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Superfund Remedy Report

15th Edition

Cover Photo Credits:

Top Left and Bottom Right: Before and after photographs of the Atlas Tack Site in Massachusetts.
Photos Courtesy of Elaine Stanley, EPA Region 1

Top Center: Pump and treat facility at Crossley Farm Site in Hereford Township, Pennsylvania.
Photo Courtesy of EPA Region 3, Site Photo Gallery:
https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302402&msspp=med

Top Right: Drill rig in the process of installing monitoring well at the Portland Harbor Site in Portland, Oregon.
Photo Courtesy of EPA Region 10

Bottom Left: Excavation of coal tar impacted sediments from approximately 9,000 linear feet of creek channel at the Tennessee Products Site in Chattanooga, Tennessee.
Photo Courtesy of Craig Zeller, RPM, EPA Region 4

Bottom Center: Operation of electrical resistance heating (ERH) and groundwater treatment system at the Spectron, Inc. Site in Elkton, Maryland. ERH evaporates and steam strips contaminants, which are extracted, cooled and treated in the groundwater treatment system, and clean steam is released.
Photo Courtesy of John Epps, RPM, EPA Region 3

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A portable document format version of *Superfund Remedy Report 15th Edition* is available for viewing or downloading from www.epa.gov/remedytech/superfund-remedy-report.

Acronyms and Abbreviations

ASR	Annual Status Report
BTEX	Benzene, toluene, ethyl-benzene, xylenes
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of concern
DNAPL	Dense non-aqueous phase liquid
EMNR	Enhanced monitored natural recovery
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
FY	Fiscal year
IC	Institutional control
ISCO	In situ chemical oxidation
ISCR	In situ chemical reduction
ISTT	In situ thermal treatment
LNAPL	Light non-aqueous phase liquid
MNA	Monitored natural attenuation
MNR	Monitored natural recovery
MPE	Multi-phase extraction
NAPL	Non-aqueous phase liquid
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
OU	Operable unit
P&T	Pump and treat
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PRB	Permeable reactive barrier
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
S/S	Solidification/stabilization
SRR	Superfund Remedy Report
SVE	Soil vapor extraction
SVOC	Semivolatile organic compound
VEB	Vertical engineered barrier
VOC	Volatile organic compound

Executive Summary

The U.S. Environmental Protection Agency (EPA) prepared the *Superfund Remedy Report (SRR) 15th Edition* to provide information and analyses on remedies selected to address contamination at Superfund sites. The statute authorizing EPA to clean up uncontrolled hazardous waste sites and spills established a clear preference for remedial actions in which treatment permanently and significantly reduces the volume, toxicity or mobility of the hazardous substances, pollutants, and contaminants. Hence, EPA is particularly interested in documenting and disseminating information on treatment technologies that advance its mission of protecting human health and the environment at contaminated sites. This report is the latest in a series, prepared since 1991, on Superfund remedy selection.

The *SRR 15th Edition* provides historical trends of remedies selected in Superfund decision documents and more detailed analyses of remedies selected in fiscal years (FYs) 2012, 2013 and 2014. Decision documents include Records of Decision (RODs), ROD Amendments, and Explanations of Significant Differences (ESDs) for National Priority List (NPL) and Superfund Alternative Approach sites. From the inception of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) through FY 2014, EPA has signed 5,197 decision documents, including 4,086 RODs and ROD Amendments and 1,111 ESDs, for 1,549 Superfund sites. Data from these documents form the basis for the SRR remedy analysis. The SRR compiles data on remedies and presents separate analyses for contaminants overall and contaminants in select media (soil, sediment and groundwater). This edition also includes a separate analysis of remedy and response action data for large sediment sites.

For the majority (78 percent) of the 1,540 Superfund sites with decision documents available, treatment has been selected, often in combination with other remedies. Most of these sites have more than one contaminated media, most frequently groundwater and soil. Most sites also have different types of contaminants of concern (COCs): more than half of sites address volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs) and metals, while a quarter of sites address two of these groups.

For FYs 2012 to 2014, remedies were selected in 308 decision documents, including 242 RODs and ROD Amendments, and 66 ESDs with remedial components. Of the 308 decision documents, 188 (61 percent) include a remedy for source materials (such as soil and sediment) and 160 (52 percent) for groundwater. Remedies were also selected for soil gas and air related to vapor intrusion.

For this three-year period, nearly half of decision documents with source remedies include treatment. A quarter of all source decision documents include in situ treatment. Soil vapor extraction, chemical treatment, and in situ thermal treatment are the most frequently selected in situ treatment technologies for sources with soil being the most common source medium addressed. Physical separation, recycling, and solidification/stabilization (S/S) are the most common ex situ treatment methods. Metals, polycyclic aromatic hydrocarbons (PAHs) and halogenated VOCs are the COCs most commonly addressed.

Of the 188 recent source decision documents, 39 include a remedy for sediments. Most of the sediment decision documents (87 percent) include dredging, excavation, off-site disposal or on-site containment as part of the selected remedy. Some treatment was also selected — for example, in situ amended caps and ex situ and in situ S/S. Examples of other remedies include wetlands replacement and enhanced or monitored natural recovery (EMNR or MNR). Two-thirds of the sediment decision documents include institutional controls (ICs). Metals, PAHs and polychlorinated biphenyls are the COCs most frequently addressed.

EPA also analyzed newly acquired remedy and response action data on the largest sediment sites, known as Tier 1 sediment sites. The data include 112 actions for 66 sites. Some of these actions have progressed to design or implementation. Most remedies for these sites include dredging and excavation (84 percent), 48 percent include residual caps, and 29 percent include engineered caps designed to isolate contaminants from the waterway. A quarter of the Tier 1 sites include MNR and 18 percent include EMNR.

For the 160 groundwater decision documents signed in FYs 2012 to 2014, the groundwater remedies continue to be primarily a mix of in situ treatment, pump and treat (P&T), and monitored natural attenuation; most also include ICs. The use of in situ groundwater treatment continues to rise and is now selected in over half of groundwater decision documents. Of these, bioremediation and chemical treatment remain the most frequently selected. The majority of in situ bioremediation remedies specify anaerobic bioremediation, and more than half of chemical treatment remedies specify in situ chemical oxidation. The selection of P&T in groundwater decision documents has decreased significantly since the early 1990s and reached its lowest, 17 percent, in FY 2014. Containment technologies (vertical engineered barriers such as slurry walls) were selected at a few sites. By far, halogenated VOCs (primarily chlorinated VOCs) are the most common type of groundwater COC, addressed in 72 percent of recent groundwater decision documents.

In addition, vapor intrusion mitigation was selected for existing structures in nine recent decision documents, and ICs for either existing structures or future construction in 34. Some ICs restrict the future use of structures to avoid vapor intrusion exposure and others require the installation of mitigation systems as part of future construction. Active depressurization is the most common mitigation method specified followed by passive barriers and sub-slab ventilation systems.

The report also includes an analysis of Superfund decision documents for federal facilities on the NPL. Since 1983, EPA has signed 1,877 RODs, ROD Amendments and ESDs for these federal facilities. From FY 2012 to 2014, nearly half of all decision documents were for federal facilities. The COCs most commonly addressed in groundwater at federal facilities are halogenated VOCs and metals. Metals and PAHs are most commonly addressed in soil at federal facilities. Groundwater and soil remedies also address munitions constituents and radioactive materials, with SVOC munitions and radioactive metals being most frequent.

In this report, EPA also discusses the use of combined remedies and optimization reviews. The combined remedy highlights provide examples of recent decision documents where remedies were combined spatially or in sequence. The optimization highlights provide examples of how optimization efforts have informed remedy selection in recent decision documents.

The remedy and site information provided in this report informs stakeholders in Superfund communities about the program's remedy decisions and helps federal, state and tribal remediation professionals select remedies. Analyzing the trends in remedy decisions provides an indication of the future demand for remedial technologies, which helps technology developers and consulting and engineering firms evaluate cleanup markets. The trends also indicate program needs for expanded technical information and support related to specific technologies or site cleanup challenges. For example, growing use of in situ groundwater technologies suggests the need for additional knowledge and support associated with those technologies.

I. Purpose and Introduction

The U.S. Environmental Protection Agency's (EPA) Office of Superfund Remediation and Technology Innovation prepared this *Superfund Remedy Report (SRR) 15th Edition* to share analysis of remediation technologies selected to address contamination at Superfund sites. EPA is particularly interested in documenting and disseminating information on treatment technologies to advance its mission of protecting human health and the environment at contaminated sites. The report focuses on treatment because the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) has a statutory preference for treatment.[1]

The *SRR 15th Edition* adds remedy information from decision documents issued during fiscal years (FYs) 2012, 2013 and 2014. The data in this report build on the evaluations in the 12 editions of *Treatment Technologies for Site Cleanup: Annual Status Report* (ASR), which covered the timeframe from FY 1982 through a portion of FY 2005; *SRR 13th Edition* (FYs 2005 to 2008); and *SRR 14th Edition* (FYs 2009 to 2011).

Selected remedial actions for Superfund sites, including National Priority List (NPL) and Superfund Alterative Approach sites are recorded in a decision document, such as a Record of Decision (ROD), ROD Amendment or Explanation of Significant Differences (ESD). The information in this report was extracted from these Superfund decision documents. This report inventories all remedies selected, however, not all selected remedies are ultimately implemented. Sometimes changes are made prior to implementation. For example, a different remedy may be required when a treatment technology that was selected in a ROD based on bench-scale treatability testing proves ineffective in pilot-scale tests conducted during the design phase. In addition, a remedial technology may be added to the original remedy if additional contamination is discovered during remedy implementation or a different approach can more efficiently address residual contamination. Furthermore, a particular remedy may have been included in a ROD as a contingent remedy, but subsequent site investigations reveal that implementation is not necessary. Fundamental changes to remedies selected in a ROD are documented in a ROD Amendment, and significant changes are documented in an ESD.

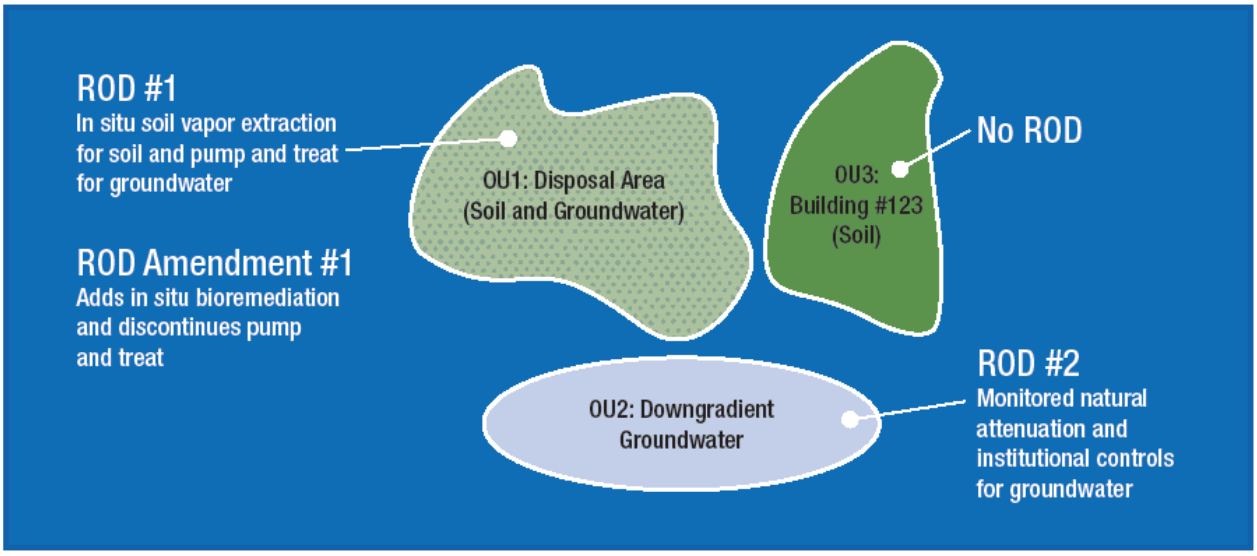
A site can be divided into a number of operable units (OUs), which can result in multiple decision documents. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) defines an OU as "a discrete action that comprises an incremental step toward comprehensively addressing site problems. This discrete portion of a remedial response manages migration, or eliminates or mitigates a release, threat of a release, or pathway of exposure. The cleanup of a site can be divided into a number of OUs, depending on the complexity of the problems associated with the site. OUs may address geographical portions of a site, specific site problems, or initial phases of an action, or may consist of any set of actions performed over time or any actions that are concurrent but located in different parts of a site."[2] Figure 1 illustrates an example of a

[1] Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and the amendments made by subsequent enactments (42 U.S.C. 9601-9675).

[2] Code of Federal Regulations (CFR), title 40, sec 300.5. www.gpo.gov/fdsys/pkg/CFR-2001-title40-vol24/pdf/CFR-2001-title40-vol24-sec300-5.pdf

remedial approach at a site with multiple OUs, decision documents, and remedies. In the example, the site has been divided into three OUs, with two addressing separate sources and two addressing groundwater. In the example, EPA has issued a ROD and ROD Amendment for the OU1 source area. The OU1 ROD Amendment made a fundamental change to the application of the selected soil vapor extraction (SVE) technology by adding in situ bioremediation and discontinuing pump and treat (P&T). OU2 has a ROD that addresses groundwater downgradient from OU1 and OU3. OU3 addresses a separate source area that is still under investigation and does not yet have a decision document.

Figure 1: Example Remedial Approach at a Site



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The *SRR 15th Edition* includes 13 sections and 8 appendices.

- Section I discusses the purpose and introduces the report.
- Section II describes the approach used to collect and analyze data.
- Section III describes the scope of the report.
- Section IV analyzes types of remedies and media addressed at Superfund sites.
- Section V analyzes contaminants included in decision documents.
- Section VI discusses source remedies, including a breakout of sediment remedies.
- Section VII discusses groundwater remedies.
- Section VIII discusses vapor intrusion remedies.
- Section IX provides a breakout of decision documents at federal facilities.
- Section X discusses combined remedies and provides four examples.
- Section XI discusses optimization and includes two examples.
- Section XII presents conclusions.
- Section XIII lists the data sources and provides information on how to access the electronic version of this and previous editions of SRR.

II. Approach

EPA used data from decision documents available as of November 2015 to compile information about remedy selection for all years with a focus on the most recent three years (FYs 2012, 2013 and 2014). The data used include remedies selected in decision documents (RODs, ROD Amendments and select ESDs). Only ESDs with additions or changes to remedy components were included in the analyses. ESDs were not included if they did not change a remedy component but instead addressed another aspect of the remedy, such as quantity of material to be addressed, contaminants of concern (COC), cost information, or monitoring requirements. EPA has updated the dataset to add remedy components for decision documents from the early years of the program that had not previously been recorded and has updated older data to conform more readily to recently updated media and remedy categories. For example, any non-aqueous phase liquid (NAPL) remedies previously captured under the "other" medium were moved to the newly established NAPL medium. In addition, some remedy names were changed to be consistent with recent terminology. Therefore, some counts presented in this edition may vary from previous editions.

The SRR remedy analysis distinguishes between remediation of contaminated source materials and non-source materials such as groundwater. EPA defines "source material" as "material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to ground water to surface water, to air, or acts as a source for direct exposure." This includes contaminated soil, sludge, sediment, solid waste, debris, drummed waste, leachate and any non-aqueous phase liquid both light (LNAPL) and dense (DNAPL) (EPA, 1991a). Groundwater is considered "non-source material" (EPA, 1991a).

The report groups remedies into major categories, indicated by the green bars in Table 1. It discusses remedies as related to source, groundwater or vapor intrusion based on the media addressed. Appendix A provides definitions of all categories and corresponding remedy types under each category.

Table 1: Summary of Remedy Categories

Source Control
Treatment
· Chemical, biological or physical means to reduce toxicity, mobility or volume of contaminated source media · Can be either in situ or ex situ · Examples include chemical treatment and in situ thermal treatment
On-site Containment
· Examples include the use of caps, liners, covers, and landfilling on site
Off-site Disposal
· Includes excavation and disposal at an off-site facility
Monitored Natural Attenuation (MNA)
· Reliance on natural processes[3] · Natural recovery processes may include physical, chemical, and biological processes

[3] For further information about MNA, refer to Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites. Office of Solid Waste and Emergency Response. April 21, 1999. OSWER Directive No. 9200.4-17P. https://semspub.epa.gov/work/HQ/159152.pdf

Source Control
Monitored Natural Recovery (MNR)
· Reliance on natural processes to reduce risk from sediments · Natural recovery processes may include physical, chemical, and biological processes
Enhanced Monitored Natural Recovery (EMNR)
· Combines natural recovery with an engineered approach for sediments · Typically includes placing a thin layer of clean sediment to accelerate the recovery process
Institutional Controls
· Non-engineered instruments, such as administrative and legal controls, that help minimize the potential for human exposure to contamination and protect the integrity of the remedy · Examples for source media include land use restrictions and access agreements
Other
· Source control remedies that do not fall into the categories of source control treatment, on-site containment, off-site disposal, MNA, MNR, EMNR, or institutional controls · Examples include wetlands replacement and shoreline stabilization
Groundwater
In Situ Treatment
· Treatment of groundwater in place without extraction from an aquifer · Examples include in situ chemical oxidation and in situ bioremediation
Pump and Treat (P&T)
· Pumping of groundwater from a well or trench, followed by aboveground treatment · Examples of aboveground treatment include air stripping and granular activated carbon
Monitored Natural Attenuation (MNA)
· Reliance on natural attenuation processes[4] · Natural attenuation processes may include physical, chemical, and biological processes
Containment
· Containment of groundwater using a vertical, engineered, subsurface, impermeable barrier
Institutional Controls
· Examples for groundwater include drilling restrictions and water supply use restrictions
Alternative Water Supply
· Examples include installing new water supply wells, providing bottled water or extending a municipal water supply
Other
· Groundwater remedies that do not fall into the categories of in situ treatment, P&T, MNA, containment, institutional controls, or alternative water supply · Examples include drainage/erosion control and wetlands restoration
Vapor Intrusion
Mitigation
· Mitigation of soil gas or indoor air to reduce exposure to vapor contamination in buildings · Examples include active depressurization technologies and passive barriers
Institutional Controls
· Examples for vapor intrusion include land use restrictions and vapor intrusion mitigation for new buildings

This report includes remedies selected in the Superfund remedial program, including treatment, containment and remedial components such as institutional controls (ICs); treatment technologies are discussed in more detail. "*Treatment technology* means any unit operation or series of unit

[4] Ibid.

operations that alters the composition of a hazardous substance or pollutant or contaminant through chemical, biological or physical means so as to reduce toxicity, mobility or volume of the contaminated materials being treated."[5]

In the analysis conducted for SRR, monitoring is not included separately as a remedy. According to EPA guidance, "[a]n alternative may include monitoring only and still be considered 'no action.'" (EPA, 1999a). Thus monitoring is not considered itself a remedy. However, the Superfund program recognizes the importance of effective monitoring and has implemented a long-term monitoring optimization strategy.[6]

The report presents data in figures at the decision document-level or at the site-level, depending on the objective of the figure. For some figures, decision documents that selected multiple remedies are counted in each remedy category, as appropriate. For example, a single decision document that selected both in situ treatment and a cap is listed in both remedy categories. For other figures, a hierarchy is used to classify a decision document into a single category of remedy types. This hierarchy has been established to represent the data consistent with the CERCLA statutory preference for treatment. Notes on individual figures and tables indicate whether a hierarchy was used. Additionally, some figures present historical or cumulative data, and others focus on recent remedy selection.

[5] CFR, title 40, sec 300.5. www.gpo.gov/fdsys/pkg/CFR-2001-title40-vol24/pdf/CFR-2001-title40-vol24-sec300-5.pdf
[6] For further information, please visit the Cleanup Optimization at Superfund Sites web page at www.epa.gov/superfund/cleanup-optimization-superfund-sites

III. Scope of this Report

This report discusses decision documents for current and deleted NPL sites that had at least one decision document as of the end of FY 2014. For the first time, the SRR analysis includes 45 decision documents for 41 Superfund Alternative Approach sites (as of May 2016).[7] The current analysis does not include decision documents for other non-NPL sites or sites that are proposed for the NPL.

There are 1,549 sites that have at least one decision document. The decision documents issued for these sites form the basis for the SRR and its analyses. A total of 5,197 decision documents, including 4,086 RODs and ROD Amendments, and 1,111 ESDs have been signed at those 1,549 sites. Eighty-four decision documents were not available; nine sites had no decision documents available. As discussed previously, most sites have multiple decision documents. Figure 2 depicts the number of RODs and ROD Amendments issued each year through FY 2014. Figure 3 shows the number of ESDs annually and identifies the number with changes to remedy components. Only ESDs with a remedy component were included in the remedy analysis. The first ESD was signed in 1988.

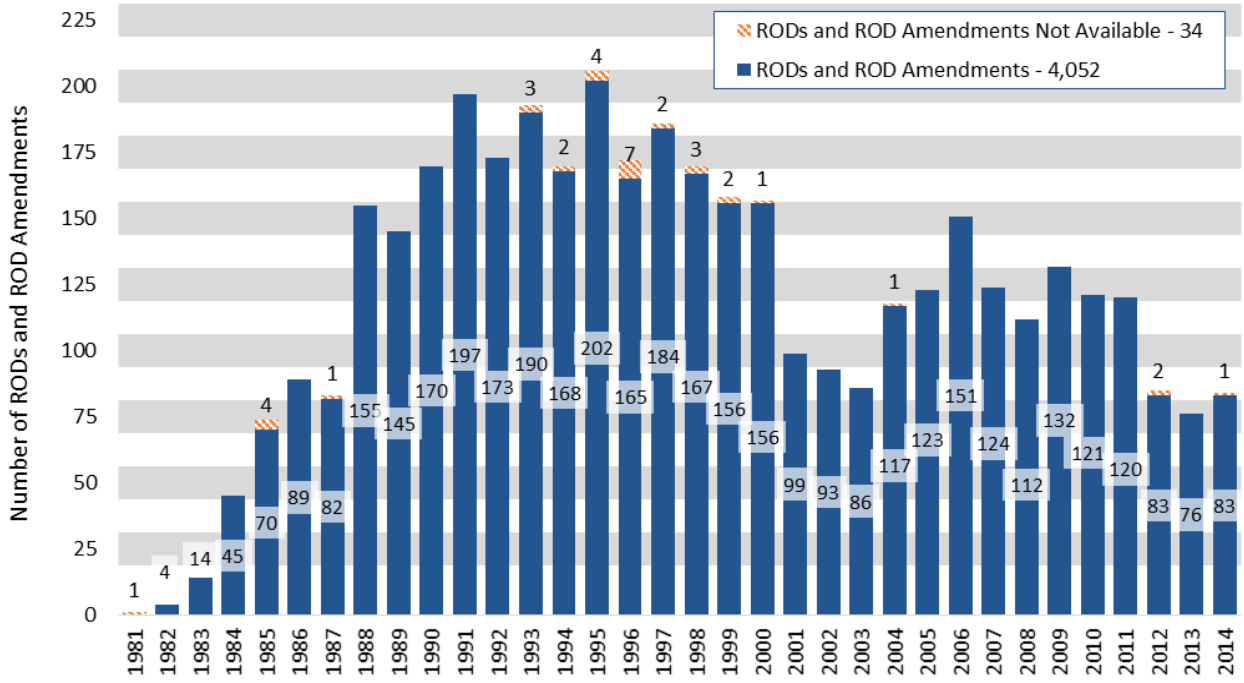
New in the 15th Edition

- Superfund Alternative Approach sites
- Contaminant analysis
- Tier 1 sediment analysis
- Decision documents at federal facilities
- Combined remedies
- Optimization

This report evaluates remedy selection trends historically and cumulatively through FY 2014. It also provides a more detailed analysis of the 308 decision documents signed at 212 sites in FYs 2012, 2013, and 2014. These documents include 242 RODs and ROD Amendments, and 66 ESDs with changes to remedy components. More than half of the decision documents from FY 2012 to 2014 are for federal facilities (see Section IX).

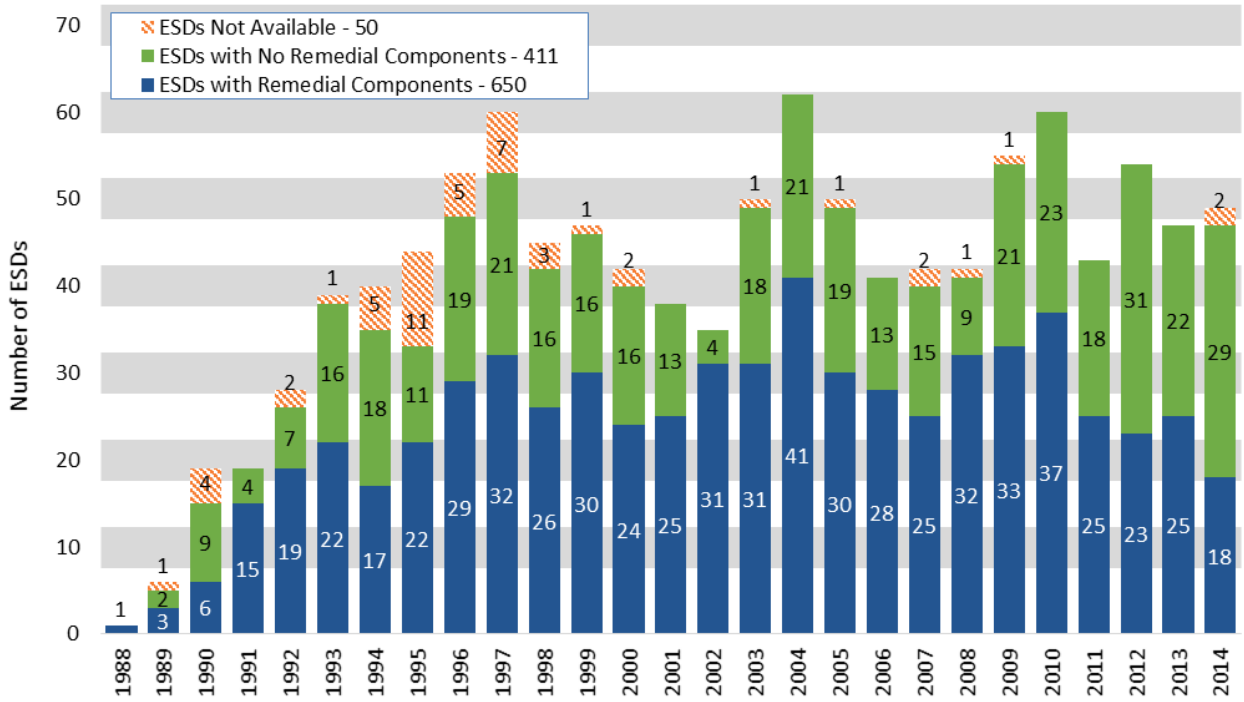
[7] "One of EPA's non-NPL Superfund pathways is referred to as the Superfund Alternative (SA) approach. The SA approach uses the same process and standards for investigation and cleanup as sites on the NPL. Sites using the SA approach are not eligible for federal remedial cleanup funds. Cleanup funding for sites with SA agreements is provided by the potentially responsible parties (PRPs)." (EPA, 2008b). To be considered an official Superfund Alternative Approach site, there needs to be a Superfund Alternative Approach agreement per OECA policy (see: www.epa.gov/enforcement/superfund-alternative-approach). The list of sites with a Superfund Alternative Approach agreement is as of May 18, 2016.

Figure 2: RODs and ROD Amendments per Year (FY 1981-2014)



- Total number of RODs and ROD Amendments = 4,086.

Figure 3: ESDs per Year (FY 1988-2014)

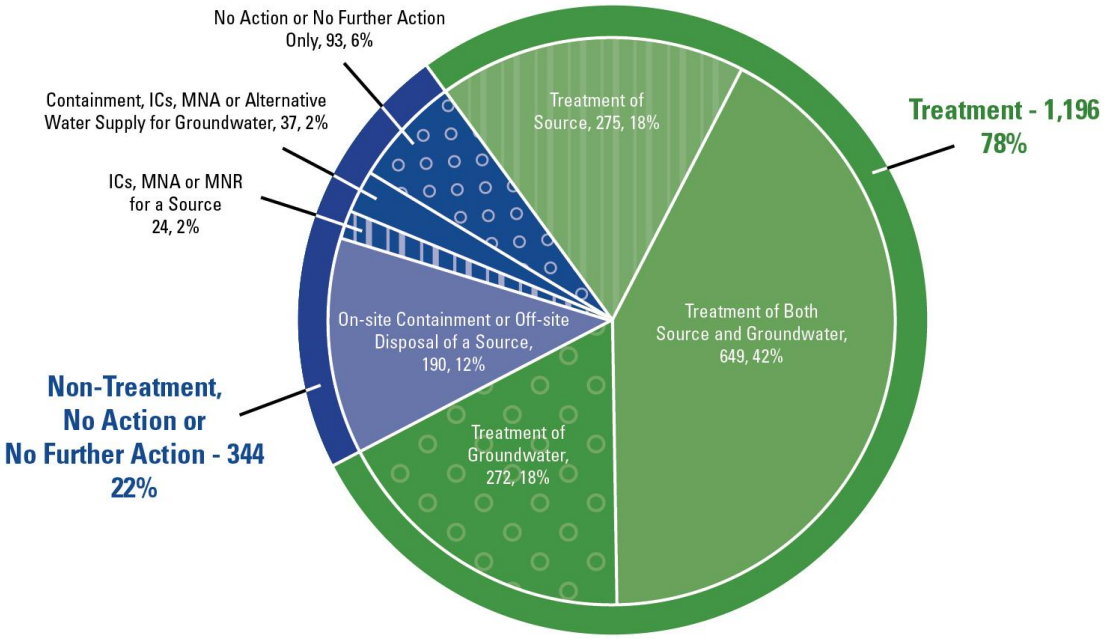


- Total number of ESDs = 1,111.
- No ESDs were signed prior to FY 1988.

IV. Overview of Remedies

Of the 1,549 sites with decision documents as of the end of FY 2014, remedies were selected at 1,447 sites and no action or no further action was specified at 93 sites. Figure 4 focuses on treatment remedies and shows the proportion of Superfund remedies by remedy category (including source and groundwater remedies). Sites are included once using the following hierarchy: treatment, on-site containment or off-site disposal, other non-treatment remedies (including institutional controls, MNA, MNR, and alternative water supply) and no action or no further action. At least one treatment remedy was selected for source, groundwater, or both at 78 percent of Superfund sites. Appendix B lists the type and number of source and groundwater treatment technologies selected by fiscal year. Appendix C summarizes all remedies selected in FY 2012, 2013, and 2014 decision documents.

Figure 4: Treatment at Superfund Sites (FY 1982-2014)



- Sites with remedies, no action or no further action = 1,540. Sites with no decision document available = 9.
- Sites are counted in this figure using the following hierarchy: (1) treatment, (2) on-site containment or off-site disposal of a source, (3) other non-treatment remedies of a source, (4) containment or non-treatment remedies for groundwater, and (5) no action or no further action only.
- Sites with treatment remedies include in situ or ex situ treatment, and may also include non-treatment remedies.
- Sites with only non-treatment remedies do not include treatment remedies in any decision document.
- Sites with only no action or no further action (93) do not have treatment or non-treatment remedies selected in any decision document.

EPA analyzed which types of media remedies target at Superfund sites (Table 2). Groundwater is addressed most frequently, followed by soil. Remedies also frequently target sediments and solid waste. In this analysis, all media addressed within decision documents for the site are counted once for each medium even if it was targeted at multiple OUs or in multiple decision documents.

NAPL is considered a source medium when it contributes to groundwater contamination. However, EPA does not have complete data on its presence at Superfund sites. NAPL is often difficult to locate during a site investigation, and there may not be direct evidence of its presence at the time EPA signs a decision document. In addition, EPA has only recently tracked NAPL as a separate medium when reviewing remedy decisions. For these reasons, NAPL is not included in Table 2.

Table 2: Media Addressed at Superfund Sites with Remedies (FY 1982-2014)

Media	Number of Sites	Percentage of Sites
Source Media	**1,293**	**89%**
Soil	1,175	81%
Sediment	435	30%
Solid waste	427	30%
Debris	218	15%
Buildings and structures	159	11%
Sludge	144	10%
Leachate	126	9%
Liquid waste	115	8%
Groundwater	**1,218**	**84%**

- Total number of sites with remedies: 1,447.
- Table 2 does not include NAPL, or soil gas and air media addressed by vapor intrusion technologies.

V. Overview of Contaminants

Decision documents typically identify COCs addressed by selected remedies. EPA evaluated the types of COCs at Superfund sites based on decision documents with remedies and COCs (1,402 sites). COC data were unavailable for 45 (approximately 3 percent) of sites with remedies. The contaminants may be in the same media, or in different media, and may be addressed by the same or different remedies.

For this report, contaminants are categorized in three major groups based on general treatability: volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs) and metals. Any contaminant that does not fit into one of those groups is categorized as "other."

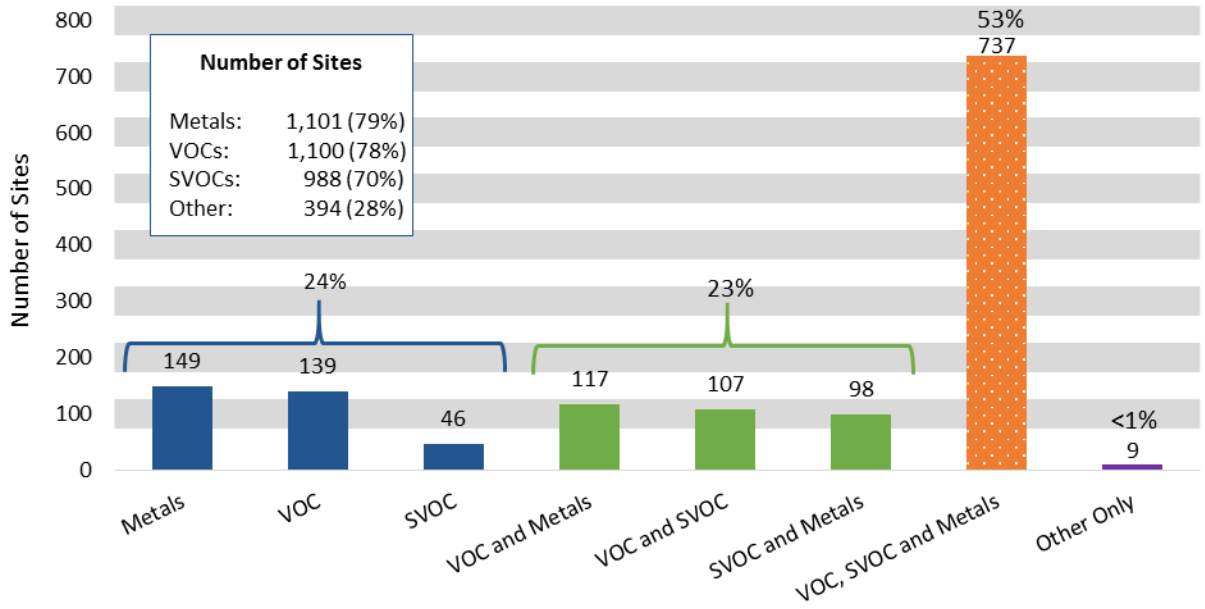
The contaminant groups are defined below:

- **Metals** – Metals; metalloids; explosive metals; radioactive metals; and organometallic pesticides and herbicides.
- **VOCs** – Halogenated VOCs (primarily chlorinated VOCs); benzene, toluene, ethylbenzene, xylene (BTEX); and other nonhalogenated VOCs.
- **SVOCs** – Polychlorinated biphenyls (PCBs); polycyclic aromatic hydrocarbons (PAHs); organic pesticides and herbicides; phenols; most fuels and distillates; most explosives; dioxins and furans; and other halogenated and nonhalogenated SVOCs.
- **Other** – nonmetallic inorganics; asbestos; and unspecified organics or inorganics.

Contaminants are further grouped into more detailed categories. Appendix D lists contaminants and their associated categories.

Over half of sites have COCs in all three groups: VOCs, SVOCs and metals (Figure 5a). Another 23 percent of sites have two types of contaminants, and 24 percent have one type. In Figures 5a and 5b, any of the groups shown may include "other" contaminants.

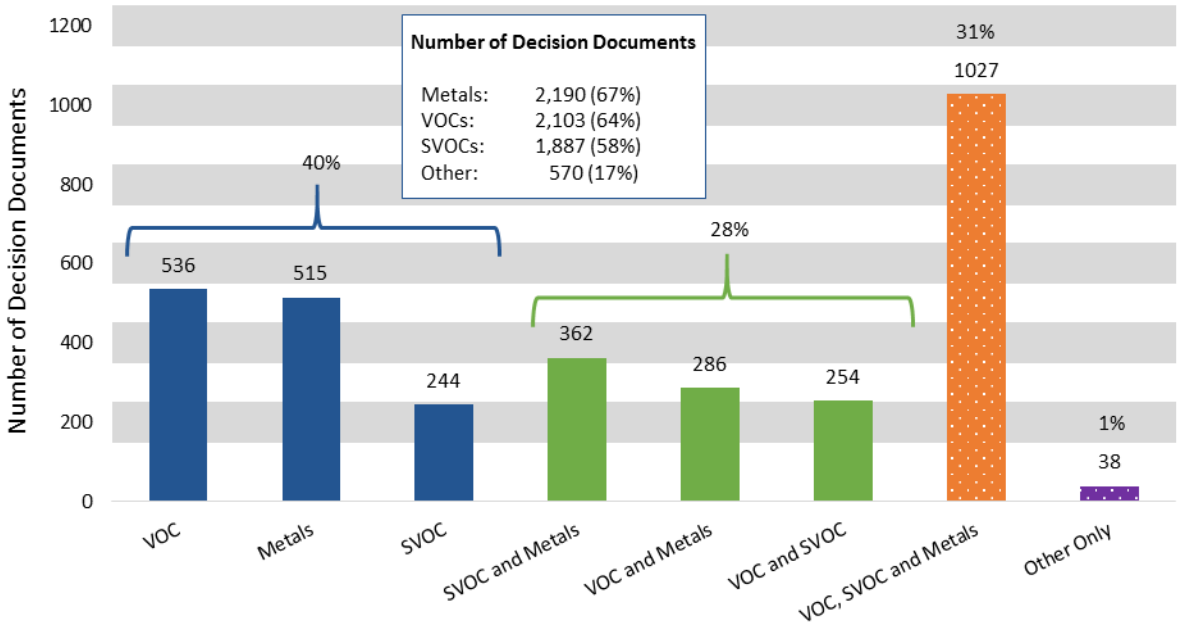
Figure 5a: COCs at Superfund Sites (FY 1982-2014)



- Number of sites with a COC and a remedy = 1,402.

EPA also conducted the contaminant group analysis based on individual decision documents with remedies and COCs, which often include a single OU and medium at a site (Figure 5b). This analysis may be more indicative of contaminants that occur together in the same medium. A larger percentage of decision documents include one or two groups of contaminants and a lower percentage have all three. The number of decision documents with COCs is less than the total number of decision documents, principally because COCs are not included for ROD Amendments and ESDs unless the COCs change from earlier decision documents.

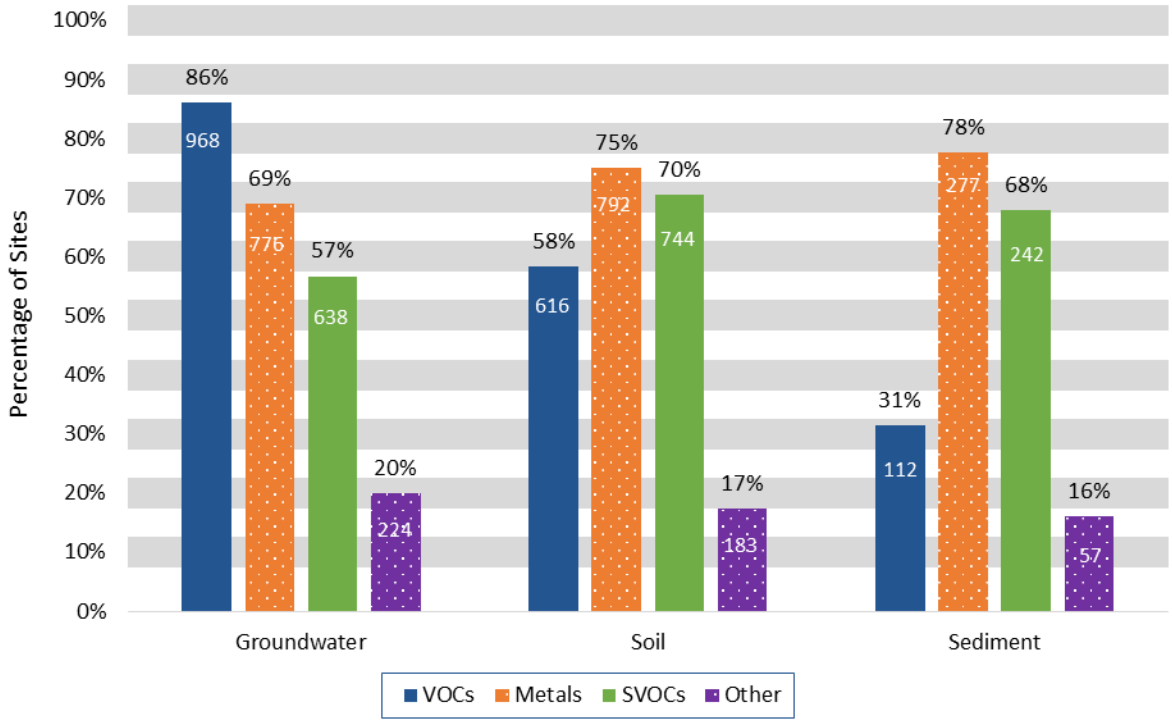
Figure 5b: COCs in Decision Documents (FY 1982-2014)



- Number of decision documents with a COC and a remedy = 3,262.

EPA analyzed COCs by the three media most frequently targeted (groundwater, soil and sediment) (Figure 6). On a site-wide basis, VOCs, metals and SVOCs are all common in groundwater and soil at Superfund sites with remedies. Metals and SVOCs are the most common COCs in sediment.

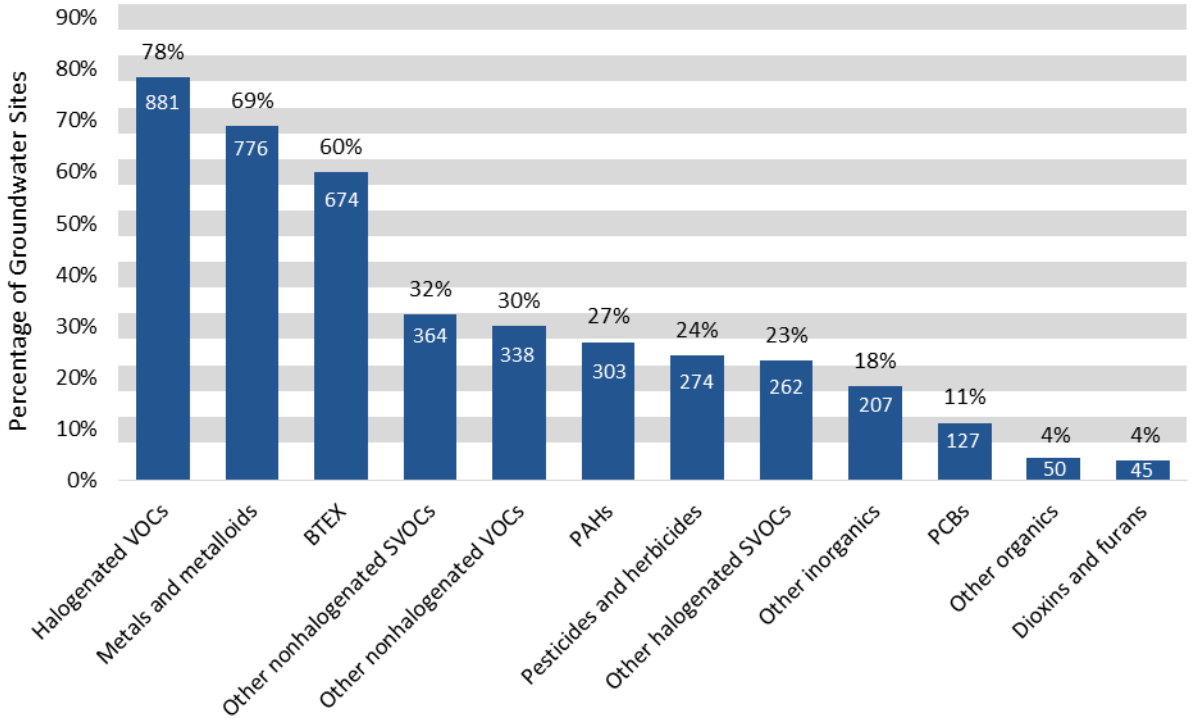
Figure 6: COCs by Media at Superfund Sites (FY 1982-2014)



- Number of groundwater sites with a COC and a remedy = 1,125.
- Number of soil sites with a COC and a remedy = 1,056.
- Number of sediment sites with a COC and a remedy = 357.

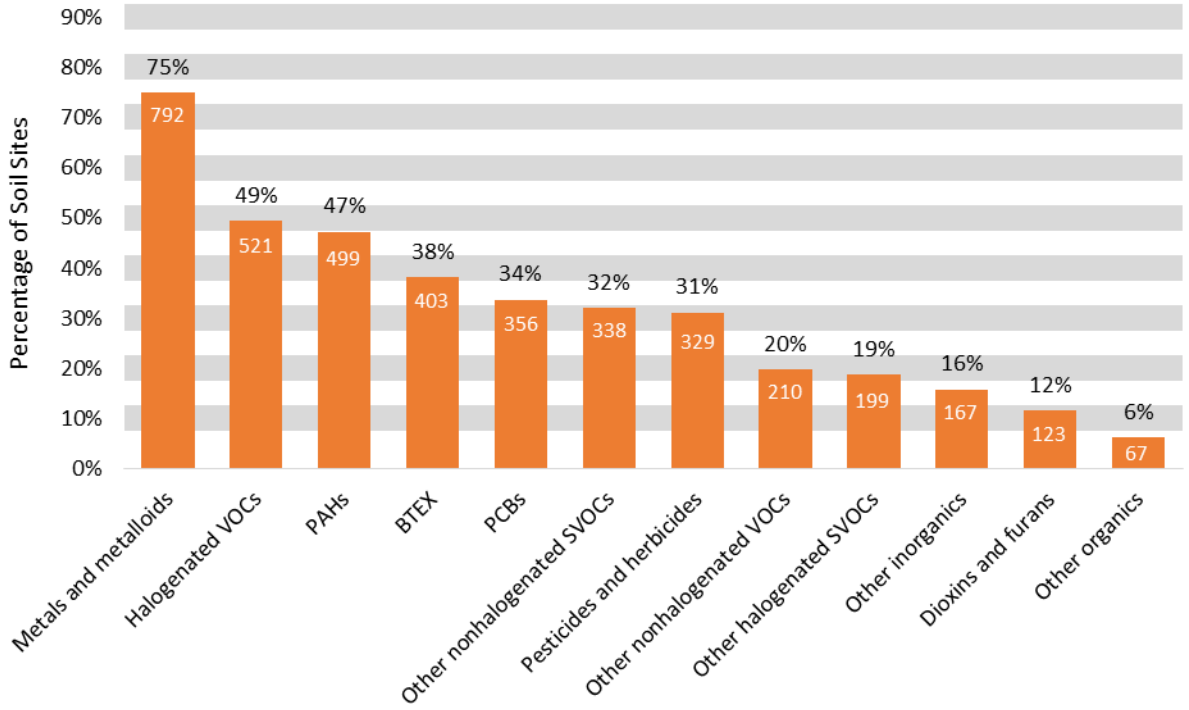
In addition to the contaminant groups discussed previously, EPA classified contaminants into more detailed categories and analyzed how frequently remedies target them in groundwater, soil, and sediment (Figures 7a, 7b and 7c). Remedies frequently address metals in all media. A more detailed look at organic COCs shows halogenated VOCs (primarily chlorinated VOCs) and BTEX to be the most common in groundwater (Figure 7a); and halogenated VOCs and PAHs in soil (Figure 7b). For sediment, PAHs and PCBs are the most frequently targeted organics (Figure 7c).

Figure 7a: Detailed COCs in Groundwater at Superfund Sites (FY 1982-2014)



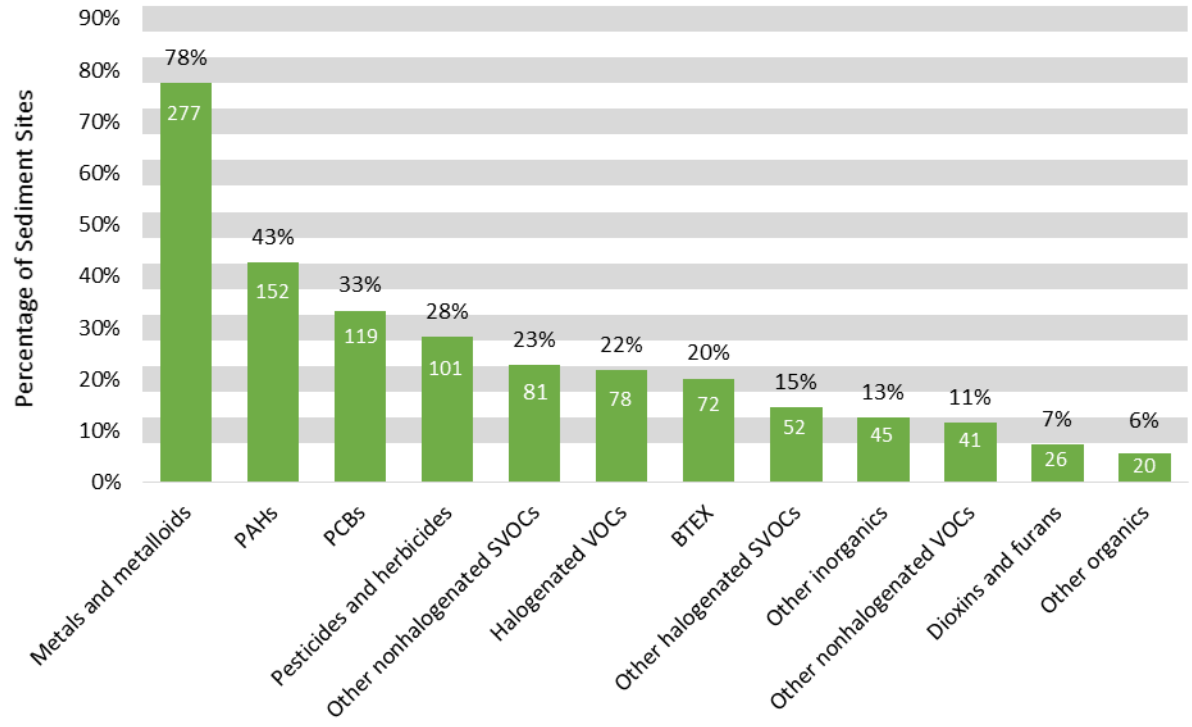
- Number of groundwater sites with a COC and a remedy = 1,125.

Figure 7b: Detailed COCs in Soil at Superfund Sites (FY 1982-2014)



- Number of soil sites with a COC and a remedy = 1,056.

Figure 7c: Detailed COCs in Sediment at Superfund Sites (FY 1982-2014)



- Number of sediment sites with a COC and a remedy = 357.

VI. Source Remedies

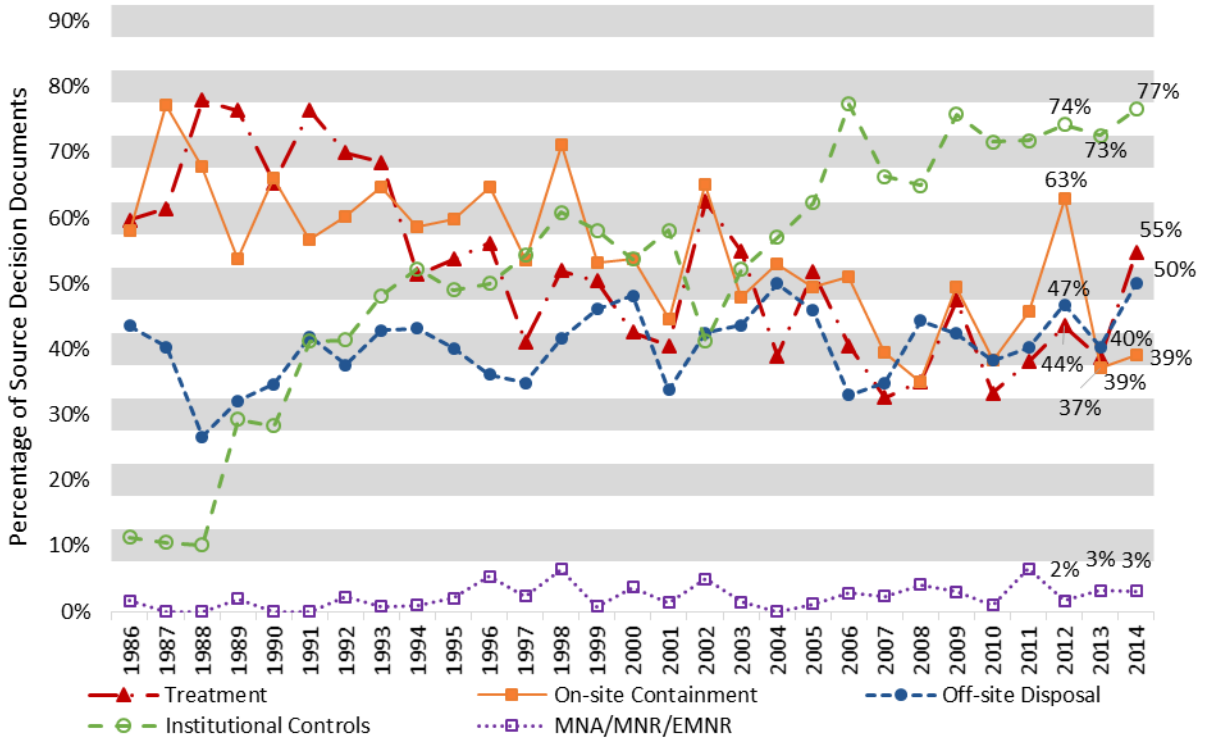
Source media include soil, sediment, solid waste, debris, buildings and structures, sludge, leachate, liquid waste, and NAPL (Table 2). The first figure in this section shows historical trends in source remedies. Subsequent figures and tables provide additional information on remedies used to address sources in recent decision documents. Descriptions of source remedies are included in Appendix A. Appendix E lists the decision documents selecting source remedies in FYs 2012, 2013 and 2014 by technology. Sediments are included in the analysis of source remedies and are discussed in more detail in the Sediment subsection.

To better understand the nature of the source remedies being selected in the Superfund program, the source remedies are grouped into the following categories. See Table 1 for more detail on each category:

- Treatment.
- On-site containment.
- Off-site disposal.
- Monitored natural attenuation (MNA) and enhanced or monitored natural recovery (EMNR or MNR).
- Institutional Controls.

EPA has tracked use of these source remedies since EPA began issuing remedy decision documents (FY 1981). EPA evaluated remedy selection trends from FY 1986 to 2014 for 2,944 source decision documents with remedies (Figure 8). In addition to those indicated in the chart, there are 101 source decision documents for FYs 1982 to 1985. The selection of treatment, on-site containment, and off-site disposal has remained relatively stable on average for source remedies over the last 20 years. IC remedies increased somewhat in the early 2000s before leveling off.

Figure 8: Selection Trends for Decision Documents with Source Remedies (FY 1986-2014)



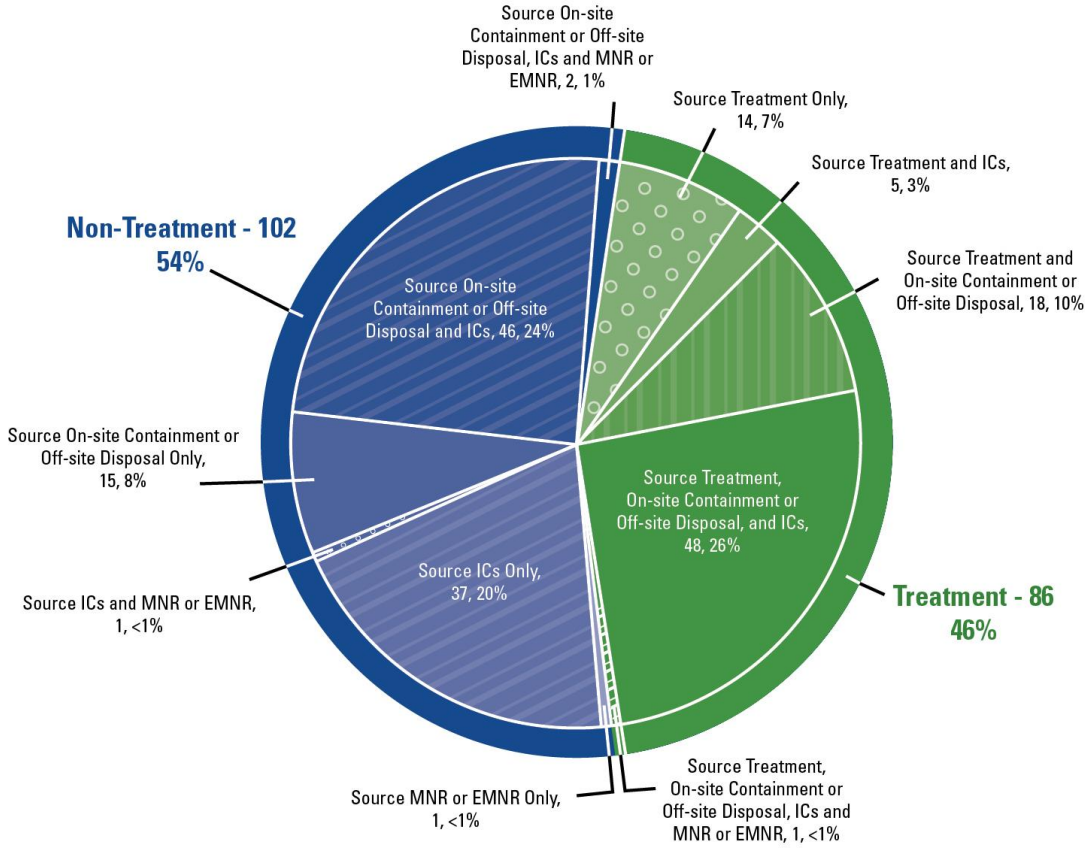
- Number of source decision documents with remedies: FY 1986-2014 = 2,944; FY 1982-2014 = 3,045.
- Decision documents may be counted in more than one category.

For this report, EPA evaluated remedies in more detail for the 308 FY 2012, 2013, and 2014 decision documents. Of these documents, 188 (or 61 percent) address source contamination at 140 sites. The percentage of decision documents addressing sources is consistent with the previous period evaluated (FYs 2009 to 2011).

Of the FY 2012 to 2014 source decision documents, nearly half select source treatment, either by itself or in combination with non-treatment remedies for sources (Figure 9). Overall, 64 percent of decision documents with source remedies select multiple remedial approaches, including various combinations of treatment, on-site containment or off-site disposal, MNR or EMNR (for sediments), and ICs. An examination of the recent decision documents selecting ICs as the only source remedy found that all were for sites with previous remedial or removal actions. This finding is consistent with the NCP, which includes the expectation that ICs should be used to supplement engineering controls to prevent or limit exposure (EPA, 2012n).

On-site source containment primarily includes caps and cover systems. Although some waste sent for off-site disposal is treated prior to disposal in accordance with waste disposal regulations, if the treatment is not specified in the decision document, it is not included as treatment in this analysis.

Figure 9: Combinations of Recent Source Remedies (FY 2012-2014)



- Number of source decision documents = 188.

Table 3 summarizes the specific types of remedies selected in source decision documents for FYs 2012, 2013 and 2014. In situ treatment was selected in nearly one-quarter of these documents. Of the 86 decision documents with source treatment, 44 (or 51 percent) specified in situ treatment. The most frequently selected in situ methods for sources are SVE, chemical treatment (including in situ chemical oxidation [ISCO] and in situ chemical reduction [ISCR]), in situ thermal treatment (ISTT), bioremediation, and solidification and stabilization (S/S).

Table 3: Source Remedies Selected in Recent Decision Documents (FY 2012-2014)

Technology	Total (FY12-14)	Percent Source Decision Documents
In Situ Treatment	**44**	**23%**
Soil vapor extraction	14	7%
Chemical treatment	12	6%
Thermal treatment	10	5%
Bioremediation	7	4%
Solidification/stabilization	7	4%
Cap (amended, in situ)	3	2%
Soil amendments	2	1%
Fracturing	1	1%
Multi-phase extraction	1	1%
Phytoremediation	1	1%
Ex Situ Treatment	**55**	**29%**
Physical separation	27	14%
Recycling	12	6%
Solidification/stabilization	5	3%
Thermal treatment	4	2%
Chemical treatment	3	2%
Source P&T (leachate)	3	2%
Bioremediation	1	1%
Constructed treatment wetland	1	1%
Soil vapor extraction	1	1%
Unspecified ex situ treatment (off-site)	7	4%
Unspecified ex situ treatment (on-site)	6	3%
Containment or Disposal	**131**	**70%**
Off-site disposal	86	46%
On-site containment	80	43%
Drainage and erosion control	34	18%
Vertical engineered barrier	8	4%
MNR or EMNR	**5**	**3%**
Sediment MNR	3	2%
Sediment EMNR	2	1%
Institutional Controls	**140**	**74%**
Other	**29**	**15%**
Fencing and signs	15	8%
Wetlands restoration	8	4%
Revegetation	5	3%
Wetlands replacement	4	2%
Shoreline stabilization	3	2%
Habitat restoration	1	1%
Stream realignment	1	1%

- Number of source decision documents = 188.
- Number of source decision documents with treatment = 86.
- Decision documents with multiple remedies within a category are counted once per category, and documents may be included in more than one remedy category.
- For unspecified on-site or off-site treatment, decision document indicates on- or off-site treatment but does not specify a particular treatment technology.
- On-site containment remedies primarily include caps and cover systems.

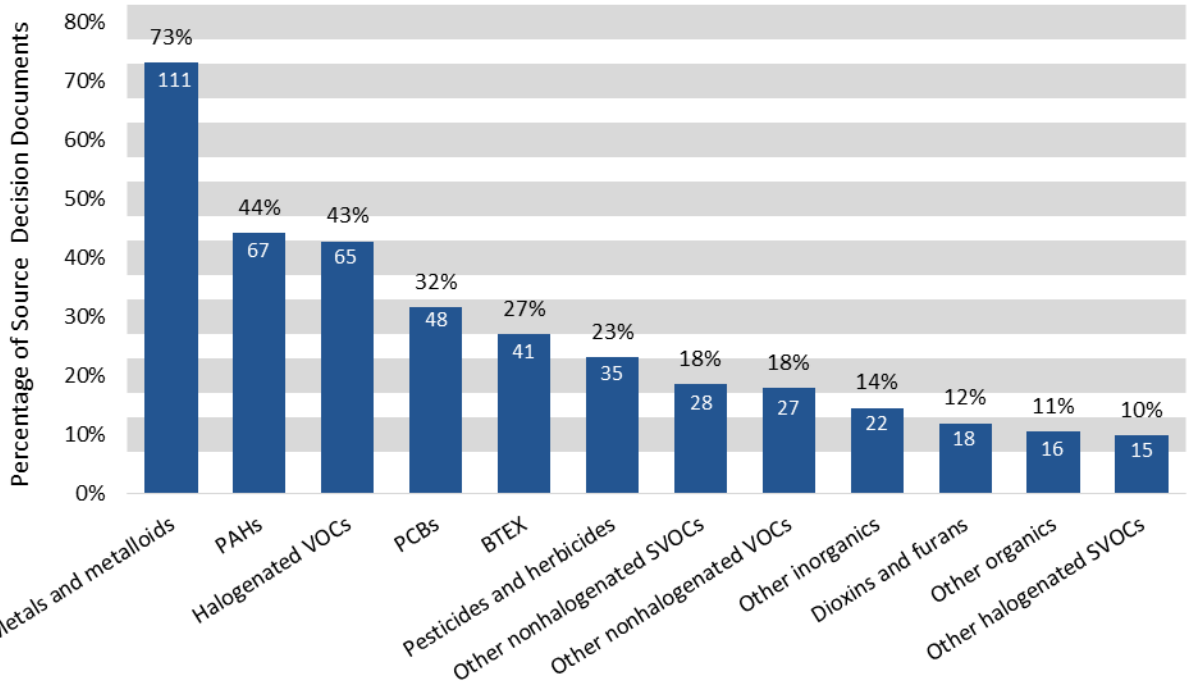
Physical separation is the most commonly selected ex situ treatment. For purposes of this report, all types of physical separation are considered treatment because they reduce the volume of contaminated material. Physical treatment processes include sifting, sieving and sorting solid media to separate components, dewatering and decontamination (for example, cleaning contaminated building surfaces). Of the 27 recent decision documents that selected physical separation, 14 selected dewatering, 8 decontamination, and 6 other physical separation processes, such as oil/water separation, sieving and mechanical sorting. One document specified both decontamination and radiological screening and separation.

Notably, ex situ S/S was selected in five recent source decision documents, down from 15 decision documents in FYs 2009, 2010 and 2011. Ex situ S/S as a percentage of source treatment dropped to 6 percent of source treatment (5 of 86) selected over the past 3 years, down from 13 percent during the previous 3-year period (FYs 2009 to 2011).

"Wetlands replacement" refers to wetlands constructed to compensate for wetlands lost by adverse impacts of a remedy (such as placement of a cap in a wetland or other habitat area). Rehabilitation of a contaminated wetland is referred to as "wetlands restoration."

Figure 10 shows the top COCs targeted by source remedies in FY 2012 to 2014 decision documents. Nearly three-quarters of these documents address metals, almost half address PAHs, and almost half address halogenated VOCs.

Figure 10: Detailed COCs in Decision Documents with Source Remedies (FY 2012-2014)



- Number of source decision documents with a COC and a remedy = 152.

Sediment Remedies

Fifty-two source decision documents for FYs 2012, 2013, and 2014 address sediment (Table 4). Of those, 39 selected a remedy for sediments (for 35 sites) and 13 specified no action or no further action. Appendix A includes descriptions of sediment remedies, and Appendix F lists the decision documents selecting sediment remedies by technology. Most (87 percent) include dredging, containment, or disposal, and 49 percent include treatment. The most common treatment method is physical separation (31 percent); as discussed previously, this report classifies any technology that reduces toxicity, mobility or volume as treatment. Other sediment treatment selected includes amended caps and ex situ S/S. The ex situ S/S remedies immobilize contaminants in the sediment prior to disposal. Two-thirds of decision documents for sediments also include ICs.

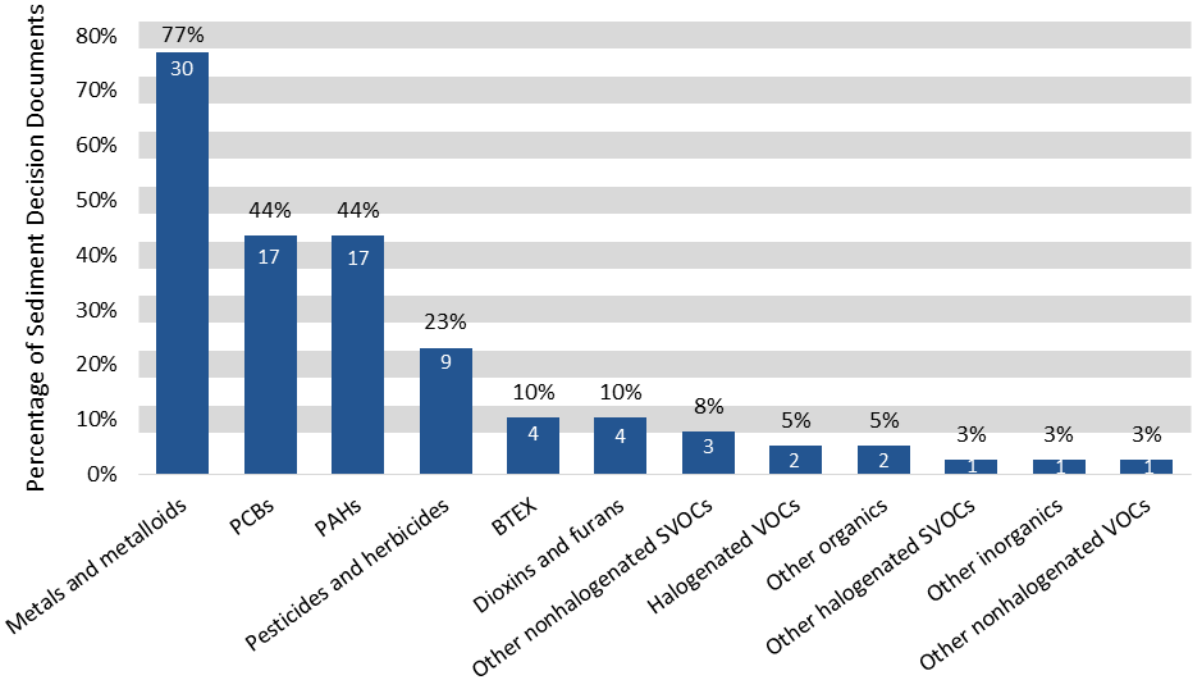
Table 4: Sediment Remedies Selected in Recent Decision Documents (FY 2012-2014)

Remedy	Total (FY12-14)	Percent Sediment Decision Documents
Treatment	**19**	**49%**
Physical separation (ex situ)	12	31%
Cap (amended, in situ)	3	8%
Solidification/stabilization (ex situ)	2	5%
Bioremediation (in situ)	1	3%
Chemical treatment (ex situ)	1	3%
Incineration (off-site)	1	3%
Neutralization (ex situ)	1	3%
Recycling (ex situ)	1	3%
Solidification/stabilization (in situ)	1	3%
Thermal desorption (ex situ)	1	3%
Thermal treatment (in situ)	1	3%
Unspecified ex situ treatment (off-site)	1	3%
Dredging, Disposal, and Containment	**34**	**87%**
Dredging or excavation	31	79%
Off-site disposal	24	62%
Capping (in situ)	8	21%
Capping (ex situ)	6	15%
Containment cell (upland, adjacent)	3	8%
Containment cell (subaqueous)	1	3%
Enhanced Monitored Natural Recovery	**2**	**5%**
Monitored Natural Recovery	**3**	**8%**
Institutional Controls	**26**	**67%**
Other	**16**	**41%**
Wetlands restoration	6	15%
Revegetation	5	13%
Fencing and signs	3	8%
Shoreline stabilization	3	8%
Wetlands replacement	3	8%
Habitat restoration	1	3%
Stream realignment	1	3%

- Number of decision documents with a sediment remedy = 39 (Does not include 13 decision documents specifying no action or no further action)
- Decision documents with multiple remedies within a category are counted once per category, and documents may be included in more than one remedy category.

EPA analyzed COCs addressed by sediment remedies in recent decision documents (Figure 11). Over three-quarters of these documents include metals. PCBs and PAHs are the next most frequent categories of COCs with 44 percent each.

Figure 11: Detailed COCs in Decision Documents with Sediment Remedies (FY 2012-2014)



- Number of sediment decision documents with a COC and a remedy = 39.

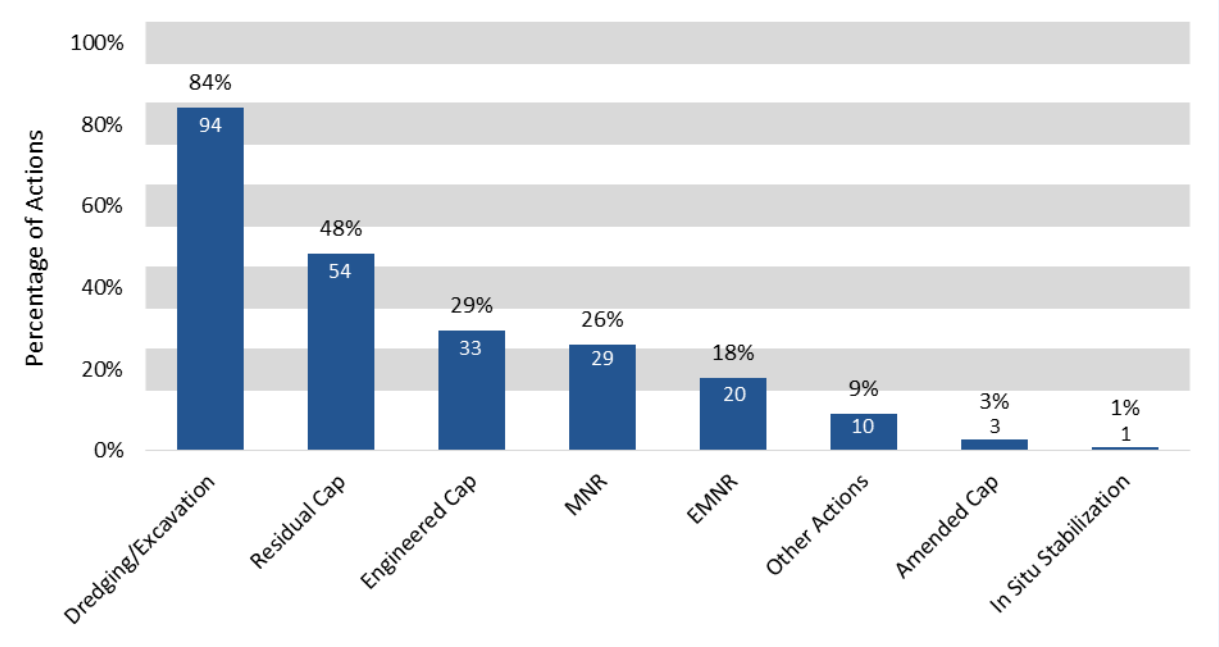
Tier 1 Sediment Sites

EPA analyzed newly acquired data on the largest sediment sites, known as Tier 1 sediment sites. EPA defines Tier 1 sites as those "[w]here the sediment action(s) for the entire site will address more than 10,000 cubic yards or five acres of contaminated sediment…" (EPA, 2002). Most are NPL sites, although a few are Superfund Alternative Approach or Resource Conservation and Recovery Act (RCRA) corrective action sites.

EPA compiled remedy data for 66 Tier 1 sites.[8] The data were based not only on the selection of remedies but also design or implementation of actions, if available. For purposes of this report, data were reorganized into 112 separate actions. Figure 12 shows the 112 actions selected or implemented at 66 sites on the Tier 1 list.

EPA distinguishes between residual caps and engineered caps on the Tier 1 list. Residual caps refer to a thin layer of clean material placed in dredged areas where it mixes with remaining sediment and further reduces risk from contamination left after dredging (EPA, 2005). Engineered caps are designed to isolate the contaminated material from the waterway. Any dredging associated with engineered caps is typically done to make room for the cap. The majority of Tier 1 sites (84 percent) have some dredging or excavation of sediment. Nearly half of the Tier 1 sites have residual caps and nearly one-third of the sites have engineered caps.

Figure 12: Actions at Tier 1 Sediment Sites



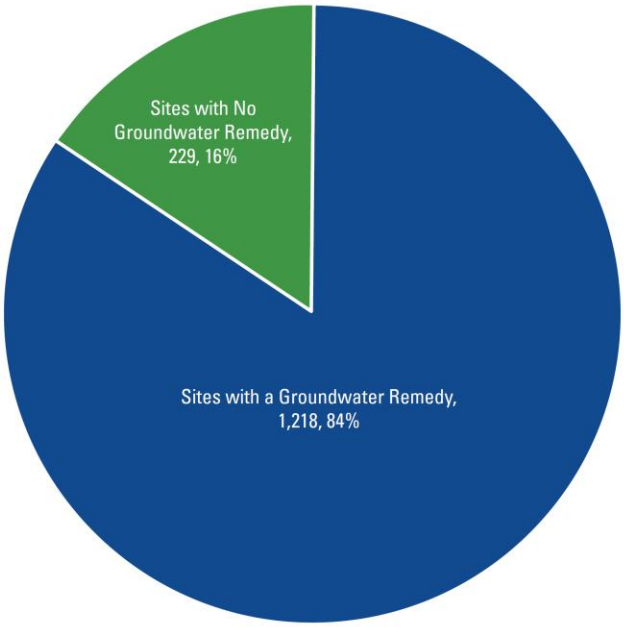
- Total number of Tier 1 sites = 66; number of Tier 1 actions = 112.
- Other actions include stream realignment, ex situ sediment washing, sediment traps, and use of sediment holding tanks.

[8] Additional information about Tier 1 sediment sites is available at www.epa.gov/superfund/superfund-contaminated-sediments-list-sediments-sites. Accessed January 2016.

VII. Groundwater Remedies

Groundwater contamination occurs at most Superfund sites. Of the 1,447 Superfund sites with remedies, 84 percent (1,218 sites) have groundwater remedies (Figure 13), which are documented in 2,425 decision documents. The figures and tables in this section present additional information on groundwater remedies and trends. Descriptions of groundwater remedies are included in Appendix A. Appendix G lists the decision documents selecting groundwater remedies from FY 2012 to 2014 by technology.

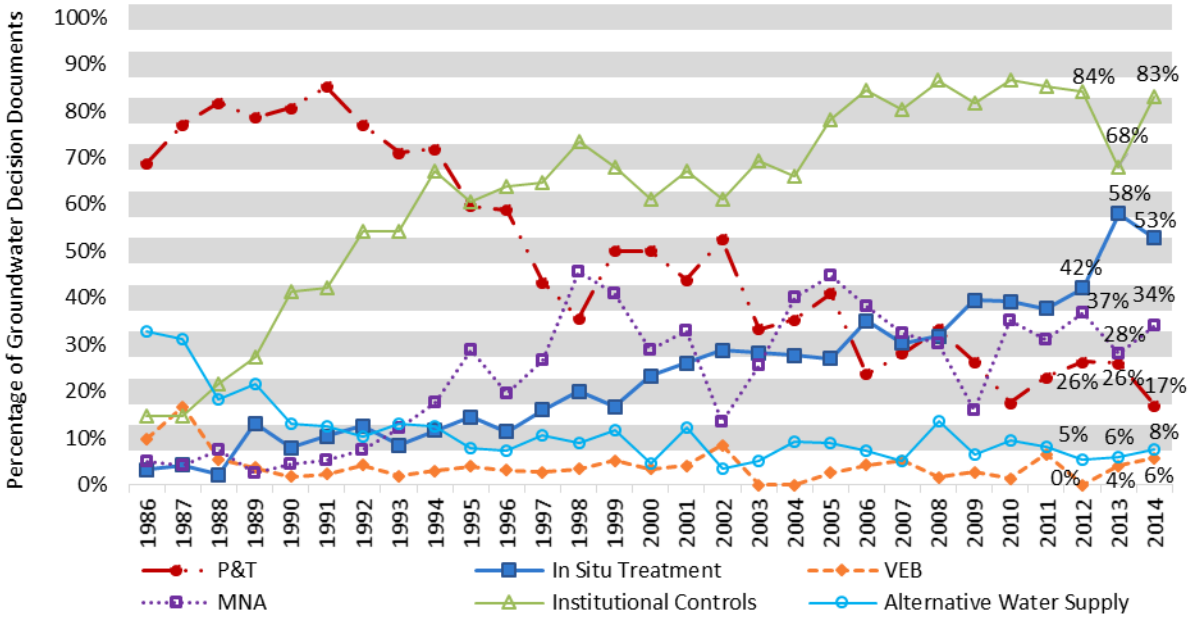
Figure 13: Superfund Sites with Groundwater Remedies (FY 1982-2014)



- Number of Superfund sites with a remedy = 1,447.
- Does not include 93 sites with only no action or no further action.

Figure 14 shows the selection trends for groundwater remedies in 2,357 decision documents from FY 1986 to 2014. In addition to those indicated in the chart, there are 68 groundwater decision documents for FYs 1982 to 1985. The most apparent trends are the continued increase in the selection of in situ groundwater treatment and decrease in the selection of P&T. In situ treatment has increased significantly; in the most recent three years, the overall percentage rose to 51 percent, up from 39 percent in the last three-year period (FYs 2009 to 2011). The percentage of groundwater decision documents selecting P&T was at its lowest, 17 percent, in FY 2014. Almost all recent groundwater decision documents include ICs[9]. Although there is an apparent decrease in IC selection in FY 2013, EPA determined that for the FY 2013 groundwater decision documents that did not include ICs, the corresponding OU had ICs for the groundwater selected in a previous decision document.

Figure 14: Selection Trends for Decision Documents with Groundwater Remedies (FY 1986-2014)

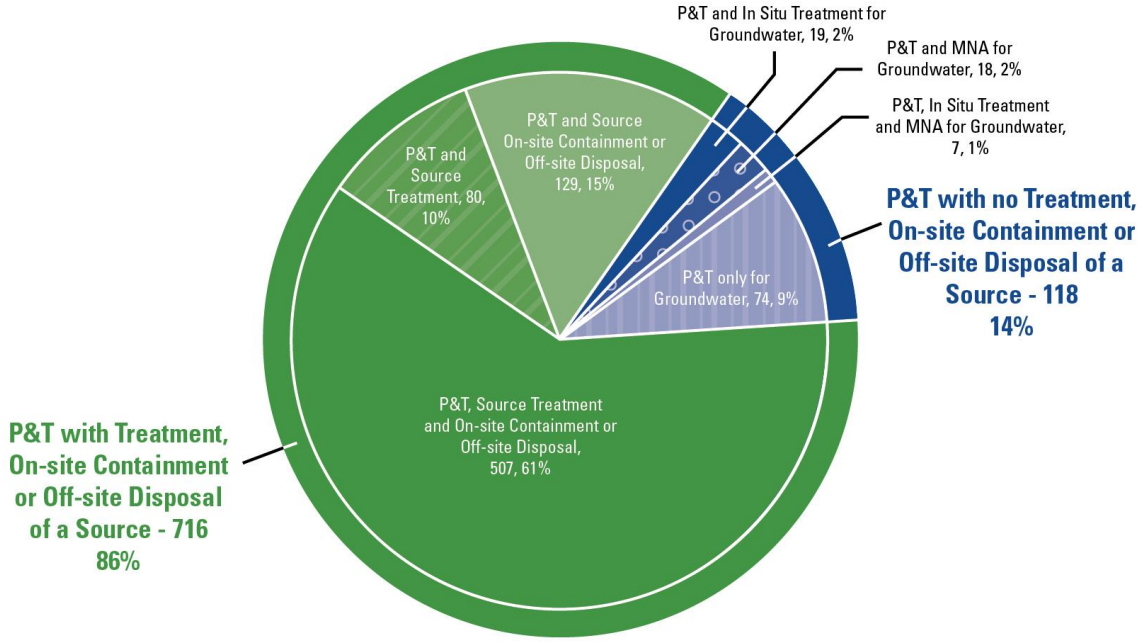


- Number of groundwater decision documents with remedies: FY 1986-2014 = 2,357; FY 1982-2014 = 2,425.
- Decision documents may be included in more than one category.

[9] Refer to Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites. OSWER. December 2012. EPA 540-R-09-011. http://semspub.epa.gov/src/document/11/175446

Since 1982, groundwater P&T was selected in at least one decision document at 834 Superfund sites. Figure 15 shows the mix of remedial approaches selected at these sites. Most sites (91 percent) are also addressing contamination with another groundwater remedy (in situ groundwater treatment or MNA) or source remedy (treatment, on-site containment, or off-site disposal). Remedies may apply to the same area or different areas of the site.

Figure 15: Summary of Remedies Selected with Groundwater P&T at Superfund Sites (FY 1982-2014)



- Total number of P&T sites = 834.

EPA evaluated groundwater remedies selected in 308 FY 2012 to 2014 decision documents. Of these, about half (160 documents) address groundwater contamination and a third (106) select groundwater treatment (Table 5). Of the 81 groundwater decision documents that select in situ treatment, over half include bioremediation and nearly half include chemical treatment. One-third of recent decision documents select MNA.

Table 5: Groundwater Remedies Selected in Recent Decision Documents (FY 2012-2014)

Remedy	Total (FY12-14)	Percent Groundwater Decision Documents
Ex Situ Treatment (P&T)	**37**	**23%**
In Situ Treatment	**81**	**51%**
Bioremediation	46	29%
Chemical treatment	37	23%
Permeable reactive barrier	7	4%
Air sparging	5	3%
Thermal treatment	4	3%
Fracturing	3	2%
In-well air stripping	2	1%
Multi-phase extraction	2	1%
Phytoremediation	2	1%
Flushing	1	1%
Unspecified in situ treatment	3	2%
Monitored Natural Attenuation	53	33%
Containment (Vertical Engineered Barrier)	5	3%
Constructed Treatment Wetland	2	1%
Institutional Controls	126	79%
Alternative Water Supply	10	6%
Other	8	5%
Containment (other)	3	2%
Fencing and signs	2	1%
Phytoremediation (for hydraulic control)	2	1%
Leachate control	1	1%
Wetlands restoration	1	1%

- Number of groundwater decision documents = 160.
- Number of groundwater decision documents with treatment = 106.
- Decision documents with multiple remedies within a category are counted once per category, and documents may be included in more than one remedy category.
- Containment (other) includes containment (unspecified) (2) and bottom liner to prevent groundwater discharge to surface water (1).

More than half of decision documents that selected bioremediation remedies specify anaerobic bioremediation (Table 6). Aerobic bioremediation and bioaugmentation (addition of bacteria capable of degrading specific chemicals) are also specified in some bioremediation remedies. More

than half of decision documents that selected chemical treatment specify ISCO, while more than a quarter select ISCR. Appendix A includes descriptions of bioremediation and chemical treatment remedies.

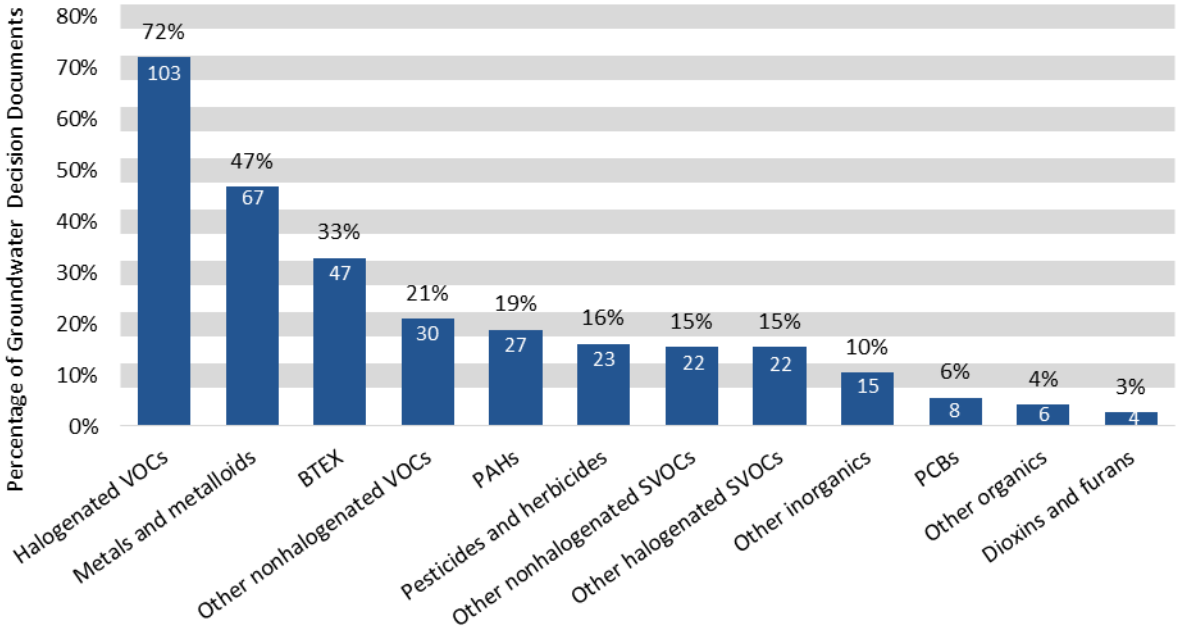
Table 6: In Situ Bioremediation and Chemical Treatment Techniques Selected in Recent Groundwater Decision Documents (FY 2012-2014)

Technology	2012	2013	2014	Total
Bioremediation	**13**	**17**	**16**	**46**
Anaerobic bioremediation	8	10	11	29
Bioremediation (unspecified)	5	5	5	15
Bioaugmentation	2	2	5	9
Aerobic bioremediation	0	2	1	3
Chemical Treatment	**15**	**9**	**13**	**37**
In situ chemical oxidation	9	5	8	22
In situ chemical reduction	4	3	6	13
In situ chemical treatment (unspecified)	1	1	1	3
Neutralization	0	1	0	1
In situ chemical oxidation/reduction	1	0	0	1

- Number of decision documents selecting in situ bioremediation or in situ chemical treatment = 72.
- Decision documents with multiple remedies within a category are counted once per category, and documents may be included in more than one remedy category.

Figure 16 shows the COCs most frequently addressed in recent groundwater decision documents. Nearly 75 percent of groundwater decision documents have remedies that target halogenated (primarily chlorinated) VOCs. Metals and BTEX are the next most common contaminant categories at 47 and 33 percent, respectively. Of the 29 decision documents with anaerobic bioremediation, 20 had COCs indicated, and all 20 included chlorinated VOCs. Of the 13 ISCR projects, 10 indicated COCs, as follows: organic COCs only (5), metals and organic COCs (2), metals only (2), and other inorganics (perchlorate) (1).

Figure 16: Detailed COCs in Decision Documents with Groundwater Remedies (FY 2012-2014)



- Number of groundwater decision documents with a COC and a remedy = 142.

VIII. Vapor Intrusion

Data for remedies that target air and soil gas media to address vapor intrusion have only recently been tracked and were included for the first time in the *SRR 14th Edition*. From FY 2009 to 2014, 61 decision documents address vapor intrusion at 52 sites. Vapor intrusion mitigation technologies and ICs selected in FY 2009 to 2014 decision documents are included in Table 7. Descriptions of the mitigation technologies are found in Appendix A. The names of the mitigation technologies have been simplified and may not match the previous edition of the SRR. Appendix H lists the decision documents selecting vapor intrusion remedies from FY 2012 to 2014 by technology.

Vapor intrusion is the term given to the migration of vapor-forming chemicals from any underground source into a structure (for example, homes, businesses, schools). Contaminated groundwater or soil is the most common subsurface vapor source, although contamination in sewers, drain lines, and other conduits can also present a vapor intrusion threat in some settings. Vapor-forming chemicals may include VOCs, select SVOCs, some pesticides, some PCBs, and some inorganic contaminants, such as elemental mercury. Concentrations of vapor-forming chemicals in indoor air may pose an unacceptable health risk to building occupants. EPA recently issued two technical guides for assessing and mitigating vapor intrusion (EPA, 2015a and 2015b).

Thirty-six FY 2012, 2013, and 2014 decision documents address vapor intrusion at 31 sites (Table 7). Nine of these decision documents select vapor intrusion mitigation for existing structures. Five of these specify active depressurization, passive barriers or sub-slab ventilation.

Eleven decision documents select ICs for vapor intrusion at existing structures. Twenty-five recent decision documents include ICs related to building design and construction of future structures in areas with subsurface contamination that does not support unlimited land use and unrestricted exposure.

Table 7: Vapor Intrusion Remedies Selected in Decision Documents (FY 2009-2014)

Remedy	2009	2010	2011	2012	2013	2014	Total
Vapor Intrusion Mitigation at Existing Structures	**1**	**8**	**6**	**3**	**3**	**3**	**24**
Active depressurization technology	0	6	3	1	0	3	13
Vapor intrusion mitigation (unspecified)	1	2	2	2	2	1	10
Sealing cracks and openings	0	4	1	0	0	0	5
Interior ventilation	0	4	0	0	0	0	4
Passive barrier (impermeable membrane)	0	0	1	1	1	0	3
Soil pressurization	0	3	0	0	0	0	3
Sub-slab ventilation	0	0	0	1	1	0	2
Institutional Controls	**0**	**11**	**11**	**6**	**6**	**22**	**56**
Future construction	0	9	7	4	5	16	41
Existing structures	0	6	6	3	2	6	23

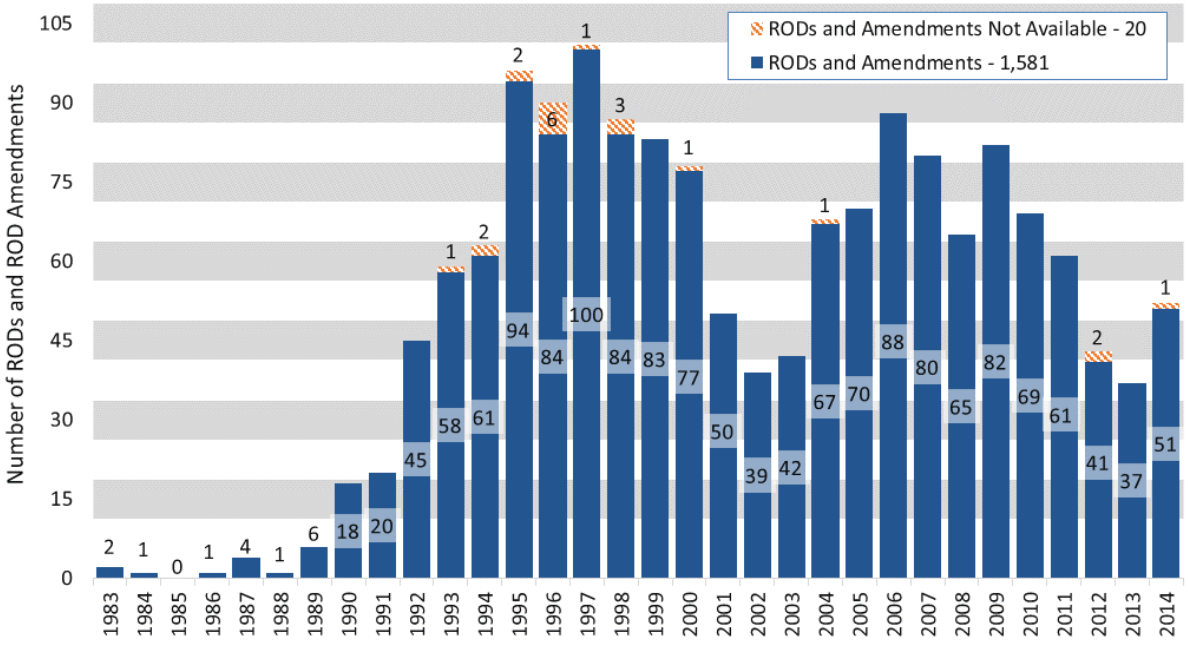
- Number of decision documents selecting vapor intrusion remedies: FY 2009-2011 = 25, FY 2012-2014 = 36.
- Decision documents with multiple remedies within a category are counted once per category, and documents may be included in more than one remedy category.

The *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* (EPA, 2015a) states that "the preferred long-term response to the intrusion of vapors into buildings is to eliminate or substantially reduce the level of contamination in the subsurface vapor source (e.g., groundwater, subsurface soil, sewer lines) by vapor-forming chemicals to acceptable-risk levels, thereby achieving a permanent remedy." Source or groundwater remedies may have been selected to address subsurface contamination or such remedies may be planned. Selected remedies are included in the source and groundwater sections (Section VI and Section VII, respectively). Building mitigation for vapor intrusion should "be regarded as an interim action that can provide effective human health protection, which may become part of a final cleanup plan" (EPA, 2015a).

IX. Decision Documents at Federal Facilities

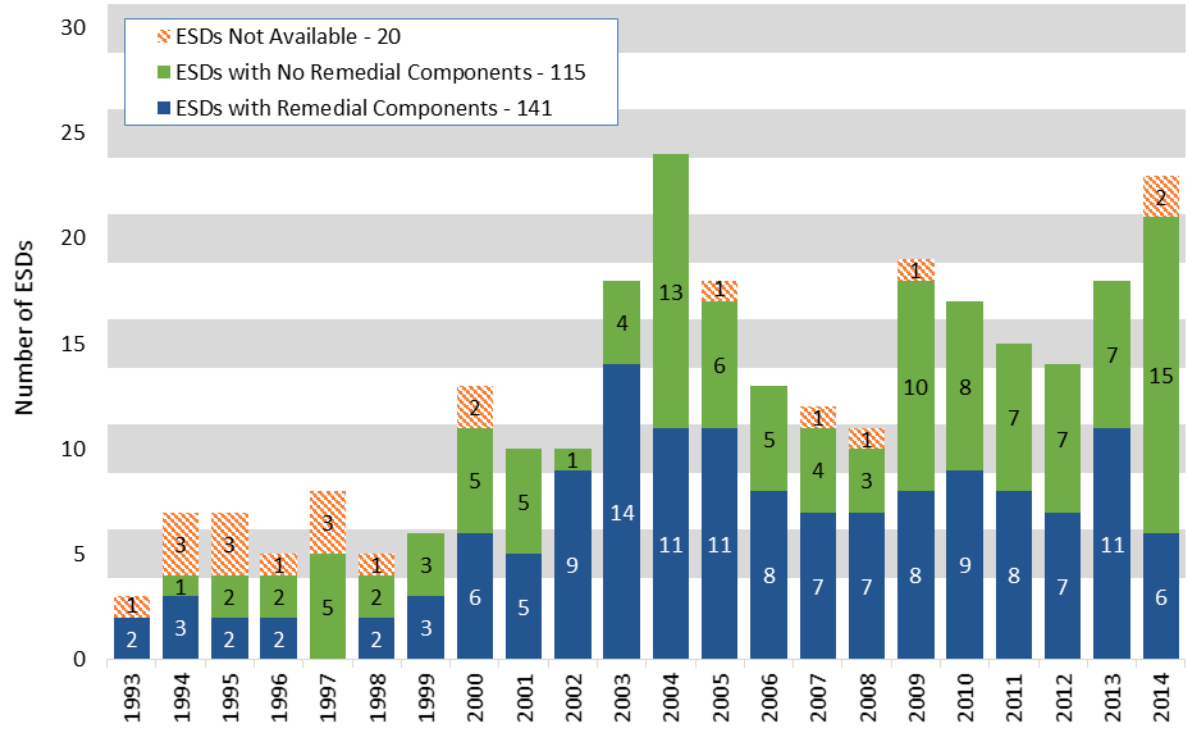
For this report, EPA conducted a separate analysis of decision documents and contaminants associated with federal facilities on the NPL. Since 1983, EPA has signed 1,877 RODs, ROD Amendments and ESDs for 171 federal facilities (Figures 17 and 18). These decision documents are a subset of the documents shown in Figures 2 and 3. A small number of decision documents are not available as indicated in the figures.

Figure 17: Federal Facility RODs and ROD Amendments per Year (FY 1983-2014)



- Total number of federal facility RODs and ROD Amendments = 1,601.
- No federal facility RODs or ROD Amendments were signed prior to 1983.

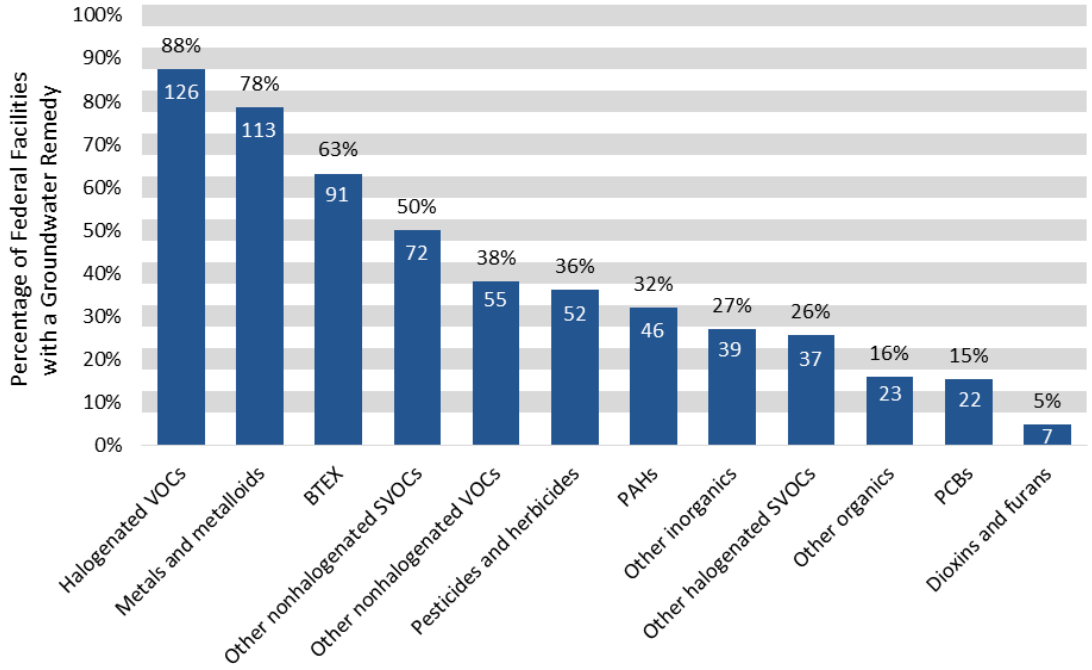
Figure 18: Federal Facility ESDs per Year (FY 1993-2014)



- Total number of federal facility ESDs = 276.
- No federal facility ESDs were signed prior to 1993.

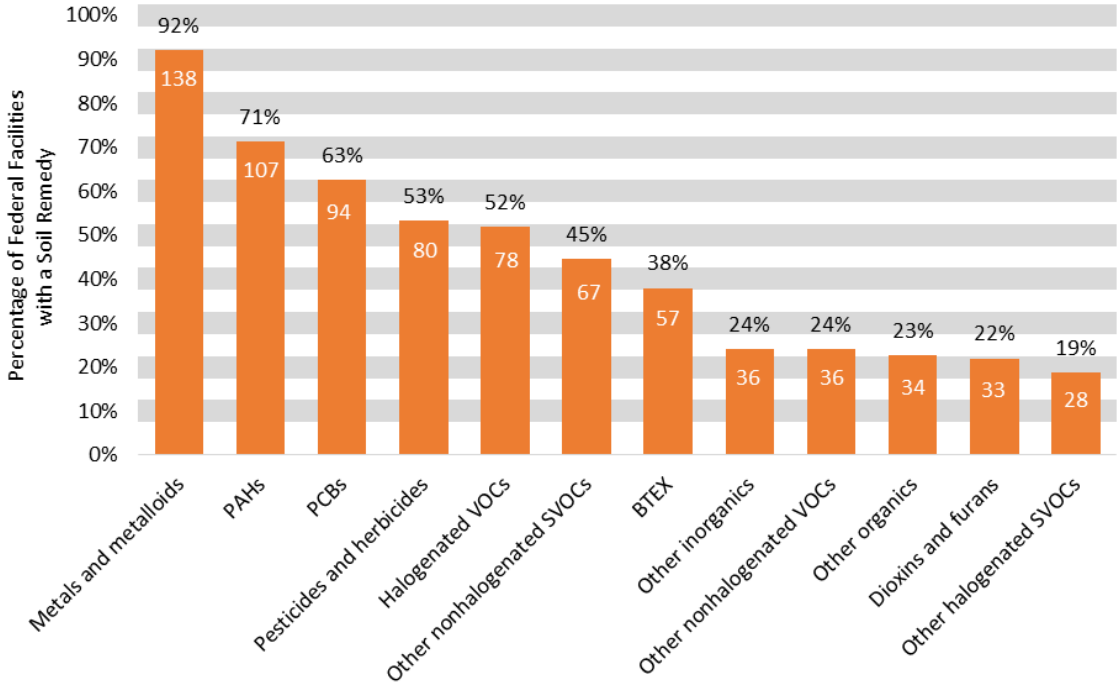
A more detailed look at COCs at federal facilities with groundwater or soil remedies shows halogenated VOCs (primarily chlorinated VOCs) and metals to be the most commonly addressed in groundwater (Figure 19), and metals and PAHs the most common in soil (Figure 20).

Figure 19: Detailed COCs in Groundwater at Federal Facilities (FY 1983-2014)



- Number of federal facilities with a groundwater remedy and groundwater COCs = 144.

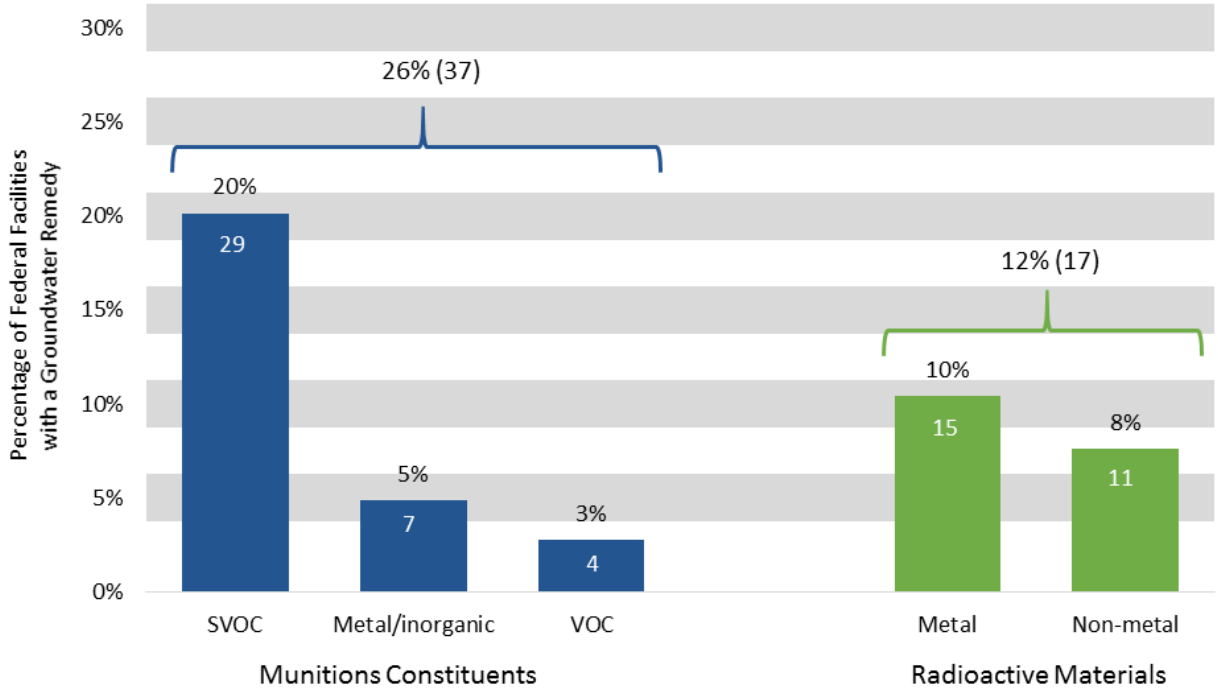
Figure 20: Detailed COCs in Soil at Federal Facilities (FY 1983-2014)



- Number of federal facilities with a soil remedy and soil COCs = 150.

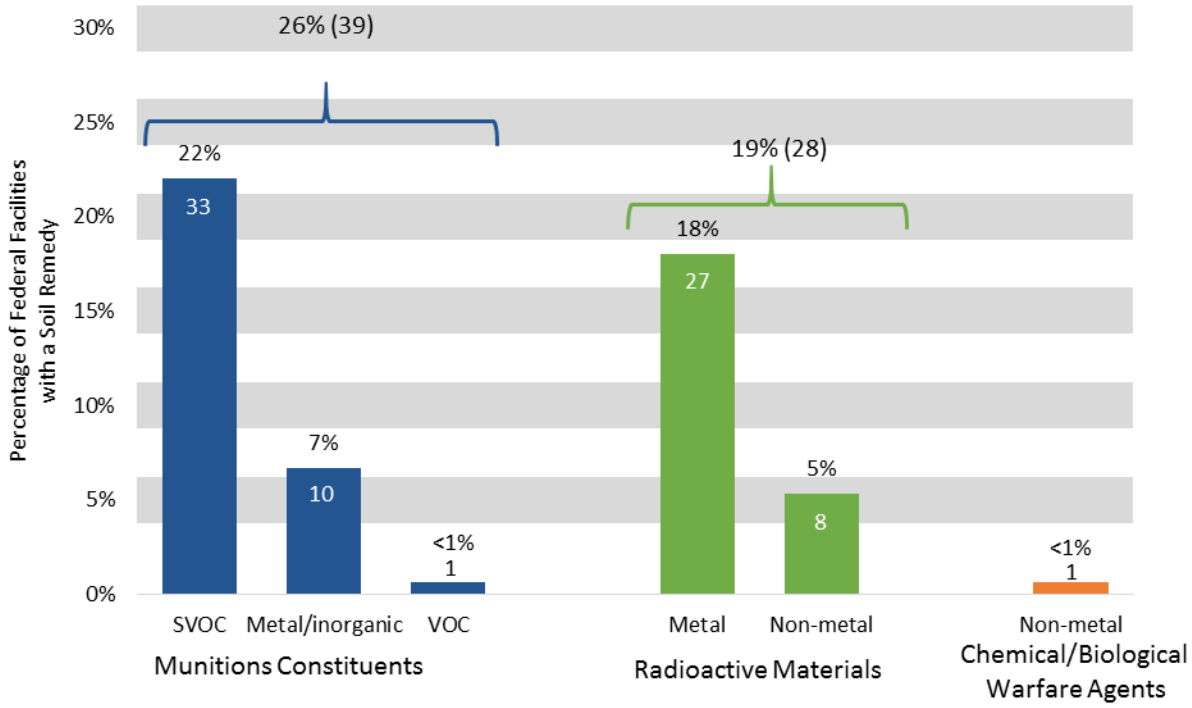
EPA also looked more closely at select categories of contaminants—munitions constituents, radioactive materials, and chemical and biological warfare agents—that may be present at federal facilities. Appendix D identifies which contaminants are included in each of these select categories. Decision documents include groundwater and soil remedies addressing munitions constituents and radioactive materials. The remedies most frequently address SVOC munitions constituents (such as RDX) and radioactive metals (such as uranium) (Figures 21 and 22).

Figure 21: Select COCs in Groundwater at Federal Facilities (FY 1983-2014)



- Number of federal facilities with a groundwater remedy and groundwater COCs = 144.

Figure 22: Select COCs in Soil at Federal Facilities (FY 1983-2014)



- Number of federal facilities with a soil remedy and soil COCs = 150.

X. Combined Remedies

Many of the remedies selected in FY 2012, 2013 or 2014 decision documents use a combined remedy approach. Combined remedies include those that are combined spatially to treat different media or areas of the plume at the same time or those that are implemented over time using a phased approach. An example of a spatial approach is the use of one remedial technology for the more concentrated plume core and another for areas of lower concentration in the distal plume. In a phased approach, one remedial technology may follow another, such as in situ chemical treatment followed by bioremediation. Phased approaches may be conducted to first address one contaminant type and then another or may be conducted sequentially to lower contaminant concentrations with one technology first and then further reduce contaminant concentrations to reach designated cleanup levels with another technology. In some cases, synergistic effects from one technology can enhance another. For example, heat remaining from ISTT may enhance bioremediation.

The following highlights (Figures 23 through 26) present four applications of combined remedies selected in recent decision documents:

- ISCO and aerobic bioremediation at Alameda Naval Air Station.
- ISTT and bioremediation (aerobic and anaerobic) at Mattiace Petrochemical Co., Inc.
- ISCR and anaerobic bioremediation at St. Julien's Creek Annex (U.S. Navy).
- Steam-enhanced extraction and in situ bioremediation at Williams Air Force Base.

Figure 23: Combined Remedy Highlight – Alameda Naval Air Station

Alameda Naval Air Station, Alameda, California ROD Date: 4/29/14
MEDIA/CONTAMINANTS ■ Groundwater ■ Chlorinated VOCs (vinyl chloride and trichloroethene) **REMEDIAL COMPONENTS** ■ ISCO ■ Aerobic bioremediation **REMEDIAL APPROACH** ■ Spatial approach ■ ISCO for higher concentrations in groundwater and aerobic bioremediation for more dilute plume areas
OU-2C encompasses the groundwater contamination located at this former Naval Air Station. Site uses included manufacturing and refurbishing associated with aircraft and missile maintenance including painting, degreasing and cleaning of airplane parts, and construction of aircraft components. The Station closed in 1997 and requires remedial action to address VOCs found in groundwater and soils around several buildings. The selected remedy for shallow groundwater in OU-2C includes the use of two in situ treatment technologies: ISCO to treat high concentrations of VOCs and aerobic bioremediation for the more dilute plume areas. This combination will reduce concentrations in shallow groundwater to achieve the remedial goals and address the risks associated with potential inhalation of vapors from chemicals in groundwater.

Figure 24: Combined Remedy Highlight – Mattiace Petrochemical Co., Inc.

Mattiace Petrochemical Co., Inc., Nassau County, New York
ROD Amendment Date: 9/29/14

MEDIA/CONTAMINANTS

- Groundwater, soil and LNAPL
- Chlorinated VOCs, BTEX

REMEDIAL COMPONENTS

- ISTT
- Bioventing
- Aerobic and anaerobic bioremediation
- Vertical engineered barrier (VEB) and phytoremediation (for hydraulic control)

REMEDIAL APPROACH

- Spatial approach
- ISTT in soil hot spot areas; bioventing, aerobic and anaerobic bioremediation in LNAPL plume; VEB and phytoremediation in downgradient plume areas

This site began operating in the mid-1960s and activities consisted of storing, blending, and repackaging of organic solvents. Numerous drums and aboveground and underground storage tanks were used at the site. Removal activities began in 1988. RODs signed in 1990 and 1991 included the following remedies: soil excavation, off-site disposal of buried drums, SVE for residual soil, P&T of groundwater, and LNAPL recovery. Since signing these RODs, EPA has concluded that additional actions were necessary.

A ROD Amendment was signed in 2014 to address groundwater and soil gas contamination remaining at the site. Several technologies were selected to address different areas of contamination. ISTT was selected for higher concentrations of VOCs in soil and groundwater. Bioventing was selected to address the residual source of contamination to groundwater, which consists of both free-phase LNAPL and LNAPL in the smear zone. Bioventing enhances aerobic biological degradation of hydrocarbons present in the LNAPL and the associated vadose portion of the smear zone. The biological degradation process produces fatty acids that, in turn, could be used by the anaerobic bacteria that are already present in the groundwater to continue the natural degradation of chlorinated VOCs in the groundwater and the saturated portion of the smear zone. In areas where existing conditions are not conducive to optimal anaerobic bioremediation, amendments will be added to enhance bioremediation of chlorinated VOCs in the groundwater. In addition, a VEB was selected in downgradient areas where the depth to the nearest subsurface clay layer is sufficiently shallow to limit future migration of both impacted groundwater and soil gas away from the site. Phytoremediation for hydraulic control will also be used in conjunction with the VEB to maintain water levels behind the wall and minimize the spread of contamination at the site.

Figure 25: Combined Remedy Highlight – St. Julien's Creek Annex (U.S. Navy)

St. Julien's Creek Annex (U.S. Navy), Chesapeake, Virginia
ROD Date: 10/20/11

MEDIA/CONTAMINANTS

- Groundwater
- Chlorinated VOCs (vinyl chloride; cis-1,2-dichloroethene; 1,1-dichloroethene; trichloroethene

REMEDIAL COMPONENTS

- ISCR
- Anaerobic bioremediation (enhanced reductive dechlorination [ERD])

REMEDIAL APPROACH

- Phased approach
- ISCR followed by anaerobic bioremediation

Site 21 is an industrial area in the south central portion of the facility, currently used for storage and maintenance operations. The site encompasses a number of nearby industrial buildings, including former machine, vehicle and locomotive maintenance shops; electrical shops; and munitions-loading facilities. The outdoor areas were used for storing equipment and chemicals. A fuel service station, including two underground storage tanks, operated just south of Building 187. The underground tanks were closed in place in 1982. Waste oils and degreasers (including trichloroethene) were reportedly disposed of on the ground surface and around the railroad tracks in this industrial area.

The selected remedy for Site 21 is shallow groundwater treatment through a two-step phased approach. First, zero-valent iron will be injected in the high-concentration areas to promote abiotic ISCR of the chlorinated VOCs to ethane and chloride. ISCR will be followed by injections of an electron donor source, such as emulsified vegetable oil, to enhance reductive dechlorination. Using ISCR prior to ERD is cost effective for high-concentration zones where individual COC concentrations are greater than 1,000 µg/L. The naturally occurring conditions present at the site are favorable for the ISCR treatment followed by ERD. ISCO could also have been effective but requires the reversing of oxidizing effects caused by the ISCO before the ERD can be implemented. ERD will also be used in portions of the low-concentration zones where the individual COC concentrations are greater than their respective cleanup level and less than 1,000 µg/L.

Figure 26: Combined Remedy Highlight – Williams Air Force Base

Williams Air Force Base, Maricopa County, Arizona ROD Amendment Date: 9/28/13
MEDIA/CONTAMINANTS ■ Groundwater, LNAPL ■ Benzene, toluene, and naphthalene **REMEDIAL COMPONENTS** ■ Steam enhanced extraction (SEE) ■ In situ bioremediation **REMEDIAL APPROACH** ■ Phased and synergistic approach ■ SEE followed by in situ bioremediation
OU-02 consists of the partially decommissioned Liquid Fuels Storage Area where releases of jet fuel and other aviation gasoline have resulted in soil and groundwater contamination. The base remains an active flight training facility, but closure of the site is planned. The remedy selected in the original ROD for OU-02 included SVE, LNAPL recovery and groundwater extraction. SVE and LNAPL recovery were initiated and continue to be conducted. A pilot study showed that groundwater P&T would not effectively remediate the groundwater. A ROD Amendment was issued in 2013 selecting SEE followed by in situ bioremediation for groundwater. The plan is to operate the SEE system until performance diminishes, then conduct in situ bioremediation using the residual heat produced by the SEE system. Bioremediation will be enhanced by the potential addition of food sources or modification of the environment, such as a change in temperature or pH. Monitored natural attenuation may occur after bioremediation until remedial action objectives have been attained.

XI. Optimization

EPA has been conducting optimization reviews and providing technical support to specific projects since 1997. Early in the program, optimization reviews focused on Fund-lead groundwater P&T remedies and primarily addressed the remedy and long-term monitoring stages. EPA has since established a new national optimization workgroup and issued the National Strategy to Expand Superfund Optimization Practices from Site Assessment to Site Completion (EPA, 2012o). It expands and formalizes optimization practices from site assessment to site completion for the Superfund program.

EPA's National Optimization Strategy "…institutes changes to Superfund remedial program business processes to take advantage of newer tools and strategies that promote more effective and efficient cleanups. The Strategy identifies several objectives to achieve verifiably protective site cleanups faster, cleaner, greener and cheaper. The objectives deploy techniques throughout the life cycle of site cleanup, including site evaluation, construction and operation and maintenance.

Many of these approaches have been applied for years at a subset of sites under the U.S. EPA's management as well as sites managed by other federal and state programs. The body of knowledge on applied optimization techniques and their use throughout the cleanup life cycle is substantial and growing rapidly" (EPA, 2012o).

EPA identified two recent decision documents, summarized in Figures 27 and 28, that have been informed, in part, by site optimization. The highlights provide more detail on the focus of the optimization review and how its conclusions and recommendations informed subsequent remedy decisions.

- EPA conducted an optimization study and a technical support project to support cleanup of the Hamilton/Labree Roads Groundwater Contamination site, OU 01, in Washington State. The 2009 optimization recommended further site characterization and sequenced remedial approaches. After additional characterization, the 2013 Interim ROD selected ISTT of soil and sediment followed by any needed removal and off-site disposal of remaining higher-concentration sediment and surface soil, before implementing in situ bioremediation of remaining contamination in subsurface soil.
- The optimization study for the Kearsarge Metallurgical Corp. in New Hampshire recommended further evaluation of MNA. After a focused feasibility study, the 2012 ROD Amendment selected MNA and discontinuation of the P&T system.

Figure 27: Optimization Highlight – Hamilton/Labree Roads Groundwater Contamination

Hamilton/Labree Roads Groundwater Contamination, OU 01, Chehalis, Washington
Optimization Review: December 2009 and 2015
Interim ROD Date: 8/28/13

NATURE OF CONTAMINATION & SCOPE OF OPTIMIZATION REVIEW

- Tetrachloroethene (PCE) contamination in soil, sediment, and groundwater
- Evaluate prior and current investigations, feasibility studies, and other site data to determine state of readiness for a proposed Interim Remedial Measure
- Determine level of uncertainty in data used to evaluate and select proposed remedies
- Provide additional site characterization support to assist in remedial design

RECOMMENDATIONS

- Conduct additional site characterization - current understanding of the nature and extent of contamination is too unreliable to support estimation of treatment volumes and remedy technology selection
- Select more aggressive remedial alternatives in a refined source area footprint that limits need for hydraulic controls and treatment of large volumes of contaminated groundwater
- Develop a site ROD that is flexible and contains triggers that allow for implementation of alternative treatment options
- Conduct three-dimensional visualization and analysis (3DVA) to aid in site characterization

REMEDIAL DECISION

- Issued an interim ROD to provide flexibility and step-wise approach to addressing site contamination
- Selected ISTT, excavation and disposal of surface soil and sediment; in situ bioremediation of subsurface soil; and in situ bioremediation of groundwater

OU 01 is the Hamilton Road Impact Area of this site. Past activities in this area resulted in PCE contamination of soil, sediment, and groundwater. The 2009 optimization found that additional information was needed to resolve key data gaps in order to develop accurate volumetric estimates of contaminated media to be addressed and to select technologies that will ensure interim goals are met. The optimization suggested tandem or sequenced remedial approaches with a more aggressive source reduction step prior to bioremediation. After additional characterization, the 2013 Interim ROD selected ISTT of soil and sediment with greater than 10 mg/kg of PCE followed by (1) removal and off-site disposal of any remaining sediment and surface soil with greater than10 mg/kg PCE and (2) in situ bioremediation of remaining subsurface soil with greater than 10 mg/kg PCE. In situ bioremediation also was selected for groundwater contamination.

In 2015, during project design, technical support was provided to plan and conduct a dynamic field investigation to further refine the areas for remedial activities selected in the 2013 ROD. The technical support project identified the footprint of each selected remedy component. Real-time measurement technologies combined with 3DVA mapping of results helped delineate the various contamination zones. Real-time results from each day's investigative efforts were processed in 3DVA software and the visualizations were then used to help guide the investigative efforts on the following days. The results of the effort are being used in the design of the multi-component remedy.

Figure 28: Optimization Highlight – Kearsarge Metallurgical Corp.

Kearsarge Metallurgical Corp., Conway, New Hampshire
Optimization Review: December 2009
ROD Amendment Date: 9/18/12

NATURE OF CONTAMINATION & SCOPE OF OPTIMIZATION REVIEW

- 1,1,1-trichloroethane; 1,1-dichloroethane and 1,1-dichloroethene in groundwater
- Optimize groundwater monitoring program to ensure data fully support site management decisions relating to long-term remedial strategy and property reuse options

RECOMMENDATIONS

- Eliminate some wells from monitoring network and reduce sampling frequency at others
- Evaluate continued attenuation of source using five identified wells

REMEDIAL DECISION

- Conducted a Focused Feasibility Study (FFS) using monitoring results from recommended wells to evaluate MNA
- Issued a ROD Amendment selecting MNA as follow-on remedial approach to replace groundwater P&T system, reducing costs while still projecting to reach cleanup levels within 18.5 years or less

In a 1990 ROD, EPA, with the concurrence of the New Hampshire Department of Environmental Services (NHDES), selected a comprehensive remedy for the Site that addressed groundwater as well as contaminated soils and materials. The groundwater treatment plant attained cleanup levels through much of the site by the late 1990s except for an area east of the treatment building. In 2003, NHDES excavated an additional 5,670 tons of contaminated, saturated soils. NHDES operated the groundwater extraction and treatment plant until December 2005, when EPA agreed to halt groundwater recovery to assess site conditions.

A 2009 optimization review found the following: active remediation from 1993 to 2005 had diminished contamination at the Site and the majority of monitoring wells showed no, or low and decreasing levels of contamination; biotic and abiotic degradation pathways were actively transforming the contaminants at the site; plume-wide concentrations were stable with the exception of three wells that showed increasing concentrations; and a longer-term dataset collected under ambient conditions was required to confirm plume stability.

In 2010, a FFS found that 225 pounds of VOC contaminants had been removed by the P&T system, approximately 150 pounds had been removed by the 2003 excavation, and that less than 3 pounds of VOCs remained in the subsurface, primarily attached to saturated silt. A residual plume of groundwater contamination was found to exist in a 20,000 square-foot area in saturated silts that are approximately 4 to 6 feet thick. It was determined that greater than 99 percent of the contaminants had been removed.

A 2012 FFS evaluated the potential of an alternative remedy, MNA, to replace the current P&T system. This FFS concluded concentrations had declined for all contaminants in all wells as verified by the October 2011 sampling event. The MNA alternative provided similar overall protection in a similar timeframe (18.5 years or less for MNA, 15.4 years or less for P&T) at significantly lower cost than the P&T system. A ROD Amendment selecting MNA was issued in September 2012.

XII. Conclusions

Based on EPA's analysis of recently selected remedies (FYs 2012, 2013, and 2014) and trends over the life of the Superfund program, treatment continues to be selected frequently and is now selected at 78 percent of Superfund sites with decision documents. Superfund also continues to address complex sites involving multiple media and contaminants. In addition, combined remedies are being applied concurrently, using a phased approach, or using a spatial approach to address different types or concentrations of contaminants. Additionally, optimization studies have led to remedy changes in recent decision documents.

With respect to recent source remedies:

- The Superfund remedial program continued to select treatment for a large number of source remedies.
- Source remedies continued to include a combination of treatment, on-site containment, off-site disposal and ICs.
- Nearly one-quarter of recent source decision documents selected in situ treatment.
- SVE, chemical treatment and ISTT were the most frequently selected remedies for in situ treatment.
- Physical separation and recycling were recently selected most often for ex situ treatment.
- Remedies in nearly three-quarters of recent source decision documents addressed metals.
- Almost all sediment decision documents included excavation or dredging. Nearly half of sediment decision documents included either in situ or ex situ treatment (primarily dewatering).

Concerning recent groundwater remedies:

- The selection of in situ treatment for groundwater continued its overall upward trend and increased to 51 percent of recent groundwater decision documents.
- The selection of P&T in groundwater decision documents has decreased significantly since the early 1990s and has reached its lowest, 17 percent, in FY 2014.
- Nearly 80 percent of recent groundwater decision documents included ICs.
- The selection of alternative water supply remedies and VEBs was steady.
- Bioremediation and chemical treatment were the most frequently selected in situ remedies for groundwater.
- The majority of in situ bioremediation remedies specified anaerobic bioremediation. More than half of the chemical treatment remedies specified ISCO.
- The most common COCs addressed by groundwater remedies were halogenated VOCs, primarily chlorinated VOCs.

Regarding vapor intrusion remedies:

- Active depressurization was the most frequently selected technology for vapor intrusion mitigation.
- ICs were frequently selected to reduce the risk of exposure to vapor intrusion in current buildings and to require mitigation for future structures constructed in areas with subsurface contamination that does not support unlimited land use and unrestricted exposure.

Regarding remedies for federal facilities:

- Nearly 40 percent of the total number of RODs and ROD Amendments selected over the life of the Superfund program were for federal facilities, and 25 percent of ESDs.
- Nearly half (47 percent) of the decision documents (RODs, ROD Amendments and ESDs) from FY 2012 to 2014 were for federal facilities.
- Halogenated VOCs and metals were the most common contaminants targeted by groundwater remedies for federal facilities, and metals and PAHs were the most common contaminants addressed by soil remedies.
- Decision documents included groundwater and soil remedies addressing munitions constituents and radioactive materials, with SVOC munitions and radioactive metals being most frequent.

Concerning recent combined remedies:

- Selected remedies were combined using a spatial, phased or synergistic approach.
  - The ROD for Alameda Naval Air Station included a spatial approach consisting of ISCO for higher concentrations in groundwater and aerobic bioremediation for more dilute plume areas.
  - The ROD Amendment at Williams Air Force Base included both a phased and synergistic approach with steam-enhanced extraction followed by in situ bioremediation that would benefit from the residual heat.

Concerning optimization:

- Some recent decision documents were partially informed by optimization reviews. At Hamilton/Labree Roads Groundwater Contamination site, the optimization review suggested a step-wise approach to remediation with aggressive source remediation before addressing groundwater. In 2013, an interim ROD was issued to conduct ISTT in the source area followed by in situ bioremediation of the groundwater.
- Optimization recommendations for these sites included further site characterization and feasibility studies that led to remedy changes.

The remedy and site information provided in this report informs stakeholders in Superfund communities about the program's remedy decisions, and helps federal, state and tribal remediation professionals select remedies. Analyzing the trends in remedy decisions provides an indication of the future demand for remedial technologies, which helps technology developers, and consulting and engineering firms, evaluate cleanup markets. The trends also indicate program needs for

expanded technical information and support related to specific technologies or site cleanup challenges. For example, growing use of in situ groundwater technologies suggests the need for additional knowledge and support associated with those technologies.

XIII. Sources and Electronic Versions

This section lists the sources of information used in this report and provides information on how to access the electronic version of this report and previous versions of the ASR and SRR.

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Electronic Versions

SRR 15th Edition is available electronically at www.epa.gov/remedytech/superfund-remedy-report. The body of the report and its appendices can be downloaded from the website. The list below describes the appendices for the SRR 15th Edition.

Appendix A: Definitions of Selected Remedies. This appendix defines the specific remedies selected as part of remedial actions.

Appendix B: Treatment Technologies by Fiscal Year. This appendix lists the ex situ and in situ source treatment technologies, groundwater in situ treatment technologies and groundwater pump and treat remedies by fiscal year from 1982 to 2014.

Appendix C: Remedy Selection Summary Matrix FY 2012–2014. This appendix lists the remedy components selected in each decision document analyzed for the SRR 15th Edition.

Appendix D: Individual Contaminants and Assigned Contaminant Groups. This appendix lists the individual contaminants from decision documents and identifies which contaminant groups the individual contaminants were assigned.

Appendix E: Source Remedies Selected in Decision Documents from FY 2012–2014. This appendix lists the source remedies selected from FY 2012 to 2014 and the associated sites and operable units.

Appendix F: Sediment Remedies Selected in Decision Documents from FY 2012–2014. This appendix lists the sediment remedies selected from FY 2012 to 2014 and the associated sites and operable units.

Appendix G: Groundwater Remedies Selected in Decision Documents from FY 2012–2014. This appendix lists the groundwater technologies selected in decision documents from FY 2012 to 2014 and the associated sites and operable units.

Appendix H: Vapor Intrusion Remedies Selected in Decision Documents from FY 2012–2014. This appendix lists the vapor intrusion remedies selected from FY 2012 to 2014 and the associated sites and operable units.

In addition, previous editions of ASR and SRR can be downloaded from www.epa.gov/remedytech/superfund-remedy-report.

APPENDIX A

DEFINITIONS OF SELECTED REMEDIES

Appendix A: Definitions of Selected Remedies

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A.1 Treatment Technologies

Most treatment technologies were grouped into one of the four main treatment categories: biological, chemical, physical or thermal treatment. Ex situ treatment technologies associated with pump and treat systems are included separately as its own treatment category.

A.1.1 Biological Treatment

Biological treatment involves adding or stimulating the growth of microorganisms, which metabolize contaminants or create conditions under which contaminants will chemically convert to non-hazardous or less toxic compounds or compounds that are more stable, less mobile, and/or inert. **Phytoremediation,** the use of plants to remove, stabilize, or destroy contaminants, is included in the definition of biological treatment.

Bioaugmentation is "[the] addition of microbes to the subsurface where organisms able to degrade specific contaminants are deficient. Microbes may be 'seeded' from populations already present at a site and grown in aboveground reactors or from specially cultivated strains of bacteria having known capabilities to degrade specific contaminants" (EPA, 2000).

Bioremediation "is a technology that uses microorganisms to treat contaminants through natural biodegradation mechanisms (intrinsic bioremediation) or by enhancing natural biodegradation mechanisms through the addition of microbes, nutrients, electron donors, and/or electron acceptors (enhanced bioremediation). This technology, performed *in situ* (below ground or in place) or *ex situ* (above ground), is capable of degrading organic compounds to less toxic materials such as carbon dioxide (CO2), methane, and water through aerobic or anaerobic processes" (EPA, 2001).

Constructed Treatment Wetlands are "manmade wetlands built to remove various types of pollutants that may be present in water that flows through them. They are constructed to recreate, to the extent possible, the structure and function of natural wetlands…They possess a rich microbial community in the sediment to effect the biochemical transformation of pollutants, they are biologically productive, and…they are self-sustaining….[Constructed wetlands] utilize many of the mechanisms of phytoremediation" (ITRC, 2003). Note that the term "constructed wetlands" is used to refer only to wetlands constructed for the purposes of treatment, and not to wetlands constructed to compensate for wetlands destroyed by a remedy (such as placement of a cap in a marsh). Such "compensatory wetlands" are considered as "Wetlands Replacement."

Phytoremediation "uses [macroscopic] plants to extract, degrade, contain, or immobilize contaminants in soil, groundwater, and other contaminated media. The phytoremediation mechanisms used to treat contaminated [media]…are phytoextraction, rhizodegradation, phytodegradation, phytovolatilization, and phytostabilization" (EPA, 2006). Phytoremediation may be applied in situ or ex situ.

Note that while phytoremediation may include the use of microorganisms in conjunction with plants, it is distinguished from bioremediation in that bioremediation does not use macroscopic plants or trees. For purposes of this report, the use of plants to control surface water drainage, to influence groundwater movement, or to adjust the water table are not considered phytoremediation since the purpose is not to extract the contaminants from the media. Such remedies are classified as engineering controls.

A.1.2 Chemical Treatment

Chemical treatment chemically converts hazardous contaminants to non-hazardous or less toxic compounds or compounds that are more stable, less mobile, inert, or all three. Even though a chemical reaction is not always involved in chemical precipitation, chemical precipitation is typically included in this category.

Cap (amended, in situ) for sediment refers to a subaqueous cover in which "[specialized] materials [are] used to enhance the chemical isolation capacity…compared to sand caps. Examples include…reactive/adsorptive materials such as activated carbon, apatite, coke, organoclay, zero-valent iron and zeolite. Composite geotextile mats containing one or more of these materials (i.e., reactive core mats) are becoming available commercially" (EPA, 2005).

Chemical Fixation or Chemical Stabilization— See Solidification and Stabilization.

Chemical Oxidation "typically involves reduction/oxidation (redox) reactions that chemically convert hazardous contaminants to nonhazardous or less toxic compounds that are more stable, less mobile, or inert. Redox reactions involve the transfer of electrons from one chemical to another. Specifically, one reactant is oxidized (loses electrons) and one is reduced (gains electrons). There are several oxidants capable of degrading contaminants. Commonly used oxidants include potassium or sodium permanganate, Fenton's catalyzed hydrogen peroxide, hydrogen peroxide, ozone, and sodium persulfate. Each oxidant has advantages and limitations, and while applicable to soil contamination and some source zone contamination, they have been applied primarily toward remediating groundwater" (EPA, 2006). Chemical oxidation can be conducted either in situ or ex situ.

Chemical Reduction "uses chemicals called 'reducing agents' to help change contaminants into less toxic or less mobile forms….[Chemical reduction] can clean up several types of contaminants dissolved in groundwater. It can also be used to clean up contaminants known as 'dense non-aqueous phase liquids' or 'DNAPLs,' which do not dissolve easily in groundwater and can be a source of contamination for a long time. [Chemical reduction] is most often used to clean up the metal chromium and the industrial solvent trichloroethene, or 'TCE,' which is a DNAPL.

"Common reducing agents include zero valent metals, which are metals in their pure form. The most common metal used in [in situ chemical reduction (ISCR)] is zero valent iron, or 'ZVI.' ZVI must be ground up into small granules for use in ISCR. In some cases, micro- or nano-scale (extremely small) particles are used. The smaller particle size increases the amount of iron available to react with contaminants. Other common reducing agents include polysulfides, sodium dithionite, ferrous iron, and bimetallic materials, which are made up of two different metals. The most common bimetallic material used in ISCR is iron coated with a thin layer of palladium or silver" (EPA, 2012e).

In Situ Chemical Oxidation (ISCO) — See Chemical Oxidation.

In Situ Chemical Reduction (ISCR) — See Chemical Reduction.

Nanoremediation "methods entail the application of reactive nanomaterials for transformation and detoxification of pollutants. These nanomaterials have properties that enable both chemical

reduction and catalysis to mitigate the pollutants of concern....Because of their minute size and innovative surface coatings, nanoparticles may be able to pervade very small spaces in the subsurface and remain suspended in groundwater, allowing the particles to travel farther than larger, macro-sized particles and achieve wider distribution....

"Many different nanoscale materials have been explored for remediation....Of these, nanoscale zero-valent iron (nZVI) is currently the most widely used....nZVI particles range from 10 to 100 [nanometers (nm)] in diameter....The high reactivity of nZVI particles is in part a direct result of their high specific surface area....nZVI's small particle size also allows more of the material to penetrate into soil pores, and it can be more easily injected into shallow and deep aquifers, a property that is particularly beneficial when contamination lies underneath a building" (Karn, Kuiken, & Otto, 2009).

Neutralization is a chemical reaction between an acid and a base. The reaction involves acidic or caustic wastes that are neutralized (pH is adjusted toward 7.0) using caustic or acid additives.

Permeable Reactive Barriers (PRB) are "in situ, permeable treatment zone[s] designed to intercept and remediate a contaminant plume. The term 'barrier' is intended to convey the idea that contaminant migration is impeded; however, the PRB is designed to be more permeable than the surrounding aquifer media so that groundwater can easily flow through the structure without significantly altering groundwater hydrology. The treatment zone may be created directly using reactive materials such as ZVI, or indirectly using materials designed to stimulate secondary processes (e.g., adding carbon substrate and nutrients to enhance microbial activity). In this way, contaminant treatment may occur through physical, chemical, or biological processes" (ITRC, 2011).

A.1.3 Physical Treatment

Physical treatment uses the physical properties of the contaminants or the contaminated medium to separate or immobilize the contamination.

Air Sparging "involves drilling one or more injection wells into the soil below the water table. An air compressor at the surface pumps air underground through the wells. As air bubbles flow through the groundwater, it carries contaminant vapors upward into the soil above the water table. The mixture of air and vapors is then pulled out of the ground for treatment using [soil vapor extraction (SVE)]" (EPA, 2012i). Oxygen added to the contaminated groundwater and vadose-zone soils also can enhance biodegradation of contaminants below and above the water table. The injection of ozone into the aquifer is referred to as ozone sparging and is a form of chemical treatment.

Electrokinetic Separation is "an emerging technology that relies on the application of a low-intensity, direct current through the soil to separate and extract heavy metals, radionuclides, and organic contaminants from unsaturated soil, sludge, and sediment. The current is applied across electrode pairs that have been implanted in the ground on each side of the contaminated soil mass. During electromigration, positively charged chemical species, such as metals, ammonium ions, and some organic compounds, move toward the cathode, and negatively charged chemicals, such as chloride, cyanide, fluoride, nitrate, and negatively-charged organic species, migrate toward

the anode….The target compounds are either extracted to a recovery system or deposited at the electrode" (EPA, 2006).

Flushing "involves flooding a zone of contamination with an appropriate solution to remove the contaminant from the soil. Water or liquid solution is injected or infiltrated into the area of contamination. The contaminants are mobilized by solubilization, formation of emulsions, or a chemical reaction with the flushing solutions. After passing through the contamination zone, the contaminant-bearing fluid is collected and brought to the surface for disposal, recirculation, or on-site treatment and reinjection….Flushing solutions may be water, acidic aqueous solutions, basic solutions, chelating or complexing agents, reducing agents, cosolvents, or surfactants" (EPA, 2006).

In Situ Geochemical Stabilization — See Chemical Treatment (for groundwater) or Solidification and Stabilization (for source media).

In-Well Air Stripping systems "create a circulation pattern in the aquifer by drawing water into and pumping it through the wells, and then reintroducing the water into the aquifer without bringing it above ground….The well is double-cased with hydraulically separated upper and lower screened intervals within the aquifer….The system can be configured with an upward in-well flow or a downward in-well flow. The most common configurations involve the injection of air into the inner casing, decreasing the density of the groundwater and allowing it to rise….Through this system, volatile contaminants in the ground water are transferred from the dissolved phase to the vapor phase by the rising air bubbles. Contaminated vapors can be drawn off and treated above ground or discharged into the vadose zone" (EPA, 1998).

Mechanical Soil Aeration agitates contaminated soil, using tilling or other means to volatilize contaminants.

Multi-Phase Extraction (MPE) "is an enhancement of the traditional SVE system. Unlike SVE, MPE simultaneously extracts both groundwater and soil vapor. The groundwater table is lowered in order to dewater the saturated zone so that the SVE process can be applied to the newly exposed soil. This allows the volatile compounds sorbed on the previously saturated soil to be stripped by the induced vapor flow and extracted. In addition, soluble VOCs present in the extracted groundwater are also removed" (EPA, 1997b). "[MPE] systems can be implemented to target all phases of contamination associated with a typical NAPL spill site. These systems remove residual vadose zone soil contamination residing in soil gas, dissolved in soil pore-space moisture, and adsorbed to soil particles. [MPE] also effectively removes dissolved and free-phase (both light and dense NAPL [LNAPL and DNAPL]) contamination in groundwater" (EPA, 1997a). Dual-phase extraction and bioslurping are types of MPE.

Physical Separation processes use physical properties to separate contaminated and uncontaminated media, or separate different types of media. For example, different-sized sieves and screens can be used to separate contaminated soil from relatively uncontaminated debris. Another application of physical separation is the dewatering of sediments or sludge. Physical separation is included as treatment because it reduces the volume of contaminated material.

Recycling is the process of collecting and processing materials that would otherwise require disposal and turning them into new products. Examples include recycling recovered oil and solvents.

Soil Vapor Extraction (SVE) "extracts vapors from the soil above the water table by applying a vacuum to pull the vapors out....SVE involves drilling one or more extraction wells into the contaminated soil to a depth above the water table, which must be deeper than 3 feet below the ground surface. Attached to the wells is equipment (such as a blower or vacuum pump) that creates a vacuum. The vacuum pulls air and vapors through the soil and up the well to the ground surface for treatment" (EPA, 2012i). SVE usually is performed in situ; however, in some cases, it can be used as an ex situ technology.

Soil Washing "is a process that uses physical and/or chemical techniques to separate contaminants from soil and sediments. Contaminants are concentrated into a much smaller volume of contaminated residue, which is either recycled or disposed. Washwater can consist of water only or can include additives such as acids, bases, surfactants, solvents, chelating or sequestering agents which are utilized to enhance the separation of contaminants from soils or sediments" (ITRC, 1997). "Hazardous contaminants tend to bind, chemically or physically, to silt and clay. Silt and clay, in turn, bind to sand and gravel particles. The soil washing process separates the contaminated fine soil (silt and clay) from the coarse soil (sand and gravel). When completed, the smaller volume of soil, which contains the majority of the fine silt and clay particles, can be further treated by other methods (such as incineration or bioremediation) or disposed of according to state and federal regulations" (EPA, 1996).

Solidification and Stabilization (S/S) "refer[s] to a group of cleanup methods that prevent or slow the release of harmful chemicals from wastes, such as contaminated soil, sediment, and sludge. These methods usually do not destroy the contaminants. Instead, they keep them from 'leaching' above safe levels into the surrounding environment....[Solidification and stabilization] are often used together to prevent people and wildlife from being exposed to contaminants, particularly metals and radioactive contaminants....

"Solidification involves mixing a waste with a binding agent, which is a substance that makes loose materials stick together. Common binding agents include cement, asphalt, fly ash, and clay. Water must be added to most mixtures for binding to occur; then the mixture is allowed to dry and harden to form a solid block.

"Similar to solidification, stabilization also involves mixing wastes with binding agents. However, the binding agents also cause a chemical reaction with contaminants to make them less likely to be released into the environment. For example, when soil contaminated with metals is mixed with water and lime — a white powder produced from limestone — a reaction changes the metals into a form that will not dissolve in water" (EPA, 2012j). Stabilization remedies are classified as S/S whether or not they ultimately involve solidification.

S/S may be performed either ex situ or in situ. Note that chemical agents added in situ for the purpose of binding with contaminants in groundwater (as opposed to soil) is classified as in situ chemical treatment, not S/S.

Solvent Extraction uses an organic solvent as an extractant to separate contaminants from soil. The organic solvent is mixed with contaminated soil in an extraction unit. The extracted solution then is passed through a separator, where the contaminants and extractant are separated from the soil.

A.1.4 Thermal Treatment

Thermal treatment uses heat to separate contaminants from contaminated media by increasing their mobility. Thermal treatment includes volatility; destroying contaminants or contaminated media by burning, decomposing, or detonating the contaminants or the contaminated media; or immobilizing contaminants by melting and solidifying the contaminated media.

Electrical Resistance Heating (ERH) "delivers an electrical current between metal rods called 'electrodes' installed underground. The heat generated as movement of the current meets resistance from soil converts groundwater and water in soil into steam, vaporizing contaminants" (EPA, 2012f). A low-energy ERH approach raises the subsurface temperatures to approximately 30 to 60°C to enhance the rate of biotic and abiotic contaminant dechlorination, respectively. (ESTCP Project ER-200719, Combining Low-Energy Electrical Resistance Heating with Biotic and Abiotic Reactions for Treatment of Chlorinated Solvent DNAPL Source Areas). A type of In Situ Thermal Treatment.

Incineration "is the process of burning hazardous materials at temperatures high enough to destroy contaminants. Incineration is conducted in an 'incinerator,' which is a type of furnace designed for burning hazardous materials in a combustion chamber....Hazardous materials must be excavated or pumped into containers before incineration. They may require further preparation, such as grinding or removing large rocks and debris, or removing excess water. The materials are then placed in the combustion chamber of an incinerator where they are heated to an extremely high temperature for a specified period of time. The temperature and length of time depend on the types of wastes and contaminants present. Air or pure oxygen may be added to the chamber to supply the oxygen needed for burning....Depending on the contaminants present, the target temperature may range from 1,600 to 2,500°F [870 to 1,370 °C]....

"As the wastes heat up, the contaminants volatilize (change into gases) and most are destroyed. Gases that are not destroyed pass through a secondary combustion chamber for further heating and destruction. The resulting gases then pass though air pollution control equipment....

"Incinerators can be constructed for temporary use at the site. However, in recent years, it has been more common for the wastes to be loaded onto trucks for transport to a permanent offsite facility. EPA requires that an incinerator can destroy and remove at least 99.99 percent of each harmful chemical in the waste it processes. When some extremely harmful chemicals are present, EPA requires that an incinerator show it can destroy and remove at least 99.9999 percent of contaminants in the waste" (EPA, 2012g).

In Situ Thermal Treatment (ISTT) "methods heat contaminated soil, and sometimes nearby groundwater, to very high temperatures. The heat vaporizes (evaporates) the chemicals and water changing them into gases... [which] can move more easily through soil. The heating process can make it easier to remove NAPLs from both soil and groundwater. High temperatures also can

destroy some chemicals in the area being heated....The chemical and water vapors are pulled to collection wells and brought to the ground surface by applying a vacuum [that is, SVE]" (EPA, 2012f). Lower energy ISTT (see ERH) can enhance biotic or abiotic contaminant destruction. Specific types of ISTT techniques include conductive heating, electrical resistive heating, radio frequency heating, hot air injection, hot water injection, and steam enhanced extraction.

In Situ Thermal Desorption – See In Situ Thermal Treatment.

Open Burn (OB) and Open Detonation (OD) operations "are conducted to destroy excess, obsolete, or unserviceable (EOU) munitions and energetic materials. In OB operations, energetics or munitions are destroyed by self-sustained combustion, which is ignited by an external source, such as a flame, heat, or a detonation wave...In OD operations, detonatable explosives and munitions are destroyed by detonation, which is generally initiated by the detonation of an energetic charge" (FRTR, 2007).

Steam Enhanced Extraction (SEE) "injects steam underground by pumping it through wells drilled in the contaminated area. The steam heats the area and mobilizes and evaporates contaminants" (EPA, 2012f). SEE is a type of In Situ Thermal Treatment.

Thermal Conduction Heating (TCH) "uses heaters placed in underground steel pipes. TCH can heat the contaminated area hot enough to destroy some chemicals" (EPA, 2012f). TCH is a type of In Situ Thermal Treatment.

Thermal Desorption "removes organic contaminants from soil, sludge or sediment by heating them in a machine called a 'thermal desorber' to evaporate the contaminants. Evaporation changes the contaminants into vapors (gases) and separates them from the solid material.... A thermal desorber is not the same as an incinerator, which heats contaminated materials to temperatures high enough to destroy the contaminants.... Thermal desorption involves excavating soil or other contaminated material for treatment in a thermal desorber. The desorber may be assembled at the site for onsite treatment, or the material may be loaded into trucks and transported to an offsite thermal desorption facility. To prepare the soil for treatment, large rocks or debris first must be removed or crushed....If the material is very wet, the water may need to be removed to improve treatment....

"The prepared soil is placed in the thermal desorber to be heated. Low-temperature thermal desorption is used to heat the solid material to 200-600°F [90 to 320°C] to treat VOCs. If SVOCs are present, then high-temperature thermal desorption is used to heat the soil to 600-1000°F [320 to 540°C].

"Gas collection equipment captures the contaminated vapors. Vapors often require further treatment, such as removing dust particles. The remaining organic vapors are usually destroyed using a thermal oxidizer, which heats the vapors to temperatures high enough to convert them to carbon dioxide and water vapor...

"Often, treated soil can be used to fill in the excavation at the site. If the treated soil contains contaminants that do not evaporate, such as most metals, they may be disposed of and capped onsite, or transported offsite to an appropriate landfill" (EPA, 2012k). Thermal desorption is an ex

situ treatment process. In situ thermal desorption processes are previously discussed as In Situ Thermal Treatment.

Thermally-Enhanced SVE – See In Situ Thermal Treatment.

Vitrification is a thermal treatment process that converts contaminated soil to stable glass and crystalline solids. There are two methods for producing heat for melting the contaminated soil. The older method uses electrodes and electrical resistance to vitrify materials, while the emerging technique uses plasma arc technology.

"In the electrical resistance method, high voltage is applied to electrodes (typically four) placed in the soil. Starter frit (generally graphite) is placed on the soil surface and electrical current heats the soil from the top down to temperatures between 1,400 and 2,000°C [2,550 to 3,650°F].... If the silica content of the soil is sufficiently high, contaminated soil can be converted into glass. Heating vaporizes or pyrolyzes organic contaminants. Most inorganic contaminants are encased in the glass-like monolith that results when the soil cools after treatment" (EPA, 2006). Vitrification may be conducted in situ or ex situ.

A.1.5 Pump and Treat (P&T)

Pump and treat "is a common method for cleaning up groundwater [and other aqueous media] contaminated with dissolved chemicals, including industrial solvents, metals, and fuel oil. [Water is extracted and conveyed] to an above-ground treatment system that removes the contaminants. (P&T) systems also are used to 'contain' the contaminant plume. Containment of the plume keeps [the plume] from spreading by pumping contaminated water toward the wells. This pumping helps keep contaminants from reaching drinking water wells, wetlands, streams, and other natural resources" (EPA, 2012h). For the purpose of this report, all P&T systems are considered treatment, even if designed to only contain, rather than restore, a contaminated plume.

Activated Carbon Treatment – "Activated carbon is a material used to filter harmful chemicals from contaminated water and air. It is composed of black granules of coal, wood, nutshells or other carbon-rich materials. As contaminated water or air flows through activated carbon, the contaminants sorb (stick) to the surface of the granules and are removed from the water or air. Granular activated carbon or 'GAC' can treat a wide range of contaminant vapors including radon and contaminants dissolved in groundwater, such as fuel oil, solvents, polychlorinated biphenyls (PCBs), dioxins, and other industrial chemicals, as well as radon and other radioactive materials. It even removes low levels of some types of metals from groundwater.

"Activated carbon treatment generally consists of one or more columns or tanks filled with GAC. Contaminated water or vapors are usually pumped through a column from the top down, but upward flow is possible. As the contaminated water or air flows through the GAC, the contaminants sorb to the outer and inner surfaces of the granules. The water and air exiting the container will be cleaner. Regular testing of exiting water or air is conducted to check contaminant levels. If testing shows that some contaminants remain, the water or air may need to be treated again to meet the treatment levels.

"The GAC will need to be replaced when the available surfaces on the granules are taken up by contaminants and additional contaminants can no longer sorb to them. The 'spent' GAC may be

replaced with fresh GAC or 'regenerated' to remove the sorbed contaminants. To regenerate spent GAC, it is usually sent to an offsite facility where it is heated to very high temperatures to destroy the contaminants. If a lot of GAC needs to be regenerated, equipment to heat the GAC and remove the sorbed contaminants can be brought to the site.

"Depending on the site, treated groundwater may be pumped into a nearby stream or river or back underground through injection wells or trenches. At some sites, a sprinkler system can distribute the water over the ground surface so that it seeps into soil. The water also may be discharged to the public sewer system for further treatment at a sewage treatment plant" (EPA, 2012a).

Air Stripping "is the process of moving air through contaminated groundwater or surface water in an above-ground treatment system. Air stripping removes chemicals called 'volatile organic compounds' or 'VOCs.' VOCs are chemicals that easily evaporate, which means they can change from a liquid to a vapor (a gas). The air passing through contaminated water helps evaporate VOCs faster. After treating the water, the air and chemical vapors are collected, and the vapors are either removed or vented outside if VOC levels are low enough. Air stripping is commonly used to treat groundwater as part of the 'pump and treat' cleanup method....

"Air stripping uses either an air stripper or aeration tank to force air through contaminated water and evaporate VOCs. The most common type of air stripper is a packed-column air stripper, which is a tall tank filled with pieces of plastic, steel, or ceramic packing material.

"Contaminated water is pumped above ground and into the top of the tank and sprayed over the top of the packing material. The water trickles downward through the spaces between the packing material, forming a thin film of water that increases its exposure to air blown in at the bottom of the tank. A sieve-tray air stripper is similar in design but contains several trays with small holes. As water flows across the trays, a fan at the bottom blows air upwards through the holes, increasing air exposure. Aeration tanks are another type of design that remove VOCs by bubbling air into a tank of contaminated water" (EPA, 2012b).

Filtration "is the physical process of mechanical separation based on particle size whereby particles suspended in a fluid are separated by forcing the fluid through a porous medium. As fluid passes through the medium, the suspended particles are trapped on the surface of the medium and/or within the body of the medium. Ultrafiltration/microfiltration occurs when particles are separated by forcing fluid through a semipermeable membrane. Only the particles whose size are smaller than the openings of the membrane are allowed to flow through" (FRTR, 2007). Other filtration methods include nanofiltration and reverse osmosis.

Ion Exchange "removes ions from the aqueous phase by the exchange of cations or anions between the contaminants and the exchange medium. Ion exchange materials may consist of resins made from synthetic organic materials that contain ionic functional groups to which exchangeable ions are attached. They also may be inorganic and natural polymeric materials. After the resin capacity has been exhausted, resins can be regenerated for re-use" (FRTR, 2007).

Metals Precipitation "from contaminated water involves the conversion of soluble heavy metal salts to insoluble salts that will precipitate. The precipitate can then be removed from the treated water by physical methods such as clarification (settling) and/or filtration. The process usually uses

pH adjustment, addition of a chemical precipitant, and flocculation. Typically, metals precipitate from the solution as hydroxides, sulfides, or carbonates. The solubilities of the specific metal contaminants and the required cleanup standards will dictate the process used. In some cases, process design will allow for the generation of sludges that can be sent to recyclers for metal recovery" (FRTR, 2007).

A.2 On-Site Containment Technologies

For the purpose of this report, containment includes several containment technologies, including caps, covers, and vertical engineered barriers.

Caps and Cover Systems – "Capping involves placing a cover over contaminated material such as landfill waste or contaminated soil.... Caps do not destroy or remove contaminants. Instead, they isolate them and keep them in place to avoid the spread of contamination....The cap design selected for a site will depend on several factors, including the types and concentrations of contaminants present, the size of the site, the amount of rainfall the area receives, and the future use of the property. Construction of a cap can be as simple as placing a single layer of a material over lightly contaminated soil to placing several layers of different materials to isolate more highly contaminated wastes. For example, an asphalt cap might be selected to cover low levels of soil contamination on a property whose future reuse requires a parking lot. A cap for a hazardous waste landfill, however, might require several layers, including a vegetative layer, drainage layer, geomembrane, and clay layer" (EPA, 2012c).

Cap (In situ) for sediment refers to "the placement of a subaqueous covering or cap of clean material over contaminated sediment that remains in place. Caps are generally constructed of granular material, such as clean sediment, sand, or gravel" (EPA, 2005).

Containment Cell (subaqueous), for sediment also referred to as contained aquatic disposal (CAD), "is a type of subaqueous capping in which the dredged sediment is placed into a natural or excavated depression elsewhere in the water body. A related form of disposal, known as level bottom capping, places the dredged sediment on a level bottom elsewhere in the water body, where it is capped. [CAD] has been used for navigational dredging projects (e.g., Boston Harbor, Providence River), but has been rarely considered for environmental dredging projects. However, there may be instances when neither dredging with land disposal nor capping contaminated sediment in-situ is feasible, and it may be appropriate to evaluate CADs. The depression used in the case of a CAD should provide lateral containment of the contaminated material, and also should have the advantage of requiring less maintenance and being more resistant to erosion than level-bottom capping" (EPA, 2005).

Containment Cell (upland, adjacent) for sediment refers to containment in a confined disposal facility (CDF) either upland or adjacent to the water body. "CDFs are engineered structures enclosed by dikes and designed to retain dredged material. They may be located upland (above the water table), partially in the water near shore, or completely surrounded by water. A CDF may have a large cell for material disposal, and adjoining cells for retention and decantation of turbid, supernatant water. A variety of linings have been used to prevent seepage through the dike walls. The most effective are clay or bentonite-cement slurries, but sand, soil, and sediment linings have also been used... Caps are the most effective way to minimize contaminant loss from CDFs, but

selection of proper liner material is also an important control in CDFs. Finally, CDFs require continuous monitoring to ensure structural integrity." (EPA, 1991b).

Evapotranspiration (ET) Covers are alternatives to conventional cap and cover systems. "ET cover systems are designed to rely on the ability of a soil layer to store the precipitation until it is naturally evaporated or is transpired by the vegetative cover. In this respect they differ from more conventional cover designs in that they rely on obtaining an appropriate water storage capacity in the soil rather than…engineered low hydraulic conductivity [barrier components]. ET cover system designs are based on using the hydrological processes (water balance components) at a site, which include the water storage capacity of the soil, precipitation, surface runoff, evapotranspiration, and infiltration. The greater the storage capacity and evapotranspirative properties are, the lower the potential for percolation through the cover system" (EPA, 2011).

Vertical Engineered Barriers (VEB) are "[walls] built below ground to control the flow of groundwater. VEBs may be used to divert the direction of contaminated groundwater flow to keep it from reaching drinking water wells, wetlands, or streams. They also may be used to contain and isolate contaminated soil and groundwater to keep them from mixing with clean groundwater. VEBs differ from permeable reactive barriers in that they do not clean up contaminated groundwater" (EPA, 2012m). Common types of VEBs include slurry walls and sheet pile walls.

A.3 Monitored Natural Attenuation (MNA)

MNA is "the reliance on natural attenuation processes (within the context of a carefully controlled and monitored site cleanup approach) to achieve site-specific remediation objectives within a timeframe that is reasonable compared to that offered by other more active methods. The 'natural attenuation processes' that are at work in such a remediation approach include a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or groundwater. These in situ processes include biodegradation; dispersion; dilution; sorption; volatilization; radioactive decay; and chemical or biological stabilization, transformation, or destruction of contaminants. When relying on natural attenuation processes for site remediation, EPA prefers those processes that degrade or destroy contaminants. Also, EPA generally expects that MNA will only be appropriate for sites that have a low potential for contaminant migration" (EPA, 1999b).

A.4 Monitored Natural Recovery (MNR) for Sediment

Sediment MNR "[relies] on a wide range of naturally occurring processes to reduce risk [from contaminated sediments] to human and/or ecological receptors. These processes may include physical, biological, and chemical mechanisms that act together to reduce the risk posed by the contaminants….Natural processes that reduce toxicity through transformation or reduce bioavailability through increased sorption are usually preferable as a basis for remedy selection to mechanisms that reduce exposure through natural burial or mixing-in-place because the destructive/sorptive mechanisms generally have a higher degree of permanence. However, many contaminants that remain in sediment are not easily transformed or destroyed. For this reason, risk reduction due to natural burial through sedimentation is more common and can be an acceptable sediment management option. Dispersion is the least preferable basis for remedy

selection based on MNR. While dispersion may reduce risk in the source area, it generally increases exposure to contaminants and may result in unacceptable risks to downstream areas or other receiving water bodies....

"The key difference between MNA for ground water and MNR for sediment is in the type of processes most often being relied upon to reduce risk. Transformation of contaminants is usually the major attenuating process for contaminated ground water; however, these processes are frequently too slow for the persistent contaminants of concern in sediment to provide for remediation in a reasonable timeframe. Therefore, isolation and mixing of contaminants through natural sedimentation is the process most frequently relied upon for contaminated sediment" (EPA, 2005).

A.5 Enhanced Monitored Natural Recovery (EMNR) for Sediment

Natural recovery combined with an engineering approach is called Enhanced Monitored Natural Recovery. "In some areas, natural recovery may appear to be the most appropriate remedy, yet the rate of sedimentation or other natural processes is insufficient to reduce risks within an acceptable timeframe. Where this is the case, project managers may consider accelerating the recovery process by engineering means, for example by the addition of a thin layer of clean sediment. This approach is sometimes referred to as 'thin-layer placement' or 'particle broadcasting.' Thin-layer placement normally accelerates natural recovery by adding a layer of clean sediment over contaminated sediment. The acceleration can occur through several processes, including increased dilution through bioturbation of clean sediment mixed with underlying contaminants. Thin-layer placement is typically different than...isolation caps...because it is not designed to provide long-term isolation of contaminants from benthic organisms. While thickness of an isolation cap can range up to several feet, the thickness of the material used in thin layer placement could be as little as a few inches....Clean sediment can be placed in a uniform thin layer over the contaminated area or it can be placed in berms or windrows, allowing natural sediment transport processes to distribute the clean sediment to the desired areas.

"Project managers might also consider the addition of flow control structures to enhance deposition in certain areas of a site" (EPA, 2005).

Note that a layer of clean sediment placed as backfill following dredging or excavation is not considered EMNR.

A.6 Vapor Intrusion Mitigation

Vapor intrusion is the term given to migration of vapor-forming chemicals from any underground source into a structure (e.g., homes, businesses, schools) (EPA, 2015a). For example, vapors can enter buildings as a component of soil gas by migrating through cracks, seams, interstices, and gaps in basement floors, walls, or foundations ("adventitious openings") or through intentional openings (e.g., perforations due to utility conduits, sump pits) (EPA, 2015a).

As used in this document, mitigation refers to "interim actions taken to reduce or eliminate human exposure to vapor-forming chemicals in a specific building arising from the vapor intrusion pathway" (EPA, 2015a). Functionally, mitigation methods can be categorized into two basic strategies: (i) those that seek to prevent or reduce vapor entry into a building (e.g., active

depressurization technologies, positive building pressurization, sealing cracks and openings); and those that seek to reduce or eliminate vapors that have entered into a building (e.g., indoor air treatment, interior ventilation). Neither strategy entails reducing the level of vapor-forming contamination in the subsurface source, which refers to remediation.

Active Depressurization Technology "creates a driving force for air flow from the building into the subsurface by lowering the pressure below the slab, thereby reducing vapor intrusion (soil gas entry into a building)" (EPA, 2015a). This approach is the most thoroughly studied and demonstrated approach for mitigating vapor intrusion. This approach consists of a group of methods that site teams can customize to treat different construction features of a building, including sub-slab depressurization (SSD), drain tile depressurization, wall depressurization, baseboard depressurization, and sub-membrane depressurization (EPA, 2015a).

Interior Ventilation — Increasing building ventilation (i.e., increasing the rate at which indoor air is replaced with outdoor air) can reduce the buildup of vapor-forming chemicals within a structure. "Natural ventilation may be accomplished by opening windows, doors, and vents. Forced or mechanical ventilation may be accomplished by using a fan to blow air into or out of the building" (EPA, 2015a). Exhausting air from the building will generally contribute to under-pressurization of the building, relative to the subsurface, thereby potentially resulting in an increased rate of soil gas entry (i.e., vapor intrusion), which could lead to *higher* levels of vapors in indoor air unless ambient air entry into the building is increased disproportionately.

Passive Barrier (Impermeable Membrane) Installation involves "placing sheets of 'geomembrane' or strong plastic beneath a building to prevent vapor entry. Vapor barriers are best installed during building construction, but can be installed in existing buildings that have crawl spaces" (EPA, 2012l). Spray-on vapor barriers (rubberized asphalt emulsions or epoxy) may also be used (EPA, 2008a).

Passive Soil Depressurization is designed to achieve lower sub-slab air pressure relative to indoor air pressure by use of a vent pipe routed through the conditioned space of a building and venting to the outdoor air, thereby relying solely on the convective flow of air upward in the vent to draw air from beneath the slab" (EPA, 2008a).

Positive Building Pressurization "involves adjusting the building's heating, ventilation, and air-conditioning [HVAC] system to increase the pressure indoors relative to the sub-slab area. This method is typically used for office buildings and other large structures" (EPA, 2012l).

Sealing Cracks and Openings involves filling in adventitious and intentional openings in the building foundation using products such as synthetic rubbers, acrylics, oil-based sealants, asphalt/bituminous products, swelling cement, silicon, epoxy or elastomeric polymers (EPA, 2015a). In addition, "[c]oncrete can be poured over unfinished dirt floors" (EPA, 2012l).

Soil Pressurization systems "are used to push air into the soil or venting layer below the slab instead of pulling it out. The intention is to increase the sub-slab air pressure above

ambient levels, forcing soil gas from the subsurface to the sides of the building." (ITRC, 2007)

Sub-slab Ventilation refers to engineered controls that function by diluting the vapor concentrations beneath the slab and foundation (EPA, 2008a) by drawing outside air into and through the sub-slab area. When installed during building construction, sub-slab ventilation systems "typically consist of: a venting layer (e.g., filled with porous media such as sand or pea gravel; or suitably fabricated with continuous voids) below a floor slab to allow soil gas to move laterally to a collection piping system for discharge to the atmosphere; and a sub-slab liner that is installed on top of the venting layer to reduce entry points for vapor intrusion" (EPA, 2015a).

A.7 Other or Unspecified Remedies

Alternative Water Supply Remedy - "In CERCLA, section 101(34) states that '[t]he term 'alternative water supplies' includes, but is not limited to, drinking water and household water supplies.' Also, CERCLA section 118 states that in taking response actions, the President [EPA] shall 'give a high priority to facilities where the release of hazardous substances or pollutants or contaminants has resulted in the closing of drinking water wells or has contaminated a principal drinking water supply.'...Providing an alternative supply of water to affected users generally is designed to prevent residents from being exposed to contaminated groundwater....Providing an alternative water supply may involve furnishing clean, drinkable water on a permanent or temporary basis. For example, providing a permanent supply of drinking water may include installing a private well, connecting to a municipal water system, drilling of a new community water supply well, or reinstating a previously contaminated water supply well once the groundwater has been cleaned up. Examples of providing a temporary supply of water may involve installing individual treatment units or delivering bottled water. When a [Superfund] response action that provides an alternative water supply involves connecting hundreds of homes to a municipal system (i.e., a residential connection to a water purveyor), it generally means that [residents are connected] to a water supply line that is located relatively close by" (EPA, 2010).

Fracturing for Site Cleanup – "Fracturing creates or enlarges openings in bedrock or dense soil, such as clay, to help soil and groundwater cleanup methods work better. The openings, called "fractures," become pathways through which contaminants in soil and groundwater can be treated in situ (in place, underground) or removed for above-ground treatment. Although fractures can occur naturally in soil and rock, they are not always wide or long enough to easily reach underground contamination using cleanup methods. Fracturing can enlarge the cracks and create new ones to improve the speed and effectiveness of the cleanup" (EPA, 2012d).

Fracturing for site cleanup is different from fracturing to recover oil and gas. "Oil and gas hydraulic fracturing is used to stimulate the recovery of oil or natural gas from underground geologic formations. Oil and gas hydraulic fracturing works by pumping a mixture of fluids and other substances into the target formation to create and enlarge fractures. Such operations are much larger, use different equipment and chemical additives, occur at greater depths, and use higher volumes of fluid than fracturing for site cleanup. Fracturing to clean up a contaminated site rarely exceeds a depth of 100 feet, and the affected area around the fracturing well usually is less

than 100 feet in any direction. However, wells to extract oil and gas often are drilled hundreds or thousands of feet downward and sometimes horizontally into the oil- or gas-bearing rock. Fractures may extend over 500 feet from these wells" (EPA, 2012d).

Institutional Controls (ICs) are defined by EPA as "non-engineered instruments, such as administrative and legal controls, that help to minimize the potential for human exposure to contamination and/or protect the integrity of a response action. ICs typically are designed to work by limiting land and/or resource use or by providing information that helps modify or guide human behavior at a site. ICs are a subset of Land Use Controls (LUCs). LUCs include engineering and physical barriers, such as fences and security guards, as well as ICs" (EPA, 2012n). Some common examples of ICs include zoning restrictions, building or excavation permits, well drilling prohibitions, easements, and covenants.

Soil Amendments – "Many soils, particularly those found in urban, industrial, mining, and other disturbed areas, suffer from a range of physical, chemical, and biological limitations. They include soil toxicity, too high or too low pH, lack of sufficient organic matter, reduced water-holding capacity, reduced microbial communities, and compaction. Appropriate soil amendments may be inorganic (e.g., liming materials), organic (e.g., composts) or mixtures (e.g., lime-stabilized biosolids). When specified and applied properly, these beneficial soil amendments may limit many of the exposure pathways and reduce soil phytotoxicity. Soil amendments also can restore appropriate soil conditions for plant growth by balancing pH, adding organic matter, restoring soil microbial activity, increasing moisture retention, and reducing compaction." (EPA, 2007).

Wetlands Replacement – "Compensatory mitigation is required to replace the loss of wetland and aquatic resource functions in [a] watershed. Compensatory mitigation refers to the restoration, establishment, enhancement, or in certain circumstances preservation of wetlands, streams or other aquatic resources for the purpose of offsetting unavoidable adverse impacts [from a specific project (EPA, 2008c). For the purposes of this report, mitigation performed at the site of the adverse impacts is excluded from the definition of wetlands replacement. For mitigation performed at the site of adverse impacts, see Wetlands Restoration. For wetlands constructed as a form of treatment, see Constructed Treatment Wetlands.

Wetlands Restoration is defined as "[r]e-establishment or rehabilitation of a wetland or other aquatic resource with a goal of returning natural or historic functions and characteristics to a former or degraded wetland" (EPA, 2008c). For the purposes of this report, restoration conducted at a location other than the impacted site is excluded from the definition of wetlands restoration, and is instead considered Wetlands Replacement. For wetlands constructed as a form of treatment, see Constructed Treatment Wetlands.

APPENDIX B

TREATMENT TECHNOLOGIES BY FISCAL YEAR

Appendix B: Treatment Technologies by Fiscal Year

Type	Remedy	82-85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	Total
Ex Situ Source Treatment	Acid Extraction	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
	Bioremediation	1	3	2	6	9	4	5	9	8	6	6	6	1	4	9	3	0	3	2	3	1	0	3	0	2	1	1	0	0	1	99
	Chemical Treatment	1	0	0	1	5	0	4	2	4	0	3	2	1	2	2	1	2	1	0	1	3	1	0	0	1	0	1	0	1	1	40
	Constructed Treatment Wetland	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	1	6
	Incineration	2	2	1	2	4	0	0	0	6	1	2	3	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	25
	Incineration (off-site)	12	8	3	9	10	9	16	7	13	7	10	7	5	5	6	2	2	3	0	1	0	1	0	1	0	1	0	2	0	0	140
	Incineration (on-site)	3	5	8	12	12	18	6	4	5	2	4	3	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	85
	Mechanical Soil Aeration	1	2	2	2	3	1	4	0	0	0	0	0	0	2	3	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	22
	Neutralization	1	0	0	0	0	1	0	4	0	0	1	2	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	1	0	13
	Open Burn and Open Detonation	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	6
	Physical Separation	15	9	7	20	19	20	33	24	20	7	17	15	11	18	15	8	8	9	12	9	9	8	4	5	14	9	10	9	6	12	382
	Recycling	1	2	2	7	4	9	9	12	11	5	4	10	3	3	6	3	1	5	2	5	6	5	2	0	4	2	3	3	4	5	138
	Soil Vapor Extraction	1	0	1	3	0	2	0	0	0	10	2	3	1	0	2	0	1	0	0	1	1	0	1	0	0	0	0	0	1	0	30
	Soil Washing	0	1	1	2	3	9	2	4	2	0	3	1	1	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	33
	Solidification/Stabilization	2	8	10	16	17	15	26	31	22	5	8	9	8	8	10	8	1	10	8	11	4	15	5	10	8	5	5	2	1	2	290
	Source P&T	12	6	4	18	5	7	12	13	7	4	6	3	2	4	4	1	1	5	1	2	1	1	1	1	1	2	1	2	1	0	128
	Thermal Desorption	0	0	0	1	1	5	8	1	4	3	6	8	1	7	5	1	1	2	1	1	2	0	0	0	1	0	0	0	1	0	60
	Thermal Treatment	0	2	3	8	6	5	4	2	3	2	4	2	1	2	2	5	0	1	1	0	0	1	0	0	0	1	0	2	0	0	57
	Unspecified Ex Situ Treatment	0	0	0	0	0	0	0	1	1	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
	Unspecified Ex Situ Treatment (off-site)	4	2	1	0	5	8	4	2	2	5	4	3	3	2	5	5	1	6	1	5	3	2	1	4	3	3	6	2	0	5	97
	Unspecified Ex Situ Treatment (on-site)	2	2	2	2	4	1	1	1	6	1	3	2	2	1	2	1	0	1	1	2	2	0	1	0	0	0	0	4	0	2	46
	Total	**58**	**52**	**47**	**109**	**107**	**115**	**135**	**119**	**115**	**58**	**85**	**79**	**42**	**62**	**72**	**41**	**21**	**50**	**29**	**41**	**33**	**35**	**18**	**22**	**35**	**25**	**29**	**26**	**16**	**29**	**1705**
In Situ Source Treatment	Bioremediation	0	0	1	4	2	2	2	7	4	6	9	11	4	12	10	3	3	3	1	1	3	5	3	1	2	2	2	1	2	4	110
	Cap (amended, insitu)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	1	5
	Chemical Treatment	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0	1	2	2	2	4	7	4	3	3	6	38
	Constructed Treatment Wetland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
	Flushing	1	0	2	4	6	3	6	3	3	2	0	1	1	0	2	2	1	0	0	0	0	0	0	2	0	1	0	0	0	0	40
	Fracturing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	3
	Multi-phase Extraction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	2
	Phytoremediation	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	8
	Soil Amendments	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	2	1	0	1	1	9
	Soil Vapor Extraction	0	0	3	9	16	15	31	18	18	7	11	22	17	12	10	6	8	11	12	8	7	7	7	8	7	7	10	2	6	6	301
	Solidification/Stabilization	4	0	3	5	5	6	7	12	9	8	9	12	10	19	4	6	4	5	3	3	5	6	3	4	4	4	3	2	3	2	170
	Thermal Treatment	0	1	2	1	5	6	5	2	11	5	6	3	6	1	5	4	1	0	0	1	4	3	2	2	3	4	0	4	3	3	93
	Unspecified In Situ Treatment	1	0	1	2	0	3	1	0	1	2	3	0	0	0	1	1	1	3	0	1	2	0	1	1	0	0	1	0	0	0	26
	Total	**6**	**1**	**13**	**25**	**34**	**36**	**53**	**42**	**46**	**30**	**38**	**49**	**38**	**46**	**36**	**23**	**18**	**22**	**16**	**15**	**23**	**25**	**19**	**21**	**25**	**27**	**21**	**13**	**21**	**24**	**806**
Source Treatment (Unspecified)	Unspecified Treatment (on-site)	8	3	3	8	2	5	6	8	4	2	3	0	3	5	4	4	2	3	2	4	1	2	0	1	1	1	1	0	0	0	86
	Unspecified Source Treatment	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3
	Total	**8**	**3**	**3**	**9**	**2**	**5**	**6**	**9**	**4**	**2**	**3**	**0**	**3**	**5**	**4**	**4**	**2**	**3**	**2**	**4**	**2**	**2**	**0**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**89**
In Situ Groundwater	Air Sparging	0	0	0	0	0	0	1	0	4	3	6	6	12	8	9	7	5	6	2	2	5	2	1	1	7	3	1	1	2	2	96
	Bioremediation	1	1	1	1	6	5	5	6	4	6	5	5	2	3	4	5	9	6	3	5	11	21	14	13	22	20	10	13	17	16	240
	Chemical Treatment	0	0	1	0	1	2	2	2	0	0	3	0	0	1	0	3	0	0	0	0	7	10	13	5	6	10	10	15	9	13	113
	Electrokinetics	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	Flushing	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	3
	Fracturing	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	5
	In-well Air Stripping	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	1	1	0	0	0	0	2	0	0	0	1	1	9
	Multi-phase Extraction	0	0	0	0	1	0	0	0	0	1	0	0	1	1	0	1	0	2	0	1	1	1	1	1	1	1	1	0	2	0	17
	Permeable Reactive Barrier	0	0	0	0	0	0	0	2	0	1	1	0	1	4	0	2	3	1	2	5	3	4	1	1	1	3	4	0	4	3	46
	Phytoremediation	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	1	0	1	2	0	2	0	0	0	0	0	0	0	2	12
	Thermal Treatment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	2	1	5
	Unspecified In Situ Treatment	1	0	0	0	1	2	4	1	1	1	0	0	1	1	1	4	1	5	3	6	2	1	3	0	0	0	0	0	1	2	42
	Vapor Extraction	0	0	0	0	0	0	3	1	1	1	3	2	9	4	5	1	0	0	1	0	0	0	2	2	0	1	2	0	0	0	38
	Total	**2**	**2**	**2**	**2**	**9**	**9**	**17**	**12**	**10**	**14**	**18**	**14**	**27**	**22**	**20**	**26**	**20**	**21**	**13**	**22**	**30**	**41**	**35**	**23**	**39**	**38**	**28**	**31**	**40**	**41**	**628**
Ex Situ Groundwater	Pump and Treat	48	42	37	76	66	92	115	74	76	74	62	57	49	32	39	45	32	31	13	23	32	23	27	22	20	13	14	15	13	9	1271

Data in Appendix B may vary from data presented in the SRR 14th Edition. EPA has updated the dataset to add remedy components for decision documents from the early years of the program that had not previously been recorded and has updated older data to conform more readily to recently updated media and remedy categories.

APPENDIX C

Remedy Selection Summary Matrix FY 2012-2014

Remedy Selection Summary Matrix, FY 2012-14

Site Name	OU	Document Type	Action ID	FY	Source									Groundwater									Vapor Intrusion	
					In Situ Treatment	Ex Situ Treatment	Off site Disposal	On site Containment	Institutional Controls	Monitored Natural Recovery	Enahanced Monitored Natural Recovery	NA/NFA Only	Other	In Situ Treatment	Pump and Treat	Constructed Treatment Wetland	Monitored Natural Attenuation	Vertical Engineered Barrier	Institutional Controls	Alternative Water Supply	NA/NFA Only	Other	Mitigation	Institutional Controls
REGION 1																								
Connecticut																								
NEW LONDON SUBMARINE BASE	04	ROD	004	2012			X		X											X				
SCOVILL INDUSTRIAL LANDFILL	01	ROD	001	2013			X	X	X														X	X
Massachusetts																								
INDUSTRI-PLEX	02	ESD	001	2014		X	X						X											
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT	01	ESD	001	2014															X					X
OTIS AIR NATIONAL GUARD BASE/CAMP EDWARDS	05	ESD	006	2013	X																			
OTIS AIR NATIONAL GUARD BASE/CAMP EDWARDS	07	ESD	007	2013					X															
SOUTH WEYMOUTH NAVAL AIR STATION	04	ESD	005	2013															X					
SOUTH WEYMOUTH NAVAL AIR STATION	09	ROD	009	2014										X			X		X					X
SOUTH WEYMOUTH NAVAL AIR STATION	11	ROD	011	2012										X					X					
SOUTH WEYMOUTH NAVAL AIR STATION	14	ROD	014	2013										X					X					X
SOUTH WEYMOUTH NAVAL AIR STATION	25	ESD	003	2012															X					
Maine																								
BRUNSWICK NAVAL AIR STATION	07	ESD	004	2014				X																
CALLAHAN MINING CORP	01	ESD	001	2013				X																
LORING AIR FORCE BASE	08	ESD	006	2014		X																		
PORTSMOUTH NAVAL SHIPYARD	04	ROD	004	2013		X	X																	
PORTSMOUTH NAVAL SHIPYARD	05	ROD	007	2013			X		X															
PORTSMOUTH NAVAL SHIPYARD	07	ROD	008	2013					X															
New Hampshire																								
FLETCHER'S PAINT WORKS & STORAGE	02	ROD	002	2012																X				
KEARSARGE METALLURGICAL CORP.	01	ROD Amendment	001	2012													X		X					
PEASE AIR FORCE BASE	07	ESD	001	2013										X										
PEASE AIR FORCE BASE	07	ESD	002	2014										X										
SOMERSWORTH SANITARY LANDFILL	01	ESD	001	2013					X															
Rhode Island																								
CENTREDALE MANOR RESTORATION PROJECT	01	ROD	001	2012		X	X	X	X				X						X					
DAVISVILLE NAVAL CONSTRUCTION BATTALION CENTER	09	ROD	008	2014		X	X	X	X					X			X		X					
NEWPORT NAVAL EDUCATION & TRAINING CENTER	02	ROD	007	2014				X	X								X		X					
NEWPORT NAVAL EDUCATION & TRAINING CENTER	03	ESD	002	2012			X																	
NEWPORT NAVAL EDUCATION & TRAINING CENTER	05	ROD	006	2014		X	X	X	X															

Remedy Selection Summary Matrix, FY 2012-14

					Source									Groundwater								Vapor Intrusion	
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NEWPORT NAVAL EDUCATION & TRAINING CENTER	06	ROD	008	2014		X	X		X								X		X					
NEWPORT NAVAL EDUCATION & TRAINING CENTER	07	ROD	009	2012		X	X	X	X					X			X		X					
NEWPORT NAVAL EDUCATION & TRAINING CENTER	11	ROD	012	2013			X		X								X		X					
NEWPORT NAVAL EDUCATION & TRAINING CENTER	12	ROD	013	2014				X	X								X		X					X
PETERSON/PURITAN, INC.	01	ESD	002	2013													X							
Region 2																								
New Jersey																								
AMERICAN CYANAMID CO	04	ROD	004	2012	X			X	X						X				X			X		
BROOK INDUSTRIAL PARK	01	ESD	001	2013				X	X						X				X					
CINNAMINSON TOWNSHIP (BLOCK 702) GROUND WATER CONTAMINATION	02	ROD	006	2014								X												
CORNELL DUBILIER ELECTRONICS INC.	03	ROD	003	2012															X					
ELLIS PROPERTY	01	ROD Amendment	001	2013	X														X					
EVOR PHILLIPS LEASING	03	ROD	003	2012										X					X					
LCP CHEMICALS INC.	01	ROD	002	2014	X	X		X	X				X		X			X	X					
MAYWOOD CHEMICAL CO.	01	ROD	001	2014	X	X	X		X				X											
MAYWOOD CHEMICAL CO.	03	ROD	003	2012			X		X					X			X		X					
NAVAL WEAPONS STATION EARLE (SITE A)	11	ROD	011	2014								X												
PICATINNY ARSENAL (USARMY)	15	ROD	052	2012			X	X	X								X		X					
PICATINNY ARSENAL (USARMY)	20	ROD	064	2014								X									X			
RADIATION TECHNOLOGY, INC.	03	ROD	005	2014		X	X																	
RARITAN BAY SLAG	01	ROD	001	2013			X																	
RINGWOOD MINES/LANDFILL	02	ROD	002	2014		X	X	X	X				X											
SCIENTIFIC CHEMICAL PROCESSING	03	ROD	003	2012										X			X		X					
SHIELDALLOY CORP.	02	ROD	005	2014		X	X	X	X				X											
WHITE CHEMICAL CORP.	03	ROD	003	2012										X					X					
WHITE SWAN LAUNDRY AND CLEANER INC.	01	ROD	001	2013	X		X							X	X		X		X				X	
WOODBROOK ROAD DUMP	01	ROD	001	2013			X		X															
New York																								
BROOKHAVEN NATIONAL LABORATORY (USDOE)	03	ESD	003	2012											X									
CAYUGA GROUNDWATER CONTAMINATION SITE	01	ROD	001	2013										X	X				X	X				
CROWN CLEANERS OF WATERTOWN INC.	01	ROD	001	2012		X	X	X	X					X			X		X					
DIAZ CHEMICAL	02	ROD	002	2012	X		X	X	X						X				X					

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GOWANUS CANAL	01	ROD	001	2013	X	X		X	X															
GRIFFISS AIR FORCE BASE (11 AREAS)	04	ROD	004	2012					X										X					
GRIFFISS AIR FORCE BASE (11 AREAS)	07	ROD	030	2012					X															X
GRIFFISS AIR FORCE BASE (11 AREAS)	32	ROD	032	2012								X									X			
GRIFFISS AIR FORCE BASE (11 AREAS)	40	ROD	040	2012								X									X			
GRIFFISS AIR FORCE BASE (11 AREAS)	41	ROD	041	2012								X												
HOOKER (HYDE PARK)	01	ESD	001	2012					X										X					
LIBERTY INDUSTRIAL FINISHING	01	ROD Amendment	001	2012																	X			
LITTLE VALLEY	02	ESD	002	2014			X																	X
MATTIACE PETROCHEMICAL CO., INC.	01	ROD Amendment	001	2014	X				X					X				X	X			X		X
NEW CASSEL/HICKSVILLE GROUND WATER CONTAMINATION	01	ROD	001	2013										X	X				X					
NIAGARA MOHAWK POWER CORP. (SARATOGA SPRINGS PLANT)	02	ROD	002	2013	X			X	X										X	X				
OLEAN WELL FIELD	02	ROD Amendment	002	2014	X				X					X					X					X
OLEAN WELL FIELD	03	ROD	007	2014										X					X					X
ONONDAGA LAKE	02	ESD	003	2014							X		X	X										
ONONDAGA LAKE	25	ROD	021	2014		X	X		X				X											
PLATTSBURGH AIR FORCE BASE	06	ROD	023	2014											X				X				X	X
PLATTSBURGH AIR FORCE BASE	20	ROD	022	2012			X	X					X											
SHENANDOAH ROAD GROUNDWATER CONTAMINATION	01	ROD	001	2012													X		X				X	X
SOLVENT SAVERS	01	ESD	002	2012		X																		
Puerto Rico																								
ATLANTIC FLEET WEAPONS TRAINING AREA	04	ROD	004	2014								X									X			
CIDRA GROUNDWATER CONTAMINATION	01	ROD	002	2014	X		X	X	X					X			X		X					X
MAUNABO URBANO PUBLIC WELLS	01	ROD	001	2012										X	X		X		X					
SCORPIO RECYCLING, INC.	02	ROD	002	2013				X	X															
Region 3																								
Maryland																								
68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	001	2013		X	X	X	X				X	X	X	X			X			X		
ABERDEEN PROVING GROUND (EDGEWOOD AREA)	29	ROD	032	2014	X	X	X		X					X					X					
ABERDEEN PROVING GROUND (EDGEWOOD AREA)	37	ROD	041	2012			X		X															
ABERDEEN PROVING GROUND (EDGEWOOD AREA)	48	ROD	051	2013					X															

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ABERDEEN PROVING GROUND (EDGEWOOD AREA)	49	ROD	054	2013								X												
CURTIS BAY COAST GUARD YARD	04	ROD	004	2013					X															
FORT GEORGE G. MEADE	09	ROD	010	2014			X																	
FORT GEORGE G. MEADE	13	ROD	013	2014					X				X						X					X
FORT GEORGE G. MEADE	17	ROD	017	2012			X		X					X					X					
FORT GEORGE G. MEADE	18	ROD	018	2014		X	X		X															
FORT GEORGE G. MEADE	20	ROD	020	2012		X	X		X															
INDIAN HEAD NAVAL SURFACE WARFARE CENTER	03	ROD	002	2014					X												X			
INDIAN HEAD NAVAL SURFACE WARFARE CENTER	07	ROD	013	2013										X			X		X					
INDIAN HEAD NAVAL SURFACE WARFARE CENTER	21	ROD	020	2014								X							X					
INDIAN HEAD NAVAL SURFACE WARFARE CENTER	24	ROD	023	2014			X		X										X					
ORDNANCE PRODUCTS, INC.	01	ROD Amendment	001	2013										X										
PATUXENT RIVER NAVAL AIR STATION	11	ROD	013	2014																	X			
PATUXENT RIVER NAVAL AIR STATION	18	ROD	025	2013								X									X			
SPECTRON, INC.	01	ROD Amendment	001	2012	X																			
SPECTRON, INC.	02	ROD	002	2012		X	X	X	X						X				X					
Pennsylvania																								
AVCO LYCOMING (WILLIAMSPORT DIVISION)	02	ESD	003	2012															X					
BRESLUBE-PENN, INC.	01	ESD	001	2014										X										
CHEM-FAB	01	ROD	002	2013			X																	
CROSSLEY FARM	03	ROD	004	2012																			X	X
LETTERKENNY ARMY DEPOT (PDO AREA)	02	ROD	007	2014					X	X			X				X		X					X
LETTERKENNY ARMY DEPOT (SE AREA)	12	ROD	017	2012				X	X										X					
LETTERKENNY ARMY DEPOT (SE AREA)	21	ROD	027	2012					X															
LETTERKENNY ARMY DEPOT (SE AREA)	28	ROD	028	2014					X														X	X
LOWER DARBY CREEK AREA	01	ROD	001	2014		X	X	X	X															
NORTH PENN - AREA 1	01	ESD	003	2012															X					
SALFORD QUARRY	01	ROD	001	2013				X	X															
SHARON STEEL CORP (FARRELL WORKS DISPOSAL AREA)	02	ROD	003	2014				X	X															
STRASBURG LANDFILL	00	ESD	002	2012					X										X					
WILLOW GROVE NAVAL AIR AND AIR RESERVE STATION	02	ROD	002	2012										X			X		X				X	X
Virginia																								
DEFENSE GENERAL SUPPLY CENTER (DLA)	06	ROD	009	2013										X			X		X					X

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DEFENSE GENERAL SUPPLY CENTER (DLA)	07	ROD	010	2012										X			X		X					X
DEFENSE GENERAL SUPPLY CENTER (DLA)	13	ROD	016	2012			X		X															
DIXIE CAVERNS COUNTY LANDFILL	02	ESD	001	2013					X															
FIRST PIEDMONT CORP. ROCK QUARRY (ROUTE 719)	01	ROD Amendment	001	2014			X	X	X				X											
GREENWOOD CHEMICAL CO.	04	ESD	003	2013																				X
LANGLEY AIR FORCE BASE/NASA LANGLEY RESEARCH CENTER	06	ROD	039	2014																	X			
LANGLEY AIR FORCE BASE/NASA LANGLEY RESEARCH CENTER	28	ROD	037	2012			X	X	X				X											
MARINE CORPS COMBAT DEVELOPMENT COMMAND	21	ROD	023	2014										X			X		X					
NAVAL AMPHIBIOUS BASE LITTLE CREEK	12	ROD	012	2013								X									X			
NAVAL WEAPONS STATION - YORKTOWN	15	ROD	030	2012										X			X		X					
ST. JULIENS CREEK ANNEX (U.S. NAVY)	12	ROD	009	2012										X					X					
Washington DC																								
WASHINGTON NAVY YARD	21	ROD	027	2013								X												
West Virginia																								
ALLEGANY BALLISTICS LABORATORY (USNAVY)	04	ROD	004	2014		X	X	X	X															
ALLEGANY BALLISTICS LABORATORY (USNAVY)	11	ROD	015	2012										X			X		X					
Region 4																								
Alabama																								
INTERSTATE LEAD CO. (ILCO)	02	ROD Amendment	001	2012								X		X	X				X					
OLIN CORP. (MCINTOSH PLANT)	02	ROD	002	2014	X			X	X				X						X					
STAUFFER CHEMICAL CO. (COLD CREEK PLANT)	02	ESD	002	2012					X															
US NASA MARSHALL SPACE FLIGHT CENTER	03	ROD	018	2012	X									X										
US NASA MARSHALL SPACE FLIGHT CENTER	07	ROD	014	2013			X		X															
Florida																								
FLORIDA STEEL CORP.	02	ESD	001	2013					X										X					
JJ SEIFERT MACHINE	01	ROD	001	2013			X		X					X			X		X	X				
ORLANDO GASIFICATION PLANT	01	ROD	001	2013	X		X	X	X					X			X	X	X					
REEVES SOUTHEASTERN GALVANIZING CORP.	02	ROD Amendment	001	2014										X					X			X		
SANFORD DRY CLEANERS	01	ROD	001	2013	X		X		X					X			X		X					
WHITING FIELD NAVAL AIR STATION	27	ROD	028	2012			X		X															

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Georgia																								
BRUNSWICK WOOD PRESERVING	02	ROD	002	2012								X												
PEACH ORCHARD RD PCE GROUNDWATER PLUME SITE	01	ROD Amendment	001	2013	X		X							X										
Kentucky																								
PADUCAH GASEOUS DIFFUSION PLANT (USDOE)	19	ROD	029	2012	X			X	X					X					X					
TRI-CITY DISPOSAL CO.	01	ESD	001	2012				X																
Mississippi																								
CHEMFAX, INC.	01	ROD Amendment	001	2013													X							
North Carolina																								
ABERDEEN CONTAMINATED GROUND WATER	01	ROD	001	2012											X					X				
ABERDEEN CONTAMINATED GROUND WATER	01	ROD Amendment	002	2014																X				
CAMP LEJEUNE MILITARY RES. (USNAVY)	12	ROD	030	2013					X										X					
CAMP LEJEUNE MILITARY RES. (USNAVY)	15	ROD	031	2013				X	X								X		X					
CAMP LEJEUNE MILITARY RES. (USNAVY)	17	ROD	028	2013										X			X		X					X
CAMP LEJEUNE MILITARY RES. (USNAVY)	24	ROD	032	2014													X		X					X
CHERRY POINT MARINE CORPS AIR STATION	01	ROD	017	2013								X									X			
GMH ELECTRONICS	01	ROD	002	2014	X		X							X					X					
KOPPERS CO., INC. (MORRISVILLE PLANT)	01	ESD	001	2012	X									X					X					
NORTH CAROLINA STATE UNIVERSITY (LOT 86, FARM UNIT #1)	01	ESD	001	2014					X										X					
South Carolina																								
BREWER GOLD MINE	01	ROD	002	2014										X	X	X								
ELMORE WASTE DISPOSAL	01	ESD	001	2014										X										
MEDLEY FARM DRUM DUMP	01	ROD Amendment	001	2012										X			X							
SAVANNAH RIVER SITE (USDOE)	21	ESD	027	2013										X										
SAVANNAH RIVER SITE (USDOE)	29	ESD	025	2013										X										
SAVANNAH RIVER SITE (USDOE)	35	ESD	024	2012					X															
SAVANNAH RIVER SITE (USDOE)	48	ROD	176	2013					X				X											
Tennessee																								
COPPER BASIN MINING DISTRICT	03	ROD	003	2012				X	X						X				X					
GALLAWAY PITS	01	ROD Amendment	001	2014								X												
MILAN ARMY AMMUNITION PLANT	05	ROD	044	2012								X												
MILAN ARMY AMMUNITION PLANT	05	ROD	045	2014					X															

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MILAN ARMY AMMUNITION PLANT	06	ROD	039	2014											X		X		X					
NATIONAL FIREWORKS	02	ROD	002	2014	X				X					X					X					
VELSICOL CHEMICAL CORP. (HARDEMAN COUNTY)	02	ROD Amendment	001	2012	X			X																
Region 5																								
Illinois																								
ALCOA PROPERTIES	01	ROD	001	2012				X	X															
EAGLE ZINC CO DIV T L DIAMOND	02	ROD	002	2012	X			X	X				X						X					
HEGELER ZINC	03	ROD	002	2014				X	X															
OLD AMERICAN ZINC PLANT	02	ROD	001	2012			X	X	X										X					
OTTAWA RADIATION AREAS	06	ESD	002	2012					X															
OTTAWA RADIATION AREAS	06	ROD Amendment	002	2013				X	X															
OUTBOARD MARINE CORP.	04	ESD	004	2012				X	X															
OUTBOARD MARINE CORP.	04	ROD Amendment	003	2013				X	X						X				X					
SANGAMO ELECTRIC DUMP/CRAB ORCHARD NATIONAL WILDLIFE REFUGE (USDOI)	02	ROD Amendment	002	2014	X		X							X					X					
SAVANNA ARMY DEPOT ACTIVITY	08	ROD	008	2012					X										X					
SAVANNA ARMY DEPOT ACTIVITY	09	ROD	009	2012								X									X			
SAVANNA ARMY DEPOT ACTIVITY	10	ROD	013	2013			X														X			
SAVANNA ARMY DEPOT ACTIVITY	17	ROD	018	2014								X									X			
SAVANNA ARMY DEPOT ACTIVITY	23	ROD	012	2014								X												
SAVANNA ARMY DEPOT ACTIVITY	26	ROD	019	2014								X												
SOUTHEAST ROCKFORD GROUND WATER CONTAMINATION	03	ESD	003	2012	X																			
Indiana																								
DOUGLASS ROAD/UNIROYAL, INC., LANDFILL	02	ESD	001	2012															X					
LUSHER STREET GROUND WATER CONTAMINATION	01	ROD	001	2014															X	X			X	X
U.S. SMELTER AND LEAD REFINERY, INC.	01	ROD	001	2013			X		X				X											
Michigan																								
PEERLESS PLATING CO.	01	ROD Amendment	001	2013	X									X										
ROSE TOWNSHIP DUMP	01	ESD	001	2013					X										X					
TEN-MILE DRAIN	01	ROD	002	2014		X	X	X	X															
VELSICOL CHEMICAL CORP. (MICHIGAN)	01	ROD	002	2012	X	X	X	X	X					X	X				X	X		X		
VERONA WELL FIELD	02	ESD	004	2014								X		X					X					

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Minnesota																								
FMC CORP. (FRIDLEY PLANT)	01	ESD	001	2013											X									
NEW BRIGHTON/ARDEN HILLS/TCAAP (USARMY)	07	ROD Amendment	009	2012								X			X		X		X					
NEW BRIGHTON/ARDEN HILLS/TCAAP (USARMY)	07	ROD Amendment	999	2014					X															
UNIVERSITY OF MINNESOTA (ROSEMOUNT RESEARCH CENTER)	03	ESD	001	2014					X															
Ohio																								
NEW LYME LANDFILL	01	ESD	001	2013					X										X					
NORTH SANITARY LANDFILL	01	ROD	001	2013	X	X	X	X	X				X						X					
WRIGHT-PATTERSON AIR FORCE BASE	01	ESD	001	2012															X					
Wisconsin																								
ONALASKA MUNICIPAL LANDFILL	01	ROD Amendment	001	2012													X		X	X				
REFUSE HIDEAWAY LANDFILL	01	ESD	002	2012											X									
TOMAH ARMORY	01	ESD	001	2014					X										X					
WPSC CAMP MARINA MGP	02	ROD	002	2012								X												
WPSC STEVENS POINT	01	ROD	001	2012		X	X	X	X								X		X					
Region 6																								
New Mexico																								
EAGLE PICHER CAREFREE BATTERY	01	ROD	001	2014			X								X				X					
UNITED NUCLEAR CORP.	02	ROD	002	2013				X	X															
Oklahoma																								
OKLAHOMA REFINING CO.	02	ROD	002	2013		X	X	X	X				X											
TINKER AIR FORCE BASE (SOLDIER CREEK/BUILDING 3001)	01	ROD	009	2014	X				X					X					X					X
Texas																								
BANDERA ROAD GROUND WATER PLUME	01	ROD	001	2013	X				X				X	X					X			X	X	
FRENCH, LTD.	01	ROD Amendment	001	2014															X					
SOUTH CAVALCADE STREET	01	ROD Amendment	002	2014		X	X										X		X					
STAR LAKE CANAL	01	ROD	001	2013		X	X	X	X	X														
VAN DER HORST USA CORPORATION	01	ROD	001	2014			X		X				X	X					X					
Region 7																								
Iowa																								
PEOPLES NATURAL GAS CO.	01	ROD Amendment	001	2013					X						X		X		X					X

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Kansas																								
ACE SERVICES	01	ESD	001	2012				X							X									
Missouri																								
MADISON COUNTY MINES	03	ROD	006	2014			X	X	X											X				
MADISON COUNTY MINES	05	ROD	005	2012				X	X	X			X						X					
ORONOGO-DUENWEG MINING BELT	01	ROD Amendment	001	2013				X																
SOUTHWEST JEFFERSON COUNTY MINING	01	ROD	001	2012			X	X	X															
SOUTHWEST JEFFERSON COUNTY MINING	02	ROD	002	2012			X	X	X															
SOUTHWEST JEFFERSON COUNTY MINING	03	ROD	003	2012			X	X	X															
Nebraska																								
10TH STREET SITE	02	ROD Amendment	001	2013	X		X							X	X									
CLEBURN STREET WELL	02	ROD Amendment	004	2012	X	X								X	X									
GARVEY ELEVATOR	01	ROD	001	2013		X		X																
GARVEY ELEVATOR	02	ROD	003	2013											X				X					
NEBRASKA ORDNANCE PLANT (FORMER)	03	ROD	003	2013								X									X			
NEBRASKA ORDNANCE PLANT (FORMER)	05	ROD	004	2013				X	X					X					X					
Region 8																								
Colorado																								
AIR FORCE PLANT PJKS	01	ROD	001	2013					X					X					X					
CALIFORNIA GULCH	01	ESD	005	2013															X					
CALIFORNIA GULCH	03	ESD	009	2014					X															
CALIFORNIA GULCH	04	ESD	007	2013					X															
CALIFORNIA GULCH	10	ESD	008	2013					X															
CAPTAIN JACK MILL	01	ESD	001	2012				X																
ROCKY MOUNTAIN ARSENAL (USARMY)	03	ESD	023	2012			X	X																
Montana																								
ANACONDA CO. SMELTER	16	ROD Amendment	002	2013	X	X		X																
FLAT CREEK IMM	01	ROD	001	2012				X	X															
South Dakota																								
ELLSWORTH AIR FORCE BASE	11	ROD Amendment	001	2012										X										
GILT EDGE MINE	01	ESD	001	2014	X			X																

Remedy Selection Summary Matrix, FY 2012-14

Site Name	OU	Document Type	Action ID	FY	Source									Groundwater									Vapor Intrusion	
					In Situ Treatment	Ex Situ Treatment	Off site Disposal	On site Containment	Institutional Controls	Monitored Natural Recovery	Enahanced Monitored Natural Recovery	NA/NFA Only	Other	In Situ Treatment	Pump and Treat	Constructed Treatment Wetland	Monitored Natural Attenuation	Vertical Engineered Barrier	Institutional Controls	Alternative Water Supply	NA/NFA Only	Other	Mitigation	Institutional Controls
Utah																								
HILL AIR FORCE BASE	06	ESD	007	2014											X									
HILL AIR FORCE BASE	13	ROD	018	2014			X		X															
OGDEN DEFENSE DEPOT (DLA)	04	ESD	005	2013											X									
TOOELE ARMY DEPOT (NORTH AREA)	16	ROD	012	2014								X												
Wyoming																								
F.E. WARREN AIR FORCE BASE	14	ROD	026	2013								X		X					X					
Region 9																								
Arizona																								
INDIAN BEND WASH AREA	08	ESD	001	2012											X									
PHOENIX-GOODYEAR AIRPORT AREA	01	ROD Amendment	002	2014										X	X									
TUCSON INTERNATIONAL AIRPORT AREA	01	ROD Amendment	003	2012										X			X		X					
WILLIAMS AIR FORCE BASE	01	ROD Amendment	002	2014	X									X					X					X
WILLIAMS AIR FORCE BASE	02	ROD Amendment	003	2013	X	X								X			X							
California																								
ALAMEDA NAVAL AIR STATION	01	ESD	001	2012								X												
ALAMEDA NAVAL AIR STATION	02	ROD	002	2013								X		X			X		X					
ALAMEDA NAVAL AIR STATION	03	ROD Amendment	001	2014				X	X															
ALAMEDA NAVAL AIR STATION	08	ROD	008	2014				X	X				X	X					X					X
CAMP PENDLETON MARINE CORPS BASE	05	ROD	011	2013								X									X			
CAMP PENDLETON MARINE CORPS BASE	05	ROD	999	2014										X					X	X				
CONCORD NAVAL WEAPONS STATION	02	ROD	002	2013	X			X																
CONCORD NAVAL WEAPONS STATION	03	ESD	002	2013								X												
CONCORD NAVAL WEAPONS STATION	04	ROD	003	2013			X		X															
CONCORD NAVAL WEAPONS STATION	08	ROD	008	2013								X												
EDWARDS AIR FORCE BASE	02	ROD Amendment	001	2012		X	X	X																
EDWARDS AIR FORCE BASE	11	ESD	001	2013					X															
EDWARDS AIR FORCE BASE	13	ROD	015	2012		X	X	X	X								X		X					
EL TORO MARINE CORPS AIR STATION	08	ROD	008	2012										X			X		X					
MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	01	ESD	002	2013										X										
MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	05	ROD	007	2012		X	X	X	X															

Remedy Selection Summary Matrix, FY 2012-14

Site Name	OU	Document Type	Action ID	FY	Source									Groundwater									Vapor Intrusion	
					In Situ Treatment	Ex Situ Treatment	Off site Disposal	On site Containment	Institutional Controls	Monitored Natural Recovery	Enahanced Monitored Natural Recovery	NA/NFA Only	Other	In Situ Treatment	Pump and Treat	Constructed Treatment Wetland	Monitored Natural Attenuation	Vertical Engineered Barrier	Institutional Controls	Alternative Water Supply	NA/NFA Only	Other	Mitigation	Institutional Controls
MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	06	ROD	008	2014	X	X		X	X				X											X
MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	07	ROD	009	2013		X	X	X	X															
MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	17	ROD	018	2012			X	X	X															X
MOFFETT NAVAL AIR STATION	05	ROD Amendment	002	2014										X			X		X					X
PURITY OIL SALES, INC.	01	ROD Amendment	002	2012													X		X					
RIVERBANK ARMY AMMUNITION PLANT	01	ESD	002	2013										X										
SHARPE ARMY DEPOT	01	ESD	001	2014										X					X					X
TRAVIS AIR FORCE BASE	06	ROD	006	2014		X								X	X		X		X					X
TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	005	2014	X	X	X	X	X				X	X			X	X	X					X
TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	07	ROD	010	2013		X	X	X	X				X		X			X	X			X		
TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	10	ROD	011	2014		X	X	X	X					X			X		X					
Guam																								
ANDERSEN AIR FORCE BASE	01	ROD	021	2014		X	X		X															
ANDERSEN AIR FORCE BASE	01	ROD	022	2012								X												
ANDERSEN AIR FORCE BASE	01	ROD	023	2012		X	X	X																
ANDERSEN AIR FORCE BASE	01	ROD	025	2012		X	X	X	X															
ANDERSEN AIR FORCE BASE	01	ROD	026	2012		X		X																
Hawaii																								
NAVAL COMPUTER AND TELECOMMUNICATIONS AREA MASTER STATION EASTERN PACIFIC	07	ROD	008	2014								X												
NAVAL COMPUTER AND TELECOMMUNICATIONS AREA MASTER STATION EASTERN PACIFIC	08	ROD	009	2013								X												
NAVAL COMPUTER AND TELECOMMUNICATIONS AREA MASTER STATION EASTERN PACIFIC	09	ROD	010	2013								X									X			
PEARL HARBOR NAVAL COMPLEX	17	ROD	021	2012				X	X															
PEARL HARBOR NAVAL COMPLEX	22	ROD	026	2013								X												
PEARL HARBOR NAVAL COMPLEX	24	ROD	024	2014					X				X											

Remedy Selection Summary Matrix, FY 2012-14

					Source									Groundwater									Vapor Intrusion	
Site Name	OU	Document Type	Action ID	FY	In Situ Treatment	Ex Situ Treatment	Off site Disposal	On site Containment	Institutional Controls	Monitored Natural Recovery	Enahanced Monitored Natural Recovery	NA/NFA Only	Other	In Situ Treatment	Pump and Treat	Constructed Treatment Wetland	Monitored Natural Attenuation	Vertical Engineered Barrier	Institutional Controls	Alternative Water Supply	NA/NFA Only	Other	Mitigation	Institutional Controls
PEARL HARBOR NAVAL COMPLEX	30	ROD	025	2013																	X			
Nevada																								
RIO TINTO COPPER MINE	01	ROD	001	2012		X		X	X										X					
Region 10																								
Alaska																								
FORT WAINWRIGHT	07	ROD	008	2014					X								X		X					
Idaho																								
BUNKER HILL MINING & METALLURGICAL COMPLEX	03	ROD Amendment	004	2012		X		X	X						X				X			X		
EASTERN MICHAUD FLATS CONTAMINATION	01	ROD Amendment	001	2012		X		X	X						X				X					
MOUNTAIN HOME AIR FORCE BASE	03	ROD Amendment	003	2013															X					
Oregon																								
HARBOR OIL INC.	01	ROD	001	2013								X									X			
TELEDYNE WAH CHANG	01	ESD	005	2013										X										
Washington																								
BANGOR NAVAL SUBMARINE BASE	09	ROD	009	2014		X	X														X			
HAMILTON/LABREE ROADS GW CONTAMINATION	01	ROD	001	2013	X	X	X		X				X	X					X					
HANFORD 100-AREA (USDOE)	35	ROD	030	2014		X	X	X	X								X		X					
HANFORD 200-AREA (USDOE)	49	ROD	039	2012											X		X		X					
HANFORD 300-AREA (USDOE)	04	ROD	004	2014	X	X	X	X	X					X			X		X					
JACKSON PARK HOUSING COMPLEX (USNAVY)	01	ROD Amendment	001	2013	X									X	X									
JACKSON PARK HOUSING COMPLEX (USNAVY)	05	ROD	005	2014					X															
LOCKHEED WEST SEATTLE	01	ROD	001	2013			X		X		X													
QUEEN CITY FARMS	01	ESD	001	2014											X									

APPENDIX D

Individual Contaminants and Assigned Contaminant Groups

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Individual Contaminants and Assigned Contaminant Groups

	High Level Group				Detailed Category												Select Federal Facility Category						
Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
1,1,1,2-TETRACHLOROETHANE			X				X																
1,1,1-TRICHLOROETHANE			X				X																
1,1,2,2-TETRABROMOETHANE			X				X																
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE			X				X																
1,1,2-TRICHLOROETHANE			X				X																
1,1-DICHLOROETHANE			X				X																
1,1-DICHLOROETHENE			X				X																
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN		X				X																	
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN (HpCDD)		X				X																	
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN (HxCDF)		X				X																	
1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN		X				X																	
1,2,3,4-TETRACHLOROBENZENE		X							X														
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN (HxCDF)		X				X																	
1,2,3,6,7,8-HEXACHLORODIBENZO-p-DIOXIN		X				X																	
1,2,3,7,8-PENTACHLORODIBENZOFURAN		X				X																	
1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN		X				X																	
1,2,3-TRICHLOROBENZENE		X							X														
1,2,3-TRICHLOROPROPANE			X				X																
1,2,3-TRIMETHYLBENZENE			X									X											
1,2,4,5-TETRACHLOROBENZENE		X							X														
1,2,4-TRICHLOROBENZENE		X							X														
1,2,4-TRIMETHYL BENZENE			X									X											
1,2-DICHLOROBENZENE			X				X																
1,2-DICHLOROETHANE			X				X																
1,2-DICHLOROETHENE			X				X																

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Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
1,2-DICHLOROPROPANE			X				X																
1,2-DICHLOROTETRAFLUOROETHANE			X				X																
1,2-DIMETHYLBENZENE			X		X																		
1,2-DIPHENYLHYDRAZINE		X									X												
1,3,5-TRICHLOROBENZENE		X							X														
1,3,5-TRIMETHYLBENZENE			X									X											
1,3-BUTADIENE			X									X											
1,3-DICHLOROBENZENE			X				X																
1,3-DICHLOROPROPENE			X				X																
1,3-DIMEHTYLBENZENE			X		X																		
1,3-DINITROBENZENE		X									X									X			
1,4-DICHLOROBENZENE			X				X																
1,4-DIMETHYLBENZENE			X		X																		
1,4-DINITROBENZENE		X									X									X			
1,4-DIOXANE			X									X											
2,2,4-TRIMETHYLPENTANE			X									X											
2,3,4,7,8-PENTACHLORODIBENZOFURAN (PeCDF)		X				X																	
2,3,5,6-TETRACHLOROPHENOL		X							X														
2,3,7,8-TETRACHLORODIBENZOFURAN		X				X																	
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN		X				X																	
2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN (TCDD)		X				X																	
2,4,5-TP ACID (SILVEX)		X												X									
2,4,5-TP ACID ESTER		X												X									
2,4,5-TRICHLOROPHENOL		X							X														
2,4,5-TRICHLOROPHENOXYACETIC ACID		X												X									

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Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
2,4,6-TRICHLOROPHENOL		X							X														
2,4,6-TRINITROTOLUENE		X									X									X			
2,4-D [ACETIC ACID (2,4-DICHLOROPHENOXY)-]		X												X									
2,4-DB [2,4-DICHLORO-PHENOXYBUTYRIC ACID]		X												X									
2,4-DICHLOROPHENOL		X							X														
2,4-DIMETHYLPHENOL		X							X														
2,4-DINITROPHENOL		X							X														
2,4-DINITROTOLUENE		X									X									X			
2,6-DINITROTOLUENE		X									X									X			
2-AMINO-4,6-DINITROTOLUENE		X									X									X			
2-AMINOPYRIDINE				X									X										
2-AZO-4,6-DINITROTOLUENE		X									X									X			
2-BUTANONE			X									X											
2-BUTOXYETHANOL				X									X										
2-CHLOROACETOPHENONE				X									X										
2-CHLOROANILINE		X							X														
2-CHLOROETHYL VINYL ETHER			X				X																
2-CHLORONAPHTHALENE		X							X														
2-CHLOROPHENOL		X							X														
2-CHLOROTOLUENE			X				X																
2-ETHOXYETHANOL			X									X											
2-HEXANONE			X									X											
2-METHYL-2-PROPENENITRILE			X									X											
2-METHYLPHENOL		X							X														
2-NAPHTHYLAMINE		X									X												

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Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
2-NITROANILINE		X									X												
2-NITROPHENOL		X							X														
3,3-DICHLOROBENZIDINE		X							X														
3,3-DIMETHYLBENZIDINE (O-TOLIDINE)		X									X												
3,4-METHYLPHENOL		X							X														
3-METHYLPHENOL		X							X														
3-NITROANILINE		X									X												
4,4-METHYLENEBIS (2-CHLOROANILINE)		X							X														
4,6-DINITRO-ORTHO-METHYLPHENOL		X							X														
4-AMINO-2,6-DINITROTOLUENE		X									X									X			
4-AMINOBIPHENYL		X									X												
4-BROMOPHENYL PHENYL ETHER		X							X														
4-CHLORO-3-METHYLPHENOL		X							X														
4-CHLOROANILINE		X							X														
4-CHLOROPHENYL PHENYL ETHER		X							X														
4-METHOXYPHENOL		X							X														
4-METHYL-2-PENTANONE			X									X											
4-METHYLCHRYSENE		X														X							
4-METHYLPHENOL		X							X														
4-NITROANILINE		X									X												
4-NITROPHENOL		X							X														
ACENAPHTHENE		X														X							
ACENAPHTHYLENE		X														X							
ACETONE			X									X											
ACETONITRILE			X									X											

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	High Level Group				Detailed Category											Select Federal Facility Category						
Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
ACETOPHENONE		X									X												
ACROLEIN			X									X											
ACRYLAMIDE		X												X									
ACRYLONITRILE			X									X									X		
ACTINIUM-227	X							X														X	
ACTINIUM-228	X							X														X	
ALACHLOR		X												X									
ALDRIN		X												X									
ALLYL CHLORIDE			X				X																
ALPHA GROSS				X						X													X
ALPHA-HEXACHLOROCYCLOHEXANE		X												X									
ALUMINUM	X							X															
ALUMINUM OXIDE	X							X															
AMERICIUM	X							X														X	
AMERICIUM-241	X							X														X	
AMMONIA				X						X													
AMMONIUM HYDROXIDE				X						X													
AMMONIUM NITRATE (SOLUTION)				X						X									X				
AMMONIUM PERCHLORATE				X						X									X				
ANILINE		X									X												
ANTHANTHRENE		X														X							
ANTHRACENE		X														X							
ANTIMONY	X							X															
AROCLOR-1016		X													X								
AROCLOR-1221		X													X								

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Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
AROCLOR-1232		X													X								
AROCLOR-1242		X													X								
AROCLOR-1248		X													X								
AROCLOR-1254		X													X								
AROCLOR-1260		X													X								
ARSENIC	X							X															
ASBESTOS				X						X													
ATRAZINE		X												X									
AZINPHOS-METHYL		X												X									
AZOBENZENE		X									X												
AZULENE		X														X							
BARIUM	X							X															
BARIUM CHLORIDE				X						X													
BENZALDEHYDE			X									X											
BENZENE			X		X																		
BENZIDINE		X									X												
BENZILIC ACID				X						X													
BENZO(A)ANTHRACENE		X														X							
BENZO(A)FLUORANTHENE		X														X							
BENZO(A)PYRENE		X														X							
BENZO(A)PYRENE EQUIVALENTS (BaPEq)		X														X							
BENZO(B)FLUORANTHENE		X														X							
BENZO(E)PYRENE		X														X							
BENZO(GHI)PERYLENE		X														X							
BENZO(J)FLUORANTHENE		X														X							

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Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
BENZO(K)FLUORANTHENE		X														X							
BENZOIC ACID		X									X												
BENZONITRILE			X									X											
BENZOYL CHLORIDE			X				X																
BENZOYL PEROXIDE				X									X										
BENZYL ALCOHOL		X									X												
BENZYL BUTYL PHTHALATE		X									X												
BENZYL CHLORIDE			X				X																
BERYLLIUM	X							X															
BETA GROSS				X						X													X
BETA-HEXACHLOROCYCLOHEXANE		X												X									
BICARBONATE				X						X													
BICYCLOHEPTADIENE				X									X										
BIPHENYL			X				X																
BIS(2-CHLOROETHOXY) METHANE		X							X														
BIS(2-CHLOROETHYL) ETHER		X							X														
BIS(2-CHLOROISOPROPYL) ETHER		X							X														
BIS(2-ETHYLHEXYL) ADIPATE				X									X										
BIS(2-ETHYLHEXYL)PHTHALATE		X									X												
BIS(CHLOROMETHYL) ETHER			X				X																
BISMUTH	X							X															
BISMUTH TEILLURIDE				X						X													
BORON	X							X															
BORON OXIDE				X						X													
BROMACIL		X												X									

Appendix D

Individual Contaminants and Assigned Contaminant Groups

	High Level Group				Detailed Category											Select Federal Facility Category						
Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
BROMINE				X						X													
BROMOCHLOROMETHANE			X				X																
BROMOFORM			X				X																
BUTYL ETHER (N-)			X									X											
BUTYLATE		X												X									
C.I. ACID GREEN 3				X									X										
C11-C22 AROMATICS		X											X										
C13-C18 ALIPHATICS		X											X										
C19-C36 ALIPHATICS		X											X										
C5-C8 ALIPHATICS		X											X										
C9-C10 AROMATICS		X											X										
C9-C12 ALIPHATICS		X											X										
C9-C18 ALIPHATICS		X											X										
CADMIUM	X							X															
CALCIUM	X							X															
CALCIUM CARBONATE				X						X									X				
CALCIUM OXIDE				X						X													
CAMPHOR				X									X										
CAPROLACTAM				X									X										
CARBARYL		X												X									
CARBAZOLE		X									X												
CARBOFURAN		X												X									
CARBON DISULFIDE			X									X											
CARBON TETRACHLORIDE			X				X																
CARBON-14				X						X													X

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Individual Contaminants and Assigned Contaminant Groups

	High Level Group				Detailed Category											Select Federal Facility Category						
Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
CARBOPHENOTHION		X												X									
CESIUM	X							X															
CESIUM-134	X							X														X	
CESIUM-137	X							X														X	
CHEMICAL AGENT (UNSPECIFIED)				X									X					X					
CHLORDANE		X												X									
CHLORDECONE		X												X									
CHLORENDIC ACID				X									X										
CHLORIDE				X						X													
CHLORINE				X						X													
CHLOROACETIC ACID		X												X									
CHLOROBENZENE			X				X																
CHLOROBENZILATE		X												X									
CHLOROBENZOIC ACID		X												X									
CHLOROETHANE			X				X																
CHLOROFORM			X				X																
CHLOROPHENOXY HERBICIDES		X												X									
CHLOROPICRIN		X												X									
CHLORPYRIFOS		X												X									
CHROMIC ACID				X						X													
CHROMIC SULFATE				X						X													
CHROMIUM	X							X															
CHROMIUM (HEXAVALENT)	X							X															
CHROMIUM CHLORIDE (3)				X						X													
CHRYSENE		X														X							

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Individual Contaminants and Assigned Contaminant Groups

	High Level Group				Detailed Category											Select Federal Facility Category						
Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
CIS-1,2-DICHLOROETHENE			X				X																
CIS-1,3,-DICHLOROPROPENE			X				X																
COBALT	X							X															
COBALT-57	X							X														X	
COBALT-60	X							X														X	
COPPER	X							X															
COUMAPHOS		X												X									
CREOSOTE		X														X							
CRESOL (MIXED ISOMERS)		X									X												
CRYSTAL VIOLET				X									X										
CURIUM	X							X														X	
CURIUM-244	X							X														X	
CYANIDE				X						X													
CYCLOHEXANE			X									X											
CYCLOHEXANOL			X									X											
CYCLOHEXANONE			X									X											
DDD (DICHLORODIPHENYLDICHLOROETHANE)		X												X									
DDE (DICHLORODIPHENYLDICHLOROETHYLENE)		X												X									
DDT (DICHLORODIPHENYLTRICHLOROETHANE)		X												X									
DDT AND METABOLITES		X												X									
DDTr		X												X									
DELTA-HEXACHLOROCYCLOHEXANE		X												X									
DIAMINOTOLUENE (MIXED ISOMERS)		X									X												
DIAZINON		X												X									
DIBENZ(A,H)ACRIDINE		X														X							

Individual Contaminants and Assigned Contaminant Groups

	High Level Group				Detailed Category												Select Federal Facility Category						
Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
DIBENZ(A,J)ANTHRACENE		X														X							
DIBENZO(A,E)PYRENE		X														X							
DIBENZO(A,H)ANTHRACENE		X														X							
DIBENZO(A,H)PYRENE		X														X							
DIBENZOFURAN		X									X												
DIBROMOCHLOROMETHANE			X				X																
DIBROMOCHLOROPROPANE		X												X									
DIBROMODIFLUOROMETHANE			X				X																
DIBROMOMETHANE			X				X																
DIBUTYL PHTHALATE		X									X												
DICAMBA		X												X									
DICHLOBENIL		X												X									
DICHLOROBENZENE (MIXED ISOMERS)			X				X																
DICHLOROBROMOMETHANE			X				X																
DICHLORODIFLUOROMETHANE			X				X																
DICHLOROPROPANE			X				X																
DICHLORPROP		X												X									
DICOFOL		X												X									
DICYCLOPENTADIENE		X									X												
DIELDRIN		X												X									
DIESEL FUEL		X											X										
DIESEL RANGE ORGANICS (DRO)		X											X										
DIETHYL BENZENE		X									X												
DIETHYL PHTHALATE		X									X												
DIETHYLENE GLYCOL				X									X										

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Individual Contaminants and Assigned Contaminant Groups

	High Level Group				Detailed Category											Select Federal Facility Category						
Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
DIMETHOATE		X												X									
DIMETHOXYMETHANE			X									X											
DIMETHYL ETHYL BENZENE			X									X											
DIMETHYL PHTHALATE		X									X												
DIMETHYL SULFIDE				X									X										
DIMETHYLFORMAMIDE		X												X									
DIMETHYLMERCURY			X									X											
DIMETHYLPHENOL		X									X												
DINITROTOLUENE (MIXED ISOMERS)		X									X									X			
DI-N-OCTYL PHTHALATE		X									X												
DINOSEB		X												X									
DIOXINS/FURANS (AS TEQ)		X				X																	
DIPHENAMIDE		X												X									
DIPHENYLAMINE		X									X									X			
DIPHENYLAMINECHLOROARSINE				X									X					X					
DISULFOTON		X												X									
DIURON		X												X									
ENDOSULFAN		X												X									
ENDOSULFAN I		X												X									
ENDOSULFAN II		X												X									
ENDOSULFAN SULFATE		X												X									
ENDRIN		X												X									
ENDRIN ALDEHYDE		X												X									
ENDRIN KETONE		X												X									
EPN		X												X									

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Individual Contaminants and Assigned Contaminant Groups

	High Level Group				Detailed Category											Select Federal Facility Category						
Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
EPTC		X												X									
ETHANE			X									X											
ETHANOL			X									X											
ETHION		X												X									
ETHOPROPHOS		X												X									
ETHYL ACETATE			X									X											
ETHYL ACRYLATE			X									X											
ETHYL CHLOROFORMATE			X				X																
ETHYL ETHER			X									X											
ETHYL MERCAPTAN			X									X											
ETHYL METHYL BENZENE			X		X																		
ETHYL TOLUENE			X		X																		
ETHYLBENZENE			X		X																		
ETHYLENE DIBROMIDE			X				X																
ETHYLENE GLYCOL		X									X												
EUROPIUM-152	X							X														X	
EUROPIUM-154	X							X														X	
EUROPIUM-155	X							X														X	
FENSULFOTHION		X												X									
FLUORANTHENE		X														X							
FLUORENE		X														X							
FLUORIDE				X						X													
FLUORINE				X						X													
FLUOROACETIC ACID		X												X									
FONOFOS		X												X									

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Individual Contaminants and Assigned Contaminant Groups

	High Level Group				Detailed Category											Select Federal Facility Category						
Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
FORMALDEHYDE			X									X											
FORMIC ACID			X									X											
FORMOTHION		X												X									
FREON-112			X				X																
FURAN		X				X																	
GAMMA RADIOACTIVITY EMITTERS				X						X													X
GASOLINE		X											X										
HALOGENATED VOCS			X				X																
HEPTACHLOR		X												X									
HEPTACHLOR EPOXIDE		X												X									
HEPTACHLORODIBENZO-p-DIOXINS (HpCDD)		X				X																	
HEPTANE			X									X											
HEXACHLOROBENZENE		X												X									
HEXACHLOROBUTADIENE		X							X														
HEXACHLOROCYCLOPENTADIENE		X												X									
HEXACHLORODIBENZODIOXIN		X				X																	
HEXACHLOROETHANE		X							X											X			
HEXANE			X									X											
HIGH MOLECULAR WEIGHT PAHS		X														X							
HMX		X									X									X			
HYDRAZINE				X						X									X				
HYDROCARBONS				X									X										
HYDROCHLORIC ACID				X						X													
HYDROGEN				X						X									X				
HYDROGEN CYANIDE				X						X													

Individual Contaminants and Assigned Contaminant Groups

	High Level Group				Detailed Category											Select Federal Facility Category						
Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
HYDROGEN SULFIDE				X						X									X				
INDENE		X														X							
INDENO(1,2,3-CD)PYRENE		X														X							
INDIUM	X							X															
INORGANICS				X						X													
IODINE				X						X													
IODINE-129				X						X													X
IRON	X							X															
ISODRIN		X												X									
ISOPHORONE		X									X												
ISOPROPENE				X									X										
ISOPROPYL ALCOHOL			X									X											
ISOPROPYL BENZENE			X									X											
ISOPROPYL ETHER			X									X											
KEPONE		X												X									
KEROSENE		X											X										
LEAD	X							X															
LEAD ACETATE			X									X											
LEAD-210	X							X														X	
LEAD-212	X							X														X	
LEWISITE	X							X									X						
LINDANE		X												X									
LINURON		X												X									
LITHIUM	X							X															
LOW MOLECULAR WEIGHT PAHS		X														X							

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Individual Contaminants and Assigned Contaminant Groups

	High Level Group				Detailed Category											Select Federal Facility Category						
Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
M,P-XYLENE			X		X																		
MAGNESIUM	X							X															
MALATHION		X												X									
MALEIC ACID				X									X										
MALONONITRILE			X									X											
MANGANESE	X							X															
MANGANESE-54	X							X														X	
MCPA; 2-METHYL-4-CHLOROPHENOXYACETIC ACID		X												X									
MECOPROP		X												X									
MERCURY	X							X															
METALS	X							X															
METHANE			X									X											
METHANOL			X									X											
METHIOCARB		X												X									
METHOXYCHLOR		X												X									
METHYL ACETATE			X									X											
METHYL ACRYLATE			X									X											
METHYL BROMIDE			X				X																
METHYL CHLORIDE			X				X																
METHYL ETHYL KETONE			X									X											
METHYL ISOBUTYL KETONE			X									X											
METHYL MERCAPTAN			X									X											
METHYL MERCURY	X							X															
METHYL METHACRYLATE			X									X											
METHYL PARATHION		X												X									

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Individual Contaminants and Assigned Contaminant Groups

	High Level Group				Detailed Category											Select Federal Facility Category						
Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
METHYL TERT-BUTYL ETHER			X									X											
METHYLCYCLOHEXANE			X									X											
METHYLCYCLOHEXANOL (ALL ISOMERS)			X									X											
METHYLENE CHLORIDE			X				X																
METHYLMERCURIC DICYANAMIDE		X												X									
METHYLNAPHTHALENE		X														X							
METHYLPHENOLS (TOTAL)		X							X														
METHYLPHOSPHONIC ACID				X									X										
METHYLPROPYLBENZENE		X									X												
MEVINPHOS		X												X									
MIREX		X												X									
MOLINATE		X												X									
MOLYBDENUM	X							X															
MONOCROTOPHOS		X												X									
MONURON		X												X									
MUSTARD GAS			X				X											X					
N,N-DIMETHYLANILINE		X									X												
NAPHTHALENE		X														X							
NAPHTHENIC ACID				X									X										
N-BUTYL ACETATE			X									X											
N-BUTYL ALCOHOL			X									X											
N-BUTYL BENZENE			X									X									X		
NEODYMIUM	X							X															
NEPTUNIUM	X							X														X	
NEPTUNIUM-237	X							X														X	

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Individual Contaminants and Assigned Contaminant Groups

	High Level Group				Detailed Category											Select Federal Facility Category						
Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
NICKEL	X							X															
NITRATE				X						X													
NITRATE/NITRITE				X						X													
NITRITE				X						X													
NITROAROMATICS		X									X									X			
NITROBENZENE		X									X									X			
NITROGEN				X						X													
NITROGLYCERIN		X									X									X			
NITROSODIMETHYLAMINE		X									X												
NITROTOLUENES		X									X									X			
N-NITROSODIETHANOLAMINE		X									X												
N-NITROSODIETHYLAMINE		X									X												
N-NITROSODI-N-BUTYLAMINE		X									X												
N-NITROSODI-N-PROPYLAMINE		X									X												
N-NITROSODIPHENYLAMINE		X									X												
N-NITROSOPYRROLIDINE		X									X												
NONANE		X									X												
N-PROPYL BENZENE		X									X												
OCTACHLORODIBENZOFURAN (OCDF)		X				X																	
OCTACHLORODIBENZO-p-DIOXIN (OCDD)		X				X																	
OCTANE			X									X											
ORGANICS				X									X										
ORTHO-DINITROBENZENE		X									X									X			
O-TOLUIDINE		X									X												
OXAMYL		X												X									

Individual Contaminants and Assigned Contaminant Groups

	High Level Group				Detailed Category												Select Federal Facility Category						
Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
O-XYLENE			X		X																		
PARATHION		X												X									
PEBULATE		X												X									
PENTACHLOROBENZENE		X							X														
PENTACHLORODIBENZOFURAN (PeCDF)		X				X																	
PENTACHLORODIBENZO-p-DIOXIN (PeCDD)		X				X																	
PENTACHLOROETHANE			X				X																
PENTACHLORONITROBENZENE		X							X														
PENTACHLOROPHENOL		X												X									
PENTANE			X									X											
PERCHLORATE				X						X									X				
PERFLUOROOCTANE SULFONIC ACID (PFOS)		X											X										
PERFLUOROOCTANOIC ACID (PFOA)		X											X										
PESTICIDES		X												X									
PHENACETIN		X									X												
PHENANTHRENE		X														X							
PHENOL		X							X														
PHENOTHIAZINE				X									X										
PHORATE		X												X									
PHOSGENE				X						X									X				
PHOSPHORIC ACID				X						X													
PHOSPHOROTHIOIC ACID, 0,0-DIMETHYL-5-(2-(METHYLTHIO)ETHYL ESTER		X												X									
PHOSPHORUS				X						X									X				
PHOTOMIREX		X												X									
PHTHALIC ANHYDRIDE		X									X									X			

Appendix D

Individual Contaminants and Assigned Contaminant Groups

	High Level Group				Detailed Category											Select Federal Facility Category						
Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
PICRIC ACID		X									X									X			
P-ISOPROPYLTOLUENE		X									X												
PLATINUM	X							X															
PLUTONIUM	X							X														X	
PLUTONIUM-238	X							X														X	
PLUTONIUM-239	X							X														X	
PLUTONIUM-239/240	X							X														X	
PLUTONIUM-240	X							X														X	
PLUTONIUM-241	X							X														X	
PLUTONIUM-242	X							X														X	
PLUTONIUM-244	X							X														X	
P-NITROSODIPHENYLAMINE		X									X												
POLONIUM-210	X							X														X	
POLYBROMINATED BIPHENYLS (PBB)				X									X										
POLYCHLORINATED BIPHENYLS (PCBS)		X													X								
POLYCHLORINATED TERPHENYLS		X													X								
POLYCYCLIC AROMATICS HYDROCARBONS (PAHS)		X														X							
POTASSIUM	X							X															
POTASSIUM CYANIDE				X						X													
POTASSIUM HYDROXIDE				X						X													
POTASSIUM NITRATE	X							X											X				
POTASSIUM PERMANGANATE				X						X													
POTASSIUM-40	X							X														X	
PROMETHIUM-147	X							X														X	
PROMETON		X												X									

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Individual Contaminants and Assigned Contaminant Groups

	High Level Group				Detailed Category											Select Federal Facility Category						
Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
PROMETRYN		X												X									
PROPENYL BENZENE				X									X										
PROPYLENE			X									X											
PROPYLENE GLYCOL		X												X									
PROPYLENE OXIDE			X									X											
PYRENE		X														X							
PYRIDINE		X									X												
QUINOLINE		X									X												
RADIONUCLIDES (NOT SPECIFIED)	X							X														X	
RADIUM	X							X														X	
RADIUM-224	X							X														X	
RADIUM-226	X							X														X	
RADIUM-228	X							X														X	
RADIUM-288	X							X														X	
RADON				X						X													X
RADON-222				X						X													X
RDX		X									X									X			
RESIDUAL RANGE ORGANICS (RRO)		X											X										
RESORCINOL		X									X									X			
RONNELL		X												X									
RUTHENIUM-106	X							X														X	
SARIN			X				X											X					
SEC-BUTYL BENZENE			X									X											
SELENIUM	X							X															
SILICA				X						X													

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Individual Contaminants and Assigned Contaminant Groups

	High Level Group				Detailed Category											Select Federal Facility Category						
Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
SILICON	X							X															
SILICONE				X						X													
SILVER	X							X															
SIMAZINE		X												X									
SODIUM	X							X															
SODIUM CYANIDE				X						X													
SODIUM HYDROXIDE				X						X													
SODIUM NITRATE				X						X									X				
SODIUM NITRITE				X						X													
SODIUM-22	X							X														X	
STODDARD SOLVENT			X									X											
STRONTIUM	X							X															
STRONTIUM-90	X							X														X	
STYRENE			X									X											
SULFATE				X						X													
SULFIDE			X									X											
SULFOTEP		X												X									
SULFUR				X						X													
SULFUR DIOXIDE				X						X									X				
SULFURIC ACID				X						X									X				
TANTALUM	X							X															
TECHNETIUM-99	X							X														X	
TEREPHTHALIC ACID				X									X										
TERT-BUTYL ALCOHOL			X									X											
TERT-BUTYLBENZENE		X									X												

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Individual Contaminants and Assigned Contaminant Groups

	High Level Group				Detailed Category											Select Federal Facility Category						
Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
TETRACHLORODIBENZOFURAN (TCDF)		X				X																	
TETRACHLORODIBENZO-p-DIOXINS (TCDD)		X				X																	
TETRACHLOROETHANE			X				X																
TETRACHLOROETHENE			X				X																
TETRAHYDROFURAN			X									X											
TETRYL		X									X									X			
THALLIUM	X							X															
THALLIUM CHLORIDE				X						X													
THALLIUM(I) CARBONATE				X						X													
THORIUM	X							X														X	
THORIUM-228	X							X														X	
THORIUM-230	X							X														X	
THORIUM-232	X							X														X	
THORIUM-234	X							X														X	
TIN	X							X															
TITANIUM DIOXIDE				X						X													
TITANIUM METAL POWDER	X							X															
TOLUENE			X		X																		
TOLUENE DIISOCYANATE (MIXED ISOMERS)		X									X												
TOTAL PAHs		X														X							
TOTAL PETROLEUM HYDROCARBON -DIESEL		X											X										
TOTAL PETROLEUM HYDROCARBON -GASOLINE		X											X										
TOTAL PETROLEUM HYDROCARBONS		X											X										
TOXAPHENE		X												X									
TRANS-1,2-DICHLOROETHENE			X				X																

Individual Contaminants and Assigned Contaminant Groups

Contaminant	High Level Group				Detailed Category											Select Federal Facility Category						
	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
TRANS-1,3-DICHLOROPROPENE			X				X																
TRANS-NONACHLOR		X												X									
TRIBUTYL PHOSPHATE		X									X												
TRIBUTYLTIN BENZOATE				X									X										
TRIBUTYLTIN CHLORIDE				X									X										
TRIBUTYLTIN ION				X									X										
TRICHLOROETHANE			X				X																
TRICHLOROETHENE			X				X																
TRICHLOROFLUOROMETHANE			X				X																
TRICHLOROPHENOLS		X							X														
TRIETHANOLAMINE			X									X											
TRIHALOMETHANES			X				X																
TRIMELLITIC ANHYDRIDE				X									X										
TRIMETHYLBENZENE		X									X												
TRINITROBENZENE		X									X									X			
TRIPHENYL PHOSPHATE				X									X										
TRIS(2,3-DIBROMOPROPYL) PHOSPHATE		X							X														
TRITIUM				X						X													X
TUNGSTEN METAL	X							X															
UNEXPLODED ORDNANCE (UXO)				X						X									X				
URANIUM	X							X														X	
URANIUM-233	X							X														X	
URANIUM-234	X							X														X	
URANIUM-234/235/238	X							X														X	
URANIUM-235	X							X														X	

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Individual Contaminants and Assigned Contaminant Groups

	High Level Group				Detailed Category											Select Federal Facility Category						
Contaminant	Metals	SVOC	VOC	Other	Benzene-toluene ethylbenzene xylene (BTEX)	Dioxins and furans	Halogenated VOCs	Metals and metalloids	Other halogenated SVOCs	Other Inorganics	Other nonhalogenated SVOCs	Other nonhalogenated VOCs	Other Organics	Pesticides and herbicides	Polychlorinated biphenyls (PCBs)	Polycyclic aromatic hydrocarbons (PAHs)	Chemical and biological warfare agents (metal)	Chemical and biological warfare agents (non-metal)	Munitions Constituents (metal/inorganic)	Munitions Constituents (SVOC)	Munitions Constituents (VOC)	Radioactive materials (metal)	Radioactive materials (non-metal)
URANIUM-238	X							X														X	
VANADIUM	X							X															
VANADIUM PENTOXIDE				X						X													
VERNOLATE		X												X									
VINYL ACETATE			X									X											
VINYL CHLORIDE			X				X																
VINYLIDINE CHLORIDE			X				X																
VX				X									X					X					
WHITE PHOSPHORUS				X						X									X				
XYLENE			X		X																		
ZINC	X							X															
ZINC AMMONIUM CHLORIDE				X						X													
ZIRCONIUM (METAL)	X							X															

APPENDIX E

SOURCE REMEDIES SELECTED IN DECISION DOCUMENTS FROM FY 2012-2014

Appendix E

Source Remedies Selected in Decision Documents from FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
IN SITU TREATMENT						
Bioremediation						
2014	GMH ELECTRONICS	01	ROD	04	NC	NCN000410161
2013	HAMILTON/LABREE ROADS GW CONTAMINATION	01	ROD	10	WA	WASFN1002174
2014	MATTIACE PETROCHEMICAL CO., INC.	01	ROD Amendment	02	NY	NYD000512459
2014	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	06	ROD	09	CA	CA4570024337
2013	NIAGARA MOHAWK POWER CORP. (SARATOGA SPRINGS PLANT)	02	ROD	02	NY	NYD980664361
2012	PADUCAH GASEOUS DIFFUSION PLANT (USDOE)	19	ROD	04	KY	KY8890008982
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	09	CA	CA1170090087
Cap (Amended, In Situ)						
2013	CONCORD NAVAL WEAPONS STATION	02	ROD	09	CA	CA7170024528
2013	GOWANUS CANAL	01	ROD	02	NY	NYN000206222
2014	OLIN CORP. (MCINTOSH PLANT)	02	ROD	04	AL	ALD008188708
Chemical Treatment						
2013	10TH STREET SITE	02	ROD Amendment	07	NE	NED981713837
2014	ABERDEEN PROVING GROUND (EDGEWOOD AREA)	29	ROD	03	MD	MD2210020036
2013	ELLIS PROPERTY	01	ROD Amendment	02	NJ	NJD980529085
2014	GMH ELECTRONICS	01	ROD	04	NC	NCN000410161
2014	HANFORD 300-AREA (USDOE)	04	ROD	10	WA	WA2890090077
2012	KOPPERS CO., INC. (MORRISVILLE PLANT)	01	ESD	04	NC	NCD003200383
2014	OLEAN WELL FIELD	02	ROD Amendment	02	NY	NYD980528657
2013	PEERLESS PLATING CO.	01	ROD Amendment	05	MI	MID006031348
2014	SANGAMO ELECTRIC DUMP/CRAB ORCHARD NATIONAL WILDLIFE REFUGE (USDOI)	02	ROD Amendment	05	IL	IL8143609487
2014	TINKER AIR FORCE BASE (SOLDIER CREEK/BUILDING 3001)	01	ROD	06	OK	OK1571724391
2012	US NASA MARSHALL SPACE FLIGHT CENTER	03	ROD	04	AL	AL1800013863
2012	VELSICOL CHEMICAL CORP. (MICHIGAN)	01	ROD	05	MI	MID000722439

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Source Remedies Selected in Decision Documents from FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
Fracturing						
2012	US NASA MARSHALL SPACE FLIGHT CENTER	03	ROD	04	AL	AL1800013863
Multi phase Extraction						
2013	JACKSON PARK HOUSING COMPLEX (USNAVY)	01	ROD Amendment	10	WA	WA3170090044
Phytoremediation						
2014	NATIONAL FIREWORKS	02	ROD	04	TN	TNSFN0407047
Soil Amendments						
2013	ANACONDA CO. SMELTER	16	ROD Amendment	08	MT	MTD093291656
2014	GILT EDGE MINE	01	ESD	08	SD	SDD987673985
Soil Vapor Extraction						
2012	AMERICAN CYANAMID CO	04	ROD	02	NJ	NJD002173276
2013	BANDERA ROAD GROUND WATER PLUME	01	ROD	06	TX	TXN000606565
2014	CIDRA GROUNDWATER CONTAMINATION	01	ROD	02	PR	PRN000204538
2014	GMH ELECTRONICS	01	ROD	04	NC	NCN000410161
2014	MAYWOOD CHEMICAL CO.	01	ROD	02	NJ	NJD980529762
2013	NORTH SANITARY LANDFILL	01	ROD	05	OH	OHD980611875
2013	OTIS AIR NATIONAL GUARD BASE/CAMP EDWARDS	05	ESD	01	MA	MA2570024487
2013	PEACH ORCHARD RD PCE GROUNDWATER PLUME SITE	01	ROD Amendment	04	GA	GAN000407449
2013	SANFORD DRY CLEANERS	01	ROD	04	FL	FLD032728032
2014	TINKER AIR FORCE BASE (SOLDIER CREEK/BUILDING 3001)	01	ROD	06	OK	OK1571724391
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	09	CA	CA1170090087
2012	VELSICOL CHEMICAL CORP. (HARDEMAN COUNTY)	02	ROD Amendment	04	TN	TND980559033
2013	WHITE SWAN LAUNDRY AND CLEANER INC.	01	ROD	02	NJ	NJSFN0204241
2014	WILLIAMS AIR FORCE BASE	01	ROD Amendment	09	AZ	AZ7570028582
Solidification/Stabilization						
2012	AMERICAN CYANAMID CO	04	ROD	02	NJ	NJD002173276
2012	EAGLE ZINC CO DIV T L DIAMOND	02	ROD	05	IL	ILD980606941
2013	GOWANUS CANAL	01	ROD	02	NY	NYN000206222
2014	LCP CHEMICALS INC.	01	ROD	02	NJ	NJD079303020

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Source Remedies Selected in Decision Documents from FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2013	NIAGARA MOHAWK POWER CORP. (SARATOGA SPRINGS PLANT)	02	ROD	02	NY	NYD980664361
2013	ORLANDO GASIFICATION PLANT	01	ROD	04	FL	FLD984169235
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	09	CA	CA1170090087
Thermal Treatment						
2014	CIDRA GROUNDWATER CONTAMINATION	01	ROD	02	PR	PRN000204538
2012	CLEBURN STREET WELL	02	ROD Amendment	07	NE	NED981499312
2012	DIAZ CHEMICAL	02	ROD	02	NY	NYD067532580
2013	HAMILTON/LABREE ROADS GW CONTAMINATION	01	ROD	10	WA	WASFN1002174
2013	JACKSON PARK HOUSING COMPLEX (USNAVY)	01	ROD Amendment	10	WA	WA3170090044
2014	MATTIACE PETROCHEMICAL CO., INC.	01	ROD Amendment	02	NY	NYD000512459
2012	SOUTHEAST ROCKFORD GROUND WATER CONTAMINATION	03	ESD	05	IL	ILD981000417
2012	SPECTRON, INC.	01	ROD Amendment	03	MD	MDD000218008
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	09	CA	CA1170090087
2013	WILLIAMS AIR FORCE BASE	02	ROD Amendment	09	AZ	AZ7570028582
EX SITU TREATMENT						
Bioremediation						
2014	LORING AIR FORCE BASE	08	ESD	01	ME	ME9570024522
Chemical Treatment						
2014	ABERDEEN PROVING GROUND (EDGEWOOD AREA)	29	ROD	03	MD	MD2210020036
2013	HAMILTON/LABREE ROADS GW CONTAMINATION	01	ROD	10	WA	WASFN1002174
2013	OKLAHOMA REFINING CO.	02	ROD	06	OK	OKD091598870
Constructed Treatment Wetland						
2014	LOWER DARBY CREEK AREA	01	ROD	03	PA	PASFN0305521
Physical Separation						
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387
2014	ALLEGANY BALLISTICS LABORATORY (USNAVY)	04	ROD	03	WV	WV0170023691
2013	ANACONDA CO. SMELTER	16	ROD Amendment	08	MT	MTD093291656
2012	BUNKER HILL MINING & METALLURGICAL COMPLEX	03	ROD Amendment	10	ID	IDD048340921

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Source Remedies Selected in Decision Documents from FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2012	CENTREDALE MANOR RESTORATION PROJECT	01	ROD	01	RI	RID981203755
2012	CLEBURN STREET WELL	02	ROD Amendment	07	NE	NED981499312
2012	CROWN CLEANERS OF WATERTOWN INC.	01	ROD	02	NY	NYD986965333
2012	EASTERN MICHAUD FLATS CONTAMINATION	01	ROD Amendment	10	ID	IDD984666610
2012	EDWARDS AIR FORCE BASE	02	ROD Amendment	09	CA	CA1570024504
2014	INDUSTRI-PLEX	02	ESD	01	MA	MAD076580950
2014	LCP CHEMICALS INC.	01	ROD	02	NJ	NJD079303020
2014	MAYWOOD CHEMICAL CO.	01	ROD	02	NJ	NJD980529762
2012	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	05	ROD	09	CA	CA4570024337
2013	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	07	ROD	09	CA	CA4570024337
2012	NEWPORT NAVAL EDUCATION & TRAINING CENTER	07	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	05	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	06	ROD	01	RI	RI6170085470
2014	ONONDAGA LAKE	25	ROD	02	NY	NYD986913580
2013	PORTSMOUTH NAVAL SHIPYARD	04	ROD	01	ME	ME7170022019
2014	RADIATION TECHNOLOGY, INC.	03	ROD	02	NJ	NJD047684451
2012	RIO TINTO COPPER MINE	01	ROD	09	NV	NV3141190030
2014	SHIELDALLOY CORP.	02	ROD	02	NJ	NJD002365930
2013	STAR LAKE CANAL	01	ROD	06	TX	TX0001414341
2014	TEN-MILE DRAIN	01	ROD	05	MI	MIN000510063
2013	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	07	ROD	09	CA	CA1170090087
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	09	CA	CA1170090087
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	10	ROD	09	CA	CA1170090087
Recycling						
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387
2014	ALLEGANY BALLISTICS LABORATORY (USNAVY)	04	ROD	03	WV	WV0170023691
2012	EDWARDS AIR FORCE BASE	02	ROD Amendment	09	CA	CA1570024504

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Source Remedies Selected in Decision Documents from FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2012	EDWARDS AIR FORCE BASE	13	ROD	09	CA	CA1570024504
2012	FORT GEORGE G. MEADE	20	ROD	03	MD	MD9210020567
2013	GOWANUS CANAL	01	ROD	02	NY	NYN000206222
2014	LCP CHEMICALS INC.	01	ROD	02	NJ	NJD079303020
2014	RINGWOOD MINES/LANDFILL	02	ROD	02	NJ	NJD980529739
2014	SOUTH CAVALCADE STREET	01	ROD Amendment	06	TX	TXD980810386
2014	TRAVIS AIR FORCE BASE	06	ROD	09	CA	CA5570024575
2013	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	07	ROD	09	CA	CA1170090087
2013	WILLIAMS AIR FORCE BASE	02	ROD Amendment	09	AZ	AZ7570028582
Soil Vapor Extraction						
2013	GARVEY ELEVATOR	01	ROD	07	NE	NEN000704351
Solidification/Stabilization						
2014	BANGOR NAVAL SUBMARINE BASE	09	ROD	10	WA	WA5170027291
2013	GOWANUS CANAL	01	ROD	02	NY	NYN000206222
2012	SOLVENT SAVERS	01	ESD	02	NY	NYD980421176
2014	TEN-MILE DRAIN	01	ROD	05	MI	MIN000510063
2012	WPSC STEVENS POINT	01	ROD	05	WI	WIN000509983
Source Pump and Treat						
2012	BUNKER HILL MINING & METALLURGICAL COMPLEX	03	ROD Amendment	10	ID	IDD048340921
2013	NORTH SANITARY LANDFILL	01	ROD	05	OH	OHD980611875
2012	RIO TINTO COPPER MINE	01	ROD	09	NV	NV3141190030
Thermal Treatment						
2012	ANDERSEN AIR FORCE BASE	01	ROD	09	GU	GU6571999519
2012	CENTREDALE MANOR RESTORATION PROJECT	01	ROD	01	RI	RID981203755
2013	GOWANUS CANAL	01	ROD	02	NY	NYN000206222
2012	VELSICOL CHEMICAL CORP. (MICHIGAN)	01	ROD	05	MI	MID000722439
Unspecified Off site Treatment						
2014	ANDERSEN AIR FORCE BASE	01	ROD	09	GU	GU6571999519
2012	CROWN CLEANERS OF WATERTOWN INC.	01	ROD	02	NY	NYD986965333

Source Remedies Selected in Decision Documents from FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2014	DAVISVILLE NAVAL CONSTRUCTION BATTALION CENTER	09	ROD	01	RI	RI6170022036
2014	FORT GEORGE G. MEADE	18	ROD	03	MD	MD9210020567
2014	HANFORD 100-AREA (USDOE)	35	ROD	10	WA	WA3890090076
2012	SPECTRON, INC.	02	ROD	03	MD	MDD000218008
2014	TRAVIS AIR FORCE BASE	06	ROD	09	CA	CA5570024575
Unspecified On site Treatment						
2012	ANDERSEN AIR FORCE BASE	01 (Action ID 023)	ROD	09	GU	GU6571999519
2012	ANDERSEN AIR FORCE BASE	01 (Action ID 025)	ROD	09	GU	GU6571999519
2012	ANDERSEN AIR FORCE BASE	01 (Action ID 026)	ROD	09	GU	GU6571999519
2014	HANFORD 300-AREA (USDOE)	04	ROD	10	WA	WA2890090077
2012	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	05	ROD	09	CA	CA4570024337
2014	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	06	ROD	09	CA	CA4570024337
CONTAINMENT/DISPOSAL						
Drainage/Erosion Control						
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387
2012	ACE SERVICES	01	ESD	07	KS	KSD046746731
2014	ALAMEDA NAVAL AIR STATION	08	ROD	09	CA	CA2170023236
2012	ALCOA PROPERTIES	01	ROD	05	IL	ILSFN0508010
2014	ALLEGANY BALLISTICS LABORATORY (USNAVY)	04	ROD	03	WV	WV0170023691
2013	ANACONDA CO. SMELTER	16	ROD Amendment	08	MT	MTD093291656
2012	BUNKER HILL MINING & METALLURGICAL COMPLEX	03	ROD Amendment	10	ID	IDD048340921
2013	CALLAHAN MINING CORP	01	ESD	01	ME	MED980524128
2013	CAMP LEJEUNE MILITARY RES. (USNAVY)	15	ROD	04	NC	NC6170022580
2012	EAGLE ZINC CO DIV T L DIAMOND	02	ROD	05	IL	ILD980606941

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Source Remedies Selected in Decision Documents from FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2012	EASTERN MICHAUD FLATS CONTAMINATION	01	ROD Amendment	10	ID	IDD984666610
2012	EDWARDS AIR FORCE BASE	02	ROD Amendment	09	CA	CA1570024504
2012	EDWARDS AIR FORCE BASE	13	ROD	09	CA	CA1570024504
2012	FLAT CREEK IMM	01	ROD	08	MT	MT0012694970
2013	GOWANUS CANAL	01	ROD	02	NY	NYN000206222
2014	HANFORD 100-AREA (USDOE)	35	ROD	10	WA	WA3890090076
2014	HANFORD 300-AREA (USDOE)	04	ROD	10	WA	WA2890090077
2014	HEGELER ZINC	03	ROD	05	IL	ILN000508134
2012	MADISON COUNTY MINES	05	ROD	07	MO	MOD098633415
2014	MADISON COUNTY MINES	03	ROD	07	MO	MOD098633415
2012	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	05	ROD	09	CA	CA4570024337
2013	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	07	ROD	09	CA	CA4570024337
2013	NORTH SANITARY LANDFILL	01	ROD	05	OH	OHD980611875
2013	ORONOGO-DUENWEG MINING BELT	01	ROD Amendment	07	MO	MOD980686281
2012	PADUCAH GASEOUS DIFFUSION PLANT (USDOE)	19	ROD	04	KY	KY8890008982
2012	PICATINNY ARSENAL (USARMY)	15	ROD	02	NJ	NJ3210020704
2014	RINGWOOD MINES/LANDFILL	02	ROD	02	NJ	NJD980529739
2012	RIO TINTO COPPER MINE	01	ROD	09	NV	NV3141190030
2014	SHARON STEEL CORP (FARRELL WORKS DISPOSAL AREA)	02	ROD	03	PA	PAD001933175
2012	SOUTHWEST JEFFERSON COUNTY MINING	01	ROD	07	MO	MON000705443
2012	SOUTHWEST JEFFERSON COUNTY MINING	02	ROD	07	MO	MON000705443
2012	SOUTHWEST JEFFERSON COUNTY MINING	03	ROD	07	MO	MON000705443
2014	TEN-MILE DRAIN	01	ROD	05	MI	MIN000510063
2013	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	07	ROD	09	CA	CA1170090087
Off site Disposal						
2013	10TH STREET SITE	02	ROD Amendment	07	NE	NED981713837
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387

Source Remedies Selected in Decision Documents from FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2012	ABERDEEN PROVING GROUND (EDGEWOOD AREA)	37	ROD	03	MD	MD2210020036
2014	ABERDEEN PROVING GROUND (EDGEWOOD AREA)	29	ROD	03	MD	MD2210020036
2014	ALLEGANY BALLISTICS LABORATORY (USNAVY)	04	ROD	03	WV	WV0170023691
2012	ANDERSEN AIR FORCE BASE	01	ROD	09	GU	GU6571999519
2012	ANDERSEN AIR FORCE BASE	01	ROD	09	GU	GU6571999519
2014	ANDERSEN AIR FORCE BASE	01	ROD	09	GU	GU6571999519
2014	BANGOR NAVAL SUBMARINE BASE	09	ROD	10	WA	WA5170027291
2012	CENTREDALE MANOR RESTORATION PROJECT	01	ROD	01	RI	RID981203755
2013	CHEM-FAB	01	ROD	03	PA	PAD002323848
2014	CIDRA GROUNDWATER CONTAMINATION	01	ROD	02	PR	PRN000204538
2013	CONCORD NAVAL WEAPONS STATION	04	ROD	09	CA	CA7170024528
2012	CROWN CLEANERS OF WATERTOWN INC.	01	ROD	02	NY	NYD986965333
2014	DAVISVILLE NAVAL CONSTRUCTION BATTALION CENTER	09	ROD	01	RI	RI6170022036
2012	DEFENSE GENERAL SUPPLY CENTER (DLA)	13	ROD	03	VA	VA3971520751
2012	DIAZ CHEMICAL	02	ROD	02	NY	NYD067532580
2014	EAGLE PICHER CAREFREE BATTERY	01	ROD	06	NM	NMD001829506
2012	EDWARDS AIR FORCE BASE	02	ROD Amendment	09	CA	CA1570024504
2012	EDWARDS AIR FORCE BASE	13	ROD	09	CA	CA1570024504
2014	FIRST PIEDMONT CORP. ROCK QUARRY (ROUTE 719)	01	ROD Amendment	03	VA	VAD980554984
2012	FORT GEORGE G. MEADE	17	ROD	03	MD	MD9210020567
2012	FORT GEORGE G. MEADE	20	ROD	03	MD	MD9210020567
2014	FORT GEORGE G. MEADE	09	ROD	03	MD	MD9210020567
2014	FORT GEORGE G. MEADE	18	ROD	03	MD	MD9210020567
2014	GMH ELECTRONICS	01	ROD	04	NC	NCN000410161
2013	HAMILTON/LABREE ROADS GW CONTAMINATION	01	ROD	10	WA	WASFN1002174
2014	HANFORD 100-AREA (USDOE)	35	ROD	10	WA	WA3890090076
2014	HANFORD 300-AREA (USDOE)	04	ROD	10	WA	WA2890090077
2014	HILL AIR FORCE BASE	13	ROD	08	UT	UT0571724350
2014	INDIAN HEAD NAVAL SURFACE WARFARE CENTER	24	ROD	03	MD	MD7170024684

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FY	Site Name	OU	Document Type	Region	State	EPA ID
2014	INDUSTRI-PLEX	02	ESD	01	MA	MAD076580950
2013	JJ SEIFERT MACHINE	01	ROD	04	FL	FLN000410232
2012	LANGLEY AIR FORCE BASE/NASA LANGLEY RESEARCH CENTER	28	ROD	03	VA	VA2800005033
2014	LITTLE VALLEY	02	ESD	02	NY	NY0001233634
2013	LOCKHEED WEST SEATTLE	01	ROD	10	WA	WAN001002655
2014	LOWER DARBY CREEK AREA	01	ROD	03	PA	PASFN0305521
2014	MADISON COUNTY MINES	03	ROD	07	MO	MOD098633415
2012	MAYWOOD CHEMICAL CO.	03	ROD	02	NJ	NJD980529762
2014	MAYWOOD CHEMICAL CO.	01	ROD	02	NJ	NJD980529762
2012	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	05	ROD	09	CA	CA4570024337
2012	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	17	ROD	09	CA	CA4570024337
2013	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	07	ROD	09	CA	CA4570024337
2012	NEW LONDON SUBMARINE BASE	04	ROD	01	CT	CTD980906515
2012	NEWPORT NAVAL EDUCATION & TRAINING CENTER	03	ESD	01	RI	RI6170085470
2012	NEWPORT NAVAL EDUCATION & TRAINING CENTER	07	ROD	01	RI	RI6170085470
2013	NEWPORT NAVAL EDUCATION & TRAINING CENTER	11	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	05	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	06	ROD	01	RI	RI6170085470
2013	NORTH SANITARY LANDFILL	01	ROD	05	OH	OHD980611875
2013	OKLAHOMA REFINING CO.	02	ROD	06	OK	OKD091598870
2012	OLD AMERICAN ZINC PLANT	02	ROD	05	IL	IL0000034355
2014	ONONDAGA LAKE	25	ROD	02	NY	NYD986913580
2013	ORLANDO GASIFICATION PLANT	01	ROD	04	FL	FLD984169235
2013	PEACH ORCHARD RD PCE GROUNDWATER PLUME SITE	01	ROD Amendment	04	GA	GAN000407449
2012	PICATINNY ARSENAL (USARMY)	15	ROD	02	NJ	NJ3210020704
2012	PLATTSBURGH AIR FORCE BASE	20	ROD	02	NY	NY4571924774

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FY	Site Name	OU	Document Type	Region	State	EPA ID
2013	PORTSMOUTH NAVAL SHIPYARD	04	ROD	01	ME	ME7170022019
2013	PORTSMOUTH NAVAL SHIPYARD	05	ROD	01	ME	ME7170022019
2014	RADIATION TECHNOLOGY, INC.	03	ROD	02	NJ	NJD047684451
2013	RARITAN BAY SLAG	01	ROD	02	NJ	NJN000206276
2014	RINGWOOD MINES/LANDFILL	02	ROD	02	NJ	NJD980529739
2012	ROCKY MOUNTAIN ARSENAL (USARMY)	03	ESD	08	CO	CO5210020769
2013	SANFORD DRY CLEANERS	01	ROD	04	FL	FLD032728032
2014	SANGAMO ELECTRIC DUMP/CRAB ORCHARD NATIONAL WILDLIFE REFUGE (USDOI)	02	ROD Amendment	05	IL	IL8143609487
2013	SAVANNA ARMY DEPOT ACTIVITY	10	ROD	05	IL	IL3210020803
2013	SCOVILL INDUSTRIAL LANDFILL	01	ROD	01	CT	CT0002265551
2014	SHIELDALLOY CORP.	02	ROD	02	NJ	NJD002365930
2014	SOUTH CAVALCADE STREET	01	ROD Amendment	06	TX	TXD980810386
2012	SOUTHWEST JEFFERSON COUNTY MINING	01	ROD	07	MO	MON000705443
2012	SOUTHWEST JEFFERSON COUNTY MINING	02	ROD	07	MO	MON000705443
2012	SOUTHWEST JEFFERSON COUNTY MINING	03	ROD	07	MO	MON000705443
2012	SPECTRON, INC.	02	ROD	03	MD	MDD000218008
2013	STAR LAKE CANAL	01	ROD	06	TX	TX0001414341
2014	TEN-MILE DRAIN	01	ROD	05	MI	MIN000510063
2013	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	07	ROD	09	CA	CA1170090087
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	09	CA	CA1170090087
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	10	ROD	09	CA	CA1170090087
2013	U.S. SMELTER AND LEAD REFINERY, INC.	01	ROD	05	IN	IND047030226
2013	US NASA MARSHALL SPACE FLIGHT CENTER	07	ROD	04	AL	AL1800013863
2014	VAN DER HORST USA CORPORATION	01	ROD	06	TX	TXD007357932
2012	VELSICOL CHEMICAL CORP. (MICHIGAN)	01	ROD	05	MI	MID000722439
2013	WHITE SWAN LAUNDRY AND CLEANER INC.	01	ROD	02	NJ	NJSFN0204241
2012	WHITING FIELD NAVAL AIR STATION	27	ROD	04	FL	FL2170023244
2013	WOODBROOK ROAD DUMP	01	ROD	02	NJ	NJSFN0204260

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Source Remedies Selected in Decision Documents from FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2012	WPSC STEVENS POINT	01	ROD	05	WI	WIN000509983
On site Containment						
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387
2012	ACE SERVICES	01	ESD	07	KS	KSD046746731
2014	ALAMEDA NAVAL AIR STATION	03	ROD Amendment	09	CA	CA2170023236
2012	ALCOA PROPERTIES	01	ROD	05	IL	ILSFN0508010
2012	AMERICAN CYANAMID CO	04	ROD	02	NJ	NJD002173276
2013	ANACONDA CO. SMELTER	16	ROD Amendment	08	MT	MTD093291656
2012	ANDERSEN AIR FORCE BASE	01	ROD	09	GU	GU6571999519
2012	ANDERSEN AIR FORCE BASE	01	ROD	09	GU	GU6571999519
2012	ANDERSEN AIR FORCE BASE	01	ROD	09	GU	GU6571999519
2013	BROOK INDUSTRIAL PARK	01	ESD	02	NJ	NJD078251675
2014	BRUNSWICK NAVAL AIR STATION	07	ESD	01	ME	ME8170022018
2012	BUNKER HILL MINING & METALLURGICAL COMPLEX	03	ROD Amendment	10	ID	IDD048340921
2013	CALLAHAN MINING CORP	01	ESD	01	ME	MED980524128
2013	CAMP LEJEUNE MILITARY RES. (USNAVY)	15	ROD	04	NC	NC6170022580
2012	CAPTAIN JACK MILL	01	ESD	08	CO	COD981551427
2012	CENTREDALE MANOR RESTORATION PROJECT	01	ROD	01	RI	RID981203755
2014	CIDRA GROUNDWATER CONTAMINATION	01	ROD	02	PR	PRN000204538
2013	CONCORD NAVAL WEAPONS STATION	02	ROD	09	CA	CA7170024528
2012	COPPER BASIN MINING DISTRICT	03	ROD	04	TN	TN0001890839
2012	CROWN CLEANERS OF WATERTOWN INC.	01	ROD	02	NY	NYD986965333
2014	DAVISVILLE NAVAL CONSTRUCTION BATTALION CENTER	09	ROD	01	RI	RI6170022036
2012	DIAZ CHEMICAL	02	ROD	02	NY	NYD067532580
2012	EAGLE ZINC CO DIV T L DIAMOND	02	ROD	05	IL	ILD980606941
2012	EASTERN MICHAUD FLATS CONTAMINATION	01	ROD Amendment	10	ID	IDD984666610
2012	EDWARDS AIR FORCE BASE	02	ROD Amendment	09	CA	CA1570024504
2012	EDWARDS AIR FORCE BASE	13	ROD	09	CA	CA1570024504
2012	FLAT CREEK IMM	01	ROD	08	MT	MT0012694970

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FY	Site Name	OU	Document Type	Region	State	EPA ID
2013	GARVEY ELEVATOR	01	ROD	07	NE	NEN000704351
2014	GILT EDGE MINE	01	ESD	08	SD	SDD987673985
2013	GOWANUS CANAL	01	ROD	02	NY	NYN000206222
2014	HANFORD 300-AREA (USDOE)	04	ROD	10	WA	WA2890090077
2014	HEGELER ZINC	03	ROD	05	IL	ILN000508134
2012	LANGLEY AIR FORCE BASE/NASA LANGLEY RESEARCH CENTER	28	ROD	03	VA	VA2800005033
2014	LCP CHEMICALS INC.	01	ROD	02	NJ	NJD079303020
2012	LETTERKENNY ARMY DEPOT (SE AREA)	12	ROD	03	PA	PA6213820503
2014	LOWER DARBY CREEK AREA	01	ROD	03	PA	PASFN0305521
2012	MADISON COUNTY MINES	05	ROD	07	MO	MOD098633415
2014	MADISON COUNTY MINES	03	ROD	07	MO	MOD098633415
2012	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	05	ROD	09	CA	CA4570024337
2012	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	17	ROD	09	CA	CA4570024337
2013	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	07	ROD	09	CA	CA4570024337
2014	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	06	ROD	09	CA	CA4570024337
2013	NEBRASKA ORDNANCE PLANT (FORMER)	05	ROD	07	NE	NE6211890011
2012	NEWPORT NAVAL EDUCATION & TRAINING CENTER	07	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	02	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	12	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	05	ROD	01	RI	RI6170085470
2013	NIAGARA MOHAWK POWER CORP. (SARATOGA SPRINGS PLANT)	02	ROD	02	NY	NYD980664361
2013	NORTH SANITARY LANDFILL	01	ROD	05	OH	OHD980611875
2013	OKLAHOMA REFINING CO.	02	ROD	06	OK	OKD091598870
2012	OLD AMERICAN ZINC PLANT	02	ROD	05	IL	IL0000034355

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FY	Site Name	OU	Document Type	Region	State	EPA ID
2014	OLIN CORP. (MCINTOSH PLANT)	02	ROD	04	AL	ALD008188708
2013	ORLANDO GASIFICATION PLANT	01	ROD	04	FL	FLD984169235
2013	ORONOGO-DUENWEG MINING BELT	01	ROD Amendment	07	MO	MOD980686281
2013	OTTAWA RADIATION AREAS	06	ROD Amendment	05	IL	ILD980606750
2012	OUTBOARD MARINE CORP.	04	ESD	05	IL	ILD000802827
2013	OUTBOARD MARINE CORP.	04	ROD Amendment	05	IL	ILD000802827
2012	PEARL HARBOR NAVAL COMPLEX	17	ROD	09	HI	HI4170090076
2014	RINGWOOD MINES/LANDFILL	02	ROD	02	NJ	NJD980529739
2012	RIO TINTO COPPER MINE	01	ROD	09	NV	NV3141190030
2012	ROCKY MOUNTAIN ARSENAL (USARMY)	03	ESD	08	CO	CO5210020769
2013	SALFORD QUARRY	01	ROD	03	PA	PAD980693204
2013	SCORPIO RECYCLING, INC.	02	ROD	02	PR	PRD987376662
2013	SCOVILL INDUSTRIAL LANDFILL	01	ROD	01	CT	CT0002265551
2014	SHARON STEEL CORP (FARRELL WORKS DISPOSAL AREA)	02	ROD	03	PA	PAD001933175
2014	SHIELDALLOY CORP.	02	ROD	02	NJ	NJD002365930
2012	SOUTHWEST JEFFERSON COUNTY MINING	01	ROD	07	MO	MON000705443
2012	SOUTHWEST JEFFERSON COUNTY MINING	02	ROD	07	MO	MON000705443
2012	SOUTHWEST JEFFERSON COUNTY MINING	03	ROD	07	MO	MON000705443
2012	SPECTRON, INC.	02	ROD	03	MD	MDD000218008
2013	STAR LAKE CANAL	01	ROD	06	TX	TX0001414341
2014	TEN-MILE DRAIN	01	ROD	05	MI	MIN000510063
2013	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	07	ROD	09	CA	CA1170090087
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	09	CA	CA1170090087
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	10	ROD	09	CA	CA1170090087
2012	TRI-CITY DISPOSAL CO.	01	ESD	04	KY	KYD981028350
2013	UNITED NUCLEAR CORP.	02	ROD	06	NM	NMD030443303
2012	VELSICOL CHEMICAL CORP. (HARDEMAN COUNTY)	02	ROD Amendment	04	TN	TND980559033
2012	VELSICOL CHEMICAL CORP. (MICHIGAN)	01	ROD	05	MI	MID000722439
2012	WPSC STEVENS POINT	01	ROD	05	WI	WIN000509983

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FY	Site Name	OU	Document Type	Region	State	EPA ID
Vertical Engineered Barrier						
2014	ALAMEDA NAVAL AIR STATION	03	ROD Amendment	09	CA	CA2170023236
2012	BUNKER HILL MINING & METALLURGICAL COMPLEX	03	ROD Amendment	10	ID	IDD048340921
2014	LCP CHEMICALS INC.	01	ROD	02	NJ	NJD079303020
2013	NIAGARA MOHAWK POWER CORP. (SARATOGA SPRINGS PLANT)	02	ROD	02	NY	NYD980664361
2013	ORLANDO GASIFICATION PLANT	01	ROD	04	FL	FLD984169235
2013	OUTBOARD MARINE CORP.	04	ROD Amendment	05	IL	ILD000802827
2012	PADUCAH GASEOUS DIFFUSION PLANT (USDOE)	19	ROD	04	KY	KY8890008982
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	09	CA	CA1170090087
MONITORED NATURAL RECOVERY/ENHANCED MONITORED NATURAL RECOVERY						
Enhanced Monitored Natural Recovery						
2013	LOCKHEED WEST SEATTLE	01	ROD	10	WA	WAN001002655
2014	ONONDAGA LAKE	02	ESD	02	NY	NYD986913580
Monitored Natural Recovery						
2014	LETTERKENNY ARMY DEPOT (PDO AREA)	02	ROD	03	PA	PA2210090054
2012	MADISON COUNTY MINES	05	ROD	07	MO	MOD098633415
2013	STAR LAKE CANAL	01	ROD	06	TX	TX0001414341
INSTITUTIONAL CONTROLS						
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387
2012	ABERDEEN PROVING GROUND (EDGEWOOD AREA)	37	ROD	03	MD	MD2210020036
2013	ABERDEEN PROVING GROUND (EDGEWOOD AREA)	48	ROD	03	MD	MD2210020036
2014	ABERDEEN PROVING GROUND (EDGEWOOD AREA)	29	ROD	03	MD	MD2210020036
2013	AIR FORCE PLANT PJKS	01	ROD	08	CO	CO7570090038
2014	ALAMEDA NAVAL AIR STATION	03	ROD Amendment	09	CA	CA2170023236
2014	ALAMEDA NAVAL AIR STATION	08	ROD	09	CA	CA2170023236
2012	ALCOA PROPERTIES	01	ROD	05	IL	ILSFN0508010
2014	ALLEGANY BALLISTICS LABORATORY (USNAVY)	04	ROD	03	WV	WV0170023691
2012	AMERICAN CYANAMID CO	04	ROD	02	NJ	NJD002173276

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FY	Site Name	OU	Document Type	Region	State	EPA ID
2012	ANDERSEN AIR FORCE BASE	01	ROD	09	GU	GU6571999519
2014	ANDERSEN AIR FORCE BASE	01	ROD	09	GU	GU6571999519
2013	BANDERA ROAD GROUND WATER PLUME	01	ROD	06	TX	TXN000606565
2013	BROOK INDUSTRIAL PARK	01	ESD	02	NJ	NJD078251675
2012	BUNKER HILL MINING & METALLURGICAL COMPLEX	03	ROD Amendment	10	ID	IDD048340921
2013	CALIFORNIA GULCH	04	ESD	08	CO	COD980717938
2013	CALIFORNIA GULCH	10	ESD	08	CO	COD980717938
2014	CALIFORNIA GULCH	03	ESD	08	CO	COD980717938
2013	CAMP LEJEUNE MILITARY RES. (USNAVY)	12	ROD	04	NC	NC6170022580
2013	CAMP LEJEUNE MILITARY RES. (USNAVY)	15	ROD	04	NC	NC6170022580
2012	CENTREDALE MANOR RESTORATION PROJECT	01	ROD	01	RI	RID981203755
2014	CIDRA GROUNDWATER CONTAMINATION	01	ROD	02	PR	PRN000204538
2013	CONCORD NAVAL WEAPONS STATION	04	ROD	09	CA	CA7170024528
2012	COPPER BASIN MINING DISTRICT	03	ROD	04	TN	TN0001890839
2012	CROWN CLEANERS OF WATERTOWN INC.	01	ROD	02	NY	NYD986965333
2013	CURTIS BAY COAST GUARD YARD	04	ROD	03	MD	MD4690307844
2014	DAVISVILLE NAVAL CONSTRUCTION BATTALION CENTER	09	ROD	01	RI	RI6170022036
2012	DEFENSE GENERAL SUPPLY CENTER (DLA)	13	ROD	03	VA	VA3971520751
2012	DIAZ CHEMICAL	02	ROD	02	NY	NYD067532580
2013	DIXIE CAVERNS COUNTY LANDFILL	02	ESD	03	VA	VAD980552095
2012	EAGLE ZINC CO DIV T L DIAMOND	02	ROD	05	IL	ILD980606941
2012	EASTERN MICHAUD FLATS CONTAMINATION	01	ROD Amendment	10	ID	IDD984666610
2012	EDWARDS AIR FORCE BASE	13	ROD	09	CA	CA1570024504
2013	EDWARDS AIR FORCE BASE	11	ESD	09	CA	CA1570024504
2014	FIRST PIEDMONT CORP. ROCK QUARRY (ROUTE 719)	01	ROD Amendment	03	VA	VAD980554984
2012	FLAT CREEK IMM	01	ROD	08	MT	MT0012694970
2013	FLORIDA STEEL CORP.	02	ESD	04	FL	FLD050432251
2012	FORT GEORGE G. MEADE	17	ROD	03	MD	MD9210020567
2012	FORT GEORGE G. MEADE	20	ROD	03	MD	MD9210020567

Appendix E

Source Remedies Selected in Decision Documents from FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2014	FORT GEORGE G. MEADE	13	ROD	03	MD	MD9210020567
2014	FORT GEORGE G. MEADE	18	ROD	03	MD	MD9210020567
2014	FORT WAINWRIGHT	07	ROD	10	AK	AK6210022426
2013	GOWANUS CANAL	01	ROD	02	NY	NYN000206222
2012	GRIFFISS AIR FORCE BASE (11 AREAS)	04	ROD	02	NY	NY4571924451
2012	GRIFFISS AIR FORCE BASE (11 AREAS)	07	ROD	02	NY	NY4571924451
2013	HAMILTON/LABREE ROADS GW CONTAMINATION	01	ROD	10	WA	WASFN1002174
2014	HANFORD 100-AREA (USDOE)	35	ROD	10	WA	WA3890090076
2014	HANFORD 300-AREA (USDOE)	04	ROD	10	WA	WA2890090077
2014	HEGELER ZINC	03	ROD	05	IL	ILN000508134
2014	HILL AIR FORCE BASE	13	ROD	08	UT	UT0571724350
2012	HOOKER (HYDE PARK)	01	ESD	02	NY	NYD000831644
2014	INDIAN HEAD NAVAL SURFACE WARFARE CENTER	03	ROD	03	MD	MD7170024684
2014	INDIAN HEAD NAVAL SURFACE WARFARE CENTER	24	ROD	03	MD	MD7170024684
2014	JACKSON PARK HOUSING COMPLEX (USNAVY)	05	ROD	10	WA	WA3170090044
2013	JJ SEIFERT MACHINE	01	ROD	04	FL	FLN000410232
2012	LANGLEY AIR FORCE BASE/NASA LANGLEY RESEARCH CENTER	28	ROD	03	VA	VA2800005033
2014	LCP CHEMICALS INC.	01	ROD	02	NJ	NJD079303020
2014	LETTERKENNY ARMY DEPOT (PDO AREA)	02	ROD	03	PA	PA2210090054
2012	LETTERKENNY ARMY DEPOT (SE AREA)	12	ROD	03	PA	PA6213820503
2012	LETTERKENNY ARMY DEPOT (SE AREA)	21	ROD	03	PA	PA6213820503
2014	LETTERKENNY ARMY DEPOT (SE AREA)	28	ROD	03	PA	PA6213820503
2013	LOCKHEED WEST SEATTLE	01	ROD	10	WA	WAN001002655
2014	LOWER DARBY CREEK AREA	01	ROD	03	PA	PASFN0305521
2012	MADISON COUNTY MINES	05	ROD	07	MO	MOD098633415
2014	MADISON COUNTY MINES	03	ROD	07	MO	MOD098633415
2014	MATTIACE PETROCHEMICAL CO., INC.	01	ROD Amendment	02	NY	NYD000512459
2012	MAYWOOD CHEMICAL CO.	03	ROD	02	NJ	NJD980529762
2014	MAYWOOD CHEMICAL CO.	01	ROD	02	NJ	NJD980529762

Source Remedies Selected in Decision Documents from FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2012	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	05	ROD	09	CA	CA4570024337
2012	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	17	ROD	09	CA	CA4570024337
2013	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	07	ROD	09	CA	CA4570024337
2014	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	06	ROD	09	CA	CA4570024337
2014	MILAN ARMY AMMUNITION PLANT	05	ROD	04	TN	TN0210020582
2014	NATIONAL FIREWORKS	02	ROD	04	TN	TNSFN0407047
2013	NEBRASKA ORDNANCE PLANT (FORMER)	05	ROD	07	NE	NE6211890011
2014	NEW BRIGHTON/ARDEN HILLS/TCAAP (USARMY)	07	ROD Amendment	05	MN	MN7213820908
2012	NEW LONDON SUBMARINE BASE	04	ROD	01	CT	CTD980906515
2013	NEW LYME LANDFILL	01	ESD	05	OH	OHD980794614
2012	NEWPORT NAVAL EDUCATION & TRAINING CENTER	07	ROD	01	RI	RI6170085470
2013	NEWPORT NAVAL EDUCATION & TRAINING CENTER	11	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	02	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	05	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	06	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	12	ROD	01	RI	RI6170085470
2013	NIAGARA MOHAWK POWER CORP. (SARATOGA SPRINGS PLANT)	02	ROD	02	NY	NYD980664361
2014	NORTH CAROLINA STATE UNIVERSITY (LOT 86, FARM UNIT #1)	01	ESD	04	NC	NCD980557656
2013	NORTH SANITARY LANDFILL	01	ROD	05	OH	OHD980611875
2013	OKLAHOMA REFINING CO.	02	ROD	06	OK	OKD091598870
2012	OLD AMERICAN ZINC PLANT	02	ROD	05	IL	IL0000034355
2014	OLEAN WELL FIELD	02	ROD Amendment	02	NY	NYD980528657
2014	OLIN CORP. (MCINTOSH PLANT)	02	ROD	04	AL	ALD008188708
2014	ONONDAGA LAKE	25	ROD	02	NY	NYD986913580

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FY	Site Name	OU	Document Type	Region	State	EPA ID
2013	ORLANDO GASIFICATION PLANT	01	ROD	04	FL	FLD984169235
2013	OTIS AIR NATIONAL GUARD BASE/CAMP EDWARDS	07	ESD	01	MA	MA2570024487
2012	OTTAWA RADIATION AREAS	06	ESD	05	IL	ILD980606750
2013	OTTAWA RADIATION AREAS	06	ROD Amendment	05	IL	ILD980606750
2012	OUTBOARD MARINE CORP.	04	ESD	05	IL	ILD000802827
2013	OUTBOARD MARINE CORP.	04	ROD Amendment	05	IL	ILD000802827
2012	PADUCAH GASEOUS DIFFUSION PLANT (USDOE)	19	ROD	04	KY	KY8890008982
2012	PEARL HARBOR NAVAL COMPLEX	17	ROD	09	HI	HI4170090076
2014	PEARL HARBOR NAVAL COMPLEX	24	ROD	09	HI	HI4170090076
2013	PEOPLES NATURAL GAS CO.	01	ROD Amendment	07	IA	IAD980852578
2012	PICATINNY ARSENAL (USARMY)	15	ROD	02	NJ	NJ3210020704
2013	PORTSMOUTH NAVAL SHIPYARD	05	ROD	01	ME	ME7170022019
2013	PORTSMOUTH NAVAL SHIPYARD	07	ROD	01	ME	ME7170022019
2014	RINGWOOD MINES/LANDFILL	02	ROD	02	NJ	NJD980529739
2012	RIO TINTO COPPER MINE	01	ROD	09	NV	NV3141190030
2013	ROSE TOWNSHIP DUMP	01	ESD	05	MI	MID980499842
2013	SALFORD QUARRY	01	ROD	03	PA	PAD980693204
2013	SANFORD DRY CLEANERS	01	ROD	04	FL	FLD032728032
2012	SAVANNA ARMY DEPOT ACTIVITY	08	ROD	05	IL	IL3210020803
2012	SAVANNAH RIVER SITE (USDOE)	35	ESD	04	SC	SC1890008989
2013	SAVANNAH RIVER SITE (USDOE)	48	ROD	04	SC	SC1890008989
2013	SCORPIO RECYCLING, INC.	02	ROD	02	PR	PRD987376662
2013	SCOVILL INDUSTRIAL LANDFILL	01	ROD	01	CT	CT0002265551
2014	SHARON STEEL CORP (FARRELL WORKS DISPOSAL AREA)	02	ROD	03	PA	PAD001933175
2014	SHIELDALLOY CORP.	02	ROD	02	NJ	NJD002365930
2013	SOMERSWORTH SANITARY LANDFILL	01	ESD	01	NH	NHD980520225
2012	SOUTHWEST JEFFERSON COUNTY MINING	01	ROD	07	MO	MON000705443
2012	SOUTHWEST JEFFERSON COUNTY MINING	02	ROD	07	MO	MON000705443
2012	SOUTHWEST JEFFERSON COUNTY MINING	03	ROD	07	MO	MON000705443

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FY	Site Name	OU	Document Type	Region	State	EPA ID
2012	SPECTRON, INC.	02	ROD	03	MD	MDD000218008
2013	STAR LAKE CANAL	01	ROD	06	TX	TX0001414341
2012	STAUFFER CHEMICAL CO. (COLD CREEK PLANT)	02	ESD	04	AL	ALD095688875
2012	STRASBURG LANDFILL	00	ESD	03	PA	PAD000441337
2014	TEN-MILE DRAIN	01	ROD	05	MI	MIN000510063
2014	TINKER AIR FORCE BASE (SOLDIER CREEK/BUILDING 3001)	01	ROD	06	OK	OK1571724391
2014	TOMAH ARMORY	01	ESD	05	WI	WID980610299
2013	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	07	ROD	09	CA	CA1170090087
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	09	CA	CA1170090087
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	10	ROD	09	CA	CA1170090087
2013	U.S. SMELTER AND LEAD REFINERY, INC.	01	ROD	05	IN	IND047030226
2013	UNITED NUCLEAR CORP.	02	ROD	06	NM	NMD030443303
2014	UNIVERSITY OF MINNESOTA (ROSEMOUNT RESEARCH CENTER)	03	ESD	05	MN	MND980613780
2013	US NASA MARSHALL SPACE FLIGHT CENTER	07	ROD	04	AL	AL1800013863
2014	VAN DER HORST USA CORPORATION	01	ROD	06	TX	TXD007357932
2012	VELSICOL CHEMICAL CORP. (MICHIGAN)	01	ROD	05	MI	MID000722439
2012	WHITING FIELD NAVAL AIR STATION	27	ROD	04	FL	FL2170023244
2013	WOODBROOK ROAD DUMP	01	ROD	02	NJ	NJSFN0204260
2012	WPSC STEVENS POINT	01	ROD	05	WI	WIN000509983
OTHER REMEDIES						
Fencing and Signs						
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387
2014	ALAMEDA NAVAL AIR STATION	08	ROD	09	CA	CA2170023236
2013	BANDERA ROAD GROUND WATER PLUME	01	ROD	06	TX	TXN000606565
2014	FORT GEORGE G. MEADE	13	ROD	03	MD	MD9210020567
2012	LANGLEY AIR FORCE BASE/NASA LANGLEY RESEARCH CENTER	28	ROD	03	VA	VA2800005033
2014	LETTERKENNY ARMY DEPOT (PDO AREA)	02	ROD	03	PA	PA2210090054
2014	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	06	ROD	09	CA	CA4570024337

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FY	Site Name	OU	Document Type	Region	State	EPA ID
2013	OKLAHOMA REFINING CO.	02	ROD	06	OK	OKD091598870
2014	OLIN CORP. (MCINTOSH PLANT)	02	ROD	04	AL	ALD008188708
2014	PEARL HARBOR NAVAL COMPLEX	24	ROD	09	HI	HI4170090076
2014	RINGWOOD MINES/LANDFILL	02	ROD	02	NJ	NJD980529739
2013	SAVANNAH RIVER SITE (USDOE)	48	ROD	04	SC	SC1890008989
2014	SHIELDALLOY CORP.	02	ROD	02	NJ	NJD002365930
2013	U.S. SMELTER AND LEAD REFINERY, INC.	01	ROD	05	IN	IND047030226
2014	VAN DER HORST USA CORPORATION	01	ROD	06	TX	TXD007357932
Habitat Restoration						
2013	HAMILTON/LABREE ROADS GW CONTAMINATION	01	ROD	10	WA	WASFN1002174
Revegetation						
2012	EAGLE ZINC CO DIV T L DIAMOND	02	ROD	05	IL	ILD980606941
2014	FIRST PIEDMONT CORP. ROCK QUARRY (ROUTE 719)	01	ROD Amendment	03	VA	VAD980554984
2012	MADISON COUNTY MINES	05	ROD	07	MO	MOD098633415
2014	ONONDAGA LAKE	02	ESD	02	NY	NYD986913580
2012	PLATTSBURGH AIR FORCE BASE	20	ROD	02	NY	NY4571924774
Shoreline Stabilization						
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387
2013	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	07	ROD	09	CA	CA1170090087
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	09	CA	CA1170090087
Stream Realignment						
2013	HAMILTON/LABREE ROADS GW CONTAMINATION	01	ROD	10	WA	WASFN1002174
Wetlands Replacement						
2012	CENTREDALE MANOR RESTORATION PROJECT	01	ROD	01	RI	RID981203755
2014	LCP CHEMICALS INC.	01	ROD	02	NJ	NJD079303020
2013	NORTH SANITARY LANDFILL	01	ROD	05	OH	OHD980611875
2013	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	07	ROD	09	CA	CA1170090087
Wetlands Restoration						
2014	FIRST PIEDMONT CORP. ROCK QUARRY (ROUTE 719)	01	ROD Amendment	03	VA	VAD980554984

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FY	Site Name	OU	Document Type	Region	State	EPA ID
2014	INDUSTRI-PLEX	02	ESD	01	MA	MAD076580950
2012	LANGLEY AIR FORCE BASE/NASA LANGLEY RESEARCH CENTER	28	ROD	03	VA	VA2800005033
2014	LCP CHEMICALS INC.	01	ROD	02	NJ	NJD079303020
2014	MAYWOOD CHEMICAL CO.	01	ROD	02	NJ	NJD980529762
2014	ONONDAGA LAKE	25	ROD	02	NY	NYD986913580
2012	PLATTSBURGH AIR FORCE BASE	20	ROD	02	NY	NY4571924774
2014	RINGWOOD MINES/LANDFILL	02	ROD	02	NJ	NJD980529739

APPENDIX F

Sediment Remedies Selected in Decision Documents from FY 2012-2014

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Sediment Remedies Selected in Decision Documents from FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
TREATMENT						
Bioremediation (In Situ)						
2013	HAMILTON/LABREE ROADS GW CONTAMINATION	01	ROD	10	WA	WASFN1002174
Cap (Amended, In Situ)						
2013	CONCORD NAVAL WEAPONS STATION	02	ROD	09	CA	CA7170024528
2013	GOWANUS CANAL	01	ROD	02	NY	NYN000206222
2014	OLIN CORP. (MCINTOSH PLANT)	02	ROD	04	AL	ALD008188708
Chemical Treatment (Ex Situ)						
2013	HAMILTON/LABREE ROADS GW CONTAMINATION	01	ROD	10	WA	WASFN1002174
Incineration (Off site)						
2012	CENTREDALE MANOR RESTORATION PROJECT	01	ROD	01	RI	RID981203755
Neutralization (Ex situ)						
2013	OKLAHOMA REFINING CO.	02	ROD	06	OK	OKD091598870
Physical Separation (Ex Situ)						
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387
2012	CENTREDALE MANOR RESTORATION PROJECT	01	ROD	01	RI	RID981203755
2014	INDUSTRI-PLEX	02	ESD	01	MA	MAD076580950
2013	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	07	ROD	09	CA	CA4570024337
2012	NEWPORT NAVAL EDUCATION & TRAINING CENTER	07	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	05	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	06	ROD	01	RI	RI6170085470
2014	ONONDAGA LAKE	25	ROD	02	NY	NYD986913580
2013	PORTSMOUTH NAVAL SHIPYARD	04	ROD	01	ME	ME7170022019
2014	SHIELDALLOY CORP.	02	ROD	02	NJ	NJD002365930
2013	STAR LAKE CANAL	01	ROD	06	TX	TX0001414341
2013	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	07	ROD	09	CA	CA1170090087
Recycling (Ex Situ)						
2013	GOWANUS CANAL	01	ROD	02	NY	NYN000206222

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FY	Site Name	OU	Document Type	Region	State	EPA ID
Solidification/Stabilization (Ex Situ)						
2013	GOWANUS CANAL	01	ROD	02	NY	NYN000206222
2012	WPSC STEVENS POINT	01	ROD	05	WI	WIN000509983
Solidification/Stabilization (In Situ)						
2013	GOWANUS CANAL	01	ROD	02	NY	NYN000206222
Thermal Desorption (Ex Situ)						
2013	GOWANUS CANAL	01	ROD	02	NY	NYN000206222
Thermal Treatment (In Situ)						
2013	HAMILTON/LABREE ROADS GW CONTAMINATION	01	ROD	10	WA	WASFN1002174
Unspecified Ex Situ treatment (Off site)						
2012	CROWN CLEANERS OF WATERTOWN INC.	01	ROD	02	NY	NYD986965333
DREDGING, DISPOSAL AND CONTAINMENT						
Capping (Ex Situ)						
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387
2012	EAGLE ZINC CO DIV T L DIAMOND	02	ROD	05	IL	ILD980606941
2013	GOWANUS CANAL	01	ROD	02	NY	NYN000206222
2012	MADISON COUNTY MINES	05	ROD	07	MO	MOD098633415
2013	OKLAHOMA REFINING CO.	02	ROD	06	OK	OKD091598870
2012	OUTBOARD MARINE CORP.	04	ESD	05	IL	ILD000802827
Capping (In Situ)						
2012	CENTREDALE MANOR RESTORATION PROJECT	01	ROD	01	RI	RID981203755
2013	CONCORD NAVAL WEAPONS STATION	02	ROD	09	CA	CA7170024528
2012	COPPER BASIN MINING DISTRICT	03	ROD	04	TN	TN0001890839
2013	GOWANUS CANAL	01	ROD	02	NY	NYN000206222
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	05	ROD	01	RI	RI6170085470
2014	OLIN CORP. (MCINTOSH PLANT)	02	ROD	04	AL	ALD008188708
2013	STAR LAKE CANAL	01	ROD	06	TX	TX0001414341
2012	WPSC STEVENS POINT	01	ROD	05	WI	WIN000509983

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FY	Site Name	OU	Document Type	Region	State	EPA ID
Containment Cell (Subaqueous)						
2014	LCP CHEMICALS INC.	01	ROD	02	NJ	NJD079303020
Containment Cell (Upland/Adjacent)						
2012	CENTREDALE MANOR RESTORATION PROJECT	01	ROD	01	RI	RID981203755
2013	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	07	ROD	09	CA	CA4570024337
2013	SALFORD QUARRY	01	ROD	03	PA	PAD980693204
Dredging/Excavation						
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387
2012	CENTREDALE MANOR RESTORATION PROJECT	01	ROD	01	RI	RID981203755
2012	CROWN CLEANERS OF WATERTOWN INC.	01	ROD	02	NY	NYD986965333
2012	EAGLE ZINC CO DIV T L DIAMOND	02	ROD	05	IL	ILD980606941
2014	FIRST PIEDMONT CORP. ROCK QUARRY (ROUTE 719)	01	ROD Amendment	03	VA	VAD980554984
2013	GOWANUS CANAL	01	ROD	02	NY	NYN000206222
2013	HAMILTON/LABREE ROADS GW CONTAMINATION	01	ROD	10	WA	WASFN1002174
2014	INDUSTRI-PLEX	02	ESD	01	MA	MAD076580950
2012	LANGLEY AIR FORCE BASE/NASA LANGLEY RESEARCH CENTER	28	ROD	03	VA	VA2800005033
2014	LCP CHEMICALS INC.	01	ROD	02	NJ	NJD079303020
2013	LOCKHEED WEST SEATTLE	01	ROD	10	WA	WAN001002655
2012	MADISON COUNTY MINES	05	ROD	07	MO	MOD098633415
2013	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	07	ROD	09	CA	CA4570024337
2012	NEW LONDON SUBMARINE BASE	04	ROD	01	CT	CTD980906515
2012	NEWPORT NAVAL EDUCATION & TRAINING CENTER	07	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	05	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	06	ROD	01	RI	RI6170085470
2013	OKLAHOMA REFINING CO.	02	ROD	06	OK	OKD091598870
2014	ONONDAGA LAKE	25	ROD	02	NY	NYD986913580
2012	OUTBOARD MARINE CORP.	04	ESD	05	IL	ILD000802827

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Sediment Remedies Selected in Decision Documents from FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2012	PLATTSBURGH AIR FORCE BASE	20	ROD	02	NY	NY4571924774
2013	PORTSMOUTH NAVAL SHIPYARD	04	ROD	01	ME	ME7170022019
2013	RARITAN BAY SLAG	01	ROD	02	NJ	NJN000206276
2013	SALFORD QUARRY	01	ROD	03	PA	PAD980693204
2014	SHIELDALLOY CORP.	02	ROD	02	NJ	NJD002365930
2013	STAR LAKE CANAL	01	ROD	06	TX	TX0001414341
2013	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	07	ROD	09	CA	CA1170090087
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	09	CA	CA1170090087
2013	US NASA MARSHALL SPACE FLIGHT CENTER	07	ROD	04	AL	AL1800013863
2014	VAN DER HORST USA CORPORATION	01	ROD	06	TX	TXD007357932
2012	WPSC STEVENS POINT	01	ROD	05	WI	WIN000509983
Off site Disposal						
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387
2012	CENTREDALE MANOR RESTORATION PROJECT	01	ROD	01	RI	RID981203755
2012	CROWN CLEANERS OF WATERTOWN INC.	01	ROD	02	NY	NYD986965333
2014	FIRST PIEDMONT CORP. ROCK QUARRY (ROUTE 719)	01	ROD Amendment	03	VA	VAD980554984
2013	HAMILTON/LABREE ROADS GW CONTAMINATION	01	ROD	10	WA	WASFN1002174
2014	INDUSTRI-PLEX	02	ESD	01	MA	MAD076580950
2012	LANGLEY AIR FORCE BASE/NASA LANGLEY RESEARCH CENTER	28	ROD	03	VA	VA2800005033
2013	LOCKHEED WEST SEATTLE	01	ROD	10	WA	WAN001002655
2013	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	07	ROD	09	CA	CA4570024337
2012	NEW LONDON SUBMARINE BASE	04	ROD	01	CT	CTD980906515
2012	NEWPORT NAVAL EDUCATION & TRAINING CENTER	07	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	05	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	06	ROD	01	RI	RI6170085470
2014	ONONDAGA LAKE	25	ROD	02	NY	NYD986913580
2012	PLATTSBURGH AIR FORCE BASE	20	ROD	02	NY	NY4571924774
2013	PORTSMOUTH NAVAL SHIPYARD	04	ROD	01	ME	ME7170022019

Appendix F

Sediment Remedies Selected in Decision Documents from FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2013	RARITAN BAY SLAG	01	ROD	02	NJ	NJN000206276
2014	SHIELDALLOY CORP.	02	ROD	02	NJ	NJD002365930
2013	STAR LAKE CANAL	01	ROD	06	TX	TX0001414341
2013	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	07	ROD	09	CA	CA1170090087
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	09	CA	CA1170090087
2013	US NASA MARSHALL SPACE FLIGHT CENTER	07	ROD	04	AL	AL1800013863
2014	VAN DER HORST USA CORPORATION	01	ROD	06	TX	TXD007357932
2012	WPSC STEVENS POINT	01	ROD	05	WI	WIN000509983
ENHANCED MONITORED NATURAL RECOVERY						
2013	LOCKHEED WEST SEATTLE	01	ROD	10	WA	WAN001002655
2014	ONONDAGA LAKE	02	ESD	02	NY	NYD986913580
MONITORED NATURAL RECOVERY						
2014	LETTERKENNY ARMY DEPOT (PDO AREA)	02	ROD	03	PA	PA2210090054
2012	MADISON COUNTY MINES	05	ROD	07	MO	MOD098633415
2013	STAR LAKE CANAL	01	ROD	06	TX	TX0001414341
INSTITUTIONAL CONTROLS						
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387
2012	CENTREDALE MANOR RESTORATION PROJECT	01	ROD	01	RI	RID981203755
2012	COPPER BASIN MINING DISTRICT	03	ROD	04	TN	TN0001890839
2012	CROWN CLEANERS OF WATERTOWN INC.	01	ROD	02	NY	NYD986965333
2012	EAGLE ZINC CO DIV T L DIAMOND	02	ROD	05	IL	ILD980606941
2014	FIRST PIEDMONT CORP. ROCK QUARRY (ROUTE 719)	01	ROD Amendment	03	VA	VAD980554984
2013	FLORIDA STEEL CORP.	02	ESD	04	FL	FLD050432251
2013	GOWANUS CANAL	01	ROD	02	NY	NYN000206222
2013	HAMILTON/LABREE ROADS GW CONTAMINATION	01	ROD	10	WA	WASFN1002174
2014	LETTERKENNY ARMY DEPOT (PDO AREA)	02	ROD	03	PA	PA2210090054
2012	LETTERKENNY ARMY DEPOT (SE AREA)	12	ROD	03	PA	PA6213820503
2013	LOCKHEED WEST SEATTLE	01	ROD	10	WA	WAN001002655
2012	MADISON COUNTY MINES	05	ROD	07	MO	MOD098633415

Sediment Remedies Selected in Decision Documents from FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2013	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	07	ROD	09	CA	CA4570024337
2012	NEW LONDON SUBMARINE BASE	04	ROD	01	CT	CTD980906515
2012	NEWPORT NAVAL EDUCATION & TRAINING CENTER	07	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	05	ROD	01	RI	RI6170085470
2013	OKLAHOMA REFINING CO.	02	ROD	06	OK	OKD091598870
2014	OLIN CORP. (MCINTOSH PLANT)	02	ROD	04	AL	ALD008188708
2014	ONONDAGA LAKE	25	ROD	02	NY	NYD986913580
2012	OUTBOARD MARINE CORP.	04	ESD	05	IL	ILD000802827
2013	SALFORD QUARRY	01	ROD	03	PA	PAD980693204
2012	SAVANNAH RIVER SITE (USDOE)	35	ESD	04	SC	SC1890008989
2013	STAR LAKE CANAL	01	ROD	06	TX	TX0001414341
2013	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	07	ROD	09	CA	CA1170090087
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	09	CA	CA1170090087
OTHER REMEDIES						
Fencing and Signs						
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387
2013	OKLAHOMA REFINING CO.	02	ROD	06	OK	OKD091598870
2014	OLIN CORP. (MCINTOSH PLANT)	02	ROD	04	AL	ALD008188708
Habitat Restoration						
2013	HAMILTON/LABREE ROADS GW CONTAMINATION	01	ROD	10	WA	WASFN1002174
Revegetation						
2012	EAGLE ZINC CO DIV T L DIAMOND	02	ROD	05	IL	ILD980606941
2014	FIRST PIEDMONT CORP. ROCK QUARRY (ROUTE 719)	01	ROD Amendment	03	VA	VAD980554984
2012	MADISON COUNTY MINES	05	ROD	07	MO	MOD098633415
2014	ONONDAGA LAKE	02	ESD	02	NY	NYD986913580
2012	PLATTSBURGH AIR FORCE BASE	20	ROD	02	NY	NY4571924774
Shoreline Stabilization						
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387

Sediment Remedies Selected in Decision Documents from FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2013	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	07	ROD	09	CA	CA1170090087
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	09	CA	CA1170090087
Stream Realignment						
2013	HAMILTON/LABREE ROADS GW CONTAMINATION	01	ROD	10	WA	WASFN1002174
Wetlands Replacement						
2012	CENTREDALE MANOR RESTORATION PROJECT	01	ROD	01	RI	RID981203755
2014	LCP CHEMICALS INC.	01	ROD	02	NJ	NJD079303020
2013	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	07	ROD	09	CA	CA1170090087
Wetlands Restoration						
2014	FIRST PIEDMONT CORP. ROCK QUARRY (ROUTE 719)	01	ROD Amendment	03	VA	VAD980554984
2014	INDUSTRI-PLEX	02	ESD	01	MA	MAD076580950
2012	LANGLEY AIR FORCE BASE/NASA LANGLEY RESEARCH CENTER	28	ROD	03	VA	VA2800005033
2014	LCP CHEMICALS INC.	01	ROD	02	NJ	NJD079303020
2014	ONONDAGA LAKE	25	ROD	02	NY	NYD986913580
2012	PLATTSBURGH AIR FORCE BASE	20	ROD	02	NY	NY4571924774

APPENDIX G

Groundwater Remedies Selected in Decision Documents from FY 2012-2014

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Groundwater Remedies Selected in Decision Documents From FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
EX SITU TREATMENT (P&T)						
2013	10TH STREET SITE	02	ROD Amendment	07	NE	NED981713837
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387
2012	ABERDEEN CONTAMINATED GROUND WATER	01	ROD	04	NC	NCN000407447
2012	ACE SERVICES	01	ESD	07	KS	KSD046746731
2012	AMERICAN CYANAMID CO	04	ROD	02	NJ	NJD002173276
2014	BREWER GOLD MINE	01	ROD	04	SC	SCD987577913
2013	BROOK INDUSTRIAL PARK	01	ESD	02	NJ	NJD078251675
2012	BROOKHAVEN NATIONAL LABORATORY (USDOE)	03	ESD	02	NY	NY7890008975
2012	BUNKER HILL MINING & METALLURGICAL COMPLEX	03	ROD Amendment	10	ID	IDD048340921
2013	CAYUGA GROUNDWATER CONTAMINATION SITE	01	ROD	02	NY	NYN000204289
2012	CLEBURN STREET WELL	02	ROD Amendment	07	NE	NED981499312
2012	DIAZ CHEMICAL	02	ROD	02	NY	NYD067532580
2014	EAGLE PICHER CAREFREE BATTERY	01	ROD	06	NM	NMD001829506
2012	EASTERN MICHAUD FLATS CONTAMINATION	01	ROD Amendment	10	ID	IDD984666610
2013	FMC CORP. (FRIDLEY PLANT)	01	ESD	05	MN	MND006481543
2013	GARVEY ELEVATOR	02	ROD	07	NE	NEN000704351
2012	HANFORD 200-AREA (USDOE)	49	ROD	10	WA	WA1890090078
2014	HILL AIR FORCE BASE	06	ESD	08	UT	UT0571724350
2012	INDIAN BEND WASH AREA	08	ESD	09	AZ	AZD980695969
2012	INTERSTATE LEAD CO. (ILCO)	02	ROD Amendment	04	AL	ALD041906173
2013	JACKSON PARK HOUSING COMPLEX (USNAVY)	01	ROD Amendment	10	WA	WA3170090044
2014	LCP CHEMICALS INC.	01	ROD	02	NJ	NJD079303020
2012	MAUNABO URBANO PUBLIC WELLS	01	ROD	02	PR	PRN000205831
2014	MILAN ARMY AMMUNITION PLANT	06	ROD	04	TN	TN0210020582
2013	NEW CASSEL/HICKSVILLE GROUND WATER CONTAMINATION	01	ROD	02	NY	NY0001095363
2013	OGDEN DEFENSE DEPOT (DLA)	04	ESD	08	UT	UT9210020922
2013	OUTBOARD MARINE CORP.	04	ROD Amendment	05	IL	ILD000802827
2013	PEOPLES NATURAL GAS CO.	01	ROD Amendment	07	IA	IAD980852578

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Groundwater Remedies Selected in Decision Documents From FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2014	PHOENIX-GOODYEAR AIRPORT AREA	01	ROD Amendment	09	AZ	AZD980695902
2014	PLATTSBURGH AIR FORCE BASE	06	ROD	02	NY	NY4571924774
2014	QUEEN CITY FARMS	01	ESD	10	WA	WAD980511745
2012	REFUSE HIDEAWAY LANDFILL	01	ESD	05	WI	WID980610604
2012	SPECTRON, INC.	02	ROD	03	MD	MDD000218008
2014	TRAVIS AIR FORCE BASE	06	ROD	09	CA	CA5570024575
2013	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	07	ROD	09	CA	CA1170090087
2012	VELSICOL CHEMICAL CORP. (MICHIGAN)	01	ROD	05	MI	MID000722439
2013	WHITE SWAN LAUNDRY AND CLEANER INC.	01	ROD	02	NJ	NJSFN0204241
IN SITU TREATMENT						
Air Sparging						
2013	CAMP LEJEUNE MILITARY RES. (USNAVY)	17	ROD	04	NC	NC6170022580
2012	MAUNABO URBANO PUBLIC WELLS	01	ROD	02	PR	PRN000205831
2014	VERONA WELL FIELD	02	ESD	05	MI	MID980793806
2013	WHITE SWAN LAUNDRY AND CLEANER INC.	01	ROD	02	NJ	NJSFN0204241
2014	WILLIAMS AIR FORCE BASE	01	ROD Amendment	09	AZ	AZ7570028582
Bioremediation						
2013	10TH STREET SITE	02	ROD Amendment	07	NE	NED981713837
2014	ABERDEEN PROVING GROUND (EDGEWOOD AREA)	29	ROD	03	MD	MD2210020036
2013	AIR FORCE PLANT PJKS	01	ROD	08	CO	CO7570090038
2013	ALAMEDA NAVAL AIR STATION	02	ROD	09	CA	CA2170023236
2014	ALAMEDA NAVAL AIR STATION	08	ROD	09	CA	CA2170023236
2012	ALLEGANY BALLISTICS LABORATORY (USNAVY)	11	ROD	03	WV	WV0170023691
2013	BANDERA ROAD GROUND WATER PLUME	01	ROD	06	TX	TXN000606565
2014	CAMP PENDLETON MARINE CORPS BASE	5	ROD	09	CA	CA2170023533
2013	CAYUGA GROUNDWATER CONTAMINATION SITE	01	ROD	02	NY	NYN000204289
2012	CLEBURN STREET WELL	02	ROD Amendment	07	NE	NED981499312
2012	DEFENSE GENERAL SUPPLY CENTER (DLA)	07	ROD	03	VA	VA3971520751
2013	DEFENSE GENERAL SUPPLY CENTER (DLA)	06	ROD	03	VA	VA3971520751

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Groundwater Remedies Selected in Decision Documents From FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2012	EL TORO MARINE CORPS AIR STATION	08	ROD	09	CA	CA6170023208
2012	FORT GEORGE G. MEADE	17	ROD	03	MD	MD9210020567
2014	GMH ELECTRONICS	01	ROD	04	NC	NCN000410161
2013	HAMILTON/LABREE ROADS GW CONTAMINATION	01	ROD	10	WA	WASFN1002174
2013	JJ SEIFERT MACHINE	01	ROD	04	FL	FLN000410232
2014	MARINE CORPS COMBAT DEVELOPMENT COMMAND	21	ROD	03	VA	VA1170024722
2014	MATTIACE PETROCHEMICAL CO., INC.	01	ROD Amendment	02	NY	NYD000512459
2012	MEDLEY FARM DRUM DUMP	01	ROD Amendment	04	SC	SCD980558142
2014	MOFFETT NAVAL AIR STATION	05	ROD Amendment	09	CA	CA2170090078
2012	NAVAL WEAPONS STATION - YORKTOWN	15	ROD	03	VA	VA8170024170
2012	NEWPORT NAVAL EDUCATION & TRAINING CENTER	07	ROD	01	RI	RI6170085470
2014	OLEAN WELL FIELD	03	ROD	02	NY	NYD980528657
2013	ORDNANCE PRODUCTS, INC.	01	ROD Amendment	03	MD	MDD982364341
2013	ORLANDO GASIFICATION PLANT	01	ROD	04	FL	FLD984169235
2012	PADUCAH GASEOUS DIFFUSION PLANT (USDOE)	19	ROD	04	KY	KY8890008982
2013	PEACH ORCHARD RD PCE GROUNDWATER PLUME SITE	01	ROD Amendment	04	GA	GAN000407449
2013	PEASE AIR FORCE BASE	07	ESD	01	NH	NH7570024847
2014	PEASE AIR FORCE BASE	07	ESD	01	NH	NH7570024847
2014	PHOENIX-GOODYEAR AIRPORT AREA	01	ROD Amendment	09	AZ	AZD980695902
2013	SANFORD DRY CLEANERS	01	ROD	04	FL	FLD032728032
2013	SAVANNAH RIVER SITE (USDOE)	21	ESD	04	SC	SC1890008989
2013	SAVANNAH RIVER SITE (USDOE)	29	ESD	04	SC	SC1890008989
2012	SCIENTIFIC CHEMICAL PROCESSING	03	ROD	02	NJ	NJD070565403
2014	SHARPE ARMY DEPOT	01	ESD	09	CA	CA8210020832
2013	SOUTH WEYMOUTH NAVAL AIR STATION	14	ROD	01	MA	MA2170022022
2014	SOUTH WEYMOUTH NAVAL AIR STATION	09	ROD	01	MA	MA2170022022
2012	ST. JULIENS CREEK ANNEX (U.S. NAVY)	12	ROD	03	VA	VA5170000181
2014	TRAVIS AIR FORCE BASE	06	ROD	09	CA	CA5570024575
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	09	CA	CA1170090087

Groundwater Remedies Selected in Decision Documents From FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	10	ROD	09	CA	CA1170090087
2014	VAN DER HORST USA CORPORATION	01	ROD	06	TX	TXD007357932
2012	WHITE CHEMICAL CORP.	03	ROD	02	NJ	NJD980755623
2013	WILLIAMS AIR FORCE BASE	02	ROD Amendment	09	AZ	AZ7570028582
2012	WILLOW GROVE NAVAL AIR AND AIR RESERVE STATION	02	ROD	03	PA	PAD987277837
Chemical Treatment						
2013	10TH STREET SITE	02	ROD Amendment	07	NE	NED981713837
2014	ALAMEDA NAVAL AIR STATION	08	ROD	09	CA	CA2170023236
2014	CAMP PENDLETON MARINE CORPS BASE	05	ROD	09	CA	CA2170023533
2012	CLEBURN STREET WELL	02	ROD Amendment	07	NE	NED981499312
2012	CROWN CLEANERS OF WATERTOWN INC.	01	ROD	02	NY	NYD986965333
2014	DAVISVILLE NAVAL CONSTRUCTION BATTALION CENTER	09	ROD	01	RI	RI6170022036
2012	ELLSWORTH AIR FORCE BASE	11	ROD Amendment	08	SD	SD2571924644
2014	ELMORE WASTE DISPOSAL	01	ESD	04	SC	SCD980839542
2012	EVOR PHILLIPS LEASING	03	ROD	02	NJ	NJD980654222
2013	F.E. WARREN AIR FORCE BASE	14	ROD	08	WY	WY5571924179
2014	GMH ELECTRONICS	01	ROD	04	NC	NCN000410161
2014	HANFORD 300-AREA (USDOE)	04	ROD	10	WA	WA2890090077
2013	INDIAN HEAD NAVAL SURFACE WARFARE CENTER	07	ROD	03	MD	MD7170024684
2012	INTERSTATE LEAD CO. (ILCO)	02	ROD Amendment	04	AL	ALD041906173
2013	JACKSON PARK HOUSING COMPLEX (USNAVY)	01	ROD Amendment	10	WA	WA3170090044
2012	KOPPERS CO., INC. (MORRISVILLE PLANT)	01	ESD	04	NC	NCD003200383
2012	MAYWOOD CHEMICAL CO.	03	ROD	02	NJ	NJD980529762
2013	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	01	ESD	09	CA	CA4570024337
2013	NEBRASKA ORDNANCE PLANT (FORMER)	05	ROD	07	NE	NE6211890011
2013	NEW CASSEL/HICKSVILLE GROUND WATER CONTAMINATION	01	ROD	02	NY	NY0001095363
2012	NEWPORT NAVAL EDUCATION & TRAINING CENTER	07	ROD	01	RI	RI6170085470
2014	OLEAN WELL FIELD	02	ROD Amendment	02	NY	NYD980528657
2014	PHOENIX-GOODYEAR AIRPORT AREA	01	ROD Amendment	09	AZ	AZD980695902

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FY	Site Name	OU	Document Type	Region	State	EPA ID
2014	REEVES SOUTHEASTERN GALVANIZING CORP.	02	ROD Amendment	04	FL	FLD000824896
2013	RIVERBANK army AMMUNITION PLANT	01	ESD	09	CA	CA7210020759
2014	SANGAMO ELECTRIC DUMP/CRAB ORCHARD NATIONAL WILDLIFE REFUGE (USDOI)	02	ROD Amendment	05	IL	IL8143609487
2012	SCIENTIFIC CHEMICAL PROCESSING	03	ROD	02	NJ	NJD070565403
2014	SHARPE ARMY DEPOT	01	ESD	09	CA	CA8210020832
2012	SOUTH WEYMOUTH NAVAL AIR STATION	11	ROD	01	MA	MA2170022022
2012	ST. JULIENS CREEK ANNEX (U.S. NAVY)	12	ROD	03	VA	VA5170000181
2013	TELEDYNE WAH CHANG	01	ESD	10	OR	ORD050955848
2014	TINKER AIR FORCE BASE (SOLDIER CREEK/BUILDING 3001)	01	ROD	06	OK	OK1571724391
2012	TUCSON INTERNATIONAL AIRPORT AREA	01	ROD Amendment	09	AZ	AZD980737530
2012	US NASA MARSHALL SPACE FLIGHT CENTER	03	ROD	04	AL	AL1800013863
2012	VELSICOL CHEMICAL CORP. (MICHIGAN)	01	ROD	05	MI	MID000722439
2012	WHITE CHEMICAL CORP.	03	ROD	02	NJ	NJD980755623
2014	WILLIAMS AIR FORCE BASE	01	ROD Amendment	09	AZ	AZ7570028582
Flushing						
2013	JACKSON PARK HOUSING COMPLEX (USNAVY)	01	ROD Amendment	10	WA	WA3170090044
Fracturing						
2012	US NASA MARSHALL SPACE FLIGHT CENTER	03	ROD	04	AL	AL1800013863
2013	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	01	ESD	09	CA	CA4570024337
2014	SHARPE ARMY DEPOT	01	ESD	09	CA	CA8210020832
In well Air Stripping						
2013	NEW CASSEL/HICKSVILLE GROUND WATER CONTAMINATION	01	ROD	02	NY	NY0001095363
2014	WILLIAMS AIR FORCE BASE	01	ROD Amendment	09	AZ	AZ7570028582
Multi phase Extraction						
2013	JACKSON PARK HOUSING COMPLEX (USNAVY)	01	ROD Amendment	10	WA	WA3170090044
2013	WILLIAMS AIR FORCE BASE	02	ROD Amendment	09	AZ	AZ7570028582

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Groundwater Remedies Selected in Decision Documents From FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
Permeable Reactive Barrier						
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387
2013	CAMP LEJEUNE MILITARY RES. (USNAVY)	17	ROD	04	NC	NC6170022580
2014	CIDRA GROUNDWATER CONTAMINATION	01	ROD	02	PR	PRN000204538
2014	GMH ELECTRONICS	01	ROD	04	NC	NCN000410161
2013	PEERLESS PLATING CO.	01	ROD Amendment	05	MI	MID006031348
2013	SOUTH WEYMOUTH NAVAL AIR STATION	14	ROD	01	MA	MA2170022022
2014	TRAVIS AIR FORCE BASE	06	ROD	09	CA	CA5570024575
Phytoremediation						
2014	NATIONAL FIREWORKS	02	ROD	04	TN	TNSFN0407047
2014	TRAVIS AIR FORCE BASE	06	ROD	09	CA	CA5570024575
Thermal Treatment						
2012	CLEBURN STREET WELL	02	ROD Amendment	07	NE	NED981499312
2013	JACKSON PARK HOUSING COMPLEX (USNAVY)	01	ROD Amendment	10	WA	WA3170090044
2014	MATTIACE PETROCHEMICAL CO., INC.	01	ROD Amendment	02	NY	NYD000512459
2013	WILLIAMS AIR FORCE BASE	02	ROD Amendment	09	AZ	AZ7570028582
Unspecified In Situ Treatment						
2014	BRESLUBE-PENN, INC.	01	ESD	03	PA	PAD089667695
2014	CIDRA GROUNDWATER CONTAMINATION	01	ROD	02	PR	PRN000204538
2013	ORLANDO GASIFICATION PLANT	01	ROD	04	FL	FLD984169235
MONITORED NATURAL ATTENUATION						
2013	ALAMEDA NAVAL AIR STATION	02	ROD	09	CA	CA2170023236
2012	ALLEGANY BALLISTICS LABORATORY (USNAVY)	11	ROD	03	WV	WV0170023691
2013	CAMP LEJEUNE MILITARY RES. (USNAVY)	15	ROD	04	NC	NC6170022580
2013	CAMP LEJEUNE MILITARY RES. (USNAVY)	17	ROD	04	NC	NC6170022580
2014	CAMP LEJEUNE MILITARY RES. (USNAVY)	24	ROD	04	NC	NC6170022580
2013	CHEMFAX, INC.	01	ROD Amendment	04	MS	MSD008154486
2014	CIDRA GROUNDWATER CONTAMINATION	01	ROD	02	PR	PRN000204538
2012	CROWN CLEANERS OF WATERTOWN INC.	01	ROD	02	NY	NYD986965333

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Groundwater Remedies Selected in Decision Documents From FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2014	DAVISVILLE NAVAL CONSTRUCTION BATTALION CENTER	09	ROD	01	RI	RI6170022036
2012	DEFENSE GENERAL SUPPLY CENTER (DLA)	07	ROD	03	VA	VA3971520751
2013	DEFENSE GENERAL SUPPLY CENTER (DLA)	06	ROD	03	VA	VA3971520751
2012	EDWARDS AIR FORCE BASE	13	ROD	09	CA	CA1570024504
2012	EL TORO MARINE CORPS AIR STATION	08	ROD	09	CA	CA6170023208
2014	FORT WAINWRIGHT	07	ROD	10	AK	AK6210022426
2014	HANFORD 100-AREA (USDOE)	35	ROD	10	WA	WA3890090076
2012	HANFORD 200-AREA (USDOE)	49	ROD	10	WA	WA1890090078
2014	HANFORD 300-AREA (USDOE)	04	ROD	10	WA	WA2890090077
2013	INDIAN HEAD NAVAL SURFACE WARFARE CENTER	07	ROD	03	MD	MD7170024684
2013	JJ SEIFERT MACHINE	01	ROD	04	FL	FLN000410232
2012	KEARSARGE METALLURGICAL CORP.	01	ROD Amendment	01	NH	NHD062002001
2014	LETTERKENNY ARMY DEPOT (PDO AREA)	02	ROD	03	PA	PA2210090054
2014	MARINE CORPS COMBAT DEVELOPMENT COMMAND	21	ROD	03	VA	VA1170024722
2012	MAUNABO URBANO PUBLIC WELLS	01	ROD	02	PR	PRN000205831
2012	MAYWOOD CHEMICAL CO.	03	ROD	02	NJ	NJD980529762
2012	MEDLEY FARM DRUM DUMP	01	ROD Amendment	04	SC	SCD980558142
2014	MILAN ARMY AMMUNITION PLANT	06	ROD	04	TN	TN0210020582
2014	MOFFETT NAVAL AIR STATION	05	ROD Amendment	09	CA	CA2170090078
2012	NAVAL WEAPONS STATION - YORKTOWN	15	ROD	03	VA	VA8170024170
2012	NEW BRIGHTON/ARDEN HILLS/TCAAP (USARMY)	07	ROD Amendment	05	MN	MN7213820908
2012	NEWPORT NAVAL EDUCATION & TRAINING CENTER	07	ROD	01	RI	RI6170085470
2013	NEWPORT NAVAL EDUCATION & TRAINING CENTER	11	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	02	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	06	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	12	ROD	01	RI	RI6170085470
2012	ONALASKA MUNICIPAL LANDFILL	01	ROD Amendment	05	WI	WID980821656
2013	ORLANDO GASIFICATION PLANT	01	ROD	04	FL	FLD984169235
2013	PEOPLES NATURAL GAS CO.	01	ROD Amendment	07	IA	IAD980852578

Groundwater Remedies Selected in Decision Documents From FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2013	PETERSON/PURITAN, INC.	01	ESD	01	RI	RID055176283
2012	PICATINNY ARSENAL (USARMY)	15	ROD	02	NJ	NJ3210020704
2012	PURITY OIL SALES, INC.	01	ROD Amendment	09	CA	CAD980736151
2013	SANFORD DRY CLEANERS	01	ROD	04	FL	FLD032728032
2012	SCIENTIFIC CHEMICAL PROCESSING	03	ROD	02	NJ	NJD070565403
2012	SHENANDOAH ROAD GROUNDWATER CONTAMINATION	01	ROD	02	NY	NYSFN0204269
2014	SOUTH CAVALCADE STREET	01	ROD Amendment	06	TX	TXD980810386
2014	SOUTH WEYMOUTH NAVAL AIR STATION	09	ROD	01	MA	MA2170022022
2014	TRAVIS AIR FORCE BASE	06	ROD	09	CA	CA5570024575
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	09	CA	CA1170090087
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	10	ROD	09	CA	CA1170090087
2012	TUCSON INTERNATIONAL AIRPORT AREA	01	ROD Amendment	09	AZ	AZD980737530
2013	WHITE SWAN LAUNDRY AND CLEANER INC.	01	ROD	02	NJ	NJSFN0204241
2013	WILLIAMS AIR FORCE BASE	02	ROD Amendment	09	AZ	AZ7570028582
2012	WILLOW GROVE NAVAL AIR AND AIR RESERVE STATION	02	ROD	03	PA	PAD987277837
2012	WPSC STEVENS POINT	01	ROD	05	WI	WIN000509983
CONTAINMENT (VERTICAL ENGINEERED BARRIER)						
2014	LCP CHEMICALS INC.	01	ROD	02	NJ	NJD079303020
2014	MATTIACE PETROCHEMICAL CO., INC.	01	ROD Amendment	02	NY	NYD000512459
2013	ORLANDO GASIFICATION PLANT	01	ROD	04	FL	FLD984169235
2013	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	07	ROD	09	CA	CA1170090087
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	09	CA	CA1170090087
CONSTRUCTED TREATMENT WETLAND						
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387
2014	BREWER GOLD MINE	01	ROD	04	SC	SCD987577913
INSTITUTIONAL CONTROLS						
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387
2014	ABERDEEN PROVING GROUND (EDGEWOOD AREA)	29	ROD	03	MD	MD2210020036
2013	AIR FORCE PLANT PJKS	01	ROD	08	CO	CO7570090038

Groundwater Remedies Selected in Decision Documents From FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2013	ALAMEDA NAVAL AIR STATION	02	ROD	09	CA	CA2170023236
2014	ALAMEDA NAVAL AIR STATION	08	ROD	09	CA	CA2170023236
2012	ALLEGANY BALLISTICS LABORATORY (USNAVY)	11	ROD	03	WV	WV0170023691
2012	AMERICAN CYANAMID CO	04	ROD	02	NJ	NJD002173276
2012	AVCO LYCOMING (WILLIAMSPORT DIVISION)	02	ESD	03	PA	PAD003053709
2013	BANDERA ROAD GROUND WATER PLUME	01	ROD	06	TX	TXN000606565
2013	BROOK INDUSTRIAL PARK	01	ESD	02	NJ	NJD078251675
2012	BUNKER HILL MINING & METALLURGICAL COMPLEX	03	ROD Amendment	10	ID	IDD048340921
2013	CALIFORNIA GULCH	01	ESD	08	CO	COD980717938
2013	CAMP LEJEUNE MILITARY RES. (USNAVY)	12	ROD	04	NC	NC6170022580
2013	CAMP LEJEUNE MILITARY RES. (USNAVY)	15	ROD	04	NC	NC6170022580
2013	CAMP LEJEUNE MILITARY RES. (USNAVY)	17	ROD	04	NC	NC6170022580
2014	CAMP LEJEUNE MILITARY RES. (USNAVY)	24	ROD	04	NC	NC6170022580
2014	CAMP PENDLETON MARINE CORPS BASE	05	ROD	09	CA	CA2170023533
2013	CAYUGA GROUNDWATER CONTAMINATION SITE	01	ROD	02	NY	NYN000204289
2012	CENTREDALE MANOR RESTORATION PROJECT	01	ROD	01	RI	RID981203755
2014	CIDRA GROUNDWATER CONTAMINATION	01	ROD	02	PR	PRN000204538
2012	CORNELL DUBILIER ELECTRONICS INC.	03	ROD	02	NJ	NJD981557879
2012	CROWN CLEANERS OF WATERTOWN INC.	01	ROD	02	NY	NYD986965333
2014	DAVISVILLE NAVAL CONSTRUCTION BATTALION CENTER	09	ROD	01	RI	RI6170022036
2012	DEFENSE GENERAL SUPPLY CENTER (DLA)	07	ROD	03	VA	VA3971520751
2013	DEFENSE GENERAL SUPPLY CENTER (DLA)	06	ROD	03	VA	VA3971520751
2012	DIAZ CHEMICAL	02	ROD	02	NY	NYD067532580
2012	DOUGLASS ROAD/UNIROYAL, INC., LANDFILL	02	ESD	05	IN	IND980607881
2014	EAGLE PICHER CAREFREE BATTERY	01	ROD	06	NM	NMD001829506
2012	EAGLE ZINC CO DIV T L DIAMOND	02	ROD	05	IL	ILD980606941
2012	EASTERN MICHAUD FLATS CONTAMINATION	01	ROD Amendment	10	ID	IDD984666610
2012	EDWARDS AIR FORCE BASE	13	ROD	09	CA	CA1570024504
2012	EL TORO MARINE CORPS AIR STATION	08	ROD	09	CA	CA6170023208

Groundwater Remedies Selected in Decision Documents From FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2013	ELLIS PROPERTY	01	ROD Amendment	02	NJ	NJD980529085
2012	EVOR PHILLIPS LEASING	03	ROD	02	NJ	NJD980654222
2013	F.E. WARREN AIR FORCE BASE	14	ROD	08	WY	WY5571924179
2013	FLORIDA STEEL CORP.	02	ESD	04	FL	FLD050432251
2012	FORT GEORGE G. MEADE	17	ROD	03	MD	MD9210020567
2014	FORT GEORGE G. MEADE	13	ROD	03	MD	MD9210020567
2014	FORT WAINWRIGHT	07	ROD	10	AK	AK6210022426
2014	FRENCH, LTD.	01	ROD Amendment	06	TX	TXD980514814
2013	GARVEY ELEVATOR	02	ROD	07	NE	NEN000704351
2014	GMH ELECTRONICS	01	ROD	04	NC	NCN000410161
2012	GRIFFISS AIR FORCE BASE (11 AREAS)	04	ROD	02	NY	NY4571924451
2013	HAMILTON/LABREE ROADS GW CONTAMINATION	01	ROD	10	WA	WASFN1002174
2014	HANFORD 100-AREA (USDOE)	35	ROD	10	WA	WA3890090076
2012	HANFORD 200-AREA (USDOE)	49	ROD	10	WA	WA1890090078
2014	HANFORD 300-AREA (USDOE)	04	ROD	10	WA	WA2890090077
2012	HOOKER (HYDE PARK)	01	ESD	02	NY	NYD000831644
2013	INDIAN HEAD NAVAL SURFACE WARFARE CENTER	07	ROD	03	MD	MD7170024684
2014	INDIAN HEAD NAVAL SURFACE WARFARE CENTER	21	ROD	03	MD	MD7170024684
2014	INDIAN HEAD NAVAL SURFACE WARFARE CENTER	24	ROD	03	MD	MD7170024684
2012	INTERSTATE LEAD CO. (ILCO)	02	ROD Amendment	04	AL	ALD041906173
2013	JJ SEIFERT MACHINE	01	ROD	04	FL	FLN000410232
2012	KEARSARGE METALLURGICAL CORP.	01	ROD Amendment	01	NH	NHD062002001
2012	KOPPERS CO., INC. (MORRISVILLE PLANT)	01	ESD	04	NC	NCD003200383
2014	LCP CHEMICALS INC.	01	ROD	02	NJ	NJD079303020
2014	LETTERKENNY ARMY DEPOT (PDO AREA)	02	ROD	03	PA	PA2210090054
2014	LUSHER STREET GROUND WATER CONTAMINATION	01	ROD	05	IN	IND982073785
2012	MADISON COUNTY MINES	05	ROD	07	MO	MOD098633415
2014	MARINE CORPS COMBAT DEVELOPMENT COMMAND	21	ROD	03	VA	VA1170024722
2014	MATTIACE PETROCHEMICAL CO., INC.	01	ROD Amendment	02	NY	NYD000512459

Groundwater Remedies Selected in Decision Documents From FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2012	MAUNABO URBANO PUBLIC WELLS	01	ROD	02	PR	PRN000205831
2012	MAYWOOD CHEMICAL CO.	03	ROD	02	NJ	NJD980529762
2014	MILAN ARMY AMMUNITION PLANT	06	ROD	04	TN	TN0210020582
2014	MOFFETT NAVAL AIR STATION	05	ROD Amendment	09	CA	CA2170090078
2013	MOUNTAIN HOME AIR FORCE BASE	03	ROD Amendment	10	ID	ID3572124557
2014	NATIONAL FIREWORKS	02	ROD	04	TN	TNSFN0407047
2014	NAVAL WEAPONS INDUSTRIAL RESERVE PLANT	01	ESD	01	MA	MA6170023570
2012	NAVAL WEAPONS STATION - YORKTOWN	15	ROD	03	VA	VA8170024170
2013	NEBRASKA ORDNANCE PLANT (FORMER)	05	ROD	07	NE	NE6211890011
2012	NEW BRIGHTON/ARDEN HILLS/TCAAP (USARMY)	07	ROD Amendment	05	MN	MN7213820908
2013	NEW CASSEL/HICKSVILLE GROUND WATER CONTAMINATION	01	ROD	02	NY	NY0001095363
2013	NEW LYME LANDFILL	01	ESD	05	OH	OHD980794614
2012	NEWPORT NAVAL EDUCATION & TRAINING CENTER	07	ROD	01	RI	RI6170085470
2013	NEWPORT NAVAL EDUCATION & TRAINING CENTER	11	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	02	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	06	ROD	01	RI	RI6170085470
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	12	ROD	01	RI	RI6170085470
2013	NIAGARA MOHAWK POWER CORP. (SARATOGA SPRINGS PLANT)	02	ROD	02	NY	NYD980664361
2014	NORTH CAROLINA STATE UNIVERSITY (LOT 86, FARM UNIT #1)	01	ESD	04	NC	NCD980557656
2012	NORTH PENN - AREA 1	01	ESD	03	PA	PAD096834494
2013	NORTH SANITARY LANDFILL	01	ROD	05	OH	OHD980611875
2012	OLD AMERICAN ZINC PLANT	02	ROD	05	IL	IL0000034355
2014	OLEAN WELL FIELD	02	ROD Amendment	02	NY	NYD980528657
2014	OLEAN WELL FIELD	03	ROD	02	NY	NYD980528657
2012	ONALASKA MUNICIPAL LANDFILL	01	ROD Amendment	05	WI	WID980821656
2013	ORLANDO GASIFICATION PLANT	01	ROD	04	FL	FLD984169235
2013	OUTBOARD MARINE CORP.	04	ROD Amendment	05	IL	ILD000802827
2012	PADUCAH GASEOUS DIFFUSION PLANT (USDOE)	19	ROD	04	KY	KY8890008982

Groundwater Remedies Selected in Decision Documents From FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2013	PEOPLES NATURAL GAS CO.	01	ROD Amendment	07	IA	IAD980852578
2012	PICATINNY ARSENAL (USARMY)	15	ROD	02	NJ	NJ3210020704
2014	PLATTSBURGH AIR FORCE BASE	06	ROD	02	NY	NY4571924774
2012	PURITY OIL SALES, INC.	01	ROD Amendment	09	CA	CAD980736151
2014	REEVES SOUTHEASTERN GALVANIZING CORP.	02	ROD Amendment	04	FL	FLD000824896
2013	ROSE TOWNSHIP DUMP	01	ESD	05	MI	MID980499842
2013	SANFORD DRY CLEANERS	01	ROD	04	FL	FLD032728032
2014	SANGAMO ELECTRIC DUMP/CRAB ORCHARD NATIONAL WILDLIFE REFUGE (USDOI)	02	ROD Amendment	05	IL	IL8143609487
2012	SAVANNA ARMY DEPOT ACTIVITY	08	ROD	05	IL	IL3210020803
2012	SCIENTIFIC CHEMICAL PROCESSING	03	ROD	02	NJ	NJD070565403
2014	SHARPE ARMY DEPOT	01	ESD	09	CA	CA8210020832
2012	SHENANDOAH ROAD GROUNDWATER CONTAMINATION	01	ROD	02	NY	NYSFN0204269
2014	SOUTH CAVALCADE STREET	01	ROD Amendment	06	TX	TXD980810386
2012	SOUTH WEYMOUTH NAVAL AIR STATION	11	ROD	01	MA	MA2170022022
2012	SOUTH WEYMOUTH NAVAL AIR STATION	25	ESD	01	MA	MA2170022022
2013	SOUTH WEYMOUTH NAVAL AIR STATION	04	ESD	01	MA	MA2170022022
2013	SOUTH WEYMOUTH NAVAL AIR STATION	14	ROD	01	MA	MA2170022022
2014	SOUTH WEYMOUTH NAVAL AIR STATION	09	ROD	01	MA	MA2170022022
2012	SPECTRON, INC.	02	ROD	03	MD	MDD000218008
2012	ST. JULIENS CREEK ANNEX (U.S. NAVY)	12	ROD	03	VA	VA5170000181
2012	STRASBURG LANDFILL	00	ESD	03	PA	PAD000441337
2014	TINKER AIR FORCE BASE (SOLDIER CREEK/BUILDING 3001)	01	ROD	06	OK	OK1571724391
2014	TOMAH ARMORY	01	ESD	05	WI	WID980610299
2014	TRAVIS AIR FORCE BASE	06	ROD	09	CA	CA5570024575
2013	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	07	ROD	09	CA	CA1170090087
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	09	CA	CA1170090087
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	10	ROD	09	CA	CA1170090087
2012	TUCSON INTERNATIONAL AIRPORT AREA	01	ROD Amendment	09	AZ	AZD980737530

Groundwater Remedies Selected in Decision Documents From FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2014	VAN DER HORST USA CORPORATION	01	ROD	06	TX	TXD007357932
2012	VELSICOL CHEMICAL CORP. (MICHIGAN)	01	ROD	05	MI	MID000722439
2014	VERONA WELL FIELD	02	ESD	05	MI	MID980793806
2012	WHITE CHEMICAL CORP.	03	ROD	02	NJ	NJD980755623
2013	WHITE SWAN LAUNDRY AND CLEANER INC.	01	ROD	02	NJ	NJSFN0204241
2014	WILLIAMS AIR FORCE BASE	01	ROD Amendment	09	AZ	AZ7570028582
2012	WILLOW GROVE NAVAL AIR AND AIR RESERVE STATION	02	ROD	03	PA	PAD987277837
2012	WPSC STEVENS POINT	01	ROD	05	WI	WIN000509983
2012	WRIGHT-PATTERSON AIR FORCE BASE	01	ESD	05	OH	OH7571724312
ALTERNATIVE WATER SUPPLY						
2012	ABERDEEN CONTAMINATED GROUND WATER	01	ROD	04	NC	NCN000407447
2014	ABERDEEN CONTAMINATED GROUND WATER	01	ROD Amendment	04	NC	NCN000407447
2014	CAMP PENDLETON MARINE CORPS BASE	05	ROD	09	CA	CA2170023533
2013	CAYUGA GROUNDWATER CONTAMINATION SITE	01	ROD	02	NY	NYN000204289
2013	JJ SEIFERT MACHINE	01	ROD	04	FL	FLN000410232
2014	LUSHER STREET GROUND WATER CONTAMINATION	01	ROD	05	IN	IND982073785
2014	MADISON COUNTY MINES	03	ROD	07	MO	MOD098633415
2013	NIAGARA MOHAWK POWER CORP. (SARATOGA SPRINGS PLANT)	02	ROD	02	NY	NYD980664361
2012	ONALASKA MUNICIPAL LANDFILL	01	ROD Amendment	05	WI	WID980821656
2012	VELSICOL CHEMICAL CORP. (MICHIGAN)	01	ROD	05	MI	MID000722439
OTHER REMEDIES						
Fencing and Signs						
2013	68TH STREET DUMP/INDUSTRIAL ENTERPRISES	01	ROD	03	MD	MDD980918387
2012	AMERICAN CYANAMID CO	04	ROD	02	NJ	NJD002173276
2013	BANDERA ROAD GROUND WATER PLUME	01	ROD	06	TX	TXN000606565
2014	MATTIACE PETROCHEMICAL CO., INC.	01	ROD Amendment	02	NY	NYD000512459
2014	REEVES SOUTHEASTERN GALVANIZING CORP.	02	ROD Amendment	04	FL	FLD000824896
2012	VELSICOL CHEMICAL CORP. (MICHIGAN)	01	ROD	05	MI	MID000722439

Groundwater Remedies Selected in Decision Documents From FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
Leachate Control						
2012	BUNKER HILL MINING & METALLURGICAL COMPLEX	03	ROD Amendment	10	ID	IDD048340921
Wetlands Restoration						
2013	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	07	ROD	09	CA	CA1170090087

APPENDIX H

VAPOR INTRUSION REMEDIES SELECTED IN DECISION DOCUMENTS FROM FY 2012-2014

Appendix H

Vapor Intrusion Remedies Selected in Decision Documents from FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
VAPOR INTRUSTION MITIGATION AT EXISTING STRUCTURES						
Active Depressurization Technology						
2012	CROSSLEY FARM	03	ROD	03	PA	PAD981740061
2014	LETTERKENNY ARMY DEPOT (SE AREA)	28	ROD	03	PA	PA6213820503
2014	LUSHER STREET GROUND WATER CONTAMINATION	01	ROD	05	IN	IND982073785
2014	PLATTSBURGH AIR FORCE BASE	06	ROD	02	NY	NY4571924774
Passive Barrier (Impermeable Membrane)						
2013	BANDERA ROAD GROUND WATER PLUME	01	ROD	06	TX	TXN000606565
2012	CROSSLEY FARM	03	ROD	03	PA	PAD981740061
Sub Slab Ventilation						
2013	BANDERA ROAD GROUND WATER PLUME	01	ROD	06	TX	TXN000606565
2012	CROSSLEY FARM	03	ROD	03	PA	PAD981740061
Vapor Intrusion Mitigation (Unspecified)						
2014	LUSHER STREET GROUND WATER CONTAMINATION	01	ROD	05	IN	IND982073785
2013	SCOVILL INDUSTRIAL LANDFILL	01	ROD	01	CT	CT0002265551
2012	SHENANDOAH ROAD GROUNDWATER CONTAMINATION	01	ROD	02	NY	NYSFN0204269
2013	WHITE SWAN LAUNDRY AND CLEANER INC.	01	ROD	02	NJ	NJSFN0204241
2012	WILLOW GROVE NAVAL AIR AND AIR RESERVE STATION	02	ROD	03	PA	PAD987277837
INSTITUTIONAL CONTROLS						
Institutional Controls for Existing Structures						
2014	CAMP LEJEUNE MILITARY RES. (USNAVY)	24	ROD	04	NC	NC6170022580
2014	CIDRA GROUNDWATER CONTAMINATION	01	ROD	02	PR	PRN000204538
2012	GRIFFISS AIR FORCE BASE (11 AREAS)	07	ROD	02	NY	NY4571924451
2014	LETTERKENNY ARMY DEPOT (SE AREA)	28	ROD	03	PA	PA6213820503
2014	OLEAN WELL FIELD	02	ROD Amendment	02	NY	NYD980528657
2013	PEOPLES NATURAL GAS CO.	01	ROD Amendment	07	IA	IAD980852578
2014	PLATTSBURGH AIR FORCE BASE	06	ROD	02	NY	NY4571924774
2013	SCOVILL INDUSTRIAL LANDFILL	01	ROD	01	CT	CT0002265551
2012	SHENANDOAH ROAD GROUNDWATER CONTAMINATION	01	ROD	02	NY	NYSFN0204269

Vapor Intrusion Remedies Selected in Decision Documents from FY 2012-14, Organized by Technology

FY	Site Name	OU	Document Type	Region	State	EPA ID
2014	TRAVIS AIR FORCE BASE	06	ROD	09	CA	CA5570024575
2012	WILLOW GROVE NAVAL AIR AND AIR RESERVE STATION	02	ROD	03	PA	PAD987277837
Institutional Controls for Future Construction						
2014	ALAMEDA NAVAL AIR STATION	08	ROD	09	CA	CA2170023236
2013	CAMP LEJEUNE MILITARY RES. (USNAVY)	17	ROD	04	NC	NC6170022580
2012	CROSSLEY FARM	03	ROD	03	PA	PAD981740061
2012	DEFENSE GENERAL SUPPLY CENTER (DLA)	07	ROD	03	VA	VA3971520751
2013	DEFENSE GENERAL SUPPLY CENTER (DLA)	06	ROD	03	VA	VA3971520751
2014	FORT GEORGE G. MEADE	13	ROD	03	MD	MD9210020567
2013	GREENWOOD CHEMICAL CO.	04	ESD	03	VA	VAD003125374
2014	LETTERKENNY ARMY DEPOT (PDO AREA)	02	ROD	03	PA	PA2210090054
2014	LITTLE VALLEY	02	ESD	02	NY	NY0001233634
2014	LUSHER STREET GROUND WATER CONTAMINATION	01	ROD	05	IN	IND982073785
2014	MATTIACE PETROCHEMICAL CO., INC.	01	ROD Amendment	02	NY	NYD000512459
2012	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	17	ROD	09	CA	CA4570024337
2014	MCCLELLAN AIR FORCE BASE (GROUND WATER CONTAMINATION)	06	ROD	09	CA	CA4570024337
2014	MOFFETT NAVAL AIR STATION	05	ROD Amendment	09	CA	CA2170090078
2014	NAVAL WEAPONS INDUSTRIAL RESERVE PLANT	01	ESD	01	MA	MA6170023570
2014	NEWPORT NAVAL EDUCATION & TRAINING CENTER	12	ROD	01	RI	RI6170085470
2014	OLEAN WELL FIELD	03	ROD	02	NY	NYD980528657
2013	SCOVILL INDUSTRIAL LANDFILL	01	ROD	01	CT	CT0002265551
2014	SHARPE ARMY DEPOT	01	ESD	09	CA	CA8210020832
2013	SOUTH WEYMOUTH NAVAL AIR STATION	14	ROD	01	MA	MA2170022022
2014	SOUTH WEYMOUTH NAVAL AIR STATION	09	ROD	01	MA	MA2170022022
2014	TINKER AIR FORCE BASE (SOLDIER CREEK/BUILDING 3001)	01	ROD	06	OK	OK1571724391
2014	TREASURE ISLAND NAVAL STATION-HUNTERS POINT ANNEX	05	ROD	09	CA	CA1170090087
2014	WILLIAMS AIR FORCE BASE	01	ROD Amendment	09	AZ	AZ7570028582
2012	WILLOW GROVE NAVAL AIR AND AIR RESERVE STATION	02	ROD	03	PA	PAD987277837