

Petroleum Remediation Program general policy

This document provides a general overview of the [Minnesota Pollution Control Agency \(MPCA\) Petroleum Remediation Program](#). It summarizes how the program responds to petroleum tank releases in fulfilling the MPCA's mission to protect and improve the environment and enhance human health. Specific program requirements are described in separate documents referenced within.

I. Program statement

The Petroleum Remediation Program (PRP) investigates and evaluates risks from petroleum tank releases, with the goal of protecting human health and the environment. The primary risks evaluated by the program are:

- Impacts to groundwater that threaten human health
- Petroleum vapors that may lead to dangerous conditions or threaten human health
- Impacts to surface water quality
- Impacts to surface soil that threaten human health or may lead to contaminated surface runoff

The program's objectives are to ensure safe drinking water supplies, prevent unsafe exposure to petroleum vapors, prevent surface water impacts, and prevent exposure to contaminated surface soil. In general, the PRP implements a **risk-based approach** for managing petroleum releases based on existing land use.

Where **exposure pathways** linking contaminant sources to receptors exist, **corrective actions** are taken to reduce risks. Where risks to receptors are low, the program relies on **natural attenuation** for long-term risk reduction. In addition, recovery of **free product** is required to the maximum extent practicable regardless of risk.

Glossary

Bolded terms are located in the glossary at the end of the document.

II. Sites requiring immediate action

In some situations, corrective action may be taken prior to fully evaluating the risk posed by a release. These situations include emergency conditions, recent releases, as well as specific circumstances when soil excavation is practical.

A. Emergency sites

Emergency conditions require immediate action and are initially managed by the Emergency Response program. The Emergency Response program oversees site management to ensure public health and safety concerns are abated, and site conditions are stable. The Emergency Response program may stabilize a site by containing, recovering, and controlling free product; providing an alternate water supply or installing a treatment system; installing passive or active venting systems to address vapor impacts; excavating and disposing of highly contaminated soil; or installing a free product recovery system. After emergency conditions are stabilized, the PRP assumes regulatory oversight.

B. Recent releases

A recent release is defined as a release that has occurred within the past 90 days. A recent release requires immediate action to stop contamination from spreading. Fast and effective response minimizes environmental and human impact and overall cost for investigation and cleanup.

C. Soil excavation

Soil excavation may occur before a site investigation is completed in the following circumstances:

1. When a release can be addressed solely by the removal of a small amount of contaminated soil, thereby avoiding a costlier site investigation.
2. During new tank installation to avoid placing contaminated soil in contact with new tanks and piping.
3. To remove highly contaminated soil while it is easily accessible at the time of tank removal or installation.
4. As a response to a recent release or an emergency condition.

Basis for the site investigation

The PRP's risk-based approach is based on a general model of petroleum behavior in the environment, which can be found in [ASTM E2531 Standard Guide for Development of Conceptual Site Models and Remediation Strategies for Light Nonaqueous-Phase Liquids Released to the Subsurface](#). If a release does not behave according to the general model, then the investigation may deviate from the standard investigation requirements.

III. Site investigation

A **site investigation** has three components: completing a risk evaluation, developing a **conceptual site model**, and making a **site management decision**.

A. Risk evaluation

The risk evaluation involves identifying receptors and completing a subsurface investigation. The following receptors are evaluated to determine the potential for or existence of a completed exposure pathway:

- Water supply wells
- Vapor receptors such as basements and other habitable structures
- Utility lines
- Surface waters such as lakes, rivers, and wetlands
- Surface soil

The subsurface investigation must determine the extent and magnitude of contamination and assess the current site conditions. If the risks are low, no further investigation may be necessary. In some cases, however, additional investigation may be necessary to determine contaminant trends over time and to further assess the need for corrective action.

B. Conceptual site model

A conceptual site model (CSM) of the release is developed as part of the site investigation. The CSM is the basis for evaluating site-specific exposure pathways and provides justification for the site management decision. The CSM answers: where is the contamination, how is it behaving, and what is or might be impacted by it.

C. Site management decision

Following development of the CSM, a site management decision is made. The decision may be to complete a corrective action, complete additional investigation or monitoring, or close the site. Site management decisions are based on the rationale listed below.

1. Water supply impacts

a. Drinking water supply well impacts

Impact to a drinking water supply well above a **drinking water standard**, or conditions that indicate an impact above a drinking water standard is imminent, is considered a high risk. Corrective action alternatives may include well replacement, connection to a municipal water supply, and **remediation** of the contaminant **source**.

b. Water supply line impacts

Petroleum can degrade plastic piping and rubber gaskets used in water distribution systems. Impacts to a water supply above a drinking water standard due to permeation, or conditions that indicate an impact above a standard is imminent, is considered a high risk. Corrective action typically involves relocating an impacted line outside of the contaminated area or replacing it with petroleum-resistant materials.

c. Nondrinking water supply well impacts

Impact to a nondrinking water supply well, such as an industrial or agricultural well, above a **beneficial use level** is considered a high risk. Beneficial use levels are based on actual water usage and the necessary quality to maintain those uses. Water quality determination and corrective actions, if necessary, are made on a site-specific basis.

d. Sensitive aquifer impacts

Impact to a sensitive **aquifer** above a drinking water standard may be considered a high risk. Corrective action typically will focus on remediation of the contaminant source when technically feasible.

2. Vapor impacts

a. Explosive vapors

Actual or potential for explosive vapor accumulation in structures or utilities is considered a high risk. The corrective action goal is to prevent unsafe vapor concentrations by eliminating or interrupting the exposure pathway. Examples are repair or replacement of damaged sewer lines that allow inflow of free product or contaminated water, or the installation of vapor mitigation systems. Remediation of the vapor source to a level sufficient to prevent unsafe vapor concentrations may also be necessary.

b. Chronic vapor exposure

Petroleum vapor impacts to a habitable structure above a vapor **intrusion screening value (ISV)**, or conditions that indicate impacts above an ISV are imminent, is considered a high risk. Corrective action alternatives include remediation of the vapor source and sub-slab depressurization.

3. Surface water impacts

Surface water impacts are evaluated based upon contamination migrating to a surface water feature. A high risk is present when contamination is discharging to a surface water feature above a surface water standard. Although pathway interruption (e.g., interceptor trench) may be necessary in order to immediately address an emergency situation, corrective action will primarily focus on remediation of the contaminant source to reduce long-term risks.

4. Surface soil impacts

When contaminated surface soil is present and not covered by an impervious surface, the risk is considered high for human exposure or surface runoff. The preferred corrective action is excavation and treatment of the contaminated surface soil and backfilling with clean fill; however, other site-specific remedies such as capping the site may be considered in some cases.

5. Free product recovery

Free product must be recovered to the maximum extent practicable before site closure is considered. Extent practicable requirements include a reduction in free product through sustained recovery efforts and post-recovery assessment of site conditions.

6. Plume stability

When aquifers are impacted above program-specific action levels, monitoring well installation is required to monitor the groundwater contaminant plume over time to assess plume stability. A stable plume is a condition of site closure. Corrective action may be warranted for an expanding plume.

7. Site closure

Site closure means that further investigation, monitoring, or corrective action is not necessary to protect receptors, even though some petroleum contamination may remain. Sites are eligible for closure when:

- Proper treatment of excavated soil is completed and documented
- Free product (if present) has been recovered to the maximum extent practicable
- The groundwater plume is demonstrably stable
- The corrective action goals have been met

Site closure also means that the PRP's regulatory oversight of the petroleum tank release ends, unless new information arises that requires reopening the site. If a person subsequently uncovers or disturbs contamination at a closed site, such as during property development, that person is legally responsible to properly manage it even if that person is not the party originally responsible for the release.

IV. Petrofund

The Minnesota Legislature established the Petroleum Tank Release Cleanup Fund (Petrofund) to reimburse eligible applicants up to 90% of reasonable and necessary costs they incur in responding to a petroleum tank release. The Petrofund has published maximum cost guidelines to assist applicants in determining which costs qualify as reasonable, and the MPCA determines what work is necessary to protect human health and the environment. Eligible applicants include responsible parties (RPs) as well as non-RPs that hold legal or equitable title to the property where the release occurred. Besides determining what work is necessary, the MPCA plays a role in the reimbursement process by reviewing an applicant's compliance with statutory requirements, which include 1) providing notice of the release, 2) fully cooperating with the MPCA in responding to the release, and 3) complying with regulations applicable to their tank(s).

The Petrofund program is governed by Minn. Stat. § 115C and Minn. R. 2890, and is administered by the Minnesota Department of Commerce. Application forms and guides, program contacts, and other information about the Petrofund can be found at <http://mn.gov/commerce/industries/fuel/petrofund/>.

V. Property development

MPCA oversight of development and other voluntary actions in response to contamination is provided by the [Brownfield Program](#), a fee-for-service program. The Brownfield Program offers technical assistance and liability assurance to facilitate voluntary investigation and development of petroleum-contaminated property. Brownfield-related costs are not eligible for Petrofund reimbursement.

VI. Statutory authority

Regulations governing the authority of the Petroleum Remediation Program are: Minn. Stat. § 116, Pollution Control Agency; Minn. Stat. § 115, Water Pollution Control; Sanitary Districts; Minn. Stat. § 103H, Groundwater Protection; Minn. Stat. § 115C, Petroleum Tank Release Cleanup; Minn. R. 7060, Underground Waters; Minn. R. 7050, Waters of the State; Minn. R. 7105, Underground Storage Tanks; Training; Minn. R. 7150, Underground Storage Tanks; Program; Minn. R. 7151, Aboveground Storage of Liquid Substances; Minn. R. 7037, Petroleum Contaminated Soil Management; and Minn. R. 2890, Petroleum Tank Releases.

VII. Additional resources

Site requiring immediate action

[Recent releases at petroleum tank sites](#)

[Light non-aqueous phase liquid management strategy](#)

[Excavation of petroleum-contaminated soil and tank removal sampling](#)

Site investigation

[Soil and groundwater assessments performed during site investigations](#)

[Vapor intrusion assessments performed during site investigations](#)

[Risk evaluation and site management decision at petroleum release sites](#)

[Light non-aqueous phase liquid management strategy](#)

Corrective action

[Corrective action design and implementation](#)

Property development

[Brownfield program services](#)

General references

[Petroleum Remediation Program webpage](#)

[Brownfield webpage](#)

[MPCA Remediation Division cleanup guidance webpage](#)

[Minnesota Department of Commerce Petrofund webpage](#)

VIII. Glossary

Aquifer: A hydrogeologic unit capable of producing groundwater to supply a well at a sustained yield of five gallons per minute, or one which is the only viable groundwater supply source in the area.

Beneficial use level: A level determined on a site-specific basis dependent on the actual usage of the groundwater and the necessary water quality level needed to maintain those uses.

Conceptual site model: A written and graphic representation of a release based on the risk evaluation completed during a site investigation.

Corrective action: Actions taken to eliminate a high risk. Actions may include interrupting a completed exposure pathway or cleaning up a release through a form of remediation.

Drinking water standard: Standards for drinking water contaminants established by the Minnesota Department of Health (Health Risk Limits, Health Based Values, Risk Assessment Advice) or the U.S. Environmental Protection Agency (Maximum Contaminant Levels).

Emergency conditions: Conditions that require an immediate response to eliminate an existing or immediate threat to a receptor.

Exposure pathway: The route contamination travels from source to receptor.

Free product: The original liquid petroleum product released to the environment.

Intrusion screening value: A value used for screening for inhalation risks to indoor air.

Natural attenuation: The demonstration that this intrinsic capacity will reduce the concentrations of contaminants before they pose unacceptable levels of risk to human health or the environment or exceed groundwater criteria at established points of regulatory compliance.

Plume stability: A groundwater contaminant plume is stable if the concentrations of volatile organic compounds do not increase over time.

Remediation: Actions taken to clean up a release. Common remediation techniques include soil excavation, air sparging, and soil venting.

Risk-based approach: An approach to decision-making in investigation and corrective action based on evaluations of risks posed to human health and the environment.

Site investigation: Determining the extent and magnitude of a petroleum release and evaluating whether receptors may be impacted by the release.

Site management decision: The conclusion reached upon completion of a site investigation. The site management decision may be to complete additional investigation, complete a corrective action, or close the site.

Source: The location and depth at which a release originated.