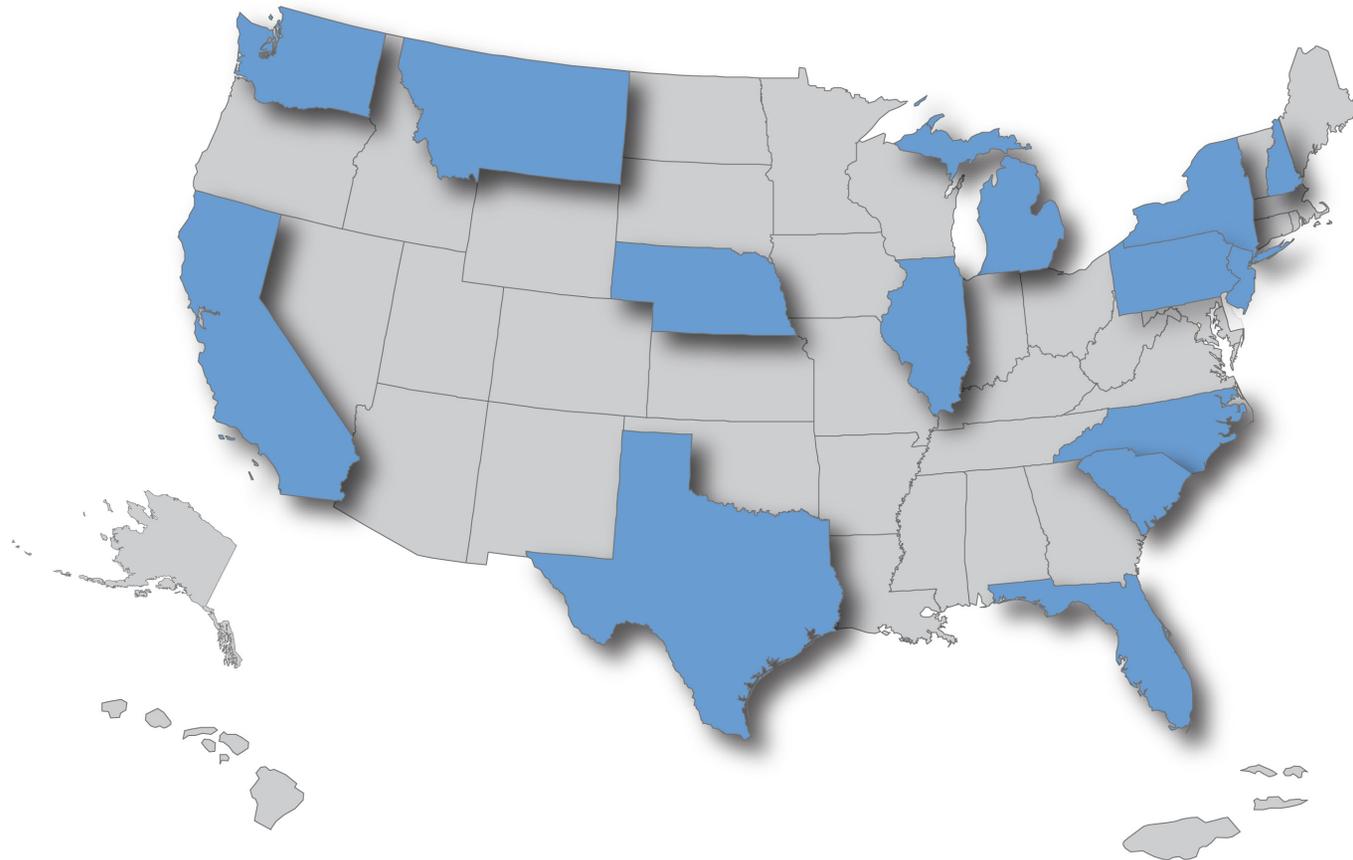


# The National LUST Cleanup Backlog: A Study of Opportunities





## LIST OF ACRONYMS

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CPI	Consumer Price Index
DEQ	Montana Department of Environmental Quality
EPA	United States Environmental Protection Agency
ESA	Expedited Site Assessment
FY	Fiscal Year
LUST	Leaking Underground Storage Tank
MCLs	Maximum Contaminant Levels
MNA	Monitored Natural Attenuation
MSA	Multi-Site Agreement
NA	Not Applicable
PTS	Petroleum Technical Section
RP	Responsible Party
UST	Underground Storage Tank

# 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.<sup>2</sup> 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 over 100,000 needing cleanup 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 MONTANA DATA

Montana's Department of Environmental Quality (DEQ) has made significant progress toward reducing its LUST cleanup backlog. As of March 2009, DEQ had completed 2,022 LUST cleanups, which is 63 percent of all known releases in the state. At the time of data collection, there were 1,189 releases remaining in its backlog.<sup>4</sup> 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 Montana to participate and represent EPA Region 8 in its national backlog study.

In this chapter, EPA characterized Montana's releases that have not been cleaned up, analyzed these releases based on categories of interest, and developed potential opportunities for DEQ and EPA to explore that might improve the state's cleanup progress and reduce its backlog. Building on the potential cleanup opportunities identified in the study, EPA will continue to work with DEQ to develop backlog reduction strategies.

In Montana, 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

## Montana LUST Data By the Numbers<sup>1</sup>

National Backlog Contribution	1.2%
Cumulative Historical Releases	3,211
Closed Releases	2,022/63%
Open Releases	1,189/37%
Stage of Cleanup <sup>3</sup>	
Confirmed Release	173/14%
Site Assessment	186/16%
Remediation	830/70%
Media Contaminated <sup>3</sup>	
Groundwater	890/75%
Soil	235/20%
Other	11/1%
Unknown <sup>5</sup>	53/4%
Median Age of Open Releases	13.2

1 Data were provided in March 2009 by DEQ staff and are not identical to the UST performance measures reported on EPA's website, available at: [www.epa.gov/oust/cat/camarchv.htm](http://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](http://www.epa.gov/305b/2000report/chp6.pdf).

3 The data available for the stage of cleanup and the media contaminated were not up to date at the time of this analysis. The stage of cleanup as defined in this report might not reflect the current cleanup status. Likewise, percentage of releases with groundwater impacts might be understated. See Data Limitations section for more information.

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 contaminated is unknown as well as those releases where the media data were not recorded in Montana's database.

circumstances in Montana might make pursuing certain opportunities challenging or unlikely. Also, in some cases, Montana is already using similar strategies as part of its ongoing program.

The findings from the analysis of DEQ's data and the potential cleanup opportunities are summarized below in eight study areas: stage of cleanup, media contaminated, state regional backlogs, cleanup financing, release priority, number of releases per responsible party (RP), geographic clusters, and data management.

### Stage of Cleanup *(page MT-12 for more details)*

Montana Finding	Potential Opportunity	Releases
18 percent of releases are either: <ul style="list-style-type: none"> <li>• 5 years old or older and site assessment has not started; or</li> <li>• 10 years old or older and still in site assessment.</li> </ul>	<ul style="list-style-type: none"> <li>• Continue to expedite site assessments at old releases to identify releases that can be closed with minimal effort or moved toward remediation and closure.</li> <li>• Implement enforcement actions at stalled releases.</li> </ul>	218
64 percent of releases are: <ul style="list-style-type: none"> <li>• 10 years old or older; and</li> <li>• in remediation.</li> </ul>	Use a systematic process to explore opportunities to accelerate cleanups and reach closure, such as: <ul style="list-style-type: none"> <li>• periodically review release-specific treatment technologies;</li> <li>• consider use of institutional or engineering controls; and</li> <li>• implement enforcement actions if cleanup has stalled.</li> </ul>	756

According to the data, releases in Montana are taking a long time to move through the cleanup process. DEQ prioritizes releases based on risk and some of these older releases are classified as high priority. There are several reasons why many releases in the backlog are old including: releases are technically complex and therefore take a long time to clean up (e.g., many of the high priority releases); releases where active remediation has concluded and the remaining contamination is being addressed through monitored natural attenuation (MNA); and releases remain unaddressed in the backlog for reasons such as a low priority ranking. EPA recognizes DEQ's interest in addressing high priority releases first and in reducing risk without necessarily completing all activities to achieve closure. DEQ has prioritized work efforts to identify and close low priority releases near to closure. DEQ has also recently updated its enforcement policy to address consistent enforcement at LUST releases. EPA believes

it is important for DEQ to continue to explore opportunities to accelerate cleanups at older releases and to continue to work toward bringing all releases to closure.

### Media Contaminated *(page MT-14 for more details)*

Montana Finding	Potential Opportunity	Releases
52 percent of releases: <ul style="list-style-type: none"> <li>• contaminate groundwater;</li> <li>• are in remediation; and</li> <li>• are 10 years old or older.</li> </ul>	Systematically evaluate cleanup progress at old releases with groundwater impacts and consider alternative cleanup technologies or other strategies to reduce time to closure.	622
9 percent of releases: <ul style="list-style-type: none"> <li>• contaminate soil only; and</li> <li>• have not begun remediation.</li> </ul>	Expedite site assessment to identify additional releases with soil contamination that can be: <ul style="list-style-type: none"> <li>• targeted for closure with minimal effort; and</li> <li>• moved more quickly into remediation.</li> </ul>	104

Releases contaminating groundwater have always been the largest part of the national backlog. In Montana, 75 percent of releases are documented as contaminating groundwater, although DEQ states that the percentage is probably higher than what is indicated in the database. 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 to have a system in place for periodic reevaluation of cleanup progress and to reconsider whether the cleanup technology being used is still optimal.

Even though soil contamination is typically easier to remediate than groundwater contamination, many releases with soil-only impacts are still unaddressed or in the early stages of remediation. DEQ states that many of these releases might also impact groundwater but these are not accurately reflected in the database. Releases with soil-only impacts could remain unaddressed because they are lower priority releases. Nevertheless, EPA believes progress toward closure should continue for all cleanups.

## State Regional Backlogs *(page MT-16 for more details)*

Montana Finding	Potential Opportunity	Releases
Site assessments are completed and remediation begins sooner for releases in Montana's western counties than for releases in the state's eastern counties.	Develop region-specific strategies for moving releases toward remediation and closure.	Variable number of releases <sup>6</sup>

EPA identified differences in the characteristics of the backlog between the eastern and western areas of the state. Differences in geology and terrain can make releases in one part of the state more difficult to clean up than releases in other parts of the state. Differences in economic factors and property values also cause differences in cleanup outcomes with property transfers often providing incentives for cleanup, particularly in the more populous parts of the state. The differences between the eastern and western counties might reveal opportunities for DEQ to develop region-specific strategies for backlog reduction.

<sup>6</sup> Opportunities marked as "variable number of releases" relate to programmatic opportunities and affect an unknown number of releases, potentially including all open releases.

## Cleanup Financing *(page MT-18 for more details)*

Montana Finding	Potential Opportunity	Releases
16 percent of releases: <ul style="list-style-type: none"> <li>are privately financed; and</li> <li>have not begun remediation.</li> </ul>	Explore opportunities to ensure that privately-financed cleanups are completed expeditiously, such as: <ul style="list-style-type: none"> <li>conducting outreach to RPs; and</li> <li>implementing enforcement actions at stalled releases.</li> </ul>	186
37 percent of releases: <ul style="list-style-type: none"> <li>are in remediation;</li> <li>contaminate groundwater; and</li> <li>are eligible for the state fund.</li> </ul>	Explore opportunities to move state-funded cleanups toward closure, such as: <ul style="list-style-type: none"> <li>reevaluate the current remedial plan at state fund eligible releases in long-term remediation to identify releases where a more cost-effective plan could be implemented, such as: <ul style="list-style-type: none"> <li>using site-specific risk-based decision making;</li> <li>closure with institutional or engineering controls; and</li> </ul> </li> <li>examine other funding sources including public/private funding options like EPA petroleum brownfields grants for low priority releases or financing claim payments.</li> </ul>	445

EPA and state programs are interested in exploring successful financing strategies for completing cleanups quickly. EPA acknowledges that the recent economic downturn has impacted cleanup financing. EPA also believes the availability of funding for cleanup is essential to reducing the backlog, so in addition to this study, EPA is increasing its focus on oversight of state funds as well as conducting a study of private insurance.

All state programs are experiencing resource limitations, and progress toward backlog reduction is dependent upon their ability to apply existing resources to their backlogs. Fees supporting Montana's fund have not increased since 1989 and are not likely to increase in the near term due to current economic conditions. Therefore, annual accruals to the fund have not kept pace with inflation or the rising cost of cleanups, and expenditures from the fund have slowed. Implementing more cost-effective remedial plans at state-funded cleanups in remediation, or identifying other funding sources such as petroleum brownfields grants for low priority releases with no viable RP, might free up funding to address more state-funded cleanups in the early stages of cleanup. DEQ is proactively reviewing lower priority releases to develop

an inventory of potential petroleum brownfields sites, which can then be used by brownfields grant recipients to identify properties at which to apply their resources.

Privately-financed cleanups account for less than half of open releases but might offer opportunities to accelerate backlog reduction through the use of enforcement actions and outreach to RPs, especially at stalled releases. DEQ states that many of the privately-financed cleanups are the responsibility of the federal government, railroads, and refineries, which typically have the financial means to address releases and are generally cooperative. On April 18, 2011, Montana instituted a legislative change allowing risk-based corrective action and institutional control closures for releases to groundwater. Implementation of this new law will help resolve certain MNA cleanups that do not pose an unacceptable risk to human health.

### Release Priority *(page MT-20 for more details)*

Montana Finding	Potential Opportunity	Releases
4 percent of releases: <ul style="list-style-type: none"> <li>are high priority;</li> <li>have not begun site assessment; and</li> <li>are 5 years old or older.</li> </ul>	Explore options for moving high priority releases forward, such as: <ul style="list-style-type: none"> <li>expediting site assessments of releases to ensure that all releases are ranked;</li> <li>ensuring releases with immediate risks are actively being worked on; and</li> <li>making progress toward closure for all sites.</li> </ul>	45
11 percent of releases meet the criteria for closure.	Continue to expedite the preparation of closure packets for submittal for peer review for releases that meet the criteria for closure.	127

DEQ's data show that some high priority releases are in the early stages of cleanup and that an appreciable number of low priority releases meeting the criteria for closure remain open. High priority releases are often the most complex to clean up. DEQ assigns priority based on site characterization, receptors impacted, and the extent of contamination. Project managers give the most attention to high priority releases. In 2008, DEQ changed its prioritization system. One change moved releases with unknown risk impacts to the high priority category. A consequence of this change is that it moved these previously lower priority releases into the high priority category, increasing the number of unaddressed high priority releases in the 2009 data. Many of these releases had not been assessed because of their former low priority. In the long run, this strategy will allow DEQ to move the unknown risk impact releases toward closure because, with a higher priority ranking, they not only receive increased project management priority, they can also receive funding. DEQ is able to adjust workload to consider redevelopment plans and requests from local governments. With these policies in mind, EPA will work with DEQ to develop strategies to move all releases

toward closure and to ensure that there are no immediate risks to human health and the environment from the high priority releases that have not been addressed.

The priority system change also created a new category called Pending Closures. This new category allows DEQ to distinguish between lower priority releases near to closure from those that are not. Using grant funding from EPA Region 8, DEQ has focused on completing the documents necessary to officially close releases in this category, resulting in an additional 100 closures from 2006 to 2009. Continuing to expedite closure packets for peer review for releases that meet the criteria for closure will further reduce the backlog.

### Number of Releases per RP *(page MT-21 for more details)*

Montana Finding	Potential Opportunity	Releases
20 percent of releases are associated with 12 RPs each with 10 or more releases.	Consider exploring possibilities for multi-site agreements (MSAs) or enforcement actions with RPs associated with multiple releases.	243

EPA analyzed the number of releases per RP to identify the RPs that are the largest potential contributors to the state's cleanup backlog. EPA was able to identify groups of 10 or more releases that are associated with the same RP. In Montana, 12 RPs are each responsible for 10 or more releases and account for 20 percent of the backlog. DEQ and EPA can consider whether to use this information to identify potential participants for multi-site strategies to clean up groups of releases.

### Geographic Clusters *(page MT-22 for more details)*

Montana Finding	Potential Opportunity	Releases
45 percent of releases are clustered within a one-mile radius of five or more releases.	Target releases within close proximity for resource consolidation opportunities.	Targeted number of releases <sup>7</sup>

Another multi-site approach that DEQ has used is to target cleanup actions at geographically-clustered releases. DEQ conducted a pilot project to conduct MNA monitoring at eight geographically-clustered releases. This type of approach may offer opportunities for new community-based reuse efforts, using economies of scale, and addressing commingled contamination. According to DEQ, preliminary results from DEQ's successful pilot indicate the potential for significant resource

<sup>7</sup> Opportunities marked as "targeted number of releases" relate to geographic opportunities that will address a limited number of releases within select designated geographic areas.

savings. EPA believes that highlighting geographic clusters of releases and working with state and local governments in area-wide initiatives will improve DEQ's pace of cleaning up releases. EPA recognizes that state laws and regulations might present implementation challenges. During the MNA pilot project, DEQ had to work through many administrative, legislative, and fiscal challenges to complete the project but DEQ believes it is worth the effort in terms of future benefit and cost savings to the program.<sup>8</sup> EPA intends to work with the states to conduct further geospatial analyses on clusters of 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.

### Data Management *(page MT-23 for more details)*

Montana Finding	Potential Opportunity	Releases
Several key data fields are not included, consistently maintained, or routinely tracked in the DEQ LUST tracking database.	Improve LUST tracking database to enhance program management and backlog reduction efforts.	Variable number of releases

Because Montana's database was not utilized to track project management, multiple data limitations prevent a full assessment of the backlog and associated strategies for backlog reduction. Because of data limitations, EPA could not analyze the media contaminated by releases, contaminants of concern, or state fund eligibility. Additional data management improvements could allow for easier overall program management within DEQ as well as provide an improved tool for developing strategies to reduce the cleanup backlog. DEQ has an initiative to improve data quality and is modifying its database, creating systems analyst positions on staff, and implementing new business processes to track release status and other project management information.

## CONCLUSION

This chapter contains EPA's data analysis of Montana's LUST cleanup backlog and identifies potential opportunities to reduce the backlog in Montana. EPA discusses the findings and opportunities for Montana, 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.

<sup>8</sup> According to Mike Trombetta, Montana DEQ Hazardous Waste Site Cleanup Bureau Chief.

# PROGRAM SUMMARY

## Montana LUST Program At A Glance

### Cleanup Rate

In fiscal year (FY) 2009, DEQ confirmed 19 releases and completed 53 cleanups.<sup>9</sup>

### Cleanup Financing

Of open releases, 57 percent (676 releases) are eligible for state funding.

### Cleanup Standards

Maximum contaminant levels (MCLs) must be used if they have been defined. If no MCL has been established, cleanups must meet risk-based screening levels.

### Priority System

Releases are prioritized for state resources based on receptors impacted and the extent of contamination.

### Average Public Spending on Cleanup

\$57,198 for open releases in the Remediation stage and \$5,982 for closed releases.<sup>12</sup>

### Releases Per Project Manager

On average, each project manager is responsible for 136 open releases.<sup>13</sup>

### Administrative Funding (2008)

\$1.0 million.<sup>14</sup>

## State LUST Program Organization and Administration

Oversight of releases from leaking underground storage tanks (LUSTs) is the responsibility of two sections within the Hazardous Waste Site Cleanup Bureau within the Remediation Division of Montana's Department of Environmental Quality (DEQ). The Petroleum Technical Section (PTS) regulates remediation activities conducted by storage tank owners and operators funded by the state's Petroleum Tank Release Cleanup Fund or self-funded by the responsible parties. The LUST-Brownfields Section manages remedial activities funded by the LUST Trust Fund, brownfield projects, and federally-owned LUSTs. Approximately 86 open releases in Montana's backlog are located in Indian country.<sup>10</sup>

## Cleanup Financing

A total of 57 percent of Montana's backlogged LUST cleanups (676 releases) have been determined to be eligible for state funding. Overseen by the Petroleum Tank Release Compensation Board, the Petroleum Tank Release Cleanup Fund finances the cleanup of accidental releases confirmed on or after April 13, 1989. Tanks must be in compliance with applicable laws and rules at the time of release discovery in order for the release to be eligible for state funding. Tanks owned by railroads, refineries, or the federal government are ineligible for state funding. Limited funding availability has recently slowed expenditures from this fund. Fees supporting this fund have not increased since 1989 and are not likely to increase in the near term due to current economic conditions. Therefore, annual accruals to the fund have not kept pace with inflation or the rising cost of cleanups. Of the additional open releases, 3 percent (41 releases) are financed by the federal LUST Trust Fund, which finances releases if the source of the release cannot be identified or the owner is insolvent or recalcitrant, and 36 percent (430 releases) are privately financed.<sup>11</sup>

## Cleanup Standards

At the time of data collection, Montana law required releases to be cleaned up to strict numerical standards which are similar to MCLs. Montana instituted a legislative change on April 18, 2011, to allow risk-based corrective action and institutional control closures for releases to groundwater. Implementation of this new law will help resolve certain monitored natural attenuation (MNA) cleanups that do not pose an unacceptable risk to human health.

<sup>9</sup> Based on FY 2009 *UST Performance Measures End of Year Activity Report*.

<sup>10</sup> According to Mike Trombetta, Montana DEQ Hazardous Waste Site Cleanup Bureau Chief.

<sup>11</sup> Data for the remaining 4 percent (42 releases) of releases was not listed in the database.

<sup>12</sup> This is the adjusted median of spending by the Petroleum Tank Release Cleanup Fund.

<sup>13</sup> Based on estimate from DEQ staff.

<sup>14</sup> Fund expenditures on administrative expenses including equipment, salaries and benefits, supplies, and other costs.

## Release Prioritization

DEQ assigns a preliminary priority based on the findings of site characterization, the receptors impacted, and the extent of contamination.<sup>15</sup> Releases with unknown risk or media are given higher priority. Responsible parties (RPs) for releases with high priority scores are required to prepare a Remedial Investigation Corrective Action Plan and the releases are assigned to DEQ project managers to be actively addressed. Lower priority releases might not be addressed immediately and may not be assigned to project managers. RPs of low priority releases are allowed to voluntarily conduct cleanup activities but are informed that they will not receive reimbursements until resources become available. Low priority releases may be addressed if opportunities arise to address multiple releases with overlapping contaminant plumes, or if the sale of idle properties would spur development and benefit adjacent communities. DEQ considers redevelopment plans and requests from local governments during release prioritization. DEQ's prioritization system has changed twice, most recently in April 2008.

## State Backlog Reduction Efforts

With funding from EPA's Region 8, DEQ has focused on completing the documents necessary to officially close remediated releases.<sup>16</sup> Temporary employees and interns developed summaries of releases for review in the state's peer review process. This ongoing effort has increased the number of closures over the last several years. Since the time of data collection, Montana identified approximately 150 low priority releases that might be closed with minimal effort. DEQ has assigned a portion of each project manager's workload to process at least one of these releases for closure each month in addition to their necessary work at high priority releases. This strategy has resulted in Montana's closure of over 100 releases in the last two years. Much of the work to facilitate closures was accomplished by temporary employees hired with the grant funding provided by EPA Region 8.

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15 Montana prioritization guidance is outlined in *Technical Guidance Document #15: Prioritization of Petroleum Release Sites*, available online at: [www.deq.mt.gov/lust/techguiddocs/techguide15.mcp.x](http://www.deq.mt.gov/lust/techguiddocs/techguide15.mcp.x).

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16 These releases meet the criteria for closure as set forth in *Technical Guidance Document #9: Petroleum Release Closure (Categorizing Petroleum Releases as Resolved)*, available online at: [www.deq.mt.gov/LUST/TechGuidDocs/techguid9.pdf](http://www.deq.mt.gov/LUST/TechGuidDocs/techguid9.pdf).

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# ANALYSIS AND OPPORTUNITIES

In this study, EPA analyzed Montana's federally-regulated releases that have not been cleaned up (open releases). EPA conducted a multivariate analysis on DEQ's data.<sup>17</sup> This technique provided an objective analysis of multiple release characteristics and allowed EPA to highlight the traits most commonly associated with older releases. 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 DEQ's data.<sup>19</sup> 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 DEQ might use as a starting point for collaborative efforts to address the backlog. Although EPA's analysis covered all releases in Montana, there are 69 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.

EPA's analyses revealed eight areas of Montana's backlog with potential opportunities for its further reduction:

- Stage of cleanup
- Media contaminated
- State regional backlogs
- Cleanup financing
- Release priority
- Number of releases per RP
- Geographic clusters
- Data management

## Data Limitations

According to DEQ staff, the data available for inclusion in this analysis were not up to date for several data fields of interest. Montana's database is used to manage regulatory documents and not to manage project status. DEQ staff informed EPA that the numbers reported for releases in the Site Assessment and Remediation stages are higher than reported in the data. Likewise, the number of releases that contaminate groundwater is higher than indicated in the available data. EPA understands that the absence of data that would indicate whether a release is in a certain stage of cleanup or contaminates various media does not mean that the release is not in that stage or that media is not contaminated. According to DEQ staff, the quality of data on current cleanup status and media contamination is being updated throughout the state's databases since the time of data collection for this analysis.

## LUST Data Source

Electronic data for LUST releases occurring between April 1982 and August 2008 were compiled with DEQ staff in 2008 and 2009.<sup>18</sup> Data were obtained from DEQ's Remediation and Petroleum Tank Release Cleanup Fund databases and selected based on quality and the ability to address areas of interest in this analysis.<sup>20</sup>

<sup>17</sup> For a detailed description of the analytic tree method, see Appendix A.

<sup>18</sup> The Chapter Notes section provides a detailed description of the Montana data used in this analysis.

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

<sup>20</sup> These databases can be queried online at [nris.mt.gov/deq/remsitequery/default.aspx?qt=rrs](http://nris.mt.gov/deq/remsitequery/default.aspx?qt=rrs).

## STAGE OF CLEANUP

As of February 2009, the Montana backlog consisted of 1,189 open releases. EPA analyzed the age of these LUST releases and their distribution among the stages of cleanup. To facilitate analysis, EPA classified Montana's open releases into three stages of cleanup: the Confirmed Release stage (releases where assessments have not begun), the Site Assessment stage (releases where assessments have begun), and the Remediation stage (releases where remedial activities have started).<sup>21</sup> 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 up front can accelerate the pace of cleanup and avoid the extra cost of repeated site assessment.

Since Montana's LUST program began, DEQ has closed 2,022 releases; half of these releases were closed in fewer than 1.2 years (Figure 1 below). 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 time of confirmation as "cleanup completed." Therefore, some releases are reported as confirmed and cleaned up simultaneously.

**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 is one closed release for which release age is unknown. This release is not part of the median age calculation.*

DEQ has pursued backlog reduction efforts. With funding from EPA Region 8, DEQ has closed over 100 lower priority releases that had gone through cleanup but had not completed the necessary closure paperwork. To facilitate this type of work, DEQ created the Pending Closure category during the revision of the prioritization system in 2008 to identify lower priority releases close to closure. In an effort to address limited state fund resources, DEQ staff work at releases until the immediate risks are addressed and then move on to other high priority releases. Release closures are thereby traded off for risk reduction at a greater number of high priority releases. As a result, a number of low priority releases continue to remain in the backlog. EPA recognizes DEQ's interest in addressing high priority releases first and in reducing risk without necessarily completing all activities to achieve closure. However, DEQ should continue to find opportunities for closure with minimal effort at lower

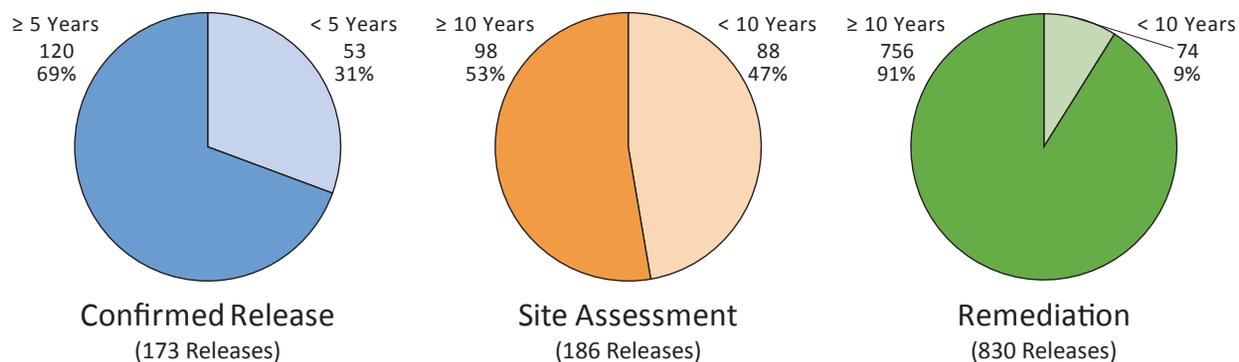
<sup>21</sup> Releases were classified into stages based on available data and discussion with DEQ staff. For more information, see the Chapter Notes section.

priority releases where little or no remedial work is required to reach closure standards, including continued efforts to close releases in the Pending Closure category.

At the time of data collection, DEQ's data showed that Montana had old LUST releases not in remediation. Figure 2 below shows the backlog of open releases by age and stage of cleanup according to the database and allows for the identification of older releases by stage. Figure 2 breaks out the 120 older releases in the Confirmed Release stage (10 percent of the backlog) that have not started assessment, five years or more after the releases were confirmed. It also shows the 98 older releases in the Site Assessment stage (8 percent of the backlog) that have not entered the Remediation stage, 10 years or more after the releases were confirmed. This subset of older releases in the early stages of cleanup accounts for 18 percent of Montana's total backlog, as indicated by the database. As noted in the data limitations section, DEQ's data likely overstate the number of releases not yet in site assessment or still in site assessment. However, although DEQ is working on data improvement, it is not complete and so, for this study, EPA will rely on the original data submission with the caveat that DEQ has conducted more work than what is reflected in this report.

DEQ has performed expedited site assessments (ESAs) with grant funding provided by EPA Region 8. If releases are privately financed and stalled, enforcement may be appropriate to move sites toward cleanup. DEQ has recently updated its enforcement policy to address consistent enforcement at LUST releases. Continuing to expedite site assessments to identify releases to be closed with minimal effort and pursuing enforcement actions in cases where cleanups have stalled could help move more releases to closure.

**Figure 2. Release Age Distribution among Stages of Cleanup**



EPA encourages states to streamline the corrective action process, improve data collection, reduce the overall cost of remediation, and move releases more rapidly toward remediation and closure. To assist states and regulators in implementing these objectives, EPA developed its *Expedited Site Assessment* guide.<sup>22</sup> The guide explains the overall ESA process as well as specific site assessment tools and methods. The ESA process rapidly characterizes site conditions to help support cost-effective corrective action decisions. ESAs can identify releases that can be closed with minimal effort or will provide all the information needed to move a release into remediation. Conducting site assessments efficiently and quickly might help reduce the backlog by accelerating the pace of cleanup and ultimately decreasing overall project costs.

<sup>22</sup> 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](http://www.epa.gov/OUST/pubs/sam.htm).

#### Montana Finding

18 percent of releases are either:

- 5 years old or older and site assessment has not started; or
- 10 years old or older and still in site assessment.

Potential Opportunity	Releases
<ul style="list-style-type: none"> <li>• Continue to expedite site assessments at old releases to identify releases that can be closed with minimal effort or moved toward remediation and closure.</li> <li>• Implement enforcement actions at stalled releases.</li> </ul>	218
<i>Releases 5 years old or older in the Confirmed Release stage</i>	120
<i>Releases 10 years old or older in the Site Assessment stage</i>	98

**Montana Finding**

64 percent of releases are:

- 10 years old or older; and
- in remediation.

**Potential Opportunity****Releases**

Use a systematic process to explore opportunities to accelerate cleanups and reach closure, such as:

- periodically review release-specific treatment technologies;
- consider use of institutional or engineering controls; and
- implement enforcement actions if cleanup has stalled.

756

**Montana Finding**

52 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.

622

Montana also has many old releases in the Remediation stage. DEQ is confident that its data accurately count the numbers of closed versus open releases. Therefore, while the data may underestimate the number of releases that have started remediation, the data still accurately report the releases as open. Based on the reported data, 64 percent of Montana's releases (756 releases) are in remediation and are 10 years old or older (Figure 3, page 15). This older group of releases represents 91 percent of the releases in remediation (Figure 2).

Because EPA only has the dates that a release was confirmed but not when it moved from one stage to the next (e.g., 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. DEQ should consider establishing a systematic process to evaluate existing releases in remediation and optimize cleanup approaches, including choice of technology and site-specific risk-based decision making where feasible. This process might save Montana resources and bring releases to closure more quickly. This could allow Montana to move on to other releases that need attention and remove releases from the backlog within existing budget limitations. This review might also identify opportunities to move stalled cleanups to closure through the use of enforcement actions. 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.

## MEDIA CONTAMINATED

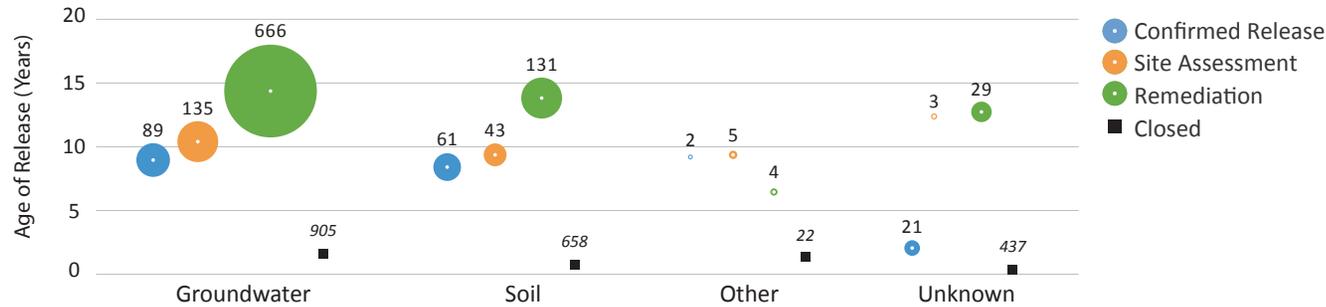
Groundwater is an important natural resource at risk from petroleum contamination. Old releases impacting groundwater make up the majority of Montana's backlog. In general, groundwater contamination takes longer and is more expensive to clean up than soil contamination. In this study, EPA examined media as a factor contributing to the backlog. Using the data submitted by DEQ, the following analysis classified media contamination into four categories: groundwater (890 open releases); soil (235 open releases); other media, which includes vapor and surface water (11 open releases); and "unknown" media, which includes releases with no media specified (53 open releases).<sup>23</sup>

In Montana, at least 75 percent of open releases (890 releases) involve groundwater contamination; these releases have a median age of 13.7 years (Figure 3).<sup>24</sup> In contrast, 57 percent of closed releases (905 releases) for which the media contamination is known impacted groundwater. These closed releases have a significantly younger median age of 1.8 years compared to the median age of open releases (Figure 3). Of the 666 Remediation stage releases that impact groundwater, 93 percent (622 releases) are 10 years old or older (Figure 4, page 15, top right). This subset of older releases that contaminate groundwater and are in remediation makes up 52 percent of Montana's total backlog. DEQ states that the percentage of releases with groundwater contamination is actually higher than what is indicated by the database. Groundwater contamination is typically more complex and difficult to remediate than soil contamination. However, if DEQ could identify opportunities to improve cleanup efficiency, it might be able to accelerate the pace of cleanups. For example, using a systematic process to evaluate cleanup progress, current contaminant levels, and treatment technologies might move releases through cleanup and to closure faster.

<sup>23</sup> For a detailed description of media contamination classifications, see the Chapter Notes section (Media Reference Table).

<sup>24</sup> The data available at the time of this analysis were not up to date. DEQ estimates that the percentage of releases impacting groundwater is higher than what is recorded in the database. DEQ is working on improvements to the quality of data, including media contaminated.

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

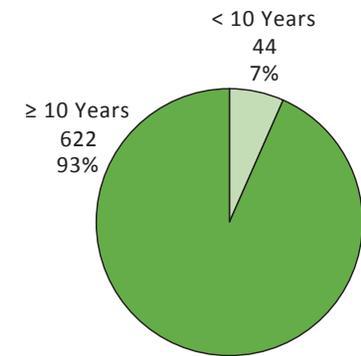


Squares indicating closed releases are not scaled to the number of releases in that stage.

In addition, evaluation of the cleanup progress of releases with groundwater impacts might identify releases where MNA can be applied. In these cases, the timeframe for remediation needs to remain reasonable compared to other methods. Montana currently requires groundwater to be cleaned up to MCLs. Where feasible, MNA can be applied as a remedy. DEQ might reduce cleanup costs by using MNA as a cleanup remedy.

Releases that contaminate soil only are of concern because they represent a potential threat to groundwater resources and contaminate properties in neighborhoods and communities. Although contaminated soil can typically be cleaned up faster than contaminated groundwater, soil cleanups in Montana tend to be as old as groundwater cleanups within each stage of cleanup (Figure 3). In Montana, 9 percent (104 releases) of the backlog is in the early stages of cleanup and contaminates soil only; 61 of these releases remain in the Confirmed Release stage and 43 are in the Site Assessment stage (Figure 3). The cleanup of soil contamination might be deferred for higher priority groundwater contamination. However, Montana’s total number of releases contaminating only soil (235 releases, 20 percent of the backlog) offer potential opportunities for reducing the backlog.<sup>25</sup> Expediting site assessments and moving forward with remediation and closure could help reduce the backlog.

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



**Montana Finding**

- 9 percent of releases:
- contaminate soil only; and
  - have not begun remediation.

**Potential Opportunity** **Releases**

Expedite site assessment to identify additional releases with soil contamination that can be: 104

- targeted for closure with minimal effort; and
- moved more quickly into remediation.

<sup>25</sup> According to DEQ, the number of soil-only releases is probably an overestimate due to data quality issues. Many of these releases might also impact groundwater.

## STATE REGIONAL BACKLOGS

**Figure 5. Map of Eastern and Western Counties<sup>26</sup>**



### Montana Finding

Site assessments are completed and remediation begins sooner for releases in Montana’s western counties than for releases in the state’s eastern counties.

### Potential Opportunity

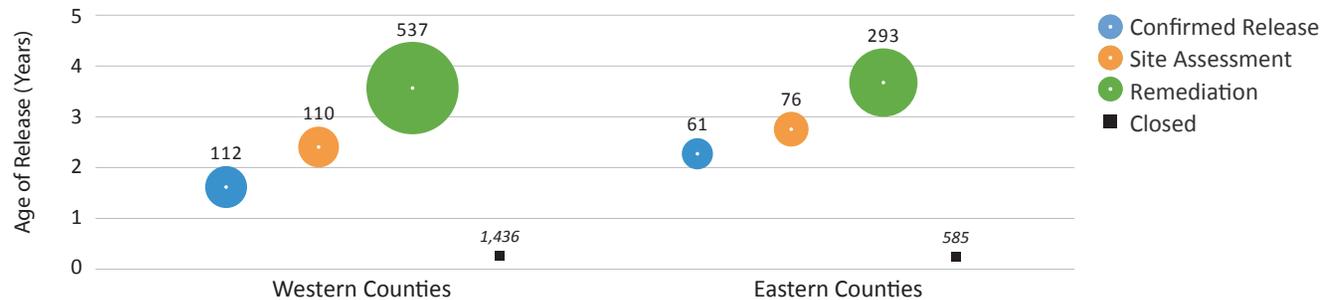
Develop region-specific strategies for moving releases toward remediation and closure.

### Releases

Variable number of releases<sup>27</sup>

EPA analyzed cleanup backlogs within Montana’s eastern and western counties to identify patterns and the opportunity for targeted backlog reduction strategies in the eastern and western parts of the state. Within the Confirmed Release and Site Assessment stages, the 222 releases located in western counties (20 percent of the Montana backlog) tend to be younger than the 137 releases in eastern counties (36 percent of the Montana backlog) (Figures 5 to the left; 6 below; and 7, page 17: Nodes 3.1 and 3.3). This pattern suggests that releases in the western counties move into remediation at a faster rate than releases in the eastern counties. The division of eastern and western counties essentially separates the more densely populated western areas of the state from the less populated eastern counties. It should be noted that an east-west geographic division may be overly simplified. Some areas of western Montana are economically depressed and some areas of eastern Montana are economically robust. However, this geographic analysis captures areas where economic conditions are generally different and how this difference influences release cleanup. DEQ staff confirmed this observation, noting that property values, incomes, and population densities tend to be lower in eastern counties. Urban areas with greater populations can have a greater financial incentive for cleanup due to property transfers. Property transactions are more likely in the western counties and are likely to accelerate the pace of cleanups. Additional efforts to promote and support property transactions at LUST sites statewide through public/private partnerships such as petroleum brownfields grants for low priority releases without a viable RP might help accelerate cleanups and further reduce the backlog. A strategic regional approach to these unique backlog characteristics should help reduce the backlog. EPA encourages DEQ to look for opportunities to share best practices among its regions and with other states.

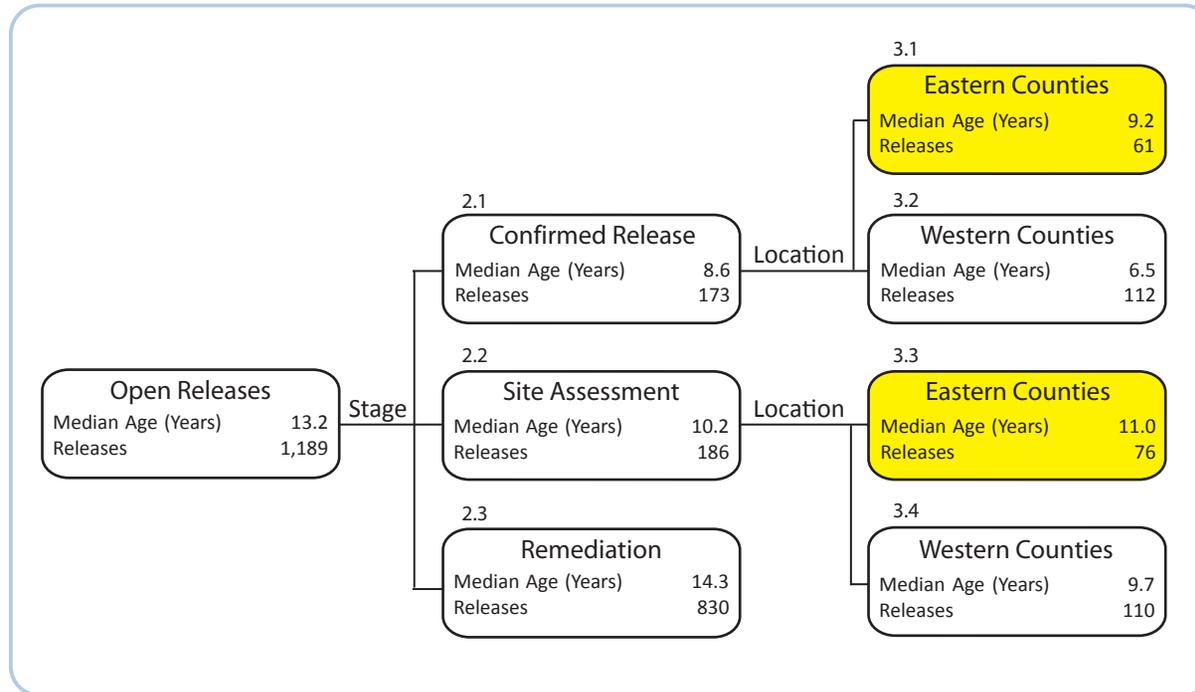
**Figure 6. Age of Releases by Location and Stage of Cleanup**



<sup>26</sup> Counties were demarcated as “western” and “eastern” by DEQ staff.

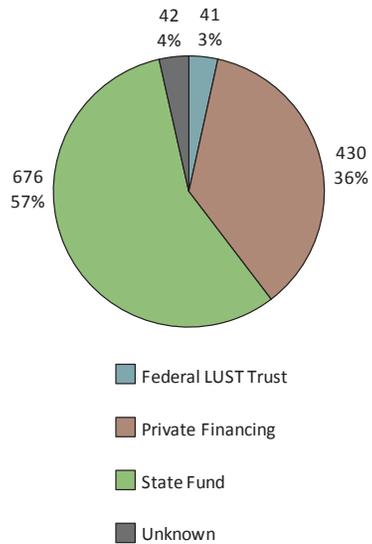
<sup>27</sup> Opportunities marked as “variable number of releases” relate to programmatic opportunities and affect an unknown number of releases, potentially including all open releases.

Figure 7. Tree Analysis of Open Release Age – Regional Focus



## CLEANUP FINANCING

**Figure 8. Distribution of Financial Mechanisms of Open Releases**



### Montana Finding

16 percent of releases:

- are privately financed; and
- have not begun remediation.

### Potential Opportunity

Releases

Explore opportunities to ensure that privately-financed cleanups are completed expeditiously, such as:

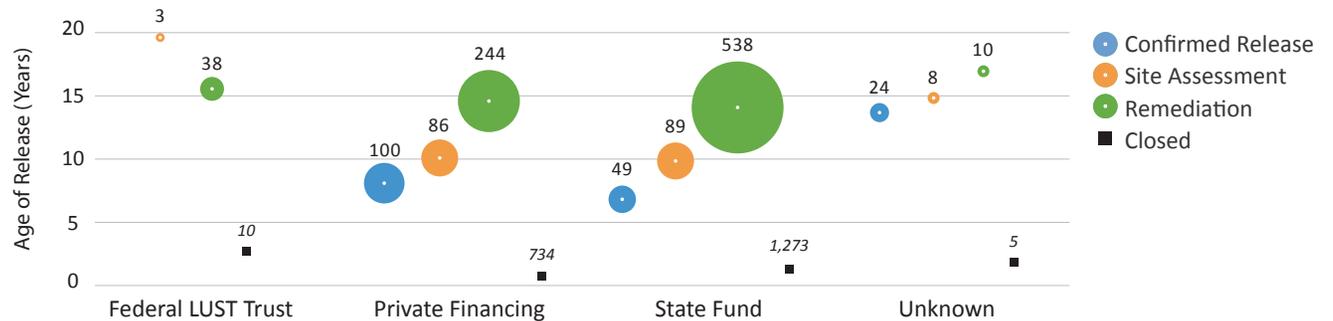
186

- conducting outreach to RPs; and
- implementing enforcement actions at stalled releases.

EPA and state programs are interested in exploring successful financing strategies for completing cleanups quickly. Differences in cleanup rates between those releases covered by state funds and those releases covered by other forms of financial responsibility could provide useful insights into what works in existing programs. EPA acknowledges that the recent economic downturn has impacted cleanup financing. EPA also believes the availability of funding for cleanup is essential to reducing the backlog, so in addition to this study, EPA is increasing its focus on oversight of state funds as well as conducting a study of private insurance. DEQ's data provide an interesting opportunity to explore these areas of interest, since Montana has both state-funded and privately-funded cleanups in its backlog.

In Montana, 36 percent of open cleanups (430 releases) are privately financed (Figure 8 to the left). The age and cleanup stage of these privately-financed cleanups are comparable to state fund eligible releases, with the exception that 43 percent of privately-financed cleanups (186 releases; 16 percent of the total backlog) have not begun remediation, compared to 20 percent of state fund eligible releases (138 releases; 12 percent of the total backlog) (Figure 9 below). According to DEQ, many of the privately-financed cleanups include ineligible releases from federal and railroad RPs and releases from tanks at refineries. These entities typically possess the financial means to address releases. Releases from tanks that were not compliant at the time of the releases or those where the RP has not requested eligibility make up the rest of Montana's privately-financed cleanups. For any privately-funded cleanups that are stalled, conducting outreach to RPs or pursuing enforcement actions where necessary to expedite cleanup activities and closure could further help to reduce the backlog.

**Figure 9. Age of Releases, by Funding Mechanism and Stage of Cleanup**

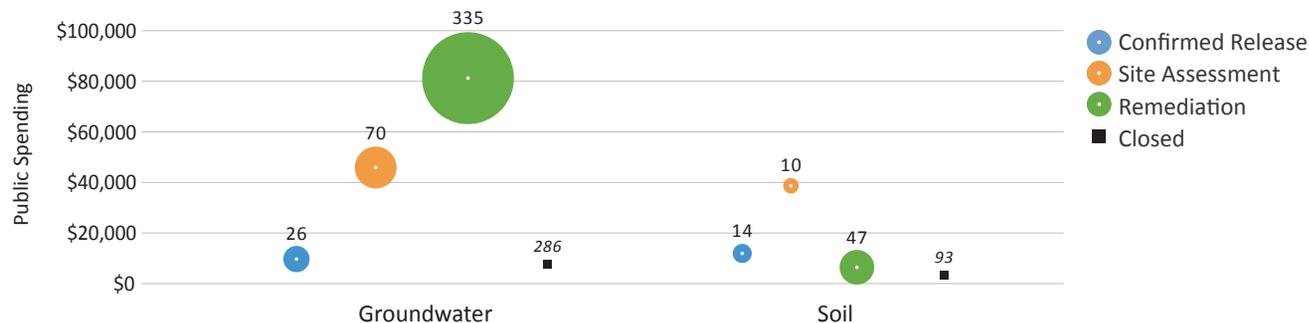


Montana has made progress moving 80 percent of state fund eligible releases (538 releases; 45 percent of the Montana backlog) into the Remediation stage; however, 93 percent of these releases (500 releases) are 10 years old or older (Figures 9 above and 10, page 19, top right). Of the Remediation stage releases eligible for the state fund, 62 percent (335 releases) impact groundwater and have received state funding (Figure 11, page 19). An additional 110 Remediation stage releases impacting groundwater are eligible for state funding, but according to available data, have not received state funds. This brings the subset of old releases with groundwater contamination eligible for state funding to 445 (37 percent of the total backlog). DEQ should continue to explore whether more cost-effective remedial designs implemented at state-funded cleanups in remediation could potentially lead to a reduction in the state fund eligible portion of Montana's backlog. Evaluation of the current contaminant levels and treatment technologies in use at state-funded cleanups that impact groundwater might identify releases where innovative remediation methods can be implemented to accelerate cleanups. These releases may

be complex and difficult to remediate. However, releases may be lingering for other reasons, such as very slow reduction in contamination from the existing remedial systems. If a thorough evaluation determines that active remediation is ineffective in reducing contamination, a less costly cleanup technology such as MNA could be considered as an appropriate remedy.<sup>28</sup> MNA should not be considered a default or presumptive remedy at any contaminated site but if used appropriately, this approach could free up state funds for use at other cleanups and could increase the number of releases that DEQ is able to address and move toward remediation and closure. DEQ noted that MNA may take several years, or decades in some cases, and releases will remain in the backlog for the entire time the release is not closed.

After adjusting for inflation, the median amount spent to date by the state fund on Remediation stage releases contaminating groundwater (\$82,251) is much higher than the median amount spent by the state fund at closed releases contaminating groundwater (\$8,705) (Figure 11).<sup>29</sup> Most state fund eligible releases impact groundwater, are in the Remediation stage, are relatively old, and cost much more to clean up than closed releases affecting groundwater. These findings suggest that cleaning up releases that contaminate groundwater is more expensive today than in the past, possibly because the easiest releases to remediate have already been closed and releases with complex contamination remain in the backlog. Another opportunity DEQ is investigating is the availability of additional funding sources through public/private partnerships such as petroleum brownfields grants for low priority releases without a viable RP. DEQ is proactively reviewing lower priority releases to develop an inventory of potential petroleum brownfields sites, which can then be used by brownfields grant recipients to identify properties at which to apply their resources. In addition, some states have started financing claims through public/private partnerships.

**Figure 11. State Funds Received, by Media Contaminated and Stage of Cleanup<sup>30</sup>**

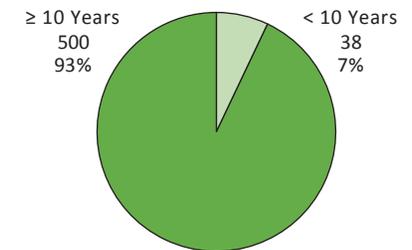


28 For more information regarding the appropriate use of MNA, see [www.epa.gov/swrust1/pubs/tums.htm](http://www.epa.gov/swrust1/pubs/tums.htm) and EPA Directive Number 9200.4-17P, *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites*, available online at: [www.epa.gov/oust/directiv/d9200417.htm](http://www.epa.gov/oust/directiv/d9200417.htm).

29 Annual data on the Petroleum Tank Release Cleanup Fund reimbursement amounts for each release were adjusted for inflation using the consumer price index (CPI). Private spending at releases by RPs and others is not tracked or analyzed in this study, so the cleanup costs might be underestimated.

30 State fund expenditure data are not available for all state fund eligible releases. Therefore, this graphic does not include 117 groundwater cleanups and 29 soil cleanups that are eligible for state funding.

**Figure 10. Age of State Fund Eligible Releases in the Remediation Stage**



#### Montana Finding

37 percent of releases:

- are in remediation;
- contaminate groundwater; and
- are eligible for the state fund.

#### Potential Opportunity

#### Releases

Explore opportunities to move state-funded cleanups toward closure, such as:

- reevaluate the current remedial plan at state fund eligible releases in long-term remediation to identify releases where a more cost-effective plan could be implemented, such as:
  - using site-specific risk-based decision making;
  - closure with institutional or engineering controls; and
- examine other funding sources including public/private funding options like EPA petroleum brownfields grants for low priority releases or financing claim payments.

**Montana Finding**

- 4 percent of releases:
- are high priority;
  - have not begun site assessment; and
  - are 5 years old or older.

**Potential Opportunity Releases**

- Explore options for moving high priority releases forward, such as: 45
- expediting site assessments of releases to ensure that all releases are ranked;
  - ensuring releases with immediate risks are actively being worked on; and
  - making progress toward closure for all sites.

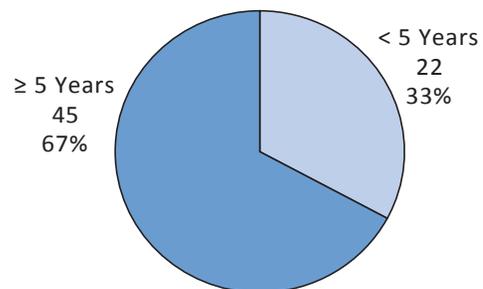
**Montana Finding**

11 percent of releases meet the criteria for closure.

**Potential Opportunity Releases**

- Continue to expedite the preparation of closure packets for submittal for peer review for releases that meet the criteria for closure. 127

**Figure 13. Age of Priority 1 Releases in the Confirmed Release Stage**



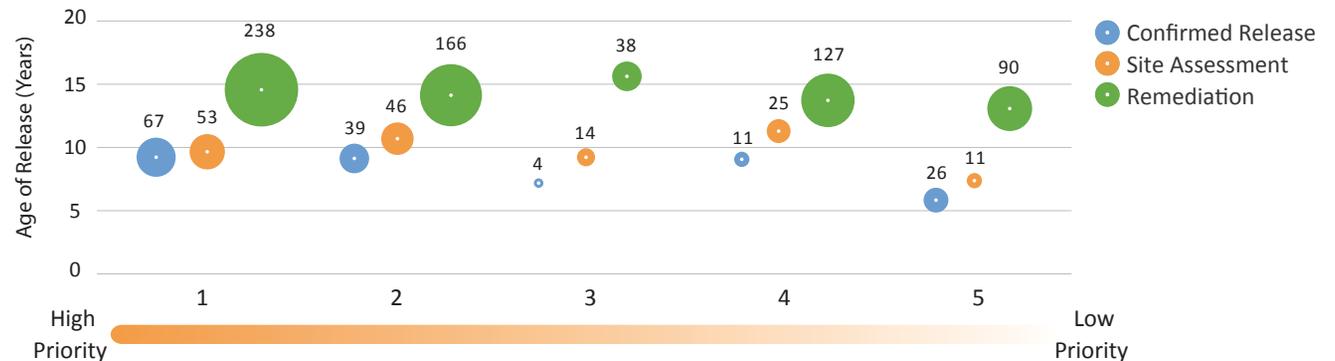
## RELEASE PRIORITY

Many state programs employ prioritization systems to decide how to best allocate state resources for assessments and cleanups. States approach cleanup prioritization differently and there might be opportunities within DEQ's prioritization system to increase the number of closures. DEQ follows its priority rankings as a matter of policy, but can make exceptions on a case-by-case basis. Prior to giving EPA the data in 2009, DEQ revised its prioritization system resulting in an increase in the number of high priority releases. The revision to the priority system added previously lower priority releases with unknown impacts into the high priority category to facilitate work on these sites.

The data collected in 2009 show a number of relatively old, high priority releases not in remediation. Although there is not a substantial difference in age distribution among priority categories, analysis of high priority (Priority 1) releases indicates that 45 releases (4 percent of the backlog) are in the Confirmed Release stage and are 5 years old or older (Figures 12 below and 13, bottom left).<sup>31</sup> As stated above, priority definitions were changed in April 2008 and the data collected in 2009 include newly-designated high priority releases that had not been assessed. DEQ should consider expediting site assessments at the pre-remediation, high priority releases that have not completed assessment and moving high priority releases into remediation and toward closure as quickly as resources permit.

DEQ also has 127 Priority 5, low priority releases (11 percent of the backlog) that meet the closure criteria and could potentially be closed quickly. As part of the revision to the priority system, DEQ created a Pending Closure category that segregates low priority releases that may be ready for closure from other low priority releases. With funding from EPA Region 8, DEQ staff has closed 100 releases in this category. This is a successful closure strategy for DEQ and should continue.

**Figure 12. Age of Releases, by Priority and Stage of Cleanup<sup>32</sup>**



<sup>31</sup> Priority 1 includes high priority categories 1.1, 1.2, 1.3, and 1.4. For details on priority classifications, see the Chapter Notes section (Release Priority Table).

<sup>32</sup> The priority categories have recently changed and 234 open releases have not been assigned new priority scores.

## NUMBER OF RELEASES PER RP

EPA analyzed the number of releases per RP to identify RPs that are the largest potential contributors to the state's cleanup backlog.<sup>33</sup> A total of 12 RPs are each responsible for 10 or more releases and account for 20 percent of the Montana backlog (243 releases) (Table 1 below). Of these, six gasoline retail, distribution, and refining businesses are the RPs for 91 releases (8 percent of the backlog), and three state or federal government RPs are responsible for 71 releases (6 percent of the backlog). In addition, a single convenience store chain is responsible for 47 open releases (4 percent of the backlog). Although the majority of these releases are located in the western counties of the state, 11 of these 12 RPs are responsible for releases in both the western and eastern counties. Of these releases, 17 percent (41 releases) are from one federal RP and 5 percent (12 releases) are from one railroad RP; these 53 releases are ineligible for state funding and their cleanup is not constrained by state funding availability. Focused efforts engaging the 12 RPs through collaboration or enforcement might expedite closure of many of these releases. DEQ has not used MSAs, preferring to address each release individually, but other states have found it successful.

**Table 1. RPs with 10 or More Open Releases**

RP	Type of RP	Number of Releases	
		West	East
A	Agricultural Product Distribution	16	6
B	Convenience Store Chain	35	12
C	Gasoline Retail/Distribution/Refining	8	2
D	Gasoline Retail/Distribution/Refining	14	2
E	Gasoline Retail/Distribution/Refining	4	10
F	Gasoline Retail/Distribution/Refining	19	4
G	Gasoline Retail/Distribution/Refining	8	2
H	Gasoline Retail/Distribution/Refining	14	4
I	Federal Government Entity	12	29
J	State Government Entity #1	8	11
K	State Government Entity #2	11	0
L	Railroad	7	5
<b>Total</b>		<b>156</b>	<b>87</b>

### Montana Finding

20 percent of releases are associated with 12 RPs each with 10 or more releases.

### Potential Opportunity

### Releases

Consider exploring possibilities for MSAs or enforcement actions with RPs associated with multiple releases. 243

33 DEQ provided names of legally responsible parties for this analysis.

## GEOGRAPHIC CLUSTERS<sup>34</sup>

### Montana Finding

45 percent of releases are clustered within a one-mile radius of five or more releases.

### Potential Opportunity

Target releases within close proximity for resource consolidation opportunities.

### Releases

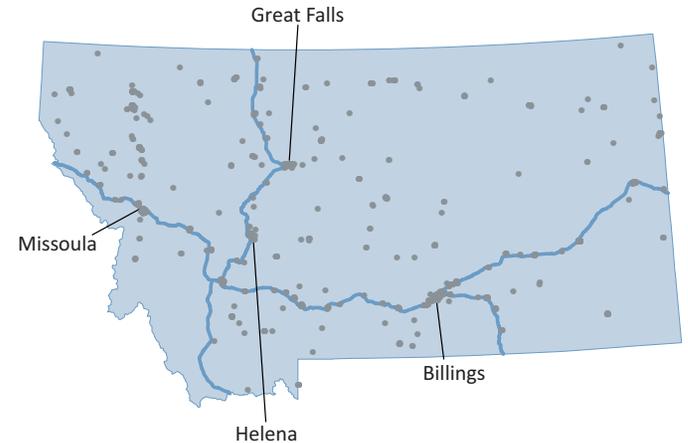
Targeted number of releases<sup>35</sup>

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.

EPA's analysis identified 537 releases (45 percent of releases) located within a one-mile radius of five or more releases (Figure 14 to the right). Of these releases, 337 (28 percent of releases) are located within a one-mile radius of 10 or more 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. DEQ encourages work at clustered releases to share mobilization of equipment such as drill rigs and coordinated schedules as much as possible, although there is limited legal authority to require such cooperation. In addition, DEQ recently completed a pilot project to conduct MNA monitoring at eight geographically-clustered releases. According to DEQ, preliminary results from DEQ's successful pilot indicate significant resource savings.

State and local governments can utilize geographic clusters for area-wide planning efforts. EPA encourages states to look for opportunities for resource consolidation and area-wide planning such as DEQ's MNA pilot but also recognizes that this approach is best geared to address targeted groups of releases as opposed to a state-wide opportunity for every cluster of releases. EPA also recognizes that state laws and regulations may present implementation challenges. During the MNA pilot project, DEQ had to work through many administrative, legislative, and fiscal challenges to complete the project but DEQ believes it is worth the effort in terms of future benefit and cost savings to the program.<sup>36</sup> EPA intends to conduct further geospatial analyses on clusters of 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 14. Map of Releases



<sup>34</sup> Cluster analysis and Figure 14 include only 75 percent of releases. Addresses for the remaining 25 percent of releases were not listed and could not be mapped.

<sup>35</sup> Opportunities marked as "targeted number of releases" relate to geographic opportunities that will address a limited number of releases within select designated geographic areas.

<sup>36</sup> According to Mike Trombetta, Montana DEQ Hazardous Waste Site Cleanup Bureau Chief.

## DATA MANAGEMENT

Improvements to database management could allow for easier overall program management as well as provide an improved tool for developing strategies to reduce the cleanup backlog. Effective data management is essential to the management of state programs, and DEQ might be limited by the type and quality of data with which it is able to work. The data available at the time of this analysis were taken from DEQ databases that are used to manage regulatory documents and not to manage project status. These databases did not maintain complete or accurate data for several data fields, limiting this analysis as well as DEQ's ability to manage cleanups. Notably, complete data on the current cleanup status, media contaminated by the release, the contaminants of concern, and eligibility for the state fund are not maintained in the DEQ databases. The absence of data representing whether a release is in a certain stage of cleanup or media contaminated does not mean that the release is not in that stage or that media is not contaminated. According to DEQ staff, the numbers reported for releases in the Site Assessment and Remediation stages are higher than reported in the data. Likewise, the number of releases contaminating groundwater is higher than represented in these data. EPA and DEQ staffs agree that a robust database that accurately tracks project status information will be a core foundation to developing and implementing Montana's sound backlog management strategies. In fact, in 2010, DEQ initiated efforts to improve data quality including tracking release status and other project management information.<sup>37</sup> Future backlog reduction efforts could be facilitated by the presence of complete LUST-related information.

### Montana Finding

Several key data fields are not included, consistently maintained, or routinely tracked in the DEQ LUST tracking database.

### Potential Opportunity

Improve LUST tracking database to enhance program management and backlog reduction efforts.

### Releases

Variable number of releases

37 According to Mike Trombetta, Montana DEQ Hazardous Waste Site Cleanup Bureau Chief.

## CONCLUSION

### Montana LUST Program Contact Information

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Helena, MT 59620-0901

Phone: 406-841-5016  
Fax: 406-841-5050

[deq.mt.gov/LUST/default.mcp](http://deq.mt.gov/LUST/default.mcp)

In this state chapter, EPA presented the analysis of LUST data submitted by DEQ and highlighted information on Montana's LUST program. Based on the analytic results, EPA identified potential opportunities that could be used to address specific backlog issues in Montana. 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, Montana, and the other states on strategies to reduce the backlog. EPA will work with states to develop detailed strategies for reducing 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 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 the states, is committed to reducing the backlog of confirmed UST releases and to protecting the nation's groundwater, land, and the communities affected by these releases.

# CHAPTER NOTES

## MONTANA DATA BY ATTRIBUTE

The following table provides details on the data elements of interest in this analysis. Data were provided by DEQ 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	Montana Data	Use in Analysis
Administrative Cost	Data were obtained from the "1_Summary_2004_-_Feb_2009_Exp(1).xls" file, which summarizes the administrative budget from 2004 through 2008.	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	Data were obtained from the "Lead" field in the "LEAD" spreadsheet from the "OUST_Inquiry_3_11_09.xls" file. The most recent entry for each release was selected. These values indicate the lead and whether state, federal, or RP funding is used.	Examined in the "Cleanup Financing" section.
Cleanup Standards	No site-specific data available.	State-wide standards examined in the national chapter.
Closure Date	Data were obtained from the "Site Cleanup/Remediation Completed" field in the "Status" spreadsheet in "OUST_STATUS_2_4_09.xls."	Included in the calculation of release age.
Confirmed Release Date	Data were obtained from the "DateDiscovered" field from the "Xtab Substance" spreadsheet in "OUST_Queries.xls."	Included in the calculation of release age.
Data Date	February 4, 2009, is used for all records. This date is when the data were sent.	Included in the calculation of release age.
Federally-Regulated LUST Releases	The data set includes only those releases marked "Yes" under the "FederalRegulatedTank" field from the "Xtab Substance" spreadsheet in "OUST_Queries.xls."	Identifies the appropriate universe of releases for analysis.
Free Product	No data available.	Not applicable (NA)
Institutional and Engineering Controls	No data available.	NA
Latitude And Longitude	Coordinates provided by DEQ staff were primarily based on zip code, so coordinates were obtained by geocoding address and street locations by EPA staff.	Used in geospatial analysis calculating the number of open releases within a one-mile radius of other open releases.
Media	Data were obtained from the "ReceptorID" field in the "With Receptors" spreadsheet in "OUST_Queries.xls" (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.	Examined in the "Media Contaminated" section.

Data Element	Montana Data	Use in Analysis
Methyl Tertiary Butyl Ether (MBTE)	No data available.	NA
Monitored Natural Attenuation (MNA)	No data available.	NA
Number of Releases per RP	Calculated as the total number of open releases associated with a unique RP name.	Examined in the “Number of Releases per RP” section.
Orphan	No data available.	NA
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	Spending is totaled by year in the “(Petro) EPA_Survey_all_years.xls” file provided by the Montana Petro Board. These annual totals were adjusted for inflation using the 2008 CPI and totaled.	Examined in the “Cleanup Financing” section and in the national chapter.
Region	Data not tracked by administrative regions.	NA
Release Location	Indicates whether the release lies in an eastern or western county. Data were obtained from the “EWSide” field in the “Sites by County East West.xls.”	Examined in the “Release Location” section.
Release Priority	The “SitePriority” field from the “SITE PRIORITY” file indicates the priority assigned to a release under the old priority system. These data are maintained in the database for historical purposes. Releases are given a score based on a number of attributes – higher scores are higher priority. The “SitePriority” field from the “Xtab with Substances” spreadsheet in the “OUST_Queries.xls” file is the new priority ranking that only applies to active releases. These releases are grouped into their main category numbers: 1 through 5 (see Release Priority Reference Table).	Examined in the “Release Priority” section.
RP	Data were obtained from “ORG_NAME” field in the “Releases with RPs” file. Three open releases with two RPs each were assigned the RP with the most other releases.	Used to calculate the number of releases associated with each unique RP.
RP Recalcitrance	Data were obtained by identifying multiple enforcement actions in the “Document Type” field of the “Actions” spreadsheet in the “from OUST_Request_3_12_09.xls” file. These releases have had multiple enforcement actions.	No informative patterns were identified.
Staff Workload	Estimate provided by DEQ staff.	Examined in the “Program Summary” section and in the national chapter.
Stage of Cleanup	Data were obtained from the “Status” and “Status Date” fields in the “LEAD” spreadsheet from the “OUST_Inquiry_3_11_09.xls” file. Each open release was counted as “Site Assessment” or “Remediation” if any status events related to those two stages occurred, regardless of the date. Open releases with no status entries related to “Site Assessment” or “Remediation” stages were counted as “Confirmed Release” (see Stage of Cleanup Reference Table).	Variable in all analyses.
Status	Data were obtained from the “Site Cleanup/Remediation Completed” field in the “Status” spreadsheet in the “OUST_STATUS_2_4_09.xls” file. All releases with a date in this field were counted as “Closed” and the remaining releases were counted as “Open.”	Identifies the appropriate universe of releases for tree analysis.
Voluntary Cleanup Program	No data available.	NA

## Media Reference Table

Each release record contains a field recording the type of media contaminated by the release. These entries were standardized using the rules below.

Receptor	Media
Soil, Depth unknown	Soil
Soil, Sub-surface (>2 feet below ground surface)	Soil
Soil, Surface ( $\leq 2$ feet below ground surface)	Soil
Utility, Other	Other
Utility, Sewer	Other
Utility, Sewer Vaults/Trenches	Other
Utility, Water Line	Other
Vapor, Basement	Other
Water, Ground	Groundwater
Water, Irrigation Well	Groundwater
Water, Private Domestic Well	Groundwater
Water, Public Supply Well	Groundwater
Water, Surface	Other
Water, Well	Groundwater

## Release Priority Table

Each open release is assigned a priority score under DEQ's new priority system. For this analysis, releases were categorized according to the main priority numbers: 1 through 5.

Category	Description
1.1	High Priority/Emergency response
1.2	High priority Remediation – Free product
1.3	High Priority Remediation
1.4	High Priority Characterization
2.0	Medium Priority Characterization
3.0	Medium Priority Remediation
4.0	Ground Water Management
5.0	Pending Closure

## Stage of Cleanup Reference Table

DEQ maintains historical status records, so each release has multiple records. Each open release was counted as “Site Assessment” or “Remediation” if any status events related to those two stages occurred, regardless of the date of the events. Each open release with no status entry related to the “Site Assessment” or “Remediation” stages was counted as a “Confirmed Release.” (Any releases with “Closure Approved” or other entries that might indicate a release was closed were counted as open and in the Remediation stage if they did not have a date in the “Site Cleanup/Remediation Completed” field in the “Status” spreadsheet in “OUST\_STATUS\_2\_4\_09.xls.”)

Status	Stage of Cleanup
Closure Approved	Remediation
Closure Denied	Remediation
Closure Submitted	Remediation
Confirmed Release	Confirmed Release
Discovery	Confirmed Release
Emergency Response Taken with Federal Funds	Site Assessment
Emergency Response Taken with State Funds	Site Assessment
Enforcement Action	Confirmed Release
Groundwater Management	Remediation
Inactive	Site Assessment
LUST Cleanup Initiated: Petroleum	Remediation
LUST Trust Action Completed	Remediation
LUST Trust Action Initiated	Remediation
Pending Closure	Remediation
Release Notification	Confirmed Release
Site Cleanup/Remediation Completed	Remediation
Site Investigation Completed	Site Assessment
Site Investigation Initiated	Site Assessment
Tank Release Under Control	Confirmed Release
Transferred to another program or agency	Site Assessment