



Rhode Island Department of
Environmental Management

LEAKING UNDERGROUND STORAGE TANK PROGRAM GUIDANCE DOCUMENT



JUNE 2015

TABLE OF CONTENTS

1.0 General Petroleum or Hazardous Material Release Notification.....	1
1.1 Release Notification Procedures.....	1
1.2 Initial Abatement Action or Other Emergency Procedures.....	1
1.3 Release Characterization Report.....	2
2.0 Underground Storage Tank Closure.....	2
2.1 UST Closure Application.....	2
2.2 UST Closure in Place	3
2.3 When is a UST Closure Assessment Report Required.....	3
2.4 UST Closure Assessment Report	4
2.5 Actions which may be Required During the UST Closure.....	4
2.6 Contaminated Soil Removal and Management	5
2.7 Reporting of Soil and Groundwater Quality Exceedances.....	6
2.8 Actions following a UST Closure.....	6
3.0 Site Investigation Report (SIR)	7
3.1 Purpose.....	7
3.2 Submission of an SIR.....	7
3.3 Contents of an SIR.....	7
3.4 Review of an SIR	8
3.5 Issuance of a No Further Action (NFA) Letter	8
3.6 Further Action is Required.....	8
4.0 Corrective Action Plan (CAP).....	9
4.1 Purpose.....	9
4.2 Submission of a CAP	9
4.3 Contents of a CAP.....	10
4.4 Corrective Actions.....	10
4.5 Review of a CAP	11
4.6 Approval of a CAP	11
4.7 Implementation of CAP	12
5.0 Cleanup Criteria.....	12
6.0 Site Closure	13
6.1 Compliance Determination	13

6.2 Risk-Based Decision Making..... 13

6.3 Issuance of a No Further Action (NFA) Letter 15

7.0 Electronic Reporting..... 15

7.1 Guidelines for Groundwater Monitoring Reports..... 15

8.0 Enforcement..... 15

8.1 Informal Enforcement..... 15

8.2 Formal Enforcement..... 16

APPENDIX

APPENDIX I – Natural Attenuation

1.0 General Petroleum or Hazardous Material Release Notification

Any person having actual knowledge of a confirmed or suspected release of petroleum product or hazardous material from any source should immediately (within the same day) report the release to the Underground Storage Tank (UST) Management Program at DEM (or “Department”) at (401) 222-2797 and local fire official. After business hours, please contact the Department at (401) 222-3070.

1.1 Release Notification Procedures

The “Rules and Regulations for Underground Storage Facilities Used for Petroleum Products and Hazardous Materials” (DEM, April 2011 or subsequent revisions) or **UST Regulations** (access at <http://www.dem.ri.gov/pubs/regs/regs/waste/ustreg11.pdf>) require that all confirmed or suspected releases of product from USTs be reported to the Department in accordance with **Rule 12.04**. The **UST Regulations** do not exempt any UST Facility used to store petroleum products and hazardous materials from release reporting requirements.

Typically, suspected UST releases are reported to the UST Management Program by the owner/operator, consultant, contractor, tank tester, DEM personnel, or third parties. The initial release notification may come in the form of:

- A. Emergency response reports from DEM's emergency response staff
- B. UST inspections during tank closures by the Leaking UST (LUST) staff
- C. Failed tank tightness tests
- D. Site assessments (conducted for requirements other than those required in the **UST Regulations** such as real estate transfers, financial institutions' requisites, etc.)

Upon the receipt of a release notification, DEM personnel will make an immediate response in cases where it is decided that there is an immediate threat to human health or the environment.

Otherwise, when a suspected or confirmed release from a UST is reported to the DEM, the LUST Program at DEM assigns a project manager to respond to the release. The LUST project manager reviews the notification report, additional information is solicited if needed, and an effort is made to identify the responsible party so that any initial abatement and all other required actions can be initiated.

1.2 Initial Abatement Action or Other Emergency Procedures

Rule 12.05 of the **UST Regulations** details the required initial abatement actions to be taken by the owner/operator (or representative) in response to a release from a UST. The DEM may with its own staff and/or hired contractors perform the necessary initial abatement actions in cases where an owner/operator cannot immediately be determined or is not responsive and human health/environment is threatened.

Initial abatement actions will at a minimum include removing the remaining contents of the

UST, removing contaminated soil, removing free product from the surface water and groundwater, and the immediate mitigation of any fire, health and safety hazards. The DEM will also require that any UST from which a release has been confirmed be closed in accordance with **Rule 13.00** of the **UST Regulations**. The time frame for tank closure will be decided by DEM and shall not exceed 180 days as required in **Rule 13.05** of the **UST Regulations**. The DEM may require that other initial abatement actions or the responsible party depending on the specifics of the release take emergency procedures.

1.3 Release Characterization Report

Rule 12.07 of the **UST Regulations** requires that within seven (7) days of a confirmed release from a UST, a release characterization report be submitted to the DEM by the owner/operator of the UST facility. The requirements of a release characterization report are detailed in **Rule 12.07** of the **UST Regulations**. This report should be directed to the Office of Waste Management/UST Management Program.

Once received, the assigned project manager reviews the release characterization report and any of the following actions may be required if not already done:

- A. Any necessary initial abatement actions such as described in **Rule 12.05** of the **UST Regulations**.
- B. Contaminated soil excavation and/or free product removal in accordance with **Rule 12.06** of the **UST Regulations**.
- C. The performance of a site investigation in accordance with **Rules 12.08 through 12.10** of the **UST Regulations**.

2.0 Underground Storage Tank Closure

2.1 UST Closure Application

An application for UST closure must be completed and submitted to the UST Management Program in accordance with **Rule 13.06** of the **UST Regulations**, at least ten (10) business days prior to the proposed date of UST closure. The “Permanent Closure Application for USTs” (***UST Closure Application***) and attached instructions are available from the Permit Application Center (PAC) at RIDEM and online at: <http://www.dem.ri.gov/programs/benviron/waste/pdf/ustclosr.pdf>.

The tank owner and a representative of the local fire department must sign the application.

The ***UST Closure Application*** is reviewed by the PAC staff and the UST Management Program staff for completeness and conformance with the conformance with the instructions and the **UST Regulations**. Once any missing or inaccurate information is corrected, the Department approves the application. A representative of the UST Management Program staff will contact the applicant to schedule a specific date for the approved tank closure.

Additionally, a letter is sent from the Department to the tank owner/operator approving the tank closure in strict accordance with the information previously submitted in the *UST Closure Application*. A copy of the approval letter is also sent to the contractor for use with transportation and disposal of the UST(s). As stated in the tank closure approval letter, the morning of the scheduled tank closure, the tank owner/operator or contractor should contact the UST representative to arrange for a specific time of inspection of the subject tank closure.

2.2 UST Closure in Place

Ordinarily, USTs are required to be closed by excavation and removal. Unless otherwise applied for and approved by the Department, this is the method that the DEM assumes will be used to close the UST when the closure application is approved.

However, a tank may be approved by the Department to be "closed in place" (CIP) based on considerations such as a threat to the structural integrity of a building or other permanent structure, sensitive/critical underground utilities, or safety of personnel. Consideration may also be given to economic impact of an impounded or inaccessible UST.

The CIP of a UST is subject to prior Department approval on a site-specific basis. The request is made in writing and with supporting documentation (Section IX of the *UST Closure Application*). Additionally, CIP of a UST is subject to **Rule 13.10** of the **UST Regulations** and the R.I. Department of Environmental Management's CIP Policy (access at <http://www.dem.ri.gov/programs/benviron/waste/pdf/cip.pdf>).

2.3 When is a UST Closure Assessment Report Required

Prior to the tank closure, the owner/operator of the UST must also make provisions to have a *UST Closure Assessment Report* performed (**Rule 13.11** of the **UST Regulations**) for tanks storing the following materials:

- Ø Gasoline or diesel.
- Ø Heating oil when the oil is not consumed entirely on site, e.g. transported off-site.
- Ø Hazardous materials, waste oils, jet fuels and aviation fuel.

The Department may also require the performance of a *UST Closure Assessment Report* on any tank in which there is evidence that a leak or release has occurred, even if this tank is considered exempt from this requirement based on the tank contents.

Closure assessments are not required to be performed during closures of tanks storing the materials:

- Ø USTs storing heating oils consumed solely on-site.
- Ø Farm and residential motor fuel USTs of less than 1,100 gallons of capacity consumed solely on-site.

2.4 UST Closure Assessment Report

The general purpose of a *UST Closure Assessment Report* is to document the details of the UST closure and more importantly to determine if a release from that UST has occurred. *UST Closure Assessment Reports* must be performed in accordance with **Rule 13.11** of the **UST Regulations** and follow the *UST Closure Assessment Guidelines* (DEM, February 2014 or subsequent revisions) (access at:

<http://www.dem.ri.gov/programs/benviron/waste/pdf/clsrasmt.pdf>). In some cases the *UST Closure Assessment Report* has been required for an exempted tank in response to a known or likely release. The *UST Closure Assessment Report* must be submitted within thirty (30) days of the actual tank closure unless a time extension is requested in writing and approved based on special circumstances and must be submitted to the Office of Waste Management / UST Management Program.

UST Closure Assessment Reports must be performed by persons of appropriate professional qualifications as detailed in the *UST Closure Assessment Guidelines*. For further clarification, the environmental professional (in the field) performing the closure assessment does not have to be a registered professional or certified professional geologist or registered geologist. However, the field work must be conducted under the supervision of the registered professional engineer, certified professional geologist or registered geologist identified and approved in the *UST Closure Application*. Furthermore, the *UST Closure Assessment Report* must be signed by that approved environmental professional identified in the *UST Closure Application* as listed above.

The DEM representative assigned to the UST closure inspection, will review the *UST Closure Assessment Report* to insure that it contains all of the specific information of the closure, is accurate, and that it meets all of the requirements of the **UST Regulations** and *UST Closure Assessment Guidelines*. Often, a release is discovered during a tank closure. In this case, the *UST Closure Assessment Report* should be written to include **Rule 12.07** of the **UST Regulations** and will serve as the release report. Therefore, a separate Release Characterization Report is not necessary.

Following the review of the UST Closure Assessment Report, the DEM representative will:

- A. Accept and file the report.
- B. Require additional information.
- C. Reject the report with specific reasons for rejection in writing and require modification or resubmission.

2.5 Actions which May be Required During the UST Closure

During the UST closure inspection, the DEM representative may require the following actions to be taken in response to conditions identified during the tank closure:

- A. The performance of a *UST Closure Assessment Report* if not already required by the *UST Closure Application*.

- B. The collection and laboratory analysis of soil samples in and around the UST and associated components.
- C. The excavation and stockpiling of contaminated soils in and around the UST and associated components (soil removal beyond, which is necessary to remove tank).
- D. The collection and laboratory analysis of post excavation soil samples.
- E. The removal of separate phase product from the water table by means of sorbent materials, use of a vacuum truck, or other approved method.
- F. The installation and sampling of groundwater monitoring wells.
- G. The submission of a site investigation report where obvious impacts to surface or groundwater, basements of structures, underground utilities have already occurred as a result of the release.
- H. Any other remedial activities as applicable under **Rule 12.00** of the **UST Regulations**.

2.6 Contaminated Soil Removal and Management

The DEM encourages contaminated soil excavations (beyond what is required to remove the tank) where practical because it is often the most efficient technique of source removal, especially during a tank closure. If successful, the removal of the contaminated soil may eliminate the need to perform a site investigation and remedial action (i.e. contamination may be limited to the adsorbed phase). Field screening instruments should be used during this excavation; however, confirmatory soil samples may be required to be taken at the limits of the excavation and laboratory analyzed.

The extent to which contaminated soil is removed during the tank closure (beyond which is required to lift the tank) is based on, but not limited to the following considerations: the extent and severity of the release if known, groundwater depth, use and classification, presence of human or ecological receptors, worker safety, the presence of permanent structures such as buildings and utilities, and property ownership limitations. This information is usually limited prior to the time of closure; therefore, the requirements are site specific and often arrived at through a consensus with the environmental consultant, contractor and the DEM representative.

Soils exhibiting contaminant levels greater than the re-use criteria must be managed in accordance with the DEM's "Oil Pollution Control Regulations" (DEM, December 1990 or subsequent revisions) (access at: <http://www.dem.ri.gov/pubs/regs/regs/compinsp/oilpollu.pdf>) and the "Solid Waste Regulation No. 1 – General Requirements" (DEM, January 1997 or subsequent revisions) (access at: http://www.dem.ri.gov/pubs/regs/regs/waste/swrg05_1.pdf).

Petroleum contaminated soil is categorized as "oil spill debris" and is by regulation required to be disposed of within thirty (30) days. Upon excavation, the contaminated soil pile must be stored on and completely covered by thick gauge polyethylene or similar impervious material to prevent runoff and/or leachate, and to control odors. Documentation in the form of a receipt of the final disposal must be included in the *UST Closure Assessment Report*. Also, copies

of the results of any laboratory analysis required for disposal must be included in the appendices of the *UST Closure Assessment Report* (if one is required).

Petroleum contaminated soil which meets the criterion for tank grave fill should not be interpreted as clean soil and therefore cannot be used as fill anywhere else onsite or offsite.

2.7 Reporting of Soil and Groundwater Quality Exceedances

Releases discovered through laboratory analysis of soil samples must be reported if the contaminant concentrations exceed the values listed in Table 2, "Soil Leachability Criteria" of the *UST Closure Assessment Guidelines*.

Discoveries of dissolved phase-groundwater contamination should be reported if the concentrations exceed the Groundwater quality standards tabulated in Table 1 of the "Groundwater Quality Rules" (DEM, amended June 2010 or subsequent revisions) or **Groundwater Regulations** (access at: <http://www.dem.ri.gov/pubs/regs/regs/water/gwqual10.pdf>) for groundwater areas with the GAA or GA designation. Discoveries of dissolved phase contamination in areas with groundwater designated, as GB must be reported if the contaminant concentration exceeds Table 4 of the RIDEM's "Rules and Regulations for the Investigation and Remediation of Hazardous Materials Releases" (November 2011 or subsequent revisions) or **Remediation Regulations** (access at: <http://www.dem.ri.gov/pubs/regs/regs/waste/remreg11.pdf>).

2.8 Actions following a UST Closure

Once a UST closure is performed and all documentation has been submitted to the Department the following actions may occur:

- A. A *Certificate of Closure* may be issued in accordance with **Rule 13.12** of the **UST Regulations**.
- B. A Site Investigation Report may be required in accordance with **Rules 12.08 through 12.10** of the **UST Regulations**. A DEM representative makes the determination of whether a SIR is required during the following circumstances:
 - Ø After a UST closure inspection, contaminated soil remains in the ground and cannot be physically removed;
 - Ø Review of a *Release Characterization Report* or a *UST Closure Assessment Report* indicates that contaminated soil or free product remains in the ground and may act as a source for groundwater contamination and/or surface waters;
 - Ø A Site Assessment has been submitted to the Department and the results of this investigation indicate that groundwater and/or soil contamination is present; this type of report does not automatically replace a SIR since it may not include all the information required in **Rule 12.09** of the **UST Regulations**;
 - Ø Discovery and/or complaints of vapors in buildings and utilities.

3.0 Site Investigation Report (SIR)

3.1 Purpose

The purpose of a SIR is as stated in **Rule 12.09(A)** of the **UST Regulations** "shall be to define the nature, degree and extent of contamination and identify threats to the public health and environment."

3.2 Submission of an SIR

The submission of a Site Investigation Report (SIR) is required in accordance with **Rules 12.08 through 12.10** of the **UST Regulations** when it has been determined that a release has or likely has occurred from the UST and/or associated components, if not waived in accordance with **Rule 12.08(A)**. **Rule 12.08(A)** allows the DEM to waive the requirement to perform a site investigation if it is determined that no free product is present, no contaminated soils are present, and there is no present or potential groundwater or surface water adverse impact from the release. The observations made during the tank closure along with the results of the ***UST Closure Assessment Report/Release Characterization Report*** and any other available information related to the release are used by the DEM representative in making the decision to require or waive the requirement to perform a site investigation.

Once a determination has been made by a DEM representative that a SIR needs to be prepared, the responsible party is notified. Notification is in the form of a letter requiring that a SIR be submitted within 60 days from the date of the letter or within an alternate deadline pre-approved by DEM. Extensions to the SIR are granted if problems arise with the scheduling of the contractor, adverse weather conditions that will not allow drilling, delays in obtaining analytical sampling results, or other reasonable delays arise. If the SIR is not received in 60 days or by an alternate DEM-approved deadline, then a second SIR letter request is sent to the responsible party.

3.3 Contents of an SIR

A complete SIR shall include all information requested in **Rules 12.08 and 12.09** of the **UST Regulations**. Brief descriptions of the required SIR contents are provided below:

- Ø the site's location and a detailed site plan,
- Ø present and past activities (including ownership)
- Ø compliance history and leak detection results,
- Ø hydrogeology,
- Ø a description of the surrounding area,
- Ø the groundwater and surface water classification of the site and surrounding the sites,
- Ø the location of surrounding public and private wells,
- Ø the nature of contamination,
- Ø a groundwater contour map,

- Ø potential receptors (human and environmental),
- Ø groundwater and soil analytical results,
- Ø and any other factors that can contribute to an adequate site characterization.

If the installation of new groundwater monitoring wells is deemed necessary for the completion of a site investigation report, the project manager must receive a site plan illustrating the proposed well locations at least 48 hours prior to the scheduled well drilling.

Conclusions and recommendations and signed statements from the owner/operator of the facility and the consultant representing the owner/operator are mandatory, and SIR reports are deemed incomplete if this information is not included. Furthermore, the SIR must be prepared under the supervision of a registered professional engineer, certified professional geologist or registered professional geologist, certifying the accuracy of the information contained in the report.

3.4 Review of an SIR

The SIR will be reviewed for completeness and accuracy of the investigation. A letter will be sent to the responsible party if the SIR is incomplete or if DEM doesn't agree with the conclusions and recommendations. If the SIR does not fulfill all the requirements of **Rules 12.08 and 12.09**, DEM will send a letter stating the deficiencies and asking the responsible party to provide additional information as required per **Rule 12.10 in UST Regulations**. After review of the SIR, the following may occur: no further action via the issuance of a No Further Action (NFA) Letter, or continued groundwater investigation and remediation.

3.5 Issuance of a No Further Action (NFA) Letter

If groundwater analytical sampling results are below the numerical groundwater quality standards listed in the **Groundwater Regulations** for areas where groundwater is classified GAA/GA and below the GB groundwater objectives in Table 4 of the **Remediation Regulations** for areas where groundwater is classified GB, then the Department will issue a NFA letter. This NFA letter states that the LUST Site is inactive based on information provided to date.

3.6 Further Action is Required

If groundwater analytical sampling results are above the numerical groundwater quality standards or objectives for areas where groundwater is classified GA, GAA or GB, then several actions may take place depending on the severity of the contamination.

If the groundwater analytical data just exceeds the above-referenced groundwater quality standards or objectives, i.e., within the same order of magnitude, and no sensitive environmental receptors are present and/or affected (such as wells or surface bodies), then groundwater monitoring (quarterly sampling for one year) will be required. The collection of this data will help determine the seasonal variations in groundwater quality and whether increasing or decreasing trends are present.

If a decreasing trend is displayed after a year of sampling, the assumption will be made that natural attenuation is taking place. Groundwater monitoring will continue until the groundwater quality standards or objectives are achieved. However, if an asymptotic curve is reached after many years of sampling and the site is in compliance with the **UST Regulations**, then the owner/operator may apply for a residual zone designation from the Groundwater Protection Program at DEM. For all practical purposes the site has become a NFA site in the UST Management Program.

In the case of analytical results staying the same or increasing after a year of sampling, then a more aggressive response will be required from the owner/operator of the facility. Responses may include additional wells may be required, additional source removal may be needed or a limited Corrective Action Plan (CAP) will need to be developed for the site.

Limited CAP may include non-mechanical remediation systems: additional remediation may take place after the SIR, and there is no need for a formal CAP. However, the Department should issue a letter of approval for the limited CAP.

If the groundwater analytical results are above the numerical groundwater quality standards by more than an order of magnitude, remedial action is required and a CAP should be prepared according to **Rule 12.12** in **UST Regulations**.

4.0 Corrective Action Plan (CAP)

4.1 Purpose

The purpose of a Corrective Action Plan (CAP) is as stated in **Rule 12.12(A)** of the **UST Regulations** “to address contaminated soils or groundwater and other related environmental or public health impacts.”

4.2 Submission of a CAP

The CAP must be submitted to the DEM for review and approval *within 60 days or within an alternate time frame approved by the Director, this* depending on the complexity of the site. An extension to the required time frame must be requested in writing; the request is for good cause and is given written approval by the DEM. The CAP must be prepared by a qualified professional and must be signed or stamped by a registered professional engineer or certified professional geologist or registered professional geologist.

The CAP may be submitted as one document or may be submitted first as a Conceptual CAP for Department comment and approval before development of the complete CAP. Submittal of a Conceptual CAP would be required in a time frame that would allow for Department review and approval of the Conceptual CAP and development and submission of the full CAP in the required time frame.

4.3 Contents of a CAP

A complete CAP shall include all information requested in **Rules 12.13** of the **UST Regulations**. The following information should be at minimum included in the CAP:

- A. A summary of the findings from the SIR and any additional information required by the DEM. This summary must include information on impacts and potential impact to all possible receptors must be provided, including but not limited to groundwater, surface water, public and private wells, environmentally sensitive areas, human exposure in nearby residences and commercial buildings. Testing of all environmental media including soil, water and air, as well as site hydrogeology, site geology, etc. shall be included.
- B. A detailed description of the proposed remedial method, including but not limited to: justification that the proposed remediation will effectively meet the remedial objectives; design standards and technical specifications for the equipment and procedures of the proposed remediation; diagrams of piping routes, instrumentation and process flows; plans for the disposal of any products or by-products of the remediation activities. Proposals and results of aquifer testing and pilot testing shall be included.
- C. A proposed schedule for implementation of all remedial actions in the CAP.
- D. A proposed groundwater monitoring plan including monitor wells to be sampled, frequency of sampling, analyses to be conducted and monitor well gauging.
- E. A proposal for submission of status reports: the reporting period is typically quarterly but may be altered depending on the sensitivity of the impacts of site contamination. All data generated during the time period covered, interpretation of the data, any conclusions and recommendations. Reports must be submitted within 45 days of the end of the reporting period. Extensions to this requirement must be requested in writing and approval given in writing.

4.4 Corrective Actions

Responsible parties may begin cleanup activities before the CAP is approved provided:

- A. The DEM is notified before cleanup is initiated. This notification must be in writing and include the time work will be conducted.
- B. The responsible party complies with any conditions imposed by the Department.
- C. Any cleanup activities are incorporated into the CAP, as an addendum or modification if necessary.

The DEM will accept as proposals both conventional and alternative corrective actions or cleanup technologies. Sufficient information must be provided to support the effectiveness of the proposed remedial action(s). Remedial actions include but are not limited to:

- A. Free product removal: active methods such as pumping or passive methods such as scavenging or absorbing.
- B. Excavation and disposal of contaminated soil.
- C. Vacuum extraction of soil (SVE) or groundwater or both (total fluid vacuum extraction).

- D. Air sparging in conjunction with SVE.
- E. Bioslurping.
- F. Pumping and treatment of groundwater. Treatment may be by air stripping, carbon absorption, ultraviolet/peroxide, etc.
- G. Enhanced biodegradation by addition of oxygen and nutrients to soil, groundwater or both.
- H. In-Situ Chemical Oxidation.
- I. Natural Attenuation (see Appendix I).
- J. Alternative Technologies.

4.5 Review of a CAP

The DEM representative assigned as Project Manager for the site will conduct review of the proposed CAP. The review will be conducted within a reasonable time frame, typically 30 to 60 days depending on the complexity of the site. The CAP will be reviewed for completeness to insure that all required information is provided. The CAP will be reviewed for technical soundness of the proposed corrective action. The DEM may require submission of additional information, which is necessary for complete review of the proposed CAP.

4.6 Approval of a CAP

The DEM may approve, approve with conditions or reject a proposed CAP based upon criteria including but not limited to:

- A. The physical and chemical characteristics of the contaminants, including toxicity, persistence and potential for migration.
- B. The geology and hydrogeology of the site.
- C. The proximity, quality and current and potential future uses of nearby surface and groundwater and the potential effects of residual contamination.
- D. The effectiveness, technical feasibility and required remedial time frame of the proposed corrective action technology to achieve clean up criteria.

Upon approval of the CAP, the DEM shall issue an *Order of Approval*, which shall govern the implementation of the CAP. The Order of Approval shall include:

- A. Specific reference to the CAP;
- B. Time schedule for implementation including installation and start up;
- C. Contingencies for potential additional necessary actions or other necessary modifications;
- D. Schedule for groundwater monitoring;
- E. Schedule for system inspections;
- F. Schedule for submission of status reports;
- G. Any other reporting obligations to the Department such as system shutdown;
- H. Any other site specific requirements.

The *Order of Approval* shall be recorded in the land evidence records of the city or town where the site is located, by the owner/operator of the facility within 10 days of issuance.

An *Interim Order of Approval* may be granted if doubt remains regarding the effectiveness of the proposed corrective action. The *Interim Order of Approval* shall make defined performance based requirements and shall include all the elements of the *Order of Approval* given above. These may include pilot testing, system operation and monitoring for a limited evaluation period. Once sufficient information is submitted to the DEM, which supports the effectiveness of the selected corrective action, the DEM shall issue an Order of Approval.

The Department may also issue a *CAP Approval Letter* instead of an *Order of Approval* if the proposed remediation does not entail an “engineered system”, such as excavation of contaminated soil, natural attenuation, and manual bailing of free product.

4.7 Implementation of CAP

The CAP shall be implemented in strict accordance with the *Order of Approval* or the *Interim Order of Approval* or a *CAP Approval Letter*. As site conditions require, modifications to the CAP may be submitted for review and approval by the DEM. If such modifications are approved, appropriate modifications to the *Order of Approval* or the *CAP Approval Letter* shall be made by the DEM.

5.0 Cleanup Criteria

Cleanup criteria are based on impacts to groundwater and surface water. Contaminated soil is considered a source of groundwater contamination and contaminant concentrations in soil are evaluated based on their potential to impact groundwater. Removal of source soils is encouraged and often the only soil remediation required. Source soils that are not or cannot be removed are remediated in situ.

Groundwater cleanup criteria shall be determined by the groundwater classification of the site (GAA, GA or GB) and any impacts contaminated groundwater may have on down gradient human or environmental receptors.

Numerical GA groundwater standards in the **Groundwater Regulations** apply where the groundwater classification is GA or GAA and the **Remediation Regulations** shall apply where the groundwater classification is GB. Remedial objectives for contaminants in groundwater for which numerical standards are not available shall be determined based upon factors such as toxicity, potential for migration and possible impact to receptors. Stricter standards may be required, especially in GB areas, to protect specific receptors or routes of exposure that exist at the site but were not considered during the calculation of the numerical standards.

If contaminated groundwater discharges to surface water, the standards in the “Water Quality Regulations” (DEM, December 2010 or subsequent revisions) apply (access at: <http://www.dem.ri.gov/pubs/regs/regs/water/h2oq10.pdf>). If numerical standards do not exist input from the Office of Water Resources may be requested. Hydraulic control or groundwater remediation may be necessary.

6.0 Site Closure

6.1 Compliance Determination

LUST sites are closed when the concentrations of contaminants in groundwater are all at or below the standards for the groundwater classification. Sites whose classification is GA must meet the numerical standards in Table 1 of the **Groundwater Regulations**. Sites whose classification is GB must meet the numerical standards in Table 4 of the **Remediation Regulations**.

Sampling results from an appropriate network of monitor wells are used to determine site compliance, which is achieved when the appropriate standards are achieved in all seasonal water table conditions. Generally, points of compliance refer to all groundwater monitoring wells onsite and offsite found to have been impacted by the release of a UST system. The duration and frequency of the sampling required to assure compliance with standards shall be defined by the DEM. Such sampling is usually required quarterly for a period of one or two years with all results at or below standards. Monitor wells, which have shown compliant concentrations for an acceptable period of time, may be eliminated from the list of monitor wells with continued monitoring requirements. Once all of the monitor wells required to be sampled for compliance determination have met the appropriate standards for the appropriate time frame, the site can be closed.

In the case where slight exceedance of groundwater standards persists on site after a reasonable period of remediation, whether active or natural attenuation, the Department may close the site under certain conditions:

- A. The exceedance of standards is only allowed in onsite wells. The points of compliance, where standards that apply to the groundwater classification must be met, include all site boundary or property line monitor wells.
- B. There are no drinking water wells or other sensitive receptors within 500 feet of the site's property boundary.
- C. Every reasonable effort by currently available technology has been made to reduce contaminant concentrations. Cost may be considered as a factor in determining reasonable effort.
- D. The expectation is that contaminant concentrations will with time reach compliance with the groundwater standards.

In the case where a significant exceedance of groundwater standards persists due to technical infeasibility or other site specific limitations, the Department may allow the site to be closed after the owner applies for and receives a change in groundwater classification or a variance to the **Groundwater Regulations**.

6.2 Risk-Based Decision Making

In accordance with the **Groundwater Regulations**, the goal for contaminated groundwater

is restoration to the groundwater quality consistent with the standards for the applicable class of groundwater. While the LUST Program has not adopted Risk-Based Corrective Action (RBCA), risk-based decision making is an integral part of the program. The numerical standards are based on risk and additional site specific risk factors may need to be considered in determination of appropriate cleanup goals. The **Remediation Regulations**, which is applied to groundwater in GB areas, was developed by modeling the risk scenario of human exposure to vapor in basements. Risk to a variety of possible human and environmental receptors is evaluated based on site specific considerations to determine whether the numerical standards based on groundwater classification are appropriate. The priority of LUST sites is ranked based on the risk to human health and the environment based on the following criteria:

- A. Immediate Action (HIGH PRIORITY)
- B. Everyday Routine Sites which include most of our sites (MEDIUM PRIORITY)
- C. Limited Action and Closed Sites (LOW PRIORITY)

Site Classification	Criteria and prescribed scenarios	Response Action
HIGH PRIORITY	<ul style="list-style-type: none"> * Explosive levels or concentrations of vapors that could cause acute health effects, are present in residence or other building * Explosive levels of vapors are present in subsurface utility system(s), but no building or residences are impacted * There is potential for explosive levels, or concentrations of vapors that could cause acute effects, to accumulate in a residence or other building * Free product is present in significant quantities at ground surface, on groundwater classified GA-GAA, on surface water bodies, in utilities other than water supply lines, or in surface water runoff * An active public water supply, public water supply line, or public surface water reservoir is impacted or immediately threatened * Ambient vapor/particulate concentrations exceed concentrations of concern from an acute or safety viewpoint 	The appropriate abatement actions are taken to protect the public and the environment from these immediate threats such as: evacuate buildings, install venting systems in basements, recover free product, notify water suppliers and/or utility companies, install water filters in affected homes and businesses, install booms in surface waters, etc.
MEDIUM PRIORITY	<ul style="list-style-type: none"> * Groundwater is impacted, and a public or private supply well producing from the impacted aquifer is located down gradient of the known extent of chemical(s) of concern * Impacted surface water, storm water, or groundwater discharges into a sensitive habitat or surface water body * Soils are significantly impacted * Non-potable aquifer with no existing local use impacted * A non-potable water supply well [irrigation well] is impacted or immediately threatened * Free product is present on GB-classified groundwater 	On these routine sites, the responsible party needs to follow the requirements in the UST Regulations . The project manager at DEM makes specific decisions and works with the responsible party in regards to compliance with the UST Regulations .
LOW PRIORITY	<ul style="list-style-type: none"> * Inactive sites where investigation or a limited cleanup is completed. Also, sites with minor exceedances of groundwater quality standards/objectives. 	Examples include soil removal only, monitoring only (natural attenuation) or no further action sites.

6.3 Issuance of a No Further Action (NFA) Letter

The DEM shall provide a NFA letter when a site has been determined to be compliant with all remedial goals. If groundwater analytical sampling results are below the numerical groundwater quality standards listed in the **Groundwater Regulations** for areas where groundwater is classified GAA/GA and below the GB groundwater objectives in Table 4 of the **Remediation Regulations** for areas where groundwater is classified GB, then the Department will issue a NFA letter. This NFA letter states that the LUST Site is inactive based on information provided to date.

7.0 Electronic Reporting

7.1 Guidelines for Groundwater Monitoring Reports

The Department has developed a new guidance document detailing the new standardized format for submissions of *“Groundwater Monitoring Reports”* (GMRs) to the UST Management Program at DEM (access at <http://www.dem.ri.gov/programs/benviron/waste/pdf/lustgwmongyd.pdf>). A *“Groundwater Monitoring Report Cover Sheet”* is to be submitted with every GMR (access at <http://www.dem.ri.gov/programs/benviron/waste/pdf/lustgwmonrep.pdf>). GMRs are now to be submitted as both a hard copy and a digital pdf copy on a compact disk as detailed in the new guidance. Presently, electronic reporting for other standard reports such as SIRs and CAPs is not included in this guidance.

8.0 Enforcement

8.1 Informal Enforcement

Letter of Responsibility (LOR)

The first level of informal enforcement in response to non-compliance at a facility is the LOR. Prepared by the project manager in the UST Management Program, the letter states the regulations that have been violated, what actions and/or submittals are required within defined deadlines and warns that failure to comply will lead to formal enforcement action with penalties. These “non-legal” letters are issued for non-compliance such as overdue soil removal, *UST Closure Assessment Reports*, SIRs or CAPs, for failure to perform required investigatory or remedial actions, etc.

If compliance with the LOR is not achieved, the case is referred to DEM’s Office of Compliance and Inspection (OCI), which is the office responsible for issuing formal enforcement actions. OCI may require the assistance of DEM’s Office of Legal Services in LUST Cases where resolution cannot be met through negotiation with the responsible party.

8.2 Formal Enforcement

Once a LUST Case is referred to OCI, the following actions may be taken:

Notice of Intent to Enforce (NOI)

If an inadequate response is received to the LOR, the staff at OCI prepares a NOI, which is more strongly worded and resembles the format of the formal enforcement document, the Notice of Violation (NOV). The NOI lists the facts supporting the enforcement action, lists the violations, states the actions required to attain compliance and warns that failure to comply will result in issuance of an NOV and penalty.

Notice of Violation (NOV)

OCI, working with the Office of Legal Services, will issue an NOV detailing all administrative and legal actions concerning the LUST case. OCI issues NOV's, negotiates Consent Agreements (CAs) and presents cases to administrative hearings and to court.

Immediate Compliance Order (ICO)

The ICO is a legal document whose purpose is to notify a responsible party that there is an immediate threat to the public health, safety, welfare and/or environment, and that immediate action is required to reduce or eliminate the threat. Failure to comply with an ICO will result in DEM's Office of Legal Services filing a complaint with Superior Court to enforce the ICO.

Leo Hellested, P.E.
Chief, Office of Waste Management
Rhode Island Department of Environmental Management

Effective Date

APPENDIX I

Natural Attenuation

The goal of the LUST Program is to protect the waters of the state from contamination from the underground storage of petroleum products and hazardous materials. In determining investigatory and remedial requirements and site cleanup goals, the Department considers impacts and potential impacts to human health and the environment. There are a variety of remedial alternatives that involve different degrees of active and passive components and different associated monitoring requirements.

Natural Attenuation is the reduction of concentrations of contaminants in soil and groundwater that occurs in the environment by a variety of natural physical, chemical and biological processes. Biodegradation by indigenous microbial populations is a major contributor to the natural attenuation of petroleum. Other processes important in the attenuation of petroleum hydrocarbons include dispersion, dilution, sorption and volatilization.

The Department does consider natural attenuation an appropriate remedial approach for the contaminated groundwater under the following conditions:

- Ø The source must have been removed or actively remediated. Natural attenuation is expected to continue reducing contaminant concentrations in any residual source material that may remain.
- Ø Natural processes must be capable of attenuating concentrations of the contaminants in a reasonable period of time. This is generally true for petroleum.
- Ø There must be no significant impact or threat to human and environmental receptors.
- Ø The plume of contaminated groundwater must be stable or shrinking. The monitor well network must include enough wells that have been sampled for a long enough time period to ensure the plume is not expanding.
- Ø Monitor well sampling results must indicate that natural attenuation is occurring. This includes contaminant reduction and/or chemical indicators such as dissolved oxygen.
- Ø Monitoring of the groundwater must continue quarterly (or at an alternate site-specific frequency required by the Department) throughout the period of remediation by natural attenuation.

Natural attenuation may be the only remedial approach at a release site if a period of monitoring during or subsequent to the site investigation provides information that satisfies the above conditions. Natural attenuation also may be used after active groundwater remediation has been terminated due to decreased remedial effectiveness or cost effectiveness.