

INVESTIGATION AND CHARACTERIZATION OF DISCHARGES FROM HEATING OIL TANKS

NOTE: This draft guidance will be placed into the 5th edition of the Storage Tank Program Technical Manual

5.4.4 Investigation and Characterization of Discharges from Heating Oil Tanks

Releases from heating oil tanks are reported with increasing frequency as homeowners interface with tank cleanup marketers, fuel suppliers, real estate agencies, and local government staff about their heating oil tank. The scope of work required to investigate and complete corrective actions following a discharge from a heating oil tank varies tremendously depending upon the extent and severity of contamination from the discharge and the risks posed by the discharge. This following guidance discusses the procedures by which DEQ will evaluate and manage discharges from heating oil tanks. This guidance does not apply nor is to be used for releases from exempt 1 USTs (small USTs containing motor fuel, e.g. gasoline) as the fuels in these tanks often are considerably more mobile than heating oil.

5.4.5 Suspected and Confirmed Releases (Discharges) from Heating Oil Tanks

Discharges from heating oil tanks must be reported to DEQ and are governed by Article 11. Article 11 does not address “suspected releases.” The law, however, stipulates that the person causing or permitting a “substantial threat” of a discharge must take action deemed necessary by the Board to contain and clean up such a discharge or threat of a discharge. Article 11 does not specify what constitutes a “substantial threat” of a discharge. While not an inclusive list, DEQ considers the following situations as examples that constitute a substantial threat of a discharge:

1. An UST that likely will overflow, especially during the next precipitation event;
2. An AST whose support structure is in such poor condition that collapse is likely, especially when the tank is refilled;
3. An AST that has a corroded and severely thinned tank bottom that is in imminent threat of failure when subjected to new stresses such as when the tank is refilled.

Tank operators are responsible for appropriately managing their equipment and preventing discharges to the extent possible. Conditions indicating or constituting a “substantial threat of a discharge” must immediately be mitigated by the tank operator. Failure to correct a “substantial threat of a discharge” that ultimately results in a discharge may be interpreted as negligence or willful misconduct and may result in the denial of access to VPSTF.

Confirmed releases (discharges) from heating oil tanks must be reported to DEQ in accordance with the requirements of Article 11 of the State Water Control Law. DEQ has the responsibility to evaluate these situations and decide if further action or investigation is warranted. The following will be treated as confirmed releases from Home Heating Oil Tanks:

1. The presence of visible free product in the environment;
2. TPH concentrations in soil samples collected in close proximity to the tank that are 100 mg/kg or greater;
3. TPH concentrations in water samples collected from close proximity to the tank that are 1 mg/l or greater;
4. TPH concentrations in soil or water samples collected from a location greater than 20 feet from the tank that are above the method detection limit.

5. An impacted receptor (e.g. petroleum contaminated water supplies, petroleum impacted surface water, petroleum vapors in a basement or crawlspace not associated with an oil furnace); and
6. Inordinate loss of fuel from a tank.

All heating oil discharges reported to DEQ should be submitted on an Environmental Pollution Report form (EPR, Appendix D). Persons reporting heating oil discharges must complete the EPR to the best of their ability and send the form (electronically is preferable) to the pertinent DEQ regional office.

As discussed in the DEQ Reimbursement Manual, DEQ may post-approve reimbursement for emergency response actions needed to abate an immediate risk to a receptor. The tank operator or consultant should contact DEQ within 24 hours to seek approval for the work performed in these circumstances. Regardless of the necessity of actions, any work performed more than 24 hours prior to the time the release was reported will not be eligible for reimbursement.

The conditions listed below may indicate a potential threat of a discharge, but do not necessarily indicate that a discharge has occurred nor do they constitute a “substantial threat” of a discharge as discussed earlier in this section. Staff receiving reports of one or more of these conditions may **recommend** that the heating oil tank operator obtain additional information to evaluate whether a discharge has occurred. Staff **will not require** the collection of additional information.

Conditions indicating a potential threat of a discharge may include, but are not limited to:

1. An active heating oil tank with > 1 inch of water in the tank;
2. Operational problems with the oil furnace;
3. The combination of tank age and the context of its location (i.e. the tank is located in a subdivision with many discharges from home heating oil tanks); and/or
4. A PID/FID reading > background.

DEQ will not require tank operators to perform additional site activities to investigate the conditions indicating a potential threat of a discharge. DEQ does not reimburse the tank owner for these activities since DEQ does not require them.

5.4.6 Heating Oil Discharges into Basements and/or Similar Structures

Discharges of oil into a basement or similar structure must be reported to DEQ immediately upon discovery of the discharge. Notification is deemed to have been provided to DEQ if the spill is less than 25 gallons, does not reach surface waters, is cleaned up immediately; and the homeowner maintains a record of the incident.

Article 10 of State Water Control Law states that disbursements may be made from the fund for corrective action costs incurred for releases of petroleum into the environment from USTs exempted from the definition of underground storage tank (e.g. heating oil USTs) and ASTs of 5000 gallons or less used for storing heating oil for use on the premises.

Basements or similar structures are neither intended nor designed to contain oil (i.e. they are not engineered secondary containment systems) and oil discharged into a basement may reach the

environment. Importantly, oil discharged into a basement also may result in health risks to the occupants of the structure.

The VPSTF is intended to provide reimbursement for reasonable and necessary corrective actions required to protect human health and the environment following petroleum releases. It may be necessary and appropriate for staff to authorize the removal and disposal of oil and oiled materials (e.g. carpets, furniture, and wallboard/sheetrock) from a structure in order to protect human health. Staff also may authorize cleaning of oiled materials if this is less expensive than removal and disposal. Staff should only authorize the replacement of structural items that are necessary to return the affected portion of the structure to a safe and serviceable condition. As an example, staff may authorize the removal of oiled carpet remnants directly overlying a concrete slab and the cleaning of the concrete slab in order to address risks. Replacement of the carpet following cleaning of the underlying floor is not a necessary activity and will not be reimbursed by the fund.

Load-bearing structural elements contaminated by oil may pose special remedial challenges. Remediation of these elements via cleaning and sealing may be preferable to removal as this minimizes risks to the building's structural integrity. If cleaning and sealing will not reduce risks to acceptable levels or is not a viable or cost effective option, staff may authorize removal and replacement of these structural elements and the costs for a structural engineer as needed.

Staff should be aware that homeowners insurance may cover costs to remediate contamination of the structure (e.g. clean walls, floors, etc). Anything covered by insurance automatically is an ineligible cost under VPSTF even if a claim is not submitted to the insurance company. When persons indicate no coverage by their homeowner's insurance, staff should request a copy of the insurance policy. OSRR staff will assist in review of homeowner policies to assess coverage.

This guidance is intended to cover catastrophic discharges from ASTs located in basements. It is not intended to apply to drips or persistent leaks that could be deemed heating oil system maintenance issues. Decisions concerning cleanup reimbursement eligibility will be made on a case-by-case basis.

5.4.7 Site Characterization and Categorization of Cases Following Discharges from Heating Oil Tanks

Discharges from heating oil tanks are subject to the requirements of Article 11 of Virginia Water Control Law and persons causing or permitting discharges of oil from these tanks are required to report, contain, and clean up the discharge. The DEQ Storage Tank Program separates confirmed releases from heating oil tanks into four (4) categories: *No Further Action (NFA)*, *Category 1*, *Category 2*, and *Category 3*. The case will be assigned to one of these categories based upon the information staff have about the site at the time the discharge is reported, severity and extent of contamination and risks from the discharge., Case Managers should use the flowchart in Figures 5-2a through 5-2d to identify the appropriate approach for responding to discharges from heating oil tanks. Staff, at their discretion, may assign discharges from heating oil tanks exceeding 1000 gallon capacity to any of the four heating oil discharge categories. Staff also may require different investigative activities than those often used for investigating discharges from smaller heating oil tanks.

As with all other releases or discharges of petroleum or regulated substances into the environment, staff should ensure that appropriate actions are taken to protect human health and the environment. The release or discharge of oil from the tank and piping must be stopped, free product must be removed to the extent practicable (See DEQ's Case Closure with Free Product Guidance,

<http://www.deq.virginia.gov/Portals/0/DEQ/Land/Tanks/LPR-SRR-03-2012.pdf>), and petroleum saturated soil must be addressed in accordance with DEQ Storage Tank Program guidance.

5.4.7.1 DEQ Evaluation for No Further Action

When a discharge from a heating oil tank is reported, the DEQ Case Manager may use existing information and professional judgment to decide that no further action (*NFA*) is necessary at the site. *NFA* sites pose a low risk to receptors. An *NFA* decision generally is appropriate at sites where the area is served by public water, the leaking tank has been out of service for an extended period and is not believed to be contributing product to the environment, and there is no reason to expect any impact(s) to receptor(s). Since a confirmed release has occurred, a pollution complaint number must be issued for all *NFA* cases.

The Case Manager may issue an *NFA* letter when there is low risk to receptors and site-specific conditions do not warrant free product recovery or the remediation of petroleum saturated soil. Justification that free product removal or remediation of petroleum saturated soil is not necessary must be documented by the Case Manager in the case file with a written memorandum and may include a statement about the low risk to receptors, the lack of measurable free product, prior knowledge of similar nearby sites, etc.

An out-of-service heating oil tank may be a building and fire code issue. If an out-of-service tank is present at an *NFA* case, the Case Manager may recommend that the tank operator contact the local building official/fire marshal and properly close the tank.

5.4.7.2 Category 1 Heating Oil Tank Discharges

Category 1 heating oil sites pose a low risk to receptors. These sites require limited field work and the submission of a Heating Oil Tank Release Characterization Report Form (Appendix AC). If an impacted receptor has not been identified at the time the discharge is reported and if DEQ has decided that the *NFA* category is not appropriate, the heating oil tank discharge will start as a *Category 1* site. At many *Category 1* sites an out-of-service heating oil tank is still in place. The DEQ Case Manager should authorize the removal and disposal of the remaining oil/water/sludge from the tank as this reduces the threat of additional or ongoing discharges.

A *Category 1* heating oil site may be closed following completion of the Heating Oil Tank Release Characterization Report Form if the Case Manager determines that there is low risk to impact receptors and the discharge has been stopped. Otherwise, the case may transition to another category as discussed below.

Figure 5-2
Release Response at Heating Oil Tank Sites
OVERVIEW of Category System

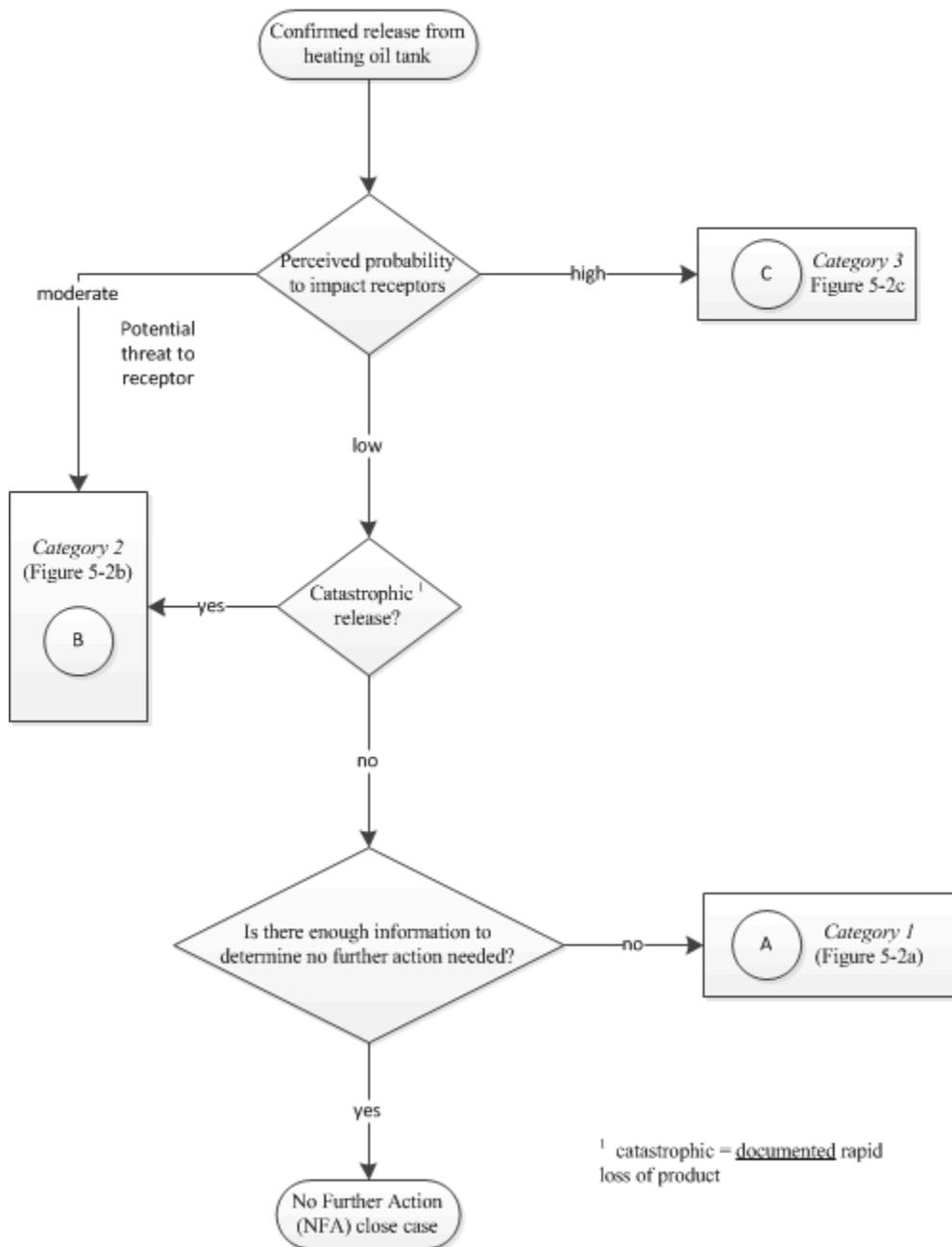


Figure 5-2a
Release Response at Heating Oil Tank Sites

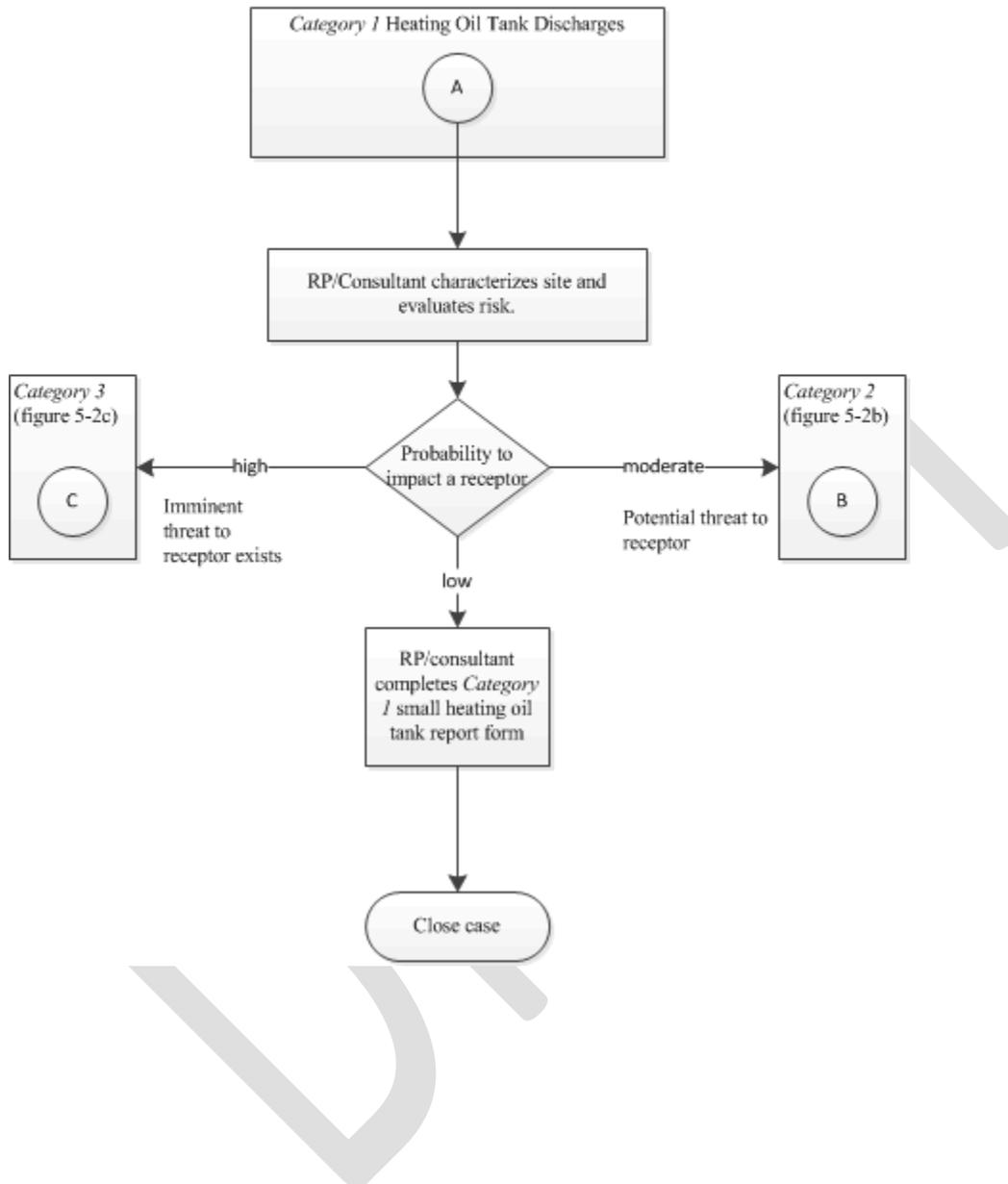


Figure 5-2b
Release Response at Heating Oil Tank Sites

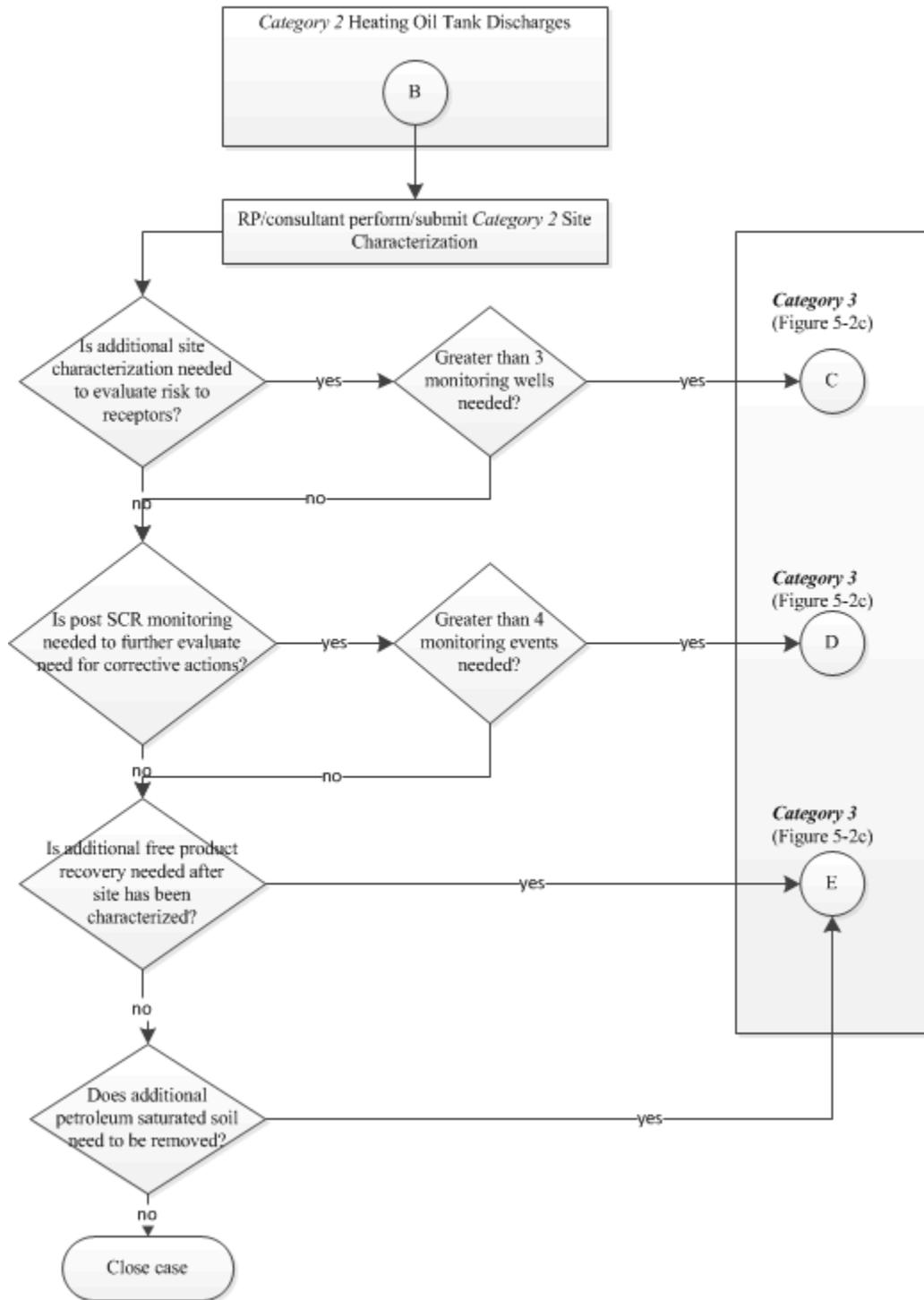
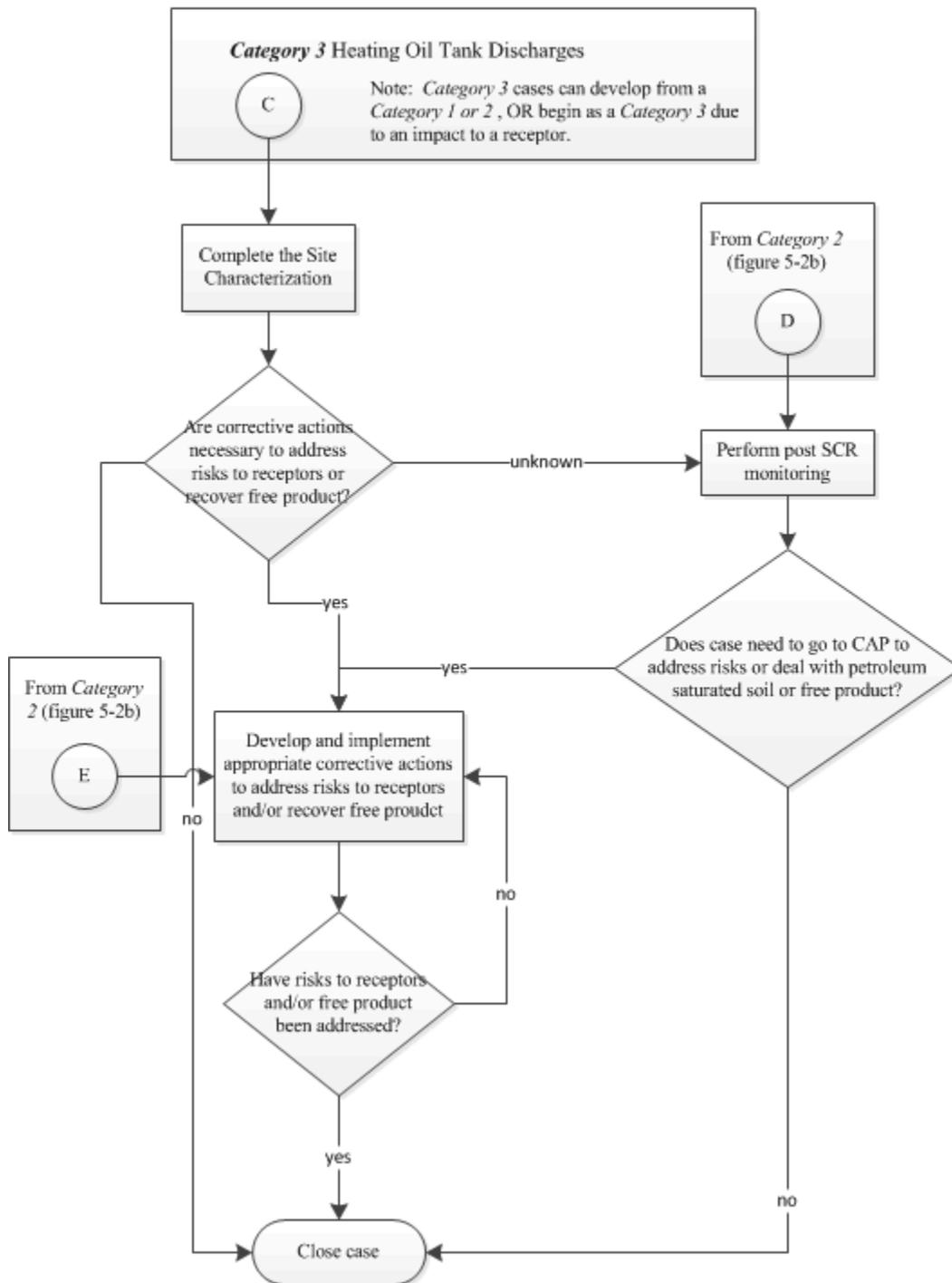


Figure 5-2c
Release Response at Heating Oil Tank Sites



Category 1 Reporting

Many heating oil tank discharges subsequently placed into *Category 1* are discovered during a property transaction-related investigation.

If an investigation or other activity is initiated at the request of a party other than DEQ staff:

- The time and materials to collect samples and all other work performed is not eligible for reimbursement.
- The cost of the laboratory analysis indicating a confirmed release is eligible for reimbursement if the analytical results are reported to DEQ within 24 hours of their receipt by the tank operator or consultant.

Category 1 Scope of Work

Work performed at a *Category 1* home heating oil tank sites may vary depending upon site conditions and the Case Manager has the latitude to authorize whatever work is needed to appropriately characterize the site. Some of the more commonly performed activities include a visual receptor survey, collecting one to four soil samples and analyzing those samples for TPH/DRO, and preparing the Heating Oil Tank Release Characterization Report Form (Appendix AC).

Soil sample collection:

After the site is assigned to *Category 1* for characterization, staff often will authorize the collection of 1 to 4 soil samples along with analysis of the samples for Total Petroleum Hydrocarbons, Diesel Range Organics (TPH/DRO). These samples usually will be collected with a soil auger. The number of soil samples to be collected and analyzed will be agreed upon by the Case Manager and consultant on an AAF.

NOTE: It is recommended that samples not be collected from previous borings due to possible infiltration of rainwater or other factors that might dilute the contamination. However, if the Case Manager and consultant agree that one or more samples are needed from a previous boring, any additional samples collected from that boring should be taken from at least two feet below the terminal depth of the previous boring to preserve data integrity.

Visual Receptor Survey:

A visual receptor survey often is part of the *Category 1* investigation and involves identifying the location of water supply wells within 500 feet of the tank and surface water within 200 feet of the tank. The survey should indicate if the well is used for potable purposes versus irrigation. Well completion information is not required for wells identified as part of a *Category 1* receptor survey. If drinking water wells exist within 100 feet of the discharge location, they should be sampled and analyzed for volatile organics and semi-volatile organics by methods 8260 and 8270, respectively.

Product/Fluid Removal from the Tank:

- The Case Manager should not authorize fluid removal if only water remains in the tank for the *Category 1* case.
- Except for a catastrophic release (as noted below) the Case Manager should only authorize fluid removal one time for each heating oil release.
- When fluid removal from the tank is authorized as part of a *Category 1* investigation it is expected that the consultant will wait for the soil analytical results before pumping out the tank.

- If there is documented evidence of a rapid catastrophic release of product from the tank or if there is a chance of product overflow from the tank due to excessive rainfall or flooding, the tank fluids should be removed as soon as possible. The Case Manager should authorize the Junior Level Professional to return to the site and oversee the removal of fluid from the tank.
- DEQ will only authorize the removal of fluid from a tank more than once when the following situation occurs:
 - a) initial fluid removal is needed to abate a rapid catastrophic release of product from the tank or if there is a chance of product overflow from the tank due to excessive rainfall or flooding; and
 - b) the second fluid removal is needed to remove water (that has infiltrated into the tank since the initial fluids removal) so that the tank can be removed to access product and/or petroleum saturated soil.

Situations involving the rapid catastrophic release of product from a tank generally will be elevated to home heating oil tank *Category 2*.

Report Preparation:

Staff will authorize report preparation time to complete the Leaking Heating Oil Tank Characterization Report Form (Appendix AC).

The Case Manager may determine that site-specific conditions do not warrant free product recovery or the remediation of petroleum saturated soil. Justification that free product removal or remediation of petroleum saturated soil is not necessary must be documented by the Case Manager in the case file with a written memorandum.

DEQ staff will authorize the materials, equipment, tasks, and personnel time needed to appropriately characterize the site. Case Managers have the flexibility to tailor the scope of work to specific site needs and conditions. Often, the work authorized includes the time and materials needed to perform a limited site characterization and visual receptor survey, time to prepare the Heating Oil Tank Release Characterization Report Form, and time to prepare the reimbursement claim. Some of the more frequently authorized tasks, materials, and personnel needed to complete a *Category 1* Heating Oil Tank discharge investigation are outlined below.

Units for the following task, material, and personnel codes often are authorized at *Category 1* heating oil tank sites include:

1-2	Hours	M0003	Project Manager (Initial Site Visit to plan field work to be performed by staff and visual receptor survey, 1-2 hours is expected for these activities)
*	Hours	M1481	Project Manager Travel
4-6^a	Hours		M0005 Junior Level Professional (Oversee sampling and log borings; oversee removal of product and fluids from tank if needed)
*	Hours	M1483	Junior Level Professional Travel
*	Mile	M0617	Vehicle Mileage – autos, vans, and pick-ups. (Up to three trips: for PM, for Jr. Level plus Technician, and for Jr. Level)
1-4^a	Sample	T030	Soil Sampling w. Hand Auger (Case specific; more than 1 sample usually will be authorized unless samples from previous work have been analyzed)
*	Hours	M1485	Technician Travel
*	Each	M1157	Bailer - Disposable Polyethylene
*	Sample	M1366	Method 8015C - modified TPH-DRO in water/wastewater
2-4^a	Sample	M1368	Method 8015C - modified TPH-DRO in solid waste/soil
3-4^b	Hour	M1766	Vacuum Truck, includes operator and operating cost *

	Gallon	M1290	Free Product/Contaminated Water Disposal
1-2^c	hour	T100	Report Writing
1	Each	T040	General Project Management
1	Claim	T114	Reimbursement Claim Prep

* = Site Dependent

^a = Most home heating oil tanks have a capacity of 550 gallons or less and 2 to 4 soil samples are expected to be sufficient to characterize the contamination in most cases. This total number of soil samples includes samples collected during any preliminary site assessment. If a sample was collected during a site assessment, analyzed, and the TPH concentration in that sample was above 100 mg/kg, but well below petroleum saturation, staff may be justified in authorizing only one additional sample from the opposite end of the tank. If a 1000 gallon home heating oil tank is encountered, more than four samples may be needed to adequately characterize the release. The number of hours allowed for a Junior Level Professional is expected to correspond with the number of samples that will be collected. If more than 4 samples are authorized by the Case Manager, the Case Manager may authorize more than 6 hours for the Junior Level Professional to oversee sampling, log the borings, and oversee the vacuuming of product from the tank (if needed). The number of samples authorized and the number of analyses authorized will be lower if samples were collected as part of a Phase II site assessment or activity directed by a party other than DEQ.

^b = This is a typical minimum time for use of a vacuum truck in an urban area. Different amounts of time may be more appropriate if the tank is located in a rural area.

^c = *Category 1* reports are provided on a fill-in-the-blank form (Heating Oil Tank Release Characterization Report Form) and one hour generally is believed to be a sufficient amount of time to prepare the report form. Up to two hours of report preparation may be justified in cases where greater than 4 samples, soil and/or water, were collected and analyzed, and if additional maps, aerial photographs and site photographs are included in the report.

Transition from a Category 1 Heating Oil Tank Discharge to Another Category

Discharges from heating oil tanks usually will be placed into *Category 1* if preliminary information indicates that there is little risk to receptors. Additional soil samples typically are collected during the *Category 1* Site Characterization and the tank operator and/or consultant are required to perform a receptor survey. Cases where a moderate⁵⁻¹¹ threat to a water supply or surface water is believed to exist, the tank operator/consultant must contact the Case Manager and an appropriate course of action must be identified. If DEQ staff believe a receptor is at a moderate degree of risk, the case should be moved to *Category 2*. If an imminent threat or high probability^{5-x} to impact a receptor is found (typically the oil discharge point is in very close proximity to a water supply or surface water), the tank operator/consultant must contact DEQ and, with the Case Manager's concurrence, the site should be moved to a *Category 3* heating oil discharge so that a more detailed characterization may occur.

⁵⁻¹¹ The terms "moderate threat" and "imminent threat/high probability" to impact a receptor are difficult to define as each individual Case Manager will utilize his/her knowledge and experience to decide the likelihood that a receptor will become impacted. Within this context, a likelihood or probability to impact a receptor that is between 5 and 50% might be considered to constitute a "moderate" degree of risk. Likewise, a situation where the probability of impacting a receptor exceeds 50% might be considered a "high" degree of risk.

5.4.7.3 Category 2 Heating Oil Tank Discharges

Discharges at *Category 2* heating oil tank sites are believed to present a threat to receptors such as drinking water supplies or a surface water body. Limited soil excavation, free product removal and vapor mitigation may be performed at *Category 2* sites. Often, *Category 2* sites involve excavation and may be characterized during the excavation process. Procedures that may be used to characterize a site during excavation are presented in Section 5.4.7.5. Monitoring wells also may be installed as needed to characterize the site. Sites also may be placed into *Category 2* if petroleum vapors are present in non-living space structures (e.g. crawl spaces) and it is believed that the *Category 2* scope of work guidelines for limited soil removal with ventilation of the crawl space will adequately protect human health. The presence of petroleum vapors in living spaces constitute a risk and should be further evaluated under *Category 3*. In addition, heating oil tank sites where the data indicate a rapid catastrophic loss of fuel should be characterized as a *Category 2* heating oil tank site.

At *Category 2* sites with unsolicited site investigations or other activities initiated at the request of a party other than DEQ staff:

- The time to collect samples and all other work performed prior to reporting the release to DEQ is not eligible for reimbursement.
- The cost of the sampling analysis indicating a confirmed release is eligible for reimbursement if the analytical results are reported to DEQ within 24 hours of their receipt by the tank operator or consultant.

Category 2 phases of work include Site Characterization, Site Characterization Addendum, Post SCR Monitoring, and Closure. Occasionally additional site characterization is needed (Site Characterization Addendum phase), as part of a *Category 2* investigation. When a total of 3 or fewer monitoring wells are necessary, site work should be completed as a *Category 2* site. (See the end of this section for information about transitioning from *Category 2* to *Category 3*). If more than 4 quarters of ground water monitoring or free product recovery are needed, the case should transition to *Category 3* and the Corrective Action Phase of work. The scope of the CAP should be tailored to site-specific needs.

Category 2 Scope of Work

Category 2 sites often can be characterized by excavating up to 26 cubic yards (approx. 39 tons) of petroleum saturated soil, and conducting field work. Work performed at a *Category 2* heating oil discharge site may include equipment, labor, time, and travel necessary to investigate the discharge and remove and dispose of up to 26 cubic yards (approx. 39 tons) of saturated soil. Time is included to conduct a visual survey of potential receptors within 500 feet of the leaking tank, collect samples from the tank pit, prepare a *Category 2* narrative report (see the fact sheet in Appendix C for a list of typical report elements), and prepare a reimbursement claim. Some sites warrant the installation of up to three groundwater monitoring wells (cases needing more monitoring wells should be elevated to *Category 3*). When applicable, the following documentation should be included in the site report: all boring and excavation logs, well construction diagrams, lab analytical reports, hauling and disposal manifests, and local permits. Photographic documentation is helpful and it is suggested that the tank operator/consultant provide this in the report.

DEQ staff will authorize the materials, equipment, tasks, and personnel time needed to appropriately characterize the site and have the flexibility to adapt the scope of work to specific site needs and conditions. Some of the more frequently authorized tasks, materials, and personnel needed to complete a

Category 2 Heating Oil Tank discharge investigation are outlined below. Alternate sample collection methods (e.g. use of direct push equipment) may be dictated by site conditions and pre-approved by the Case Manager as deemed necessary.

The following task, material, and personnel codes often are authorized at *Category 2* heating oil tank sites:

1-2	Hour	M0003	Project Manager (Initial Site Visit to plan field work to be performed by staff and visual receptor survey, 1-2 hours is expected for these activities. The Project Manager may oversee removal of fluid/product from the tank on the initial site visit [as approved by the Case Manager] if there is documented evidence of a catastrophic release and the materials remaining in the tank must be removed as soon as possible. In this situation, the Case Manager should authorize an additional 1 to 2 hours for a Project Manager to oversee removal of fluids from the tank.)
*	Hour	M1481	Project Manger Travel
1	5% Per Claim	T040	General Project Management
8-10	Hour	M0004	Mid-Level Professional (Supervise field work including soil excavation and removal of fluids from the tank and collect soil samples from backhoe bucket during the process of removing petroleum saturated soil. The typical amount of soil excavated from these sites is 10 to 20 tons. Eight hours is a reasonable amount of time for a mid-level professional where less than 13 tons of soil is excavated. An additional hour or two of time for the mid-level professional may be warranted when 13 – 20 tons of soil will be excavated. Additional hours for a mid-level professional may be warranted if the excavation of greater than 20 tons of soil is authorized by DEQ Case Manager.)
*	Hour	M1482	Mid-Level Professional Travel
8-10	Hour	M1670	Equipment Operator (Eight hours is believed to be sufficient in most cases. Additional hours may be authorized as deemed necessary. When a skid steer and mini-excavator combination is authorized, typically 2 operators for a total of 16 – 20 hours should be authorized)
*	Mile	M0617	Vehicle Mileage – autos, vans, and pick-ups.
1	Day	M1771	Backhoe Loader – 75 HP, 4wd, 15,000 lb operating weight. (In lieu of a backhoe loader, different equipment such as a Skid Steer Loader [Bobcat 853H] in combination with mini-excavator may be authorized. A total of 1 Heavy Equipment Mob/Demob should be authorized for skid steer and mini excavator.)
2-4^a	Sample	M1368	Method 8015C - modified TPH-DRO in solid waste/soil. (Additional samples may be authorized as needed by the Case Manager.)
*	Sample	M1366	Method 8015C - modified TPH-DRO in water/wastewater. May be authorized as needed by the Case Manager.
3-4^b	Hour	M1766	Vacuum Truck - includes Operator & Operation Cost (a 3 – 4 hour minimum may apply)
*	Ton	T012	Thermal or Bio-treatment of petroleum contaminated soils (Maximum expected is 39 tons)
*	Gallon	M1290	Free Product/Contaminated Water Disposal
1-4^a	Sample	T133	Grab Sample - Sample collected with backhoe or directly by hand. (The collection of up to 4 soil samples is expected to be typical at most sites having tanks of 550 gallons or less. Staff may require additional samples for larger tanks or to further delineate contamination as required by site conditions. Some or all of these samples may be collected with the backhoe bucket during the removal of petroleum saturated soil.)
1	Round Trip Mob	T036	Heavy Equipment Mob/Demob (A total of 1 should be authorized for Skid Steer and Mini Excavator)
*	Sample	T086	Domestic Well Sampling

*	Hour	T132	Subsurface line location
*	Roll	M0058	Poly film (100' x 20') – 6 mil. (Up to one roll of poly film may be authorized on a case-specific basis provided that the poly film will be used to contain petroleum contaminated soil prior to disposal. Staff will not authorize poly film if it will be used only for placement of the removed storage tank.)
*	Sq. Ft.	T047	Re-seeding < 1 acre Re-seeding disturbed area (recommend using perennial/annual blend)
1	Site	T014	Site Reconnaissance, initial site map (This must be a to-scale map showing utilities, wells, septic fields, etc.)
*	Hour	M0005	Junior Level Professional (M005 only will be authorized for this person to supervise a Technician collecting soil samples with a hand auger [T030] in those cases where higher level personnel [mid-level professional, PM] are not already on site. This person will not be needed at all <i>Category 2</i> sites. Time for a Junior Level Professional to log soil borings is included in T028.)
8-10	Hour	M0007	Technician (Assists with excavation and general site work including moving soil and materials by hand. A technician will only be authorized in conjunction with M1771. A technician is not needed if two equipment operators are present at the site.)
*	Hour	M1485	Technician travel.
6-10	Hour	T100	Report Preparation (6 hours is expected to be sufficient for simple sites where 3 or 4 soil samples were collected and analyzed. If wells were installed, domestic wells were sampled or additional soil or ground water samples were collected, additional report writing hours corresponding with the complexity of the site should be approved. See Appendix D for reporting elements.)
1	Claim	T114	Reimbursement Claim Prep

Tasks/Codes for Soil hauling and Backfilling:

If contaminated SOIL HAULING is less than 25 miles to the disposal facility, the following codes may be utilized to haul contaminated soil away and bring in backfill materials.

1 Day M1299 Dump truck - tandem, 12 ton capacity (Generally 1 day is sufficient for both soil hauling and backfill. If site conditions or delays at the disposal facility require additional time an additional ½ day may be authorized for backfill.)

OR

1 Day M1300 Dump truck - three axle, 16 ton capacity (Generally 1 day is sufficient for both soil hauling and backfill. If site conditions or delays at the disposal facility require additional time an additional ½ day may be authorized for backfill.)

*** Ton M1725 Gravel - #57 crushed stone.**

If contaminated SOIL HAULING is 25 miles or more to the disposal facility, the contractor/consultant may claim the soil hauling T-code(s).

*** Ton/Mile T075 Soil Hauling < 75 Tons the First 100 Miles** (use T076 for additional miles > first 100)

*** Ton/Mile T076 Soil Hauling < 75 Tons Over 100 Miles** (use only when miles > 100 in T075)

*** A Code Minimum hauling charge**

*** Cubic Yard T042 Backfilling**

These Items/Codes are Expected when Monitoring Wells are Installed, Sampled, and/or Water Supply Wells are Sampled:

*** Sample M1379 Method 8260B – Volatile Organics GC/MS in water/wastewater** (for analyzing water from

domestic wells)

*	Sample	M0149	Method 8270C – semi-volatile organics in water/wastewater (for analyzing water from domestic wells)
*	Round trip MOB	T023	Drill rig MOB/DMOB
*	Linear Foot	T025	Monitoring Well Installation, 2” dia. using HAS
*	Linear Foot	T079	Monitoring Well Installation, 2” diameter using Air Rotary
*	Hour	T028	Log soil borings. Used to log monitoring wells or borings installed with a drill rig, task requires Jr. Level Prof.
*	Hour	M1483	Junior Level Professional Travel (only to be used when Jr. Level Prof. is at site to log soil borings [T028] or supervise a Tech collecting soil samples with a hand auger [T030])
*	Well	T118	Monitoring Well Sampling, 2” diameter (sampling performed by Technician).
*	Sample	T086	Domestic Well Sampling
*	Hour	M1485	Technician travel. (Tech samples monitoring wells [T118], domestic wells [T086], and collects soil samples w. a hand auger [T030]. Additional technician travel time and mileage to take samples to the lab may be authorized in conjunction with T028 {this additional time and mileage may be used in lieu of shipping M0099}).
*	Sample	M1375	Method 8021B, BTEX/MTBE/Naphthalene in water/wastewater (generally will be used for water samples collected from monitoring wells)
*	Cooler	M0099	Shipping Laboratory Samples (up to 50 pounds). (Use this code only in combination with T028 to send samples to the lab. In lieu of M0099, time for a technician to take samples to the lab may be provided.)

* = Site Dependent

^a = Most home heating oil tanks have a capacity of 550 gallons or less and 2 – 4 soil samples are expected to be sufficient to characterize the contamination in most cases. This total number of soil sample includes samples collected during any assessments performed at the request of parties other than DEQ staff. If a 1000 gallon heating oil tank is encountered, more than four samples may be needed to adequately characterize the release. The number of samples authorized and the number of analyses authorized may be different if samples were collected as part of an activity directed by a party other than DEQ.

^b = This is a typical minimum time for use of a vacuum truck in an urban area. Different amounts of time may be more appropriate if the tank is located in a rural area.

NOTE: Tank closure is the responsibility of the tank operator and is not a reimbursable activity. Likewise, permit fees required for tank closure and tank hauling and disposal following removal of the tank and backfill amounts greater than the quantity of disposed, contaminated soil are not reimbursable.

Transition from a Category 2 Heating Oil Tank Discharge to Category 3

Category 2 phases of work include Site Characterization, Site Characterization Addendum, Post SCR Monitoring, and Closure. Occasionally additional site characterization is needed (Site Characterization Addendum phase), as part of a *Category 2* investigation. When more than 3 monitoring wells are necessary at a site, the *Category 2* site should transition to *Category 3*.

Up to four Post SCR ground water monitoring events after the initial sampling may be performed under *Category 2* provided that the Case Manager believes this action is appropriate. The site must transition to *Category 3*, and it is recommended a CAP be prepared, if additional Post SCR Monitoring events are

performed.

If the Tank operator/consultant finds impacted surface water or drinking water supplies or an imminent threat to drinking water supplies or surface water, the Case Manager should be notified prior to completing the *Category 2* Site Characterization Report. If a receptor has been impacted or an imminent threat to a receptor exists, the Case Manager should elevate the case to a *Category 3*. In these cases the Site Characterization (including any additional work authorized by the Case Manager) should be completed under *Category 3*.

5.4.7.4 Category 3 Heating Oil Tank Discharges

Discharges at *Category 3* heating oil tank sites have impacted or present a high probability to impact a receptor. At their discretion, staff may place discharges from large heating oil tanks having a capacity of greater than 1,000 gallons and a high throughput into *Category 3* because they believe additional characterization is warranted. These sites require an SCR before determining appropriate corrective actions. The Case Manager, tank operator, and consultant need to decide upon the scope of work needed to characterize the site. Work for *Category 3* sites follows the program's normal procedures for release response and corrective action. The Case Manager may require initial abatement, an appropriate site characterization, and, if warranted, the development and implementation of a Corrective Action Plan.

Discharges impacting drinking water supplies, surface water bodies, or other receptors will be considered *Category 3* heating oil tank discharges. Sites requiring more than three monitoring wells or more than four quarters of ground water monitoring or free product removal should be placed in or moved to *Category 3*. Staff should use DEQ's LNAPL guidance when evaluating the need, efficacy, and termination point for free product recovery.

5.4.7.5 Characterization by Excavation

Category 2 SCRs (and *Category 3* sites where excavation is the main activity), often are characterized by excavation. Excavation provides a means of describing the bulk characteristics of soil and rock that is not available when using other investigation techniques. The location and distribution of hydrocarbons in the excavation can be accurately mapped. To get the maximum benefit from the excavation, however, the excavation and associated sampling needs to be documented adequately.

USDA⁵⁻¹², AASHTO⁵⁻¹³, OSHA⁵⁻¹⁴, ASTM⁵⁻¹⁵ and the Naval Facilities Engineering Command (NAVFAC), have established methods for describing excavations in soil and rock that share several elements, particularly:

- Use a common terminology for describing soil and rock (typically based on the Unified Soil Classification System, USCS: ASTM D-2487-92) that describes soil moisture, color, consistency, type, structure, origin and the presence of water, and, for petroleum investigations, the presence or otherwise of fuel, odors and *in-situ* test results;
- Describe soil and rock layers, bedding features, artificial and geologic structures in three dimensions and the stability of the exposed soil and rock faces;
- Provide a graphical representation of the excavation.

The key information to be collected during an excavation for petroleum release investigations include:

- Changes in soil type;
- Depth and location of discolored soil or rock;
- Location of seeps of water, oil or oily water;
- Location, size, aperture, persistence and orientation of soil and rock bedding, cracks and fractures;
- Sample location, showing depth and position in the excavation and relationship to key strata and other features (e.g. oil or water seepages or discolored soil);
- Changes in PID/FID readings with depth and soil or rock type;
- Photographs of each excavation face and detailed photos of any particular features. Each excavation should be described by at least five photographs (each face and the excavation floor).

A soil excavation log form and an example soil excavation log are found on the following pages.

⁵⁻¹² Schoeneberger, P.J., D.A. Wysocki, E.C. Benham, and Soil Survey Staff. 2012. Field book for describing and sampling soils, Version 3.0. Natural Resources Conservation Service, National Soil Survey Center, Lincoln, NE.

⁵⁻¹³ AASTHO. 2012. Standard Practice for Conducting Geotechnical Subsurface Investigations. AASTHO R13-12.

⁵⁻¹⁴ U.S. Dept. of Labor, OSHA. Inspection Procedures for Enforcing the Excavation Standard, 29 CFU 1926, Subpart P, particularly Appendix A.

⁵⁻¹⁵ ASTM. 2011. Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System), ASTM 2487-11. ASTM International. West Conshocken, PA.

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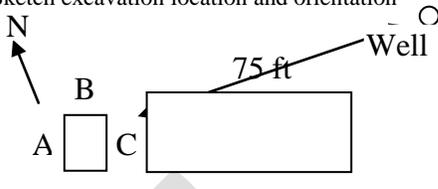
PC Case	
Project Name	
Location	

Date		Sketch excavation location and orientation
Logged by		
Groundwater Depth		
Excavation equipment		
Excavation depth		
Excavation width		
Excavation length		
Excavation trend		

Depth (ft)	Sample	PID	Face A	Face B	Face C	Face D
1						
2						
3						
4						
5						
6						
7						
8						
9						

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PC Case	2025-9016
Project Name	Methuselah Residence
Location	Namura

Date	July 6, 2024	Sketch excavation location and orientation 
Logged by	BJ	
Groundwater Depth	Dry: one seep at 6.8 ft	
Excavation equipment		
Excavation depth	9 feet	
Excavation width	8	
Excavation length	12	
Excavation trend	020°	

Depth (ft)	Sample	PID	Face A	Face B	Face C	Face D
			Topsoil			
1		0	Soft orange brown CLAY			
2		0	Firm orange CLAY			
3		0				
4		35				
5	S6	70			Base of UST S6	
6	S1	325	Dense orange brown SAND		S1 Black, discolored, odor	
7	S2 S4	600 5	Grey green DIORITE Heavily weathered to orange brown sand S4 and clay	Fractures	Black seep at 6.8 ft: S2 dipping at 55°E	
8	S3	0	S3			
			Base of excavation at 8ft			
9						

5.4.7.6 Activity Authorization at Heating Oil Tank Sites

Activity Authorization Forms have been developed for work likely to be performed at Category 1 and 2 heating oil tank sites and may be found in the Reimbursement Guidance Manual. Activities performed at *Category 1* and 2 sites predominantly occur within the Site Characterization Phase. Occasionally, it may be necessary to perform limited additional work at *Category 2* sites in the Site Characterization Addendum and Post SCR Monitoring Phases. When monitoring wells are installed at a *Category 2* site, abandonment of those wells generally will be performed during a Closure Phase.

When a site advances from one category to a higher category, the Case Manager should collect all AAFs for that particular phase of work and verify the work performed. The Case Manager also should provide a note on the verified AAF that the site was transitioned to a different heating oil release category and list the transition date.

Sites that transition from one category to another within the Site Characterization Phase are eligible for only one claim preparation task for the Site Characterization Phase.

5.4.7.7 Excavation or Intrusive Work Near Structures

Home heating oil USTs may be found in close proximity to houses or other buildings. DEQ expects the tank operator/consultant to exercise all care when performing release response and corrective actions for home heating oil discharges to minimize, to the extent possible, risk to the building. Damages to buildings are not reimbursable expenses. If the tank operator/consultant believes that excavation or other intrusive activities may present a risk to damaging a building, the tank operator/consultant needs to contact the DEQ Case Manager prior to initiating work. The tank operator/consultant and Case Manager may then decide upon a scope of work that can meet the release response and corrective action objectives without compromising the integrity of the building.

Appendix D

Environmental Pollution Report Form

DRAFT

**VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ)
 ENVIRONMENTAL POLLUTION REPORT (EPR)
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PC#: _____ **PREP#:** _____ **Facility ID#:** _____

SITE NAME:	DATE REPORTED:	TIME reported:
SITE 911 ADDRESS: Street number and name: City: ZIP CODE: COUNTY (if applicable) :		
OTHER LOCATION INFORMATION (ROUTE #, NEAREST LOCALITY/intersection, DIRECTIONS, ETC.), especially if no 911 address exists:		
Tank Release/Spill GPS Coordinates (NAD 83, USA-Virginia) in decimal degrees: Latitude: _____ Longitude: _____		
SITE CONTACT NAME:	TELEPHONE: ()	E-MAIL:
Site OWNER NAME & ADDRESS (Only if owner and/or mailing information is different from site address): Site Owner/Company Name: _____ Contact Name (if Co.): _____ Mailing Address: _____ City: _____ ZIP CODE: _____ COUNTY (if applicable) : _____ TELEPHONE: () _____ E-MAIL: _____	RESPONSIBLE PERSON NAME & ADDRESS (If different than that of Site Owner): RP (Tank Owner/Company) Name: _____ Contact Name (if Co.): _____ Mailing Address: _____ City: _____ ZIP CODE: _____ COUNTY (if applicable) : _____ TELEPHONE: () _____ E-MAIL: _____	
REPORTING PERSON'S NAME, ADDRESS: Name: Company Name (if applicable): _____ Mailing Address: City: State: ZIP CODE:		
TELEPHONE: () FAX: () E-MAIL:		
DESCRIPTION OF INCIDENT:		TIME: _____ DATE: _____
ATTACHED TO EPR: <input type="checkbox"/> SITE SKETCH <input type="checkbox"/> LOCATION MAP <input type="checkbox"/> LAB CERTIFICATES		
DISCOVERY OF INCIDENT: Emergency: <input type="checkbox"/> Y / <input type="checkbox"/> N (see end of form for additional reporting requirements) Storm-related: <input type="checkbox"/> Y / <input type="checkbox"/> N Real Estate Transaction <input type="checkbox"/> Y / <input type="checkbox"/> N HO Contractor Marketing: <input type="checkbox"/> Y / <input type="checkbox"/> N Release Detection: <input type="checkbox"/> Y / <input type="checkbox"/> N Incidental Discovery: <input type="checkbox"/> Y / <input type="checkbox"/> N Other: _____		
SITE WATER SUPPLY: * Public Water <input type="checkbox"/> * Private Well <input type="checkbox"/> *Provide details below under Receptor Impacts and Potable Well Impacts.		
Please Complete Below If Applicable		

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Soil Sample Result/Depth: ____ / ____ ft.
Additional Sample Results/Depths: ____ / ____ ft. ____ / ____ ft. ____ / ____ ft.
Attach analytical.

Tank Information:

Number of AST Tanks: ____ Number of UST Tanks: ____ In Use? Y / N Number Yrs. Out of Use ____

Tank Size(s) /Age(s): _____

Liquid Amounts in Tank: Water: ____ inches Fuel ____ inches Other ____ inches

Impacts

Product Type Released:

Gasoline Diesel Kerosene H.O. Used Oil Pump Oil Hydraulic Oil Other ____

Product State: Vapor Dissolved Free Product Residual

Receptor Impacts:

*On-site Potable Well *Off-site Potable Well *Crawlspace/Basement *Interior of Bldg. Ditch/Stream
Spring Lake/Pond River/Estuary Utility Yard/Ground Other ____

* If potable well impact or building structure impact (crawlspace, basement, interior, etc.) complete Page 2 of form.

Distance to Nearest Surface Water: ____ ft. Type: ____ (e.g. Stream, River, Lake, etc.) Name of Surface Water: ____

***Potable Well Impacts:**

On-Site Well: Y / N Distance to well: ____ ft. In use: Y / N Impacted: Y / N

Type : shallow deep potable irrigation abandoned

Location: upgradient downgradient cross gradient Number of humans potentially impacted: ____

Additional On-Site Well: Y / N Distance to well: ____ ft. In use: Y / N Impacted: Y / N

Type : shallow deep potable irrigation abandoned

Location: upgradient downgradient cross gradient Number of humans potentially impacted: ____

In Use Off-Site Well: Y / N Distance to well: ____ ft. In use: Y / N Impacted: Y / N

Type : shallow deep potable irrigation abandoned

Location: upgradient downgradient cross gradient Number of humans potentially impacted: ____

Additional Comments:

***Building Structure Impacts:**

Buildings Impacted: Y / N

If YES, the building is impacted by:

Vapor Intrusion: Y / N

- Petroleum odors/vapors confined to basement only (no impacts to living space): Y / N
- Petroleum odors/vapors confined to crawl space only (no impacts to living space): Y / N

Seepage: Y / N Flooding: Y / N

Sump present: Y / N Location: ____ Number of sumps: : ____

Number of humans potentially impacted: ____

Structure Foundation Type: Basement Crawlspace Slab Other ____

Foundation Construction Type: Block Concrete Earthen Other ____

Floor Construction Type of Basement/Crawlspace: Block Concrete Earthen Other ____

Petroleum staining of foundation wall/floor: Y / N Location: ____

Number of Impacted Buildings: : ____ Building Type: Residential Commercial Other ____

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Additional Comments:

DEQ USE ONLY	Email Received by: _____	Assigned To: _____
Release: Suspected <input type="checkbox"/> Confirmed <input type="checkbox"/> Federally Regulated : Y <input type="checkbox"/> / N <input type="checkbox"/>		
Current Responsibility: RP Lead <input type="checkbox"/> State Lead <input type="checkbox"/>		
Priority: 1-Impacted Receptor (AWS; GW drinking water; S/W impact; Vapor) <input type="checkbox"/> 2-GW Impact (dissolved or LNAPL) <input type="checkbox"/> 3-Soil Contamination only <input type="checkbox"/> 10-Loss of Beneficial Use <input type="checkbox"/>		
Tank Type: Regulated Petroleum UST <input type="checkbox"/> Excluded UST <input type="checkbox"/> Deferred UST <input type="checkbox"/> Partially Deferred UST <input type="checkbox"/> Exempt UST 1 <input type="checkbox"/> Exempt UST 2 <input type="checkbox"/> Small Heating Oil AST <input type="checkbox"/> Heating Oil Category: Category 1 <input type="checkbox"/> Category 2 <input type="checkbox"/> Category 3 <input type="checkbox"/> NFA <input type="checkbox"/> Regulated AST <input type="checkbox"/> Unregulated AST <input type="checkbox"/> Unknown <input type="checkbox"/> Other <input type="checkbox"/> _____		

- Please submit the completed electronic EPR to the appropriate [DEQ Regional Office Petroleum Program](#).
- Report emergencies, leaking fugitive tanks, and fish kills to the [Virginia DEQ Pollution Response Preparedness \(PREP\) Contact](#) or online using the PREP [Pollution Reporting Form](#).
- Report non-leaking fugitive tanks or containers to the [Virginia Department of Emergency Management \(DEM\)](#) at 1-800-468-8892.
- Report all fish kills to [Virginia Department of Game and Inland Fisheries \(DGIF\)](#) at (804) 367-1000.
- Report releases impacting or threatening to impact state waters (storm drains, creeks, rivers, lakes, etc.) to the local fire department and to the [National Response Center](#) at 1-800-424-8802.
- Report fire and safety hazards to your local fire or emergency official.