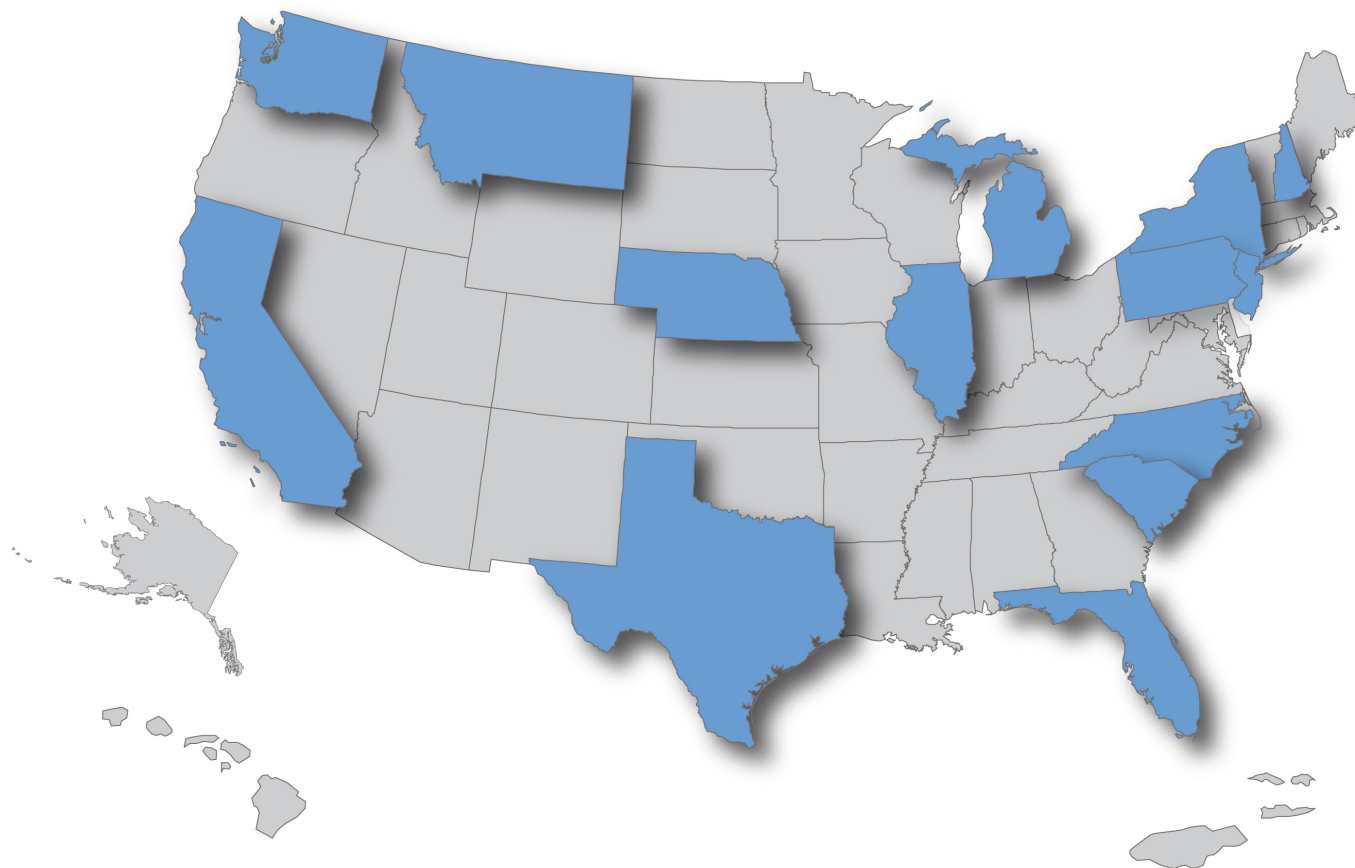
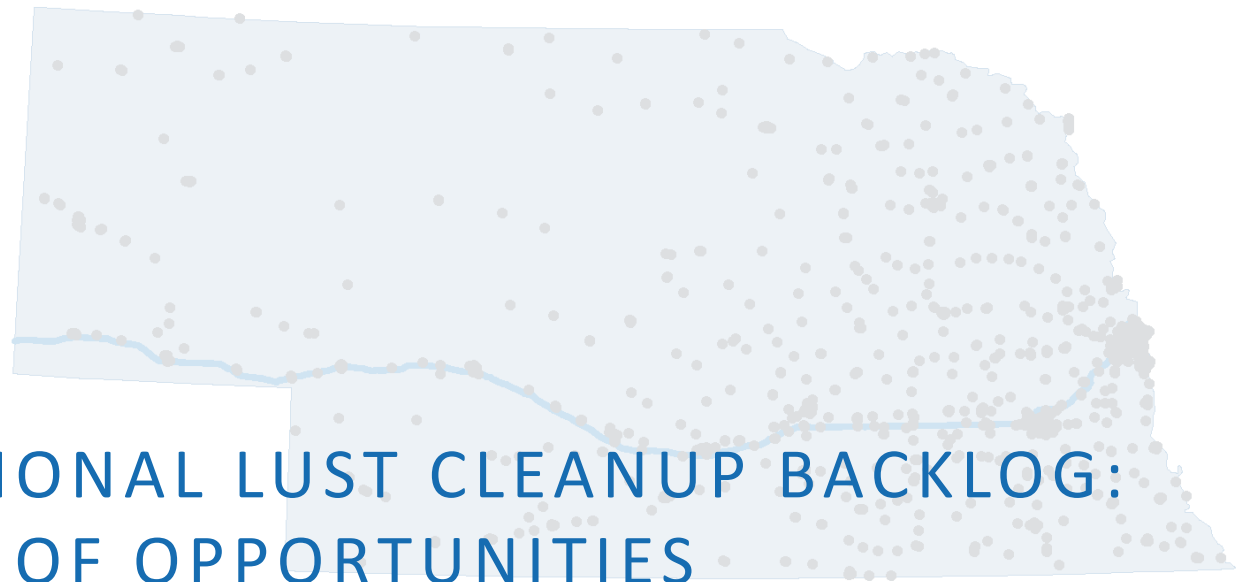


# The National LUST Cleanup Backlog: A Study of Opportunities





# THE NATIONAL LUST CLEANUP BACKLOG: A STUDY OF OPPORTUNITIES

STATE SUMMARY CHAPTER: NEBRASKA

## LIST OF ACRONYMS

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AP	Affiliated Party
DEQ	Nebraska Department of Environmental Quality
EPA	United States Environmental Protection Agency
ESA	Expedited Site Assessment
FY	Fiscal Year
LUST	Leaking Underground Storage Tank
NA	Not Applicable
PFP	Pay for Performance
RAC	Remedial Action Class
RBCA	Risk-Based Corrective Action
RP	Responsible Party
SPILLTRACK	Leaking Underground Storage Tank and Surface Spill Site Information Database
UST	Underground Storage Tank
VRA	Voluntary Remedial Action

# 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 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 NEBRASKA DATA

Nebraska's Department of Environmental Quality (DEQ) has made significant progress toward reducing its LUST cleanup backlog. As of July 2009, DEQ had completed 4,351 LUST cleanups, which is 71 percent of all known releases in the state. At the time of data collection, there were 1,771 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 states with the largest backlogs. EPA invited Nebraska to participate and represent EPA Region 7 in its national backlog study.

In this chapter, EPA characterized Nebraska'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 Nebraska, 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 Nebraska might make pursuing certain opportunities challenging or unlikely. Also, in some cases, DEQ 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 seven study areas: stage of cleanup, release priority, cleanup financing, voluntary cleanups, number of releases per affiliated party (AP), geographic clusters, and data management.

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

National Backlog Contribution	1.7%
Cumulative Historical Releases	6,122
Closed Releases	4,351/71%
Open Releases	1,771/29%
Stage of Cleanup	
Confirmed Release	535/30%
Site Assessment	783/44%
Remediation	453/26%
Media Contaminated <sup>3</sup>	Data not available
Median Age of Open Releases	16.0 years

- 1 Data were provided in July 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 Data on media contamination were not available electronically and are not included in this analysis.
- 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.

## Stage of Cleanup *(see page NE-10 for more details)*

Nebraska Finding	Potential Opportunity	Releases
63 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 are still in site assessment.</li> </ul>	<ul style="list-style-type: none"> <li>• Expedite site assessments at old releases to identify releases that can be closed with minimal effort or moved toward remediation.</li> <li>• Provide information and technical assistance to responsible parties (RPs) or implement enforcement actions at old releases that are stalled.</li> <li>• Continue to encourage use of the voluntary cleanup program to move releases into remediation and closure.</li> </ul>	1,117
24 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>• review site-specific cleanup standards;</li> <li>• implement institutional or engineering controls; and</li> <li>• implement enforcement actions if cleanup has stalled.</li> </ul>	423

Releases are taking a long time to move through the cleanup process, and while Nebraska prioritizes the cleanups of high risk releases, some of these older releases in the early stages of cleanup were classified by the state 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; many releases do not have a viable RP; 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. Nevertheless, EPA believes it important for DEQ to explore opportunities to accelerate cleanups at older releases and to make progress toward bringing all releases to closure.

## Release Priority *(see page NE-12 for more details)*

Nebraska Finding	Potential Opportunity	Releases
17 percent of releases: <ul style="list-style-type: none"> <li>• are high priority; and</li> <li>• have not begun remediation.</li> </ul>	Explore options for moving high priority releases forward, such as: <ul style="list-style-type: none"> <li>• using enforcement actions to initiate the cleanup of stalled releases;</li> <li>• expediting site assessments of all releases to ensure that all releases are appropriately ranked;</li> <li>• ensuring releases with immediate risk are actively being worked on; and</li> <li>• making progress toward closure for all sites.</li> </ul>	309
33 percent of releases: <ul style="list-style-type: none"> <li>• are low priority; and</li> <li>• have not begun remediation.</li> </ul>	Explore options for moving low priority releases forward, such as: <ul style="list-style-type: none"> <li>• encouraging voluntary cleanup of low priority releases that otherwise would not be addressed expeditiously;</li> <li>• expediting site assessments of all releases to ensure that all releases are appropriately ranked; and</li> <li>• making progress toward closure for all sites.</li> </ul>	582

Nebraska allocates state resources to the highest priority releases first as a matter of policy. However, EPA was surprised that an appreciable number of releases considered high priority by the state still remain in the early stages of cleanup after a considerable length of time. Low priority releases also tend to be old and remain in the backlog. 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.

## Cleanup Financing *(see page NE-13 for more details)*

Nebraska Finding	Potential Opportunity	Releases
33 percent of releases: <ul style="list-style-type: none"> <li>• have not begun remediation; and</li> <li>• are orphans.</li> </ul>	Explore ways to move more orphan state-lead cleanups toward closure, such as: <ul style="list-style-type: none"> <li>• continue to explore opportunities to address more releases with available funds, such as cost-cutting measures;</li> <li>• examine other funding sources including public/private funding options like petroleum brownfields grants for low priority sites or financing claim payments;</li> <li>• redirect funds saved at cleanups with improved cost-effectiveness to state-lead cleanups where assessments have not been completed; and</li> <li>• expedite site assessments of orphan releases to identify releases that can be closed with minimal effort or moved toward remediation.</li> </ul>	588
41 percent of releases <ul style="list-style-type: none"> <li>• have not begun remediation; and</li> <li>• are RP-lead.</li> </ul>	Pursue enforcement actions or provide additional guidance to expedite site assessments and cleanup at RP-lead cleanups.	730

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. Nebraska has a large number of orphan releases for which the state will assume financial responsibility. EPA 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 Petroleum Release Remedial Action Reimbursement Fund pays for cleanups, minus the deductible and co-payments, at all RP releases where tanks are in compliance with state regulations. The fund also finances state-lead cleanup activities at 42 percent of releases (those that are determined to be orphan releases with no viable RP). These releases tend to be old and many have not begun remediation (33 percent of the total backlog). Forty-one percent of releases are RP-lead and have not begun remediation.

All state programs are experiencing resource limitations, and progress toward backlog reduction is dependent on their ability to apply existing resources to their backlogs. If more cost-effective remedial plans could be implemented at state-funded cleanups in remediation, or other funding sources could be found for those not in remediation, this would free up funding to address more releases in the early stages of cleanup.

## Voluntary Cleanups *(see page NE-14 for more details)*

Nebraska Finding	Potential Opportunity	Releases
2 percent of releases participate in Voluntary Remedial Action (VRA).	Provide additional incentives for RPs of low priority releases to participate in VRA.	769

DEQ finances and performs cleanups using a risk-based priority system, addressing the highest risk releases first. However, under VRA, RPs may perform cleanup activities regardless of release priority provided that they will accept reimbursement for eligible expenditures at a later date. Although 32 cleanups are known to be proceeding through VRA, RPs are not required to formally enroll in a program and an unknown number of additional cleanups might also be occurring through VRA. Further efforts to make VRA into a more widely-known program among RPs and real estate transaction stakeholders might lead to the accelerated closure of more low priority releases.

## Number of Releases per Affiliated Party

*(see page NE-15 for more details)*

Nebraska Finding	Potential Opportunity	Releases
6 percent of releases are affiliated with seven parties each with 10 or more releases.	Explore possibilities for multi-site agreements or enforcement actions with parties affiliated with multiple releases.	99

EPA was able to identify groups of 10 or more releases that have common ownership or name affiliation from data provided by DEQ on the names of facility owners and company names. EPA analyzed the number of releases per AP to identify the largest potential contributors to the state's cleanup backlog. In Nebraska, seven parties are each affiliated with 10 or more releases and account for 6 percent of the Nebraska backlog. These APs may or may not be the party legally responsible for cleanup. DEQ and EPA can use this information to identify potential participants for multi-site strategies to clean up groups of releases.

## Geographic Clusters *(see page NE-15 for more details)*

Nebraska Finding	Potential Opportunity	Releases
54 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>5</sup>

Another multi-site approach that Nebraska could use is targeting cleanup actions at geographically-clustered releases. This approach could offer opportunities for new community-based reuse efforts, using economies of scale, and addressing commingled contamination. DEQ uses the same contractor to address commingled orphan releases when feasible. EPA believes that highlighting geographic clusters of releases and working with state and local governments in area-wide initiatives will improve Nebraska'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.

## Data Management *(see page NE-16 for more details)*

Nebraska Finding	Potential Opportunity	Releases
Several key data fields are not included, consistently maintained, or routinely tracked in the Leaking Underground Storage Tank and Surface Spill Site Information (SPILLTRACK) database.	Improve database to enhance program management and backlog reduction efforts.	Variable number of releases <sup>6</sup>

Multiple data management 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.

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

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

## CONCLUSION

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

The Petroleum Remediation Program within the Nebraska Department of Environmental Quality (DEQ) manages oversight of and financial assistance for the investigation and cleanup of petroleum contamination resulting from leaking underground storage tanks (LUSTs). Responsible parties (RPs) are responsible for selecting approved contractors to perform site investigation and cleanup. When a site is activated for cleanup based on its priority ranking, the DEQ project manager assigned to the release contacts the RP. The project manager tells the RP what remedial actions are needed at the site. Then the RP hires a consultant to perform the required remedial actions. The RP typically will be asked to have their consultant provide a work plan and a cost estimate for the proposed remedial actions. The DEQ project manager reviews this information and, if acceptable, sends an approval letter. The contractor performs the work and a report is submitted to DEQ. The RP can then submit a reimbursement claim for the work performed.

RPs may choose to undertake Voluntary Remedial Action (VRA) and perform cleanup activities more rapidly than DEQ can grant approval based on available funds. RPs performing remedial actions under VRA are eligible to apply for reimbursement at a later date.

At releases without a viable RP, the state performs cleanups through contracts paid with federal funds or the state fund. At some of these “orphan” releases, DEQ’s Pay for Performance (PFP) program is used. The PFP program pays contractors as specific amounts of contamination are reduced within a fixed-price, time-limited contract. The PFP program is intended to clean up releases more quickly and DEQ staff believe it has. To date, 27 cleanup contracts have been approved under the PFP program, and eight of these contracts have since been completed.

## Cleanup Financing

DEQ’s Petroleum Release Remedial Action Reimbursement Fund provides reimbursements to owners and operators for costs associated with investigation and remediation activities at releases, minus deductibles and co-payments. RPs are not required to have additional financial responsibility mechanisms to cover the state-required deductible and co-payments.<sup>8</sup> Releases from underground storage tanks (USTs) and above-ground storage tanks occurring between July 17, 1983, and June 30, 2012, are eligible for the fund.

## Cleanup Standards

Since 1999, DEQ has used a two-tier RBCA system to evaluate releases based on risks to human health and the environment. The program initiates investigations to collect information needed for Tier 1, the first step in the RBCA process. DEQ intends

<sup>7</sup> Based on FY 2009 *UST Performance Measures End of Year Activity Report*.

<sup>8</sup> DEQ’s *Reasonable Rate Schedule and Reimbursement Guidance Manual* is available online at: [www.deq.state.ne.us/Publications/23e5e39594c064ee852564ae004fa010/5c5fff57a49c592f862574f9007a18dd/\\$FILE/08-023.pdf](http://www.deq.state.ne.us/Publications/23e5e39594c064ee852564ae004fa010/5c5fff57a49c592f862574f9007a18dd/$FILE/08-023.pdf).

<sup>9</sup> Estimate provided by DEQ staff.

<sup>10</sup> This is the operating budget.

## Nebraska LUST Program At a Glance

### Cleanup Rate

In fiscal year (FY) 2009, DEQ confirmed 39 releases and completed 112 cleanups.<sup>7</sup>

### Cleanup Financing

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

### Cleanup Financing

The Petroleum Release Remedial Action Reimbursement Fund provides reimbursements. RPs are required to pay a deductible for cleanups.

### Cleanup Standards

A two-tier risk-based corrective action (RBCA) system is in place to evaluate threats to human health and the environment.

### Priority System

Releases are prioritized based on risk to receptors.

### Average Public Spending on Cleanup

\$80,557 for releases in the Remediation stage; \$11,324 for closed releases.

### Releases per Project Manager

There are an average of 85 active cases per project manager. Approximately 1,000 open releases are not assigned to a project manager.<sup>9</sup>

### Administrative Funding (2007)

\$1.4 million.<sup>10</sup>



to investigate additional releases each month until the information necessary for a RBCA Tier 1 evaluation has been collected at all releases. Releases that fail Tier 1 are activated for Tier 2, which provides for a more detailed investigation and is the next step in the RBCA process. If a release fails Tier 2, it is generally then scheduled for cleanup. Releases that pass Tier 1 or Tier 2 are closed. In some cases, DEQ will replace drinking water wells that might be threatened by a plume in order to reduce the risk and lower the cleanup threshold. Since 2002, 10 wells have been moved.

## Release Prioritization

Due to the high number of unaddressed LUST releases, DEQ adopted a policy of prioritizing all releases for cleanup. Priority is based on risk and is used to rank cleanups for allocation of state resources. An initial prioritization is conducted at the time of discovery based on potential receptors and other release characteristics.<sup>11</sup> Prioritization may be refined as more information is learned about a release. Resources are focused on releases with the greatest health and safety concerns such as vapors in a building or a nearby municipal well. Release priority is based on a release's proximity to groundwater resources and receptors and is used in the subsequent calculation of the priority score for all releases. If a release is low risk, DEQ does not direct the RP to perform the cleanup until other higher priority cleanups are completed, but RPs of low priority releases are permitted to complete cleanups under VRA. If an RP does not perform a directed cleanup, the RP can be placed under enforcement actions.

## State Backlog Reduction Efforts

In 1999, DEQ implemented a RBCA system to provide clear guidance for evaluating releases and allow for site-specific cleanup goals that are protective of human health and the environment. Implementation of VRA and PFP programs was also intended to improve and accelerate the cleanup process. DEQ has also used a \$100,000 grant from EPA Region 7 to perform a review of backlogged releases. At the time data were compiled for this study, the case reviews had led to closure of 25 releases. Subsequently, the review process led to a total of 31 closures plus an additional five closures achieved using leftover funds to perform Tier 1 investigations.

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11 The initial prioritization is not the same as the Tier 1 RBCA assessment.

# ANALYSIS AND OPPORTUNITIES

In this study, EPA analyzed Nebraska's federally-regulated releases that have not been cleaned up (open releases). EPA conducted a multivariate analysis on all of Nebraska's data. However, this technique did not identify strong underlying patterns in the data.<sup>12</sup> 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>14</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 Nebraska, there are 20 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 seven areas of Nebraska's backlog with potential opportunities for its further reduction:

- Stage of cleanup
- Release priority
- Cleanup financing
- Voluntary cleanups
- Number of releases per Affiliated Party (AP)
- Geographic clusters
- Data management

## LUST Data Source

Electronic data for LUST releases occurring between April 1971 and June 2009 were compiled with DEQ staff in 2008 and 2009.<sup>13</sup> Data were obtained from DEQ's Leaking Underground Storage Tank and Surface Spill Site Information Database (SPILLTRACK) and selected based on quality and the ability to address areas of interest in this analysis.

<sup>12</sup> 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.

<sup>13</sup> For a detailed description of the Nebraska data used in this analysis, see the Chapter Notes section.

<sup>14</sup> For a detailed description of release stages, see the Chapter Notes section (Stage of Cleanup Reference Table).

**Nebraska Finding**

- 63 percent of releases are either:
- 5 years old or older and site assessment has not started; or
  - 10 years old or older and are still in site assessment.

**Potential Opportunity** **Releases**

- Expedite site assessments at old releases to identify releases that can be closed with minimal effort or moved toward remediation.
- Provide information and technical assistance to responsible parties (RPs) or implement enforcement actions at old releases that are stalled.
- Continue to encourage use of the voluntary cleanup program to move releases into remediation and closure.

1,117

*Releases 5 years old or older in the Confirmed Release stage* 481

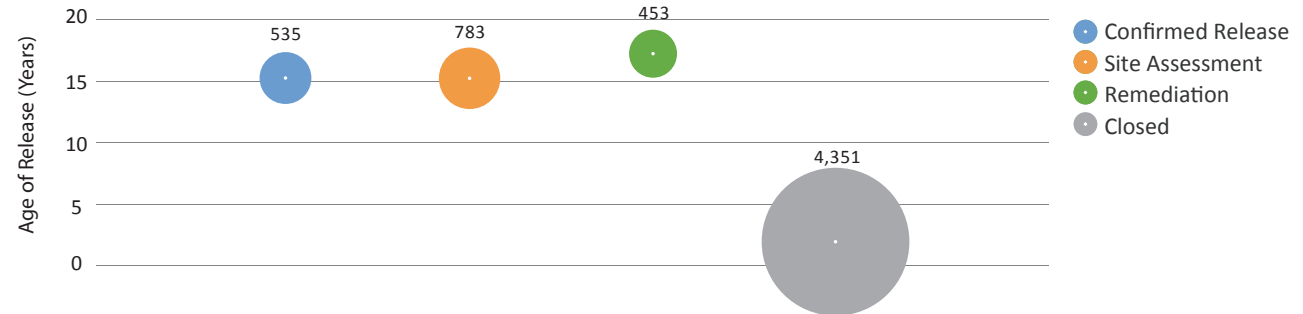
*Releases 10 years old or older in the Site Assessment stage* 636

## STAGE OF CLEANUP

As of July 27, 2009, the Nebraska backlog consisted of 1,771 open releases. EPA analyzed the age of these LUST releases and their distribution among the stages of cleanup. To facilitate analysis, EPA classified Nebraska’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 begun).<sup>15</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 Nebraska’s LUST program began, DEQ has closed 4,351 releases, half of which were closed in fewer than 1.8 years (Figure 1 below). The young median age of closed LUST releases might be attributable to the rapid closure of relatively easy to close 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 are 16 closed releases for which release age is unknown. These releases are not part of the median age calculation.*

DEQ implemented several policies to accelerate the cleanup process, including a RBCA system and the VRA and PFP programs.<sup>16</sup> DEQ has also used a \$100,000 grant from EPA Region 7 to perform a review of low priority releases, a process that led to closure of 25 releases as of the date of data collection, with an additional six releases closed later. Leftover funds were used to perform Tier 1 investigations resulting in five additional closures. 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.

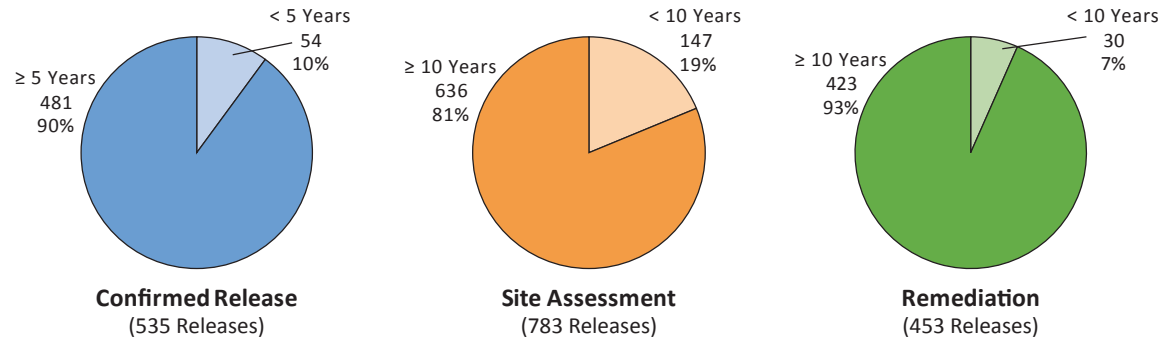
Nebraska has many old LUST releases not in remediation. Figure 2 on page 11 shows the backlog of open releases by age and stage of cleanup and allows for the identification of older releases by stage. Figure 2 breaks out the 481 older releases

<sup>15</sup> Releases were classified into stages based on available data and discussion with DEQ staff. For more information, see the Chapter Notes section.

<sup>16</sup> See State Backlog Reduction Efforts in the Program Summary.

in the Confirmed Release stage (27 percent of the backlog) that have not been assessed five years or more after the releases were confirmed. It also shows the 636 older releases in the Site Assessment stage (36 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 63 percent of Nebraska's total backlog. DEQ's data indicate that releases have not moved into remediation quickly.

**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 (ESA) guide*.<sup>17</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 make cost-effective corrective action decisions. ESAs will help identify releases that can be closed with minimal effort or 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 decrease overall project costs.

Under Nebraska's VRA program, RPs can move forward with cleanup without needing DEQ prior approval of workplans. This approach can be a source of continued backlog reduction and DEQ should consider ways to encourage RPs to pursue VRA. Providing information and technical assistance to RPs, encouraging the use of VRA, or pursuing enforcement action at old releases could move releases toward remediation and more rapid cleanup.

Nebraska also has many old releases in the Remediation stage. Twenty-four percent of Nebraska's releases (423 releases) are in remediation and are 10 years old or older (Figure 2). This older group of releases represents 94 percent of the releases in remediation. Because EPA only has the date 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. This process might save resources and bring releases to closure more quickly. This would allow DEQ to move on to other releases that need attention and remove releases from the backlog with available state funds.

<sup>17</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).

### Nebraska Finding

24 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:

423

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

## RELEASE PRIORITY

### Nebraska Finding

17 percent of releases:

- are high priority; and
- have not begun remediation.

Potential Opportunity	Releases
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Explore options for moving high priority releases forward, such as:	309
<ul style="list-style-type: none"> <li>• using enforcement actions to initiate the cleanup of stalled releases;</li> <li>• expediting site assessments of all releases to ensure that all releases are appropriately ranked;</li> <li>• ensuring releases with immediate risk are actively being worked on; and</li> <li>• making progress toward closure for all sites.</li> </ul>	

### Nebraska Finding

33 percent of releases:

- are low priority; and
- have not begun remediation.

Potential Opportunity	Releases
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Explore options for moving low priority releases forward, such as:	582
<ul style="list-style-type: none"> <li>• encouraging voluntary cleanup of low priority releases that otherwise would not be addressed expeditiously;</li> <li>• expediting site assessments of all releases to ensure that all releases are appropriately ranked; and</li> <li>• making progress toward closure for all sites.</li> </ul>	

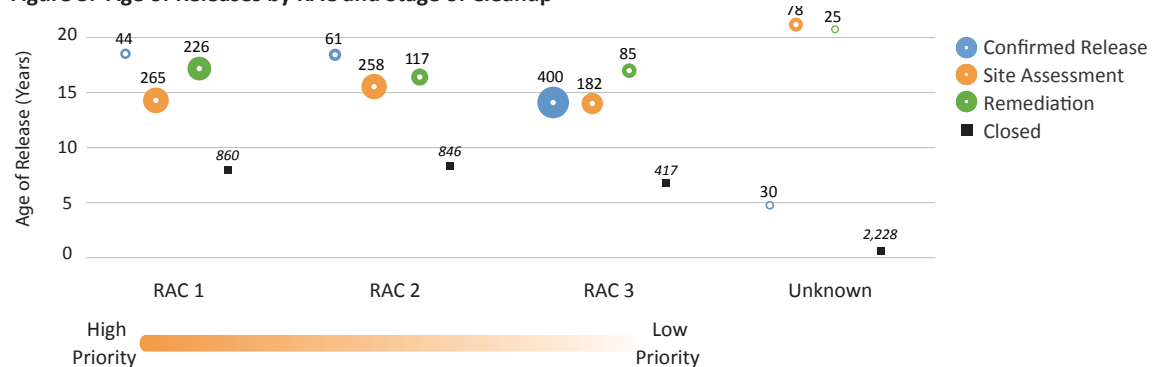
DEQ focuses resources on the highest risk releases and unconfirmed risk releases so EPA was surprised that an appreciable number of high priority releases still remain in the early stages of cleanup after a considerable length of time. Nebraska has a policy to address the highest priority releases first. Cleanups at the highest priority releases are carried through to completion, once initiated. Even with this focus on high priority releases, DEQ has not had sufficient resources to clean up all high priority releases quickly. DEQ does not dedicate resources to low priority releases unless resources have already been made available to address all higher priority releases. Consequently, low priority releases tend to be old and remain in the backlog.

DEQ assigns each LUST release a Remedial Action Class (RAC), which classifies cleanups based on risk of drinking water contamination.<sup>18</sup> Release priority is based on a release’s proximity to groundwater resources and receptors and is used in the subsequent calculation of the priority score for all releases. RAC 1 includes higher priority releases, and RAC 3 releases generally pose the smallest risk to receptors.

A significant percentage of DEQ’s backlog is made up of high priority releases. Many of these releases are old and in the early stages of cleanup. There are 44 releases in the Confirmed Release stage (2 percent of the backlog) and 265 releases in the Site Assessment stage (15 percent of the backlog) with a RAC 1 score (Figure 3 below). The median ages of these releases are 18.9 and 14.8 years, respectively. These releases affect high priority groundwater resources and should be moved toward remediation and closure as quickly as resources permit. Continuing efforts to expedite site assessments and move these releases toward remediation and closure could help protect high priority groundwater resources and can also reduce the backlog. With Nebraska’s focus on high priority releases 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.

Many old, low priority cleanups remain in Nebraska’s backlog. Thirty three percent of releases (582 releases) are classified as RAC 3 releases and are in the Confirmed Release or Site Assessment stage (Figure 3). Implementing enforcement actions or encouraging RPs to undertake VRA and moving these releases into remediation and to closure could help reduce the backlog.

**Figure 3. Age of Releases by RAC and Stage of Cleanup**



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

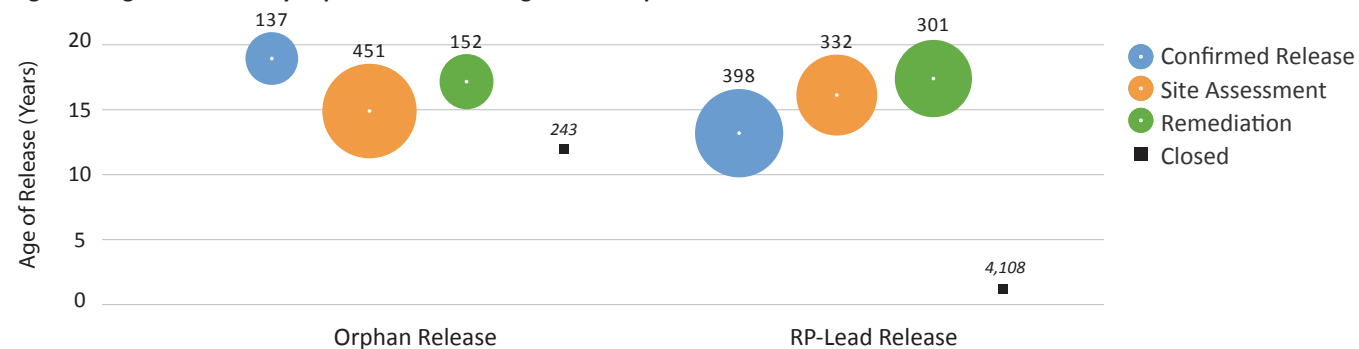
18 For more information on RACs, see the Chapter Notes section (RAC Reference Table).

## CLEANUP FINANCING

EPA believes the availability of funding for cleanup is essential to reducing the backlog. DEQ's Petroleum Release Remedial Action Reimbursement Fund pays for cleanups, minus the deductible and co-payments, at all releases where tanks are in compliance with state regulations. In addition, DEQ's fund assumes all financial costs for the large number of orphan releases in the state. To help analyze the impact of state fund issues on closure, EPA evaluated the progress of releases funded by the state (both state-lead and RP-lead cleanups). 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 leads cleanup activities for all orphan releases in the state (740 releases; 42 percent of total backlog). DEQ defines orphan releases as releases with no viable RP.<sup>19</sup> Orphan releases tend to be old and 79 percent of the orphan releases (588 releases; 33 percent of total backlog) have not begun remediation (Figure 4 below). DEQ should continue to explore opportunities to address more releases with the state cleanup fund such as continued use of cost-cutting measures. DEQ already uses the same contractor to address commingled orphan releases whenever feasible and DEQ also uses pay for performance contracts to clean up orphan releases. EPA encourages these types of cost saving approaches. Another opportunity DEQ could investigate is the availability of additional funding sources through public/private partnerships such as petroleum brownfields grants for low priority orphan releases. In addition, some states have started financing claims through public/private partnerships. DEQ can use ESAs to identify orphan releases that can be closed with minimal effort or provide all the information needed to move a release into remediation sooner.

**Figure 4. Age of Releases by Orphan Status and Stage of Cleanup**



DEQ also has 152 orphan releases in remediation, with a median age of more than 15 years. DEQ should explore opportunities to move these releases towards closure, thus freeing up resources to address additional releases. The releases in the Remediation stage might be complex and difficult to remediate, but also might remain open 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, lower-cost cleanup technologies such as monitored natural attenuation could be considered as an appropriate remedy. If used appropriately, this could free up state funds for use at other cleanups

<sup>19</sup> DEQ considers a release to be an orphan release if the person or business that caused the contamination either cannot be identified or does not have the resources to pay for its share of cleanup costs. DEQ case workers perform procedural reviews to identify orphan releases as soon as possible.

### Nebraska Finding

33 percent of releases:

- have not begun remediation; and
- are orphans.

### Potential Opportunity

### Releases

Explore ways to move more orphan state-lead cleanups toward closure, such as:

- continue to explore opportunities to address more releases with available funds, such as cost-cutting measures;
- examine other funding sources including public/private funding options like petroleum brownfields grants for low priority sites or financing claim payments;
- redirect funds saved at cleanups with improved cost-effectiveness to state-lead cleanups where assessments have not been completed; and
- expedite site assessments of orphan releases to identify releases that can be closed with minimal effort or moved toward remediation.

**Nebraska Finding**

- 41 percent of releases
- have not begun remediation; and
  - are RP-lead.

**Potential Opportunity** **Releases**

Pursue enforcement actions or provide additional guidance to expedite site assessments and cleanup at RP-lead cleanups. 730

**Nebraska Finding**

2 percent of releases participate in VRA.

**Potential Opportunity** **Releases**

Provide additional incentives for RPs of low priority releases to participate in VRA. 769

and could increase the number of releases that DEQ is able to address and move toward closure. If additional releases could be closed through the use of institutional or engineering controls where protective and appropriate, DEQ could also use the resources slated for those releases to work on reaching closure at other releases.

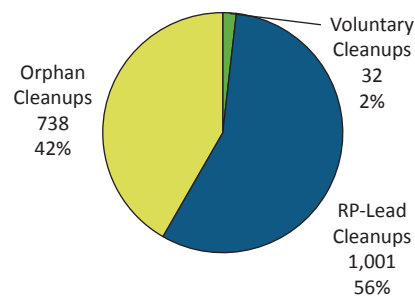
The remaining 58 percent of open releases (1,031 releases) funded by the state are RP-lead, where RPs are responsible for selecting contractors for site investigations and cleanup (Figure 4). The majority of RP-lead releases (71 percent, 730 releases) have not begun remediation, more than half of which are 10 years old or older (Figure 4). These older, RP-lead releases in the early stages of cleanup account for 41 percent of the total backlog. A larger proportion of RP-lead releases than orphan releases have moved into remediation from site assessment (Figure 4); however, the RP-lead releases in the Remediation stage are no younger than the state-lead orphan releases, suggesting that the type of lead (RP or state) does not have much impact on the speed of cleanup. Additional guidance to RPs on how to effectively begin and complete cleanups or pursuing enforcement actions where necessary could help move more RP-lead cleanups toward remediation.

## VOLUNTARY CLEANUPS

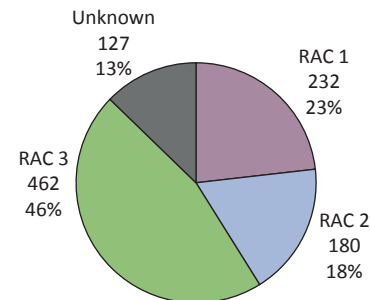
VRA allows RPs to perform cleanup activities regardless of their priority and allows future reimbursement for eligible expenditures. According to DEQ's SPILLTRACK database, only 2 percent of the backlog (32 open releases) participates in VRA (Figure 5 below, left). However, because RPs are not required to formally enroll into a program, DEQ cannot confirm how many RPs are engaged in VRA. One of the most likely reasons a RP would undertake VRA is to conduct a Title 118 RBCA investigation or minimal cleanup in an effort to receive closure from DEQ. DEQ will, in as timely a manner as practical, review the VRA investigation and remediation reports, and if the cleanup meets closure criteria in place at the time, a closure letter will be sent to the RP. Releases in VRA are still funded in order of their priority and, therefore, a RP might not receive reimbursement for several years. Encouraging RPs to perform VRA and complete cleanups sooner would help reduce risk to receptors and help reduce the backlog.

Only 23 percent of RP-lead cleanups (232 releases) are RAC 1 (Figure 6 below, right). The remaining 77 percent of RP-lead cleanups (769 releases) will likely not be addressed until the higher priority cleanups are completed. Therefore, enhancing the VRA program and providing cost-saving incentives to RPs who enter VRA could increase the number of releases at which RPs complete site assessments and remedial activities.

**Figure 5. Types of Cleanup<sup>20</sup>**



**Figure 6. RP-Lead Cleanups by RAC**



<sup>20</sup> Of the 32 releases classified as Voluntary Cleanups, two are classified as Orphan and the remaining 30 are classified as RP-lead.

## NUMBER OF RELEASES PER AFFILIATED PARTY

EPA analyzed the number of releases per affiliated party (AP) to identify entities that are the largest potential contributors to the state's cleanup backlog.<sup>21</sup> APs may or may not be the parties legally responsible for cleanup.

A total of seven APs are each affiliated with 10 or more releases and account for 6 percent of the Nebraska backlog (99 releases; Table 1 to the right). Of these, one local government body is affiliated with 2 percent of the backlog (27 releases) and four gasoline, retail, and distribution businesses and convenience store chains are affiliated with another 3 percent of the backlog (47 releases; Table 1). Focused efforts engaging these seven APs through collaboration or enforcement might expedite closure of many of these releases.

**Table 1. Parties Affiliated with 10 or More Open Releases**

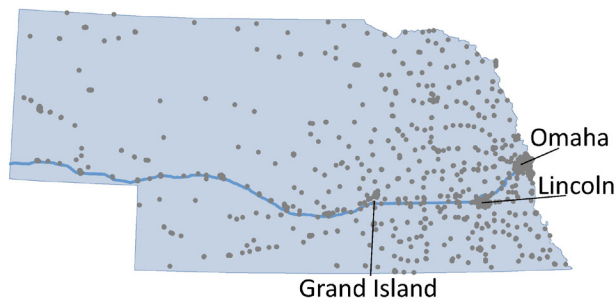
Type of Party	Number of Releases	Number of APs
Gasoline Retail/Distribution/Refining	26	2
Government – Local	27	1
Convenience Store Chain	21	2
Government – Federal	13	1
Government – State	12	1
<b>Total</b>	<b>99</b>	<b>7</b>

## GEOGRAPHIC CLUSTERS

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, and ecological sensitivity.

State and local governments can utilize geographic clusters for area-wide planning efforts. EPA's analysis identified 955 releases (54 percent of releases) located within a one-mile radius of five or more releases (Figure 7 below, left). Of these releases, 613 (35 percent of releases) are located within a one-mile radius of 10 or more other releases. Approaching the assessment and cleanup needs of an area impacted by LUSTs can be more effective than focusing on individual sites in

**Figure 7. Map of All Open Releases**



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 already uses the same contractor to address commingled orphan releases when feasible. 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 as opposed to a state-wide opportunity for every cluster of releases. EPA intends to

<sup>21</sup> DEQ provided data on entities identified as company RPs, but these parties may not actually be liable for the cleanups.

<sup>22</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.

### Nebraska Finding

6 percent of releases are affiliated with seven parties each with 10 or more releases.

### Potential Opportunity

Explore possibilities for multi-site agreements or enforcement actions with parties affiliated with multiple releases.

### Releases

99

### Nebraska Finding

54 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>22</sup>



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

### Nebraska Finding

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

### Potential Opportunity

Improve database to enhance program management and backlog reduction efforts.

### Releases

Variable number of releases<sup>23</sup>

Additional 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. Notably, complete data on the media contaminated by the release, the contaminants of concern, and the confirmed liable RP for the release are not maintained in the SPILLTRACK database, limiting this analysis as well as DEQ's ability to manage cleanups. Future backlog reduction efforts similar to the effort undertaken with an EPA Region 7 grant could be facilitated by the presence of complete LUST-related information.

<sup>23</sup> Opportunities marked as “variable number of releases” relate to programmatic opportunities and affect an unknown number of releases, potentially including all open releases.

## CONCLUSION

In this state chapter, EPA presented the analysis of LUST data submitted by DEQ and highlighted information on Nebraska's LUST program. Based on the analytic results, EPA identified potential opportunities that could be used to address specific backlog issues in Nebraska. 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, Nebraska, 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 strategies might include targeting 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 the 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 releases.

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LUST](http://www.deq.state.ne.us/LUST-RA.nsf/Pages/LUST)

# CHAPTER NOTES

## NEBRASKA 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	Nebraska Data	Use in Analysis
Administrative Cost	Estimates were provided by DEQ 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.
AP	Data were obtained from the "OWNCO" data field in the "NE_LUST_DATA_7-29-09.xls" file. Entries in this data field represent the AP company, which might not be the current owner.	Used to calculate the number of releases associated with each unique AP.
Cleanup Standards	No site-specific data available.	State-wide standards examined in the national chapter.
Closure Date	Data were obtained from the "DATEACH" and "TYPE" data fields in the "NE_LUST_DATA_ACTIONS_7-29-09.xls" file. When a release had a type of "SC," "Z5," or "R8," the corresponding date entry in the "DATEACH" field was used as the closure date.	Included in the calculation of release age.
Confirmed Release Date	Data were obtained from the "DIDATE" data field in the "NE_LUST_DATA_7-29-09.xls" file.	Included in the calculation of release age.
Data Date	July 29, 2009, is used for all records. This is the date the "NE_LUST_DATA_7-29-09.xls" file was received.	Included in the calculation of release age.
Federally-Regulated LUST Releases	Data were obtained from the "SPILLNO" data field in the "NE_LUST_DATA_7-29-09.xls" file. When a closed release had a spill number in the "APxxxx" form, it indicated that it was a clean closure and did not count toward release numbers that DEQ reported to EPA.	Identifies the appropriate universe of releases for analysis.
Free Product	No data available.	Not applicable (NA)
Institutional and Engineering Controls	Data were obtained from the "NE_WellsMoved-Replaced" file. Fewer than 10 releases were listed in this file.	Data not suitable for analysis.
Latitude and Longitude	Data were obtained from the "LAT" and "LON" data fields in the "LST_coordinate_list_2009.xls" file. Where possible, coordinates for releases without existing latitude and longitude values were obtained by EPA 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.
Media	No data available.	NA
Monitored Natural Attenuation	No data available.	NA
Methyl Tertiary Butyl Ether	Data were obtained from the "ACTCOM1" field in the "NE_LUST_DATA_MTBE.xls" file. When a release had a record of MTBE in the "ACTCOM1" data field, it was marked as having MTBE contamination.	No informative patterns were identified.

Data Element	Nebraska Data	Use in Analysis
Number of Releases per AP	Calculated as the total number of open releases associated with a unique AP name.	Examined in the "Number of Releases per AP" section.
Orphan	Data were obtained from a compiled list of releases listed in the "Orphan T200 site costs.xls," "Orphan Sites LUST Fed payments.xls," and "NE_LUST_PRIORITY_LIST.xls" files.	Examined in the "Cleanup Financing" section.
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 "Orphan T200 site costs.xls," "Orphan RP split sites T200.xls," "Orphan sites_LUST Fed payments.xls," and "RP T200 site reimbursements.xls" files. The dollar amounts in the "total payment" data field from each of the source files were added up to identify cumulative public spending to date for a release. Because these spending data are cumulative, inflation adjustment was not applied and it was not included in release level analysis.	Data not suitable for analysis.
Region	Data not tracked by administrative regions.	NA
Release Priority - Remedial Action Class (RAC), Score, Rank	Data were obtained from the "RAC" and "SCORE" fields in the "NE_LUST_DATA_7-29-09.xls" file. RAC is divided into categories 1-3, and drinking water source is one of the major criteria (see RAC Reference Table). Scores are based on several factors, including RAC. All of the releases that have not been worked on will have a score; other releases that are being actively worked on will have a score but not a rank.	Examined in the "Release Priority" section.
RP Recalcitrance	No data available.	NA
Staff Workload	Estimates provided by DEQ staff.	Examined in the "Program Summary" section and in the national chapter.
Stage of Cleanup	Data were obtained from the "DATEACH" and "TYPE" data fields in the "NE_LUST_DATA_ACTIONS_7-29-09.xls" file. A release was assigned to a specific cleanup stage depending on its most recent action type ("TYPE" that corresponded to the most recent data entry in "DATEACH"; see Stage of Cleanup Reference Table for details).	Variable in all analyses.
Status	Data were obtained from the "TYPE" data field in the "NE_LUST_DATA_ACTIONS_7-29-09.xls" file. When a release had a type of "SC," "Z5," or "R8," the release was marked as "Closed"; otherwise, the release was marked as "Open."	Identifies the appropriate universe of releases for tree analysis.
Voluntary Cleanups	Data were obtained from the "SPILLNO" data field in the "VRA Sites 2009.xls" file. Releases that were listed in the VRA data set were marked as having VRAs.	Examined in the "Voluntary Cleanups" section.

## Stage of Cleanup Reference Table

Each release has multiple action records; releases were assigned to a specific stage of cleanup depending on the most recent action type.

Type	Description	Stage
NA	Confirmed UST Release	Confirmed Release
R2	Source Notification	Confirmed Release
R3	Source Response	Confirmed Release
U1	Confirmed UST Release	Confirmed Release
U2	Spill Investigation Initiated	Confirmed Release
U3	Official Source Notification	Confirmed Release
U4	Obtain Contractor	Confirmed Release
U5	State/Source Meeting	Confirmed Release
U6	Precision Testing	Confirmed Release
N2	Investigation Initiated	Site Assessment
PH	Environmental Assessment	Site Assessment
R5	Ground Water Monitoring/Report	Site Assessment
R6	Investigation Phase Complete	Site Assessment
U7	Preliminary Site Assessment	Site Assessment
U8	Initial Site Assessment	Site Assessment
U9	Detailed Site Assessment	Site Assessment
X3	This code is used when project manager activates the site. DATESCH is the date the site is activated; DATEACH is the date the investigation is discontinued.	Site Assessment
P1	R.P. Lead - Cleanup Started	Remediation
P2	R.P. Lead - Cleanup Under Control	Remediation
P3	R.P. Lead - Cleanup Completed	Remediation
QA	Cleanup Started	Remediation
QB	Release Under Control	Remediation
QC	Cleanup Complete	Remediation
R4	Remedial Action Plan/Status	Remediation
R7	On-site Inspection/Follow-up	Remediation
R9	Remedial Action - Long term Monitoring	Remediation

Type	Description	Stage
X4	This code is used when a site goes into remediation. DATESCH is the date the site begins remediation process. DATEACH is the date the cleanup process is discontinued.	Remediation
X5	This code is used when a site goes into monitoring. The remediation system has either been shut down or there is no remediation system. DATESCH is the date the site goes into monitoring. DATEACH is the date when the monitoring ends.	Remediation
X6	This code is used when a site goes into closure phase. DATESCH is the date the site goes into closure. DATEACH is the date the site is officially closed.	Remediation
R8	Site Closed	Closed
SC	Site Closed	Closed
Z5	Closed Site	Closed

## 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.

1	RAC 1 includes groundwater of Class GA and a portion of Class GB, imposing a 500-foot radius around all private drinking water supply wells. RAC 1 groundwater receives the most extensive remedial action measures.
2	RAC 2 includes groundwater of Class GB (except for the portion of Class GB placed in RAC 1) and Class GC(R).
3	RAC 3 includes, but is not limited to, groundwater of Class GC – except for Class GC(R) that was placed in RAC 2. RAC 3 groundwater receives the least extensive remedial action measures.