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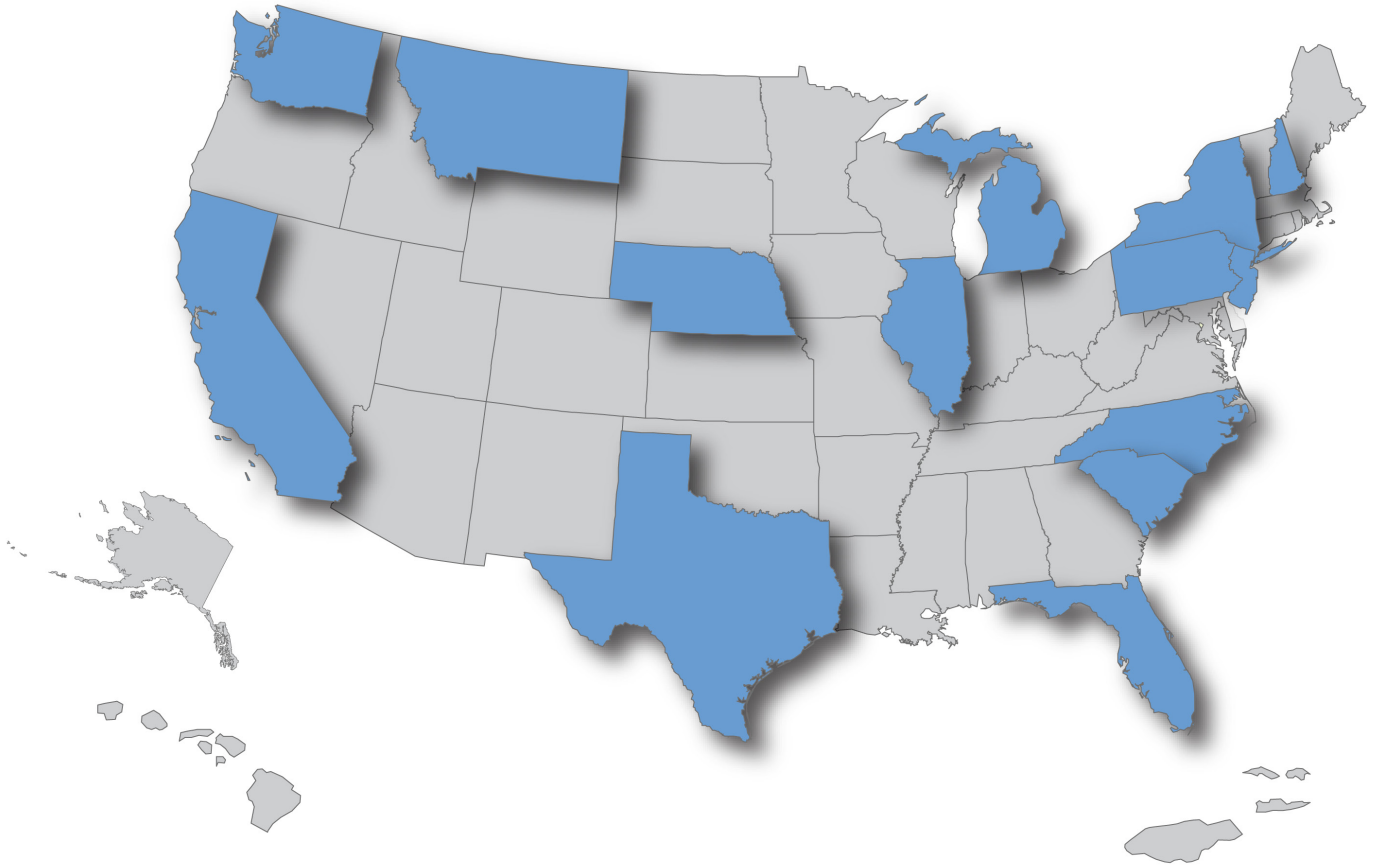
The National LUST Cleanup Backlog:
A Study of Opportunities



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THE NATIONAL LUST CLEANUP BACKLOG: A STUDY OF OPPORTUNITIES

STATE SUMMARY CHAPTER: WASHINGTON STATE

Office of Solid Waste and Emergency Response
Office of Underground Storage Tanks
September 2011

LIST OF ACRONYMS

CSCS	Confirmed and Suspected Contaminated Sites
ECY	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
ESA	Expedited Site Assessment
FR	Financial Responsibility
FY	Fiscal Year
ISIS	Integrated Site Information System
LUST	Leaking Underground Storage Tank
MNA	Monitored Natural Attenuation
MSA	Multi-Site Agreement
MTCA	Model Toxics Control Act
NFA	No Further Action
PCP	Pentachlorophenol
PLIA	Pollution Liability Insurance Agency
RCU	Reported Cleaned Up
RP	Responsible Party
UST	Underground Storage Tank
VCP	Voluntary Cleanup Program
WARM	Washington Ranking Method

EXECUTIVE SUMMARY

Leaks from underground storage tanks (USTs) threaten America's groundwater and land resources. Even a small amount of petroleum released from a leaking underground storage tank (LUST) can contaminate groundwater, the drinking water source for nearly half of all Americans. In surveys of state water programs, 39 states and territories identified USTs as a major source of groundwater contamination.[2] As the reliance on our resources increases due to the rise in population and use, there is a correspondingly greater need to protect our finite natural resources.

From the beginning of the UST program to September 2009, more than 488,000 releases were confirmed from federally-regulated USTs nationwide. Of these confirmed releases needing cleanup, over 100,000 remained in the national LUST backlog. These releases are in every state, and many are old and affect groundwater. To help address this backlog of releases, the United States Environmental Protection Agency (EPA) invited 14 states to participate in a national backlog characterization study.

ANALYSIS OF WASHINGTON STATE DATA

Washington State's Department of Ecology (ECY) has made significant progress toward reducing its LUST cleanup backlog. As of February 2009, ECY had completed 4,411 LUST cleanups, which is 69 percent of all known releases in the state. At the time of data collection, there were 2,003 releases remaining in its backlog.[4] To most effectively reduce the national cleanup backlog, EPA believes that states and EPA must develop backlog reduction strategies that can be effective in most states as well as those with the largest backlogs. EPA invited Washington State to participate and represent EPA Region 10 in its national backlog study.

In this chapter, EPA characterizes Washington State's releases that have not been cleaned up, analyzes these releases based on categories of interest, and identifies potential opportunities for ECY and EPA to explore that might improve the state's cleanup progress and reduce its backlog. Building from the potential cleanup opportunities identified in the study, EPA will continue to work with Washington State to develop backlog reduction strategies.

In Washington, as in every state, many factors affect the pace of cleaning up releases, such as the availability and mechanisms of funding, statutory requirements, and program structure. The recent economic downturn has also had an impact on the ability of many states to make progress on cleanups.

EPA included potential cleanup opportunities in this report even though current circumstances in Washington State might make pursuing certain opportunities challenging or unlikely. Also, in some cases, ECY is already using similar strategies as part of its ongoing program. The findings from the analysis of ECY's data and the potential cleanup opportunities are summarized below in five study areas: stage of cleanup, media contaminated, state regional backlogs, voluntary cleanups, and geographic clusters.

Washington State LUST Data
By the Numbers[1]

Cumulative Historical Releases	6,414
Closed Releases	4,411/69%
Open Releases	2,003/31%
Stage of Cleanup	
Pre-remediation[3]	518/26%
Remediation	1,485/74%
Media Contaminated	
Groundwater	1,364/68%
Soil	630/31%
Other	7/ <1%
Unknown[5]	2/ <1%
National Backlog Contribution	1.9%
Median Age of Open Releases	14.7 years

1 Data were provided in February 2009 by ECY staff and are not identical to UST performance measures on EPA's website, available at: www.epa.gov/oust/cat/camarchv.htm.
2 EPA, *National Water Quality Inventory: 2000 Report*, pp. 50-52. www.epa.gov/305b/2000report/chp6.pdf.
3 Available data do not distinguish between whether a release is in the confirmed release or the site assessment stage.
4 EPA tracks individual releases rather than sites in its performance measures. Therefore, the analyses in this report account for numbers of releases, not sites.
5 Unknown media releases include those releases where the media is unknown as well as those releases where, based on available data, it was not possible to identify the media contaminated.

Stage of Cleanup *(see page WA-12 for more details)*

Washington Finding	Potential Opportunity	Releases
15 percent of releases: • have not finished site assessment; and • are 10 years old or older.	• Provide information and technical assistance to responsible parties (RPs) or implement enforcement actions at old releases. • Encourage RPs and stakeholders to examine public and private funding options.	305
59 percent of releases: • are in remediation; and • are 10 years old or older.	Use a systematic process to explore opportunities to accelerate cleanups and reach closure, such as: • periodic review of release-specific treatment technologies; • review of site-specific cleanup standards; • consider use of institutional or engineering controls; and • pursue alternative funding mechanisms or enforcement actions for old releases that are stalled.	1,191

Washington State's releases are taking a long time to move through the cleanup process and the progress of many old cleanups is stalled. There are several reasons why many releases in the backlog are old, including: many releases are complex and therefore take a long time to address; RPs are not moving cleanups forward quickly; and program issues exist, such as LUST sites generally having low priority rankings compared to other contaminated sites in ECY's cleanup program. EPA believes it is important for ECY to explore opportunities to accelerate cleanups at older releases and to make progress toward bringing these old releases to closure.

Media Contaminated *(see page WA-14 for more details)*

Washington Finding	Potential Opportunity	Releases
43 percent of releases: • contaminate groundwater; • are in remediation; and • are 10 years old or older.	Systematically evaluate cleanup progress at old releases with groundwater impacts and consider alternative cleanup technologies or other strategies to reduce time to closure.	858
6 percent of releases: • impact soil only; • have not finished site assessment; and • are 10 years old or older.	• Continue to use targeted backlog reduction efforts to close old releases with soil contamination with minimal effort. • Encourage RPs to use expedited site assessment to move releases more quickly into remediation.	118

Releases contaminating groundwater have always been the largest part of the national backlog and 68 percent of releases in Washington State are documented as contaminating groundwater. In general, groundwater contamination is more technically complex to remediate and also takes longer to clean up than soil contamination. For old, complex cleanups where long-term remediation is underway, EPA believes it is important for ECY to periodically reevaluate cleanup progress and consider whether the cleanup technology being used is still optimal.

Even though soil contamination is easier to remediate than groundwater contamination, many of Washington State's old releases that impact soil only are unaddressed or in the early stages of cleanup. ECY only grants no further action determinations at sites where all contamination is addressed, including non-LUST contamination. ECY might not consider some of the releases with soil-only contamination as closed because of additional non-LUST contamination. Nevertheless, EPA believes ECY should continue to make progress toward closure for all of its LUST releases.

State Regional Backlogs *(see page WA-16 for more details)*

Washington Finding	Potential Opportunity	Releases
Several key release attributes, including release age, stage of cleanup, and media contamination vary among ECY's regions.	Develop region-specific strategies for moving releases toward remediation and closure.	Variable number of releases[6]

EPA identified differences in the backlog among ECY's four regions. For example, areas of higher population result in larger backlogs, property transfers provide incentives for cleanup, particularly in urban areas and differences in management and administration of the cleanup program might also cause differences between the ECY regions. These differences could reveal opportunities for region-specific backlog reduction. ECY should work with its regions to address their specific backlog issues and facilitate the sharing of information and best practices.

Voluntary Cleanups *(see page WA-17 for more details)*

Washington Finding	Potential Opportunity	Releases
Only 18 percent of releases are in the Voluntary Cleanup Program (VCP); 82 percent are not in the VCP.	• Encourage RPs to enroll in the VCP; • Initiate enforcement actions to help move cleanups toward remediation; or • Develop another process to move cleanups forward.	1,645

Since Washington State does not have a state fund, RPs pay for almost all LUST cleanup work. Private insurance is the primary means of maintaining financial responsibility for Washington State UST owners. A large number of releases occurred prior to the federal or state requirements for financial responsibility. In these cases, a RP's existing insurance policy might not cover prior releases. Therefore, paying for these cleanups are generally "out-of-pocket" expenses for RPs. ECY implemented a fee-based VCP to facilitate its review of assessment and cleanup documents which allows for rapid review of work plans and reports. As its name implies, entry into the VCP is voluntary. ECY issues No Further Action (NFA) letters for releases that completed the VCP and met all of its requirements. ECY also issues NFA determinations for releases addressed through ECY's formal enforcement orders and consent decrees. To date, property transactions are the reason most releases enter ECY's VCP, but EPA believes ECY could improve the state's cleanup rate by encouraging more RPs to enter the VCP. For stalled releases, ECY should consider taking enforcement actions, where appropriate, to move cleanups forward.

Geographic Clusters *(see page WA-18 for more details)*

Washington Finding	Potential Opportunity	Releases
53 percent of releases are clustered within a one-mile radius of five or more other releases.	Target releases within close proximity for multi-site agreements (MSAs) or other resource consolidation opportunities.	Targeted number of releases[7]

ECY has a multi-site cleanup agreement initiative with Shell Oil to clean up 83 releases at different locations affiliated with the company. Another approach ECY could use to address multiple releases is to target cleanup actions at geographically clustered releases. The geographic cluster approach might offer opportunities for new community-based reuse efforts, using economies of scale, and addressing commingled contamination. EPA believes that highlighting geographic clusters of releases and working with state and local governments in area-wide initiatives will accelerate ECY's pace of cleaning up releases. EPA intends to work with the states to conduct further geospatial analyses on clusters of open releases in relation to RPs, highway corridors, local geologic and hydrogeologic settings, groundwater resources, and/or communities with environmental justice concerns. These analyses might reveal additional opportunities for backlog reduction.

6 Opportunities marked as "targeted number of releases" relate to geographic opportunities that will address a limited number of releases within select designated geographic areas.

CONCLUSION

This chapter contains EPA's data analysis of Washington State's LUST cleanup backlog and identifies potential opportunities to reduce the backlog in Washington State. EPA discusses the findings and opportunities for Washington State, along with those of 13 additional states, in the national chapter of this report. EPA will work with states to develop potential approaches and detailed strategies for reducing the backlog. Development of strategies could involve targeted data collection, reviewing particular case files, analyzing problem areas, and sharing best practices. Final strategies could involve EPA actions such as using additional program metrics to show cleanup progress, targeting resources for specific cleanup actions, clarifying and developing guidance, and revising policies. EPA, in partnership with states, is committed to reducing the backlog of confirmed UST releases and to protecting the nation's groundwater, land, and communities affected by these releases.

PROGRAM SUMMARY

State LUST Program Organization and Administration

Responsible parties (RPs) clean up releases with varying levels of oversight from Washington State's Department of Ecology (ECY) Toxics Cleanup Program. ECY addresses all types of contaminated sites under Washington's Model Toxics Control Act (MTCA), including underground storage tanks (USTs). Until recently, RPs conducted the majority of leaking underground storage tank (LUST) cleanups without ECY oversight until they submitted the final closure report. ECY staff reviewed the report to determine if the LUST release no longer posed a threat to human health or the environment. If the cleanup met closure standards, ECY designated the release as "Reported Cleaned Up" (RCU) in its LUST database and included the release in the completed cleanups count reported to EPA. Over the past few years, RCU closures accounted for half the LUST closures reported by ECY on an annual basis to EPA. As of 2009, ECY stopped using the RCU designation. Closure is now only reached through the more formal "No Further Action" (NFA) process.

ECY provides greater oversight in the NFA process. To obtain an NFA determination, the RP must have a formal order with ECY or enter ECY's Voluntary Cleanup Program (VCP).[8] Under the VCP, the RP pays ECY a fee for cleanup oversight and report review and approval. An RP can choose to enroll in the VCP at any time in the cleanup process, even after the final report is submitted. Less oversight reduces the fee amount, but an RP must enroll in the VCP before ECY will review the final cleanup report and issue an NFA determination. For sites with formal orders, ECY is involved throughout the entire cleanup process and seeks cost recovery for all of its oversight costs.

Under the VCP, the RP must address all contamination at a facility, regardless of the source of contamination. For example, if a LUST is present at a wood treating facility that also has pentachlorophenol (PCP) contamination, the RP must meet cleanup standards for both the LUST and PCP contamination before the facility will receive an NFA determination, especially if the contamination from these two sources were commingled. In contrast, under the former RCU process, ECY could report a LUST release as cleaned up without addressing the PCP contamination. Since ECY changed its policy, RPs must address all contaminants to achieve closure, unless the contamination is separate and distinct, in which case the site can be divided into sub-sites which proceed separately through the VCP. According to ECY, a typical gas station is usually not divided into sub-sites because the contamination from multiple releases is either commingled or addressed under one cleanup action (e.g., the releases from spills and overfills and the surface contamination of motor oil from a former service station and auto repair facility).[10]

Cleanup Financing

Washington State does not have a state fund; therefore, RPs privately finance all LUST cleanups, usually through private insurance. Washington State has a unique program to support the availability of private insurance. Washington State's Pollution Liability Insurance Agency (PLIA) acts as the reinsurer for private insurance companies. Washington State reimburses

Washington State LUST Program At a Glance

Cleanup Rate
In fiscal year (FY) 2009, ECY confirmed 43 releases and completed 69 cleanups.[8]

Cleanup Financing
As of February 1994, all storage tank facilities in Washington State were required to have a private financial responsibility (FR) mechanism. Forty-eight percent of open releases were reported to ECY prior to the FR deadline.

Cleanup Standards
The MTCA sets cleanup standards but also allows for site-specific flexibility.

Priority System
Priority is assigned at the facility level and incorporates both LUST and non-LUST contamination.

Releases Per Project Manager
On average, each project manager is responsible for 184 open releases.[10]

Administrative Spending (FY 2006-2007)
$1.2 million.[12]

7 Based on FY 2009 *UST Performance Measures End of Year Activity Report*.
8 Formal orders include administrative orders and consent decrees.
9 Estimate provided by ECY staff.
10 According to Mike Blum, UST & LUST Coordinator, ECY Toxics Cleanup Program.
11 Estimate includes personnel and indirect costs for the LUST program.

insurance companies for costs over a certain percentage of the total insurance. For example, PLIA will cover costs between $75,000 and $1 million at releases where $1 million policies are in place. This reinsurance approach was implemented to help make the cost of obtaining pollution liability insurance for UST owners more affordable, especially for small businesses and local government.

In Washington State, RPs must cover the federal FR requirement. The FR requirement was phased in between 1989 and February 18, 1994, for all releases except those located on tribal lands, which occurred later. In the current backlog, ECY confirmed 38 releases prior to January 1, 1989, and 926 releases between January 1, 1989, and February 18, 1994. Therefore, RPs for these 964 releases might not have had an FR mechanism in place on the date of the release. However, 82 percent of these 964 open releases (794 releases) are in remediation, suggesting the RPs have funding for at least some of the cleanup activities. The remaining 170 releases could be potential orphan cleanups. These releases were confirmed prior to February 18, 1994, and the RPs have not begun remediation.[12]

If an existing UST facility was sold after February 1994 and no site assessment was conducted to determine if a release had occurred, the later discovery of a release would likely not be covered under either the existing (new) insurance policy or the former policy. The pollution liability insurance policies are "claims-made" policies, and policies only include a six-month insurance extension or "tail." If a claim for a release is not made within six months of the expiration of the policy, that release is not covered under the policy. Generally, new owners of existing UST facilities buy new policies, which resets the retroactive coverage date. While buying an UST facility without first determining if the site is contaminated is not a good business practice, there are no regulatory requirements for doing so. The new owner incurs the liability for the pre-existing contamination. However, without adequate monetary resources and no insurance coverage, the contamination often is not addressed. Also, the amount of the insurance deductible payment required of the policyholder can sometimes be an impediment to initiating cleanup action by the site owner.[13]

Cleanup Standards

ECY used to allow RPs to set site specific cleanup standards as long as they met Washington State's established cleanup levels for total combined risk. Previously, a LUST release could achieve RCU status when it had met its cleanup standards based on an informal review. ECY no longer makes RCU determinations. However, in order for a LUST release to achieve an NFA determination, ECY must do a formal detailed review and all LUST and non-LUST contaminants at a facility must meet Washington State's cleanup levels as defined in the MTCA.[14]

Release Prioritization

The MTCA requires ranking of all contaminated sites, including LUSTs, relative to each other based on the level of risk to human health and the environment. ECY ranks all sites on its Hazardous Sites List based on information collected during a site hazard assessment. Scores range from high priority (1) to low priority (5). Facilities with only LUST contamination are often ranked low priority because the single exposure pathway is groundwater and the contaminants pose relatively lower risk to receptors.[15] LUST releases with multiple exposure pathways are given higher priority. However, in determining the level of priority, ECY also takes into account the availability of oversight funds, the potential cost of cleanup, the media contaminated, the level of cooperation shown by an RP, and the public concern about the release.[16] Rank does not play a role for cleanups in the VCP. In addition, facilities for which there is a cooperative funding agreement in place, such as some Department of Defense facilities, might be given higher priority than indicated by their hazard ranking.

The MTCA requires that all sites be ranked to determine their relative priority to all other sites. Sites that are placed on the Confirmed and Suspected Contaminated Sites (CSCS) List get scheduled for a Site Hazard Assessment so the priority ranking can be completed. All cleanup sites, including LUST sites, are evaluated using the Washington Ranking Method (WARM). That screening model evaluates risks to human health and the environment based on various predefined exposure pathways. Because more sites need ranking than there are resources available to complete that work, sites to be ranked are also prioritized. Generally, sites assumed to be a greater risk (higher priority) to human health and the environment are ranked before those that would likely be lower-risk sites. Based on the data provided for this study, 194 of the 886 releases on the CSCS List (22 percent) had a priority rank. None of the 1,117 sites still on the LUST List had been ranked.

12 Pre-remediation releases include those releases where assessments have either not begun or have not been completed.

13 According to Mike Blum, UST & LUST Coordinator, ECY Toxics Cleanup Program.

14 Washington State maintains a Web-based tool, Cleanup Levels and Risk Calculations, to help parties performing cleanups choose appropriate site cleanup levels according to MTCA Chapter 173-340 of the Washington Administrative Code (fortress.wa.gov/ecy/clarc/CLARCOverview.aspx).

15 According to Mike Blum, UST & LUST Coordinator, ECY Toxics Cleanup Program.

16 According to *ECY Focus Sheet 91-107*, available online at: www.ecy.wa.gov/biblio/ftc91107.html.

State Backlog Reduction Efforts

In recent years, ECY conducted file reviews of approximately 1,000 releases to identify releases that could be closed with minimal effort. Of these, 150 releases were given RCU status. In a separate effort, ECY used an EPA grant to hire contractors to assess approximately 120 releases classified by ECY as being in "monitoring" status. As of August 2009, ECY determined these releases required either continued sampling from existing wells, additional site characterization or additional cleanup effort before qualifying for NFA determinations. In another effort, ECY initiated a multi-site agreement (MSA) project. ECY worked with EPA staff through an interagency personnel agreement to identify a set of potential participants covering both releases and companies. Subsequent to that effort, ECY entered into a MSA with Shell Oil.[17] This agreement includes cleanups over the next 10 years at 83 releases in the Northwest region of the state and, if ECY determines it is successful, the MSA might be expanded to include the entire state. In the future, ECY will consider whether to pursue additional MSAs with other companies that have large numbers of open releases.

17 For more information, see: www.ecy.wa.gov/programs/tcp/sites/vcp_sites/vcpOverview.htm.

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ANALYSIS AND OPPORTUNITIES

In this study, EPA analyzed Washington State's federally-regulated releases that have not been cleaned up (open releases). EPA conducted a multivariate analysis on all of ECY's data. However, this technique did not identify strong underlying patterns in the data.[18] Next, EPA divided the open releases into groups that might warrant further attention. EPA used descriptive statistics to examine the distribution of releases by age of release and stage of cleanup and highlighted findings based on ECY's data.[19] EPA then identified potential opportunities for addressing particular groups of releases in the backlog. Many releases are included in more than one opportunity. These opportunities describe actions that EPA and ECY might use as a starting point for collaborative efforts to address the backlog. Although EPA's analysis covered all releases in Washington State, there are 116 releases that are not included in any of the subsets identified in the findings or opportunities due to the way EPA structured the analysis. These releases might also benefit from some of the suggested opportunities and strategies.[20]

EPA's analyses revealed five areas of Washington State's backlog where there are potential opportunities for its further reduction:

- Stage of cleanup
- Media contaminated
- State regional backlogs
- Voluntary cleanups
- Geographic clusters

LUST Data Source

Electronic data for LUST releases occurring between October 1979 and February 2009 were compiled with ECY staff in 2008 and 2009.[21] Data were obtained from ECY's CSCS List and Integrated Site Information System (ISIS) database and selected based on quality and the ability to address areas of interest in this analysis.

Data Limitation

In an effort to consolidate tracking of contaminated sites, ECY is in the process of transferring all LUST release data from its LUST-specific database within ISIS to its CSCS database also within ISIS. At the time of this analysis, 56 percent of open releases had been transferred into the CSCS database. The LUST and CSCS databases track unique data fields related to each contaminated site, so certain release characteristics (e.g., cleanup priority) were not available for all releases in this analysis. Efforts to combine the two datasets yielded complete data attributes for the 17 percent of open releases that were present on both lists.

The LUST and CSCS databases each maintain a data field indicating releases with RCU status that are considered closed and are therefore reported to EPA as cleanups completed. For this analysis, all releases with RCU status were considered closed and all remaining releases were counted as open. The 1,416 LUST releases that have received NFA determinations are not tracked in either the LUST or CSCS databases and therefore fewer release-level data were available for this analysis. Sites that receive an NFA determination are tracked in ECY's NFA Sites List. All releases with NFA determinations were included in the overall closure count.

18 The analytic tree method, a multivariate technique used to identify underlying patterns among large data sets, did not reveal strong patterns within the data. For more information on analytic trees, see Appendix A.

19 For a detailed description of release stages, see the Chapter Notes section (Stage of Cleanup Reference Table).

20 For a detailed description of the Washington State data used in this analysis, see the Chapter Notes section.

STAGE OF CLEANUP

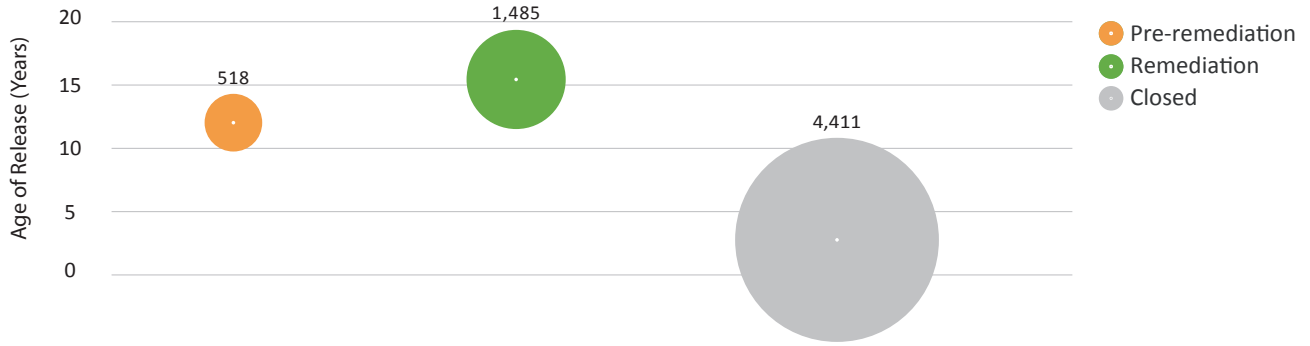
Washington Finding
15 percent of releases: • have not finished site assessment; and • are 10 years old or older.

Potential Opportunity	Releases
• Provide information and technical assistance to RPs or implement enforcement actions at old releases. • Encourage RPs and stakeholders to examine public and private funding options.	305

As of February 10, 2009, the Washington State backlog consisted of 2,003 open releases. EPA analyzed the age of these LUST releases and their distribution among the stages of cleanup. To facilitate analysis, EPA classified Washington State's open releases into two stages of cleanup: the Pre-remediation stage (releases where site assessments have begun) and the Remediation stage (releases where remedial activities have started).[21] While EPA grouped the releases into linear stages for this analysis, EPA recognizes that cleanups might not proceed in a linear fashion. Cleanup can be an iterative process where releases go through successive rounds of site assessment and remediation. However, in the long run, this approach might be both longer and more costly. Acquiring good site characterization can accelerate the pace of cleanup and avoid the extra cost of repeated site assessment.

Since Washington State's LUST program began, ECY has closed 4,411 releases, half of which were closed in less than 3.6 years (Figure 1 below). Of these releases, 2,995 (68 percent) were closed through ECY's RCU status and the remaining 1,416 releases (32 percent) were closed with NFA determinations. The young median age of closed LUST releases might be attributable to the rapid closure of relatively easy to remediate releases. Also, national program policy allows states to report confirmed releases that require no further action at the time of confirmation as "cleanup completed." Therefore, some releases are reported as confirmed and cleaned up simultaneously. In general, in the early days of the LUST program (pre-1998) when many USTs were being removed and legacy contamination was being discovered, ECY did not classify a number of those as LUST sites if the cleanup involved removal and disposal of only a small volume of contaminated soil. That small volume of soil was considered incidental during removal of tanks and piping. Therefore, the total number of LUST sites in Washington State would have been larger and the percentage of cleanups completed would also have been higher.

Figure 1. Age of Releases among Stages of Cleanup



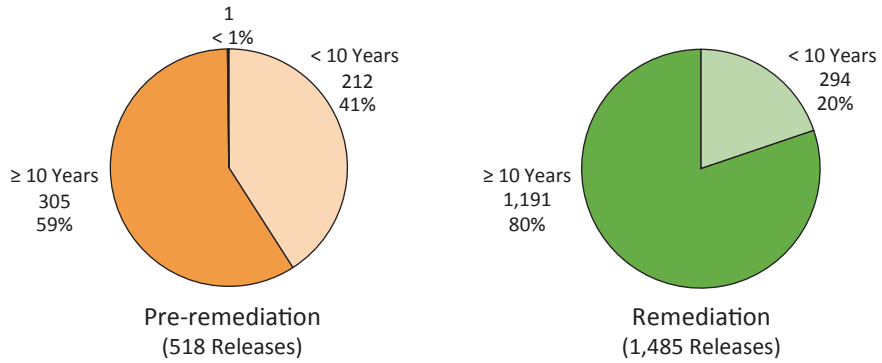
The white dot at the center of each circle represents the median age of releases. Each circle is labeled with, and scaled to, the number of releases within each stage. Included in the release counts and size of circles are one open release and 40 closed releases for which release age is unknown. These releases are not part of the median age calculation.

21 Releases were classified into stages based on available data and discussion with ECY staff. For more information, see the Chapter Notes section.

ECY initiated two projects to look for releases that could be closed with minimal effort.[22] ECY staff closed 150 releases based on file reviews and are currently pursuing final sampling at another group of releases with groundwater contamination. States might find opportunities for closure with minimal effort at lower priority releases where little or no remedial work is required to reach closure standards or at releases that have met closure standards but have not finished closure review.

LUST releases in the ECY's backlog are significantly older than closed releases. According to ECY, nearly all LUST releases have completed site assessments, although EPA cannot confirm this with the available data. Figure 2 below shows the backlog of open releases by age and stage of cleanup and allows for the identification of older releases by stage. Figure 2 shows there are 305 releases in the Pre-remediation stage (15 percent of the backlog) that are 10 years old or older. ECY's data indicate that these releases have not moved into remediation quickly. Providing information and technical assistance to RPs, encouraging the use of the VCP or pursuing enforcement action of old releases could move releases toward remediation and more rapid cleanup. ECY has initiated a regular process of sending letters to RPs every one-to-two years to encourage cleanup activities. ECY should encourage RPs and communities to look at other funding options such as other public and private funding sources to facilitate assessment, cleanup, and reuse. Where there is no viable RP, ECY can encourage the use of petroleum brownfields grants for low priority releases.

Figure 2. Release Age Distribution among Stages of Cleanup



Washington State has many old releases in the Remediation stage. Approximately 75 percent of all open releases (1,485 releases) are in the Remediation stage (Figure 1). Fifty-nine percent of Washington State's releases (1,191 releases) are in the Remediation stage and are 10 years old or older (Figure 3, page 14). This older group of releases represents 80 percent of the releases in the Remediation stage. The data might overinflate the numbers of releases actually in remediation. In ECY's data management process, when a LUST release entered the remediation phase, its status in the database was changed to "cleanup in progress." The classification of "cleanup in progress" would have been given to a release where initial soil removal was implemented. However, in many cases, the impacted groundwater issues were never addressed and the state database shows no further work is currently "in progress." ECY's current practice is to not move releases backwards in its status even if the site has been stalled for many years. So, for many sites that are in the Remediation stage, initial cleanup might have occurred years ago but no further work is currently being conducted.[23]

Because EPA only has the date that a release was confirmed but not for when it moved from one stage to the next (i.e., from assessment to remediation), EPA can calculate the overall age of the release but not the actual time spent in the Remediation stage. It is possible that some of these releases might have only recently begun remediation. Increasing efficiency and

Washington Finding
59 percent of releases: • are in remediation; and • are 10 years old or older.

Potential Opportunity	Releases
Use a systematic process to explore opportunities to accelerate cleanups and reach closure, such as: • periodic review of release-specific treatment technologies; • review of site-specific cleanup standards; • consider use of institutional or engineering controls; and • pursue alternative funding mechanisms or enforcement actions for old releases that are stalled.	1,191

22 See State Backlog Reduction Efforts in the Program Summary.

23 According to Mike Blum, UST & LUST Coordinator, ECY Toxics Cleanup Program.

getting releases through the cleanup process as quickly as possible will expedite the reduction of the backlog. ECY should establish a systematic process to evaluate existing releases in remediation and optimize cleanup approaches, including choice of technology and site-specific risk-based decision-making. This process might save ECY resources and bring releases to closure more quickly. If releases are stalled, ECY should encourage RPs and stakeholders to pursue alternative public and private funding sources, particularly petroleum brownfields grants in the case of low priority releases with no viable RP. ECY should also consider enforcement actions against RPs that are not moving forward with cleanups.

MEDIA CONTAMINATED

Washington Finding

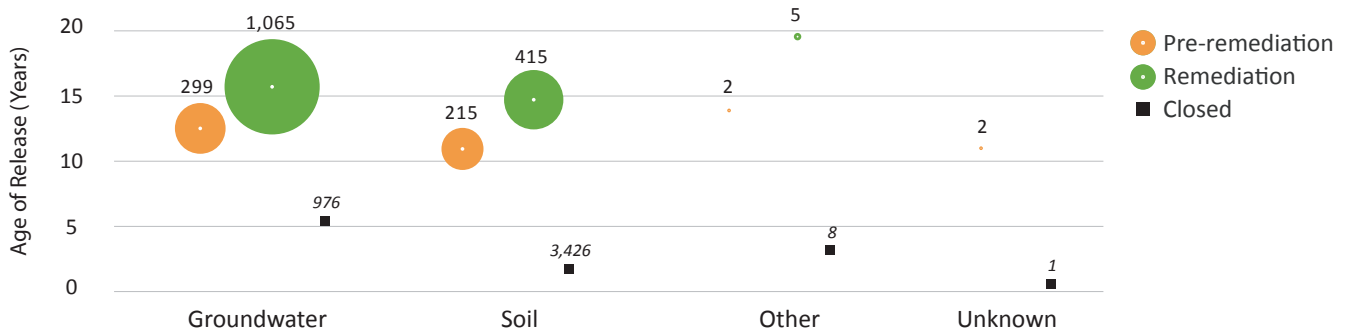
43 percent of releases:
- contaminate groundwater;
- are in remediation; and
- are 10 years old or older.

Potential Opportunity	Releases
Systematically evaluate cleanup progress at old releases with groundwater impacts and consider alternative cleanup technologies or other strategies to reduce time to closure.	858

Groundwater is an important natural resource at risk from petroleum contamination. Releases impacting groundwater make up the majority of Washington State's backlog. In general, groundwater contamination takes longer and is more expensive to clean up than soil contamination. In this study, EPA examined media as a factor contributing to the backlog. The following analysis classified media contamination into four categories: groundwater (1,364 open releases), soil (630 open releases), other media, which includes vapor and surface water (seven open releases), and "unknown" media, which includes releases with no media specified (two open releases).[24]

In Washington State, 68 percent of open releases (1,364 releases) involve groundwater contamination; these releases have a median age of 15.0 years (Figure 3 below). In contrast, only 22 percent of closed releases (976 releases) impacted groundwater. These closed releases have a significantly younger median age of 5.6 years compared to the median age of open releases (Figure 3). Of the 1,065 Remediation stage releases that impact groundwater, 81 percent (858 releases) are 10 years old or older (Figure 4, page 15). This subset of older releases that contaminate groundwater and are in remediation accounts for 43 percent of Washington State's total backlog. Groundwater contamination is typically more complex and difficult to remediate. However, if ECY could identify opportunities to improve cleanup efficiency, ECY might be able to accelerate the pace of cleanups. For example, encouraging RPs to reevaluate the cleanup progress, current contaminant levels, and treatment technologies might move releases through remediation faster.

Figure 3. Age of Releases by Media Contaminated and Stage of Cleanup



Squares indicating closed releases are not scaled to the number of releases in that stage.

24 For a detailed description of contaminated media classifications, see the Chapter Notes section.

The use of institutional or engineering controls can also reduce the time to closure by eliminating exposure pathways and allowing for less stringent cleanup standards, where protective and appropriate. ECY has occasionally used institutional controls as a remedy to minimize exposure to contamination. For example, restrictive covenants have been in place at 31 closed releases since 1991.

According to ECY, there are additional institutional controls used through the NFA process, but data were unavailable for this analysis. ECY has implemented a formal five-year review process for releases with institutional controls to ensure the cleanups are still protective of human health and the environment.

Releases that contaminate soil only represent a potential threat to groundwater resources and contaminate properties in neighborhoods and communities. Contaminated soil can typically be cleaned up faster than contaminated groundwater. Most of Washington State's releases with soil contamination have been closed, but those releases that remain open are significantly older than the closed releases with soil-only contamination. Thirty-one percent of the Washington State backlog (630 releases) involves soil contamination and has a median age of 14.1 years, compared to 78 percent of closed releases (3,426 releases), half of which were closed in less than 2.8 years (Figure 3). ECY might not consider some of these soil cleanups closed because they are sites with additional non-LUST contamination present. However, 118 soil cleanups (6 percent of the backlog) have not begun remediation 10 years or more after the release was confirmed (Figure 5 below).

ECY can encourage RPs to use expedited site assessments to help rapidly characterize site conditions and move releases into remediation and to closure sooner. One of the tools available to both regulators and RPs is EPA's *Expedited Site Assessment* (ESA) guide.25 The guide explains the overall ESA process as well as specific site assessment tools and methods. Conducting site assessments efficiently and quickly can help reduce the backlog.

Figure 5. Age Distribution of Pre-remediation Stage Releases with Soil Impacts

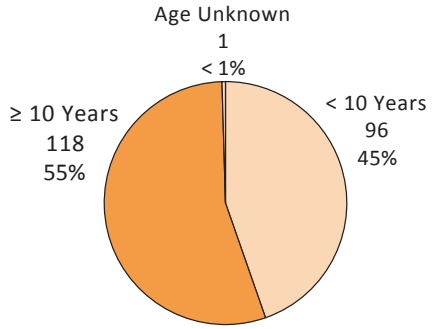
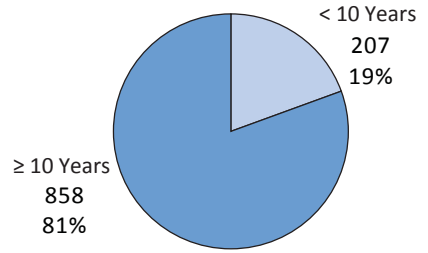


Figure 4. Age Distribution of Remediation Stage Releases with Groundwater Impacts



Washington Finding
6 percent of releases: • impact soil only; • have not finished site assessment; and • are 10 years old or older.

Potential Opportunity	Releases
• Continue to use targeted backlog reduction efforts to close old releases with soil contamination with minimal effort. • Encourage RPs to use expedited site assessment to move releases more quickly into remediation.	118

25 EPA's 1997 guidance document, *Expedited Site Assessment Tools for Underground Storage Tank Sites: A Guide for Regulators* (EPA 510 B-97-001), is available online at: www.epa.gov/OUST/pubs/sam.htm.

STATE REGIONAL BACKLOGS

Washington Finding
Several key release attributes, including release age, stage of cleanup, and media contamination vary among ECY's regions.

Potential Opportunity	Releases
Develop region-specific strategies for moving releases toward remediation and closure.	Variable number of releases[27]

EPA analyzed the cleanup backlogs in ECY's four regions to identify patterns and opportunities for developing targeted backlog reduction strategies within each region. There are significant differences in media contamination and release age among the releases managed by ECY's four regional offices (Figure 6 below left and Table 1 below). The more densely populated Northwest and Southwest regions include the majority of releases. More than half of all open releases (1,055 releases) are located within the Northwest region (Figure 7 below). Releases with groundwater contamination also predominate in these two regions (Table 1). In contrast, soil contamination is more common in the Central and Eastern regions (Table 1). The Northwest and Southwest regions have large numbers of old releases in the Pre-remediation stage (Table 1 and Figure 7). The Southwest region is the only region where there are more releases in the Pre-remediation stage than in the Remediation stage (Table 1 and Figure 7). Urban areas with larger populations can create greater financial incentives for cleanup due to property transfers. A strategic regional approach to these unique backlog characteristics should help reduce the backlog. EPA encourages ECY to look for opportunities to share best practices among its regions and with other states.

Figure 6. ECY Regions

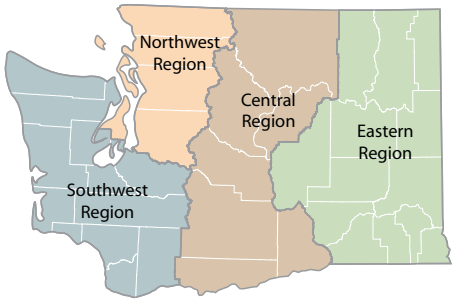
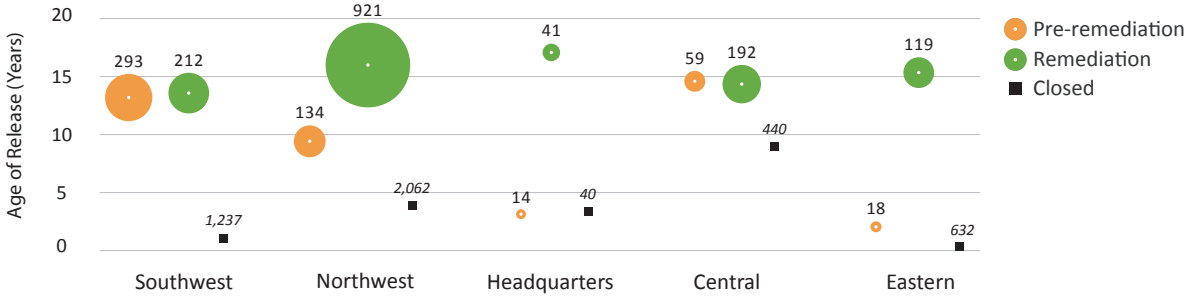


Table 1. Washington State Backlog, by ECY Region

	SOUTHWEST	NORTHWEST	CENTRAL	EASTERN	HEADQUARTERS[28]
State Backlog Contribution	25%	53%	12%	7%	3%
Cumulative Historical Releases	1,742	3,117	691	769	95
Closed Releases	1,237/71%	2,062/66%	440/64%	632/82%	40/42%
Open Releases	505/29%	1,055/34%	251/36%	137/18%	55/58%
Stage of Cleanup					
Pre-remediation	293/58%	134/13%	59/24%	18/13%	14/25%
Remediation	212/42%	921/87%	192/76%	119/87%	41/75%
Media Contaminated					
Groundwater	363/72%	758/72%	146/58%	84/61%	13/24%
Soil	141/28%	293/28%	102/41%	53/39%	41/74%
Other	1/ < 1%	4/ < 1%	1/ < 1%	-	1/2%
Unknown	-	-	2/ 1%	-	-
Median Age of Open Releases	13.3 years	15.4 years	14.5 years	14.3 years	16.2 years

Figure 7. Age of Release by Region and Stage of Cleanup



26 Opportunities marked as "variable number of releases" affect an unknown number of releases potentially including all open releases.

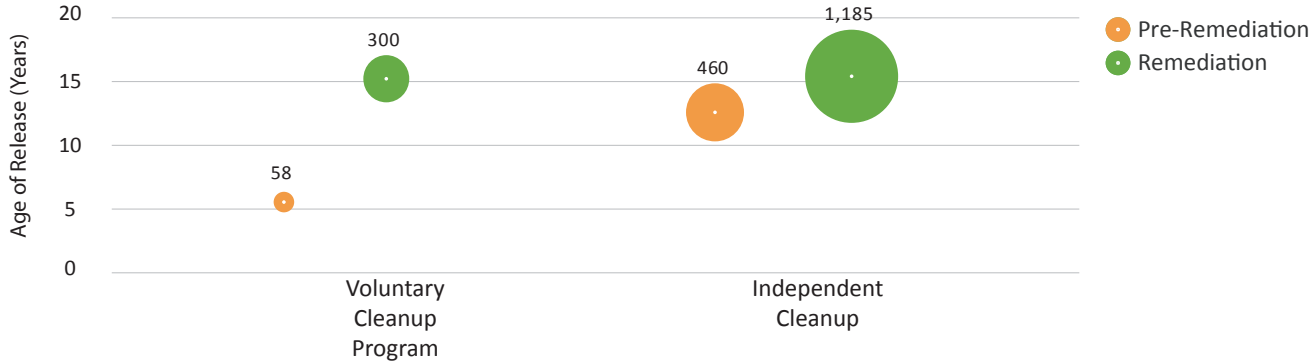
27 While ECY Headquarters is not an official ECY region, it is listed as the "responsible unit" for 55 open releases and was therefore analyzed as a region. ECY Headquarters manages federal facilities in the western part of the state.

VOLUNTARY CLEANUPS

RPs privately finance all LUST cleanups in Washington State typically by private insurance. Therefore, a lack of funds should not be a cause of delayed remedial activities. Until 2009, RPs conducted most cleanup activities independently. ECY was only involved at the end of the process, reviewing documents to make sure that risks were adequately addressed. If ECY's review determined that a cleanup was complete, ECY applied a RCU status to the release and reported it as closed to EPA. In these cases, ECY did not issue an NFA determination letter. RPs must enter the VCP or be subject to an administrative order or consent decree to receive an NFA determination.

In the current backlog, 82 percent of the releases (1,645 releases) are independent cleanups that are not in the VCP (Figure 8 below). As of 2009, ECY no longer uses the RCU process and cleanups are not considered complete unless RPs receives an NFA determination through the VCP or an order or decree. The consequence of this process change is that releases from RPs that do not enroll in the VCP or have an enforcement order will be considered open indefinitely. ECY notes the following advantages to the change in the closure process for independent cleanups; the NFA determination is based on a more rigorous review than the RCU process and addresses all contamination issues at that facility; and the NFA determination is a letter that RPs can "take to the bank" to identify the site as cleaned up for property transaction and loan purposes. The RCU process was a less rigorous review and resulted in a less formal opinion from ECY. The review was focused solely on the LUST issues at a facility. Also, the RCU process was implemented primarily for ECY and EPA reporting purposes and it was not a fee-based review.

Figure 8. Age of Releases by VCP Participation and Stage of Cleanup[28]



Within the current backlog, independent cleanups in the Pre-remediation stage are significantly older than pre-remediation releases enrolled in the VCP. Twelve percent of open releases (230 releases) are independent cleanups that have not yet begun remediation 12.5 years or more since the releases occurred, compared to the 5.8-year median age of Pre-remediation stage VCP releases (Figure 8). Most RPs enroll in the VCP for property transactions and therefore have a financial incentive to move the cleanups forward. ECY's encouragement of RPs to enroll in the VCP and/or their increased use of enforcement actions could help to move cleanups toward remediation.

Washington Finding

Only 18 percent of releases are in the VCP; 82 percent are not in the VCP.

Potential Opportunity	Releases
• Encourage RPs to enroll in the VCP; • Initiate enforcement actions to help move cleanups toward remediation; or • Develop another process to move cleanups forward.	1,645

28 The Independent Cleanup designation includes 42 releases addressed under formal actions.

Although most cleanups are addressed independently by RPs, 18 percent of open releases (358 releases) are currently being addressed through the VCP (Figure 8). The majority of the VCP releases are in the Remediation stage, 42 percent of which (150 releases) are more than 15.5 years old. The age gap between releases in the Pre-remediation and Remediation stages in the VCP is likely due to variable ages of releases entering the VCP (Figure 8). For example, a release might wait 15 years without remediation and then enter the VCP due to a property transaction. Over the past five years, ECY has received approximately 300 VCP applications annually, and approximately 810 cleanups have been completed under the VCP during that period.[29] Because ECY no longer issues RCU determinations for independent cleanups, ECY should encourage RPs to enter the VCP, conduct enforcement actions, or develop other requirements to ensure that RPs will make progress cleaning up and closing releases.

GEOGRAPHIC CLUSTERS

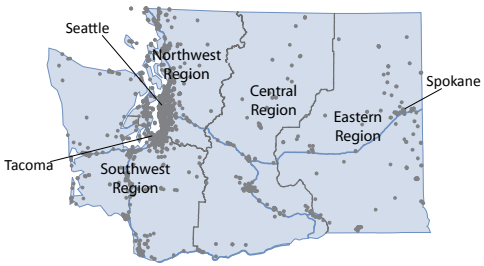
Washington Finding
53 percent of releases are clustered within a one-mile radius of five or more other releases.

Potential Opportunity	Releases
Target releases within close proximity for MSAs or other resource consolidation opportunities.	Targeted number of releases[31]

EPA performed a geospatial analysis to look for alternative ways to address the backlog. While releases in geographic clusters might not have the same RP, they tend to be located in densely populated areas and might present opportunities to consolidate resources and coordinate efforts. Geographic proximity can call attention to releases in areas of interest such as redevelopment, environmental justice, or ecological sensitivity.

State and local governments can utilize geographic clusters for area-wide planning efforts. EPA's analysis identified 1,055 open releases (53 percent of open releases) located within a one-mile radius of five or more other open releases (Figure 9 below left). Of these releases, 576 (29 percent of open releases) are located within a one-mile radius of 10 or more other open releases. Approaching the assessment and cleanup needs of an area impacted by LUSTs can be more effective than focusing on individual sites in isolation from the adjacent or surrounding area. Considering geographically-clustered releases might pave the way for new community-based revitalization efforts, utilize economies of scale to yield benefits such as reduced equipment costs, and present opportunities to develop multi-site cleanup strategies, especially at locations with commingled contamination. ECY has recently approached cleanup in Montesano, Washington, based on a geographic cluster where three adjacent sites are being addressed simultaneously through separate agreed orders. EPA encourages states to look for opportunities for resource consolidation and area-wide planning but also recognizes that this approach is best geared to address targeted groups of releases such as Washington's Montesano initiative as opposed to a state-wide opportunity for every cluster of releases. EPA also recognizes that state laws and regulations might present implementation challenges. For example, in Washington State, if two (or more) facilities have commingled plumes, then ECY considers and addresses those programs as one cleanup site. If the contamination is not commingled, however, they must then be treated as individual sites. EPA intends to conduct further geospatial analyses on clusters of open releases in relation to RPs, highway corridors, local geologic and hydrogeologic settings, groundwater resources, and/or communities with environmental justice concerns. These analyses might reveal additional opportunities for backlog reduction.

Figure 9. Map of All Open Releases, by ECY Region



29 According to Mike Blum, UST & LUST Coordinator, ECY Toxics Cleanup Program.

30 Opportunities marked as "targeted number of releases" relate to geographic opportunities that will address a limited number of releases within select designated geographic areas.

CONCLUSION

In this state chapter, EPA presented the analysis of LUST data submitted by ECY and highlighted information on Washington State's LUST program. Based on the analytic results, EPA identified potential opportunities that could be used to address specific backlog issues within Washington State. Over the course of the entire study, EPA also analyzed data from 13 other states. Findings and opportunities that apply to all 14 states are discussed in the national chapter of the report. Each opportunity represents one potential approach among many to address the backlog. Discussion of the opportunities as a whole is intended as a starting point for further conversations among EPA, ECY, and the other states on strategies to reduce the backlog. Development of the strategies might include targeted data collection, reviewing particular case files, analyzing problem areas, and sharing best practices. The strategies could also involve actions from EPA, such as using additional program metrics, targeting resources for specific cleanup actions, clarifying and developing guidance, and revising policies. EPA, in partnership with states, is committed to reducing the backlog of confirmed UST releases and to protecting the nation's groundwater and land and the communities affected by these contaminated releases.

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www.ecy.wa.gov/programs/tcp/ust-lust/tanks.html

CHAPTER NOTES

WASHINGTON STATE DATA BY ATTRIBUTE

The following table provides details on the data elements of interest in this analysis. Data were provided by ECY staff in 2008 and 2009 for use in this analysis. Several data elements of interest could not be addressed with the information available. All available data elements were analyzed and only those data elements that revealed informative patterns of interest are included in the report.

Data Element	Washington State Data	Use in Analysis
Administrative Cost	Estimates were provided by ECY staff.	Included in the "Program Summary" section and in the national chapter.
Age	Age was calculated for closed releases by subtracting the confirmed release date from the closure date and dividing by 365. Age was calculated for open releases by subtracting the confirmed release date from the data date and dividing by 365. Any values less than -.1 were left blank. Values between -.1 and 0 were counted as 0. All dates were rounded to one decimal point. Ages of releases with insufficient or invalid data were left blank.	Variable in all analyses.
Cleanup Financing	Washington State does not have a state fund and no data on private financing mechanisms were available.	Not applicable.
Cleanup Standards	No site-specific data available.	State-wide standards examined in the national chapter.
Closure Date	Data were obtained from the date field "Release Status Change Date" in "LUSTList_data.xls" and from the "STATUSDATE" in "WA_RawData1009." The former corresponds with releases that achieved an RCU status and the latter corresponds with releases that achieved an NFA status.	Included in the calculation of release age.
Confirmed Release Date	Data were obtained from the "Release Notification Date" field in the "LUSTList_data.xls" and "WA_RawData1009.xls" files.	Included in the calculation of release age.
Data Date	February 10, 2009, is used for all records. This is the date the data were sent.	Included in the calculation of release age.
ECY Region	Data were obtained from the data field "Responsible Unit" in "LUSTList_data.xls" downloaded from ECY's ISIS Web site. There are four ECY regions in Washington State: Central, Eastern, Northwest, and Southwest. Headquarters is also included as an entry in this field.	Examined in "Regional Differences" section.
Federally-Regulated LUST Releases	All releases in the "LUSTList_data.xls" file are federally-regulated LUST releases.	Identifies the appropriate universe of releases for analysis.
Free Product	No data available.	Not applicable.
Institutional and Engineering Controls	Data were obtained from the "TYPE" data field (when "TYPE" = "Restrictive Covenant") in the "UECARgistry_data.xls" ("Environmental Covenant Registry") from ECY's ISIS website. However, this list only tracks releases that have left contaminants on site and require a five-year review process. There are only records of institutional controls for 31 releases.	Data not suitable for analysis.
Latitude and Longitude	Data were obtained from the "Latitude" and "Longitude" fields in the "LUSTList_data.xls" file. Where possible, coordinates for releases without existing latitude and longitude values were obtained by EPA staff by geocoding address and street locations.	Used in geospatial analysis calculating the number of open releases within a one-mile radius of other open releases.

Data Element	Washington State Data	Use in Analysis
Media	Data were obtained from the "Media" field in the "LUSTList_data.xls" file (see Media Reference Table). Releases with groundwater contamination marked (in addition to any other media) were counted as "groundwater." Releases with only soil contamination marked were counted as "soil." Releases with any other combination of media were counted as "other." "Unknown" releases might include those releases for which there are no data available in the database, but for which information is available in other files and releases for which the type of media contaminated is truly unknown. Note that ECY is in the process of eliminating drinking water as a media choice and moving those few releases into the groundwater category.	Examined in the "Media Contaminated" section.
Monitored Natural Attenuation (MNA)	Data were obtained from the "TLU_COMMENT_DS" field in the "r_tab_lust_non_nfa_rcu_w_contam.xls" file. Releases with the value "GW - Monitored Natural Attenuation" were marked as using MNA. These data were only tracked since 2000 and only 12 releases met these criteria.	Data not suitable for analysis.
Methyl Tertiary Butyl Ether	Data were obtained from the "CTLU_COMMENT_DS" data field in "r_tab_lust_non_nfa_rcu_w_contam.xls." These data were only tracked since 2000.	Data not suitable for analysis.
Number of Releases per RP	No data available.	Not applicable
Orphan	ECY has an "abandoned" data field to mark abandoned sites in its UST and LUST databases. This status designation is not routinely used and there is not a clear ECY definition available to indicate which releases qualify as "abandoned." Some LUST releases are truly abandoned, whereby the site owner/operator is no longer present or viable and the property has or might default back to a prior owner, bank, or locality due to back taxes or lack of mortgage payments. Other "abandoned" LUST releases might have an owner/operator but the parties might have no financial resources to affect a cleanup. ECY staff does not recommend using this data field to draw any conclusions.	Data not suitable for analysis.
Proximity	Geospatial analysis performed by EPA revealed the number of other open releases located within a one-mile radius of each open release.	Examined in the "Geographic Clusters" section.
Public Spending	Data were obtained from the "Grant Amount" field in the "AllGrants_id of New and LUST.xls" file. This data set contains information on the amount of public grant money awarded for 30 LUST cleanups between 1997 and 2009. However, ID numbers to link these data to other release-level information are not available. The average grant amount per LUST cleanup based on this data set is $256,044; the average project cost per LUST cleanup based on the same data set is $412,206, indicating that public spending is only a portion of the overall cleanup cost. Because the grant money was spent over several years but reported as a cumulative sum, inflation adjustment is not possible.	Data not suitable for analysis.
Release Priority	Data were only available on the CSCS List, which contains only a subset of LUST releases (ECY is in the process of moving all LUST release data to the CSCS List). Data that are available only on the CSCS List are at the facility level and can be linked only to individual releases through facility IDs. Accordingly, the priority rank for a facility on the CSCS List will be assigned to all releases at that facility. In addition, because this priority rank is based on all contamination, not just LUST-related contamination, LUST releases are in general low priority. Therefore, this data field would not indicate priorities among LUST releases.	No informative patterns were identified.
RP	No data available.	Not applicable.
RP Recalcitrance	No data available.	Not applicable.
Site Owner Type	Data were obtained from the "ownertyp_ds" field in the "r_tab_lust_non_nfa_rcu_w_contam.xls" file. These data were only tracked since 2000. The type of owners that ECY tracks include: Private, Municipal (City/PUD/Town/Port), County, Federal, State, Mixed, Public School, and 1872 Mining Law.	No informative patterns were identified.

Data Element	Washington State Data	Use in Analysis
Staff Workload	Estimates provided by ECY staff.	Examined in the "Program Summary" section and in the national chapter.
Stage of Cleanup	Data were obtained from the "Release Status" field in the "LUSTList_data.xls" file downloaded from ECY's ISIS website. ECY uses several release statuses, such as "Awaiting Cleanup," "Cleanup Started," "Reported Cleaned Up," and "Monitoring" (see Stage of Cleanup Reference Table). There is not an easy way to further separate open releases into Confirmed Release and Site Assessment stages. In Washington State, a site assessment is usually completed to confirm a release.	Variable in all analyses.
Status	Data were obtained from the "Release Status" data field in the "LUSTList_data.xls" file downloaded from ECY's online ISIS website. When a release had an RCU status, it was marked as "Closed;" other releases were marked as "Open." In Washington State, "closed releases" are those releases with an RCU status or NFA determination. An NFA determination is a formal determination from ECY. An RCU status is not a formal agency determination. A list of additional releases closed with NFA determinations was obtained from the "r_tab_lust_nfa_excel_version_4_epa_10-7-09.xls" file. These releases were counted as closed.	Identifies the appropriate universe of releases for tree analysis.
VCP	Data were only available on the CSCS List, which contains a partial subset of LUST releases. (ECY is in the process of moving all LUST release data to the CSCS List.) Data that are available only on the CSCS List are at the facility level and can be linked to individual releases only through facility IDs. However, because LUST releases were added to the CSCS List when they entered the VCP, this data element is representative of the majority of releases in the VCP.	Examined in the "Cleanup Oversight" section.

Media Reference Table

Each release was assigned to a single media type for this analysis, based on the ECY Media data.

ECY Media	Media in this Analysis
Air	Other
Drinking Water	Groundwater
Ground Water	Groundwater
Sediments (Underlying Water)	Other
Soil	Soil
Surface Water	Other
Unknown	Other

Stage of Cleanup Reference Table

Each release was assigned to a specific stage of cleanup for this analysis, based on the ECY Release Status. Releases represented in a supplemental list of releases closed with NFA determinations were counted as closed.

ECY Release Status	Stage in this Analysis
Awaiting Cleanup	Confirmed Release/Site Assessment
Other	Confirmed Release/Site Assessment
Unknown	Confirmed Release/Site Assessment
Cleanup Started	Remediation
Monitoring	Remediation
Reported Cleaned Up	Closed