
TETRACHLOROETHENE	127-18-4	--	127184	165.83	3.4	4	0.033	0.165426	0.892271	2.14145	1	4	Tevent>t*	0.4132241	0.4514447	1.84E-01
TOLUENE	108-88-3	--	108883	92.142	2.73	4	0.031	0.11482	0.34502	0.828047	1	4	Tevent>t*	0.3773839	0.4138216	1.35E-01
TOTAL 1,2-DICHLOROETHENE	540-59-0	--	540590	96.95	1.86	4	0.011	0.041658	0.36653	0.879672	1	4	Tevent>t*	0.3291042	0.3616603	5.06E-02
TRANS-1,2-DICHLOROETHENE	156-60-5	--	156605	96.944	2.09	4	0.011	0.041656	0.367058	0.88094	1	4	Tevent>t*	0.3291034	0.3616594	5.07E-02
TRANS-1,3-DICHLOROPROPENE	10061-02-6	--	10061026	110.965	2.03	4	0.008	0.03379	0.43913	1.053912	1	4	Tevent>t*	0.3241411	0.356228	3.98E-02
TRICHLOROETHENE	79-01-6	M	79016	131.39	2.42	4	0.012	0.051141	0.572312	1.373549	1	4	Tevent>t*	0.3351426	0.3682564	5.81E-02
TRICHLOROFUOROMETHANE	75-69-4	--	75694	137.37	2.53	4	0.013	0.05725	0.618188	1.483652	1	4	Tevent>t*	0.339066	0.3725334	6.46E-02
VINYL CHLORIDE	75-01-4	M	75014	62.499	1.38	4	0.008	0.025481	0.23542	0.565008	1	4	Tevent>t*	0.3189445	0.3505314	3.67E-02
O-XYLENES	95-47-6	--	95476	106.17	3.12	4	0.047	0.186659	0.413429	0.992229	1	4	Tevent>t*	0.4289024	0.4675595	2.05E-01
TOTAL XYLENES	1330-20-7	--	1330207	106.17	3.16	4	0.050	0.198152	0.413429	0.992229	1	4	Tevent>t*	0.4375526	0.4763579	2.16E-01

NOTE:

\*cis isomer

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Special Chemical (*) or (**)	Derm/ Drink	Chem Assess	Derm/ Total Dose	B	tau (hr)	t_star (hr)	FA	Conc (mg/cm3)	Kp used in DA_event	DA_event (mg/cm2-evt)	DAD (mg/kg-day)
1 Acetaldehyde	75070	44.1	-0.22	2.4E-05	6.3E-04		1.6E-02		1%	N	0%	0.0	0.19	0.45	1.0	1.0E-03	6.3E-04	6.1E-07	6.4E-05
2 Acetamide	60355	59.0	-1.26	3.9E-06	1.1E-04		2.9E-03		0%	N	0%	0.0	0.23	0.55	1.0	1.0E-03	1.1E-04	1.1E-07	1.2E-05
3 Acetylaminofluorene, 2-	53963	223.0	3.24	5.0E-04	1.2E-02		3.1E-01		33%	Y	0%	0.1	1.90	4.56	1.0	1.0E-03	1.2E-02	3.6E-05	3.8E-03
4 Acrolein	107028	56.1	-0.10	2.5E-05	6.5E-04		1.7E-02		1%	N	0%	0.0	0.22	0.53	1.0	1.0E-03	6.5E-04	6.7E-07	7.0E-05
5 Acrylamide	79061	71.0	-0.67	8.5E-06	2.2E-04		5.9E-03		0%	N	0%	0.0	0.27	0.64	1.0	1.0E-03	2.2E-04	2.4E-07	2.6E-05
6 Acrylonitrile	107131	53.1	0.25	4.5E-05	1.2E-03		2.9E-02		1%	N	0%	0.0	0.21	0.51	1.0	1.0E-03	1.2E-03	1.2E-06	1.2E-04
7 Aldrin	309002	365.0	3.01	5.7E-05	1.4E-03		3.5E-02		9%	N	0%	0.0	11.89	28.54	1.0	1.0E-03	1.4E-03	1.0E-05	1.1E-03
** 8 Allyl chloride	107051	76.5	1.45	2.2E-04	5.4E-03		1.3E-01	**	5%	N	0%	0.0	0.29	0.69	1.0	1.0E-03	5.4E-03	6.1E-06	6.4E-04
9 Amino-2-methylantraquinone, 1-	82280	237.3	2.80	2.2E-04	5.3E-03		1.3E-01		15%	Y	0%	0.0	2.28	5.48	1.0	1.0E-03	5.3E-03	1.7E-05	1.8E-03
10 Aminoanthraquinone, 2-	117793	223.0	2.15	9.7E-05	2.4E-03		5.7E-02		6%	N	0%	0.0	1.90	4.56	1.0	1.0E-03	2.4E-03	6.9E-06	7.2E-04
11 Aminoazobenzene, p-	60093	197.0	2.62	2.8E-04	6.8E-03		1.7E-01		15%	Y	0%	0.0	1.36	3.26	1.0	1.0E-03	6.8E-03	1.7E-05	1.8E-03
12 Aminoazotoluene, o-	97563	225.3	3.92	1.4E-03	3.4E-02		8.7E-01		91%	Y	0%	0.2	1.96	4.69	1.0	1.0E-03	3.4E-02	1.0E-04	1.1E-02
13 Aminobiphenyl, 4-	92671	169.2	2.80	5.2E-04	1.3E-02		3.2E-01		24%	Y	0%	0.1	0.95	2.27	1.0	1.0E-03	1.3E-02	2.6E-05	2.8E-03
14 Aniline	62533	93.1	0.90	7.5E-05	1.9E-03		4.7E-02		2%	N	0%	0.0	0.35	0.85	1.0	1.0E-03	1.9E-03	2.3E-06	2.5E-04
15 Anisidine, o-	90040	145.0	1.18	5.9E-05	1.5E-03		3.6E-02		2%	N	0%	0.0	0.69	1.66	1.0	1.0E-03	1.5E-03	2.6E-06	2.7E-04
16 Auramine	492808	267.4	3.54	4.5E-04	1.1E-02		2.8E-01		35%	Y	0%	0.1	3.37	8.09	0.9	1.0E-03	1.1E-02	3.9E-05	4.1E-03
17 Benzene	71432	78.1	2.13	5.9E-04	1.5E-02		3.7E-01		15%	Y	0%	0.1	0.29	0.70	1.0	1.0E-03	1.5E-02	1.7E-05	1.8E-03
18 Benzdine	92875	184.2	1.34	4.6E-05	1.1E-03		2.8E-02		2%	N	0%	0.0	1.15	2.76	1.0	1.0E-03	1.1E-03	2.6E-06	2.7E-04
* 19 Benzo-a-anthracene	56553	228.3	5.66	1.7E-02	4.7E-01		1.3E+01	*	1283%	Y	4%	2.8	2.03	8.53	1.0	1.0E-03	4.7E-01	1.4E-03	1.5E-01
* 20 Benzo-a-pyrene	50328	250.0	6.10	2.4E-02	7.0E-01		2.0E+01	*	2186%	Y	7%	4.3	2.69	11.67	1.0	1.0E-03	7.0E-01	2.4E-03	2.6E-01
* 21 Benzo-b-fluoranthene	205992	252.3	6.12	2.4E-02	7.0E-01		2.0E+01	*	2221%	Y	7%	4.3	2.77	12.03	1.0	1.0E-03	7.0E-01	2.5E-03	2.6E-01
22 Benzoic acid	65850	122.0	1.87	2.3E-04	5.7E-03		1.4E-01		8%	N	0%	0.0	0.51	1.24	1.0	1.0E-03	5.7E-03	8.6E-06	9.1E-04
23 Benzotrchloride	98077	195.0	2.92	4.5E-04	1.1E-02		2.7E-01		24%	Y	0%	0.1	1.32	3.17	1.0	1.0E-03	1.1E-02	2.7E-05	2.8E-03
24 Benzyl chloride	100447	127.0	2.30	4.1E-04	1.0E-02		2.5E-01		14%	Y	0%	0.0	0.55	1.32	1.0	1.0E-03	1.0E-02	1.6E-05	1.7E-03
25 Bis(2-chloroethyl)ether	111444	143.0	1.29	7.2E-05	1.8E-03		4.4E-02		3%	N	0%	0.0	0.68	1.62	1.0	1.0E-03	1.8E-03	3.1E-06	3.3E-04
** 26 Bromodichloromethane	75274	163.8	2.09	1.9E-04	4.6E-03		1.1E-01	**	8%	N	0%	0.0	0.88	2.12	1.0	1.0E-03	4.6E-03	9.2E-06	9.7E-04
** 27 Bromoform	75252	252.8	2.37	9.2E-05	2.2E-03		5.5E-02	**	7%	N	0%	0.0	2.79	6.70	1.0	1.0E-03	2.2E-03	7.9E-06	8.4E-04
** 28 Bromomethane	74839	95.0	1.19	1.1E-04	2.8E-03		7.0E-02	**	3%	N	0%	0.0	0.36	0.87	1.0	1.0E-03	2.8E-03	3.6E-06	3.8E-04
29 Bromophenol, p-	106412	173.0	2.59	5.8E-03	8.8E-03		1.3E-02		17%	Y	0%	0.0	0.99	2.39	1.0	1.0E-03	8.8E-03	1.9E-05	2.0E-03
30 Butadiene, 1,3-	106990	54.0	1.99	6.5E-04	1.6E-02		4.1E-01		15%	Y	0%	0.0	0.21	0.51	1.0	1.0E-03	1.6E-02	1.6E-05	1.7E-03
31 2,3-Butanediol	513859	90.1	-0.92	5.2E-05	1.2E-04	4.0E-05	2.8E-04		0%	N	0%	0.0	0.34	0.82	1.0	1.0E-03	1.2E-04	1.5E-07	1.6E-05
32 n-Butanol	71363	74.1	0.88	1.3E-03	2.3E-03	2.5E-03	4.0E-03		2%	N	0%	0.0	0.28	0.67	1.0	1.0E-03	2.3E-03	2.6E-06	2.7E-04
33 Butoxyethanol, 2-	111762	118.0	0.83	4.9E-05	1.2E-03		3.0E-02		2%	N	0%	0.0	0.49	1.17	1.0	1.0E-03	1.2E-03	1.8E-06	1.9E-04
34 Captan	133062	300.0	2.35	4.8E-05	1.2E-03		2.9E-02		5%	N	0%	0.0	5.13	12.32	1.0	1.0E-03	1.2E-03	5.7E-06	6.0E-04
35 Carbon disulfide	75150	80.0	2.24	6.9E-04	1.7E-02		4.3E-01		18%	Y	0%	0.1	0.30	0.72	1.0	1.0E-03	1.7E-02	2.0E-05	2.1E-03
** 36 Carbon tetrachloride	56235	153.8	2.83	6.6E-04	1.6E-02		4.0E-01	**	27%	Y	0%	0.1	0.78	1.86	1.0	1.0E-03	1.6E-02	3.0E-05	3.2E-03
37 Chlordane	57749	409.8	5.54	1.4E-03	3.8E-02		1.0E+00		231%	Y	1%	0.3	21.21	50.91	0.7	1.0E-03	3.8E-02	2.6E-04	2.7E-02
38 Chlordane (cis)	5103719	410.0	5.47	1.2E-03	3.4E-02		9.2E-01		208%	Y	1%	0.3	21.27	51.05	0.7	1.0E-03	3.4E-02	2.3E-04	2.4E-02
39 Chlordane (trans)	5103742	410.0	5.47	1.2E-03	3.4E-02		9.2E-01		208%	Y	1%	0.3	21.27	51.05	0.7	1.0E-03	3.4E-02	2.3E-04	2.4E-02
40 Chlorobenzene	108907	112.6	2.84	1.1E-03	2.8E-02		7.1E-01		36%	Y	0%	0.1	0.46	1.09	1.0	1.0E-03	2.8E-02	4.0E-05	4.2E-03
41 4-Chlorocresol	59507	142.6	3.10	1.7E-02	2.9E-02	5.5E-02	4.9E-02		44%	Y	0%	0.1	0.67	1.61	1.0	1.0E-03	2.9E-02	4.9E-05	5.2E-03
** 42 Chlorodibromomethane	124481	208.3	2.23	1.3E-04	3.2E-03		7.9E-02	**	8%	N	0%	0.0	1.57	3.77	1.0	1.0E-03	3.2E-03	8.5E-06	9.0E-04
** 43 Chloroethane	75003	64.5	1.43	2.4E-04	6.1E-03		1.5E-01	**	6%	N	0%	0.0	0.24	0.59	1.0	1.0E-03	6.1E-03	6.3E-06	6.7E-04
** 44 Chloroform	67663	119.4	1.97	2.8E-04	6.8E-03		1.7E-01	**	9%	N	0%	0.0	0.50	1.19	1.0	1.0E-03	6.8E-03	1.0E-05	1.1E-03
** 45 Chloromethane	74873	50.5	0.91	1.3E-04	3.3E-03		8.3E-02	**	3%	N	0%	0.0	0.20	0.49	1.0	1.0E-03	3.3E-03	3.3E-06	3.4E-04
46 2-Chlorophenol	95578	128.6	2.15	5.2E-03	8.0E-03	3.3E-02	1.2E-02		11%	Y	0%	0.0	0.56	1.34	1.0	1.0E-03	8.0E-03	1.3E-05	1.3E-03
47 4-Chlorophenol	106489	128.6	2.39	7.3E-03	1.2E-02	3.6E-02	1.8E-02		16%	Y	0%	0.1	0.56	1.34	1.0	1.0E-03	1.2E-02	1.8E-05	1.9E-03
48 Chlorothalonil	1897456	265.9	3.86	7.4E-04	1.9E-02		4.7E-01		58%	Y	0%	0.1	3.30	7.93	0.9	1.0E-03	1.9E-02	6.4E-05	6.8E-03
* 49 Chrysene	218019	228.3	5.66	1.7E-02	4.7E-01		1.3E+01	*	1283%	Y	4%	2.8	2.03	8.53	1.0	1.0E-03	4.7E-01	1.4E-03	1.5E-01
50 Cresidine, p-	120718	137.2	1.67	1.4E-04	3.4E-03		8.4E-02		5%	N	0%	0.0	0.63	1.50	1.0	1.0E-03	3.4E-03	5.7E-06	6.0E-04
51 m-Cresol	108394	108.1	1.96	4.9E-03	7.8E-03	1.5E-02	1.2E-02		10%	N	0%	0.0	0.43	1.03	1.0	1.0E-03	7.8E-03	1.1E-05	1.1E-03
52 o-Cresol	95487	108.1	1.95	4.8E-03	7.7E-03	1.6E-02	1.2E-02		10%	N	0%	0.0	0.43	1.03	1.0	1.0E-03	7.7E-03	1.1E-05	1.1E-03
53 p-Cresol	106445	108.1	1.95	4.8E-03	7.7E-03	1.8E-02	1.2E-02		10%	N	0%	0.0	0.43	1.03	1.0	1.0E-03	7.7E-03	1.1E-05	1.1E-03
* 54 DDD	72548	320.0	5.80	6.4E-03	1.8E-01		5.0E+00	*	703%	Y	2%	1.2	6.65	25.99	0.8	1.0E-03	1.8E-01	7.8E-04	8.3E-02
* 55 DDE	72559	318.0	5.69	5.6E-03	1.6E-01		4.3E+00	*	602%	Y	2%	1.1	6.48	25.08	0.8	1.0E-03	1.6E-01	6.7E-04	7.1E-02

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Special Chemical (*) or (**)	Derm/ Drink	Chem Assess	Derm/ Total Dose	B	tau (hr)	t_star (hr)	FA	Conc (mg/cm3)	Kp used in DA_event	DA_event (mg/cm2-evt)	DAD (mg/kg-day)
* 56 DDT	50293	355.0	6.36	9.2E-03	2.7E-01		7.8E+00	*	1156%	Y	3%	1.9	10.45	42.51	0.7	1.0E-03	2.7E-01	1.3E-03	1.4E-01
* 57 n-Decanol	112301	158.3	4.57	9.5E-02	2.2E-01	7.9E-02	5.1E-01	*	380%	Y	1%	1.1	0.82	3.18	1.0	1.0E-03	2.2E-01	4.2E-04	4.5E-02
58 Di-2-ethylhexyl phthalate	117817	391.0	5.11	9.4E-04	2.5E-02		6.6E-01		155%	Y	0%	0.2	16.64	39.93	0.8	1.0E-03	2.5E-02	1.7E-04	1.8E-02
59 Diaminoanisole, 2,4-	615054	138.2	-0.12	8.5E-06	2.2E-04		5.6E-03		0%	N	0%	0.0	0.63	1.52	1.0	1.0E-03	2.2E-04	3.7E-07	3.9E-05
60 Diaminotoluene	95807	122.0	0.34	2.2E-05	5.4E-04		1.4E-02		1%	N	0%	0.0	0.51	1.24	1.0	1.0E-03	5.4E-04	8.3E-07	8.7E-05
61 Diaminotoluene, 2,4-	101804	200.0	2.06	1.1E-04	2.8E-03		6.7E-02		6%	N	0%	0.0	1.41	3.38	1.0	1.0E-03	2.8E-03	6.9E-06	7.3E-04
* 62 Dibenzo(a,h)anthracene	53703	278.4	6.84	4.9E-02	1.5E+00		4.7E+01	*	3388%	Y	10%	9.7	3.88	17.57	0.6	1.0E-03	1.5E+00	3.8E-03	4.0E-01
63 Dibutyl phthalate	84742	278.0	4.13	9.4E-04	2.4E-02		6.1E-01		81%	Y	0%	0.2	3.86	9.27	0.9	1.0E-03	2.4E-02	9.0E-05	9.5E-03
64 Dichlorobenzene, 1,2-	95501	147.0	3.38	1.6E-03	4.1E-02		1.0E+00		66%	Y	0%	0.2	0.71	1.71	1.0	1.0E-03	4.1E-02	7.4E-05	7.8E-03
65 Dichlorobenzene, 1,3-	541731	147.0	3.60	2.3E-03	5.8E-02		1.5E+00		93%	Y	0%	0.3	0.71	1.71	1.0	1.0E-03	5.8E-02	1.0E-04	1.1E-02
66 Dichlorobenzene, 1,4-	106467	147.0	3.39	1.7E-03	4.2E-02		1.1E+00		67%	Y	0%	0.2	0.71	1.71	1.0	1.0E-03	4.2E-02	7.5E-05	7.9E-03
67 Dichlorobenzidine, 3,3'	91941	253.1	3.51	5.1E-04	1.3E-02		3.2E-01		41%	Y	0%	0.1	2.80	6.72	1.0	1.0E-03	1.3E-02	4.5E-05	4.8E-03
** 68 Dichlorodifluoromethane	75718	120.9	2.16	3.6E-04	9.0E-03		2.2E-01	**	12%	Y	0%	0.0	0.51	1.22	1.0	1.0E-03	9.0E-03	1.3E-05	1.4E-03
** 69 Dichloroethane, 1,1-	75343	99.0	1.79	2.7E-04	6.7E-03		1.7E-01	**	8%	N	0%	0.0	0.38	0.92	1.0	1.0E-03	6.7E-03	8.8E-06	9.3E-04
** 70 Dichloroethane, 1,2-	107062	99.0	1.48	1.7E-04	4.2E-03		1.0E-01	**	5%	N	0%	0.0	0.38	0.92	1.0	1.0E-03	4.2E-03	5.5E-06	5.8E-04
** 71 Dichloroethylene, 1,1-	75354	96.9	2.13	4.7E-04	1.2E-02		2.9E-01	**	14%	Y	0%	0.0	0.37	0.89	1.0	1.0E-03	1.2E-02	1.5E-05	1.6E-03
** 72 Dichloroethylene, 1,2- (trans)	540590	96.9	1.86	3.1E-04	7.7E-03		1.9E-01	**	9%	N	0%	0.0	0.37	0.89	1.0	1.0E-03	7.7E-03	9.9E-06	1.0E-03
73 2,4-Dichlorophenol	120832	163.0	3.06	1.2E-02	2.1E-02	6.0E-02	3.4E-02		37%	Y	0%	0.1	0.87	2.10	1.0	1.0E-03	2.1E-02	4.1E-05	4.3E-03
** 74 Dichloropropane, 1,2-	78875	113.0	2.00	3.1E-04	7.8E-03		1.9E-01	**	10%	N	0%	0.0	0.46	1.10	1.0	1.0E-03	7.8E-03	1.1E-05	1.2E-03
** 75 Dichloropropene, 1,3-	542756	111.0	1.60	1.7E-04	4.3E-03		1.1E-01	**	5%	N	0%	0.0	0.45	1.07	1.0	1.0E-03	4.3E-03	6.1E-06	6.4E-04
76 Dichlorvos	62737	221.0	1.47	3.5E-05	8.5E-04		2.1E-02		2%	N	0%	0.0	1.85	4.44	1.0	1.0E-03	8.5E-04	2.5E-06	2.6E-04
77 Dieldrin	60571	381.0	4.56	4.7E-04	1.2E-02		3.2E-01		71%	Y	0%	0.1	14.62	35.09	0.8	1.0E-03	1.2E-02	7.9E-05	8.3E-03
78 Diepoxybutane	1464535	86.1	-1.84	1.1E-06	3.1E-05		8.7E-04		0%	N	0%	0.0	0.32	0.78	1.0	1.0E-03	3.1E-05	3.7E-08	3.9E-06
79 Diethyl phthalate	84662	222.0	2.47	1.6E-04	3.9E-03		9.5E-02		10%	Y	0%	0.0	1.87	4.50	1.0	1.0E-03	3.9E-03	1.1E-05	1.2E-03
80 Diethyl sulfate	64675	154.0	1.14	5.0E-05	1.2E-03		3.0E-02		2%	N	0%	0.0	0.78	1.87	1.0	1.0E-03	1.2E-03	2.3E-06	2.4E-04
81 Dimethoxybenzidine, 3,3'	119904	254.4	1.81	3.8E-05	9.3E-04		2.3E-02		3%	N	0%	0.0	2.85	6.84	1.0	1.0E-03	9.3E-04	3.3E-06	3.5E-04
82 Dimethyl phthalate	131113	194.0	1.56	5.7E-05	1.4E-03		3.4E-02		3%	N	0%	0.0	1.30	3.13	1.0	1.0E-03	1.4E-03	3.4E-06	3.5E-04
83 Dimethyl sulfate	77781	126.0	1.16	7.3E-05	1.8E-03		4.5E-02		3%	N	0%	0.0	0.54	1.30	1.0	1.0E-03	1.8E-03	2.8E-06	3.0E-04
84 Dimethylamine, n-nitroso-	62759	74.1	-0.57	9.6E-06	2.5E-04		6.6E-03		0%	N	0%	0.0	0.28	0.67	1.0	1.0E-03	2.5E-04	2.8E-07	3.0E-05
85 Dimethylaminoazobenzene, 4-	60117	225.0	4.58	3.6E-03	9.5E-02		2.5E+00		251%	Y	1%	0.5	1.95	4.67	1.0	1.0E-03	9.5E-02	2.8E-04	2.9E-02
86 Dimethylbenzidine, 3,3'	119937	212.3	2.34	1.5E-04	3.6E-03		8.8E-02		9%	N	0%	0.0	1.65	3.97	1.0	1.0E-03	3.6E-03	9.8E-06	1.0E-03
87 DimethylcarbamyI chloride	79447	107.5	0.00	4.9E-06	3.9E-04		3.4E-03		0%	N	0%	0.0	0.43	1.02	1.0	1.0E-03	3.9E-04	5.4E-07	5.7E-05
88 Dimethylhydrazine, 1,1-	57147	60.0	-1.50	2.6E-06	7.3E-05		2.0E-03		0%	N	0%	0.0	0.23	0.55	1.0	1.0E-03	7.3E-05	7.6E-08	8.0E-06
89 Dimethylphenol, 2,4-	105679	122.2	2.30	4.4E-04	1.1E-02		2.7E-01		15%	Y	0%	0.0	0.52	1.24	1.0	1.0E-03	1.1E-02	1.7E-05	1.7E-03
90 Dimethylphenol, 3,4-	95658	122.0	2.23	4.0E-04	9.8E-03		2.4E-01		13%	Y	0%	0.0	0.51	1.24	1.0	1.0E-03	9.8E-03	1.5E-05	1.6E-03
91 Dinitrophenol, 2,4-	51285	184.1	1.54	6.3E-05	1.5E-03		3.7E-02		3%	N	0%	0.0	1.15	2.76	1.0	1.0E-03	1.5E-03	3.5E-06	3.7E-04
92 Dinitrotoluene, 2,4-	121142	182.1	1.98	1.3E-04	3.1E-03		7.5E-02		6%	N	0%	0.0	1.12	2.69	1.0	1.0E-03	3.1E-03	6.9E-06	7.3E-04
93 Dinitrotoluene, 2,6-	606202	182.1	1.72	8.5E-05	2.1E-03		5.1E-02		4%	N	0%	0.0	1.12	2.69	1.0	1.0E-03	2.1E-03	4.6E-06	4.9E-04
94 Dioxane, 1,4-	123911	88.1	-0.27	1.3E-05	3.3E-04		8.6E-03		0%	N	0%	0.0	0.33	0.80	1.0	1.0E-03	3.3E-04	4.0E-07	4.3E-05
95 Diphenylamine, n-nitroso-	86306	198.2	3.13	5.9E-04	1.5E-02		3.6E-01		32%	Y	0%	0.1	1.38	3.31	1.0	1.0E-03	1.5E-02	3.6E-05	3.8E-03
96 Diphenylhydrazine, 1,2-	122667	184.2	2.94	5.3E-04	1.3E-02		3.2E-01		27%	Y	0%	0.1	1.15	2.76	1.0	1.0E-03	1.3E-02	3.0E-05	3.1E-03
97 Dipropylamine, n-nitroso-	621647	130.2	1.36	9.5E-05	2.3E-03		5.8E-02		3%	N	0%	0.0	0.57	1.37	1.0	1.0E-03	2.3E-03	3.7E-06	3.9E-04
98 Endrin	72208	381.0	4.56	4.7E-04	1.2E-02		3.2E-01		71%	Y	0%	0.1	14.62	35.09	0.8	1.0E-03	1.2E-02	7.9E-05	8.3E-03
99 Epichlorohydrin	106898	92.0	-0.21	1.3E-05	3.5E-04		8.9E-03		0%	N	0%	0.0	0.35	0.84	1.0	1.0E-03	3.5E-04	4.3E-07	4.6E-05
100 Ethanol	64175	46.1	-0.31	2.6E-04	5.4E-04	7.9E-04	1.1E-03		0%	N	0%	0.0	0.19	0.46	1.0	1.0E-03	5.4E-04	5.2E-07	5.5E-05
101 Ethanol, 2-(2-butoxyethoxy)-	112345	162.0	-0.92	1.8E-06	4.7E-05		1.3E-03		0%	N	0%	0.0	0.86	2.07	1.0	1.0E-03	4.7E-05	9.3E-08	9.8E-06
102 Ethanol, 2-(2-ethoxyethoxy)-	111900	134.0	-0.08	9.6E-06	2.5E-04		6.3E-03		0%	N	0%	0.0	0.60	1.44	1.0	1.0E-03	2.5E-04	4.0E-07	4.2E-05
103 Ethanol, 2-(2-methoxyethoxy)-	111773	120.0	-0.42	6.7E-06	1.7E-04		4.5E-03		0%	N	0%	0.0	0.50	1.20	1.0	1.0E-03	1.7E-04	2.6E-07	2.8E-05
104 2-Ethoxy ethanol (Cellosolve)	11805	90.1	-0.32	1.5E-04	3.0E-04		6.1E-04		0%	N	0%	0.0	0.34	0.82	1.0	1.0E-03	3.0E-04	3.7E-07	3.9E-05
105 Ethoxyethyl acetate, 2-	111159	132.0	0.65	3.1E-05	7.7E-04		1.9E-02		1%	N	0%	0.0	0.59	1.41	1.0	1.0E-03	7.7E-04	1.2E-06	1.3E-04
106 Ethyl acrylate	140885	100.0	1.32	1.3E-04	3.2E-03		8.0E-02		4%	N	0%	0.0	0.39	0.93	1.0	1.0E-03	3.2E-03	4.3E-06	4.5E-04
107 Ethyl carbamate	51796	89.0	-0.15	1.5E-05	3.9E-04		1.0E-02		0%	N	0%	0.0	0.34	0.81	1.0	1.0E-03	3.9E-04	4.8E-07	5.1E-05
108 Ethyl ether	60297	74.1	0.89	1.4E-03	2.3E-03	1.6E-02	4.0E-03		2%	N	0%	0.0	0.28	0.67	1.0	1.0E-03	2.3E-03	2.6E-06	2.8E-04
109 Ethylbenzene	100414	106.2	3.15	1.9E-03	4.9E-02		1.2E+00		61%	Y	0%	0.2	0.42	1.01	1.0	1.0E-03	4.9E-02	6.7E-05	7.1E-03
110 Ethylene oxide	75218	44.1	-0.30	2.2E-05	5.6E-04		1.5E-02		0%	N	0%	0.0	0.19	0.45	1.0	1.0E-03	5.6E-04	5.4E-07	5.7E-05

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Special Chemical (*) or (**)	Derm/ Drink	Chem Assess	Derm/ Total Dose	B	tau (hr)	t_star (hr)	FA	Conc (mg/cm3)	Kp used in DA_event	DA_event (mg/cm2-evt)	DAD (mg/kg-day)
** 111 Ethylenedibromide	106934	188.0	1.96	1.1E-04	2.8E-03		6.8E-02 **	6%	N		0%	0.0	1.21	2.90	1.0	1.0E-03	2.8E-03	6.4E-06	6.8E-04
112 Ethyleneimine	151564	43.0	-1.12	6.0E-06	1.6E-04		4.4E-03	0%	N		0%	0.0	0.19	0.45	1.0	1.0E-03	1.6E-04	1.5E-07	1.6E-05
113 Ethylenethiourea	96457	96.0	-0.66	6.3E-06	1.7E-04		4.3E-03	0%	N		0%	0.0	0.37	0.88	1.0	1.0E-03	1.7E-04	2.1E-07	2.2E-05
114 4-Ethylphenol	123079	122.2	2.58	1.0E-02	1.7E-02	3.5E-02	2.7E-02	23%	Y		0%	0.1	0.52	1.24	1.0	1.0E-03	1.7E-02	2.5E-05	2.7E-03
* 115 Fluoranthene	206440	202.3	4.95	8.3E-03	2.2E-01		6.0E+00 *	512%	Y		2%	1.2	1.45	5.68	1.0	1.0E-03	2.2E-01	5.7E-04	6.0E-02
116 Formaldehyde	50000	30.0	0.35	7.1E-05	1.8E-03		4.6E-02	1%	N		0%	0.0	0.16	0.38	1.0	1.0E-03	1.8E-03	1.6E-06	1.7E-04
117 Glycerol	56815	92.1	-1.76	1.1E-06	3.2E-05		9.1E-04	0%	N		0%	0.0	0.35	0.84	1.0	1.0E-03	3.2E-05	4.0E-08	4.3E-06
118 Heptachlor	76448	373.5	4.27	3.4E-04	8.6E-03		2.2E-01	48%	Y		0%	0.1	13.27	31.85	0.8	1.0E-03	8.6E-03	5.3E-05	5.6E-03
119 n-Heptanol	111706	116.2	2.62	1.2E-02	1.9E-02	3.2E-02	3.2E-02	25%	Y		0%	0.1	0.48	1.15	1.0	1.0E-03	1.9E-02	2.8E-05	3.0E-03
* 120 Hexachlorobenzene	118741	284.8	5.31	4.9E-03	1.3E-01		3.6E+00 *	469%	Y		1%	0.9	4.22	16.21	0.9	1.0E-03	1.3E-01	5.2E-04	5.5E-02
** 121 Hexachlorobutadiene	87683	260.8	4.78	3.1E-03	8.1E-02		2.1E+00 **	243%	Y		1%	0.5	3.09	7.42	0.9	1.0E-03	8.1E-02	2.7E-04	2.9E-02
** 122 Hexachloroethane	67721	236.7	3.93	1.2E-03	3.0E-02		7.6E-01 **	86%	Y		0%	0.2	2.27	5.44	1.0	1.0E-03	3.0E-02	9.6E-05	1.0E-02
123 Hexamethylphosphoramide	680319	179.0	0.03	6.4E-06	1.6E-04		4.1E-03	0%	N		0%	0.0	1.08	2.58	1.0	1.0E-03	1.6E-04	3.6E-07	3.8E-05
124 n-Hexanol	111273	102.2	2.03	5.8E-03	9.3E-03	1.3E-02	1.5E-02	11%	Y		0%	0.0	0.40	0.96	1.0	1.0E-03	9.3E-03	1.2E-05	1.3E-03
* 125 Hydrazine/Hydrazine sulfate	302012	32.0	-2.07	1.5E-06	4.4E-05		1.3E-03 *	0%	N		0%	0.0	0.16	0.39	1.0	1.0E-03	4.4E-05	3.9E-08	4.2E-06
* 126 Indeno(1,2,3-CD)pyrene	193395	276.3	6.58	3.5E-02	1.0E+00		3.1E+01 *	2307%	Y		7%	6.7	3.78	16.83	0.6	1.0E-03	1.0E+00	2.6E-03	2.7E-01
127 Isophorone	78591	138.2	1.67	1.4E-04	3.4E-03		8.3E-02	5%	N		0%	0.0	0.63	1.52	1.0	1.0E-03	3.4E-03	5.7E-06	6.0E-04
128 Lindane	58899	291.0	3.72	4.3E-04	1.1E-02		2.7E-01	40%	Y		0%	0.1	4.57	10.97	0.9	1.0E-03	1.1E-02	4.4E-05	4.6E-03
129 Mechloroethamine	51752	156.0	1.07	4.4E-05	1.1E-03		2.6E-02	2%	N		0%	0.0	0.80	1.92	1.0	1.0E-03	1.1E-03	2.0E-06	2.1E-04
130 Methanol	67561	32.0	-0.77	1.4E-04	3.2E-04	5.0E-04	7.3E-04	0%	N		0%	0.0	0.16	0.39	1.0	1.0E-03	3.2E-04	2.9E-07	3.0E-05
131 Methoxyethanol, 2-	109864	76.0	-0.77	6.8E-06	1.8E-04		4.8E-03	0%	N		0%	0.0	0.28	0.68	1.0	1.0E-03	1.8E-04	2.0E-07	2.1E-05
132 Methoxypropan-2-ol, 1-	107982	90.0	-0.18	1.4E-05	3.7E-04		9.6E-03	0%	N		0%	0.0	0.34	0.82	1.0	1.0E-03	3.7E-04	4.6E-07	4.8E-05
133 Methyl ethyl ketone	78933	72.0	0.29	3.8E-05	9.6E-04		2.4E-02	1%	N		0%	0.0	0.27	0.65	1.0	1.0E-03	9.6E-04	1.1E-06	1.1E-04
134 Methyl-4-hydroxy benzoate	99763	152.1	1.96	3.0E-03	4.4E-03	9.1E-03	6.5E-03	7%	N		0%	0.0	0.76	1.82	1.0	1.0E-03	4.4E-03	8.1E-06	8.6E-04
** 135 Methyl iodide	74884	142.0	1.51	1.0E-04	2.5E-03		6.2E-02 **	4%	N		0%	0.0	0.67	1.60	1.0	1.0E-03	2.5E-03	4.3E-06	4.6E-04
136 Methylaziridine, 2-	75558	57.0	-0.60	1.1E-05	3.0E-04		7.9E-03	0%	N		0%	0.0	0.22	0.53	1.0	1.0E-03	3.0E-04	3.1E-07	3.3E-05
137 Methylene bis(2-chloroaniline), 4,4'-	101144	267.2	3.94	8.2E-04	2.1E-02		5.2E-01	65%	Y		0%	0.1	3.36	8.06	0.9	1.0E-03	2.1E-02	7.2E-05	7.6E-03
138 Methylene bis(N,N'-dimethyl)aniline,	101611	254.0	4.75	3.2E-03	8.4E-02		2.2E+00	270%	Y		1%	0.5	2.83	6.80	1.0	1.0E-03	8.4E-02	3.0E-04	3.2E-02
** 139 Methylene chloride	75092	84.9	1.25	1.4E-04	3.5E-03		8.8E-02 **	4%	N		0%	0.0	0.32	0.76	1.0	1.0E-03	3.5E-03	4.2E-06	4.5E-04
140 Methylenedianiline, 4,4'-	101779	198.0	1.59	5.7E-05	1.4E-03		3.4E-02	3%	N		0%	0.0	1.37	3.30	1.0	1.0E-03	1.4E-03	3.4E-06	3.6E-04
141 Michler's ketone	90948	268.4	4.07	9.8E-04	2.5E-02		6.3E-01	78%	Y		0%	0.2	3.41	8.19	0.9	1.0E-03	2.5E-02	8.7E-05	9.2E-03
** 142 Mustard Gas	505602	159.1	2.03	1.8E-04	4.5E-03		1.1E-01 **	8%	N		0%	0.0	0.83	2.00	1.0	1.0E-03	4.5E-03	8.6E-06	9.1E-04
143 Naphthalene	91203	128.2	3.30	1.8E-03	4.7E-02		1.2E+00	66%	Y		0%	0.2	0.56	1.34	1.0	1.0E-03	4.7E-02	7.4E-05	7.8E-03
144 2-Naphthol	135193	144.2	2.84	1.1E-02	1.9E-02	2.8E-02	3.1E-02	30%	Y		0%	0.1	0.69	1.64	1.0	1.0E-03	1.9E-02	3.3E-05	3.5E-03
145 Naphthylamine, 1-	134327	143.2	2.25	3.1E-04	7.7E-03		1.9E-01	12%	Y		0%	0.0	0.68	1.62	1.0	1.0E-03	7.7E-03	1.3E-05	1.4E-03
146 Naphthylamine, 2-	91598	143.2	2.28	3.3E-04	8.1E-03		2.0E-01	13%	Y		0%	0.0	0.68	1.62	1.0	1.0E-03	8.1E-03	1.4E-05	1.5E-03
147 Nitrotriacetic acid	139139	191.0	-0.18	3.9E-06	1.0E-04		2.6E-03	0%	N		0%	0.0	1.26	3.01	1.0	1.0E-03	1.0E-04	2.4E-07	2.5E-05
148 Nitro-o-anisidine, 5-	99592	152.7	1.47	8.4E-05	2.1E-03		5.1E-02	3%	N		0%	0.0	0.77	1.84	1.0	1.0E-03	2.1E-03	3.8E-06	4.0E-04
149 Nitrobiphenyl, 4-	92933	199.2	3.77	1.5E-03	3.8E-02		9.7E-01	86%	Y		0%	0.2	1.40	3.35	1.0	1.0E-03	3.8E-02	9.5E-05	1.0E-02
* 150 Nitrofen	1836755	284.1	5.53	6.8E-03	1.9E-01		5.2E+00 *	660%	Y		2%	1.2	4.18	16.33	0.9	1.0E-03	1.9E-01	7.3E-04	7.7E-02
151 Nitrophenol, 2-	88755	139.1	1.79	1.6E-04	4.0E-03		9.9E-02	6%	N		0%	0.0	0.64	1.54	1.0	1.0E-03	4.0E-03	6.8E-06	7.2E-04
152 Nitrophenol, 2-amino-4-	99570	154.1	1.36	7.0E-05	1.7E-03		4.2E-02	3%	N		0%	0.0	0.78	1.87	1.0	1.0E-03	1.7E-03	3.2E-06	3.4E-04
153 3-Nitrophenol	554847	139.1	2.00	3.7E-03	5.5E-03	5.6E-03	8.4E-03	8%	N		0%	0.0	0.64	1.54	1.0	1.0E-03	5.5E-03	9.4E-06	9.9E-04
154 4-Nitrophenol	100027	139.1	1.91	3.2E-03	4.8E-03	5.6E-03	7.3E-03	7%	N		0%	0.0	0.64	1.54	1.0	1.0E-03	4.8E-03	8.2E-06	8.6E-04
155 Nitrophenol, 4-amino-2-	119346	154.1	0.96	3.8E-05	9.3E-04		2.3E-02	2%	N		0%	0.0	0.78	1.87	1.0	1.0E-03	9.3E-04	1.7E-06	1.8E-04
156 Nitropropane, 2-	79469	110.0	0.55	3.5E-05	8.8E-04		2.2E-02	1%	N		0%	0.0	0.44	1.06	1.0	1.0E-03	8.8E-04	1.2E-06	1.3E-04
157 Nitroso-di-n-butylamine, n-	924163	158.2	1.92	1.6E-04	3.8E-03		9.4E-02	7%	N		0%	0.0	0.82	1.97	1.0	1.0E-03	3.8E-03	7.3E-06	7.7E-04
158 Nitroso-N-ethylurea, n-	759739	117.1	0.23	1.9E-05	4.9E-04		1.2E-02	1%	N		0%	0.0	0.48	1.16	1.0	1.0E-03	4.9E-04	7.2E-07	7.6E-05
159 Nitroso-N-methylurea, n-	684935	103.1	-0.03	1.5E-05	3.9E-04		1.0E-02	0%	N		0%	0.0	0.40	0.97	1.0	1.0E-03	3.9E-04	5.3E-07	5.6E-05
160 Nitrosodiethanolamine, n-	1116547	134.0	-1.58	8.9E-07	2.5E-05		6.9E-04	0%	N		0%	0.0	0.60	1.44	1.0	1.0E-03	2.5E-05	4.0E-08	4.3E-06
161 Nitrosodiethylamine, n-	55185	88.0	0.48	4.2E-05	1.0E-03		2.6E-02	1%	N		0%	0.0	0.33	0.80	1.0	1.0E-03	1.0E-03	1.3E-06	1.3E-04
162 Nitrosodiphenylamine, p-	156105	198.2	3.50	1.0E-03	2.6E-02		6.4E-01	57%	Y		0%	0.1	1.38	3.31	1.0	1.0E-03	2.6E-02	6.4E-05	6.7E-03
163 Nitrosomethylvinylamine, n-	4549400	86.1	0.00	2.0E-05	5.1E-04		1.3E-02	1%	N		0%	0.0	0.32	0.78	1.0	1.0E-03	5.1E-04	6.2E-07	6.5E-05
164 Nitrosomorpholine, n-	59892	116.1	-0.44	6.9E-06	1.8E-04		4.6E-03	0%	N		0%	0.0	0.48	1.14	1.0	1.0E-03	1.8E-04	2.6E-07	2.7E-05
165 Nitrosonornicotine, n-	16543558	177.2	0.03	6.5E-06	1.7E-04		4.2E-03	0%	N		0%	0.0	1.05	2.52	1.0	1.0E-03	1.7E-04	3.6E-07	3.8E-05

CHEMICAL	CAS No.	MWT	logKow	Kp 95% LCI	Kp (cm/hr) predicted	Kp (cm/hr) measured	Kp 95% UCI	Special Chemical (*) or (**)	Derm/ Drink	Chem Assess	Derm/ Total Dose	B	tau (hr)	t_star (hr)	FA	Conc (mg/cm3)	Kp used in DA_event	DA_event (mg/cm2-evt)	DAD (mg/kg-day)
166 Nitrosopiperidine, n-	100754	350.3	0.36	1.1E-06	2.9E-05		7.6E-04		0%	N	0%	0.0	9.83	23.60	1.0	1.0E-03	2.9E-05	1.9E-07	2.1E-05
167 n-Nonanol	143088	144.3	3.77	4.0E-02	7.8E-02	6.0E-02	1.5E-01		122%	Y	0%	0.4	0.69	1.65	1.0	1.0E-03	7.8E-02	1.4E-04	1.4E-02
168 n-Octanol	111875	130.2	2.97	1.6E-02	2.7E-02	5.2E-02	4.7E-02		39%	Y	0%	0.1	0.57	1.37	1.0	1.0E-03	2.7E-02	4.4E-05	4.6E-03
169 Parathion	56382	291.0	3.83	5.1E-04	1.3E-02		3.2E-01		47%	Y	0%	0.1	4.57	10.97	0.9	1.0E-03	1.3E-02	5.2E-05	5.5E-03
* 170 PCB-chlorobiphenyl, 4-	2051629	292.0	6.50	2.5E-02	7.5E-01		2.2E+01 *		1844%	Y	6%	4.9	4.63	20.27	0.6	1.0E-03	7.5E-01	2.0E-03	2.2E-01
* 171 PCB-hexachlorobiphenyl	26601649	361.0	6.72	1.4E-02	4.3E-01		1.3E+01 *		1378%	Y	4%	3.2	11.29	47.90	0.5	1.0E-03	4.3E-01	1.5E-03	1.6E-01
** 172 Pentachloronitrobenzene	82688	295.3	4.64	1.6E-03	4.2E-02		1.1E+00 **		157%	Y	0%	0.3	4.83	11.60	0.9	1.0E-03	4.2E-02	1.7E-04	1.8E-02
* 173 Pentachlorophenol	87865	266.4	5.86	1.4E-02	3.9E-01		1.1E+01 *		1226%	Y	4%	2.5	3.33	13.82	0.9	1.0E-03	3.9E-01	1.4E-03	1.4E-01
174 n-Pentanol	71410	88.2	1.56	3.4E-03	5.5E-03	6.0E-03	8.9E-03		6%	N	0%	0.0	0.33	0.80	1.0	1.0E-03	5.5E-03	6.6E-06	7.0E-04
175 Pentanone, 4-methyl-2-	108101	100.0	1.19	1.1E-04	2.7E-03		6.6E-02		3%	N	0%	0.0	0.39	0.93	1.0	1.0E-03	2.7E-03	3.5E-06	3.7E-04
* 176 Phenanthrene	85018	178.2	4.46	5.5E-03	1.4E-01		3.8E+00 *		283%	Y	1%	0.7	1.06	4.11	1.0	1.0E-03	1.4E-01	3.1E-04	3.3E-02
177 Phenol	108952	94.1	1.46	2.7E-03	4.3E-03	8.1E-03	7.0E-03		5%	N	0%	0.0	0.36	0.86	1.0	1.0E-03	4.3E-03	5.5E-06	5.8E-04
178 Phenol, 4,6-dinitro-2-methyl-	534521	198.1	2.12	1.3E-04	3.1E-03		7.6E-02		7%	N	0%	0.0	1.38	3.30	1.0	1.0E-03	3.1E-03	7.7E-06	8.1E-04
179 n-Propanol	71238	60.1	0.25	5.6E-04	1.1E-03	1.4E-03	2.0E-03		1%	N	0%	0.0	0.23	0.56	1.0	1.0E-03	1.1E-03	1.1E-06	1.2E-04
180 Propiolactone, beta-	57578	72.0	-0.46	1.2E-05	3.1E-04		8.0E-03		0%	N	0%	0.0	0.27	0.65	1.0	1.0E-03	3.1E-04	3.4E-07	3.5E-05
181 Propylene oxide	75569	58.1	0.03	3.0E-05	7.7E-04		2.0E-02		1%	N	0%	0.0	0.23	0.54	1.0	1.0E-03	7.7E-04	8.0E-07	8.5E-05
182 Resorcinol	108463	110.1	0.80	7.7E-04	1.3E-03		2.1E-03		2%	N	0%	0.0	0.44	1.06	1.0	1.0E-03	1.3E-03	1.8E-06	1.9E-04
183 Safrole	94597	162.2	2.66	4.6E-04	1.1E-02		2.8E-01		20%	Y	0%	0.1	0.87	2.08	1.0	1.0E-03	1.1E-02	2.2E-05	2.3E-03
184 Styrene	100425	104.1	2.95	1.5E-03	3.7E-02		9.4E-01		45%	Y	0%	0.1	0.41	0.98	1.0	1.0E-03	3.7E-02	5.0E-05	5.3E-03
185 Styrene oxide	96093	120.0	1.61	1.6E-04	3.9E-03		9.6E-02		5%	N	0%	0.0	0.50	1.20	1.0	1.0E-03	3.9E-03	5.8E-06	6.2E-04
* 186 TCDD	1746016	322.0	6.80	2.7E-02	8.1E-01		2.5E+01 *		2003%	Y	6%	5.6	6.82	30.09	0.5	1.0E-03	8.1E-01	2.2E-03	2.4E-01
** 187 Tetrachlorethylene	127184	165.8	3.40	1.3E-03	3.3E-02		8.4E-01 **		60%	Y	0%	0.2	0.91	2.18	1.0	1.0E-03	3.3E-02	6.7E-05	7.1E-03
** 188 Tetrachloroethane, 1,1,2,2-	79345	167.9	2.39	2.8E-04	6.9E-03		1.7E-01 **		13%	Y	0%	0.0	0.93	2.24	1.0	1.0E-03	6.9E-03	1.4E-05	1.5E-03
189 Thioacetamide	62555	75.0	0.71	7.0E-05	1.8E-03		4.4E-02		2%	N	0%	0.0	0.28	0.67	1.0	1.0E-03	1.8E-03	2.0E-06	2.1E-04
190 Thiodianiline, 4,4'-	139651	216.0	2.03	8.8E-05	2.1E-03		5.2E-02		5%	N	0%	0.0	1.73	4.16	1.0	1.0E-03	2.1E-03	6.0E-06	6.3E-04
191 Thiourea	62566	76.0	-0.95	5.1E-06	1.4E-04		3.7E-03		0%	N	0%	0.0	0.28	0.68	1.0	1.0E-03	1.4E-04	1.5E-07	1.6E-05
192 Thymol	89838	150.2	3.34	2.1E-02	3.7E-02	5.2E-02	6.6E-02		61%	Y	0%	0.2	0.74	1.78	1.0	1.0E-03	3.7E-02	6.8E-05	7.2E-03
193 Toluene	108883	92.1	2.73	1.2E-03	3.1E-02		7.8E-01		35%	Y	0%	0.1	0.35	0.84	1.0	1.0E-03	3.1E-02	3.9E-05	4.1E-03
194 Toluidine hydrochloride, o-	636215	143.2	1.29	7.2E-05	1.8E-03		4.4E-02		3%	N	0%	0.0	0.68	1.62	1.0	1.0E-03	1.8E-03	3.1E-06	3.3E-04
195 Toluidine, o-	95534	107.0	1.32	1.2E-04	3.0E-03		7.3E-02		4%	N	0%	0.0	0.42	1.02	1.0	1.0E-03	3.0E-03	4.1E-06	4.3E-04
196 Toxaphene	8001352	414.0	4.82	4.5E-04	1.2E-02		3.1E-01		85%	Y	0%	0.1	22.40	53.75	0.8	1.0E-03	1.2E-02	9.5E-05	1.0E-02
197 Trichlorobenzene, 1,2,4-	120821	181.5	3.98	2.6E-03	6.6E-02		1.7E+00		133%	Y	0%	0.3	1.11	2.66	1.0	1.0E-03	6.6E-02	1.5E-04	1.6E-02
** 198 Trichloroethane, 1,1,1-	71556	133.4	2.49	5.1E-04	1.3E-02		3.1E-01 **		19%	Y	0%	0.1	0.60	1.43	1.0	1.0E-03	1.3E-02	2.1E-05	2.2E-03
** 199 Trichloroethane, 1,1,2-	79005	133.4	2.05	2.6E-04	6.4E-03		1.6E-01 **		9%	N	0%	0.0	0.60	1.43	1.0	1.0E-03	6.4E-03	1.0E-05	1.1E-03
** 200 Trichloroethylene	79016	131.4	2.42	4.7E-04	1.2E-02		2.9E-01 **		17%	Y	0%	0.1	0.58	1.39	1.0	1.0E-03	1.2E-02	1.9E-05	2.0E-03
** 201 Trichlorofluoromethane	75694	137.4	2.53	5.1E-04	1.3E-02		3.2E-01 **		19%	Y	0%	0.1	0.63	1.51	1.0	1.0E-03	1.3E-02	2.1E-05	2.3E-03
202 2,4,6-Trichlorophenol	88062	197.5	3.69	1.9E-02	3.5E-02		6.2E-02		77%	Y	0%	0.2	1.36	3.27	1.0	1.0E-03	3.5E-02	8.5E-05	9.0E-03
* 203 Tris(2,3-dibromopropyl)phosphate	126727	697.6	4.98	1.3E-05	3.9E-04		1.1E-02 *		22%	Y	0%	0.0	874.39	2098.53	1.0	1.0E-03	3.9E-04	2.4E-05	2.6E-03
204 Tris(aziridinyl)-para-benzoquinone	68768	231.3	-1.34	3.7E-07	1.0E-05		2.8E-04		0%	N	0%	0.0	2.11	5.07	1.0	1.0E-03	1.0E-05	3.1E-08	3.3E-06
* 205 Urea	57136	60.0	-2.11	9.9E-07	2.9E-05		8.3E-04 *		0%	N	0%	0.0	0.23	0.55	1.0	1.0E-03	2.9E-05	3.0E-08	3.2E-06
** 206 Vinyl bromide	593602	107.0	1.57	1.8E-04	4.3E-03		1.1E-01 **		5%	N	0%	0.0	0.42	1.02	1.0	1.0E-03	4.3E-03	6.0E-06	6.3E-04
** 207 Vinyl chloride	75014	62.5	1.36	2.2E-04	5.6E-03		1.4E-01 **		5%	N	0%	0.0	0.24	0.57	1.0	1.0E-03	5.6E-03	5.9E-06	6.3E-04
* 208 Water	7732185	18.0	-1.38	5.8E-05	1.5E-04	5.0E-04	3.9E-04 *		0%	N	0%	0.0	0.13	0.32	1.0	1.0E-03	1.5E-04	1.3E-07	1.4E-05
209 Xylene, m-	108383	106.2	3.20	2.1E-03	5.3E-02		1.4E+00		65%	Y	0%	0.2	0.42	1.01	1.0	1.0E-03	5.3E-02	7.3E-05	7.7E-03
Tetrahydrofuran		72.1	0.46		1.2E-03		1.3E+00		1%	N	0%	0.0	0.27	0.65	1.0	1.0E-03	1.2E-03	1.4E-06	1.4E-04





CHEMICAL	log(Ds/lsc)	Dsc/lsc	Dsc	b	c	t_star1 B>0.6	t_star3 B<=0.6	EPD1-c Eq (3.9)	EPD2-c Eq (3.10)	outside EPD?	Chemical outside EPD (*)	Kp 95% LCI	Kp (cm/hr) predicted	Kp 95% UCI	DA_event ng/cm2-avg 95% LCI	DA_event ng/cm2-avg Average	DA_event ng/cm2-avg 95% UCI	DAD mg/kg-day 95% LCI
1 Acetaldehyde	-3.1E+00	8.86E-04	8.86E-07	3.0E-01	3.3E-01	#VALUE!	0.45	0.010150354	-0.034859600	N		2.4E-05	6.3E-04	1.6E-02	2.3E-08	6.1E-07	1.6E-05	2.5E-06
2 Acetamide	-3.1E+00	7.31E-04	7.31E-07	3.0E-01	3.3E-01	#VALUE!	0.55	-0.040649596	-0.100866995	N		3.9E-06	1.1E-04	2.9E-03	4.1E-09	1.1E-07	3.0E-06	4.3E-07
3 Acetylaminofluorene, 2-	-4.1E+00	8.78E-05	8.78E-08	3.5E-01	3.8E-01	#VALUE!	4.56	0.295750580	0.068149225	N		5.0E-04	1.2E-02	3.1E-01	1.5E-06	3.6E-05	9.0E-04	1.6E-04
4 Acrolein	-3.1E+00	7.59E-04	7.59E-07	3.0E-01	3.3E-01	#VALUE!	0.53	0.023013043	-0.034244518	N		2.5E-05	6.5E-04	1.7E-02	2.6E-08	6.7E-07	1.7E-05	2.7E-06
5 Acrylamide	-3.2E+00	6.26E-04	6.26E-07	3.0E-01	3.3E-01	#VALUE!	0.64	-0.001392940	-0.073857945	N		8.5E-06	2.2E-04	5.9E-03	9.3E-09	2.4E-07	6.4E-06	9.8E-07
6 Acrylonitrile	-3.1E+00	7.89E-04	7.89E-07	3.1E-01	3.4E-01	#VALUE!	0.51	0.041137174	-0.013058485	N		4.5E-05	1.2E-03	2.9E-02	4.6E-08	1.2E-06	3.0E-05	4.8E-06
7 Aldrin	-4.9E+00	1.40E-05	1.40E-08	3.1E-01	3.4E-01	#VALUE!	28.54	0.355299389	-0.017231978	N		5.7E-05	1.4E-03	3.5E-02	4.1E-07	1.0E-05	2.5E-04	4.4E-05
** 8 Allyl chloride	-3.2E+00	5.83E-04	5.83E-07	3.1E-01	3.5E-01	#VALUE!	0.69	0.120467443	0.042388951	N		2.2E-04	5.4E-03	1.3E-01	2.4E-07	6.1E-06	1.5E-04	2.6E-05
9 Amino-2-methylantraquinone, 1-	-4.1E+00	7.30E-05	7.30E-08	3.2E-01	3.5E-01	#VALUE!	5.48	0.278338866	0.036142446	N		2.2E-04	5.3E-03	1.3E-01	6.9E-07	1.7E-05	4.1E-04	7.3E-05
10 Aminoanthraquinone, 2-	-4.1E+00	8.78E-05	8.78E-08	3.1E-01	3.4E-01	#VALUE!	4.56	0.234539039	0.006937683	N		9.7E-05	2.4E-03	5.7E-02	2.8E-07	6.9E-06	1.7E-04	3.0E-05
11 Aminoazobenzene, p-	-3.9E+00	1.23E-04	1.23E-07	3.3E-01	3.6E-01	#VALUE!	3.26	0.247664766	0.046599891	N		2.8E-04	6.8E-03	1.7E-01	6.8E-07	1.7E-05	4.1E-04	7.2E-05
12 Aminoazotoluene, o-	-4.1E+00	8.52E-05	8.52E-08	4.4E-01	4.8E-01	#VALUE!	4.69	0.335111325	0.105162512	N		1.4E-03	3.4E-02	8.7E-01	4.0E-06	1.0E-04	2.6E-03	4.2E-04
13 Aminobiphenyl, 4-	-3.8E+00	1.76E-04	1.76E-07	3.4E-01	3.8E-01	#VALUE!	2.27	0.243586283	0.070895030	N		5.2E-04	1.3E-02	3.2E-01	1.1E-06	2.6E-05	6.5E-04	1.1E-04
14 Aniline	-3.3E+00	4.70E-04	4.70E-07	3.1E-01	3.4E-01	#VALUE!	0.85	0.098052147	0.003031132	N		7.5E-05	1.9E-03	4.7E-02	9.4E-08	2.3E-06	5.8E-05	9.9E-06
15 Anisidine, o-	-3.6E+00	2.41E-04	2.41E-07	3.1E-01	3.4E-01	#VALUE!	1.66	0.140261661	-0.007730251	N		5.9E-05	1.5E-03	3.6E-02	1.0E-07	2.6E-06	6.3E-05	1.1E-05
16 Auramine	-4.3E+00	4.95E-05	4.95E-08	3.5E-01	3.8E-01	#VALUE!	8.09	0.335255865	0.062338366	N		4.5E-04	1.1E-02	2.8E-01	1.6E-06	3.9E-05	9.7E-04	1.6E-04
17 Benzene	-3.2E+00	5.71E-04	5.71E-07	3.3E-01	3.7E-01	#VALUE!	0.70	0.159470967	0.079759461	N		5.9E-04	1.5E-02	3.7E-01	6.8E-07	1.7E-05	4.2E-04	7.2E-05
18 Benzdine	-3.8E+00	1.45E-04	1.45E-07	3.1E-01	3.4E-01	#VALUE!	2.76	0.169251266	-0.018749495	N		4.6E-05	1.1E-03	2.8E-02	1.0E-07	2.6E-06	6.3E-05	1.1E-05
* 19 Benzo-a-anthracene	-4.1E+00	8.20E-05	8.20E-08	6.1E+00	2.8E+00	8.53	4.88	0.434356113	0.201345398	Y	*	1.7E-02	4.7E-01	1.3E+01	5.1E-05	1.4E-03	4.0E-02	5.3E-03
* 20 Benzo-a-pyrene	-4.2E+00	6.19E-05	6.19E-08	1.3E+01	4.3E+00	11.67	6.46	0.470139236	0.214980766	Y	*	2.4E-02	7.0E-01	2.0E+01	8.4E-05	2.4E-03	7.1E-02	8.8E-03
* 21 Benzo-b-fluoranthene	-4.2E+00	6.01E-05	6.01E-08	1.3E+01	4.4E+00	12.03	6.65	0.472436113	0.214930185	Y	*	2.4E-02	7.0E-01	2.0E+01	8.5E-05	2.5E-03	7.2E-02	9.0E-03
22 Benzoic acid	-3.5E+00	3.24E-04	3.24E-07	3.2E-01	3.5E-01	#VALUE!	1.24	0.167272962	0.042755629	N		2.3E-04	5.7E-03	1.4E-01	3.5E-07	8.6E-06	2.1E-04	3.7E-05
23 Benzotrichloride	-3.9E+00	1.26E-04	1.26E-07	3.4E-01	3.7E-01	#VALUE!	3.17	0.263491345	0.064467738	N		4.5E-04	1.1E-02	2.7E-01	1.1E-06	2.7E-05	6.6E-04	1.1E-04
24 Benzyl chloride	-3.5E+00	3.04E-04	3.04E-07	3.3E-01	3.6E-01	#VALUE!	1.32	0.193972219	0.064351716	N		4.1E-04	1.0E-02	2.5E-01	6.5E-07	1.6E-05	4.0E-04	6.9E-05
25 Bis(2-chloroethyl)ether	-3.6E+00	2.47E-04	2.47E-07	3.1E-01	3.4E-01	#VALUE!	1.62	0.145418339	-0.000532306	N		7.2E-05	1.8E-03	4.4E-02	1.3E-07	3.1E-06	7.6E-05	1.3E-05
** 26 Bromodichloromethane	-3.7E+00	1.89E-04	1.89E-07	3.2E-01	3.5E-01	#VALUE!	2.12	0.200958833	0.033779004	N		1.9E-04	4.6E-03	1.1E-01	3.7E-07	9.2E-06	2.2E-04	4.0E-05
** 27 Bromoform	-4.2E+00	5.97E-05	5.97E-08	3.1E-01	3.4E-01	#VALUE!	6.70	0.262101107	0.004084862	N		9.2E-05	2.2E-03	5.5E-02	3.2E-07	7.9E-06	1.9E-04	3.4E-05
** 28 Bromomethane	-3.3E+00	4.59E-04	4.59E-07	3.1E-01	3.4E-01	#VALUE!	0.87	0.115307388	0.018347170	N		1.1E-04	2.8E-03	7.0E-02	1.5E-07	3.6E-06	9.0E-05	1.5E-05
29 Bromophenol, p-	-3.8E+00	1.68E-04	1.68E-07	3.3E-01	3.6E-01	#VALUE!	2.39	0.233737541	0.057157673	N		5.8E-03	8.8E-03	1.3E-02	1.2E-05	1.9E-05	2.8E-05	1.3E-03
30 Butadiene, 1,3-	-3.1E+00	7.80E-04	7.80E-07	3.3E-01	3.6E-01	#VALUE!	0.51	0.139310295	0.084196066	N		6.5E-04	1.6E-02	4.1E-01	6.5E-07	1.6E-05	4.1E-04	6.9E-05
31 2,3-Butanediol	-3.3E+00	4.89E-04	4.89E-07	3.0E-01	3.3E-01	#VALUE!	0.82	-0.005675024	-0.097654550	N		5.2E-05	1.2E-04	2.8E-04	6.4E-08	1.5E-07	3.4E-07	6.8E-06
32 n-Butanol	-3.2E+00	6.01E-04	6.01E-07	3.1E-01	3.4E-01	#VALUE!	0.67	0.087243184	0.011593800	N		1.3E-03	2.3E-03	4.0E-03	1.5E-06	2.6E-06	4.4E-06	1.6E-04
33 Butoxyethanol, 2-	-3.5E+00	3.41E-04	3.41E-07	3.1E-01	3.4E-01	#VALUE!	1.17	0.106828022	-0.013606776	N		4.9E-05	1.2E-03	3.0E-02	7.2E-08	1.8E-06	4.5E-05	7.6E-06
34 Captan	-4.5E+00	3.25E-05	3.25E-08	3.1E-01	3.4E-01	#VALUE!	12.32	0.285064919	-0.021125245	N		4.8E-05	1.2E-03	2.9E-02	2.3E-07	5.7E-06	1.4E-04	2.4E-05
35 Carbon disulfide	-3.3E+00	5.57E-04	5.57E-07	3.4E-01	3.7E-01	#VALUE!	0.72	0.166617880	0.084967170	N		6.9E-04	1.7E-02	4.3E-01	7.9E-07	2.0E-05	5.0E-04	8.4E-05
** 36 Carbon tetrachloride	-3.7E+00	2.15E-04	2.15E-07	3.5E-01	3.9E-01	#VALUE!	1.86	0.237412123	0.080438632	N		6.6E-04	1.6E-02	4.0E-01	1.2E-06	3.0E-05	7.5E-04	1.3E-04
37 Chlordane	-5.1E+00	7.86E-06	7.86E-09	5.1E-01	5.5E-01	#VALUE!	50.91	0.520239752	0.101983988	N		1.4E-03	3.8E-02	1.0E+00	9.4E-06	2.6E-04	7.0E-03	9.9E-04
38 Chlordane (cis)	-5.1E+00	7.84E-06	7.84E-09	4.9E-01	5.3E-01	#VALUE!	51.05	0.516410799	0.097950908	N		1.2E-03	3.4E-02	9.2E-01	8.5E-06	2.3E-04	6.3E-03	8.9E-04
39 Chlordane (trans)	-5.1E+00	7.84E-06	7.84E-09	4.9E-01	5.3E-01	#VALUE!	51.05	0.516410799	0.097950908	N		1.2E-03	3.4E-02	9.2E-01	8.5E-06	2.3E-04	6.3E-03	8.9E-04
40 Chlorobenzene	-3.4E+00	3.66E-04	3.66E-07	3.8E-01	4.1E-01	#VALUE!	1.09	0.216948639	0.102025264	N		1.1E-03	2.8E-02	7.1E-01	1.6E-06	4.0E-05	1.0E-03	1.7E-04
41 4-Chlorocresol	-3.6E+00	2.48E-04	2.48E-07	3.9E-01	4.3E-01	#VALUE!	1.61	0.246848859	0.101326880	N		1.7E-02	2.9E-02	4.9E-02	2.9E-05	4.9E-05	8.5E-05	3.0E-03
** 42 Chlorodibromomethane	-4.0E+00	1.06E-04	1.06E-07	3.1E-01	3.5E-01	#VALUE!	3.77	0.231529970	0.018931933	N		1.3E-04	3.2E-03	7.9E-02	3.5E-07	8.5E-06	2.1E-04	3.7E-05
** 43 Chloroethane	-3.2E+00	6.81E-04	6.81E-07	3.1E-01	3.5E-01	#VALUE!	0.59	0.113220492	0.047389607	N		2.4E-04	6.1E-03	1.5E-01	2.5E-07	6.3E-06	1.6E-04	2.7E-05
** 44 Chloroform	-3.5E+00	3.35E-04	3.35E-07	3.2E-01	3.5E-01	#VALUE!	1.19	0.171561876	0.049698191	N		2.8E-04	6.8E-03	1.7E-01	4.1E-07	1.0E-05	2.5E-04	4.4E-05
** 45 Chloromethane	-3.1E+00	8.16E-04	8.16E-07	3.1E-01	3.4E-01	#VALUE!	0.49	0.076874219	0.025332208	N		1.3E-04	3.3E-03	8.3E-02	1.3E-07	3.3E-06	8.2E-05	1.4E-05
46 2-Chlorophenol	-3.5E+00	2.97E-04	2.97E-07	3.2E-01	3.6E-01	#VALUE!	1.34	0.186344707	0.055132015	N		5.2E-03	8.0E-03	1.2E-02	8.1E-06	1.3E-05	2.0E-05	8.6E-04
47 4-Chlorophenol	-3.5E+00	2.97E-04	2.97E-07	3.3E-01	3.7E-01	#VALUE!	1.34	0.199822477	0.068609786	N		7.3E-03	1.2E-02	1.8E-02	1.2E-05	1.8E-05	2.9E-05	1.2E-03
48 Chlorothalonil	-4.3E+00	5.04E-05	5.04E-08	3.8E-01	4.1E-01	#VALUE!	7.93	0.352460751	0.081074202	N		7.4E-04	1.9E-02	4.7E-01	2.5E-06	6.4E-05	1.6E-03	2.7E-04
* 49 Chrysene	-4.1E+00	8.20E-05	8.20E-08	6.1E+00	2.8E+00	8.53	4.88	0.434356113	0.201345398	Y	*	1.7E-02	4.7E-01	1.3E+01	5.1E-05	1.4E-03	4.0E-02	5.3E-03
50 Cresidine, p-	-3.6E+00	2.66E-04	2.66E-07	3.1E-01	3.4E-01	#VALUE!	1.50	0.163798304	0.023767336	N		1.4E-04	3.4E-03	8.4E-02	2.3E-07	5.7E-06	1.4E-04	2.5E-05
51 m-Cresol	-3.4E+00	3.87E-04	3.87E-07	3.2E-01	3.5E-01	#VALUE!	1.03	0.165254133	0.054882786	N		4.9E-03	7.8E-03	1.2E-02	6.8E-06	1.1E-05	1.7E-05	7.2E-04
52 o-Cresol	-3.4E+00	3.87E-04	3.87E-07	3.2E-01	3.5E-01	#VALUE!	1.03	0.164692560	0.054321212	N		4.8E-03	7.7E-03	1.2E-02	6.7E-06	1.1E-05	1.7E-05	7.1E-04
53 p-Cresol	-3.4E+00	3.87E-04	3.87E-07	3.2E-01	3.5E-01	#VALUE!	1.03	0.164692560	0.054321212	N		4.8E-03	7.7E-03	1.2E-02	6.7E-06	1.1E-05	1.7E-05	7.1E-04
* 54 DDD	-4.6E+00	2.51E-05	2.51E-08	1.8E+00	1.4E+00	25.99	15.96	0.489014209	0.162411367	N		6.4E-03	1.8E-01	5.0E+00	2.8E-05	7.8E-04	2.2E-02	3.0E-03
* 55 DDE	-4.6E+00	2.57E-05	2.57E-08	1.5E+00	1.2E+00	25.08	15.55	0.481816263	0.157254690	N		5.6E-03	1.6E-01	4.3E+00	2.4E-05	6.7E-04	1	



CHEMICAL	log(Ds/lsc)	Dsc/lsc	Dsc	b	c	t_star1 B>0.6	t_star3 B<=0.6	EPD1-c Eq (3.9)	EPD2-c Eq (3.10)	outside EPD?	Chemical outside EPD (*)	Kp 95% LCI	Kp (cm/hr) predicted	Kp 95% UCI	DA_event1 ng/cm2-avg 95% LCI	DA_event2 ng/cm2-avg Average	DA_event3 ng/cm2-avg 95% UCI	DAD mg/kg-day 95% LCI
* 56 DDT	-4.8E+00	1.59E-05	1.59E-08	3.5E+00	2.1E+00	42.51	25.08	0.538323433	0.175998406	Y	*	9.2E-03	2.7E-01	7.8E+00	4.4E-05	1.3E-03	3.7E-02	4.7E-03
* 57 n-Decanol	-3.7E+00	2.03E-04	2.03E-07	1.5E+00	1.2E+00	3.18	1.97	0.337412179	0.175866249	Y	*(signific	9.5E-02	2.2E-01	5.1E-01	1.8E-04	4.2E-04	9.8E-04	1.9E-02
58 Di-2-ethylhexyl phthalate	-5.0E+00	1.00E-05	1.00E-08	4.3E-01	4.7E-01	#VALUE!	39.93	0.486498121	0.087430274	N		9.4E-04	2.5E-02	6.6E-01	6.4E-06	1.7E-04	4.6E-03	6.8E-04
59 Diaminoanisole, 2,4-	-3.6E+00	2.63E-04	2.63E-07	3.0E-01	3.3E-01	#VALUE!	1.52	0.063786916	-0.077264686	N		8.5E-06	2.2E-04	5.6E-03	1.4E-08	3.7E-07	9.4E-06	1.5E-06
60 Diaminotoluene	-3.5E+00	3.24E-04	3.24E-07	3.0E-01	3.3E-01	#VALUE!	1.24	0.081352175	-0.043165158	N		2.2E-05	5.4E-04	1.4E-02	3.3E-08	8.3E-07	2.1E-05	3.5E-06
61 Diaminotoluene, 2,4-	-3.9E+00	1.18E-04	1.18E-07	3.1E-01	3.4E-01	#VALUE!	3.38	0.217747585	0.013620809	N		1.1E-04	2.8E-03	6.7E-02	2.8E-07	6.9E-06	1.7E-04	3.0E-05
* 62 Dibenzo(a,h)anthracene	-4.4E+00	4.29E-05	4.29E-08	6.3E+01	9.7E+00	17.57	9.32	0.526188697	0.242044224	Y	*	4.9E-02	1.5E+00	4.7E+01	1.2E-04	3.8E-03	1.2E-01	1.3E-02
63 Dibutyl phthalate	-4.4E+00	4.31E-05	4.31E-08	4.0E-01	4.4E-01	#VALUE!	9.27	0.373798077	0.090061859	N		9.4E-04	2.4E-02	6.1E-01	3.5E-06	9.0E-05	2.3E-03	3.7E-04
64 Dichlorobenzene, 1,2-	-3.6E+00	2.34E-04	2.34E-07	4.3E-01	4.7E-01	#VALUE!	1.71	0.264828525	0.114795345	N		1.6E-03	4.1E-02	1.0E+00	2.9E-06	7.4E-05	1.9E-03	3.1E-04
65 Dichlorobenzene, 1,3-	-3.6E+00	2.34E-04	2.34E-07	4.9E-01	5.3E-01	#VALUE!	1.71	0.277183148	0.127149968	N		2.3E-03	5.8E-02	1.5E+00	4.0E-06	1.0E-04	2.6E-03	4.3E-04
66 Dichlorobenzene, 1,4-	-3.6E+00	2.34E-04	2.34E-07	4.4E-01	4.7E-01	#VALUE!	1.71	0.265390099	0.115356919	N		1.7E-03	4.2E-02	1.1E+00	3.0E-06	7.5E-05	1.9E-03	3.1E-04
67 Dichlorobenzidine, 3,3'	-4.2E+00	5.95E-05	5.95E-08	3.5E-01	3.9E-01	#VALUE!	6.72	0.326273612	0.067951177	N		5.1E-04	1.3E-02	3.2E-01	1.8E-06	4.5E-05	1.1E-03	1.9E-04
** 68 Dichlorodifluoromethane	-3.5E+00	3.28E-04	3.28E-07	3.3E-01	3.6E-01	#VALUE!	1.22	0.182997253	0.059602617	N		3.6E-04	9.0E-03	2.2E-01	5.4E-07	1.3E-05	3.3E-04	5.8E-05
** 69 Dichloroethane, 1,1-	-3.4E+00	4.36E-04	4.36E-07	3.2E-01	3.5E-01	#VALUE!	0.92	0.151043082	0.050000328	N		2.7E-04	6.7E-03	1.7E-01	3.6E-07	8.8E-06	2.2E-04	3.8E-05
** 70 Dichloroethane, 1,2-	-3.4E+00	4.36E-04	4.36E-07	3.1E-01	3.4E-01	#VALUE!	0.92	0.133634295	0.032591541	N		1.7E-04	4.2E-03	1.0E-01	2.2E-07	5.5E-06	1.4E-04	2.3E-05
** 71 Dichloroethylene, 1,1-	-3.3E+00	4.48E-04	4.48E-07	3.3E-01	3.6E-01	#VALUE!	0.89	0.169064925	0.070165502	N		4.7E-04	1.2E-02	2.9E-01	6.0E-07	1.5E-05	3.7E-04	6.4E-05
** 72 Dichloroethylene, 1,2- (trans)	-3.3E+00	4.48E-04	4.48E-07	3.2E-01	3.5E-01	#VALUE!	0.89	0.153902433	0.055003010	N		3.1E-04	7.7E-03	1.9E-01	4.0E-07	9.9E-06	2.5E-04	4.2E-05
73 2,4-Dichlorophenol	-3.7E+00	1.91E-04	1.91E-07	3.7E-01	4.0E-01	#VALUE!	2.10	0.255023236	0.088659913	N		1.2E-02	2.1E-02	3.4E-02	2.5E-05	4.1E-05	6.7E-05	2.6E-03
** 74 Dichloropropane, 1,2-	-3.4E+00	3.64E-04	3.64E-07	3.2E-01	3.5E-01	#VALUE!	1.10	0.169980569	0.054648940	N		3.1E-04	7.8E-03	1.9E-01	4.5E-07	1.1E-05	2.7E-04	4.7E-05
** 75 Dichloropropene, 1,3-	-3.4E+00	3.73E-04	3.73E-07	3.1E-01	3.5E-01	#VALUE!	1.07	0.146496984	0.033206623	N		1.7E-04	4.3E-03	1.1E-01	2.5E-07	6.1E-06	1.5E-04	2.6E-05
76 Dichlorvos	-4.0E+00	9.01E-05	9.01E-08	3.1E-01	3.4E-01	#VALUE!	4.44	0.195331388	-0.030228699	N		3.5E-05	8.5E-04	2.1E-02	1.0E-07	2.5E-06	6.0E-05	1.1E-05
77 Dieldrin	-4.9E+00	1.14E-05	1.14E-08	3.6E-01	4.0E-01	#VALUE!	35.09	0.450508394	0.061646886	N		4.7E-04	1.2E-02	3.2E-01	3.0E-06	7.9E-05	2.0E-03	3.2E-04
78 Diepoxybutane	-3.3E+00	5.15E-04	5.15E-07	3.0E-01	3.3E-01	#VALUE!	0.78	-0.059391286	-0.147267863	N		1.1E-06	3.1E-05	8.7E-04	1.3E-09	3.7E-08	1.0E-06	1.4E-07
79 Diethyl phthalate	-4.1E+00	8.89E-05	8.89E-08	3.2E-01	3.5E-01	#VALUE!	4.50	0.251999082	0.025418361	N		1.6E-04	3.9E-03	9.5E-02	4.6E-07	1.1E-05	2.7E-04	4.9E-05
80 Diethyl sulfate	-3.7E+00	2.14E-04	2.14E-07	3.1E-01	3.4E-01	#VALUE!	1.87	0.142608219	-0.014569399	N		5.0E-05	1.2E-03	3.0E-02	9.3E-08	2.3E-06	5.6E-05	9.8E-06
81 Dimethoxybenzidine, 3,3'	-4.2E+00	5.85E-05	5.85E-08	3.1E-01	3.4E-01	#VALUE!	6.84	0.231469482	-0.028179777	N		3.8E-05	9.3E-04	2.3E-02	1.4E-07	3.3E-06	8.1E-05	1.4E-05
82 Dimethyl phthalate	-3.9E+00	1.28E-04	1.28E-07	3.1E-01	3.4E-01	#VALUE!	3.13	0.186606995	-0.011395978	N		5.7E-05	1.4E-03	3.4E-02	1.4E-07	3.4E-06	8.2E-05	1.4E-05
83 Dimethyl sulfate	-3.5E+00	3.08E-04	3.08E-07	3.1E-01	3.4E-01	#VALUE!	1.30	0.129442492	0.000842623	N		7.3E-05	1.8E-03	4.5E-02	1.1E-07	2.8E-06	7.0E-05	1.2E-05
84 Dimethylamine, n-nitroso-	-3.2E+00	6.01E-04	6.01E-07	3.0E-01	3.3E-01	#VALUE!	0.67	0.005804780	-0.069824190	N		9.6E-06	2.5E-04	6.6E-03	1.1E-08	2.8E-07	7.3E-06	1.1E-06
85 Dimethylaminoazobenzene, 4-	-4.1E+00	8.56E-05	8.56E-08	7.6E-01	7.6E-01	#VALUE!	4.67	0.372022099	0.142379476	N		3.6E-03	9.5E-02	2.5E+00	1.1E-05	2.8E-04	7.3E-03	1.1E-03
86 Dimethylbenzidine, 3,3'	-4.0E+00	1.01E-04	1.01E-07	3.2E-01	3.5E-01	#VALUE!	3.97	0.239748549	0.023067976	N		1.5E-04	3.6E-03	8.8E-02	4.0E-07	9.8E-06	2.4E-04	4.3E-05
87 Dimethylcarbaryl chloride	-3.4E+00	3.91E-04	3.91E-07	3.0E-01	3.3E-01	#VALUE!	1.02	0.054859071	-0.054859071	N		4.9E-06	3.9E-04	3.4E-03	6.8E-09	5.4E-07	4.7E-06	7.2E-07
88 Dimethylhydrazine, 1,1-	-3.1E+00	7.21E-04	7.21E-07	3.0E-01	3.3E-01	#VALUE!	0.55	-0.053617049	-0.114855082	N		2.6E-06	7.3E-05	2.0E-03	2.7E-09	7.6E-08	2.1E-06	2.9E-07
89 Dimethylphenol, 2,4-	-3.5E+00	3.23E-04	3.23E-07	3.3E-01	3.6E-01	#VALUE!	1.24	0.191522698	0.066801238	N		4.4E-04	1.1E-02	2.7E-01	6.7E-07	1.7E-05	4.1E-04	7.1E-05
90 Dimethylphenol, 3,4-	-3.5E+00	3.24E-04	3.24E-07	3.3E-01	3.6E-01	#VALUE!	1.24	0.187489618	0.062972285	N		4.0E-04	9.8E-03	2.4E-01	6.0E-07	1.5E-05	3.7E-04	6.4E-05
91 Dinitrophenol, 2,4-	-3.8E+00	1.45E-04	1.45E-07	3.1E-01	3.4E-01	#VALUE!	2.76	0.180431710	-0.007466988	N		6.3E-05	1.5E-03	3.7E-02	1.4E-07	3.5E-06	8.5E-05	1.5E-05
92 Dinitrotoluene, 2,4-	-3.8E+00	1.49E-04	1.49E-07	3.1E-01	3.4E-01	#VALUE!	2.69	0.204120322	0.018262892	N		1.3E-04	3.1E-03	7.5E-02	2.8E-07	6.9E-06	1.7E-04	3.0E-05
93 Dinitrotoluene, 2,6-	-3.8E+00	1.49E-04	1.49E-07	3.1E-01	3.4E-01	#VALUE!	2.69	0.189519404	0.003661974	N		8.5E-05	2.1E-03	5.1E-02	1.9E-07	4.6E-06	1.1E-04	2.0E-05
94 Dioxane, 1,4-	-3.3E+00	5.02E-04	5.02E-07	3.0E-01	3.3E-01	#VALUE!	0.80	0.029796431	-0.060121414	N		1.3E-05	3.3E-04	8.6E-03	1.6E-08	4.0E-07	1.0E-05	1.7E-06
95 Diphenylamine, n-nitroso-	-3.9E+00	1.21E-04	1.21E-07	3.5E-01	3.9E-01	#VALUE!	3.31	0.276917408	0.074627773	N		5.9E-04	1.5E-02	3.6E-01	1.5E-06	3.6E-05	8.9E-04	1.5E-04
96 Diphenylhydrazine, 1,2-	-3.8E+00	1.45E-04	1.45E-07	3.5E-01	3.8E-01	#VALUE!	2.76	0.259103069	0.071102309	N		5.3E-04	1.3E-02	3.2E-01	1.2E-06	3.0E-05	7.3E-04	1.3E-04
97 Dipropylamine, n-nitroso-	-3.5E+00	2.91E-04	2.91E-07	3.1E-01	3.4E-01	#VALUE!	1.37	0.142817299	0.009930767	N		9.5E-05	2.3E-03	5.8E-02	1.5E-07	3.7E-06	9.2E-05	1.6E-05
98 Endrin	-4.9E+00	1.14E-05	1.14E-08	3.6E-01	4.0E-01	#VALUE!	35.09	0.450508394	0.061646886	N		4.7E-04	1.2E-02	3.2E-01	3.0E-06	7.9E-05	2.0E-03	3.2E-04
99 Epichlorohydrin	-3.3E+00	4.77E-04	4.77E-07	3.0E-01	3.3E-01	#VALUE!	0.84	0.035156109	-0.058742208	N		1.3E-05	3.5E-04	8.9E-03	1.7E-08	4.3E-07	1.1E-05	1.8E-06
100 Ethanol	-3.1E+00	8.64E-04	8.64E-07	3.0E-01	3.3E-01	#VALUE!	0.46	0.006101514	-0.040919088	N		2.6E-04	5.4E-04	1.1E-03	2.5E-07	5.2E-07	1.1E-06	2.6E-05
101 Ethanol, 2-(2-butoxyethoxy)-	-3.7E+00	1.93E-04	1.93E-07	3.0E-01	3.3E-01	#VALUE!	2.07	0.031006557	-0.134336131	N		1.8E-06	4.7E-05	1.3E-03	3.5E-09	9.3E-08	2.5E-06	3.7E-07
102 Ethanol, 2-(2-ethoxyethoxy)-	-3.6E+00	2.77E-04	2.77E-07	3.0E-01	3.3E-01	#VALUE!	1.44	0.063889880	-0.072875060	N		9.6E-06	2.5E-04	6.3E-03	1.6E-08	4.0E-07	1.0E-05	1.7E-06
103 Ethanol, 2-(2-methoxyethoxy)-	-3.5E+00	3.32E-04	3.32E-07	3.0E-01	3.3E-01	#VALUE!	1.20	0.037651934	-0.084824131	N		6.7E-06	1.7E-04	4.5E-03	1.0E-08	2.6E-07	6.8E-06	1.1E-06
104 2-Ethoxy ethanol (Cellosolve)	-3.3E+00	4.89E-04	4.89E-07	3.0E-01	3.3E-01	#VALUE!	0.82	0.028019402	-0.063960123	N		1.5E-04	3.7E-04	6.1E-04	1.8E-07	3.7E-07	7.5E-07	1.9E-05
105 Ethoxyethyl acetate, 2-	-3.5E+00	2.85E-04	2.85E-07	3.1E-01	3.4E-01	#VALUE!	1.41	0.1										

CHEMICAL	log(Ds/lsc)	Dsc/lsc	Dsc	b	c	t_star1 B>0.6	t_star3 B<=0.6	EPD1-c Eq (3.9)	EPD2-c Eq (3.10)	outside EPD?	Chemical outside EPD (*)	Kp 95% LCI	Kp (cm/hr) predicted	Kp 95% UCI	DA_event 1g/cm2-avg 95% LCI	DA_event 1g/cm2-avg Average	DA_event 1g/cm2-avg 95% UCI	DAD mg/kg-day 95% LCI
** 111 Ethylenedibromide	-3.9E+00	1.38E-04	1.38E-07	3.1E-01	3.4E-01	#VALUE!	2.90	0.206008044	0.014128875	N		1.1E-04	2.8E-03	6.8E-02	2.6E-07	6.4E-06	1.6E-04	2.8E-05
112 Ethyleneimine	-3.0E+00	8.99E-04	8.99E-07	3.0E-01	3.3E-01	#VALUE!	0.45	-0.040952634	-0.084839891	N		6.0E-06	1.6E-04	4.4E-03	5.7E-09	1.5E-07	4.2E-06	6.0E-07
113 Ethylenethiourea	-3.3E+00	4.53E-04	4.53E-07	3.0E-01	3.3E-01	#VALUE!	0.88	0.011926557	-0.086054295	N		6.3E-06	1.7E-04	4.3E-03	8.0E-09	2.1E-07	5.6E-06	8.5E-07
114 4-Ethylphenol	-3.5E+00	3.23E-04	3.23E-07	3.5E-01	3.8E-01	#VALUE!	1.24	0.207231454	0.082540613	N		1.0E-02	1.7E-02	2.7E-02	1.6E-05	2.5E-05	4.2E-05	1.6E-03
* 115 Fluoranthene	-3.9E+00	1.15E-04	1.15E-07	1.8E+00	1.4E+00	5.68	3.49	0.381216134	0.174741900	N		8.3E-03	2.2E-01	6.0E+00	2.1E-05	5.7E-04	1.5E-02	2.2E-03
116 Formaldehyde	-3.0E+00	1.06E-03	1.06E-06	3.1E-01	3.4E-01	#VALUE!	0.38	0.034964590	0.004345574	N		7.1E-05	1.8E-03	4.6E-02	6.4E-08	1.6E-06	4.2E-05	6.7E-06
117 Glycerol	-3.3E+00	4.77E-04	4.77E-07	3.0E-01	3.3E-01	#VALUE!	0.84	-0.051836794	-0.145837174	N		1.1E-06	3.2E-05	9.1E-04	1.4E-09	4.0E-08	1.1E-06	1.5E-07
118 Heptachlor	-4.9E+00	1.26E-05	1.26E-08	3.4E-01	3.8E-01	#VALUE!	31.85	0.430395378	0.049188624	N		3.4E-04	8.6E-03	2.2E-01	2.1E-06	5.3E-05	1.4E-03	2.2E-04
119 n-Heptanol	-3.5E+00	3.49E-04	3.49E-07	3.5E-01	3.9E-01	#VALUE!	1.15	0.206431157	0.087833500	N		1.2E-02	1.9E-02	3.2E-02	1.7E-05	2.8E-05	4.7E-05	1.8E-03
* 120 Hexachlorobenzene	-4.4E+00	3.95E-05	3.95E-08	1.2E+00	1.0E+00	16.21	10.12	0.443533938	0.152857409	N		4.9E-03	1.3E-01	3.6E+00	1.9E-05	5.2E-04	1.4E-02	2.0E-03
** 121 Hexachlorobutadiene	-4.3E+00	5.39E-05	5.39E-08	7.1E-01	7.2E-01	#VALUE!	7.42	0.401522921	0.135341605	N		3.1E-03	8.1E-02	2.1E+00	1.0E-05	2.7E-04	7.1E-03	1.1E-03
** 122 Hexachloroethane	-4.1E+00	7.36E-05	7.36E-08	4.2E-01	4.6E-01	#VALUE!	5.44	0.341490512	0.099906473	N		1.2E-03	3.0E-02	7.6E-01	3.8E-06	9.6E-05	2.4E-03	4.0E-04
123 Hexamethylphosphoramide	-3.8E+00	1.55E-04	1.55E-07	3.0E-01	3.3E-01	#VALUE!	2.58	0.093031454	-0.089662011	N		6.4E-06	1.6E-04	4.1E-03	1.4E-08	3.6E-07	9.0E-06	1.5E-06
124 n-Hexanol	-3.4E+00	4.18E-04	4.18E-07	3.3E-01	3.6E-01	#VALUE!	0.96	0.166143661	0.061855291	N		5.8E-03	9.3E-03	1.5E-02	7.8E-06	1.2E-05	2.0E-05	8.2E-04
* 125 Hydrazine/Hydrazine sulfate	-3.0E+00	1.04E-03	1.04E-06	3.0E-01	3.3E-01	#VALUE!	0.39	-0.099915629	-0.132575913	Y	*	1.5E-06	4.4E-05	1.3E-03	1.4E-09	3.9E-08	1.1E-06	1.4E-07
* 126 Indeno(1,2,3-CD)pyrene	-4.4E+00	4.41E-05	4.41E-08	3.1E+01	6.7E+00	16.83	9.07	0.510516113	0.228514972	Y	*	3.5E-02	1.0E+00	3.1E+01	8.5E-05	2.6E-03	7.7E-02	9.0E-03
127 Isophorone	-3.6E+00	2.63E-04	2.63E-07	3.1E-01	3.4E-01	#VALUE!	1.52	0.164308621	0.023257019	N		1.4E-04	3.4E-03	8.3E-02	2.3E-07	5.7E-06	1.4E-04	2.4E-05
128 Lindane	-4.4E+00	3.65E-05	3.65E-08	3.5E-01	3.8E-01	#VALUE!	10.97	0.357407673	0.060403214	N		4.3E-04	1.1E-02	2.7E-01	1.8E-06	4.4E-05	1.1E-03	1.9E-04
129 Mechloroethamine	-3.7E+00	2.09E-04	2.09E-07	3.1E-01	3.4E-01	#VALUE!	1.92	0.139697836	-0.019521049	N		4.4E-05	1.1E-03	2.6E-02	8.2E-08	2.0E-06	5.0E-05	8.7E-06
130 Methanol	-3.0E+00	1.04E-03	1.04E-06	3.0E-01	3.3E-01	#VALUE!	0.39	-0.026890626	-0.059591735	N		1.4E-04	3.2E-04	7.3E-04	1.3E-07	2.9E-07	6.6E-07	1.3E-05
131 Methoxyethanol, 2-	-3.2E+00	5.87E-04	5.87E-07	3.0E-01	3.3E-01	#VALUE!	0.68	-0.004457093	-0.082025268	N		6.8E-06	1.8E-04	4.8E-03	7.7E-09	2.0E-07	5.4E-06	8.1E-07
132 Methoxypropan-2-ol, 1-	-3.3E+00	4.90E-04	4.90E-07	3.0E-01	3.3E-01	#VALUE!	0.82	0.035820197	-0.056036853	N		1.4E-05	3.7E-04	9.6E-03	1.8E-08	4.6E-07	1.2E-05	1.9E-06
133 Methyl ethyl ketone	-3.2E+00	6.18E-04	6.18E-07	3.1E-01	3.4E-01	#VALUE!	0.65	0.053028459	-0.020457180	N		3.8E-05	9.6E-04	2.4E-02	4.2E-08	1.1E-06	2.7E-05	4.4E-06
134 Methyl-4-hydroxy benzoate	-3.7E+00	2.19E-04	2.19E-07	3.2E-01	3.5E-01	#VALUE!	1.82	0.187708079	0.032428840	N		3.0E-03	4.4E-03	6.5E-03	5.5E-06	8.1E-06	1.2E-05	5.8E-04
** 135 Methyl iodide	-3.6E+00	2.50E-04	2.50E-07	3.1E-01	3.4E-01	#VALUE!	1.60	0.157262645	0.012332634	N		1.0E-04	2.5E-03	6.2E-02	1.8E-07	4.3E-06	1.1E-04	1.9E-05
136 Methylaziridine, 2-	-3.1E+00	7.50E-04	7.50E-07	3.0E-01	3.3E-01	#VALUE!	0.53	-0.004606361	-0.062782492	N		1.1E-05	3.0E-04	7.9E-03	1.2E-08	3.1E-07	8.1E-06	1.2E-06
137 Methylene bis(2-chloroaniline), 4,4'-	-4.3E+00	4.96E-05	4.96E-08	3.9E-01	4.2E-01	#VALUE!	8.06	0.357616753	0.084903380	N		8.2E-04	2.1E-02	5.2E-01	2.8E-06	7.2E-05	1.8E-03	3.0E-04
138 Methylene bis(N,N'-dimethyl)aniline,	-4.2E+00	5.88E-05	5.88E-08	7.3E-01	7.4E-01	#VALUE!	6.80	0.396368045	0.137127039	N		3.2E-03	8.4E-02	2.2E+00	1.1E-05	3.0E-04	7.9E-03	1.2E-03
** 139 Methylene chloride	-3.3E+00	5.23E-04	5.23E-07	3.1E-01	3.4E-01	#VALUE!	0.76	0.113522630	0.026870813	N		1.4E-04	3.5E-03	8.8E-02	1.7E-07	4.2E-06	1.1E-04	1.8E-05
140 Methylenedianiline, 4,4'-	-3.9E+00	1.21E-04	1.21E-07	3.1E-01	3.4E-01	#VALUE!	3.30	0.190332984	-0.011752524	N		5.7E-05	1.4E-03	3.4E-02	1.4E-07	3.4E-06	8.4E-05	1.5E-05
141 Michler's ketone	-4.3E+00	4.88E-05	4.88E-08	4.1E-01	4.4E-01	#VALUE!	8.19	0.365529592	0.091591459	N		9.8E-04	2.5E-02	6.3E-01	3.4E-06	8.7E-05	2.2E-03	3.6E-04
** 142 Mustard Gas	-3.7E+00	2.00E-04	2.00E-07	3.2E-01	3.5E-01	#VALUE!	2.00	0.195190901	0.032808051	N		1.8E-04	4.5E-03	1.1E-01	3.5E-07	8.6E-06	2.1E-04	3.7E-05
143 Naphthalene	-3.5E+00	2.99E-04	2.99E-07	4.4E-01	4.8E-01	#VALUE!	1.34	0.250741977	0.119896713	N		1.8E-03	4.7E-02	1.2E+00	2.9E-06	7.4E-05	1.9E-03	3.1E-04
144 2-Naphthol	-3.6E+00	2.43E-04	2.43E-07	3.6E-01	3.9E-01	#VALUE!	1.64	0.233054241	0.085919661	N		1.1E-02	1.9E-02	3.1E-02	2.0E-05	3.3E-05	5.4E-05	2.1E-03
145 Naphthylamine, 1-	-3.6E+00	2.46E-04	2.46E-07	3.3E-01	3.6E-01	#VALUE!	1.62	0.199431485	0.053276713	N		3.1E-04	7.7E-03	1.9E-01	5.4E-07	1.3E-05	3.3E-04	5.7E-05
146 Naphthylamine, 2-	-3.6E+00	2.46E-04	2.46E-07	3.3E-01	3.6E-01	#VALUE!	1.62	0.201116206	0.054961434	N		3.3E-04	8.1E-03	2.0E-01	5.7E-07	1.4E-05	3.4E-04	6.0E-05
147 Nitrilotriacetic acid	-3.9E+00	1.33E-04	1.33E-07	3.0E-01	3.3E-01	#VALUE!	3.01	0.087362208	-0.107578863	N		3.9E-06	1.0E-04	2.6E-03	9.3E-09	2.4E-07	6.1E-06	9.8E-07
148 Nitro-o-anisidine, 5-	-3.7E+00	2.18E-04	2.18E-07	3.1E-01	3.4E-01	#VALUE!	1.84	0.160476741	0.004625948	N		8.4E-05	2.1E-03	5.1E-02	1.6E-07	3.8E-06	9.4E-05	1.6E-05
149 Nitrobiphenyl, 4-	-3.9E+00	1.19E-04	1.19E-07	4.4E-01	4.8E-01	#VALUE!	3.35	0.313368447	0.110058178	N		1.5E-03	3.8E-02	9.7E-01	3.8E-06	9.5E-05	2.4E-03	4.0E-04
* 150 Nitrofen	-4.4E+00	3.99E-05	3.99E-08	1.8E+00	1.4E+00	16.33	10.03	0.455531339	0.165569254	N		6.8E-03	1.9E-01	5.2E+00	2.7E-05	7.3E-04	2.0E-02	2.8E-03
151 Nitrophenol, 2-	-3.6E+00	2.60E-04	2.60E-07	3.1E-01	3.5E-01	#VALUE!	1.54	0.171506792	0.029536619	N		1.6E-04	4.0E-03	9.9E-02	2.8E-07	6.8E-06	1.7E-04	2.9E-05
152 Nitrophenol, 2-amino-4-	-3.7E+00	2.14E-04	2.14E-07	3.1E-01	3.4E-01	#VALUE!	1.87	0.155013874	-0.002265807	N		7.0E-05	1.7E-03	4.2E-02	1.3E-07	3.2E-06	7.8E-05	1.4E-05
153 3-Nitrophenol	-3.6E+00	2.60E-04	2.60E-07	3.2E-01	3.5E-01	#VALUE!	1.54	0.183304944	0.041324565	N		3.7E-03	5.5E-03	8.4E-03	6.2E-06	9.4E-06	1.4E-05	6.6E-04
154 4-Nitrophenol	-3.6E+00	2.60E-04	2.60E-07	3.2E-01	3.5E-01	#VALUE!	1.54	0.178250780	0.036270401	N		3.2E-03	4.8E-03	7.3E-03	5.4E-06	8.2E-06	1.2E-05	5.7E-04
155 Nitrophenol, 4-amino-2-	-3.7E+00	2.14E-04	2.14E-07	3.1E-01	3.4E-01	#VALUE!	1.87	0.132550923	-0.024728758	N		3.8E-05	9.3E-04	2.3E-02	7.0E-08	1.7E-06	4.3E-05	7.4E-06
156 Nitropropane, 2-	-3.4E+00	3.78E-04	3.78E-07	3.1E-01	3.4E-01	#VALUE!	1.06	0.087021421	-0.025248306	N		3.5E-05	8.8E-04	2.2E-02	4.9E-08	1.2E-06	3.1E-05	5.2E-06
157 Nitroso-di-n-butylamine, n-	-3.7E+00	2.03E-04	2.03E-07	3.1E-01	3.5E-01	#VALUE!	1.97	0.188554304	0.027090024	N		1.6E-04	3.8E-03	9.4E-02	3.0E-07	7.3E-06	1.8E-04	3.2E-05
158 Nitroso-N-ethylurea, n-	-3.5E+00	3.45E-04	3.45E-07	3.0E-01	3.3E-01	#VALUE!	1.16	0.072674310	-0.046841917	N		1.9E-05	4.9E-04	1.2E-02	2.8E-08	7.2E-07	1.8E-05	3.0E-06
159 Nitroso-N-methylurea, n-	-3.4E+00	4.13E-04	4.13E-07	3.0E-01	3.3E-01	#VALUE!	0.97	0.050928955	-0.054298398	N		1.5E-05	3.9E-04	1.0E-02	2.1E-08	5.3E-07	1.4E-05	2.2E-06
160 Nitrosodiethanamine, n-	-3.6E+00	2.77E-04	2.77E-07	3.0E-01	3.3E-01	#VALUE!	1.44	-0.020346186	-0.157111126	N		8.9E-07	2.5E-05	6.9E-04	1.5E-09	4.0E-08	1.1E-06	1.5E-07
161 Nitrosodiethylamine, n-	-3.3E+00	5.02E-04	5.02E-07	3.1E-01	3.4E-01	#VALUE!	0.80	0.071863432	-0.017952350	N		4.2E-05	1.0E-03	2.6E-02	5.1E-08	1.3E-06	3.2E-05	5.3E-06
162 Nitrosodiphenylamine, p-	-3.9E+00	1.21E-04	1.21E-07	3.9E-01	4.3E-01	#VALUE!	3.31	0.297695638	0.095406003	N		1.0E-03	2.6E-02	6.4E-01	2.5E-06	6.4E-05	1.6E-03	2.7E-04
163 Nitrosomethylvinylamine, n-	-3.3E+00	5.15E-04	5.15E-07	3.0E-01	3.3E-01	#VALUE!	0.78	0.043938289	-0.043938289	N		2.0E-05	5.1E-04	1.3E-02	2.4E-08	6.2E-07	1.6E-05	2.6E-06
164 Nitrosomorpholine, n-	-3.5E+00	3.49E-04	3.49E-07	3.0E-01	3.3E-01	#VALUE!	1.14	0.034538551	-0.083957043	N		6.9E-06	1.8E-04	4.6E-03	1.0E-08	2.6E-07	6.7E-06	1.1E-06
165 Nitrosomonocotine, n-	-3.8E+00	1.59E-04	1.59E-07	3.0E-01	3.3E-01	#VALUE!	2.52	0.092112883	-0.088743440	N								

CHEMICAL	log(Ds/lsc)	Dsc/lsc	Dsc	b	c	t_star1 B>0.6	t_star3 B<=0.6	EPD1-c Eq (3.9)	EPD2-c Eq (3.10)	outside EPD?	Chemical outside EPD (*)	Kp 95% LCI	Kp (cm/hr) predicted	Kp 95% UCI	DA_event1 ng/cm2-avg 95% LCI	DA_event1 ng/cm2-avg Average	DA_event1 ng/cm2-avg 95% UCI	DAD mg/kg-day 95% LCI
166 Nitrosopiperidine, n-	-4.8E+00	1.69E-05	1.69E-08	3.0E-01	3.3E-01	#VALUE!	23.60	0.198980680	-0.158547368	N		1.1E-06	2.9E-05	7.6E-04	7.5E-09	1.9E-07	5.0E-06	8.0E-07
167 n-Nonanol	-3.6E+00	2.43E-04	2.43E-07	5.7E-01	6.0E-01	#VALUE!	1.65	0.285331634	0.138094991	N		4.0E-02	7.8E-02	1.5E-01	6.9E-05	1.4E-04	2.7E-04	7.3E-03
168 n-Octanol	-3.5E+00	2.91E-04	2.91E-07	3.8E-01	4.2E-01	#VALUE!	1.37	0.233245986	0.100328835	N		1.6E-02	2.7E-02	4.7E-02	2.6E-05	4.4E-05	7.5E-05	2.7E-03
169 Parathion	-4.4E+00	3.65E-05	3.65E-08	3.6E-01	3.9E-01	#VALUE!	10.97	0.363584984	0.066580525	N		5.1E-04	1.3E-02	3.2E-01	2.1E-06	5.2E-05	1.3E-03	2.2E-04
* 170 PCB-chlorobiphenyl, 4-	-4.4E+00	3.60E-05	3.60E-08	1.7E+01	5.0E+00	20.27	11.11	0.514035499	0.216010406	Y	*	2.5E-02	7.5E-01	2.2E+01	6.9E-05	2.0E-03	6.1E-02	7.3E-03
* 171 PCB-hexachlorobiphenyl	-4.8E+00	1.48E-05	1.48E-08	7.8E+00	3.2E+00	47.90	27.10	0.561601990	0.193153160	Y	*	1.4E-02	4.3E-01	1.3E+01	5.1E-05	1.5E-03	4.6E-02	5.4E-03
** 172 Pentachloronitrobenzene	-4.5E+00	3.45E-05	3.45E-08	5.0E-01	5.4E-01	#VALUE!	11.60	0.411266823	0.109873638	N		1.6E-03	4.2E-02	1.1E+00	6.7E-06	1.7E-04	4.5E-03	7.1E-04
* 173 Pentachlorophenol	-4.3E+00	5.01E-05	5.01E-08	5.1E+00	2.6E+00	13.82	7.98	0.465030664	0.193133798	Y	*	1.4E-02	3.9E-01	1.1E+01	4.8E-05	1.4E-03	3.9E-02	5.1E-03
174 n-Pentanol	-3.3E+00	5.01E-04	5.01E-07	3.2E-01	3.5E-01	#VALUE!	0.80	0.132589947	0.042621070	N		3.4E-03	5.5E-03	8.9E-03	4.1E-06	6.6E-06	1.1E-05	4.3E-04
175 Pentanone, 4-methyl-2-	-3.4E+00	4.30E-04	4.30E-07	3.1E-01	3.4E-01	#VALUE!	0.93	0.117858973	0.015795585	N		1.1E-04	2.7E-03	6.6E-02	1.4E-07	3.5E-06	8.7E-05	1.5E-05
* 176 Phenanthrene	-3.8E+00	1.57E-04	1.57E-07	1.0E+00	9.3E-01	4.11	2.55	0.341400381	0.159523424	N		5.5E-03	1.4E-01	3.8E+00	1.2E-05	3.1E-04	8.3E-03	1.3E-03
177 Phenol	-3.3E+00	4.64E-04	4.64E-07	3.1E-01	3.4E-01	#VALUE!	0.86	0.130015698	0.033963844	N		2.7E-03	4.3E-03	7.0E-03	3.4E-06	5.5E-06	8.8E-06	3.6E-04
178 Phenol, 4,6-dinitro-2-methyl-	-3.9E+00	1.21E-04	1.21E-07	3.1E-01	3.4E-01	#VALUE!	3.30	0.220147426	0.017959854	N		1.3E-04	3.1E-03	7.6E-02	3.2E-07	7.7E-06	1.9E-04	3.3E-05
179 n-Propanol	-3.1E+00	7.21E-04	7.21E-07	3.1E-01	3.4E-01	#VALUE!	0.56	0.044709392	-0.016630704	N		5.6E-04	1.1E-03	2.0E-03	5.9E-07	1.1E-06	2.1E-06	6.2E-05
180 Propiolactone, beta-	-3.2E+00	6.18E-04	6.18E-07	3.0E-01	3.3E-01	#VALUE!	0.65	0.010910426	-0.062575213	N		1.2E-05	3.1E-04	8.0E-03	1.3E-08	3.4E-07	8.7E-06	1.4E-06
181 Propylene oxide	-3.1E+00	7.39E-04	7.39E-07	3.0E-01	3.3E-01	#VALUE!	0.54	0.031334136	-0.027964693	N		3.0E-05	7.7E-04	2.0E-02	3.1E-08	8.0E-07	2.1E-05	3.3E-06
182 Resorcinol	-3.8E+00	3.78E-04	3.78E-07	3.1E-01	3.4E-01	#VALUE!	1.06	0.101116900	-0.011265096	N		7.7E-04	1.3E-03	2.1E-03	1.1E-06	1.8E-06	3.0E-06	1.1E-04
183 Safrole	-3.7E+00	1.93E-04	1.93E-07	3.4E-01	3.7E-01	#VALUE!	2.08	0.232152031	0.066605216	N		4.6E-04	1.1E-02	2.8E-01	9.0E-07	2.2E-05	5.5E-04	9.5E-05
184 Styrene	-3.4E+00	4.08E-04	4.08E-07	4.0E-01	4.4E-01	#VALUE!	0.98	0.218788256	0.112540269	N		1.5E-03	3.7E-02	9.4E-01	2.0E-06	5.0E-05	1.3E-03	2.1E-04
185 Styrene oxide	-3.5E+00	3.32E-04	3.32E-07	3.1E-01	3.4E-01	#VALUE!	1.20	0.151651410	0.029175345	N		1.6E-04	3.9E-03	9.6E-02	2.4E-07	5.8E-06	1.4E-04	2.5E-05
* 186 TCDD	-4.6E+00	2.44E-05	2.44E-08	2.2E+01	5.6E+00	30.09	16.37	0.546192220	0.217548111	Y	*	2.7E-02	8.1E-01	2.5E+01	7.3E-05	2.2E-03	6.8E-02	7.7E-03
** 187 Tetrachlorethylene	-3.7E+00	1.84E-04	1.84E-07	4.1E-01	4.5E-01	#VALUE!	2.18	0.275545631	0.106324534	N		1.3E-03	3.3E-02	8.4E-01	2.7E-06	6.7E-05	1.7E-03	2.8E-04
** 188 Tetrachloroethane, 1,1,2,2-	-3.7E+00	1.79E-04	1.79E-07	3.2E-01	3.6E-01	#VALUE!	2.24	0.219898346	0.048533917	N		2.8E-04	6.9E-03	1.7E-01	5.8E-07	1.4E-05	3.5E-04	6.1E-05
189 Thioacetamide	-3.2E+00	5.94E-04	5.94E-07	3.1E-01	3.4E-01	#VALUE!	0.67	0.078145508	0.001597967	N		7.0E-05	1.8E-03	4.4E-02	7.8E-08	2.0E-06	4.9E-05	8.3E-06
190 Thiodianiline, 4,4'-	-4.0E+00	9.61E-05	9.61E-08	3.1E-01	3.4E-01	#VALUE!	4.16	0.224227935	0.003771017	N		8.8E-05	2.1E-03	5.2E-02	2.4E-07	6.0E-06	1.5E-04	2.6E-05
191 Thiourea	-3.2E+00	5.87E-04	5.87E-07	3.0E-01	3.3E-01	#VALUE!	0.68	-0.014565421	-0.092133596	N		5.1E-06	1.4E-04	3.7E-03	5.8E-09	1.5E-07	4.1E-06	6.1E-07
192 Thymol	-3.6E+00	2.25E-04	2.25E-07	4.2E-01	4.6E-01	#VALUE!	1.78	0.264220348	0.110910932	N		2.1E-02	3.7E-02	6.6E-02	3.8E-05	6.8E-05	1.2E-04	4.0E-03
193 Toluene	-3.3E+00	4.77E-04	4.77E-07	3.8E-01	4.1E-01	#VALUE!	0.84	0.200309830	0.106309450	N		1.2E-03	3.1E-02	7.8E-01	1.5E-06	3.9E-05	9.8E-04	1.6E-04
194 Toluidine hydrochloride, o-	-3.6E+00	2.46E-04	2.46E-07	3.1E-01	3.4E-01	#VALUE!	1.62	0.145520402	-0.000634369	N		7.2E-05	1.8E-03	4.4E-02	1.3E-07	3.1E-06	7.6E-05	1.3E-05
195 Toluidine, o-	-3.4E+00	3.93E-04	3.93E-07	3.1E-01	3.4E-01	#VALUE!	1.02	0.128731651	0.019523825	N		1.2E-04	3.0E-03	7.3E-02	1.6E-07	4.1E-06	1.0E-04	1.7E-05
196 Toxaphene	-5.1E+00	7.44E-06	7.44E-09	3.6E-01	4.0E-01	#VALUE!	53.75	0.481949772	0.059407345	N		4.5E-04	1.2E-02	3.1E-01	3.6E-06	9.5E-05	2.5E-03	3.8E-04
197 Trichlorobenzene, 1,2,4-	-3.8E+00	1.50E-04	1.50E-07	5.6E-01	5.9E-01	#VALUE!	2.66	0.316128886	0.130883837	N		2.6E-03	6.6E-02	1.7E+00	5.7E-06	1.5E-04	3.8E-03	6.1E-04
** 198 Trichloroethane, 1,1,1-	-3.6E+00	2.79E-04	2.79E-07	3.4E-01	3.7E-01	#VALUE!	1.43	0.207908149	0.071755590	N		5.1E-04	1.3E-02	3.1E-01	8.3E-07	2.1E-05	5.1E-04	8.8E-05
** 199 Trichloroethane, 1,1,2-	-3.6E+00	2.79E-04	2.79E-07	3.2E-01	3.5E-01	#VALUE!	1.43	0.183198903	0.047046344	N		2.6E-04	6.4E-03	1.6E-01	4.3E-07	1.0E-05	2.6E-04	4.5E-05
** 200 Trichloroethylene	-3.5E+00	2.87E-04	2.87E-07	3.4E-01	3.7E-01	#VALUE!	1.39	0.202956499	0.068845207	N		4.7E-04	1.2E-02	2.9E-01	7.6E-07	1.9E-05	4.6E-04	8.0E-05
** 201 Trichlorofluoromethane	-3.6E+00	2.65E-04	2.65E-07	3.4E-01	3.7E-01	#VALUE!	1.51	0.212195712	0.071960617	N		5.1E-04	1.3E-02	3.2E-01	8.6E-07	2.1E-05	5.3E-04	9.1E-05
202 2,4,6-Trichlorophenol	-3.9E+00	1.22E-04	1.22E-07	4.3E-01	4.7E-01	#VALUE!	3.27	0.307982802	0.106458642	N		1.9E-02	3.5E-02	6.2E-02	4.7E-05	8.5E-05	1.5E-04	5.0E-03
* 203 Tris(2,3-dibromopropyl)phosphate	-6.7E+00	1.91E-07	1.91E-10	3.1E-01	3.4E-01	#VALUE!	2098.53	0.635660836	-0.076333359	Y	*	1.3E-05	3.9E-04	1.1E-02	8.3E-07	2.4E-05	7.1E-04	8.7E-05
204 Tris(aziridinyl)-para-benzoquinone	-4.1E+00	7.89E-05	7.89E-08	3.0E-01	3.3E-01	#VALUE!	5.07	0.042785423	-0.193287194	N		3.7E-07	1.0E-05	2.8E-04	1.1E-09	3.1E-08	8.6E-07	1.2E-07
* 205 Urea	-3.1E+00	7.21E-04	7.21E-07	3.0E-01	3.3E-01	#VALUE!	0.55	-0.087873050	-0.149111082	Y	*	9.9E-07	2.9E-05	8.3E-04	1.0E-09	3.0E-08	8.6E-07	1.1E-07
** 206 Vinyl bromide	-3.4E+00	3.93E-04	3.93E-07	3.1E-01	3.4E-01	#VALUE!	1.02	0.142770995	0.033563170	N		1.8E-04	4.3E-03	1.1E-01	2.4E-07	6.0E-06	1.5E-04	2.6E-05
** 207 Vinyl chloride	-3.2E+00	6.99E-04	6.99E-07	3.1E-01	3.4E-01	#VALUE!	0.57	0.108268842	0.044479224	N		2.2E-04	5.6E-03	1.4E-01	2.4E-07	5.9E-06	1.5E-04	2.5E-05
* 208 Water	-2.9E+00	1.24E-03	1.24E-06	3.0E-01	3.3E-01	#VALUE!	0.32	-0.068306373	-0.086687989	N	*(signific	5.8E-05	1.5E-04	3.9E-04	4.9E-08	1.3E-07	3.3E-07	5.2E-06
209 Xylene, m-	-3.4E+00	3.97E-04	3.97E-07	4.5E-01	4.9E-01	#VALUE!	1.01	0.233899266	0.125507948	N		2.1E-03	5.3E-02	1.4E+00	2.9E-06	7.3E-05	1.8E-03	3.0E-04
Tetrahydrofuran	-3.2E+00	6.17E-04	6.17E-07	3.1E-01	3.4E-01	#VALUE!	0.65	0.0626	-0.0110	N		2.2E-03	1.3E-03	1.4E+00	2.4E-06	1.4E-06	1.5E-03	2.5E-04

CHEMICAL	log(Ds/lsc)	Dsc/lsc	Dsc	b	c	t_star1 B>0.6	t_star3 B<=0.6	EPD1-c Eq (3.9)	EPD2-c Eq (3.10)	outside EPD?	Chemical outside EPD (*)	Kp 95% LCI	Kp (cm/hr) predicted	Kp 95% UCI	DA_event 1g/cm2-avg 95% LCI	DA_event 2-avg Average	DA_event 1g/cm2-avg 95% UCI	DAD mg/kg-day 95% LCI
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Flynn's in vitro experimental data

- 1 Aldosterone
- 2 Amobarbital
- 3 Atropine
- 4 Barbitol
- 5 Benzyl alcohol
- 6 *4-Bromophenol*
- 7 *2,3-Butanediol*
- 8 Butanoic acid (butyric acid)
- 9 *n-Butanol*
- 10 2-Butanone
- 11 Butobarbital
- 12 *4-Chlorocresol*
- 13 *2-Chlorophenol*
- 14 *4-Chlorophenol*
- 15 Chloroxylenol
- 16 Codeine
- 17 Cortexolone (11-desoxy-17-hydroxyc
- 18 Cortexone (deoxycorticosterone)
- 19 Corticosterone
- 20 Cortisone
- 21 *o-Cresol*
- 22 *m-Cresol*
- 23 *p-Cresol*
- 24 *n-Decanol*
- 25 *2,4-Dichlorophenol*
- 26 Digitoxin
- 27 Ephedrine
- 28 B-estradiol
- 29 B-estradiol (2)
- 30 Estriol
- 31 Estrone
- 32 *Ethanol*
- 33 *2-Ethoxy ethanol (Cellosolve)*
- 34 *Ethyl ether*
- 35 *4-Ethylphenol*
- 36 Etorphine
- 37 Fentanyl
- 38 Fentanyl (2)
- 39 Fluocinonide
- 40 Heptanoic acid (enanthic acid)
- 41 *n-Heptanol*
- 42 Hexanoic acid (caproic acid)
- 43 *n-Hexanol*
- 44 Hydrocortisone
- 45 Hydrocortisone (2)
- 46 [Hydrocortisone-21-yl]-N,N dimethyl :
- 47 [Hydrocortisone-21-yl]-hemipimelate
- 48 [Hydrocortisone-21-hemisuccinate
- 49 [Hydrocortisone-21-yl]-hexanoate
- 50 [Hydrocortisone-21-yl]-6-hydroxy hex
- 51 [Hydrocortisone-21-yl]-octanoate
- 52 [Hydrocortisone-21-yl]-pimelamate



CHEMICAL	DAD	DAD	Derm/	Derm/	Derm/
	ng/kg-day	mg/kg-day	Drink	Drink	Drink
	Average	95% UCI	95% LCI	Average	95% UCI Kp
1 Acetaldehyde	6.4E-05	1.7E-03	0%	1%	14%
2 Acetamide	1.2E-05	3.2E-04	0%	0%	3%
3 Acetylaminofluorene, 2-	3.8E-03	9.5E-02	1%	33%	810%
4 Acrolein	7.0E-05	1.8E-03	0%	1%	15%
5 Acrylamide	2.6E-05	6.8E-04	0%	0%	6%
6 Acrylonitrile	1.2E-04	3.1E-03	0%	1%	27%
7 Aldrin	1.1E-03	2.7E-02	0%	9%	227%
** 8 Allyl chloride	6.4E-04	1.6E-02	0%	5%	136%
9 Amino-2-methylantraquinone, 1-	1.8E-03	4.4E-02	1%	15%	373%
10 Aminoanthraquinone, 2-	7.2E-04	1.8E-02	0%	6%	150%
11 Aminoazobenzene, p-	1.8E-03	4.3E-02	1%	15%	367%
12 Aminoazotoluene, o-	1.1E-02	2.7E-01	4%	91%	2314%
13 Aminobiphenyl, 4-	2.8E-03	6.9E-02	1%	24%	584%
14 Aniline	2.5E-04	6.2E-03	0%	2%	53%
15 Anisidine, o-	2.7E-04	6.7E-03	0%	2%	57%
16 Auramine	4.1E-03	1.0E-01	1%	35%	870%
17 Benzene	1.8E-03	4.5E-02	1%	15%	381%
18 Benzidine	2.7E-04	6.6E-03	0%	2%	56%
* 19 Benzo-a-anthracene	1.5E-01	4.2E+00	45%	1283%	36172%
* 20 Benzo-a-pyrene	2.6E-01	7.5E+00	75%	2186%	63553%
* 21 Benzo-b-fluoranthene	2.6E-01	7.6E+00	76%	2221%	64633%
22 Benzoic acid	9.1E-04	2.2E-02	0%	8%	190%
23 Benzotrichloride	2.8E-03	7.0E-02	1%	24%	593%
24 Benzyl chloride	1.7E-03	4.2E-02	1%	14%	357%
25 Bis(2-chloroethyl)ether	3.3E-04	8.0E-03	0%	3%	68%
** 26 Bromodichloromethane	9.7E-04	2.4E-02	0%	8%	202%
** 27 Bromoform	8.4E-04	2.0E-02	0%	7%	174%
** 28 Bromomethane	3.8E-04	9.5E-03	0%	3%	81%
29 Bromophenol, p-	2.0E-03	3.0E-03	11%	17%	25%
30 Butadiene, 1,3-	1.7E-03	4.4E-02	1%	15%	373%
31 2,3-Butanediol	1.6E-05	3.6E-05	0%	0%	0%
32 n-Butanol	2.7E-04	4.7E-04	1%	2%	4%
33 Butoxyethanol, 2-	1.9E-04	4.7E-03	0%	2%	40%
34 Captan	6.0E-04	1.5E-02	0%	5%	124%
35 Carbon disulfide	2.1E-03	5.2E-02	1%	18%	446%
** 36 Carbon tetrachloride	3.2E-03	8.0E-02	1%	27%	678%
37 Chlordane	2.7E-02	7.4E-01	8%	231%	6332%
38 Chlordane (cis)	2.4E-02	6.6E-01	8%	208%	5656%
39 Chlordane (trans)	2.4E-02	6.6E-01	8%	208%	5656%
40 Chlorobenzene	4.2E-03	1.1E-01	1%	36%	908%
41 4-Chlorocresol	5.2E-03	9.0E-03	26%	44%	76%
** 42 Chlorodibromomethane	9.0E-04	2.2E-02	0%	8%	187%
** 43 Chloroethane	6.7E-04	1.7E-02	0%	6%	143%
** 44 Chloroform	1.1E-03	2.7E-02	0%	9%	226%
** 45 Chloromethane	3.4E-04	8.7E-03	0%	3%	74%
46 2-Chlorophenol	1.3E-03	2.1E-03	7%	11%	18%
47 4-Chlorophenol	1.9E-03	3.0E-03	10%	16%	26%
48 Chlorothalonil	6.8E-03	1.7E-01	2%	58%	1450%
* 49 Chrysene	1.5E-01	4.2E+00	45%	1283%	36172%
50 Cresidine, p-	6.0E-04	1.5E-02	0%	5%	127%
51 m-Cresol	1.1E-03	1.8E-03	6%	10%	15%
52 o-Cresol	1.1E-03	1.8E-03	6%	10%	15%
53 p-Cresol	1.1E-03	1.8E-03	6%	10%	15%
* 54 DDD	8.3E-02	2.3E+00	25%	703%	19664%
* 55 DDE	7.1E-02	2.0E+00	22%	602%	16700%

CHEMICAL	DAD ng/kg-day	DAD mg/kg-day	Derm/ Drink	Derm/ Drink	Derm/ Drink
	Average	95% UCI	95% LCI	Average	95% UCI Kp
* 56 DDT	1.4E-01	4.0E+00	40%	1156%	33682%
* 57 <i>n-Decanol</i>	4.5E-02	1.0E-01	164%	380%	880%
58 Di-2-ethylhexyl phthalate	1.8E-02	4.8E-01	6%	155%	4120%
59 Diaminoanisole, 2,4-	3.9E-05	9.9E-04	0%	0%	8%
60 Diaminotoluene	8.7E-05	2.2E-03	0%	1%	19%
61 Diaminotoluene, 2,4-	7.3E-04	1.8E-02	0%	6%	152%
* 62 Dibenzo(a,h)anthracene	4.0E-01	1.2E+01	110%	3388%	104681%
63 Dibutyl phthalate	9.5E-03	2.4E-01	3%	81%	2048%
64 Dichlorobenzene, 1,2-	7.8E-03	2.0E-01	3%	66%	1673%
65 Dichlorobenzene, 1,3-	1.1E-02	2.8E-01	4%	93%	2362%
66 Dichlorobenzene, 1,4-	7.9E-03	2.0E-01	3%	67%	1699%
67 Dichlorobenzidine, 3,3'	4.8E-03	1.2E-01	2%	41%	1013%
** 68 Dichlorodifluoromethane	1.4E-03	3.5E-02	0%	12%	299%
** 69 Dichloroethane, 1,1-	9.3E-04	2.3E-02	0%	8%	196%
** 70 Dichloroethane, 1,2-	5.8E-04	1.4E-02	0%	5%	122%
** 71 Dichloroethylene, 1,1-	1.6E-03	3.9E-02	1%	14%	336%
** 72 Dichloroethylene, 1,2- (trans)	1.0E-03	2.6E-02	0%	9%	222%
73 2,4-Dichlorophenol	4.3E-03	7.1E-03	22%	37%	61%
** 74 Dichloropropane, 1,2-	1.2E-03	2.9E-02	0%	10%	247%
** 75 Dichloropropene, 1,3-	6.4E-04	1.6E-02	0%	5%	135%
76 Dichlorvos	2.6E-04	6.3E-03	0%	2%	54%
77 Dieldrin	8.3E-03	2.2E-01	3%	71%	1841%
78 Diepoxybutane	3.9E-06	1.1E-04	0%	0%	1%
79 Diethyl phthalate	1.2E-03	2.9E-02	0%	10%	247%
80 Diethyl sulfate	2.4E-04	5.9E-03	0%	2%	51%
81 Dimethoxybenzidine, 3,3'-	3.5E-04	8.6E-03	0%	3%	73%
82 Dimethyl phthalate	3.5E-04	8.7E-03	0%	3%	74%
83 Dimethyl sulfate	3.0E-04	7.4E-03	0%	3%	63%
84 Dimethylamine, n-nitroso-	3.0E-05	7.7E-04	0%	0%	7%
85 Dimethylaminoazobenzene, 4-	2.9E-02	7.7E-01	10%	251%	6579%
86 Dimethylbenzidine, 3,3'-	1.0E-03	2.5E-02	0%	9%	216%
87 Dimethylcarbamyl chloride	5.7E-05	5.0E-04	0%	0%	4%
88 Dimethylhydrazine, 1,1-	8.0E-06	2.2E-04	0%	0%	2%
89 Dimethylphenol, 2,4-	1.7E-03	4.3E-02	1%	15%	368%
90 Dimethylphenol, 3,4-	1.6E-03	3.9E-02	1%	13%	331%
91 Dinitrophenol, 2,4-	3.7E-04	9.0E-03	0%	3%	76%
92 Dinitrotoluene, 2,4-	7.3E-04	1.8E-02	0%	6%	151%
93 Dinitrotoluene, 2,6-	4.9E-04	1.2E-02	0%	4%	102%
94 Dioxane, 1,4-	4.3E-05	1.1E-03	0%	0%	9%
95 Diphenylamine, n-nitroso-	3.8E-03	9.4E-02	1%	32%	804%
96 Diphenylhydrazine, 1,2-	3.1E-03	7.7E-02	1%	27%	657%
97 Dipropylamine, n-nitroso-	3.9E-04	9.7E-03	0%	3%	83%
98 Endrin	8.3E-03	2.2E-01	3%	71%	1841%
99 Epichlorohydrin	4.6E-05	1.2E-03	0%	0%	10%
100 Ethanol	5.5E-05	1.1E-04	0%	0%	1%
101 Ethanol, 2-(2-butoxyethoxy)-	9.8E-06	2.6E-04	0%	0%	2%
102 Ethanol, 2-(2-ethoxyethoxy)-	4.2E-05	1.1E-03	0%	0%	9%
103 Ethanol, 2-(2-methoxyethoxy)-	2.8E-05	7.2E-04	0%	0%	6%
104 2-Ethoxy ethanol (Cellosolve)	3.9E-05	7.9E-05	0%	0%	1%
105 Ethoxyethyl acetate, 2-	1.3E-04	3.3E-03	0%	1%	28%
106 Ethyl acrylate	4.5E-04	1.1E-02	0%	4%	95%
107 Ethyl carbamate	5.1E-05	1.3E-03	0%	0%	11%
108 Ethyl ether	2.8E-04	4.7E-04	1%	2%	4%
109 Ethylbenzene	7.1E-03	1.8E-01	2%	61%	1538%
110 Ethylene oxide	5.7E-05	1.5E-03	0%	0%	13%

CHEMICAL	DAD ng/kg-day	DAD mg/kg-day	Derm/ Drink	Derm/ Drink	Derm/ Drink
	Average	95% UCI	95% LCI	Average	95% UCI Kp
** 111 Ethylenedibromide	6.8E-04	1.7E-02	0%	6%	141%
112 Ethyleneimine	1.6E-05	4.4E-04	0%	0%	4%
113 Ethylenethiourea	2.2E-05	5.9E-04	0%	0%	5%
114 4-Ethylphenol	2.7E-03	4.4E-03	14%	23%	37%
* 115 Fluoranthene	6.0E-02	1.6E+00	19%	512%	13809%
116 Formaldehyde	1.7E-04	4.4E-03	0%	1%	37%
117 Glycerol	4.3E-06	1.2E-04	0%	0%	1%
118 Heptachlor	5.6E-03	1.4E-01	2%	48%	1224%
119 n-Heptanol	3.0E-03	4.9E-03	15%	25%	42%
* 120 Hexachlorobenzene	5.5E-02	1.5E+00	17%	469%	12729%
** 121 Hexachlorobutadiene	2.9E-02	7.5E-01	9%	243%	6411%
** 122 Hexachloroethane	1.0E-02	2.6E-01	3%	86%	2180%
123 Hexamethylphosphoramide	3.8E-05	9.5E-04	0%	0%	8%
124 n-Hexanol	1.3E-03	2.1E-03	7%	11%	18%
* 125 Hydrazine/Hydrazine sulfate	4.2E-06	1.2E-04	0%	0%	1%
* 126 Indeno(1,2,3-CD)pyrene	2.7E-01	8.2E+00	77%	2307%	69550%
127 Isophorone	6.0E-04	1.5E-02	0%	5%	126%
128 Lindane	4.6E-03	1.2E-01	2%	40%	989%
129 Mechlorethamine	2.1E-04	5.3E-03	0%	2%	45%
130 Methanol	3.0E-05	7.0E-05	0%	0%	1%
131 Methoxyethanol, 2-	2.1E-05	5.7E-04	0%	0%	5%
132 Methoxypropan-2-ol, 1-	4.8E-05	1.2E-03	0%	0%	11%
133 Methyl ethyl ketone	1.1E-04	2.8E-03	0%	1%	24%
134 Methyl-4-hydroxy benzoate	8.6E-04	1.3E-03	5%	7%	11%
** 135 Methyl iodide	4.6E-04	1.1E-02	0%	4%	96%
136 Methylaziridine, 2-	3.3E-05	8.6E-04	0%	0%	7%
137 Methylene bis(2-chloroaniline), 4,4'-	7.6E-03	1.9E-01	3%	65%	1631%
138 Methylene bis(N,N'-dimethyl)aniline,	3.2E-02	8.3E-01	10%	270%	7105%
** 139 Methylene chloride	4.5E-04	1.1E-02	0%	4%	95%
140 Methylenedianiline, 4,4'-	3.6E-04	8.8E-03	0%	3%	75%
141 Michler's ketone	9.2E-03	2.3E-01	3%	78%	1984%
** 142 Mustard Gas	9.1E-04	2.2E-02	0%	8%	190%
143 Naphthalene	7.8E-03	2.0E-01	3%	66%	1675%
144 2-Naphthol	3.5E-03	5.7E-03	18%	30%	48%
145 Naphthylamine, 1-	1.4E-03	3.5E-02	0%	12%	296%
146 Naphthylamine, 2-	1.5E-03	3.6E-02	1%	13%	310%
147 Nitrotriacetic acid	2.5E-05	6.5E-04	0%	0%	6%
148 Nitro-o-anisidine, 5-	4.0E-04	9.9E-03	0%	3%	84%
149 Nitrobiphenyl, 4-	1.0E-02	2.6E-01	3%	86%	2174%
* 150 Nitrofen	7.7E-02	2.1E+00	24%	660%	18187%
151 Nitrophenol, 2-	7.2E-04	1.8E-02	0%	6%	150%
152 Nitrophenol, 2-amino-4-	3.4E-04	8.3E-03	0%	3%	71%
153 3-Nitrophenol	9.9E-04	1.5E-03	6%	8%	13%
154 4-Nitrophenol	8.6E-04	1.3E-03	5%	7%	11%
155 Nitrophenol, 4-amino-2-	1.8E-04	4.5E-03	0%	2%	39%
156 Nitropropane, 2-	1.3E-04	3.3E-03	0%	1%	28%
157 Nitroso-di-n-butylamine, n-	7.7E-04	1.9E-02	0%	7%	162%
158 Nitroso-N-ethylurea, n-	7.6E-05	1.9E-03	0%	1%	16%
159 Nitroso-N-methylurea, n-	5.6E-05	1.4E-03	0%	0%	12%
160 Nitrosodiethanolamine, n-	4.3E-06	1.2E-04	0%	0%	1%
161 Nitrosodiethylamine, n-	1.3E-04	3.4E-03	0%	1%	29%
162 Nitrosodiphenylamine, p-	6.7E-03	1.7E-01	2%	57%	1433%
163 Nitrosomethylvinylamine, n-	6.5E-05	1.7E-03	0%	1%	14%
164 Nitrosomorpholine, n-	2.7E-05	7.1E-04	0%	0%	6%
165 Nitrosornicotine, n-	3.8E-05	9.7E-04	0%	0%	8%



CHEMICAL	DAD ng/kg-day	DAD mg/kg-day	Derm/ Drink	Derm/ Drink	Derm/ Drink
	Average	95% UCI	95% LCI	Average	95% UCI Kp
166 Nitrosopiperidine, n-	2.1E-05	5.3E-04	0%	0%	5%
167 <i>n</i> -Nonanol	1.4E-02	2.8E-02	62%	122%	240%
168 <i>n</i> -Octanol	4.6E-03	7.9E-03	23%	39%	68%
169 Parathion	5.5E-03	1.4E-01	2%	47%	1175%
* 170 PCB-chlorobiphenyl, 4-	2.2E-01	6.5E+00	62%	1844%	54977%
* 171 PCB-hexachlorobiphenyl	1.6E-01	4.9E+00	46%	1378%	41414%
** 172 Pentachloronitrobenzene	1.8E-02	4.8E-01	6%	157%	4091%
* 173 Pentachlorophenol	1.4E-01	4.1E+00	43%	1226%	34780%
174 <i>n</i> -Pentanol	7.0E-04	1.1E-03	4%	6%	10%
175 Pentanone, 4-methyl-2-	3.7E-04	9.2E-03	0%	3%	78%
* 176 Phenanthrene	3.3E-02	8.7E-01	11%	283%	7446%
177 Phenol	5.8E-04	9.3E-04	3%	5%	8%
178 Phenol, 4,6-dinitro-2-methyl-	8.1E-04	2.0E-02	0%	7%	169%
179 <i>n</i> -Propanol	1.2E-04	2.2E-04	1%	1%	2%
180 Propiolactone, beta-	3.5E-05	9.2E-04	0%	0%	8%
181 Propylene oxide	8.5E-05	2.2E-03	0%	1%	18%
182 Resorcinol	1.9E-04	3.2E-04	1%	2%	3%
183 Safrole	2.3E-03	5.8E-02	1%	20%	492%
184 Styrene	5.3E-03	1.3E-01	2%	45%	1141%
185 Styrene oxide	6.2E-04	1.5E-02	0%	5%	130%
* 186 TCDD	2.4E-01	7.2E+00	66%	2003%	61044%
** 187 Tetrachlorethylene	7.1E-03	1.8E-01	2%	60%	1521%
** 188 Tetrachloroethane, 1,1,2,2-	1.5E-03	3.7E-02	1%	13%	312%
189 Thioacetamide	2.1E-04	5.2E-03	0%	2%	45%
190 Thiodianiline, 4,4'-	6.3E-04	1.5E-02	0%	5%	131%
191 Thiourea	1.6E-05	4.4E-04	0%	0%	4%
192 Thymol	7.2E-03	1.3E-02	34%	61%	108%
193 Toluene	4.1E-03	1.0E-01	1%	35%	879%
194 Toluidine hydrochloride, o-	3.3E-04	8.0E-03	0%	3%	68%
195 Toluidine, o-	4.3E-04	1.1E-02	0%	4%	91%
196 Toxaphene	1.0E-02	2.6E-01	3%	85%	2248%
197 Trichlorobenzene, 1,2,4-	1.6E-02	4.0E-01	5%	133%	3407%
** 198 Trichloroethane, 1,1,1-	2.2E-03	5.4E-02	1%	19%	458%
** 199 Trichloroethane, 1,1,2-	1.1E-03	2.7E-02	0%	9%	233%
** 200 Trichloroethylene	2.0E-03	4.9E-02	1%	17%	417%
** 201 Trichlorofluoromethane	2.3E-03	5.6E-02	1%	19%	475%
202 2,4,6-Trichlorophenol	9.0E-03	1.6E-02	43%	77%	138%
* 203 Tris(2,3-dibromopropyl)phosphate	2.6E-03	7.5E-02	1%	22%	642%
204 Tris(aziridinyl)-para-benzoquinone	3.3E-06	9.1E-05	0%	0%	1%
* 205 Urea	3.2E-06	9.1E-05	0%	0%	1%
** 206 Vinyl bromide	6.3E-04	1.6E-02	0%	5%	133%
** 207 Vinyl chloride	6.3E-04	1.6E-02	0%	5%	133%
* 208 Water	1.4E-05	3.5E-05	0%	0%	0%
209 Xylene, m-	7.7E-03	2.0E-01	3%	65%	1663%
Tetrahydrofuran	1.5E-04	1.6E-01	2%	1%	1370%

## CHEMICAL

DAD	DAD	Derm/	Derm/	Derm/
ng/kg-day	mg/kg-day	Drink	Drink	Drink
Average	95% UCI	95% LCI	Average	95% UCI Kp

Flynn's in vitro experimental data

- 1 Aldosterone
- 2 Amobarbital
- 3 Atropine
- 4 Barbitol
- 5 Benzyl alcohol
- 6 *4-Bromophenol*
- 7 *2,3-Butanediol*
- 8 Butanoic acid (butyric acid)
- 9 *n-Butanol*
- 10 2-Butanone
- 11 Butobarbital
- 12 *4-Chlorocresol*
- 13 *2-Chlorophenol*
- 14 *4-Chlorophenol*
- 15 Chloroxylenol
- 16 Codeine
- 17 Cortisol (11-desoxy-17-hydroxyc)
- 18 Cortisone (deoxycorticosterone)
- 19 Corticosterone
- 20 Cortisone
- 21 *o-Cresol*
- 22 *m-Cresol*
- 23 *p-Cresol*
- 24 *n-Decanol*
- 25 *2,4-Dichlorophenol*
- 26 Digitoxin
- 27 Ephedrine
- 28 B-estradiol
- 29 B-estradiol (2)
- 30 Estriol
- 31 Estrone
- 32 *Ethanol*
- 33 *2-Ethoxy ethanol (Cellosolve)*
- 34 *Ethyl ether*
- 35 *4-Ethylphenol*
- 36 Etorphine
- 37 Fentanyl
- 38 Fentanyl (2)
- 39 Fluocinonide
- 40 Heptanoic acid (enanthic acid)
- 41 *n-Heptanol*
- 42 Hexanoic acid (caproic acid)
- 43 *n-Hexanol*
- 44 Hydrocortisone
- 45 Hydrocortisone (2)
- 46 [Hydrocortisone-21-yl]-N,N dimethyl :
- 47 [Hydrocortisone-21-yl]-hemipimelate
- 48 [Hydrocortisone-21-hemisuccinate
- 49 [Hydrocortisone-21-yl]-hexanoate
- 50 [Hydrocortisone-21-yl]-6-hydroxy hex
- 51 [Hydrocortisone-21-yl]-octanoate
- 52 [Hydrocortisone-21-yl]-pimelamate

## CHEMICAL

DAD	DAD	Derm/	Derm/	Derm/	
ng/kg-day	mg/kg-day	Drink	Drink	Drink	
Average	95% UCI	95% LCI	Average	95% UCI	Kp

- 53 [Hydrocortisone-21-yl]-propionate
- 54 [Hydrocortisone-21-yl]-succinamate
- 55 Hydromorphone
- 56 Hydroxypregnenolone
- 57 17a-Hydroxyprogesterone
- 58 Isoquinoline
- 59 Meperidine
- 60 *Methanol*
- 61 Methyl-[hydrocortisone-21-yl]-succinate
- 62 Methyl-[hydrocortisone-21-yl]-pimelate
- 63 *Methyl-4-hydroxy benzoate*
- 64 Morphine
- 65 *2-Naphthol*
- 66 Naproxen
- 67 Nicotine
- 68 Nitroglycerine
- 69 *3-Nitrophenol*
- 70 *4-Nitrophenol*
- 71 *n-Nonanol*
- 72 Octanoic acid (caprylic acid)
- 73 *n-Octanol*
- 74 Pentanoic acid (valeric acid)
- 75 *n-Pentanol*
- 76 Phenobarbital
- 77 *Phenol*
- 78 Pregnenolone
- 79 Progesterone
- 80 *n-Propanol*
- 81 *Resorcinol*
- 82 Salicylic acid
- 83 Scopolamine
- 84 Sucrose
- 85 Sufentanyl
- 86 Testosterone
- 87 *Thymol*
- 88 *2,4,6-Trichlorophenol*
- 89 *Water*
- 90 3,4-Xylenol

OU7

# Site-specific

## Composite Worker Equation Inputs for Soil

Variable	Value
TR (target cancer risk) unitless	1.0E-5
THQ (target hazard quotient) unitless	1
AT <sub>w</sub> (averaging time)	365
EF <sub>w</sub> (exposure frequency) d/yr	250
ED <sub>w</sub> (exposure duration) yr	25
ET <sub>w</sub> (exposure time) hr	8
LT (lifetime) yr	70
BW <sub>w</sub> (body weight)	80
IR <sub>w</sub> (soil ingestion rate) mg/day	100
SA <sub>w</sub> (surface area) cm <sup>2</sup> /day	3527
AF <sub>w</sub> (skin adherence factor) mg/cm <sup>2</sup>	0.12
City (Climate Zone) PEF Selection	0
A <sub>s</sub> (acres)	.5
Q/C <sub>wp</sub> (g/m <sup>2</sup> -s per kg/m <sup>3</sup> )	93.77
PEF (particulate emission factor) m <sup>3</sup> /kg	1359344438
A (PEF Dispersion Constant)	16.2302
B (PEF Dispersion Constant)	18.7762
C (PEF Dispersion Constant)	216.108
V (fraction of vegetative cover) unitless	0.5
U <sub>m</sub> (mean annual wind speed) m/s	4.69
U <sub>t</sub> (equivalent threshold value)	11.32
F(x) (function dependant on U <sub>m</sub> /U <sub>t</sub> ) unitless	0.194
City (Climate Zone) VF Selection	0
A <sub>s</sub> (acres)	.5
Q/C <sub>vol</sub> (g/m <sup>2</sup> -s per kg/m <sup>3</sup> )	68.18
foc (fraction organic carbon in soil) g/g	0.006
&rho; <sub>b</sub> (dry soil bulk density) g/cm <sup>3</sup>	1.5
&rho; <sub>s</sub> (soil particle density) g/cm <sup>3</sup>	2.65
n (total soil porosity) L <sub>pore</sub> /L <sub>soil</sub>	0.43396
&theta; <sub>a</sub> (air-filled soil porosity) L <sub>air</sub> /L <sub>soil</sub>	0.28396
&theta; <sub>w</sub> (water-filled soil porosity) L <sub>water</sub> /L <sub>soil</sub>	0.15
T (exposure interval) s	819936000
A (VF Dispersion Constant)	11.911

# Site-specific

## Composite Worker Equation Inputs for Soil

Variable	Value
B (VF Dispersion Constant)	18.4385
C (VF Dispersion Constant)	209.7845
City (Climate Zone) VF <sub>ml</sub> Selection	0
VF <sub>s</sub> (volitization factor) m <sup>3</sup> /kg	.
Q/C <sub>vol</sub> (g/m <sup>2</sup> -s per kg/m <sup>3</sup> )	68.18365
A <sub>s</sub> (acres)	.5
T (exposure interval) yr	26
d <sub>s</sub> (depth of source) m	.
&rho; <sub>b</sub> (dry soil bulk density) g/cm <sup>3</sup>	1.5
A (VF Dispersion Constant - Mass Limit)	11.911
B (VF Dispersion Constant - Mass Limit)	18.4385
C (VF Dispersion Constant - Mass Limit)	209.7845

# Site-specific

## Composite Worker Screening Levels (RSL) for Soil

ca=Cancer, nc=Noncancer, ca\* (Where nc SL < 100 x ca SL),  
 ca\*\* (Where nc SL < 10 x ca SL), max=SL exceeds ceiling limit (see User's Guide), sat=SL exceeds csat,  
 Smax=Soil SL exceeds ceiling limit and has been substituted with the max value (see User's Guide),  
 Ssat=Soil inhalation SL exceeds csat and has been substituted with the csat

Chemical	CAS Number	Mutagen?	VOC?	Ingestion SF (mg/kg-day) <sup>-1</sup>	SFO Ref	Inhalation Unit Risk (ug/m <sup>3</sup> ) <sup>-1</sup>	IUR Ref	Chronic RfD (mg/kg-day)	Chronic RfD Ref	Chronic RfC (mg/m <sup>3</sup> )
Polychlorinated Biphenyls (high risk)	1336-36-3	No	Yes	2.00E+00	U	5.71E-04	U	-		-
TCDD, 2,3,7,8-	1746-01-6	No	Yes	1.30E+05	U	3.80E+01	U	7.00E-10	U	4.00E-08

Chemical	Chronic RfC Ref	GIABS	ABS	RBA	Volatilization Factor (m <sup>3</sup> /kg)	Henry's Law Constant (atm-m <sup>3</sup> /mol)	Soil Saturation Concentration (mg/kg)	Particulate Emission Factor (m <sup>3</sup> /kg)	Ingestion SL TR=1.0E-5 (mg/kg)
Polychlorinated Biphenyls (high risk)		1	0.14	1	5.32E+05	0.017	-	1.36E+09	1.64E+01
TCDD, 2,3,7,8-	U	1	0.03	1	1.96E+06	0.00204	-	1.36E+09	2.52E-04

Chemical	Dermal SL TR=1.0E-5 (mg/kg)	Inhalation SL TR=1.0E-5 (mg/kg)	Carcinogenic SL TR=1.0E-5 (mg/kg)	Ingestion SL THQ=1 (mg/kg)	Dermal SL THQ=1 (mg/kg)	Inhalation SL THQ=1 (mg/kg)	Noncarcinogenic SL THI=1 (mg/kg)	Screening Level (mg/kg)
Polychlorinated Biphenyls (high risk)	2.76E+01	1.14E+02	9.42E+00	-	-	-	-	9.42E+00 ca
TCDD, 2,3,7,8-	1.98E-03	6.33E-03	2.16E-04	8.18E-04	6.44E-03	3.44E-01	7.24E-04	2.16E-04 ca**

# Site-specific

## Resident Equation Inputs for Soil

Variable	Value
THQ (target hazard quotient) unitless	1
TR (target risk) unitless	0.000033
LT (lifetime) years	70
ET <sub>res</sub> (exposure time) hours/day	24
ET <sub>res-c</sub> (child exposure time) hours/day	24
ET <sub>res-a</sub> (adult exposure time) hours/day	24
ET <sub>0-2</sub> (mutagenic exposure time) hours/day	24
ET <sub>2-6</sub> (mutagenic exposure time) hours/day	24
ET <sub>6-16</sub> (mutagenic exposure time) hours/day	24
ET <sub>16-26</sub> (mutagenic exposure time) hours/day	24
ED <sub>res</sub> (exposure duration) years	26
ED <sub>res-c</sub> (exposure duration - child) years	6
ED <sub>res-a</sub> (exposure duration - adult) years	20
ED <sub>0-2</sub> (mutagenic exposure duration) years	2
ED <sub>2-6</sub> (mutagenic exposure duration) years	4
ED <sub>6-16</sub> (mutagenic exposure duration) years	10
ED <sub>16-26</sub> (mutagenic exposure duration) years	10
BW <sub>res-c</sub> (body weight - child) kg	15
BW <sub>res-a</sub> (body weight - adult) kg	80
BW <sub>0-2</sub> (mutagenic body weight) kg	15
BW <sub>2-6</sub> (mutagenic body weight) kg	15
BW <sub>6-16</sub> (mutagenic body weight) kg	80
BW <sub>16-26</sub> (mutagenic body weight) kg	80
SA <sub>res-c</sub> (skin surface area - child) cm <sup>2</sup> /day	2373
SA <sub>res-a</sub> (skin surface area - adult) cm <sup>2</sup> /day	6032
SA <sub>0-2</sub> (mutagenic skin surface area) cm <sup>2</sup> /day	2373
SA <sub>2-6</sub> (mutagenic skin surface area) cm <sup>2</sup> /day	2373
SA <sub>6-16</sub> (mutagenic skin surface area) cm <sup>2</sup> /day	6032
SA <sub>16-26</sub> (mutagenic skin surface area) cm <sup>2</sup> /day	6032
EF <sub>res</sub> (exposure frequency) days/year	350
EF <sub>res-c</sub> (exposure frequency - child) days/year	350
EF <sub>res-a</sub> (exposure frequency - adult) days/year	350
EF <sub>0-2</sub> (mutagenic exposure frequency) days/year	350



# Site-specific

## Resident Equation Inputs for Soil

Variable	Value
EF <sub>2-6</sub> (mutagenic exposure frequency) days/year	350
EF <sub>6-16</sub> (mutagenic exposure frequency) days/year	350
EF <sub>16-26</sub> (mutagenic exposure frequency) days/year	350
IFS <sub>res-adj</sub> (age-adjusted soil ingestion factor) mg/kg	36750
IFSM <sub>res-adj</sub> (mutagenic age-adjusted soil ingestion factor) mg/kg	166833.33
IRS <sub>res-c</sub> (soil intake rate - child) mg/day	200
IRS <sub>res-a</sub> (soil intake rate - adult) mg/day	100
IRS <sub>0-2</sub> (mutagenic soil intake rate) mg/day	200
IRS <sub>2-6</sub> (mutagenic soil intake rate) mg/day	200
IRS <sub>6-16</sub> (mutagenic soil intake rate) mg/day	100
IRS <sub>16-26</sub> (mutagenic soil intake rate) mg/day	100
AF <sub>res-a</sub> (skin adherence factor - adult) mg/cm <sup>2</sup>	0.07
AF <sub>res-c</sub> (skin adherence factor - child) mg/cm <sup>2</sup>	0.2
AF <sub>0-2</sub> (mutagenic skin adherence factor) mg/cm <sup>2</sup>	0.2
AF <sub>2-6</sub> (mutagenic skin adherence factor) mg/cm <sup>2</sup>	0.2
AF <sub>6-16</sub> (mutagenic skin adherence factor) mg/cm <sup>2</sup>	0.07
AF <sub>16-26</sub> (mutagenic skin adherence factor) mg/cm <sup>2</sup>	0.07
DFS <sub>res-adj</sub> (age-adjusted soil dermal factor) mg/kg	103390
DFSM <sub>res-adj</sub> (mutagenic age-adjusted soil dermal factor) mg/kg	428260
City <sub>PEF</sub> (Climate Zone) Selection	Default
A <sub>s</sub> (acres)	.5
Q/C <sub>wp</sub> (inverse of the ratio of the geometric mean air concentration to the emission flu	93.77
PEF (particulate emission factor) m <sup>3</sup> /kg	1359344438
A (PEF Dispersion Constant)	16.2302
B (PEF Dispersion Constant)	18.7762
C (PEF Dispersion Constant)	216.108
V (fraction of vegetative cover) unitless	0.5
U <sub>m</sub> (mean annual wind speed) m/s	4.69
U <sub>t</sub> (equivalent threshold value)	11.32
F(x) (function dependant on U <sub>m</sub> /U <sub>t</sub> ) unitless	0.194
City <sub>VF</sub> (Climate Zone) Selection	Default
A <sub>s</sub> (acres)	.5
Q/C <sub>vol</sub> (inverse of the ratio of the geometric mean air concentration to the emission flu	68.18

# Site-specific

## Resident Equation Inputs for Soil

Variable	Value
foc (fraction organic carbon in soil) g/g	0.006
$p_b$ (dry soil bulk density) g/cm <sup>3</sup>	1.5
$p_s$ (soil particle density) g/cm <sup>3</sup>	2.65
n (total soil porosity) $L_{pore}/L_{soil}$	0.43396
$a$ (air-filled soil porosity) $L_{air}/L_{soil}$	0.28396
$w$ (water-filled soil porosity) $L_{water}/L_{soil}$	0.15
T (exposure interval) s	819936000
A (VF Dispersion Constant)	11.911
B (VF Dispersion Constant)	18.4385
C (VF Dispersion Constant)	209.7845
City <sub>VF mass-loading</sub> (Climate Zone) Selection	Default
VF <sub>ml</sub> (volitization factor - mass-limit) m <sup>3</sup> /kg	.
Q/C <sub>vol</sub> (inverse of the ratio of the geometric mean air concentration to the emission fl	68.18
A <sub>s</sub> (acres)	.5
T (exposure interval) yr	26
$d_s$ (depth of source) m	.
$p_b$ (dry soil bulk density) g/cm <sup>3</sup>	1.5
A (VF Dispersion Constant - Mass Limit)	11.911
B (VF Dispersion Constant - Mass Limit)	18.4385
C (VF Dispersion Constant - Mass Limit)	209.7845

# Site-specific

## Resident Screening Levels (RSL) for Soil

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #27); H = HEAST; F = See FAQ; J = New Jersey; E = see user guide Section 2.3.5; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; \* = where: n SL < 100X c SL; \*\* = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Chemical	CAS Number	Mutagen?	VOC?	Ingestion SF (mg/kg-day) <sup>-1</sup>	SFO Ref	Inhalation Unit Risk (ug/m <sup>3</sup> ) <sup>-1</sup>	IUR Ref	Chronic RfD (mg/kg-day)	Chronic RfD Ref	Chronic RfC (mg/m <sup>3</sup> )	Chronic RfC Ref	GIABS	ABS	RBA
TCDD, 2,3,7,8-	1746-01-6	No	Yes	1.30E+05	C	3.80E+01	C	7.00E-10	IR	4.00E-08	CA	1	0.03	1
Polychlorinated Biphenyls (high risk)	1336-36-3	No	Yes	2.00E+00	I	5.71E-04	I	-	-	-	-	1	0.14	1
Benzo[a]pyrene	50-32-8	Yes	No	1.00E+00	I	6.00E-04	I	3.00E-04	IR	2.00E-06	IR	1	0.13	1

Chemical	Volatilization Factor (m <sup>3</sup> /kg)	Henry's Law Constant (unitless)	S (mg/L)	K <sub>oc</sub> (cm <sup>3</sup> /g)	Soil Saturation Concentration (mg/kg)	Particulate Emission Factor (m <sup>3</sup> /kg)	Ingestion SL TR=0.000033 (mg/kg)	Dermal SL TR=0.000033 (mg/kg)	Inhalation SL TR=0.000033 (mg/kg)
TCDD, 2,3,7,8-	1.96E+06	2.04E-03	2.00E-04	2.49E+05	-	1.36E+09	1.76E-04	2.09E-03	4.78E-03
Polychlorinated Biphenyls (high risk)	5.32E+05	1.70E-02	7.00E-01	7.81E+04	-	1.36E+09	1.15E+01	2.91E+01	8.62E+01
Benzo[a]pyrene	-	1.87E-05	1.62E-03	5.87E+05	-	1.36E+09	5.05E+00	1.51E+01	7.58E+04

Chemical	Carcinogenic SL TR=0.000033 (mg/kg)	Ingestion SL Child THQ=1 (mg/kg)	Dermal SL Child THQ=1 (mg/kg)	Inhalation SL Child THQ=1 (mg/kg)	Noncarcinogenic SL Child THI=1 (mg/kg)	Ingestion SL Adult THQ=1 (mg/kg)	Dermal SL Adult THQ=1 (mg/kg)	Inhalation SL Adult THQ=1 (mg/kg)	Noncarcinogenic SL Adult THI=1 (mg/kg)	Screening Level (mg/kg)
TCDD, 2,3,7,8-	1.57E-04	5.48E-05	7.69E-04	8.17E-02	5.11E-05	5.84E-04	4.61E-03	8.17E-02	5.15E-04	5.11E-05 nc
Polychlorinated Biphenyls (high risk)	7.51E+00	-	-	-	-	-	-	-	-	7.51E+00 ca
Benzo[a]pyrene	3.79E+00	2.35E+01	7.61E+01	2.84E+03	1.78E+01	2.50E+02	4.56E+02	2.84E+03	1.53E+02	3.79E+00 ca**

# Site-specific

## Resident Equation Inputs for Soil

Variable	Value
THQ (target hazard quotient) unitless	0.5
TR (target risk) unitless	1.0E-6
LT (lifetime) year	70
ET <sub>res</sub> (exposure time) hour	24
ET <sub>res-c</sub> (child exposure time) hour	24
ET <sub>res-a</sub> (adult exposure time) hour	24
ET <sub>0-2</sub> (mutagenic exposure time) hour	24
ET <sub>2-6</sub> (mutagenic exposure time) hour	24
ET <sub>6-16</sub> (mutagenic exposure time) hour	24
ET <sub>16-26</sub> (mutagenic exposure time) hour	24
ED <sub>res</sub> (exposure duration) year	26
ED <sub>res-c</sub> (exposure duration - child) year	6
ED <sub>res-a</sub> (exposure duration - adult) year	20
ED <sub>0-2</sub> (mutagenic exposure duration) year	2
ED <sub>2-6</sub> (mutagenic exposure duration) year	4
ED <sub>6-16</sub> (mutagenic exposure duration) year	10
ED <sub>16-26</sub> (mutagenic exposure duration) year	10
BW <sub>res-c</sub> (body weight - child) kg	15
BW <sub>res-a</sub> (body weight - adult) kg	80
BW <sub>0-2</sub> (mutagenic body weight) kg	15
BW <sub>2-6</sub> (mutagenic body weight) kg	15
BW <sub>6-16</sub> (mutagenic body weight) kg	80
BW <sub>16-26</sub> (mutagenic body weight) kg	80
SA <sub>res-c</sub> (skin surface area - child) cm <sup>2</sup> /day	2373
SA <sub>res-a</sub> (skin surface area - adult) cm <sup>2</sup> /day	6032
SA <sub>0-2</sub> (mutagenic skin surface area) cm <sup>2</sup> /day	2373
SA <sub>2-6</sub> (mutagenic skin surface area) cm <sup>2</sup> /day	2373
SA <sub>6-16</sub> (mutagenic skin surface area) cm <sup>2</sup> /day	6032
SA <sub>16-26</sub> (mutagenic skin surface area) cm <sup>2</sup> /day	6032
EF <sub>res</sub> (exposure frequency) day/year	350
EF <sub>res-c</sub> (exposure frequency - child) day/year	350
EF <sub>res-a</sub> (exposure frequency - adult) day/year	350
EF <sub>0-2</sub> (mutagenic exposure frequency) day/year	350

# Site-specific

## Resident Equation Inputs for Soil

Variable	Value
EF <sub>2-6</sub> (mutagenic exposure frequency) day/year	350
EF <sub>6-16</sub> (mutagenic exposure frequency) day/year	350
EF <sub>16-26</sub> (mutagenic exposure frequency) day/year	350
IFS <sub>res-adj</sub> (age-adjusted soil ingestion factor) mg/kg	36750
IFSM <sub>res-adj</sub> (mutagenic age-adjusted soil ingestion factor) mg/kg	166833.33
IRS <sub>res-c</sub> (soil intake rate - child) mg/day	200
IRS <sub>res-a</sub> (soil intake rate - adult) mg/day	100
IRS <sub>0-2</sub> (mutagenic soil intake rate) mg/day	200
IRS <sub>2-6</sub> (mutagenic soil intake rate) mg/day	200
IRS <sub>6-16</sub> (mutagenic soil intake rate) mg/day	100
IRS <sub>16-26</sub> (mutagenic soil intake rate) mg/day	100
AF <sub>res-a</sub> (skin adherence factor - adult) mg/cm <sup>2</sup>	0.07
AF <sub>res-c</sub> (skin adherence factor - child) mg/cm <sup>2</sup>	0.2
AF <sub>0-2</sub> (mutagenic skin adherence factor) mg/cm <sup>2</sup>	0.2
AF <sub>2-6</sub> (mutagenic skin adherence factor) mg/cm <sup>2</sup>	0.2
AF <sub>6-16</sub> (mutagenic skin adherence factor) mg/cm <sup>2</sup>	0.07
AF <sub>16-26</sub> (mutagenic skin adherence factor) mg/cm <sup>2</sup>	0.07
DFS <sub>res-adj</sub> (age-adjusted soil dermal factor) mg/kg	103390
DFSM <sub>res-adj</sub> (mutagenic age-adjusted soil dermal factor) mg/kg	428260
City (Climate Zone) PEF Selection	0
A <sub>s</sub> (acres)	.5
Q/C <sub>wp</sub> (g/m <sup>2</sup> -s per kg/m <sup>3</sup> )	93.77
PEF (particulate emission factor) m <sup>3</sup> /kg	1359344438
A (PEF Dispersion Constant)	16.2302
B (PEF Dispersion Constant)	18.7762
C (PEF Dispersion Constant)	216.108
V (fraction of vegetative cover) unitless	0.5
U <sub>m</sub> (mean annual wind speed) m/s	4.69
U <sub>t</sub> (equivalent threshold value)	11.32
F(x) (function dependant on U <sub>m</sub> /U <sub>t</sub> ) unitless	0.194
City (Climate Zone) VF Selection	0
A <sub>s</sub> (acres)	.5
Q/C <sub>vol</sub> (g/m <sup>2</sup> -s per kg/m <sup>3</sup> )	68.18

# Site-specific

## Resident Equation Inputs for Soil

Variable	Value
foc (fraction organic carbon in soil) g/g	0.006
$\rho_b$ (dry soil bulk density) g/cm <sup>3</sup>	1.5
$\rho_s$ (soil particle density) g/cm <sup>3</sup>	2.65
n (total soil porosity) $L_{pore}/L_{soil}$	0.43396
$\theta_a$ (air-filled soil porosity) $L_{air}/L_{soil}$	0.28396
$\theta_w$ (water-filled soil porosity) $L_{water}/L_{soil}$	0.15
T (exposure interval) s	819936000
A (VF Dispersion Constant)	11.911
B (VF Dispersion Constant)	18.4385
C (VF Dispersion Constant)	209.7845
City (Climate Zone) VF <sub>ml</sub> Selection	0
VF <sub>s</sub> (volitization factor) m <sup>3</sup> /kg	.
Q/C <sub>vol</sub> (g/m <sup>2</sup> -s per kg/m <sup>3</sup> )	68.18365
A <sub>s</sub> (acres)	.5
T (exposure interval) yr	26
d <sub>s</sub> (depth of source) m	.
$\rho_b$ (dry soil bulk density) g/cm <sup>3</sup>	1.5
A (VF Dispersion Constant - Mass Limit)	11.911
B (VF Dispersion Constant - Mass Limit)	18.4385
C (VF Dispersion Constant - Mass Limit)	209.7845

# Site-specific

## Resident Screening Levels (RSL) for Soil

ca=Cancer, nc=Noncancer, ca\* (Where nc SL < 100 x ca SL),

ca\*\* (Where nc SL < 10 x ca SL), max=SL exceeds ceiling limit (see User's Guide), sat=SL exceeds csat,

Smax=Soil SL exceeds ceiling limit and has been substituted with the max value (see User's Guide),

Ssat=Soil inhalation SL exceeds csat and has been substituted with the csat

Chemical	CAS Number	Mutagen?	VOC?	Ingestion SF (mg/kg-day) <sup>-1</sup>	SFO Ref	Inhalation Unit Risk (ug/m <sup>3</sup> ) <sup>-1</sup>	IUR Ref	Chronic RfD (mg/kg-day)	Chronic RfD Ref	Chronic RfC (mg/m <sup>3</sup> )	Chronic RfC Ref	GIABS	ABS	RBA
Copper	7440-50-8	No	No	-		-		4.00E-02	U	-		1	-	1
Iron	7439-89-6	No	No	-		-		7.00E-01	U	-		1	-	1

Chemical	Volatilization Factor (m <sup>3</sup> /kg)	Henry's Law Constant (atm-m <sup>3</sup> /mol)	Soil Saturation Concentration (mg/kg)	Particulate Emission Factor (m <sup>3</sup> /kg)	Ingestion SL TR=1.0E-6 (mg/kg)	Dermal SL TR=1.0E-6 (mg/kg)	Inhalation SL TR=1.0E-6 (mg/kg)	Carcinogenic SL TR=1.0E-6 (mg/kg)	Ingestion SL Child THQ=0.5 (mg/kg)	Dermal SL Child THQ=0.5 (mg/kg)
Copper	-	-	-	1.36E+09	-	-	-	-	1.56E+03	-
Iron	-	-	-	1.36E+09	-	-	-	-	2.74E+04	-

Chemical	Inhalation SL Child THQ=0.5 (mg/kg)	Noncarcinogenic SL Child THI=0.5 (mg/kg)	Ingestion SL Adult THQ=0.5 (mg/kg)	Dermal SL Adult THQ=0.5 (mg/kg)	Inhalation SL Adult THQ=0.5 (mg/kg)	Noncarcinogenic SL Adult THI=0.5 (mg/kg)	Screening Level (mg/kg)
Copper	-	1.56E+03	1.67E+04	-	-	1.67E+04	1.56E+03 nc
Iron	-	2.74E+04	2.92E+05	-	-	2.92E+05	2.74E+04 nc

OU9



# Site-specific

## Resident Equation Inputs for Soil

Variable	Value
THQ (target hazard quotient) unitless	1
TR (target risk) unitless	1.0E-4
LT (lifetime) year	70
ET <sub>res</sub> (exposure time) hour	24
ET <sub>res-c</sub> (child exposure time) hour	24
ET <sub>res-a</sub> (adult exposure time) hour	24
ET <sub>0-2</sub> (mutagenic exposure time) hour	24
ET <sub>2-6</sub> (mutagenic exposure time) hour	24
ET <sub>6-16</sub> (mutagenic exposure time) hour	24
ET <sub>16-26</sub> (mutagenic exposure time) hour	24
ED <sub>res</sub> (exposure duration) year	26
ED <sub>res-c</sub> (exposure duration - child) year	6
ED <sub>res-a</sub> (exposure duration - adult) year	20
ED <sub>0-2</sub> (mutagenic exposure duration) year	2
ED <sub>2-6</sub> (mutagenic exposure duration) year	4
ED <sub>6-16</sub> (mutagenic exposure duration) year	10
ED <sub>16-26</sub> (mutagenic exposure duration) year	10
BW <sub>res-c</sub> (body weight - child) kg	15
BW <sub>res-a</sub> (body weight - adult) kg	80
BW <sub>0-2</sub> (mutagenic body weight) kg	15
BW <sub>2-6</sub> (mutagenic body weight) kg	15
BW <sub>6-16</sub> (mutagenic body weight) kg	80
BW <sub>16-26</sub> (mutagenic body weight) kg	80
SA <sub>res-c</sub> (skin surface area - child) cm <sup>2</sup> /day	2373
SA <sub>res-a</sub> (skin surface area - adult) cm <sup>2</sup> /day	6032
SA <sub>0-2</sub> (mutagenic skin surface area) cm <sup>2</sup> /day	2373
SA <sub>2-6</sub> (mutagenic skin surface area) cm <sup>2</sup> /day	2373
SA <sub>6-16</sub> (mutagenic skin surface area) cm <sup>2</sup> /day	6032
SA <sub>16-26</sub> (mutagenic skin surface area) cm <sup>2</sup> /day	6032
EF <sub>res</sub> (exposure frequency) day/year	350
EF <sub>res-c</sub> (exposure frequency - child) day/year	350
EF <sub>res-a</sub> (exposure frequency - adult) day/year	350
EF <sub>0-2</sub> (mutagenic exposure frequency) day/year	350

# Site-specific

## Resident Equation Inputs for Soil

Variable	Value
EF <sub>2-6</sub> (mutagenic exposure frequency) day/year	350
EF <sub>6-16</sub> (mutagenic exposure frequency) day/year	350
EF <sub>16-26</sub> (mutagenic exposure frequency) day/year	350
IFS <sub>res-adj</sub> (age-adjusted soil ingestion factor) mg/kg	36750
IFSM <sub>res-adj</sub> (mutagenic age-adjusted soil ingestion factor) mg/kg	166833.33
IRS <sub>res-c</sub> (soil intake rate - child) mg/day	200
IRS <sub>res-a</sub> (soil intake rate - adult) mg/day	100
IRS <sub>0-2</sub> (mutagenic soil intake rate) mg/day	200
IRS <sub>2-6</sub> (mutagenic soil intake rate) mg/day	200
IRS <sub>6-16</sub> (mutagenic soil intake rate) mg/day	100
IRS <sub>16-26</sub> (mutagenic soil intake rate) mg/day	100
AF <sub>res-a</sub> (skin adherence factor - adult) mg/cm <sup>2</sup>	0.07
AF <sub>res-c</sub> (skin adherence factor - child) mg/cm <sup>2</sup>	0.2
AF <sub>0-2</sub> (mutagenic skin adherence factor) mg/cm <sup>2</sup>	0.2
AF <sub>2-6</sub> (mutagenic skin adherence factor) mg/cm <sup>2</sup>	0.2
AF <sub>6-16</sub> (mutagenic skin adherence factor) mg/cm <sup>2</sup>	0.07
AF <sub>16-26</sub> (mutagenic skin adherence factor) mg/cm <sup>2</sup>	0.07
DFS <sub>res-adj</sub> (age-adjusted soil dermal factor) mg/kg	103390
DFSM <sub>res-adj</sub> (mutagenic age-adjusted soil dermal factor) mg/kg	428260
City <sub>PEF</sub> (Climate Zone) Selection	Default
A <sub>s</sub> (acres)	.5
Q/C <sub>wp</sub> (inverse of the ratio of the geometric mean air concentration to the emission flu	93.77
PEF (particulate emission factor) m <sup>3</sup> /kg	1359344438
A (PEF Dispersion Constant)	16.2302
B (PEF Dispersion Constant)	18.7762
C (PEF Dispersion Constant)	216.108
V (fraction of vegetative cover) unitless	0.5
U <sub>m</sub> (mean annual wind speed) m/s	4.69
U <sub>t</sub> (equivalent threshold value)	11.32
F(x) (function dependant on U <sub>m</sub> /U <sub>t</sub> ) unitless	0.194
City <sub>VF</sub> (Climate Zone) Selection	Default
A <sub>s</sub> (acres)	.5
Q/C <sub>vol</sub> (inverse of the ratio of the geometric mean air concentration to the emission flu	68.18

# Site-specific

## Resident Equation Inputs for Soil

Variable	Value
foc (fraction organic carbon in soil) g/g	0.006
$p_b$ (dry soil bulk density) g/cm <sup>3</sup>	1.5
$p_s$ (soil particle density) g/cm <sup>3</sup>	2.65
n (total soil porosity) $L_{pore}/L_{soil}$	0.43396
$n_a$ (air-filled soil porosity) $L_{air}/L_{soil}$	0.28396
$n_w$ (water-filled soil porosity) $L_{water}/L_{soil}$	0.15
T (exposure interval) s	819936000
A (VF Dispersion Constant)	11.911
B (VF Dispersion Constant)	18.4385
C (VF Dispersion Constant)	209.7845
City <sub>VF mass-loading</sub> (Climate Zone) Selection	Default
VF <sub>ml</sub> (volitization factor - mass-limit) m <sup>3</sup> /kg	.
Q/C <sub>vol</sub> (inverse of the ratio of the geometric mean air concentration to the emission fl	68.18
A <sub>s</sub> (acres)	.5
T (exposure interval) yr	26
$d_s$ (depth of source) m	.
$p_b$ (dry soil bulk density) g/cm <sup>3</sup>	1.5
A (VF Dispersion Constant - Mass Limit)	11.911
B (VF Dispersion Constant - Mass Limit)	18.4385
C (VF Dispersion Constant - Mass Limit)	209.7845

# Site-specific

## Resident Screening Levels (RSL) for Soil

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #27); H = HEAST; F = See FAQ; J = New Jersey; E = see user guide Section 2.3.5; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; \* = where: n SL < 100X c SL; \*\* = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Chemical	CAS Number	Mutagen?	VOC?	Ingestion SF (mg/kg-day) <sup>-1</sup>	SFO Ref	Inhalation Unit Risk (ug/m <sup>3</sup> ) <sup>-1</sup>	IUR Ref	Chronic RfD (mg/kg-day)	Chronic RfD Ref	Chronic RfC (mg/m <sup>3</sup> )	Chronic RfC Ref	GIABS	ABS	RBA
Benzo[a]pyrene	50-32-8	Yes	No	1.00E+00	I	6.00E-04	I	3.00E-04	IR	2.00E-06	IR	1	0.13	1

Chemical	Volatilization Factor (m <sup>3</sup> /kg)	Henry's Law Constant (unitless)	S (mg/L)	K <sub>oc</sub> (cm <sup>3</sup> /g)	Soil Saturation Concentration (mg/kg)	Particulate Emission Factor (m <sup>3</sup> /kg)	Ingestion SL TR=1.0E-4 (mg/kg)	Dermal SL TR=1.0E-4 (mg/kg)	Inhalation SL TR=1.0E-4 (mg/kg)	Carcinogenic SL TR=1.0E-4 (mg/kg)	Ingestion SL Child THQ=1 (mg/kg)
Benzo[a]pyrene	-	1.87E-05	1.62E-03	5.87E+05	-	1.36E+09	1.53E+01	4.59E+01	2.30E+05	1.15E+01	2.35E+01

Chemical	Dermal SL Child THQ=1 (mg/kg)	Inhalation SL Child THQ=1 (mg/kg)	Noncarcinogenic SL Child THI=1 (mg/kg)	Ingestion SL Adult THQ=1 (mg/kg)	Dermal SL Adult THQ=1 (mg/kg)	Inhalation SL Adult THQ=1 (mg/kg)	Noncarcinogenic SL Adult THI=1 (mg/kg)	Screening Level (mg/kg)
Benzo[a]pyrene	7.61E+01	2.84E+03	1.78E+01	2.50E+02	4.56E+02	2.84E+03	1.53E+02	1.15E+01 ca**

**Appendix D**

**Response to Agency Comments on Draft Third Year Five Year Review**

**EPA Comments (4/19/2017) on the  
Draft Third Five-Year Review for Operable Units (OUs) 1, 2, 3, 7, and 9  
Portsmouth Naval Shipyard, Kittery, Maine**

**General Comments**

EPA Comment 1.

References to OU4. While it is correct to briefly introduce OU4 and discuss the remedy inspection, the Navy incorrectly describes this Five Year Review (“FYR”) as applicable to OU1, 2, 3, 4, 7, and 9, rather than OU1, 2, 3, 7, and 9. Please modify the document to reflect the fact that the FYR does not apply to OU4, as remediation at OU4 has been completed and is unlimited use/unrestricted exposure (“UU/UE”). Specific instances where OU4 is improperly referenced:

- a. Summary Form – OU4 is listed as having no issues or recommendations.
- b. p. 1 – sentence reads: “The objective of this five-year review is to evaluate implementation and performance of remedies at *six* PNS Operable Units (OUs; OU1, OU2, OU3, OU7, and OU9) . . .” Only five OUs are listed here, but it would be six if OU4 were included.
- c. p. 2 – “Sections 3 through 8 are the five-year reviews for OUs 1, 2, 3, 4, 7, and 9, respectively.” There is no FYR section for OU4, and it should be removed from this list.
- d. Appendix B - ARARs Tables. All the ARARs Tables for OU4 are included, and should not be because OU4 is not dealt with in this FYR.

**Response:** Edits will be made as requested.

EPA Comment 2.

As detailed below, there is a need to recognize that: 1) the target blood lead level has decreased to 5 ug/deciliter, and 2) the EPA Region 1 assumption of a 150 day/year residential exposure duration is no longer valid. These changes may result in the need to update ROD cleanup levels in an ESD during the next FYR review period. Since Navy has recognized potential changes in protectiveness for lead and antimony in the draft document, EPA requests that these potential changes in cleanup levels and protectiveness be identified in the Technical Assessment Question B sections for each Operable Unit in the final version of this Third FYR. Alternatively, If the changes are unlikely to affect current protectiveness due to institutional controls or other reason(s), EPA would concur with identifying these potential changes as action items for resolution during the next FYR period.

**Response:** While the target blood lead level is likely to be lowered based on a scientific basis provided in a December 2016 memorandum (Mathy Stanislaus OLEM memorandum titled “Updated Scientific Considerations for Lead in Soil Cleanups” dated December 22, 2016), the actual level has not been promulgated. The text will be edited slightly to note that calculations will need to be performed when the blood lead level and any other exposure parameters are finalized.

The EPA Region 1 assumption of a 150-day/year residential exposure duration will be discussed as no longer being valid for the OUs which previously used that duration during

cleanup level development. Any resulting changes to cleanup levels and protectiveness will be added to the text.

### **Specific Comments**

#### EPA Comment 3.

p. 4 – typo, "which13" must change to "which 13".

**Response:** Edit will be made as requested.

#### EPA Comment 4.

p. 10, § 2.2, ¶ 2 – grammatical error, must add a verb to this sentence. E.g., “To confirm remedies are operational and are functioning to meet RAOs, long-term monitoring . . . , and Remedial Design (RD) documents *were identified and examined.*”

**Response:** Edit will be made as requested.

### **OU1**

#### EPA Comment 5.

p. 14, § 3.2, sentence 1 – typo, “The primary chemicals” (add an “s”)

**Response:** Edit will be made as requested.

#### EPA Comment 6.

p. 23. § 3.5.2 - In referring to the upcoming decrease of the recommended target blood lead level, the last sentence of the second ¶ states “Application of these changes will need to be performed to determine if there would be any change in protectiveness.” Per Comment 2, either in this FYR or during the next FYR period, Navy should recalculate protective lead concentrations for each receptor using a recommended blood lead level of 5 ug/deciliter and the appropriate most recently available EPA blood lead models.

**Response:** As noted in the response to EPA Comment 2, while the target blood lead level is likely to be lowered based on a scientific basis provided in a December 2016 memorandum (Mathy Stanislaus OLEM memorandum titled “Updated Scientific Considerations for Lead in Soil Cleanups” dated December 22, 2016), the actual level has not been promulgated. The text will be edited slightly to note that calculations will need to be performed when the blood lead level and any other exposure parameters are finalized.

#### EPA Comment 7.

p. 23. § 3.5.2 - In the last ¶ of it is stated that the EPA Region 1 residential exposure duration of 150 days/year is still applicable. EPA Region 1 has transitioned to national EPA guidance for all Superfund exposure assumptions when new Superfund documents come up for EPA Region 1 review. Please discuss whether revision of the antimony cleanup level from 73 mg/kg to 31 mg/kg would affect protectiveness.

**Response:** The text will be updated to state that the exposure duration is no longer appropriate. The text already includes that a LUC is in place to limit residential exposures, but the text will be clarified to state that the revised duration will not affect protectiveness.

#### EPA Comment 8.

p. 25, Table 3-3 – In the bottom row, “Changes in Toxicity, Risk Assessment Methods, and Cleanup Levels,” the Navy writes that there have been no changes that affect protectiveness. Please expand this to discuss the changes in exposure assumptions outlined above.

**Response:** The table will be updated to include discussion of the change in residential exposure duration and that the remedy remains protective due to LUCs.

#### EPA Comment 9.

Appendix B – OU1 ARAR Tables: Other ARARs that may be applicable and were not included in the ROD:

- a. **Maine Remedial Action Guidelines for Hazardous Substances in Soil** (To be considered): These draft guidelines provide specific chemical concentrations determined by the State of Maine Department of Environmental Protection (MEDEP) to be protective under various exposure scenarios and for groundwater.
- b. **Maine Natural Resources Protection Act, Permit-by-Rule Standards**, 06-096 CMR 305 (Applicable): This rule prescribes standards for specific activities that may take place in or adjacent to wetlands and water bodies. The standards are designed to ensure that the disturbed soil material is stabilized to prevent erosion and siltation of the water.
- c. **Erosion and Sedimentation Control, Stormwater Management Rules, and Direct Watershed of Waterbodies Most at Risk from New Development**, 38 MRSA § 420-C (Revised: 38 MRSA 420-C and 420-D); 06-096 CMR 500, 502 (Applicable): Erosion control measures must be in place before activities such as filling, displacing or exposing soil or other earthen materials take place.
- d. **Coastal Management Policy Act**, 38 MRSA §§ 1801 *et seq.* (Applicable): This Act provides for the regulation, conservation, beneficial use, and management of coastal resources.
- e. **Maine Mandatory Shoreland Zoning Act**, 38 MRSA §§ 435-449; 06-096 CMR 1000 (Applicable): This Act protects and conserves shoreland areas by controlling activities within 250 feet of high water mark, as defined in State law.

**Response:** Per EPA guidance, ARARs are generally frozen at the time of ROD signature unless new or modified requirements call into question the protectiveness of the selected remedy. Five Year Reviews should only consider changes in standards that were identified as ARARs in the ROD, newly promulgated standards for chemicals of potential concern, and TBCs identified in the ROD that bear on the protectiveness of the remedy. Unless otherwise indicated, none of the suggested ARARs fit these criteria. The suggested ARARs are either not yet promulgated or have not changed since the ROD.

## **OU2**

#### EPA Comment 10.

p. 35 – The Navy states that long term monitoring of groundwater will be conducted to ensure that copper, lead, and nickel do not migrate to groundwater at unacceptable levels. Explain what levels will be determined “unacceptable.” Please note that risk assessment ARARs for groundwater should be included in ARARs tables (action specific).

**Response:** Although pre-remediation groundwater concentrations at OU2 were at acceptable levels, post-remedial groundwater monitoring data will be conducted to provide confidence that



copper, lead, and nickel do not migrate to groundwater at unacceptable levels. The following text will be added to the last paragraph on page 35, following the second sentence in that paragraph:

“The groundwater monitoring will be evaluated in accordance with the LTMgt Plan (Tetra Tech, March 2016a).” The Navy doesn’t think it is appropriate to add risk assessment guidance as ARAR.

#### EPA Comment 11.

p. 37, § 4.5.1 - It is stated in the first ¶ that “There are no analytical or operational data to review relative to the OU2 remedy as groundwater sampling did not commence until fall 2016”. Once available, please evaluate the remedy for groundwater in the next version of the Third FYR report.

**Response:** No analytical or operational data was available for review during this next version of the FYR report. Report text will be updated to reflect that groundwater sampling will not commence until summer 2017.

#### EPA Comment 12.

p. 39, § 4.5.2 - Please discuss whether the cleanup levels recalculated using the new oral slope factor for benzo(a)pyrene are still protective.

**Response:** The text will be updated to note that the changes in toxicity values for benzo(a)pyrene would result in higher cleanup levels, which maintains protectiveness.

#### EPA Comment 13.

p. 38, § 4.5.2 - The last ¶ states that the EPA Region 1 residential exposure duration of 150 days/year is still applicable. This is incorrect. EPA Region 1 has transitioned to national EPA guidance for all Superfund exposure assumptions when new Superfund documents come up for EPA Region 1 review. Please discuss whether revision of the antimony cleanup level from 73 mg/kg to 31 mg/kg would affect current protectiveness.

**Response:** The text will be updated to state that the exposure duration is no longer appropriate. The text will also be updated to state that a LUC is in place to limit residential exposures and that, therefore, the remedy is still considered protective.

#### EPA Comment 14.

ARARs that are applicable, but were not included in the FYR:

- a. **Maine Mandatory Shoreland Zoning Act**, 38 MRSA §§ 435-449; 06-096 CMR 1000 (Applicable): This Act protects and conserves shoreland areas by controlling activities within 250 feet of high water mark, as defined in State law.
- b. **Maine Solid Waste Rules: Lead Management Regulations**, 06-096 CMR 424 (Relevant and appropriate): These regulations establish lead safe standards for soil containing lead - if lead in soil exceeds 375 parts per million (ppm) in bare soil in potential play areas, the soil in these areas shall be considered a lead hazard.
- c. Under the “Floodplain Management” Location-Specific ARAR, please note that the regulations cited interpret both EO 13690 as well as EO 11988.

**Response:** Per EPA guidance, ARARs are generally frozen at the time of ROD signature unless new or modified requirements call into question the protectiveness of the selected

remedy. Five Year Reviews should only consider changes in standards that were identified as ARARs in the ROD, newly promulgated standards for chemicals of potential concern, and TBCs identified in the ROD that bear on the protectiveness of the remedy. Unless otherwise indicated, none of the suggested ARARs fit these criteria. The suggested ARARs are either not yet promulgated or have not changed since the ROD. EO 13690 is not a new or modified requirement that calls into question the protectiveness of the remedy. The requirements of the cited regulations were therefore frozen at the time of ROD signature. The existing text in the first row of Table 4-3 that discusses EO 13690 will therefore be deleted.

### **OU3**

#### EPA Comment 15.

p. 52, § 5.4.5 - The last ¶ states that the area and slope surrounding Gas Vent #14 should continue to be evaluated. Please add this to the action items for this OU.

**Response:** This action item is included on the table provided in Section 5.6, *Issues, Recommendations, and Follow-Up Actions*.

#### EPA Comment 16.

p. 54, § 5.4.5 - In the subsection entitled “Groundwater Sampling” it is stated that PFOS and PFOA were detected in monitoring wells and that the concentrations were lower than Maine Remedial Action Guideline (RAG) for Construction Worker RAG. Please discuss whether the Maine RAG would be protective given the EPA Health Advisory level of 70ppt for groundwater.

**Response:** The text will be updated to include the RAG concentrations discussed and the Health Advisory level. The text will provide information as to whether the health advisory for drinking water is exceeded. The text already states that LUCs prevent drinking water use and that, therefore, there is no exposure pathway for these contaminants.

#### EPA Comment 17.

p. 57 – The Navy states, “Recalculated action levels and screening levels for groundwater are presented in Appendix C.” Please add a phrase or sentence that describes how the recalculated levels affect/do not affect the protectiveness of the remedy.

**Response:** The text will include reference to the data section where the action and screening levels will be compared to existing data. A statement about protectiveness will also be included following the data comparison.

#### EPA Comment 18.

P 58, Table 5-3 - The text in the first question on this table indicates that ecological action levels for chromium “should be modified to 33 ug/l for the acute value (previously 40 ug/l) and 2963 ug/l for the chronic value (previously 330 ug/l)”. Please add an explanation for these changes as a footnote to the table or in the text.

**Response:** The text incorrectly stated chromium instead of cadmium and incorrectly stated the revised chronic value, which should be 7.9 ug/L for the chronic value (previously 8.8 ug/L). The basis for the changes is already included in the text (the NRWQCs were updated in April 2016).

#### EPA Comment 19.

p. 58, Table 5-3 - In the row describing emerging contaminants, please describe those monitoring wells that had readings for PFOS and PFOAs above recreational or residential use levels.

**Response:** The following sentence will be added before the last two sentences in that row of Table 5-3: “The concentrations at well HW-3 (located upgradient of OU3) are above the EPA HA level and Maine Residential RAG.”

#### EPA Comment 20.

In OU 3 ARARs Table, under Federal Location-Specific, there is a row for “Floodplains. The requirement cited is Executive Order 11988 and Appendix A of 4 CFR 6. This provision of the CFR no longer exists. The relevant provision is a FEMA regulation, codified at 44 CFR 9 (as well as a mention of the Executive Order that amends 11988, or Executive Order 13690).

**Response:** No new or modified requirements have been identified that call into question the protectiveness of the remedy. The requirements of the cited regulations were therefore frozen at the time of ROD signature.

#### EPA Comment 21.

Also, in the same ARARs chart, under Wetlands, the Navy refers to Executive Order 11990, and 40 CFR 6. Again, 40 CFR 6 no longer exists, and the FEMA regulation, 44 CFR 9, should be cited instead.

**Response:** See response to the previous EPA Comment 20.

#### EPA Comment 22.

Please include Maine RAGs and EPA’s HA for PFAS are included as TBCs in the Appendix B ARARs Table.

**Response:** The Maine Remedial Action Guideline (RAG) and EPA’s Health Advisory (HA) level for PFAS are not promulgated standards and PFAS is not a Contaminant of Concern in OU3; therefore, no change to the ROD ARARs is required. No edits have been made based on this comment.

## **OU7**

#### EPA Comment 23.

p. 61 – typo. The following sentence is missing a verb: “Prior to the Site Screening Investigation (SSI) for OU7, several environmental investigations at PNS including sampling within what is now the OU7 area.”

**Response:** Edit will be made as requested.

#### EPA Comment 24.

p. 69, § 6.5.2, par. 1, sentence: “The use of updated exposure assumptions would have negligible effect on the calculated risks.” Please expand this conclusion.

**Response:** This statement has been removed, as the section is focused on remedy protectiveness (including impacts to cleanup levels), rather than baseline risks.

EPA Comment 25.

p. 70 (same issue), sentence: “Based on the recalculated cleanup values, the remedy is still protective of all receptors.” Explain more about how they are still protective (e.g., despite slightly more stringent cleanup levels for X, Y, and Z, exposure prevention is the remedy and therefore, the remedy remains protective...).

**Response:** Text will be added which includes discussion of the changes in cleanup values and why the remedy remains protective.

EPA Comment 26.

p. 70, § 6.5.2 – “The cleanup levels for lead provided in the 2013 ROD are consistent with US EPA Office of Solid Waste and Emergency Response (OSWER) directive 9355.4-12 soil screening level for residential land use.” Please discuss whether the potential change of the residential lead screening level to approximately 200 ppm (as will be obtained using a target blood lead level of 5 ug/deciliter) could affect current and future protectiveness, given that residential use is prohibited.

**Response:** Text will be added which discusses the potential changes to lead modeling parameters and how protectiveness would not be impacted due to the use of LUCs.

EPA Comment 27.

p. 71, Table 6-3, first row, sentence: “While some of the ARARs have been amended since the ROD, no changes were identified that would call into question the protectiveness of the remedy...” Please specify which ARARs have been amended, and why they do not affect the protectiveness of the remedy.

**Response:** The cited language will be replaced with “There are no new or modified requirements that would call into question the protectiveness of the remedy.”

ARARs:

- a. **Maine Mandatory Shoreland Zoning Act**, 38 MRSA §§ 435-449; 06-096 CMR 1000 (Applicable): This Act protects and conserves shoreland areas by controlling activities within 250 feet of high water mark, as defined in State law.
- b. **FEMA Regulations** Interpreting Executive Orders 11988 and 13690, should be included as Location-Specific ARARs (44 CFR 9).

**Response:** Per EPA guidance, ARARs are generally frozen at the time of ROD signature unless new or modified requirements call into question the protectiveness of the selected remedy. Five Year Reviews should only consider changes in standards that were identified as ARARs in the ROD, newly promulgated standards for chemicals of potential concern, and TBCs identified in the ROD that bear on the protectiveness of the remedy. Unless otherwise indicated, none of the suggested ARARs fit these criteria. The suggested ARARs are either not yet promulgated or have not changed since the ROD. Note that the existing text in the first row of Table 6-3 that discusses EO 13690 will therefore be deleted.

**OU9**

EPA Comment 28.

p. 79, § 7.4.1 - please explain why the residential RAO for subsurface soil for carcinogenic PAHs based on benzo(a)pyrene of 1.5 mg/kg is higher than the 0.5 mg/kg cleanup level for a hypothetical residential receptor in § 6.4.1.

**Response:** The text will be updated to note that the remedial goal is based on a cancer risk level of  $1 \times 10^{-4}$  and will refer to the Question B section for further discussion. Other OUs have various site-specific risk levels that the cleanup levels were based on.

EPA Comment 29.

p. 80, par. 2, 2nd sentence, typo: “remain in place” is repeated. Please remove the extra phrase.

**Response:** Edit will be made as requested.

EPA Comment 30.

p. 80, par. 3 – discussion of the MS-01 shoreline remedial actions. Please explain how this remedial action affects the protectiveness of the OU9 remedy.

**Response:** The statement will be added, “MS-01 remedial action performed adjacent to OU9 does not affect the protectiveness of the OU9 remedy”.

EPA Comment 31.

p. 84, § 7.5.2 - At the end of this section it is stated that it is unclear if there is a complete exposure pathway related to vapor intrusion in Building 62 Annex, and that additional data collection (i.e. soil borings) below Building 62 Annex is recommended to reaffirm protectiveness of the remedy. Please add this as a recommendation and action item for the next FYR period.

**Response:** The statement was added, “updates in vapor intrusion assessment methodology necessitate the collection of soil gas data beneath Building 62 Annex to determine protectiveness of the remedy to potential human receptors.”

EPA Comment 32.

p. 87, § 8.1 - Final sentence typo: “form”. Also, please correct Section 8.6 to state Section 7.6.

**Response:** Edit will be made as requested.

EPA Comment 33.

p. 87 – please provide an exact date (May 2, 2022) for the next FYR.

**Response:** The date was changed to May 2, 2022 as requested.

EPA Comment 34.

Because the Selected Remedy includes LUCs addressing any future excavation or construction in Building 62 Annex, then Action specific ARARs (**Federal and Maine Hazardous waste, capping ARARs and Risk-based ARARs**) would be applicable to this site.

**Response:** Per EPA guidance, ARARs are generally frozen at the time of ROD signature unless new or modified requirements call into question the protectiveness of the selected remedy. Five Year Reviews should only consider changes in standards that were identified as ARARs in the ROD, newly promulgated standards for chemicals of potential concern, and TBCs

identified in the ROD that bear on the protectiveness of the remedy. Unless otherwise indicated, none of the suggested ARARs fit these criteria. The suggested ARARs are either not yet promulgated or have not changed since the ROD.

EPA Comment 35.

Also, include the following location-specific ARAR: **Floodplain Management and Protection of Wetlands** (44 CFR 9) (should reflect the content included in the OU7 ARAR table).

**Response:** See response to Comment 35 above.

EPA Comment 36.

Please note that there should be an ARAR addressing the fact that OU9 is an area within the National Register of Historic Places. **National Historic Preservation Act** (16 USC 470 et seq., 36 CFR 800) should be included as an ARAR in any LUC addressing future excavation or construction activities.

**Response:** Per EPA guidance, ARARs are generally frozen at the time of ROD signature unless new or modified requirements call into question the protectiveness of the selected remedy. Five Year Reviews should only consider changes in standards that were identified as ARARs in the ROD, newly promulgated standards for chemicals of potential concern, and TBCs identified in the ROD that bear on the protectiveness of the remedy. Unless otherwise indicated, none of the suggested ARARs fit these criteria. The suggested ARARs are either not yet promulgated or have not changed since the ROD.

EPA Comment 37.

Appendix A – Not all Site Inspection Checklists are included. OU1 is provided in duplicate.

**Response:** Appendix A revised to include all site inspection checklists and removal of duplicates.

EPA Comment 38.

Summary Form – As stated in EPA's letter of May 2, 2012, the trigger date and due date is May 2, not May 31. This May 2 date will remain the due date in all future FYR Reviews. Please correct.

**Response:** The date will be changed to May 2, 2022 as requested.

**MEDEP Comments (4/27/2017) on the  
Draft Third Five-Year Review for Operable Units (OUs) 1, 2, 3, 7, and 9  
Portsmouth Naval Shipyard, Kittery, Maine**

**General Comment**

MEDEP Comment 1.

MEDEP agrees with EPA's April 19, 2017 comments on this document, especially as they pertain to State ARARs and TBCs.

**Response:** See responses to EPA comments.

MEDEP Comment 2.

In their comment letter the USEPA indicated that the 150 day/year residential exposure duration is no longer valid. This value, which takes into account snow cover, is still valid with MEDEP. Note however, that MEDEP may transition to using EPA default exposure values in the near future.

**Response:** Noted. As discussed in EPA comments, the text has been edited to summarize the impacts of changing to EPA residential default values.

**Specific Comments**

MEDEP Comment 3.

Five Year Summary Form, Protectiveness Statement, OU9, Please spell out RCM.

**Response:** Edit will be made as requested.

MEDEP Comment 4.

Section 3.0, OU1 – Site 10. In a September 30, 2013 Response to Comments letter, CB&I recommended that the Navy reinstall vent covers on the Building 238 crawl space to increase air flow. While not a requirement of the remedy or the LUCs, please indicate whether or not this was done.

**Response:** The report was revised to state that the crawl space is vented by vents installed along the outside of Building 238.

MEDEP Comment 5.

Section 5.4.5 Data Collection, Groundwater Sampling, p. 54. MECDC has recently adopted maximum exposure guidelines in accordance with the USEPA Has for PFOA and PFOS. New construction worker screening levels were updated prior to that change. The levels are 0.74 ng/L for PFOA and 1.3 ng/L for PFOS. It is unclear if/when these will be revised to reflect the adoption of the EPA Has. (For consideration of USEPA's comment on this section)

**Response:** The text will be updated to note the adoption of the HA value for drinking water in December 2016. The construction worker screening levels discussed in the comment do not appear to be presented online and appear to be much lower than the drinking water levels. Detection limits for the most recent sampling do not achieve the levels noted above. The text will be updated to state that the Maine RAGs are in the process of being updated related to PFOS and PFOA and that future sampling will need to account for achieving potentially lower screening levels, as appropriate.

MEDEP Comment 6.

Section 5.5.2 and Table 5-3. Based on comment 5, some revision to the text is needed; however the overall conclusion remains the same.

**Response:** The text and table will note that changes to the RAGs are ongoing.

MEDEP Comment 7.

Fig. 7-1.

- a) In the legend change "OU9 Boundary" to "OU9 LUC Boundary".
- b) Please add the location of the petroleum contaminated soil/debris and RCM to this figure.

**Response:** The figure will be revised as requested

MEDEP Comment 8.

7.5.2, Risk Summary, p. 81 and Conclusions, p. 84. "...the remaining contaminated soils are located below paved areas or building foundations." This isn't entirely correct as there is an area of subsurface contaminated soil (with corresponding LUCs) north of Building 62 that is unpaved. Please revise this statement in both locations where it occurs.

**Response:** Added statement "(except for an area of subsurface contaminated soil (with corresponding LUCs) north of Building 62 that is unpaved)."



## **Appendix E**

### **Response to Agency Follow-On Comments on Draft Final Third Year Five Year Review**

**EPA Follow-on Comments (6/28/2017) on the  
Draft Third Five-Year Review for Operable Units (OUs) 1, 2, 3, 7, and 9  
Portsmouth Naval Shipyard, Kittery, Maine**

**EPA Follow-on Comment 1.**

This follow-up comment relates to EPA comments #9, 14, 20, 21, 27, 34, 35, 36, which identify ARARs.

EPA suggested that several Federal and Maine State regulations should be identified as applicable, relevant and appropriate, or to-be-considered at the operable units covered by the Third Five Year Review. The Navy responded that the none of these regulations need to be included in the FYR because ARARs are frozen at the time of signature of the ROD.

EPA requests not that the Navy include these regulations into the ARARs tables, but rather that the Navy include some reference to these potentially applicable standards in the body of the document (corresponding to each of the operable units). Specifically, EPA requests that the Navy add text that identifies that while these potential ARARs were not included in the ROD, they are applicable, and further explains that these ARARs do not affect the protectiveness of the remedy (so long as that is the case). For many of the standards, it may be necessary to describe why the standards do not affect protectiveness at the Operable Unit.

**Response:** This response relates to EPA comments #9, 14, 20, 21, 27, 34, 35, 36, which identify ARARs.

The Navy respectfully disagrees. Identifying any particular requirement as “applicable”, (i.e, an ARAR) whether in a table or in text, is outside the scope of a Five Year Review. Should there come a time when the Navy determines that a remedy is no longer protective, the Navy will revise the remedy and execute appropriate CERCLA decision documents to support selection of that revised remedy. At that time, ARARs will be identified for the revised remedy. Speculating now about what requirements may or may not exist at this future date and may or may not be included as an ARAR is not appropriate for a Five Year Review. Instead, the Navy’s task in a Five Year Review is to consider changes in standards that were identified as ARARs in the ROD, newly promulgated standards for chemicals of potential concern, and TBCs identified in the ROD that bear on the protectiveness of the remedy. Therefore, the Five Year Review will not discuss standards or requirements that are not new or changed – like the state’s coastal zone management act or the state’s zoning requirements. The proposed additional language to be included in the Five Year Review is discussed below for each OU where standards have changed.

**Response Related to EPA Comment #27 (for OU7):**

Table 6-3. Additional text will be added in the first row of Table 6-3 following the statement that “There are no new or modified requirements that would call into question the protectiveness of the remedy.” The text will read “In 2015, the 40 CFR 230 was updated to clarify the definition of “waters of the United States”; however, a subsequent stay of the 2015 Clean Water Rule resulted in no change to how the definition applies and therefore, there is no impact on the protectiveness of the remedy. Certain definitions within the federal endangered species regulations have been updated; however, they do not change the action identified in the ROD, which states that future maintenance activities as part of long-term management of the shoreline erosion controls will be conducted so as to avoid any adverse effect under the act to short-nosed and Atlantic sturgeon present in the Piscataqua River. Also, the Northern Long-Eared Bat was identified as a Threatened species in 2015; however, future maintenance of

shoreline erosion controls would not involve tree clearing or be expected to impact any potential bat hibernacula. Therefore, none of the changes impact the ongoing components of the remedy.”

### **EPA Follow-on Comment 2.**

This comment relates to those comments set forth by EPA addressing changes to the Floodplain regulations (# 14, 20, 21, 27, 35).

The Draft Third Five Year Review includes references to 40 C.F.R. § 6, which once governed Floodplain issues but no longer exists. Instead, FEMA regulation 44 C.F.R. § 9, is now in effect and addresses the Floodplain issues. The Navy responds that “No new or modified requirements have been identified that call into question the protectiveness of the remedy.” It may be true that no changed requirements call into question the protectiveness, however, it is untrue that some of the requirements have not changed. The Floodplains regulations have changed both in name and in substance, and the Navy must therefore include some text or discussion in the Five Year Review that addresses this change. While the ARAR table need not necessarily be modified, the Navy must describe the regulatory change and how it does not call into question the protectiveness of the remedy now and in the future.

The Navy’s response to EPA comment 27, in fact, squarely addresses this issue. In the first Draft of the Five Year Review, the Navy itself acknowledged that “some of the ARARS have been amended since the ROD.” Draft FYR, p. 71. However, now the Navy suggests removing this language. EPA agrees with the Navy’s initial language, and requests that it be kept in the document. Essentially, with regard to both the Floodplain ARARs and the other suggested ARARs, EPA simply requests that the Navy acknowledge that changes have occurred and other ARARs may now be applicable (i.e., include the language cited above from p. 71), and further to briefly explain how these changes do not affect protectiveness at the site.

### **Response (Related to EPA Comment 14c):**

Comment 14c pointed out that the regulations cited under “Floodplain Management” in the ROD ARARs interpret both Executive Order (E.O.) 13690 and E.O. 11988. Since E.O. 13690 has been revoked with the recent August 15, 2017 Presidential E.O., *Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure Projects*, E.O. 13690 will not be evaluated in the five-year review and no further changes are proposed.

### **Response (Related to EPA Comments 20 and 21):**

The Navy will add the following language to the first row of Table 5-4: “Note that the 2001 ROD includes Executive Order 11988 and Appendix A of 40 CFR 6 as applicable floodplain management and wetland protection requirements. This provision of the CFR no longer exists. The current provision is a FEMA regulation codified at 44 CFR 9 (Floodplain Management and Protection of Wetlands). Since the remedy has been constructed and will continue to be maintained, including the landfill cover and shoreline erosion controls, there are no concerns with the protectiveness of the remedy.”

### **Response (Related to EPA Comment 28b):**

Comment 28b stated that FEMA regulations interpreting E.O. 11988 and E.O. 13690 should be included as Location-Specific ARARs (44 CFR 9). The OU7 ROD includes the FEMA regulation (44 CFR 9) and E.O. 11988. Since E.O. 13690 was revoked with the recent August 15, 2017 Presidential E.O., *Establishing Discipline and Accountability in the Environmental Review and*

*Permitting Process for Infrastructure Projects*, E.O. 13690 will not be evaluated in the five-year review and no further changes are proposed.

**Response Related to EPA Comment # 36**

See response under EPA Follow-on Comment 1 above.