
**New Mexico Environment Department
Ground Water Quality Bureau**

**Orphan Site Investigation and Remediation Program
Gap Analysis Report**

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Executive Summary

Authorities, staffing levels and funding “gaps” that limit the ability of the New Mexico Environment Department (NMED) to address the risks of contamination outlined in the 2021 NMED report titled “Orphan Sites in New Mexico – The Need to Mitigate Risks to Public Health and the Environment” (the 2021 Orphan Report) are analyzed in this gap analysis report. An evaluation of existing programs currently being run by other state environmental regulatory agencies informs its recommendations.

At least 302 orphan sites located across the state in both urban and rural areas are identified in the 2021 Orphan Report. As summarized in this Gap Analysis, orphan sites contain soil, soil gas, and groundwater contamination that emanate from such businesses, facilities, and general operations as former auto service/repair, dry cleaning, wood treating, oil processing, power generation, manufacturing, agricultural practices, electroplating, research facilities, natural gas plants, chemical handling, and landfills. The 2021 NMED Orphan Report included recommendations to: 1) conduct an evaluation of sustainable funding options, and, 2) prepare a list of high-priority, initial action items that an Orphan Program should implement.

Sufficient authority and funding are the key elements needed to conduct assessments, investigations, and remedial actions of orphan sites. NMED currently has many successful programs that possess some of these elements and, therefore, serve as a template for the development of an Orphan Program. However, limitations exist that prohibit an Orphan Program from being folded into one of these existing programs. For example, Superfund only funds cleanup at sites on the National Priority List and only addresses hazardous substances, while other contaminants such as nitrate and petroleum products are excluded. Likewise, the Corrective Action Fund and Petroleum Storage Tank program are limited with few exceptions to sites contaminated by a release from a petroleum tank.

A lack of funding is a significant obstacle for addressing risks at orphan sites. Other states such as Kansas, Arizona, Oregon, and Minnesota that are currently running orphan programs have annual expenditures ranging from approximately \$1 million to \$10 million. Further insight into the funding needed to start and sustain an Orphan Program comes from within NMED. The NMED Voluntary Remediation Program/Brownfields program, for example, contains 3.5 Full-Time Equivalent Employees (FTEs) and equivalent capabilities to those envisioned for an Orphan Program; their budget for staff alone is \$350,000 per year. In addition to funding for staff, a successful Orphan Program will also need sustainable funds for investigations and cleanup. These needs are extremely variable depending on the nature and extent of the contamination and the hydrogeologic setting of the impacted media; costs well over \$100,000 per site and some over \$1 million can be expected.

An analysis of the approaches being used in other states identified methods that warrant consideration as models to structure and fund a New Mexico Orphan Program. The analysis revealed that many states use a Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)-style approach. Some have developed special programs to investigate and remediate landfills and dry-cleaner sites. Table 1 included in this Gap Analysis provides a state-by-state summary of such analysis criteria as the state's ranking system, funding source, relevant laws/regulations/policies, Responsible Party (RP) liability, general liability, etc.

Based on the successes and limitations of existing NMED programs and the evaluation of the approaches by other states used to address risk from orphan sites, the following four legislative scenarios emerged as means to address authority and funding gaps identified in this analysis:

- 1) Request an initial sum to begin assessments, conduct pilot project remediation, research long-term funding options, add staff, and develop on-going program details/budget.
- 2) Amend the New Mexico Water Quality Act to authorize specific orphan program regulations and create a dedicated orphan site assessment and cleanup fund.
- 3) Establish a long-term, sustainable funding source for an Orphan Program.
- 4) Draft new statute including all needed authorities.

The NMED Ground Water Quality Bureau (GWQB) recommends that legislative scenario 1 above be implemented and proposes the following specific elements:

Appropriation amount: \$10 million

Staffing: Create an orphan program unit with five full time employees (FTEs) in the GWQB consisting of a program manager, team leader, and three technical staff. The unit would require an addition 0.5 FTE for contracting/financial support, 0.5 FTE for administrative support, and 0.3 FTE for legal services support for RP research, negotiations, and cost recovery.

Goals for 4-year period:

Site work:

- Select priorities for initial screening of sites based on risk to groundwater, human health, and sensitive environments.
- Add additional FTE's to the GWQB.
- Conduct initial assessments at an estimated 100 sites.
- Conduct detailed assessments at 20-35 sites.
- Remove sites from the Orphan List by granting No Further Action Status upon review/generation of additional data.
- Conduct/begin pilot project remediation at two to five sites.

Program development:

- Develop system for prioritizing sites for cleanup based on risk to groundwater, human health, and sensitive environments, and considering community interest and environmental justice factors.
- Develop web portal with information about each site, e.g., map, assessment and cleanup status, public involvement opportunities.
- Update the Legislature on progress in 2025.
- Research and develop proposal – with stakeholder input – for a sustainable, long-term orphan site investigation and remediation program: legislative approach, specific elements to be included, cost details, funding mechanism(s). Timeline: legislative considerations anticipated to be presented at 2027 legislative session.

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Table 1. State Orphan Programs

List of Acronyms

CAF	Corrective Action Fund
CALA	Controlled Allocation of Liability Act
CDPHE	Colorado Department of Public Health and the Environment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
DEQ	Department of Environmental Quality
ELI	Environmental Law Institute
EMNRD	Energy, Minerals, and Natural Resources Department
EPA	U.S. Environmental Protection Agency
FTE	Full-Time Equivalent staff position
GWQB	Ground Water Quality Bureau
GWPA	New Mexico Groundwater Protection Act
HRS	Hazard Ranking System
MECS	Mining Environmental Compliance Section
MPCA	Minnesota Pollution Control Agency
NMED	New Mexico Environment Department
NFRAP	No Further Remedial Action Planned
NMAC	New Mexico Administrative Code
NMSA	New Mexico Statutes Annotated
NPL	National Priorities List
OCD	Oil Conservation Division
PCBs	polychlorinated biphenyls
PCE	perchloroethylene or tetrachloroethylene
PFAS	Poly and perfluoroalkyl substances
PST	Petroleum storage tank
RP	responsible party
SOS	Superfund Oversight Section
TBA	Targeted Brownfields Assistance
TCE	Trichloroethylene
VRP	New Mexico Voluntary Remediation Program
WQA	New Mexico Water Quality Act
WQCC	New Mexico Water Quality Control Commission

I. Introduction

The New Mexico Environment Department (NMED) prepared a report in 2021 that characterized what is currently known about the nature, extent, and risks of contaminated orphan sites in the state. Orphan sites are locations where known or suspected contamination is causing a threat to human health or the environment, the responsible party is unknown or is unwilling/unable to assess and clean up the contamination, and the site cannot receive cleanup assistance through an existing state or federal program. As a follow-up to the NMED 2021 report, “Orphan Sites in New Mexico – The Need to Mitigate Risks to Public Health and the Environment,” (the 2021 Orphan Report), this report presents a gap analysis to identify what would be needed to enable NMED to assess, prioritize, and take corrective actions at the many orphan sites across the state that currently constitute an unknown risk to human health, groundwater resources, and the environment.

A gap analysis compares an organization’s current performance with what is needed to achieve a desired future objective. It identifies the “gaps” – why and to what extent the organization is not able to achieve the objective – and suggests solutions that would fill the gaps. This gap analysis assesses NMED’s capacity to address orphan site contamination by examining its statutory and regulatory authorities, staffing levels, and funding.

II. Background: Orphan Site Report

The 2021 Orphan Report identified at least 302 orphan sites located across the state, in urban and rural areas. Documentation on the type of contamination exists for 43% of the identified orphan sites. Little information is available for the rest. Many of these are legacy sites, where the responsible parties (RPs) that caused the contamination are either unknown or abandoned or sold the site long ago.

Contamination at orphan sites in New Mexico is associated with former auto service/repair, dry cleaning, wood treating, oil processing, power generation, manufacturing, agricultural practices, electroplating, research facilities, natural gas plants, chemical handling, and other operations. Numerous spills, historic (pre-regulatory) landfills, and illegal dumps are also on the current version of the NMED Orphan Site List.¹ The most common contaminants are petroleum hydrocarbons, chlorinated solvents, polychlorinated biphenyls (PCBs), and heavy metals, though emerging contaminants such as poly and perfluoroalkyl substances (PFAS) are of growing concern. These sites pose environmental, human health, social, economic, and safety risks to their communities. The threat they pose to scarce groundwater resources is of particular concern.

Highlighting the lack of funding to address orphan sites, the 2021 Orphan Report recommended **evaluating sustainable funding options** for ongoing assessment and cleanup. With additional funding and staff, NMED would then be in the position to consider implementing the report’s other recommendations:

- Review/consolidate files and populate the database with additional site data and details;

¹ The Orphan Site List was compiled based on available information about potential or confirmed releases of contaminants into the environment and lack of RP action. Sites are updated, added to, or removed from the list as additional information becomes available.

- Evaluate which sites pose the greatest threats to water supplies, neighboring properties, and redevelopment potentials using existing information and geographic information system (GIS) tools;
- Conduct targeted sampling of groundwater, soil, and soil vapor to roughly characterize magnitude and extent of plumes at highest-risk sites;
- Implement a pilot project for assessment and cleanup of orphan sites on a limited scale;
- Increase public outreach with communities about orphan site locations and risks; and
- Increase efforts to identify and hold RPs accountable.

III. Elements Needed for Success

What capabilities does NMED require to effectively investigate and remediate contamination at New Mexico's orphan sites? The statutory basis, funding approach, and processes employed to create an effective orphan site cleanup program could take various forms. Based on a review of NMED's own existing programs as well as approaches used in other states, this analysis refers to the following program elements when identifying gaps in NMED's capacity (ELI [2002] and state-specific program materials).

These elements are *essential* for a basic capacity to address orphan site contamination:

- Authority to conduct investigations, including on-site sampling activities;
- Authority to conduct remedial actions, including installation of treatment systems;
- Right of entry for on-site activities and right to inspect relevant records;
- Established cleanup standards;
- Applicability to all media and types of contaminants;
- Funding for staff to direct/oversee technical work; and
- Funding to pay for the investigative and remedial actions

These elements would provide a significantly *enhanced* capacity to address orphan contamination, especially over the long term:

- Process for prioritizing sites for remedial action;
- Public notice and involvement process;
- Long-term stewardship: mechanisms for post-closure care if needed, e.g., monitoring, land-use restrictions, environmental covenants;
- Clearly defined liability structure (strict, joint, several, proportionate) for involved parties, e.g., RPs, landowners, prospective purchasers, lenders, the State;
- Clear delineation of who is and who is not a RP;
- Process for documenting the lack of a viable RP;
- Cost recovery procedure;
- Process for transferring the responsibility to a viable RP who is identified after state-led work has begun;
- Reporting to the public and legislature; and
- Long-term, sustainable funding mechanism for technical/legal staff and for investigative/remedial actions.

IV. NMED Authorities to Address Orphan Site Contamination

This section reviews NMED's existing authorities and their limitations regarding cleanup of contaminated orphan sites in New Mexico.² It evaluates to what extent these authorities already encompass or allow for the development of the essential and enhanced orphan program elements described in Section III.

A. CERCLA/Superfund

NMED works cooperatively with the United States Environmental Protection Agency (EPA) to identify, investigate, and remediate contaminated hazardous waste sites in New Mexico under the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. §§ 9601-9675. CERCLA establishes prohibitions and requirements concerning closed and abandoned hazardous waste sites and delineates the liability of persons responsible for release of hazardous waste at these sites. The law authorizes EPA to require the parties responsible for the contamination to clean it up. CERCLA established a Trust Fund, informally called the "Superfund," to finance the program. When there is no viable responsible party, i.e., an orphan site, CERCLA gives the EPA the authority and the funding to conduct or provide for the cleanup. Remedial actions intended to achieve full cleanup (as opposed to short-term emergency actions) are implemented at sites on the National Priorities List (NPL). Nationwide, the NPL currently includes [1,333 sites](#). New Mexico has 14 sites on the NPL in various stages of investigation and remediation. Five New Mexico sites have been deleted from the NPL because cleanup was completed.

Beneficial Program Elements: CERCLA represents a significant component of the state's capacity to investigate and clean up orphan sites. It finances initial assessments to identify hazards and contamination sources. NMED's Orphan Site List identifies 57 sites with the Superfund designation of "NFRAP" – No Further Remedial Action Planned – which indicates these sites were assessed by NMED or EPA but did not qualify for further CERCLA investigation. Most of these were conducted during the 1990s; however, NMED continues to perform environmental assessments under CERCLA authority and funding at newly discovered contaminated sites where the RP is not readily apparent. Approximately nine sites are in various phases of assessment every year. Essentially all orphan discoveries of CERCLA hazardous substances undergo environmental assessment through NMED's Superfund Oversight Section (SOS). The vast majority of those sites result in NFRAP status.

In addition to enabling initial investigations, CERCLA authorizes and funds the evaluation and implementation of remedial actions at NPL sites where no RP has been identified, while also providing for enforcement, penalties, and cost recovery if RPs are later identified. Liability and responsible persons are clearly defined; contamination in all environmental media is covered. Public notice and involvement are integral to the cleanup process.

GAP – Program Limitations: The primary reason NMED cannot rely more on CERCLA to address orphan sites is that it only funds cleanup at sites on the NPL. The main mechanism used to place sites on the NPL and thereby qualify for CERCLA-financed cleanup is EPA's Hazard Ranking System

² This analysis does not focus on situations requiring an emergency response. NMED does have the authority to respond to emergency situations pursuant to existing statutes, e.g., Section 74-4-8 of the Hazardous Waste Act and Section 74-6-11 of the Water Quality Act. In some cases, a contaminated site initially addressed by an emergency response may become an orphan site requiring additional remediation.

(HRS). NMED believes this system does not capture all the sites that merit consideration for the NPL because some of the criteria, such as population density and proximity to surface water, are not well suited to fully characterize risks in New Mexico. However, even with a perfect scoring system, CERCLA is not designed or funded to clean up all contaminated sites. NFRAP sites on NMED's Orphan Site List did not qualify for the NPL, but they may still pose a significant threat to human health or water resources. The other significant limitation of CERCLA is that it applies only to waste defined as "hazardous." Other contaminants, such as petroleum products, nitrate, and elevated salinity in soil and groundwater cannot be addressed by CERCLA.

B. Voluntary Remediation Program (VRP)

The purpose of New Mexico's Voluntary Remediation Act, New Mexico Statutes Annotated (NMSA) 1978, Section 74-4G-1 to 74-4G-12, is "to provide incentives for the voluntary assessment and remediation of contaminated property, with state oversight, and to remove future liability of lenders and landowners." The Act and its Regulations (20.6.3 New Mexico Administrative Code [NMAC]) authorize NMED to enter into voluntary remediation agreements with eligible participants, review and approve remediation activities, and provide closure documentation, including a Covenant Not to Sue to future purchasers of the property. To date, 143 properties have completed remediation and received closure documentation through the VRP. Some of these properties would have remained otherwise as orphan sites.

Beneficial Program Elements: The VRP contributes to reducing the number of orphan sites in New Mexico. The flexible process and liability protections encourage participation, especially when a property transaction or redevelopment is contemplated. An interested buyer/developer may have resources the current property owner lacks to undertake the cleanup. The VRP is also a companion to the Brownfields Program, described below, because NMED requires entities receiving Brownfields assistance to participate and follow the cleanup process outlined in the VRP.

The VRP is authorized by a stand-alone statute, and NMED promulgates the rules rather than the Water Quality Control Commission (WQCC) or the Environmental Improvement Board. It contains all the necessary elements to achieve full cleanup at a site as long as a willing party comes forward to participate and provide funding. The VRP clearly articulates the liability of lenders and program participants (owners and operators), establishes participant eligibility, covers all environmental media and a broad range of contaminants, and establishes performance standards that include the WQCC water quality standards and risk-based criteria for other media. It allows for conditional closures with monitoring, institutional controls, and audits. Public notice and public involvement are integral to the process.

GAP – Program Limitations: The VRP is not sufficient to address all orphan sites in New Mexico, nor can it alone form the basis for a comprehensive orphan site program. Significantly, it does not provide funding; it relies on the participant to fund investigations and remedial actions. Participation in the program is limited by statute to owners, prospective owners, operators, and prospective operators. As such, NMED cannot be a VRP participant. The program relies on an agreement between the participant and NMED. Again, this structure could not provide a framework for NMED to conduct cleanups.

C. Brownfields Program

NMED's VRP and its Brownfields Program grew out of EPA's Brownfields Initiative in the late 1990s to facilitate redevelopment of abandoned and underused properties tainted by contamination or perceived contamination. EPA provides competitive Brownfields grants for planning, environmental assessments, and cleanup. Over the past decade EPA has awarded substantial assessment grants to New Mexico coalitions that included NMED. The grants have enabled NMED and its partners to hire contractors to perform Targeted Brownfields Assessments (TBAs) at dozens of Brownfield sites for governmental, Tribal, or nonprofit entities who can demonstrate they do not have CERCLA liability. EPA Region 6 has also performed TBAs. Depending on the specific need, a TBA is an initial or more detailed investigation of the type and extent of contamination and may be used to evaluate cleanup options and associated costs. It is provided at no cost to an eligible owner or prospective owner of the property. To finance cleanup, NMED has a Brownfields Revolving Loan Fund, which provides loans and, to a lesser extent, sub-grants. Eligible entities can also compete for small cleanup grants directly from EPA.

Beneficial Program Elements: Entities receiving Brownfields assistance must participate in the VRP, so the VRP's beneficial elements apply here as well. The Brownfields Program adds the critical element of funding to complete assessments and cleanups. The funding makes it possible for a local government, for example, to finally do something about a long-abandoned, blighted property that may have contamination issues. It also adds a focus on redeveloping or rehabilitating the formerly contaminated property to become a community asset. Brownfield projects usually rely on partnerships. They can revitalize neighborhoods or commercial districts. They often incorporate green design features and address a community need like affordable housing, improved transportation options, or green space (EPA, 2019).

GAP – Program Limitations: NMED's Brownfields Program is funded by limited EPA grants and assistance. The program could do more to address orphan sites with redevelopment potential if more funding were available. The state could add its own funding for specified purposes, e.g., to conduct more TBAs, provide cleanup grants, or extend assistance to entities ineligible for federal Brownfield assistance. The state could add other incentives, like tax credits or tax abatements. Aside from funding, however, the Brownfields Program has other limitations. With its focus on property redevelopment, it excludes many orphan sites with limited redevelopment potential. It is better suited for relatively simple cleanups like soil removal or asbestos abatement than for complicated situations like extensive groundwater plume remediation associated with multiple sources. The requirement for a willing party to take on the cleanup and redevelopment at a site can be a significant impediment. Brownfields assistance is available only for property owners or prospective purchasers. The Brownfields Program does not provide the authority for NMED to simply move forward with investigation and remedial action at sites posing a threat.

D. Groundwater Protection Act/Corrective Action Fund/Petroleum Storage Tank Regulations

The purpose of the Groundwater Protection Act (GWPA), NMSA 1978, Sections 74-4B-1 to 74-4G-14, is "to provide substantive provisions and funding mechanisms to the extent that funds are available to enable the state to take corrective action at sites contaminated by leakage from storage tanks." In passing this legislation, the Legislature recognized that leaking tanks posed a threat to groundwater resources but also that some owners and operators would face serious financial jeopardy if required to undertake corrective actions. Furthermore, the availability of fuel could be

restricted if fuel stations went out of business. The GWPA created the Corrective Action Fund (CAF), which may be used to reimburse owners and operators of petroleum tanks for eligible assessment and cleanup costs (conditions apply). The Petroleum Storage Tank (PST) Regulations (20.6.5 NMAC), which were promulgated pursuant to the GWPA, the Hazardous Waste Act, and the Environmental Improvement Act, establish requirements for tank registration, operation, installation, financial responsibility, and closure, as well as for reporting, investigating, and taking corrective action for releases. The CAF is financed by a fee collected from wholesale distributors of petroleum products. Since 1992, the CAF has been used to clean up approximately 1,900 sites.

Beneficial Program Elements: The GWPA and PST Regulations have been very successful in cleaning up contamination from leaking petroleum tanks. The program's structure is comprehensive in scope, including tank registration, pollution prevention requirements such as proper installation and maintenance, clear delineation of liability, a cleanup process, and the availability of the CAF to cover the bulk of cleanup costs for compliant owners and operators. It also provides for orphan site cleanup by authorizing use of the CAF for NMED to take corrective actions at sites where owners and operators are unknown, unable, or unwilling to take corrective action (20.5.121.2102 NMAC).

GAP – Program Limitations: The PST program has an important but narrow focus. With respect to orphan site cleanup, it is limited with few exceptions to sites contaminated by a release from a petroleum tank. Spills of oil or petroleum that were not released from a tank are not covered by the PST Regulations. Releases from most above-ground storage tanks with a capacity greater than 55,000 gallons also are not covered. Most sites eligible for CAF-financed investigation and cleanup have already been referred to that program. Some of the orphan sites were referred from the PST program. Upon investigation, tank releases qualifying for the CAF may be discovered at some additional orphan sites, but a large majority of the sites on the Orphan Site List do not qualify.

E. Water Quality Act/Water Quality Control Commission Regulations

The Water Quality Act (WQA), NMSA 1978, 74-6-1 et seq., does not include a purpose statement, but its purpose is inherent in its creation of the WQCC and delineation of its duties and powers, and the duties and powers of its constituent agencies.

Section 74-6-4(D) requires the WQCC to adopt standards for surface and ground waters. Those standards are enumerated in rule at 20.6.4 NMAC for surface waters, and in Sections 20.6.2.3101-3103 NMAC of the Ground and Surface Water Protection Regulations, 20.6.2 NMAC, for groundwater. These standards are applicable for all cleanup actions undertaken in the state under any authority.

Section 74-6-4(E) directs the WQCC to “adopt, promulgate and publish regulations to prevent or abate water pollution in the state or in any specific geographic area, aquifer or watershed of the state or in any part thereof, or for any class of water ...”

“Water pollution” is defined broadly at Section 74-6-2(C) to mean “introducing or permitting the introduction into water, either directly or indirectly, of one or more water contaminants in such quantity and of such duration as may with reasonable probability injure human health, animal or plant life or property, or to unreasonably interfere with the public welfare or the use of property”.

Section 74-6-9(B) explicitly allows NMED to conduct site investigations. It authorizes NMED, as a constituent agency of the WQCC, to “develop facts and make studies and investigations and require the production of documents necessary to carry out the responsibilities assigned to the constituent agency. The result of any investigation shall be reduced to writing and a copy furnished to the commission and to the owner or occupant of the premises investigated.” Under this authority NMED does conduct some sampling as resources allow. Section 74-6-10 provides enforcement and penalties authority for violations of the Act or regulations adopted pursuant to the Act. These existing sections of the WQA (74-6-4(D) and (E), 74-6-9(B) and 74-6-10) could provide the authority for an orphan site cleanup program, provided the goal is to prevent or abate water pollution.

The WQCC Regulations at 20.6.2 NMAC, promulgated pursuant to the WQA, contain cleanup requirements. Section 20.6.2.1203 NMAC requires owners/operators to undertake corrective action for spills. Under the abatement regulations (20.6.2.4101-4115 NMAC) an RP proposes a Stage 1 Abatement Plan for investigating the nature and extent of contamination and a Stage 2 Abatement Plan for presenting and selecting a remedial option that will meet the abatement standards. Both stages require approval from the constituent agency and public notice. Post-closure care may be required as appropriate. The constituent agency either requires the abatement plan from a RP, or a RP may voluntarily submit an abatement plan. Through these existing authorities, it is possible for NMED to take the lead in site investigation and cleanup under the voluntary abatement option.

Beneficial Program Elements. The WQA provides authority for NMED to conduct investigations at orphan sites. Pilot project remediation could also proceed under this authority. The spill and abatement provisions provide a regulatory framework for RP cleanup of contaminated sites, and it may be possible to conduct state-led cleanup under the same authority. The WQA clearly provides authority for the WQCC to promulgate regulations for orphan site cleanup with the objective of preventing or abating water pollution, and such regulations could incorporate most of the enhanced program elements described in Section III. There would be continuity with the existing abatement program, in cases where an RP is later identified to assume responsibility for the cleanup. All categories of pollutants for which the state has adopted water quality standards would be covered. The broad definition of “water pollution” has enabled the WQCC Regulations to not only protect people against the health risks of drinking contaminated water but also to protect people from other types of exposure, e.g., vapor intrusion, and to protect animal and plant life.

GAP – Program Limitations. The WQA currently does not define what type of liability applies for cleanup nor who constitutes a RP. The WQCC Regulations are also vague in this regard, defining “responsible person” as “a person who is required to submit an abatement plan or who submits an abatement plan.” The definition does not explicitly include the property owner, facility operator, or persons who may have contributed to the contamination. This lack of clear definition could make it difficult to document that a viable RP does not exist and to require remittance of cleanup costs from a viable RP. For NMED to proceed as the lead under the existing abatement regulations may present difficulties as the regulations were not designed for that scenario. Also, neither the WQA nor the WQCC Regulations currently include a process for ranking sites based on the hazards that they may pose. In sum, the existing WQA and WQCC Regulations may suffice for initiating an orphan site investigation and remediation effort, but to provide the foundation for a sustainable, well-functioning program, the development of new regulations would be advised. Amendment of the WQA itself also merits consideration, rather than leaving substantial issues like liability to the regulatory process.

V. Staffing Levels and Funding

An orphan site program would align very well with the existing Ground Water Quality Bureau (GWQB) cleanup programs and expertise. However, no funding is currently available for NMED to assess, prioritize, and implement remedial actions at orphan sites. Whether a basic or an enhanced orphan site cleanup program is initiated, funding for staff and for the investigative and remedial site work would be needed.

How much funding is needed? One approach to estimate the amount of funding needed is to consider similar programs in other states. Often it is difficult to find a direct comparison in the financial reports produced by other states. The totals in the following list appear to correlate relatively well. They represent expenditures at non-NPL sites for investigative and remedial work only – they do not include staff oversight costs. Also excluded are expenditures for dry cleaner or landfill programs.

- Kansas: \$1.09 million/year (Kansas Water Authority, 2021)
- Arizona: \$10 million/year (Arizona DEQ, FY21)
- Oregon: \$2.5 million/year (Oregon DEQ, 2022)
- Minnesota: \$2.9 million/year (MPCA, 2021)

Another approach that can lend insight into the funding need is to understand the scope of work. A detailed environmental investigation of a site where groundwater contamination is suspected may involve the installation of monitoring wells and other sampling equipment, one or more sampling events, geotechnical work, groundwater modeling, and interpretation of the results. The cost of such an investigation can range from \$40,000 to \$100,000 (or more). Remedial actions can include removal of old equipment (demolition), asbestos and lead-based paint abatement, soil excavation, contaminated materials removal, design, installation, and operation of groundwater treatment systems, installation of vapor mitigation systems, ongoing monitoring, provision of alternative water, and many other possible actions. Occasionally only a small remedial action is required. However, often the cost to remediate a site exceeds \$100,000 and can exceed \$1 million, especially for complex groundwater contamination. Furthermore, remedial actions may continue for many years.

Existing GWQB staff are already fully committed, and funding to support additional staff or contract work is not available. The existing staffing levels identified as Full-Time-Equivalent (FTE) positions, expenditures, responsibilities, and funding sources for GWQB cleanup sections are summarized below. The Office of General Counsel provides legal support for all programs, but that staffing cost is not included in the totals below.

CERCLA. Staff comprise the GWQB SOS, with assistance from the Mining Environmental Compliance Section (MECS).

- Staff: 9 FTEs in SOS plus 3 FTEs in MECS, \$1.35 million per year
- Investigative Actions: \$400,000 per year
- Remedial Actions: Highly variable from \$3 to \$4 million per year for routine operations and maintenance activities peaking as high as \$18 million during remedial construction years

- Responsibilities: Conduct assessments and RP research at approximately 9 orphan sites/year; direct and oversee contracted remediation activities, assist with monitoring, and conduct public involvement currently related to 5 NPL sites. Provide state oversight of RP-funded or EPA-lead remedial activities at 9 NPL sites.

Funding Sources: Federal EPA cooperative agreements (90%) with required state match (10%) for core program activities and remedial actions. In recent years the state match has been provided by legislative appropriation. The Hazardous Waste Emergency Fund may also be used for the “state’s share of any response action” under CERCLA (NMSA 1978 74-4-8), but the fund is inadequate to support the CERCLA match requirements and address its other intended purposes. 100% state funding is required at any NPL site in ongoing cleanup during the time period after the first 10 years of operations and maintenance are completed, until cleanup is achieved. If post-closure maintenance is required at a site, then the state is required to provide 100% funding.

VRP/Brownfields Program. These staff are a team in the GWQB’s Remediation Oversight Section.

- Staff: 3.5 FTEs, \$350,000 per year
- Targeted Brownfields Assessments: \$50,000 per year
- Responsibilities: Administer the VRP with 34 active sites and the Brownfields Revolving Loan Fund, direct and oversee contracted TBAs at approximately sites each year, apply for EPA Brownfields grants, conduct extensive outreach to assist communities with Brownfields projects.

Funding Sources: NMED relies on participant fees and EPA cooperative agreements to support the VRP staff positions. The VRP is intended to be fully funded by participant fees, but due to the overlap with Brownfield activities, EPA also provides support. The Brownfields staff managing and administering TBA work are supported by EPA cooperative agreements. The Brownfields Revolving Loan Fund is refreshed from loan repayments but also receives supplemental grant funding from EPA.

State Cleanup Program. These staff comprise a team in the GWQB Remediation Oversight Section and currently administer the abatement and spill regulations.

- Staff: 4.5 FTEs, \$433,000 per year
- Responsibilities: Identify and notify RPs. Oversee cleanups at approximately 90 active sites by responsible parties under the spill and abatement regulations in 20.6.2 NMAC.

Funding Sources: State general fund (50%) and CAF (50%) for staff. The CAF can be used to fund these staff positions pursuant the GWPA provision that created the fund (74-6B-7), which reads in part, “The legislature may appropriate up to thirty percent of the annual distribution to the fund pursuant to Section 7-1-6.25 NMSA 1978 to the department to match federal funds, for underground contamination cleanup, and to address water needs.”

VI. Gap Summary

To summarize current authorities: CERCLA enables NMED to address orphan sites with the highest risk contamination and to conduct initial assessments of newly discovered contamination where the RP is not readily apparent. It provides both authority and funding. It only addresses contaminants defined as hazardous waste. The VRP and the Brownfields Program provide incentives and some funding to address orphan sites if an eligible participant is willing to take the lead. These programs are best suited for sites with significant redevelopment potential and where cleanup costs are moderate. They do not have a state-lead option. The GWPA and PST Regulations provide a process and funding for state-lead orphan cleanup, but these primarily target petroleum contamination from tanks.

With respect to the contaminated sites on the Orphan Site List which do not fall under the programs listed above, NMED currently has explicit authority under the WQA to conduct site investigations. Current staffing and funding levels allow this to occur only to a limited degree. However, if funding and additional staff were available, NMED could proceed with gathering information, establishing priorities, and conducting investigations and pilot project remediation at orphan sites. Formal public notice requirements would not apply, but NMED could nevertheless provide for public involvement.

NMED may have the authority to conduct investigations and remedial actions at orphan sites pursuant to the voluntary abatement provisions in the WQCC Regulations, 20.6.2 NMAC. As these rules were not designed for state-lead actions, however, that approach would require resolving some process and liability questions.

The WQCC has clear authority to adopt regulations under the WQA for an orphan site cleanup program, which could include most of the essential and enhanced elements. Amending the WQA to establish some basics, such as the liability parameters, might avoid undue controversy in the rulemaking process.

Currently, no funding is available to fund an effort to assess, prioritize, and implement remedial actions at NMED orphan sites.

VII. Approaches Used in Other States

Most states have orphan site cleanup programs. A review of several of these programs revealed a range of approaches, as described in this section, which offer ideas for New Mexico's consideration in developing its own capacity. This discussion focuses primarily on states in EPA Region 6, the mountain west, and the Pacific Northwest. Table 1 presents links to the details of the state programs reviewed.

A. CERCLA-Style Programs

Many state programs were initiated in the 1980s and 1990s following the passage of CERCLA, and they contain many similar features. They authorize the state to undertake investigations and implement remedial actions. The strict, joint, and several liability structure, an official list of sites to be addressed, a system for prioritizing the sites on the list, a formal listing and de-listing process, cost recovery procedures, public involvement processes, and funding to address orphan sites are typical features of these programs. The state cleanup program is often integrated with the federal

CERCLA program. One result of this integration is that NPL sites are among the sites on the state list. These state programs are also usually the same programs under which RPs are required to conduct cleanup.³

Kansas presents an exception to the CERCLA-style program. [The Kansas Department of Health and the Environment Orphan Sites Unit](#) addresses contaminated orphan sites under its “Water Pollution Remediation” policy, and funding is provided from the State Water Plan Fund.

B. Liability Standards

Most CERCLA-style programs broadly define RPs to include parties who:

- Own or operate the contaminated property;
- Owned or operated the property at the time of the disposal of the contaminants;
- Arranged for the transport or disposal of the contaminants at the property; or
- Transported the contaminants to the property.

Some RPs are held strictly liable, that is, without regard to fault or negligence. Joint and several liability allows for one RP to held liable for the entire cleanup of the site when the harm caused by multiple parties cannot be separated.

Some states, including Montana and Arizona, have adopted a proportionate liability scheme as an alternative to strict or joint and several liability. In both these states any “orphan share” of a site remediation is paid for using the orphan site cleanup funding. [Montana’s Controlled Allocation of Liability Act \(CALA\)](#) was designed to be a streamlined, voluntary allocation process. For facilities where a potential RP does not initiate the CALA process, strict or joint and several liability still applies. In Arizona the Department of Environmental Quality (DEQ) conducts significant RP research to establish each party’s responsibility, then negotiates a settlement, in which the state covers the orphan share of assessment and remediation costs. The state’s orphan share responsibility has increased over time to more than half of the estimated cleanup costs (Arizona DEQ, FY21).

C. Hazard Ranking and Prioritization

An analysis by the Environmental Law Institute (ELI) conducted in 2001 reported that 37 states maintain an officially sanctioned inventory, priority list, or registry of sites, but these vary widely in approach. Some lists include all known and suspected sites, while others include only a very small number of sites that have completed a long evaluation process. Still others include only orphan sites where cleanup is funded by states rather than by RPs (ELI, 2002).

Many states have a formal process including public involvement for listing or de-listing a site on the list. Sites on the list are often ranked or classified according to how much of a threat they pose, and sometimes this ranking is used to prioritize cleanup funding. The Superfund HRS prioritizes the worst contamination, an approach sometimes referred to as “worst first.” State programs often have the same emphasis, but some states are beginning to give more consideration to other factors, such as environmental justice, climate change impacts, and community priorities. Not uncommonly, states

³ This is handled differently in NM, where RPs for sites on the NPL cleanup pursuant to CERCLA. Otherwise, RPs are required to clean up pursuant to the WQCC Regulations under the WQA.

propose a budget and specific work plan tied to a legislative request or report. For example, Washington, Oregon, and Minnesota do this.

Ranking and priority approaches in a few states are highlighted below.

Montana DEQ has criteria for listing a site and a system for ranking the sites on the list. DEQ may list a facility on its priority list if it determines “there is a confirmed release or substantial threat of a release of a hazardous or deleterious substance that may pose an imminent and substantial threat to public health, safety, or welfare or the environment.” The ranking system – maximum, high, medium, and low priority - emphasizes actual and threatened impacts to water sources for drinking and other beneficial uses, but also considers vapor intrusion and the risk of contaminant migration (ARM [17.55.108](#) and [17.55.111](#)).

Washington ranks all sites on its hazardous sites list “to estimate the relative potential risk posed by the site to human health and the environment. This assessment considers air, groundwater, and surface water migration pathways, human and nonhuman exposure targets, properties of the substances present, and the interaction of these variables” ([WAC 173-340-330](#)). The Washington Department of Ecology is currently in the process of revising its ranking tool to include not only the severity of contamination but social factors, environmental justice, and climate change. The revised tool should be able to avoid comparing apples and oranges, such as a large, contaminated site in Seattle with a small site in a rural town. It will take into consideration vulnerable populations and disproportionate impacts (Washington Department of Ecology, 2022).

Minnesota has four classifications for sites on its Permanent List of Priorities: Class A - a declared emergency by the commissioner; Class B - the operation and maintenance at a site that has undergone previous response actions; Class C - other response actions which may include the first-year costs associated with operation and maintenance at a site; and Class D - remedial investigations and feasibility studies. Funding priority goes first to sites in Class A, then Class B. The Minnesota Pollution Control Agency (MPCA) Commissioner may assign funding priority to sites in Classes C and D based on HRS scores and other considerations ([MAR Chapter 7044](#)). Like Washington, Minnesota is also considering how to incorporate environmental justice and climate change factors into its priority-setting (MPCA, 2022b).

In Texas a site with a Superfund HRS score of 5.0 or greater may be proposed for listing on the State Superfund Registry. Other factors in addition to the HRS score may be considered, including community interests, simplicity, and costs of investigation and remedial action ([TAC 30.1.335 Subchapter K §335.343](#)).

D. Brownfields Incentives

Approximately half of the states in the US offer Brownfields incentives – tax abatement and tax credits of various types - beyond what New Mexico offers (EPA, 2017). Colorado, which doesn't have an orphan site cleanup program, offers a state income tax credit of up to \$525,000 for eligible remediation costs for brownfields in the voluntary remediation program: 40% credit for up to \$750,000 in costs and 30% for costs between \$750,000 and \$1.5 million. The program is currently limited to \$3 million per year and the credits are allocated on a first-come, first-serve basis. The program is very effective in the Denver real-estate market, but the credits are also used in rural areas (CDPHE, 2022). In Washington the Department of Ecology hopes to continue offering “flexible”

Brownfields funding for limited cleanups or some investigation of a site with community interest. This state funding provides an option for cases where federal Brownfields funding cannot be used, e.g., when a property owner did not complete a Phase I Environmental Site Assessment before the purchase of a property (Washington Department of Ecology, 2022). Oklahoma DEQ's [Community Revitalization Program](#) uses a small percentage of the state's petroleum taxes to provide cleanup grants to local governments for environmental hazards, particularly asbestos and lead-based paint, but also other contaminants that pose an imminent and substantial endangerment to human health (Oklahoma DEQ, 2022).

E. Long-Term Stewardship

Long-term stewardship refers to the establishment and maintenance of physical and non-physical controls that are necessary to maintain the effectiveness of the remediation at a site. For example, post-closure monitoring or an engineering control may be required, or the site may only be appropriate for an industrial end use and not residential use. Pennsylvania is an example of a state with a [Uniform Environmental Covenants Act](#). It provides a standardized process for creating, documenting and assuring the enforceability of activity and use limitations on contaminated sites. It also requires the state to maintain a registry for the public display of covenants in effect. The lack of a Uniform Environmental Covenants statute in New Mexico makes the tracking of institutional controls in a given area of a town or county problematic.

F. Landfill Programs

Several states have special programs to address landfills.

North Carolina DEQ has a [Pre-Regulatory Landfill Program](#) for prioritizing, assessing, and implementing remedial action plans at landfills and dumps, whether publicly or privately owned, where municipal solid waste disposal occurred prior to 1983. The program is funded by a tax on the disposal of municipal solid waste and construction and demolition debris. In addition to state-lead actions, a unit of local government may voluntarily undertake assessment and remedial action at a pre-1983 landfill and be reimbursed as long as the work is pre-approved and complies with state requirements (North Carolina DEQ, 2021).

Minnesota's [Closed Landfill Program](#) is responsible for managing and monitoring 110 closed municipal waste landfills in perpetuity to protect the environment and human health. The program monitors for groundwater contamination, maintains gas and leachate systems, and implements projects to mitigate risk to the public and the environment. Current concerns include addressing vapor intrusion of trichloroethylene (TCE) and investigating on-site PFAS and 1,4 dioxane treatment systems as these contaminants occur at most sites. The program has 10 FTEs plus engineering assistance. They conduct some of the monitoring and oversee contract work. The approach recognizes the specific challenges posed by municipal landfills, where the RPs may be hundreds of businesses and waste haulers, and thousands of residents (MPCA, 2022a).

The [Wyoming Landfill Remediation Program](#) was created after improved groundwater monitoring beginning in the 2000s determined that landfill activities were impacting groundwater at many facilities. In 2013 new legislation appropriated \$45 million and authorized DEQ to provide oversight and fund up to 75% of the cost of investigating and remediating contamination at open and closed municipal solid waste landfills with a 25% facility match. The State of Wyoming remains a funding

partner on projects for the first 10 years of the selected remedy. The state estimates remediation costs of \$31.9 million for the 10 highest ranking landfills for the first 10 years. Ongoing funding is provided by the State of Wyoming's petroleum fund (Wyoming DEQ, 2021).

G. Dry-Cleaner Remediation Programs

Thirteen states have dry-cleaner remediation programs.⁴ These programs typically mandate dry cleaner registration and pollution prevention measures.⁵ Annual fees or taxes on gross receipts and/or solvents are collected for a remediation fund, which is used for assessment and remediation of contamination discovered at dry cleaning sites. The programs limit the cleanup liability of the participating dry-cleaning businesses to a deductible or a cost-share. Similar to the purpose of petroleum storage tank cleanup programs, the dry-cleaner programs aim to protect small businesses from bankruptcy due to high contamination cleanup costs (State Coalition for Remediation of Drycleaners, no date).

North Carolina's dry-cleaner program collects approximately \$9 million in revenue annually from taxes on dry cleaner solvents and a portion of North Carolina's sales tax on dry cleaner businesses. This revenue remains steady. An additional \$100,000 derives from the dry cleaners' portion of the cleanup costs. By using a risk-based strategy that allows staff to calculate cleanup levels for soil and groundwater based on site-specific risks, the state has been able to prioritize remediation and keep the fund solvent. Mitigating indoor air pollution from vapor intrusion of perchloroethylene (PCE) and TCE is a high priority, but soil and groundwater remediation also receive attention. Up to 1% of the dry-cleaner remediation fund may be used to investigate active and abandoned dry-cleaner sites that the program believes may be contaminated. Currently, 460 North Carolina dry-cleaner sites are certified into the cleanup program, but the state estimates that as many as 750 additional contaminated sites could qualify. Based on an estimated average cleanup cost per site of \$450,000, cleanup costs could total \$338 million (North Carolina DEQ, 2021).

Revenue from dry cleaner programs is dwarfed by cleanup costs in other states as well. [Oregon DEQ](#) receives approximately \$500,000 annually from dry cleaner fees and estimates a total cleanup cost of \$100 million for all the dry-cleaner sites in the state. This discrepancy results in a slow rate of cleanup. In addition, the remediation funds face declining revenues as dry-cleaning businesses shift

⁴ Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

⁵ Dry cleaners in New Mexico must comply with air quality and hazardous waste regulations. As such they are subject to some pollution prevention requirements. The NMED Air Quality Bureau Small Business Compliance Assistance program has developed materials to assist dry cleaners comply with changing federal air quality regulations. At this time dry cleaners must meet equipment requirements, monitor, and keep records, but they are not required to submit anything to EPA or NMED. While the air quality requirements may indirectly help to prevent releases to soil and groundwater, they are not specifically designed for that purpose. Dry cleaners in New Mexico were required to submit some information to NMED in 2008 on solvent use, but that information would no longer be reliable. Many dry cleaners have gone out of business, have stopped using PCE, or have become drop-off locations only (NMED AQB, 2022). Dry cleaners using PCE are "small" or "very small" hazardous waste generators that must ensure proper on-site storage, transportation, and disposal of spent PCE and PCE filters. Stoddard solvent waste must also be handled as a hazardous waste because of its low flash point. Other wastes generated must be fully characterized to determine if they are hazardous. Those that are small quantity generators are required to register with EPA. Like all New Mexico businesses, dry cleaners are subject to potential inspection by the NMED Hazardous Waste Bureau (NMED HWB, 2022).

away from PCE. Dry-cleaner remediation programs benefit small businesses from financial ruin, and they benefit the public by accomplishing more cleanups than would otherwise occur.

H. Funding Approaches

States use a variety of funding mechanisms for their orphan site cleanup programs. According to the ELI analysis in 2001, appropriations were a significant source for 28 funds, waste fees were a significant source for 24 funds; taxes were a significant source for 19 funds, while cost recovery was a significant source for 19 funds. Bonds provided significant funding for 14 funds and user fees were a significant source for 13 funds. Some of these funds were used primarily for other purposes than site cleanup, for example, to fund agency hazardous waste management programs (ELI, 2002).

The most common funding mechanisms encountered in our review are listed below, with interesting aspects highlighted. The list of states using each mechanism is not exhaustive. See attached Table 1 for links to more details about the programs reviewed.

- Appropriations: Arkansas, Kansas, Montana
Montana DEQ receives appropriations in varying amounts to cover the orphan share at various sites. A one-time appropriation of \$7 million for the 2016-2017 biennium helped to enable the state to address 81 and close 58 sites.
- Corporate Income Tax: Arizona
Arizona statute mandates the transfer of \$15 million annually from the corporate income tax, but the full transfer only occurred twice, and the fund no longer receives any transfers despite the statutory mandate.
- Hazardous Substances Possession Tax: Washington
Voters in Washington approved a tax on petroleum products, CERCLA-listed substances, and registered pesticides, which provides approximately 40% of the revenue for the Washington Department of Ecology, including for orphan site cleanup.
- Hazardous waste generation and/or treatment/storage/disposal fees⁶: Illinois, Arkansas, Louisiana, Texas, Georgia
- Hazardous waste treatment/storage/disposal of hazardous waste generated out of state: Arkansas, Texas
- Petroleum Fund: Arizona, Oklahoma, and Wyoming
Wyoming diverts funding from its Correction Action Account for its Landfill Remediation Program Account (\$5 million for 2021) and its Orphan Site Remediation Program account

⁶ NMED HWB collects fees from businesses generating hazardous waste, conducting permitted hazardous waste management activities, and seeking a permit for the management of hazardous waste. These fees are deposited into the Hazardous Waste Fund, which is used for the administration and operation of the hazardous waste program (NMSA 1978 Sections 74-4-4.2(J) and 74-4-4.5, 20.4.2 and 20.4.3 NMAC).

(\$1 million for 2021), provided that adequate funds are available for the Storage Tank Program that year.

- Solid Waste Disposal or Management fees: North Carolina Pre-regulatory landfill program, Minnesota Closed Landfill Program, Oregon Solid Waste Orphan Program, Texas, Georgia
- Lead-Acid Battery Sale Fee: Texas
- Water fees: Arizona, Kansas
The State Water Fund provides funding for many water-related project in Kansas, including orphan site cleanup. The fund receives revenues from the general fund, the economic development fund, water use fees, pesticide and fertilizer registration fees, and sand royalties.
- Pesticide/fertilizer fees: Arizona, Kansas
- Oil and Natural Gas production-related fees: Montana, Pennsylvania
- Coal and other Minerals Fee: Montana
- Bonds: Oregon Industrial Orphan Site program, Minnesota Closed Landfill Program
The [Oregon Industrial Sites Cleanup Program](#) has been funded since its inception 30 years ago through the sale of bonds every four years. Oregon DEQ develops a 4-year projection for costs, which has typically been approximately 10 million dollars. The cost associated with each bond sale is \$300,000, and 80% of the funds must be spent within three years. The utilization of the bond sale has provided the program with continuing infusions of cash while allowing for the repayment from each bond sale (from the general fund and hazardous substance possession fees) to occur over a 20-year period (Oregon DEQ, 2022).
The [Minnesota Closed Landfill Program](#) uses general obligation bonds for larger construction projects.
- Investment Income: Montana Closed Landfill Program, Pennsylvania
The Minnesota Legislature set aside \$20.4 million in 1999 to be used beginning in 2020. The fund also received proceeds from settlements with insurance companies. The 20 years from enactment until intended first use was to allow sufficient time for investment earnings to accumulate to an amount that could support the long-term care of the program. The fund's value at the end of 2020 was \$119.3 million (MPCA, 2021).

VIII. Alternative Legislative Scenarios for Establishing Capacity

To address the authority and funding gaps identified in this analysis, the following legislative scenarios have been identified. These alternative legislative scenarios could be adopted separately or in combination.

- 1) Request an initial sum to begin assessments, conduct pilot project remediation, research long-term funding options, and develop on-going program details/budget.

This approach would allow NMED to immediately begin conducting assessments of sites on the orphan site list using existing authority granted by the Legislature under the appropriation. The assessments would provide a better understanding of the risks and the potential remediation costs. Some sites likely could be closed after assessment and removed from the list. Remediation at pilot project sites could also begin. This on-the-ground component would inform and complement a concurrent effort to develop the details of a long-term program and sustainable funding source.

- 2) Amend the WQA to authorize specific orphan program regulations and create a dedicated orphan site assessment and cleanup fund.

A short amendment to the WQA would give NMED a firmer foundation and clearer guidance for an orphan site assessment and remediation program. It could remedy current weaknesses, e.g., give specific authority for remediation, define RP and liability structure. It could also specify desirable program components such as a ranking/prioritization system. A fund could be created to accept revenue from multiple sources, similar to the recently established Uranium Mining Reclamation Revolving Fund. An initial appropriation could be placed there, as well as revenue from ongoing funding sources created in the future.

- 3) Establish a long-term, sustainable funding source for the program.

Various funding approaches used in other states are described in this analysis. Additional NMED research as well as stakeholder engagement would be advised for selecting an approach appropriate for New Mexico.

- 4) Draft new statute including all needed authorities.

A stand-alone statute would provide the strongest footing for an orphan program because it could include clear definitions, describe the liability and cost recovery structure, include all environmental media, provide all needed authorities, and specify other desirable program elements. It could also provide for a degree of integration and continuity with the Superfund process. Special program aspects for landfills or dry cleaners, if desired, could be built in. Additional research as well as stakeholder engagement would be advised for the creation of a stand-alone statute to address orphan sites in New Mexico.

IX. GWQB Recommendation

GWQB recommends legislative scenario 1: Request an initial sum to begin assessments, conduct pilot project remediation, research long-term funding options, and develop on-going program details/budget. The appropriation would be used as sketched out below. GWQB intends to develop an implementation plan with more details about the proposal to inform the public and the Legislature.

Appropriation amount: \$10 million

Staffing: Create an orphan program unit with five (5) FTEs in the GWQB consisting of a program manager, team leader, and three (3) technical staff. The unit would require an addition 0.5 FTE for contracting/financial support, 0.5 FTE for administrative support, and 0.3 FTE for legal services support for RP research, negotiations, and cost recovery.

Goals for 4-year period:

Site work:

- Select priorities for initial screening of sites based on risk to groundwater, human health, and sensitive environments.
- Add additional FTEs to the GWQB.
- Conduct initial assessments at an estimated 100 sites.
- Conduct detailed assessments at 20-35 sites.
- Remove sites from the Orphan list by granting no further action status upon review/generation of additional data.
- Conduct/begin pilot project remediation at two to five sites.

Program development:

- Develop system for prioritizing sites for cleanup based on risk to groundwater, human health, and sensitive environments, and considering community interest and environmental justice factors.
- Develop web portal with information about each site, e.g., map, assessment and cleanup status, public involvement opportunities.
- Update the Legislature on progress in 2025.
- Research and develop proposal – with stakeholder input – for a sustainable, long-term orphan site investigation and remediation program: legislative approach, specific elements to be included, cost details, funding mechanism(s). Timeline: legislative considerations anticipated to be presented at 2027 legislative session.

X. References

- Arizona Department of Environmental Quality (Arizona DEQ), FY21. [Water Quality Assurance Revolving Fund \(WOARF\) Annual Report](#).
- Colorado Department of Public Health and the Environment (CDPHE), Fonda Apostolopoulos, March 17, 2022, personal communication.
- Energy, Minerals, and Natural Resources Department Oil Conservation Division (EMNRD OCD), Jim Griswold, March 9, 2022, personal communication.
- Environmental Law Institute (ELI), 2002. [An Analysis of State Superfund Programs: 50-State Study, 2001 Update](#).
- Environmental Protection Agency (EPA), United States, 2017. [State Brownfields and Voluntary Response Programs. EPA F-560-17-212](#).
- Environmental Protection Agency (EPA), United States, 2019. [Anatomy of Brownfields Redevelopment. EPA 560-F-19-012](#).
- Kansas Water Authority, 2021. [Annual Report to the Governor and Legislature](#).
- Minnesota Pollution Control Agency (MPCA), March 2021. [Closed Landfill Investment Fund: A Report on the MPCA's past use of the fund and why it is needed in the future](#).
- Minnesota Pollution Control Agency (MPCA), 2022a, Shawn Ruotsinoja, personal communication. March 20.
- Minnesota Pollution Control Agency (MPCA), 2022b, Jeff Thuma, personal communication April 12.
- Minnesota Pollution Control Agency (MPCA), 2021. [Superfund Program Fiscal Years 2019 and 2020 Report to the Legislature](#).
- New Mexico Environment Department (NMED), October 2021. Orphan Sites in New Mexico – The Need to Mitigate Risks to Public Health and the Environment.
- New Mexico Environment Department Air Quality Bureau (NMED AQB), Roseanne Sanchez, March 17, 2022, personal communication.
- New Mexico Environment Department Hazardous Waste Bureau (NMED HWB), Aaron Coffman, April 22, 2022, personal communication.
- North Carolina DEQ Division of Waste Management, April 2021. [Annual Report to the North Carolina General Assembly](#).
- Oklahoma Department of Environmental Quality (Oklahoma DEQ), Aron Samwell, March 16, 2022, personal communication.
- Oregon Department of Environmental Quality (Oregon DEQ), Danielle Johnson, April 5, 2022, personal communication.
- State Coalition for Remediation of Drycleaners, no date. [State Approaches for Drycleaner Remediation Programs](#).
- Washington Department of Ecology – Ali Furmall and Marge Thomson, March 31, 2022, personal communication.

Wyoming Department of Environmental Quality (Wyoming DEQ), June 2021. [Annual Report to the Joint Minerals, Business, and Economic Development Interim Committee: Municipal Solid Waste Landfill Prioritization, Monitoring, and Remediation.](#)

Table 1. State Orphan Cleanup Programs

State Orphan Program	Ranking System	Funding	Relevant Laws/Regulations/ Policies	Separate Landfill Program	Separate Dry Cleaner Program	Other Information
EPA Region VI States						
Texas	Sites with a score of 5.0 or above through the HRS may be referred to the Superfund Site Discovery and Assessment program or the Preliminary Assessment and Site Inspection program to be proposed to the state registry.	<ul style="list-style-type: none"> Dry Cleaner Environmental Response: Subchapter B Registration, Certificates and Fees. Hazardous and Solid Waste Remediation Fees 	<ul style="list-style-type: none"> Hazardous Substance Facilities Assessment and Remediation; Texas Risk Reduction Program Solid Waste Disposal Act Dry Cleaner Environmental Response 	No	Dry Cleaner Remediation Program	Super Superfund Power Point
Louisiana	<ul style="list-style-type: none"> Based the Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites (ASTM E 1739-95) Site Ranking Example 	Hazardous Waste Site Cleanup Fund	<ul style="list-style-type: none"> Risk Evaluation / Corrective Action Program (RECAP) Title 33 Environmental Quality Act 	No	No	<ul style="list-style-type: none"> Remediation 101 Power Point Inactive and Abandoned Hazardous Waste and Hazardous Substance Site Remediation Inactive and Abandoned Hazardous Waste Sites 2020 Legislative Report Remediation 101 Presentation
Oklahoma Grants to local governments	Ranking Tool	Program relies on a portion of the petroleum fund (similar to NM's CAF)	Oklahoma Petroleum Storage Tank Consolidation Act SB1366 (2006 passed)	Solid Waste Grants are Available to Local Governments, Non-Profits.	No	<ul style="list-style-type: none"> Oklahoma FY12 Executive Budget Community Revitalization Program
Arkansas	Similar to the federal HRS	Hazardous Substances Remedial Action Fund	<ul style="list-style-type: none"> Resource Reclamation Act Remedial Action Trust Fund Act 	No	No	
Intermountain West States						
Montana	Facility Ranking: Sites are ranked based on potential risks to public health and the environment.	<ul style="list-style-type: none"> Environmental Quality Protection Fund Orphan Share State Special Revenue Account 	<ul style="list-style-type: none"> Remedial Action Upon Release of Hazardous Substance; Associated Rules 	No	No	<ul style="list-style-type: none"> Improving the State Superfund Process 2020 Annual Orphan Share Report to EOC Priority Ranking Sheet
California	Selection Criteria	Site Remediation Account	<ul style="list-style-type: none"> Hazardous Waste Control Hazardous Substance Account 	Solid Waste Disposal and Co-disposal Site Cleanup Program	Dry Cleaner Discovery and Enforcement Program	<ul style="list-style-type: none"> 2021 Report on Estimated Direct Site Remediation Costs CalEnviroScreen
Arizona	Water Quality Assurance Revolving Fund (WQARF) Registry	Water Quality Assurance Revolving Fund	<ul style="list-style-type: none"> Investigation Scoring and Site Registry; No Further Action 	No	No	<ul style="list-style-type: none"> WQARF FY21 Annual Report

Table 1. State Orphan Cleanup Programs

State Orphan Program	Ranking System	Funding	Relevant Laws/Regulations/ Policies	Separate Landfill Program	Separate Dry Cleaner Program	Other Information
			<ul style="list-style-type: none"> Preliminary Investigations and Site Scoring ARS Title 49 Chapter 2 Article 5 			<ul style="list-style-type: none"> What property Owners, Prospective Buyers and Lenders Need to Know WQARF Presentation
Nevada (Not an Orphan Site Program, Only for Abandoned Mines)	The hazard ranking utilizes ten human health and environmental criteria, and associated weighting factors similar to the Federal HRS.	No Sustainable Form of Funding . Work with Federal Partners	Dangerous Conditions Created by Abandonment of Mines			
Wyoming	Evaluates and then Scores Based on Highest Overall Scores	Wyoming Statute: 35-11-424. Deposit of fees and forfeitures	Wyoming Statute: 35-11-1701: Orphan Site Remediation	<ul style="list-style-type: none"> Landfill Remediation Program (grant program, has its own ranking process) Municipal Landfill Cease and Transfer 	No	<ul style="list-style-type: none"> Orphan Site Identification, Evaluation and Prioritization Process Summary of State Accounts
Oregon	<ul style="list-style-type: none"> Environmental Cleanup Site Information Database Hazard Index 	Bond Sale	Chapter 465 — Hazardous Waste and Hazardous Materials I	Solid Waste Orphan Site Account (funded from \$ 0.13 per ton tipping fee for solid waste)	Dry Cleaner Environmental Program	<ul style="list-style-type: none"> Examples of sites that used Solid Waste Orphan Site Account funds Hazardous Waste Clean-up Funding Green Remediation
Washington	Hazard ranking and the hazardous sites list	<ul style="list-style-type: none"> Model Toxics Control Act: Hazardous Substance Tax 	<ul style="list-style-type: none"> Model Toxics Control Act- Cleanup Hazardous Waste Cleanup- Model Toxics Control Act 	Local Solid Waste Financial Assistance (grant program)	PERC equipment replacement program (grant program)	<ul style="list-style-type: none"> How the MTCA Cleanup Process Works. Site Register & Contaminated Sites Lists
Colorado	No Orphan Site Program					
Utah	No Orphan Site Program					
Other States						
Minnesota Superfund (combined federal/state) Closed Landfills	State Superfund Permanent List of Priorities Changes to the list go thru PN. Funding priorities: 1) declared emergency, 2) O&M at existing systems, 3) HRS score.	<ul style="list-style-type: none"> Remediation Fund: Cost recovery, interest. Closed Landfill Investment Fund: transfers from solid waste fund plus investment earnings. Bonds for closed landfills construction projects. 	<ul style="list-style-type: none"> State Response to Releases Priority Assessment Criteria Environmental Response and Liability Act 115B.01 - 115B.20 	Closed Landfill Program	Dry Cleaner Fund: Environmental Response and Reimbursement Account	<ul style="list-style-type: none"> Minnesota Pollution Control Agency Voluntary Investigation and Cleanup Superfund Fact Sheet Superfund Biennial Report 2019/2020 Minnesota Pollution Control Agency Voluntary Investigation and Cleanup

Table 1. State Orphan Cleanup Programs

State Orphan Program	Ranking System	Funding	Relevant Laws/Regulations/ Policies	Separate Landfill Program	Separate Dry Cleaner Program	Other Information
						<ul style="list-style-type: none"> Closed Landfill Investment Fund Report Mar 2021 MPCA 5-Year Strategic Plan
Indiana	Priority Ranking System	<ul style="list-style-type: none"> Hazardous Substances Response Trust Fund Hazardous Waste Disposal Fee 	Hazardous Substances Response Trust Fund Act	No	No	<ul style="list-style-type: none"> State Cleanup Program Remediation Process Petroleum Orphan Sites Initiative
Iowa	Site Registry	<ul style="list-style-type: none"> Hazardous Substance Remedial Fund Hazardous Waste Fees 	<ul style="list-style-type: none"> Rules for Determining Cleanup Actions and Responsible Parties Iowa Land Recycling Program and Response Action Standards Iowa Code: Chapter 455B: Jurisdiction of Department of Natural Resources 	No	No	<ul style="list-style-type: none"> The Hazardous Waste Fee Collection Form Land Recycling Program
Kansas: <ul style="list-style-type: none"> Orphan Hazardous Waste Disposal Program Old City Dump Cleanup Program (Grant Program) 	Ranking Similar to Federal HRS process (For Old City Dump Cleanup Program)	State Water Plan Funds	State Water Plan	<ul style="list-style-type: none"> Old City Cleanup Program City / County Illegal Dump Cleanup Program 	Kansas Dry Cleaning Program	What is the Orphan Hazardous Waste Disposal Program
Connecticut	Superfund Priority Score Similar to that used by Federal Superfund sites but adapted for use in Connecticut.	Special Contaminated Property Remediation and Insurance Fund	<ul style="list-style-type: none"> Chapter 445 Hazardous Waste Determination of the use of state funds and accounts for remedial action at hazardous waste disposal sites Criteria for Prioritizing Sites for Assessment Costs of Remedial Action Reimbursement for Costs and Expenses of Remedial Action 	No	No	
Delaware	Risk-based cleanup standards of 1.0x10 ⁻⁵ for carcinogenic risk and a Hazard Index of 1.0 for non-carcinogenic risks are used.	<ul style="list-style-type: none"> Tax (gross receipts from the sale of petroleum or petroleum products, 	<ul style="list-style-type: none"> Regulations Governing Hazardous Substance Cleanup Delaware Hazardous Substance Cleanup Act 	No	No	Div. of Revenue announces new Hazardous Substance Cleanup Act rate for new year

Table 1. State Orphan Cleanup Programs

State Orphan Program	Ranking System	Funding	Relevant Laws/Regulations/ Policies	Separate Landfill Program	Separate Dry Cleaner Program	Other Information
		with the exception of crude oil) <ul style="list-style-type: none"> Hazardous Substance Cleanup Fund 				
Georgia	Hazardous Site Inventory	<ul style="list-style-type: none"> Hazardous Waste Trust Fund Hazardous waste management fees and hazardous substance reporting fees 	<ul style="list-style-type: none"> Hazardous Site Response Regulations Hazardous Site Response Act 	No	No	Hazardous Site Response Act Guidance
North Carolina	Inactive Hazardous Waste Sites Priority List	Inactive Hazardous Sites Cleanup Fund	Inactive Hazardous Sites Statutes and Rules	Pre-Regulatory Landfill Program	Dry-Cleaning Solvent Cleanup Act Program	<ul style="list-style-type: none"> Risk-Based Remediation Guidelines for Addressing Pre-Regulatory Landfills and Dumps
Illinois	No ranking but they do have a database available to the public.	<ul style="list-style-type: none"> Hazardous Waste Fund Hazardous Waste Research Fund 	Site Remediation Program	No	Drycleaner Environmental Response Trust Fund	Greener Cleanups Whitepaper
Pennsylvania	No ranking but they do have a site list available to the public.	Hazardous Sites Fund Funding Act	<ul style="list-style-type: none"> Hazardous Site Cleanup Act Standards for Administrative Records for Hazardous Waste Sites 	No	No	2021 Hazardous Sites Cleanup Fund Annual Report
New York	Hazardous Waste Site Classification	Hazardous Waste Assessments and Fees	<ul style="list-style-type: none"> Inactive Hazardous Waste Disposal Sites Enforcement Policy Inactive Hazardous Waste Disposal Sites Law 	No	No. They do have a Dry Cleaner Registration Program under the Air Program.	<ul style="list-style-type: none"> Site Characterization Remedial Investigation/Feasibility Study Record of Decision Remedial Design and Construction Interim Remedial Measures State Superfund Program Citizen Participation