

**GUIDELINES FOR SITE CHECKS, TANK CLOSURE,
AND INITIAL RESPONSE AND ABATEMENT
FOR UST RELEASES**

UST Section

North Carolina Department of Environmental Quality

Division of Waste Management

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Definitions

Action Level: the concentration of a contaminant that if exceeded may require further regulatory action such as cleanup or monitoring.

Aquifer: a permeable body of rock or sediment that stores and transmits groundwater in sufficient quantity to supply wells or springs.

Bedrock: any consolidated rock which is encountered in the place in which it was formed or deposited and which cannot be readily excavated without the use of explosives or heavy rock cutting equipment. Bedrock generally underlies soil or other unconsolidated, superficial material.

Cleanup Level: the concentration of a contaminant at which *no* further cleanup actions are required based on the risk of harm posed by the contaminant.

Closure: activities conducted during the permanent removal (or abandonment) of underground storage tank systems and not inclusive of abatement or corrective actions, or remediation.

Commercial Underground Storage Tank: any tank or tank system, including any connected piping, containing petroleum products, where at least ten percent (10%) of the total system volume (including both tanks and piping) is buried beneath the surface of the ground, excluding any systems exempted in North Carolina General Statute (NCGS) 143-215.94A(2) .

Confining Layer: a layer having very low hydraulic conductivity, in relationship to adjacent stratigraphic units, that restricts the movement of water into and out of an aquifer (e.g., dense, unfractured clay).

Confirmed Release: a release for which an analytical result for sampled media shows any contaminant level above the Method Detection Limit.

De Minimus Concentration: amount of a regulated substance which does not exceed one percent of the capacity of the tank, excluding piping and vent lines.

Department: the North Carolina Department of Environmental Quality.

Discharge: a release (See also Release).

Division: the Division of Waste Management.

Ex Situ Soil: soil that has been excavated.

Free Product: free-phase petroleum (See also NAPL).

Gross Contamination Levels (GCLs): levels of groundwater contamination for any contaminant (except ethylene dibromide, benzene and the aliphatic and aromatic carbon fraction classes)

that exceed 50 percent of the solubility of the contaminant at 25 degrees Celsius or 1,000 times the groundwater quality standard or interim groundwater quality standard established in 15A NCAC 2L .0202, whichever is lower; and levels of groundwater contamination for ethylene dibromide and benzene that exceed 1,000 times the federal drinking water standard set out in 40 CFR 141.

Groundwater: those waters occurring in the subsurface under saturated conditions.

Hazardous Substance: a hazardous substance defined in Section 101 (14) of the Comprehensive Environmental Response Compensation and Liability (CERCLA) Act of 1980 (but not including any substances regulated as a hazardous waste under Subtitle C or any mixture of such substances and petroleum).

Hazardous Waste: discarded material which, due to its quantity, concentration, or physical or chemical characteristics, may cause or significantly contribute to an increase in mortality, irreversible or incapacitating reversible illness, or pose a substantial threat or potential hazard to human health or the environment when improperly treated, stored, transported, disposed or otherwise managed (Federal regulations define a waste as a hazardous waste if it exhibits a characteristic of a hazardous waste (40 CFR 261.20 through 261.24); has been listed as hazardous (40 CFR 261.31 through 261.33); or is a mixture containing a listed hazardous waste and a non-hazardous solid waste (unless the mixture is specifically excluded or no longer exhibits any of the characteristics of a hazardous waste).)

In Situ Soil: soil or fill material that is in the ground and has not been disturbed.

Land Application: the process of remediating contaminated soil by spreading soil over land. Land application may include remediating soil by natural biological methods, enhanced biological methods, or volatilization.

Maximum Soil Contaminant Concentration (MSCC): the concentration of a soil contaminant at which no further cleanup actions are required based upon the risk of harm posed by the contaminant.

Method Detection Limit (MDL): the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte (40 CFR 136 Appendix B).

Maximum Extent Practicable (MEP): the limits of available technology and the practical and technical limits on an owner or operator of an underground storage tank to conduct assessment and cleanup activities that are protective of human health and the environment in response to a discharge of petroleum to the environment.

Minimum Reporting Limit (MRL): the minimum reporting limit that must be achieved by laboratories for target analyte results submitted to the UST Section; it is a reporting limit established by the UST Section for the target analytes required for each approved analytical

method as an alternative to the detection limit indicated in the method description and is listed for each analyte in the *Guidelines for Sampling*.

NAPL: also known as “free product”. A non-aqueous phase liquid (i.e., not dissolved in water) which may be present within the subsurface at a measureable thickness greater than or equal to 0.01 of a foot (approximately 1/8 inch), as a sheen on surface water, or accumulating as a liquid on an exposed surface. Depending on the density of the liquid in relation to water, the NAPL may be further described as ‘Light’ (LNAPL) or ‘Dense’ (DNAPL).

Non-Commercial Underground Storage Tank: any tank or tank system, including any connected piping, containing petroleum products, where at least ten percent (10%) of the total system volume (including both tanks and piping) is buried beneath the surface of the ground, that is *not* included within the Commercial UST classification, and excluding any systems exempted in North Carolina General Statute (NCGS) 143-215.94A(7) .

Petroleum or Petroleum Product: crude oil or any fraction thereof which is liquid at standard conditions of temperature (60 degrees Fahrenheit) and pressure (14.7 pounds per square inch absolute), but excluding substances defined as a hazardous substance in Section 101 (14) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980.

Petroleum Contaminated Soil or Soil Containing Petroleum Products: any soil that has been exposed to petroleum products because of any emission, spillage, leakage, pumping, pouring, emptying, or dumping of petroleum products onto or beneath the land surface and that exhibits characteristics or concentrations of typical petroleum product constituents in sufficient quantities as to be detectable by approved analytical procedures.

Practical Quantitation Limit (PQL): the lowest concentration of a given material that can be reliably achieved among laboratories within specified limits of precision and accuracy by a given analytical method during routine laboratory analysis.

Receptor: any human, plant or animal, structure or surface water body that is or has the potential to be adversely effected by the release or migration of contaminants.

Release: any spilling, leaking, emitting, discharging, escaping, leaching or disposing into groundwater, surface water or subsurface soils. (Refer to statutes and regulations relevant to UST releases or to AST and surface releases.)

Responsible Party (RP): a UST owner, UST operator, and/or landowner seeking reimbursement from the State Trust Fund, or any person who is responsible for a discharge or release of petroleum or a hazardous substance. (Refer to statutes and regulations relevant to UST releases or to AST releases and spills.)

Smear Zone: the zone around a source area where LNAPL has been ‘smeared’ across different soil horizons due to water table fluctuations, with some LNAPL remaining trapped in pore spaces beneath the historic high water table.

Soil or Regolith: a general term for the fragmental and unconsolidated geological material of highly varied character that nearly everywhere forms the surface of the land and overlies or covers bedrock. It includes rock debris of all kinds, volcanic ash, glacial till, alluvium, loess and eolian deposits, and vegetal accumulations.

Soil Scientist: an individual who is a Certified Professional in Soils through the NCRCPS (N.C. Registry of Certified Professionals in Soils) or a Certified Professional Soil Scientist or Soil Specialist by ARCPACS (American Registry of Certified Professionals in Agronomy, Crops and Soils) or a Registered Professional Soil Scientist by NSCSS (the National Society of Consulting Soil Scientist) or can provide documentation that he/she meets the minimum education and experience requirements for certification or registration by one or more of the organizations named in this Subparagraph or upon approval by the Director, an individual with a demonstrated knowledge of soil science.

Source Area: point of release or discharge. The term 'secondary source area' refers to any zone of NAPL-impacted soil that continues to release contaminants in the subsurface.

Surface Water: all waters of the state as defined in North Carolina General Statute (NCGS) 143-215.77 Article 21A, except for underground waters, such that "waters" shall mean any stream, river, creek, brook, run, canal, swamp, lake, sound, tidal estuary, bay, reservoir, waterway, wetlands or any other body or accumulation of water, surface or underground, public or private, natural or artificial, which is contained within, flows through, or borders upon this State, or any portion thereof, including those portions of the Atlantic Ocean over which this State has jurisdiction.

Total Petroleum Hydrocarbons (TPH): the concentration of petroleum fuel contamination present.

Transmissivity: the ability of geologic material to transmit water.

Underground Storage Tank (UST): any one or combination of tanks (including underground pipes connected thereto) that is used to contain an accumulation of regulated substances, and the volume of which (including the volume of underground pipes connected thereto) is 10 percent or more beneath the surface of the ground (Refer to full definition in 15A NCAC 2N .0203.).

UST System: an underground storage tank, connected underground piping, underground ancillary equipment, and containment system, if any.

Waste Oil: any used non-hazardous petroleum product other than crankcase oil. Crankcase oil mixed with other used non-hazardous petroleum products shall be considered as waste oil.

Water Table: the surface of the saturated zone below which all interconnected voids are filled with water and at which the pressure is atmospheric.

Acronyms

| | |
|------------------------|--|
| <u>AFVR</u> | Aggressive Fluid - Vapor Recovery |
| <u>AST</u> | Aboveground Storage Tank |
| <u>ASTM</u> | American Society for Testing and Materials |
| <u>CAP</u> | Corrective Action Plan |
| <u>CAS</u> | Chemical Abstracts Service Number |
| <u>CERCLA</u> | Comprehensive Environmental Response, Compensation and Liability Act |
| <u>CFR</u> | Code of Federal Regulations |
| <u>CSA</u> | Comprehensive Site Assessment |
| <u>DEQ</u> | Department of Environmental Quality |
| <u>DWR</u> | Division of Water Resources |
| <u>DWM</u> | Division of Waste Management |
| <u>EDB</u> | Ethylene Dibromide (1,2 Dibromoethane) |
| <u>EPA</u> | The Environmental Protection Agency |
| <u>FID</u> | Flame Ionization Detector |
| <u>GCL</u> | Gross Contamination Level |
| <u>HCl</u> | Hydrochloric Acid |
| <u>HNO₃</u> | Nitric Acid |
| <u>IAA</u> | Initial Abatement Action |
| <u>IAR</u> | Initial Site Assessment Report |
| <u>IATA</u> | International Air Transport Association |
| <u>ITRC</u> | Interstate Technology & Regulatory Council |
| <u>L.G.</u> | Licensed Geologist |
| <u>LSA</u> | Limited Site Assessment |
| <u>MADEP</u> | Massachusetts Department of Environmental Protection |
| <u>MDL</u> | Method Detection Limit |
| <u>MMPE</u> | Mobile Multi-phase Extraction |
| <u>MRL</u> | Minimum Reporting Limit |
| <u>MSCC</u> | Maximum Soil Contaminant Concentration |
| <u>NAPL</u> | Non-Aqueous Phase Liquid |

| | |
|--------------------|---|
| <u>NC</u> | North Carolina |
| <u>NCAC</u> | North Carolina Administrative Code |
| <u>NCDA&CS</u> | North Carolina Department of Agriculture & Consumer Services |
| <u>NCGS</u> | North Carolina General Statutes |
| <u>NCS</u> | Notice of Contaminated Site |
| <u>NFA</u> | No Further Action |
| <u>NORR</u> | Notice of Regulatory Requirements |
| <u>NOV</u> | Notice of Violation |
| <u>NPDES</u> | National Pollutant Discharge Elimination System |
| <u>NRP</u> | Notice of Residual Petroleum |
| <u>OPHSCA</u> | Oil Pollution and Hazardous Substances Control Act of 1978 |
| <u>PAH</u> | Polycyclic Aromatic Hydrocarbon |
| <u>PCB</u> | Polychlorinated Biphenyl |
| <u>P.E.</u> | Professional Engineer |
| <u>PID</u> | Photoionization Detector |
| <u>POTW</u> | Publicly Owned Treatment Works |
| <u>PVI</u> | Petroleum Vapor Intrusion |
| <u>QA/QC</u> | Quality Assurance/Quality Control |
| <u>SAR</u> | Soil Assessment Report |
| <u>SCR/SCR</u> | Soil Cleanup Report/Site Closure Request |
| <u>SM</u> | Standard Method |
| <u>STF</u> | State Trust Fund |
| <u>SVE</u> | Soil Vapor Extraction |
| <u>SVOC</u> | Semi-Volatile Organic Compounds |
| <u>SW</u> | Solid Waste |
| <u>TCLP</u> | Toxicity Characteristic Leaching Procedure (EPA Method SW-846 1311) |
| <u>TOC</u> | Total Organic Carbon |
| <u>TPH</u> | Total Petroleum Hydrocarbons |
| <u>TPH-DRO</u> | Total Petroleum Hydrocarbons - Diesel Range Organics |
| <u>TPH-GRO</u> | Total Petroleum Hydrocarbons - Gasoline Range Organics |
| <u>UST</u> | Underground Storage Tank |

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|-------------|---------------------------------|
| <u>UVF</u> | Ultraviolet Fluorescence |
| <u>USGS</u> | United States Geological Survey |
| <u>VOA</u> | Volatile Organic Analysis |
| <u>VOC</u> | Volatile Organic Compounds |

GUIDELINES FOR SITE CHECKS, TANK CLOSURE, AND INITIAL RESPONSE AND ABATEMENT FOR UST RELEASES

1.0 Regulatory Background

Underground Storage Tank (UST) systems are regulated by the Division of Waste Management (DWM), a division of the Department of Environmental Quality (DEQ). Its regulatory authority can be found in **Title 15A** of the North Carolina Administrative Code (NCAC), **Subchapter 2N** and **Subchapter 2L**. The rules establish criteria and standards applicable to underground storage tanks and include the requirements and procedures for permanently closing UST systems, investigating suspected releases, and performing initial response and abatement actions.

2.0 Purpose of the Guidelines

The purpose of the *Guidelines for Site Checks, Tank Closure, and Initial Response and Abatement*, hereafter referred to as the “*Guidelines*”, is to provide procedures for performing site checks to investigate suspected releases from regulated UST systems; to provide guidance for permanently closing regulated petroleum and hazardous substance UST systems; and to provide guidance for performing and reporting initial response and abatement action for releases from all UST systems. This document replaces all previous guidance documents issued by the UST Section pertaining to UST system closure and initial response and abatement actions. Any release discovered from a UST system during closure, during site check, or by other means must be initially addressed with initial response and abatement actions in accordance with this document and then, if further assessment is required, addressed in accordance with the *Guidelines for Assessment and Corrective Action for UST Releases*, current version.

All work performed pursuant to these *Guidelines* which involves site assessment, interpretation of subsurface geologic conditions, or preparation of corrective action plans or which requires detailed technical knowledge of site conditions must be performed by persons, firms, and corporations licensed by the North Carolina State Board of Professional Engineers or the North Carolina State Board of Licensed Geologists, as required under **15A NCAC 2L .0103(e)**. Furthermore, the title pages of the *20-Day Report* and the *Initial Abatement Action Report* required by these *Guidelines* must display the seal and signature of the certified Professional Engineer or Licensed Geologist and the name and corporate certification number of the firm or corporation, as applicable.

Questions concerning the information presented in this document should be directed to the UST Section Central Office at 919-707-8171. Questions concerning a specific site should be directed to the UST Section regional office that is responsible for the county in which the site is located. The address, telephone number, and the jurisdiction of each regional office are presented in Figure 7, p. 51. Guidance pertaining to contamination from sources other than USTs is presented in Appendix F.

Note: Throughout this document, comments related to the North Carolina Commercial Leaking Petroleum Underground Storage Tank Cleanup Fund (State Trust Fund) will be enclosed in boxed text, such as this. If State Trust Fund reimbursement is anticipated for any work related

to a leaking Commercial UST, the parties concerned should be aware of all policies and procedures that pertain to the State Trust Fund to insure reimbursement eligibility.

Information related to the scope-of-work of tasks that may be required to be performed in accordance with the regulations and to the maximum rates allowed for these tasks is provided in the current version of the Reasonable Rate Document, which is available in electronic format from the UST Section's web page at <https://deq.nc.gov/about/divisions/waste-management/underground-storage-tanks-section/trust-fund-branch/reasonable-rate-documents>.

The State Trust Fund is authorized under Chapter 143, Article 21A, Part 2a of the North Carolina General Statutes, and is regulated under Title 15A of the North Carolina Administrative Code, Subchapter 2P. State Trust Funds may be used only for the cleanup of commercial leaking petroleum USTs. Furthermore, some costs incurred for cleanup of leaking petroleum USTs may not be reimbursable, as described in the most current version of the Task Scope-of-Work Document.

Owners or operators applying for participation in the State Trust Fund are cautioned that all required annual operating fees must be paid in full before any release is discovered, or reimbursement will not be available for any cleanup or third-party liability expense incurred in response to a release from that UST system (even if all outstanding fees are subsequently paid). Questions related to eligibility and reimbursement should be directed to the Trust Fund Branch at 919-707-8171.

3.0 Applicability of Regulatory Requirements

3.1 Regulated USTs vs. Non-Regulated USTs

This document provides guidance relevant to both regulated USTs and non-regulated USTs for any closure or site check activity through the initial abatement of a release. The term “regulated UST” is defined and distinguished from “non-regulated UST”. A “regulated UST” is any underground tank containing regulated substances, as defined in **15A NCAC 2N**, specifically petroleum (including but not limited to gasoline, diesel and used/waste oil) or a hazardous substance (including halogenated or non-halogenated solvents). USTs which constitute exceptions to this definition are considered “non-regulated USTs” and include, among others:

- USTs containing heating oil that is used on the premises where stored.
- Farm or residential motor-fuel USTs (such as those containing gasoline or diesel fuel) that hold 1,100 gallons or less in capacity. *(To be considered exempt from the regulations, both farm and residential tanks must be 1,100 gallons or less in capacity and not be used for commercial (e.g., resale, delivery fleets, etc.) purposes. USTs located on farm or residential property which are used for fuel resale or for other commercial purposes are regulated.)*
- USTs that hold under 110 gallons in capacity.

The difference between regulated and non-regulated USTs is clarified further under the definition of UST in **15A NCAC 2N.0203**, and examples of regulated and non-regulated USTs are presented in Appendix C.

3.2 *Commercial USTs vs. Noncommercial USTs*

Tanks are further designated as either “commercial” or “noncommercial”. A “commercial UST” is defined in North Carolina General Statute (NCGS) **143-215.94A(2)** as all USTs containing petroleum with the exception of a few specific types of tanks. The exceptions include, but are not limited to, the following:

- Farm or residential motor-fuel USTs (such as those containing gasoline or diesel fuel) that hold 1,100 gallons or less in capacity and are used for non-commercial purposes.
- USTs of 1,100 gallons or less in capacity containing heating oil that is used on the premises where stored.
- USTs of more than 1,100 gallons in capacity containing heating oil that is used on the premises where stored by four or fewer households.
- Flow-through process tanks.
- Storage tanks situated in an underground area if the storage tank is situated upon or above the surface of the floor.

A “noncommercial” tank is defined in **NCGS 143-215.94A(7)**, which restates some exemptions from the commercial definition, such as septic tanks, surface lagoons, storm water collection systems, etc.

The regulated/non-regulated alignment is matched in the commercial/noncommercial designations in many cases. According to the exception lists within each set of definitions, all regulated tanks must also be *commercial* tanks, while all *noncommercial* tanks must also be defined as non-regulated tanks. Some UST systems, such as some very large heating oil USTs, may be excluded from the regulated UST definition, while satisfying the commercial UST definition, representing a *non-regulated commercial* UST. While non-regulated, commercial tanks do not have to comply with some of the construction and monitoring requirements listed in **15A NCAC 2N**, there are other requirements that do apply to these USTs in that rule as well as in **NCGS 143-215.94C**. There are no conditions that provide for a *noncommercial regulated* UST.

The difference between commercial and noncommercial USTs is clarified further under the definitions of these two terms in **NCGS 143-215.94A(2)** and **(7)** respectively..

3.3 *Applicability of UST Closure Requirements*

Regulated USTs: Closure activities performed during the permanent removal of all regulated USTs (petroleum and hazardous substance USTs) must be conducted in accordance with the UST closure requirements provided in **15A NCAC 2N .0800**. These requirements incorporate the federal underground storage tank requirements by reference in accordance with **NCGS 150B-14(c)**.

Non-Regulated USTs: Most of the UST closure requirements applicable to regulated USTs are not applicable to non-regulated USTs. Non-regulated petroleum USTs (e.g., heating oil USTs) are not required to be removed from the ground or closed by any specific procedure. For non-regulated, commercial USTs, soil or groundwater samples are not required at the time of closure UNLESS a release is suspected or has been confirmed. For non-regulated noncommercial USTs,

initial abatement and assessment of suspected releases from tanks will only be necessary where explicitly directed by the Department based on an evaluation of the risk posed by the release. (See Section 6.0 for additional details on this topic.)

Non-regulated non-petroleum USTs (e.g., alcohol, vegetable oil, or propylene glycol USTs) also are not required to be removed from the ground or closed by any specific procedure. Soil or groundwater samples are not required at the time of closure UNLESS a release is suspected or has been confirmed.

3.4 Applicability of Initial Response and Abatement Requirements

Regulated USTs: For releases from regulated, commercial petroleum USTs (e.g., gasoline or diesel USTs, etc.), the responsible party is required to comply with the release response requirements of **15A NCAC 2N .0702, .0703, and .0705, and 15A NCAC 2L .0404(1)**, and thus perform specific initial response and initial abatement actions, including excavation of contaminated soil.

For releases from regulated hazardous substance USTs (e.g., halogenated solvent USTs), the responsible party is required to comply with the release response requirements of **15A NCAC 2N .0702, .0703, and .0705**, and thus to perform specific initial response and initial abatement actions, including excavation of contaminated soil.

Non-Regulated USTs: For releases from non-regulated, commercial petroleum USTs (e.g., large heating oil USTs), the responsible party is required to comply with the release response requirements of **15A NCAC 2N .0702, .0703, and .0705, and 15A NCAC 2L .0404(1)**, and thus perform specific initial response and initial abatement actions, including excavation of contaminated soil.

For releases from non-regulated noncommercial petroleum USTs (e.g., home heating oil USTs), the responsible party is required to take action to address any emergency condition, such as vapor, fire, or explosion hazards, or imminent threats to public health, safety, welfare, or the environment. However, the responsible party is not required to comply with the initial response and initial abatement action requirements of **15A NCAC 2N .0702, .0703, and .0705, and 15A NCAC 2L .0404(1)**, unless specifically directed to by the Department based upon the risk posed by the release.

For releases from non-regulated non-petroleum USTs, the responsible party is required, if the substance is not naturally occurring (or is naturally occurring but exceeds the naturally-occurring background standard), to comply with the release response requirements of **15A NCAC 2L .0106**, and thus perform initial response and initial abatement actions. *(A flowchart illustrating the requirements for releases from non-regulated non-petroleum USTs is presented as Figure 6 on page 47.)*

More specific procedural guidance for release response at non-regulated non-petroleum UST releases (e.g., alcohol, vegetable oil, or propylene glycol UST releases) is not presented in this document as the composition and properties of non-regulated non-petroleum substances vary widely. Therefore, for releases from non-regulated non-petroleum USTs the responsible party

should contact the Corrective Action Branch of the UST Section for site specific guidance at (919) 707-8171.

Please note that the process of denaturing certain stored non-petroleum products (such as ethanol or other alcohol fuels, etc.) by adding a volume of petroleum may alter the classification of the UST system. For these denatured product tanks, the responsible party should contact the Corrective Action Branch of the UST Section for site specific guidance at (919) 707-8171.

Some non-regulated non-petroleum UST releases (e.g., hazardous waste UST releases) do not fall under the authority of the UST Section; these releases must be referred to the appropriate agency.

4.0 UST Site Check Guidelines for Regulated UST Systems

4.1 Regulatory Authority

A site check is required if a release from a regulated UST system has been suspected or confirmed, at the site or nearby, by the presence of the regulated substance as free product, dissolved product, or vapor detected in soils, sewer and utility lines, surface water, groundwater, etc.; by unusual operating conditions of the system itself; or by leak detection and/or tightness testing results, in accordance with **15A NCAC 2N .0601** and **.0603**, and **.0701** through **.0704**. A site check is also required if a spill or overfill is known to have occurred at the site. A site check may be directed in accordance with **15A NCAC 2N .0602**, if the UST system is suspected to be the source of a release that is discovered off-site.

4.2 Site Check Description

The site check assessment procedure requires sampling where contamination is observed or is most likely to be present at the site. The scope of assessment therefore includes the soil surrounding the entire UST system, and the groundwater within the immediate area. The sampling procedure requires the same sampling protocol required for UST closure. The sampling protocol must consider the nature of the stored substance, the type of initial alarm or cause for suspicion, the type of backfill, the depth to groundwater, and any other factors appropriate for identifying the presence and source of the release.

Site check activities are required of owners and operators of UST systems in any of the circumstances described below:

- 1) Evidence of a release is present at the UST site or is found offsite and may be related to a release at the UST site. Such evidence includes, but is not limited to, the discovery of the presence of regulated substances (such as dissolved product, free product, or vapors) in soils, basements, sewer or utility lines, and nearby surface water and groundwater;
- 2) Tightness test results for the UST system do not indicate that a leak exists, but environmental contamination indicates that a release from the UST system may have occurred;
- 3) The applied method of leak detection indicates a suspected release and a follow-up tightness test confirms that result;
- 4) A spill or overfill of a regulated substance has occurred.

If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document (which is available in electronic format from the UST Section's web page at <https://deq.nc.gov/about/divisions/waste-management/underground-storage-tanks-section/trust-fund-branch/reasonable-rate-documents>) for information about reimbursement.

4.3 Site Check Requirements

When conducting a site check per **Title 15A NCAC 2N .0703** and **.0704**, the procedures below must be included:

- 1) Soil samples must be collected around the perimeter of a single UST or around the perimeter of a set of USTs in a single pit, according to the sampling procedure described in Item #1 of 5.3.B: Removal of UST(s) underlain by a concrete pad.
- 2) One sample must be collected at the fill port of each UST (or under any catchment basin at the fill port) to document overfills.
- 3) Soil samples must also be collected underneath associated product lines, dispensers, containment sumps, turbine pumps or turbine containment sumps, and other areas where contamination is suspected or observed, as described in 5.3.F.

Note that all samples must be collected from native soil within 3 feet of, and no deeper than 2 feet below, the base of the system component being assessed. Also, it may not be necessary to collect samples from around the entire system, as indicated in items 1-3 above, if the area of the suspected release is known and localized.

- 4) All soil samples must be analyzed by approved methods as specified in Table 3, p. 59.

Note, if the UST system contains an ethanol-gasoline blend greater than E15, the UST Section will determine if the assessment required in items 1-4 is sufficient to detect a release, or if additional analytical methodologies will be necessary.

- 5) If required by the UST Section, a permanent monitoring well, constructed according to **Title 15A NCAC 2C**, Well Construction Standards, must be installed as close as possible to and within 5 feet of the (part of the) UST system with the (suspected) release in a downgradient direction, and a groundwater sample must be collected and analyzed as specified in Tables 4 and 8.

If the results of the site check indicate that:

- soil contamination does not equal or exceed 50 mg/kg TPH GRO or 100 mg/kg TPH DRO for petroleum (or where tested, *such as for regulated hazardous substances*, does not exceed the soil-to-groundwater MSCC or the MDL if no MSCC is established),
- groundwater contamination does not equal or exceed the groundwater quality standard established in 15A NCAC 2L .0202, and
- NAPL is not present,

then the results must be reported to the UST Section in a **Site Check Report**.

The **Site Check Report** must be submitted to the appropriate regional office of the Corrective Action Branch of the UST Section (as well as a separate copy to the Permits and Inspections Branch, if the site check was required by a UST inspector). The **Site Check Report** must be received by the UST Section **within 30 days** of the receipt of the **Notice of Regulatory**

Requirements or the **Notice of Violation**. If the removal of all or part of the UST system was necessary to allow access for site check sampling, then the required UST closure report elements (**UST-12 Format** with a **UST-2A** or **UST-2B Form**, Appendix A, p. 82) should be submitted as part of the **Site Check Report**. The reporting requirements are described in Section 8.0, and the outline of the **Site Check Report** format is presented in Appendix A, p. 67. If the three conditions above are confirmed, then no further action will be required.

If the results of the site check indicate that:

- soil contamination does equal or exceed 50 mg/kg TPH GRO or 100 mg/kg TPH DRO for petroleum (or where tested, *such as for regulated hazardous substances*, soil contamination equals or exceeds the soil-to-groundwater MSCCs, or the MDL if no MSCC is established),
- groundwater contamination does equal or exceed any 2L groundwater quality standards, or
- free product is present,

then **initial response and abatement actions (Section 6.0), including excavation of contaminated soil (Section 7.0), are required**. A flowchart illustrating the requirements for releases discovered during site checks is presented as Figure 1 on p. 45.

Initial response actions which are required include submittal of a **Form UST-61 - 24-Hour Release and Reporting Form** (Appendix A, p. 75) to the UST Section within 24 hours following discovery of the release; action to stop the release; and identification and mitigation of hazards from exposure to pollutants.

Initial abatement actions include:

- determination of the source of the release (if not previously identified);
- investigation and removal of free product;
- submittal of a **20-Day Report** (Appendix A, p. 78) to the UST Section within 20 days following discovery of the release; and
- excavation of contaminated soil to the maximum extent possible (Section 7), followed by confirmation sampling as described in Section 9.1 and in Table 3, p. 59.

The final results of the initial abatement actions for a petroleum release must be reported in an **Initial Abatement Action Report** (Appendix A, p. 89), which must be submitted to the UST Section within 90 days following discovery of the release. (*The final results of the initial abatement actions for a hazardous substance release must be reported in a **45-Day Report**, the requirements for which are addressed in the current version of the Guidelines for Assessment and Corrective Action for UST Releases; the **45-Day Report** must be submitted within 45 days following discovery of the release.*)

The **24-Hour Report**, the **20-Day-Report**, and the **Initial Abatement Action Report (or the 45-Day Report, for a hazardous substance release)** must be submitted to appropriate regional office of the Corrective Action Branch of the UST Section (as well as a separate copy to the Permits and Inspections Branch, if required by a UST inspector). If it was necessary to remove all or part of the UST system to allow access for site check sampling and/or excavation, then the required UST closure report elements (**UST-12 Format** with a **UST-2A** or **UST-2B Form**, Appendix A, p. 82)

should be submitted as part of the ***Initial Abatement Action Report***. The reporting requirements are described in Section 8.0, and the outline of the format is presented in Appendix A, p. 89.

If the ***Initial Abatement Action Report*** for a petroleum release shows that, post-excavation:

- soil contamination does not exceed the lower of the soil-to-groundwater or residential maximum soil contaminant concentrations (MSCCs),
- neither groundwater nor bedrock was encountered in the excavation, and
- where assessed, groundwater samples collected from one or more monitoring wells installed within the source area do not exceed any 2L groundwater quality standards,

then no further action will be required.

However, if the ***Initial Abatement Action Report*** indicates that, post-excavation:

- soil contamination does equal or exceed the lower of the soil-to-groundwater or residential MSCCs following excavation to the maximum extent practicable,
- either groundwater or bedrock was encountered, *and* groundwater contamination was not assessed or
- groundwater contamination does equal or exceed the 2L groundwater quality standards,

then the responsible party must perform further assessment and submit a ***Limited Site Assessment Report*** within 120 days of the discovery of the release. The ***Limited Site Assessment Report*** format is presented in the *Guidelines for Assessment and Corrective Action for UST Releases*, current version.

Per NCGS 143-215.94B(b)8, State Trust Fund reimbursement may be available for investigative costs if a site investigation is required by the Department to determine if a release has occurred. This statute excludes coverage of routine leak detection procedures that are required by statute or rule. Accordingly, reimbursement is not available for costs incurred for routine leak detection investigations by the tank owner or operator where required by rule under 15A NCAC 2N .0601 following evidence of a release detected onsite. However, reimbursement of some or all investigation costs may be available for a tank owner or operator who is directed by the Department to perform a leak detection investigation under 15A NCAC 2N .0602 following a release detection off-site.

Additionally, please note that a failure to locate and repair or remove a leaking component or system may jeopardize future access to the State Trust Fund, or require cost recovery for prior reimbursements, if the presence of an ongoing release results in an increase in cleanup costs.

Please refer to the current version of the Reasonable Rate Document (available in electronic format from the UST Section's web page at <https://deq.nc.gov/about/divisions/waste-management/underground-storage-tanks-section/trust-fund-branch/reasonable-rate-documents>) for more information about reimbursement.

5.0 UST Closure (and Change-in-Service) Guidelines for Regulated UST Systems

Per **15A NCAC 2N .0802** and **.0803** the procedure to close a regulated UST system consists of:

1. Pre-closure notifications;
2. Cleaning, removal, and disposal of any liquids and sludge present in the system;
3. Removal and disposal of the system itself (or filling with an inert solid material, if in-place closure has been approved by the Department)
4. Collection and analysis of soil and/or groundwater samples to determine the presence or absence of a release; and
5. Reporting of the results.

If no release is indicated by the results, no further action may be required. If a release is determined, then initial response and abatement actions (Section 6.0), including excavation of contaminated soil (Section 7.0), are required. Flowcharts illustrating UST closure and initial release response and abatement actions for regulated petroleum USTs (Figure 2) and for regulated hazardous substance USTs (Figure 3) are presented on pages 43 and 44, respectively.

A change-in-service is the continued use of a UST system previously used to store a regulated substance that is modified to store a non-regulated substance. For example, an owner or operator of a UST system that stores ethylene glycol, a regulated substance used for de-icing airplanes, wants to change the use of the UST system to store propylene glycol, a non-regulated substance also used for de-icing airplanes. This is considered a change-in-service.

To complete a change-in-service, tank owners and operators must follow the same procedures as for an in-place permanent closure of a regulated UST system (including all notifications and reporting, emptying and cleaning the UST system, and conducting a site assessment), except that the UST system is not filled with an inert substance but with a non-regulated substance. Changes-in-service are allowed only if no release is found during the site assessment. If a release is discovered, then initial response and abatement actions must be completed, which may require UST system repair or removal per **15A NCAC 2N .0501**. Flowcharts illustrating a change-in-service and initial release response and abatement actions for regulated petroleum USTs (Figure 2) and for regulated hazardous substance USTs (Figure 3) are presented on pages 43 and 44, respectively.

Please note that, if any portion of a tank system (except the vent or fill lines, and dispensers) is visible above the ground surface or is inside a floored vault, and the system has not already been evaluated by UST Section staff, the responsible party must notify the appropriate UST Section regional office to determine if the tank meets the definition of a UST (see above) prior to any activities being conducted under the UST program. Failure to properly classify a tank before removal so may result in cleanup requirements defaulting to those applicable for aboveground storage tanks, and could lead to a denial of access to the State Trust Fund.

Please refer to the current version of the Reasonable Rate Document (available in electronic format from the UST Section's web page at <https://deq.nc.gov/about/divisions/waste-management/underground-storage-tanks-section/trust-fund-branch/reasonable-rate-documents>) for more information about reimbursement.

Per NCGS 143-215.94B((d)(2) and 15A NCAC 2P.0402(b)(1) and (b)(2), costs associated with the removal or replacement/repair of any UST system, component, or contents, would not be eligible for reimbursement. State Trust Fund coverage at closure is limited only to assessment costs (e.g., necessary sampling to document the presence or extent of a petroleum release.)

The assessment of a new release would qualify for potential reimbursement of the necessary sampling and analytical costs, as part of the required initial abatement actions. A new release would also be defined by any sampling that discovers a petroleum release above detection limits for that method even if below the applicable action limit or closure standards. In this latter case, no abatement or cleanup would be required, therefore only the sampling, analytical, and report costs would be potentially eligible for reimbursement.

The use of closure samples to assess a known prior release in the same area as the tank closure efforts may also be eligible, but only if preapproved. Please note that the sample locations and methods necessary for the assessment of the known release may not necessarily match those methods or locations described as appropriate for UST system closure sampling described below, and should be discussed with the UST Section regional office managing that existing site.

If no release is detected, then none of the costs associated with the removal event would be eligible for reimbursement (including sampling) except where system closure was performed in lieu of a site check directed by the Department per 15A NCAC 2N.0602 (see Section 4.3).

5.1 Pre-Closure Actions

Before closure (or a change-in-service) of a regulated UST is initiated, the responsible party must contact the local fire marshal and/or local county or municipality for special closure or permit requirements. The responsible party must also file a **UST-3 Form - Notice of Intent: UST Permanent Closure or Change-in-Service** (Appendix A, p. 73) with the appropriate UST Section regional office 30 days before closure activities begin. [If a professional engineer (P.E.) or licensed geologist (L.G.) is supervising the closure, the **UST-3 Form** may be submitted at least five working days before the UST closure, instead.]

The responsible party also must submit a separate copy of the **UST-3 Form** to the Permits and Inspection Branch at the UST Section Central Office, or directly to the appropriate UST system inspector, if known.

Additionally, if any portion of the UST system scheduled to be closed is located within what is already known to be an area of contamination, and State Trust Fund reimbursement is anticipated for the removal of any contamination associated with the pre-existing release, formal preapproval must be obtained for the excavation soil in the proposed corrective action footprint, separate from any ineligible tank removal area footprint, prior to the start of any work onsite (See Section 7 below for details.)

5.2 *Cleaning, Removal, and Disposal of USTs and Associated Piping and Dispensers*

To close a regulated UST system, the responsible party first must clean the tank and remove all liquids and accumulated sludge.

A regulated UST system (including tanks, associated piping and dispensers) should be closed by removal. In-place closure of USTs associated with a release thought filling with an inert solid material may be conducted only with the written approval of the UST Section confirming that system removal is not necessary for the proper assessment and cleanup of the release, or that system removal would otherwise be unreasonable or impracticable. In-place closure is typically appropriate where the system components and associated release are determined to be inaccessible (e.g., the leaking UST and associated contaminated soils are located partly or wholly under substantial structures).

If a tank is replaced with a new tank, the old piping and dispensers may continue to be used only if the piping and dispensers meet all applicable requirements of **15A NCAC 2N** and if closure soil samples collected from those areas in accordance with Section 5.3.F indicate that no contaminants are present at concentrations equal to or in excess of 50 mg/kg TPH GRO or 100 mg/kg TPH DRO (or above soil-to-groundwater MSCCs for hazardous substances). If contamination is present under the piping or dispensers, the old piping and dispensers should be removed and replaced.

During UST closure activities, the responsible party must ensure that all USTs are rendered non-hazardous prior to removal from the site and are properly disposed according to all local, state or federal requirements. In selecting a tank closure contractor, the responsible party should ask the contractor where the tank(s) are to be disposed. All product, water and sludge generated during the closure activities must be properly stored, labeled, transported, and disposed as well. Tanks that are disposed in fields or unpermitted dumping sites, or that are otherwise improperly discarded, may leak petroleum products and sludge into the environment. The tank owner will be held responsible for the cleanup of any environmental damage that occurs from improperly disposed UST components, which would not be eligible for State Trust Fund reimbursement.

Individuals performing tank closure activities should adhere to the cleaning, removal, and safety procedures provided in the most recent versions of the following documents:

- **American Petroleum Institute**
 - Recommended Practice 1604, *Removal and Disposal of Used Underground Petroleum Storage Tanks*.
 - Standard 2015, *Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks*.
 - Publication 2217A, *Guidelines for Work in Inert Confined Spaces in the Petroleum and Petrochemical Industry*.
 - Publication 2219, *Safe Operating Guidelines for Vacuum Trucks in Petroleum Service*.
 - Recommended Practice 2003, *Protection Against Ignition Arising Out of Static, Lightning and Stray Currents*.

- **National Fire Protection Agency (NFPA)**
 - 70B, *Electrical Equipment Maintenance*.
 - 326, *Safe Entry of Underground Storage Tanks*.
 - 327, *Standard Procedure for Cleaning or Safeguarding Small tanks and Containers*.
- **The National Institute for Occupational Safety and Health,**
 - *Criteria for a Recommended Standard: Working in Confined Spaces*.
- **Occupational Safety and Health Administration**
 - 29 Code of Federal Regulations Part 1910 (Occupational Safety and Health Standards).

Please remember that, as described above, State Trust Fund reimbursement for the removal or replacement/repair of any UST system, component, or contents is prohibited by statute and rule. For any costs associated with any assessment or corrective action (i.e., excavation) of contamination associated with a pre-existing release, formal preapproval must be obtained for the excavation soil in the proposed corrective action footprint, separate from any ineligible tank removal area footprint, prior to the start of any work onsite (See Section 5.0 and Section 7.)

Where a new release is discovered during tank closure, assessment and initial abatement actions must be taken as defined in the remainder of this Section, and in Sections 6 and 7 below. This also applies for any surface spill or overflow release discovered in the shallow soils, including those in soils located immediately above any system component.

5.3 Regulated UST Closure (and Change-in-Service) Assessment Requirements

Before permanent closure (or a change in service) of regulated USTs is completed, owners and operators must assess the UST site for the presence of a release where contamination is most likely to be present. Therefore, the scope of assessment is inclusive of the soil surrounding the entire UST system (the tank, connected piping, dispensers, and containment system) and of the groundwater in particular circumstances where soil assessment is inadequate or not otherwise possible.

The assessment procedure to be performed is determined by the method selected for UST closure (removal of USTs, removal of USTs underlain by a concrete pad, or in-place closure of USTs) or by hydrogeological conditions encountered at the closure site. *(If the UST system contained an ethanol-gasoline blend greater than E15, the UST Section will determine if the assessment procedure for any UST closure method is adequate or if it should be supplemented by the groundwater assessment described in 5.3.G.)*

5.3.A Closure by Removal of USTs

Where closure by removal of USTs has been performed, the procedures listed below must be performed:

- 1) Soil samples must be collected underneath all product lines, dispensers, containment sumps, fill port/spill buckets, and any other areas where contamination is suspected or observed, as described under 5.3.F. (Note: This includes areas of suspected surface spills immediately beneath any removed paving or other surface cover (asphalt, concrete, etc.))
- 2) After the tank(s) have been removed, and before excavating any deeper, samples must be collected in the excavation pit directly beneath the mid-line location of the former tank. The number of samples required depends on the length (longest dimension) of the tank. These samples should be collected at evenly spaced intervals along the length of the tank, no deeper than two feet into the native soil, as follows:

| | | |
|----------------------|-------|------------------------------------|
| Less than 6 feet | ----- | 1 sample |
| 6 to 20 feet | ----- | 2 samples |
| >20 to 30 feet | ----- | 3 samples |
| >30 to 40 feet | ----- | 4 samples |
| >40 to 50 feet | ----- | 5 samples |
| Greater than 50 feet | ----- | 1 sample per 10 ft. of tank length |

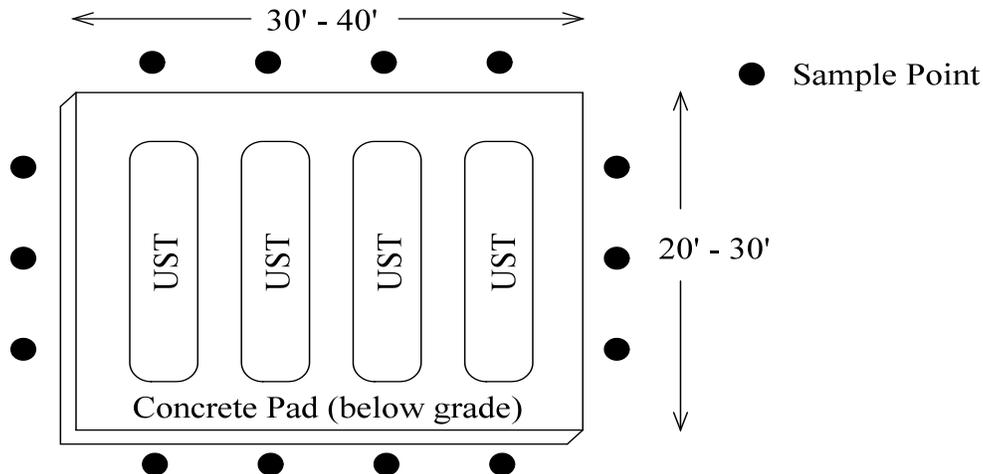
- 3) The UST Section may direct that a permanent monitoring well, constructed according to **15A NCAC 2C Well Construction Standards**, be installed in the pit or, if that is not technically possible, as close as possible to and within 5 feet of the UST(s) in a downgradient direction (and/or under product lines, dispensers, or other areas), and that a groundwater sample be collected and analyzed as specified in Tables 4 and 8, if the soil assessment procedure described in items 1 and 2 above is determined by the incident manager or compliance inspector to be inadequate to measure for the presence of a release at a particular site. (See 5.3.D and 5.3.E below for information on high water table or bedrock tank sites, respectively.)

5.3.B Closure by Removal of UST(s) Underlain by Concrete Pad

Where closure by removal of UST(s) underlain by a concrete pad is performed, the procedures listed below must be performed:

- 1) Soil samples must be collected along the outside edge of the concrete pad, within 3 feet of the pad and no deeper than 2 feet into the native soil below the bottom level of the pad, around the full perimeter of the pad. The minimum number of samples required per side around the perimeter of the concrete pad, is as follows:

| | | |
|----------------------|-------|------------------------------------|
| Less than 6 feet | ----- | 1 sample |
| 6 to 20 feet | ----- | 2 samples |
| >20 to 30 feet | ----- | 3 samples |
| >30 to 40 feet | ----- | 4 samples |
| >40 to 50 feet | ----- | 5 samples |
| Greater than 50 feet | ----- | 1 sample per 10 feet of pad length |



- 2) Soil samples must also be collected underneath associated product lines, dispensers, containment sumps, and areas where contamination is suspected or observed, as described under 5.3.F; and
- 3) To verify that no contamination is present under the center of the pad, either a sample must be collected no deeper than 2 feet under the center of the pad; or a permanent monitoring well, constructed according to **15A NCAC 2C** Well Construction Standards, must be installed as close as possible to and within 5 feet of the concrete pad in a downgradient direction, and a groundwater sample must be collected and analyzed as specified in Tables 4 and 8.

5.3.C In-Place Closure (or Change-in-Service) of USTs

In-place closure of USTs following the detection of a release may be performed only with the written approval of the UST Section that system removal is not necessary for the assessment and cleanup of the release, or that system removal would otherwise be unreasonable or impracticable. Normally, only USTs which are determined to be inaccessible (e.g., located under substantial structures such as buildings, but not such as dispensers or canopies) will be approved for in-place closure.

However, proper in-place closure (or change-in-service) must include the following procedures:

- 1) Soil samples must be collected around the perimeter of a single UST or around the perimeter of a set of USTs in a single pit, according to the sampling requirements described above in 5.3.B, Closure by Removal of UST(s) Underlain by Concrete Pad. Samples must be collected less than 3 feet from the UST(s) at the depth of the tank bottom or no deeper than 2 feet into the native soil below the depth of the tank bottom;
- 2) One sample must be collected at the fill port/spill bucket of each UST to document overfills;
- 3) Soil samples must also be collected underneath all associated product lines, dispensers, containment sumps, and any other areas where contamination is suspected or observed, as described under 5.3.F (Note: This includes areas of suspected surface spills immediately beneath any removed paving or other surface cover (asphalt, concrete, etc.));

- 4) A permanent monitoring well, constructed according to **15ANCAC 2C** Well Construction Standards, must be installed as close as possible to and within 5 feet of the UST(s) in a downgradient direction, and a groundwater sample must be collected and analyzed as specified in Tables 4 and 8; and
- 5) The tank must be thoroughly cleaned, according to the guidance in Section 5.2 and filled with an inert, solid material.

The practice of boring through the bottom of a tank that is to be closed in-place in order to facilitate sampling directly under the UST is hazardous. If this procedure is performed, all applicable safety measures should be observed.

If evidence of a release is detected, reasonable efforts should be made to recover contamination and restore the condition of the property in that area to pre-release conditions. For UST components located beneath substantial, permanent structures, in-place closure may be approved by the UST Section based on the potential for in situ remediation of those inaccessible areas.

5.3.D Closure of USTs in Areas with High Water Tables

Where groundwater is encountered in the excavation from which the UST or USTs have been removed or at the base of closed-in-place USTs, the procedures below must be performed. *(This does not include perched water, or surface runoff that temporarily collects within a tank basin, but rather only those tank installations that intersect the water table.)*

- 1) Soil samples must be collected in the sidewalls of the excavation immediately above the water table. One sample must be collected at a minimum interval of 10 linear feet around the perimeter of the excavation with a minimum of one sample per sidewall;
- 2) Where possible, soil samples must also be collected underneath associated product lines, dispensers, containment sumps, fill ports/spill buckets, and any other areas where contamination is suspected or observed, as described under 5.3.F; and
- 3) A permanent monitoring well, constructed according to **15ANCAC 2C** Well Construction Standards, must be installed in the pit or, if that is not technically possible, as close as possible to and within 5 feet of the UST(s) in a downgradient direction. A groundwater sample must be collected and analyzed as specified in Tables 4 and 8. *Pit water grab samples will not be accepted.*

5.3.E Closure of USTs Located in or on Bedrock

When tanks are located in or on bedrock, the procedures below must be performed:

- 1) After the tank(s) have been removed, samples of backfill or of "native" soil must be collected in the excavation pit beneath the mid-line location of the former tank, from the interface between soil and rock. The number of samples required depends on the length (longest dimension) of the tank. These samples should be collected at evenly spaced intervals along the length of the tank, as follows:

| | | |
|------------------|-------|-----------|
| Less than 6 feet | ----- | 1 sample |
| 6 to 20 feet | ----- | 2 samples |

| | | |
|----------------------|-------|------------------------------------|
| >20 to 30 feet | ----- | 3 samples |
| >30 to 40 feet | ----- | 4 samples |
| >40 to 50 feet | ----- | 5 samples |
| Greater than 50 feet | ----- | 1 sample per 10 ft. of tank length |

- 2) Soil samples must also be collected underneath associated product lines, dispensers, containment sumps, fill ports/spill buckets, and any other areas where contamination is suspected or observed, as described in 5.3.F; and
- 3) A permanent monitoring well, constructed according to **15A NCAC 2C** Well Construction Standards, must be installed in the pit or, if that is not technically possible, as close as possible to and within 5 feet of the UST(s) in a downgradient direction, and a groundwater sample collected and analyzed as specified in Tables 4 and 8. Contact the UST Section Regional Office for further guidance when drilling in competent bedrock if uppermost groundwater is *not* encountered within 50 feet total depth.,

5.3.F Sampling Under Product Lines, Dispensers or Dispenser Islands, and Fill Ports or Spill Buckets,

For sampling under product lines (including lines under dispenser islands) the procedures listed below must be performed:

- 1) The product lines/ must be completely exposed prior to sampling (*This procedure is not required for site checks.*);
- 2) Samples must be collected **no deeper than 2 feet** into the native soil beneath the product lines;
- 3) A minimum of one sample must be collected for each 10 linear foot interval along a line (and if the line is less than 10 feet in length, one sample still is required);
- 4) Samples must be collected at all fittings, especially joints, or wherever there is heightened potential for a release, and at all locations where staining is present or where contamination is suspected;
- 5) Samples are required under product lines even if it is planned that the lines remain for use with replacement UST(s).

For sampling under dispensers, the procedures listed below must be performed:

- 1) The dispenser piping must be completely exposed prior to sampling (*This procedure is not required for site checks.*);
- 2) Samples must be collected **no deeper than 2 feet** into the native soil directly below each individual dispenser;
- 3) Samples must be collected **no deeper than 2 feet** into the native soil directly below all couplings, pumps, and containment sumps, or wherever there is heightened potential for a release, and at all locations where staining is present or where contamination is suspected;
- 4) Samples are required under dispensers even if it is planned that the dispensers remain for use with replacement UST(s).

For sampling under containment sumps, fill ports, spill buckets, or any other near-surface fixtures, or shallow areas where contamination is suspected, the procedures described below must be performed:

- 1) Samples must be collected **no deeper than 2 feet** into the native soil directly below containment structures and other areas where contamination is suspected or observed.
- 2) Samples must be taken from directly below the piping that enters the sump and beneath any defective area of the sump.
- 3) If the containment sump is sitting directly on the tank, thereby preventing collection of samples under the sump, then samples must be collected along the perimeter of the sump within one foot of the sump.
- 4) **In addition, samples must be collected from any area where contamination is observed.** This includes samples for suspected releases in the shallow soils overlying any part of the UST system if there is evidence of an overflow or other surface release.

When only the product lines or the dispensers of a UST system are being replaced, soil samples are not required unless evidence of a release is observed.

When groundwater or bedrock is encountered in the trench or pit in which product lines, dispensers, or sumps are or were located or when the incident manager determines that soil assessment is not adequate to determine the presence of a release, a monitoring well must be installed and sampled as described in 5.3D above.

5.3.G Additional Groundwater Assessment for Ethanol-Gasoline Blend UST Systems

If the UST system contained an ethanol-gasoline blend in excess of E15, the UST Section may direct that a permanent monitoring well, constructed according to **15A NCAC 2C** Well Construction Standards, be installed in the pit and/or under product lines, dispensers, or other areas and a groundwater sample be collected and analyzed as specified in Tables 4 and 8.

5.4 Reporting of Regulated UST Closure Assessment Results

Regulated Petroleum USTs: Following the closure of a regulated commercial petroleum UST system, where:

- soil contamination in the closure samples does not equal or exceed 50 mg/kg TPH GRO or 100 mg/kg TPH DRO (*or, where tested, the soil-to-groundwater MSCCs, or the MDL if no MSCC is established*),
- neither groundwater nor bedrock was encountered in the excavation, or
- if groundwater or bedrock were encountered, that groundwater samples collected from one or more monitoring wells installed within the source area do not exceed any 2L groundwater quality standards,

then, **within 30 days** a ***UST Closure Report*** following the ***UST-12*** format, and a ***UST-2 Form - Site Investigation Report for Permanent Closure or Change-in-Service of USTs, Version A*** or

B (Appendix A, p. 82), must be completed and submitted to the appropriate regional office of the Corrective Action Branch of the UST Section.

However, if, based on the results of closure sampling:

- soil contamination does equal or exceed 50 mg/kg TPH GRO or 100 mg/kg TPH DRO for petroleum (*or, where tested, soil contamination equals or exceeds the soil-to-groundwater MSCCs, or the MDL if no MSCC is established*),
- groundwater contamination exceeds the 2L standards, or
- NAPL is present,

then, **within 90 days** of discovery of the release, an **Initial Abatement Action Report** (Appendix A, p. 89), must be submitted instead. The **Initial Abatement Action Report** incorporates the requirements of the **UST Closure Report**, as previously described, and also presents post-excavation soil assessment information required under **15A NCAC 2L .0404(3)** to demonstrate the extent to which the contaminated soil has been removed.

*[Note: Whenever a regulated or commercial UST closure is reported to the Corrective Action Branch, a separate copy of the report and **UST-2A** or **UST-2B Form** must be submitted to the proper UST System inspector for the system location, or directly to the Permits and Inspection Branch in the UST Section Central Office.*

This is necessary for the permit status for that system to be changed to “permanently closed” so no additional permit fees for that system are incurred by the tank owner.

To locate the proper inspector for the UST system, please refer to the UST Inspector Assignments Map (available in electronic format at this address: <https://ncdenr.s3.amazonaws.com/s3fs-public/Waste%20Management/DWM/UST/PIB/Inspector%20Map.pdf>) or by contacting the UST Section Permits and Inspection Branch at 919-707-8171.]

Regulated Hazardous Substance USTs: Following the closure of a regulated hazardous substance UST system, where:

- soil contamination in the closure samples does not equal or exceed the applicable soil-to-groundwater MSCCs (*or the MDL if no MSCC is established for a contaminant*),
- neither groundwater nor bedrock was encountered in the excavation, or
- if groundwater or bedrock encountered, that groundwater samples collected from one or more monitoring wells installed within the source area do not exceed any 2L groundwater quality standards,

then, **within 30 days** a **UST Closure Report** following the **UST-12** format, and a **UST-2 Form - Site Investigation Report for Permanent Closure or Change-in-Service of USTs, Version A or B** (Appendix A, p. 82), must be completed and submitted to the appropriate regional office of the Corrective Action Branch of the UST Section (as well as a separate copy to the Permits and Inspections Branch, if required by a UST inspector).

However, if, based on the results of closure sampling:

- soil contamination does equal or exceed any soil-to-groundwater MSCC (or the MDL if no MSCC is established),
- groundwater contamination exceeds the 2L standards, or
- NAPL is present,

then, **within 45 days** of discovery of the release a ***45-Day Report (Guidelines for Assessment and Corrective Action for UST Releases***, current version) must be submitted instead.

*[Note: Whenever a regulated or commercial UST closure is reported to the Corrective Action Branch, a separate copy of the report and UST-2A or UST-2B Form **must be submitted** to the proper UST System inspector for the system location, or directly to the Permits and Inspection Branch in the UST Section Central Office.*

This is necessary in part so the permit status for the system will be changed to “permanently closed” so no additional permit fees for that system are incurred by the tank owner.

To locate the proper inspector for the UST system, please refer to the UST Inspector Assignments Map (available in electronic format at this address: <https://ncdenr.s3.amazonaws.com/s3fs-public/Waste%20Management/DWM/UST/PIB/Inspector%20Map.pdf>) or by contacting the UST Section Permits and Inspection Branch at 919-707-8171.]

5.5 Non-Regulated Petroleum UST Closure Assessment Requirements

Non-regulated petroleum USTs are not required to be removed from the ground or closed by any specific procedure.

Non-regulated Commercial USTs: For a non-regulated, commercial UST, soil or groundwater samples are not required at closure **UNLESS** a release is suspected or has been confirmed.

However, if a release is discovered from a non-regulated commercial petroleum UST system, tank removal and soil and groundwater assessment requirements stipulated in Section 5.3 for regulated UST closure do apply, as do initial response and abatement action requirements, including excavation (Sections 6 and 7). See Figure 4 for a flowchart illustrating initial response and abatement action requirements in the case of a non-regulated commercial release.

Non-regulated Noncommercial UST: For non-regulated noncommercial UST, tank removal and confirmation sampling are not required except where explicitly directed by the Department based on an evaluation of the risk posed by the suspected release.

If a tank owner chooses to pursue a ***No Further Action*** determination without any deed recordation or land use restrictions, where there is no formal requirement to do so, then voluntary sampling during closure should follow the recommended sampling guidance in Section 5.3 (or contact the applicable regional office of the Corrective Action Branch of the UST Section for guidance.)

6.0 Initial Response and Abatement Actions Following UST Release

6.1 *Initial Response Actions*

Regulated and Non-regulated Commercial USTs: For discharges and releases from regulated (petroleum or hazardous substance) USTs and non-regulated commercial USTs, the responsible party must comply with the release response requirements of **15A NCAC 2N .0702** and/or **15A NCAC 2L .0404(1)** **within 24 hours** of the discovery of a release.

Non-regulated Noncommercial USTs: For discharges and releases from non-regulated noncommercial USTs, the responsible party is required to comply with the reporting requirements of **15A NCAC 2N .0702** and/or **15A NCAC 2L .0404(1)** **within 24 hours** of discovery of a release and to take such action as determined by the Department to be necessary to protect public health, safety, and welfare, and the environment, and to mitigate any fire, explosion, or vapor hazard. Actions must be taken to prevent the recurrence of the emergency condition which may include actions to repair any leaking components, drain and temporarily close the affected UST, or permanently close the UST (in-place or by removal).

If State Trust Fund reimbursement is anticipated for any potentially-eligible emergency response actions (such as explosion abatement, product recovery, etc.) associated with a release from a commercial UST, please refer to the current version of the Reasonable Rate Document (which is available in electronic format from the UST Section's web page available at <https://deq.nc.gov/about/divisions/waste-management/underground-storage-tanks-section/trust-fund-branch/reasonable-rate-documents>) for information regarding eligibility and documentation requirements related to the emergency response.

6.1.A 24-Hour Release Report

Following the discovery of any evidence of a release (including odor or vapor, free product, stained soil, analytical data indicating contamination of soil or groundwater, etc.) from any UST system (i.e., all types and classifications) the suspected release **must be reported** to the UST Section **within 24 hours**, per **15A NCAC 2N .0601**.

The responsible party must complete ***Form UST-61 - 24-Hour Release and UST Leak Reporting Form*** (Appendix A, p. 75) and submit the form to the appropriate regional office of the Corrective Action Branch of the UST Section (as well as a separate copy to the Permits and Inspections Branch as well, if the investigation was initiated by a UST inspector) by mail, fax, courier, or email (or transmit the information by phone if other methods are unavailable) **within 24 hours** of release discovery. This notification is required for all UST releases, including those where the release was ultimately remediated in full or was detected at concentrations that were below the applicable TPH Action Levels or applicable MSCCs.

6.1.B Action to Prevent Further Release

To prevent any further release of the substance from the UST system to the environment, the responsible party must take the following steps **within 24 hours** of release discovery:

- shut down the operation of all or part of the system;
- remove the substance from the system;
- repair, replace, or remove all or part of the system; and
- perform any other action deemed effective.

The responsible party for a release from regulated (petroleum/commercial and hazardous substance) USTs and non-regulated commercial USTs must immediately undertake an investigation to confirm the presence of any environmental contamination and determine the precise source of the release, if not previously determined by a site check, closure assessment, or other means. No initial abatement is required for a non-regulated noncommercial UST, except for actions necessary to abate an emergency condition or where directed by the Department based on the risk posed by the site.

6.1.C Identification and Mitigation of Hazards from Exposure to Pollutants

The responsible party must take immediate action to identify and mitigate hazards resulting from exposure to pollutants. For discharges and releases from regulated USTs and non-regulated commercial petroleum USTs, any water supply wells, surface water bodies, utility lines, basements, and other potential receptors must be identified and sampled where the potential for impact by the release represents an immediate risk to human health and/or the environment. For non-regulated noncommercial USTs, the Department must be informed of any known or suspected receptors in the area when the release is reported, and will direct any necessary sampling required based on an evaluation of the potential risk posed by the release.

If a receptor is found to be impacted by the release, then the responsible party for any UST system (i.e., all types and classifications) must act at once to mitigate that impact. For example, if contaminants from a UST release are found in a water supply well at concentrations which exceed the groundwater quality standards, then the sampling results **must be sent immediately** to the appropriate regional office of the UST Section and, **within 24 hours, an emergency alternate water supply must be provided to the well user by the responsible party** as a necessary mitigation of an exposure hazard under **15A NCAC 2L .0106(b)**. Additional temporary or permanent solutions may be required following an evaluation of the health risk posed by the detected contaminant concentrations.

If NAPL is found standing or running across the ground surface, or the surface of a body of water, or weeping from a vertical wall, then efforts must be made **within 24 hours** to control and recover that NAPL.

A secondary deductible applies to any State Trust Fund claims related to third-party injuries, damages, or loss of normal use of property, per NCGS 143-215.94B(b)(5) and 15A NCAC 2P .0403. The loss of normal use of a water supply, due to any detected impact to that well, is considered applicable under this category whether damages are calculated in a formal

settlement or incurred within the structure provided by the State Trust Fund for alternate water supplies. Please be aware that a failure to provide alternate water to an impacted well user in a timely manner may result in the Department providing the alternate water and seeking cost recovery for the expense.

6.1.D Identification and Mitigation of Fire, Explosion, and Vapor Hazards

The responsible party for all UST types must take immediate action to identify and mitigate fire, vapor, and explosion hazards posed by vapors or free product which have migrated from the UST system into utility lines, vaults, basements, or other subsurface features. The local Fire Department should be contacted if explosive conditions or a risk of fire are suspected. The local Fire Department (or regional HAZMAT Response Team) should be contacted if there is evidence of a concentrated vapor exposure risk.

Screening and testing for petroleum vapor intrusion (PVI) risks in adjacent structures may be addressed as presented in the *Guidelines for Assessment and Corrective Action for UST Releases*, current version, based upon the Interstate Technology and Regulatory Council (ITRC) guidance on the topic entitled: *Petroleum Vapor Intrusion: Fundamentals of Screening, Investigation, and Management*, dated October 2014 (available at <http://www.itrcweb.org/PetroleumVI-Guidance/>).

6.2 Initial Abatement Actions

For discharges and releases from regulated (petroleum/commercial and hazardous substance) USTs and non-regulated commercial petroleum USTs, the responsible party is required to comply with the initial abatement requirements of **15A NCAC 2L .0404(1)** and/or **15A NCAC 2N .0703** and **.0705**. With the exception of the emergency conditions described in Section 6.1 above, no immediate action or initial abatement actions are required for non-regulated noncommercial USTs, unless specifically directed by the Department based on the site risk.

If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document (which is available in electronic format from the UST Section's web page at <https://deq.nc.gov/about/divisions/waste-management/underground-storage-tanks-section/trust-fund-branch/reasonable-rate-documents>) for information about reimbursement.

Please note that proper initial abatement efforts associated with a new release are exempted from preapproval as an emergency response action under 15A NCAC 2P .0402(b)(9). However, corrective action efforts associated with a pre-existing release are not exempted by this rule, and must be preapproved as representing a necessary, cost-effective cleanup strategy to remain conditionally eligible for reimbursement. Additionally, work conducted beyond the 90-day initial abatement reporting deadline may not be considered an emergency, and may require preapproval as assessment or corrective actions to remain eligible for reimbursement.

6.2.A Completion of Investigation to Confirm Presence of Environmental Contamination and Determine Source of Release

The responsible party for regulated USTs and non-regulated commercial USTs must complete the investigation to confirm the presence of, and/or determine the precise source of, the release, if those determinations *have not been* accomplished during any site check, initial response, or closure assessment. The responsible party must measure for the presence of a release wherever soil or groundwater contamination is likely to be present. Releases from non-regulated noncommercial systems do not require confirmatory sampling, and site risk may be evaluated based on visual, olfactory (odor), or field screening via handheld vapor monitors.

6.2.B Investigation and Recovery of Free Product

Regulated and Non-regulated Commercial USTs: As required by 15A NCAC 2N .0703(1), the responsible party for regulated and non-regulated commercial USTs must investigate to determine the possible presence of NAPL and, if NAPL is discovered, begin recovery within 14 days. Following the initial NAPL recovery event and the subsequent *Free Product Recovery Report*, the responsible party must investigate to determine the type, thickness, rate of recovery, and lateral extent of NAPL; evaluate relevant hydrogeological factors and potential receptors; and submit the results in a *Free Product Recovery System Specification Report*.

In this specification report, the responsible party must evaluate recovery system options and propose a recovery plan which incorporates the most appropriate option. The plan should be designed to minimize the spread of contamination and treat, discharge, and dispose of NAPL in compliance with all applicable regulations. The objectives of the plan should be to halt migration and to remove NAPL to the maximum extent practicable, usually to a thickness of less than 0.01 foot (~1/8 inch). The specification report should conclude with a schedule for the NAPL recovery plan which includes implementation, attainment of NAPL recovery progress milestones, and submittal of progress reports.

The responsible party must continue any emergency recovery of NAPL, and implement the NAPL recovery plan in strict accordance with the proposed schedule upon approval of the plan by the Department. The responsible party must continue to execute the plan, simultaneously with all other required abatement, assessment, cleanup, and reporting activities, until NAPL has been removed or until the plan is superseded by the Corrective Action Plan. The responsible party is required to handle flammable product safely and competently in order to prevent fire or explosion. (See Section 8.8 for a discussion of reports.)

If State Trust Fund reimbursement is anticipated, please Refer to the current version of the Reasonable Rate Document (which is available in electronic format from the UST Section's web page at <https://deq.nc.gov/about/divisions/waste-management/underground-storage-tanks-section/trust-fund-branch/reasonable-rate-documents>) for information about reimbursement.

Please note that an initial NAPL recovery event may qualify as an emergency response that is exempt from the preapproval requirements, where following the procedures described above.

However, subsequent events will require preapproval as corrective actions to remain conditionally eligible for reimbursement.

Non-regulated Noncommercial USTs: The responsible party for a non-regulated noncommercial UST must act to control and recover any NAPL causing an emergency condition (including ponding or running across the ground surface, impacting a surface water body, or weeping from a vertical wall) **within 24 hours** of discovery. Except where directed by the Department based upon other evidence related to incident risk, there is no requirement for the responsible party for a non-regulated noncommercial UST to install wells or otherwise investigate for the presence of NAPL below the ground surface.

However, if measurable NAPL greater than 1/8 of an inch in thickness is found in a monitoring well or in an excavation below the water table, and the location of that discovery is within 30 feet of the boundary with an adjacent property owned by someone other than the responsible party, then an emergency response to the NAPL is required to protect the neighboring third-party property owner. *(Note that any impact to a water supply well from a non-regulated noncommercial UST release constitutes an emergency that must be addressed immediately, whether it results in the presence of NAPL or dissolved-phase contamination.)*

6.2.C Continued Mitigation and Monitoring of Fire, Explosion, and Vapor Hazards

The responsible party for all UST system types must continue to mitigate and monitor any fire, explosion, and vapor hazards posed by free product or by vapors which have migrated into structures, as described in 6.1.D above.

6.2.D Remediation of Hazards Posed by Exposed Contaminated Soil

The responsible party for regulated USTs and non-regulated commercial USTs must remedy hazards posed by contaminated soils exposed by assessment or excavation activities. Contaminated soil must be treated and disposed in compliance with state and local requirements. Refer to Section 7.4, for guidance on disposal of contaminated soil from excavations.

Although the responsible party for non-regulated noncommercial USTs is not required to perform any initial abatement actions except where directed by the Department based on the risk posed by the site, any petroleum contaminated soil generated by any assessment or cleanup action must be treated and disposed in compliance with state and local requirements.

If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document (which is available in electronic format from the UST Section's web page at <https://deq.nc.gov/about/divisions/waste-management/underground-storage-tanks-section/trust-fund-branch/reasonable-rate-documents>) for information about reimbursement.

Please note that proper initial abatement efforts associated with a new release are exempted from preapproval as an emergency response action under 15A NCAC 2P .0402(b)(9). However, corrective action efforts associated with a pre-existing release are not exempted by this rule, and

must be preapproved as representing a necessary, cost-effective cleanup strategy to remain conditionally eligible for reimbursement. Additionally, work conducted beyond the 90-day initial abatement reporting deadline may not be considered an emergency, and may require preapproval as assessment or corrective actions to remain eligible for reimbursement.

Please also note that, as described in Section 5.2 above, any costs associated with tank removal are not eligible for reimbursement, including any costs to remove surface cover (e.g., asphalt or concrete, etc.) and overburden soils to access the tank system. Where a suspected surface spill or overfill in the shallow subsurface is discovered following the removal of surface cover for any purpose (including in preparation for tank removals) actions must be taken to assess and, where necessary, to abate that release in the same manner as any other suspected release (i.e., those soils may represent a shallow secondary source that requires abatement, and would no longer represent ‘overburden’ associated with an ineligible tank removal.)

6.2.E Submittal of 20-Day Report

The responsible party for regulated USTs and non-regulated commercial USTs must submit a **20-Day Report** (Appendix A, p. 78) summarizing the initial abatement actions that were performed **within 20 days** following release confirmation to the appropriate regional office of the Corrective Action Branch of the UST Section (and to the Permits and Inspections Branch, if the investigation was initiated by a UST inspector). The responsible party for non-regulated noncommercial USTs is not required to perform any initial abatement actions or additional reporting except where directed by the Department based on the risk posed by the site.

6.2.F Excavation of Contaminated Soil

Excavation of contaminated soil is addressed in Section 7.0.

7.0 Initial Abatement - Excavation of Contaminated Soil Following UST Release

If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document (which is available in electronic format from the UST Section’s web page at <https://deq.nc.gov/about/divisions/waste-management/underground-storage-tanks-section/trust-fund-branch/reasonable-rate-documents>) for information about reimbursement.

7.1 Excavation of Contaminated Soil from Regulated Petroleum UST Releases

The following guidance related to initial abatement excavation efforts is required only of a responsible party for regulated USTs and non-regulated commercial USTs. This guidance may be used by a responsible party for non-regulated noncommercial USTs, if additional work is required due to an emergency condition or to address the risk associated with a release determined by the Department to be ‘High’ risk. The use of the term “responsible party” throughout Section 7 is intended based on the understanding that the guidance is applicable for those parties described

above, and not for a responsible party for a non-regulated noncommercial UST release that has not been determined to be 'High' risk.

7.1.A Requirements for Excavation

The responsible party must comply with the initial abatement requirements in **15A NCAC 2L .0106(f)(2)** and **(4)** which necessitate the removal, treatment, or control of secondary pollution sources, such as contaminated soils, which would be potential continuing sources of contaminants to the groundwater, and the requirements in **15A NCAC 2L .0404(1)** and **15A NCAC 2N .0703**, which require the prevention of further migration of the released substance into surrounding soils and groundwater.

The Department specifically requires that the responsible party excavate contaminated soil immediately upon determining that a new release has been detected, based on site check, a UST closure, or other preliminary investigation soil contaminant concentrations equal to or greater than the following action levels when the soil samples have been analyzed by the approved TPH (or equivalent) methods listed in Table 3:

- 50 mg/kg TPH GRO, or
- 100 mg/kg TPH DRO,

Initial abatement excavations should be carried out for each source of a newly-detected release on the site where contaminant concentrations exceed the applicable TPH action level (or constituent-specific standard, if analyzed). Please note that this includes shallow contaminated soils located above any portion of the UST system where the source of contamination is potentially a leaking system component (such as a spill bucket, dispenser, containment sump, etc.) or surface spills from the operation of the UST system (vehicle fueling spills or tank overfills, etc.) as well as smear-zone soils where shallow water table fluctuations have washed NAPL up into the shallow soil.

If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document (which is available in electronic format from the UST Section's web page at <https://deq.nc.gov/about/divisions/waste-management/underground-storage-tanks-section/trust-fund-branch/reasonable-rate-documents>) for information about reimbursement.

Please note that proper initial abatement efforts associated with a new release are exempted from preapproval as an emergency response action under 15A NCAC 2P .0402(b)(9). However, corrective action efforts associated with a pre-existing release are not exempted by this rule, and must be preapproved as representing a necessary, cost-effective cleanup strategy to remain conditionally eligible for reimbursement. Additionally, work conducted beyond the 90-day initial abatement reporting deadline may not be considered an emergency, and may require preapproval as assessment or corrective actions to remain eligible for reimbursement.

7.1.B Limitations to Excavation

At the initial abatement stage, the responsible party should attempt to remove all contaminated soil that is accessible. Excavation should cease in any direction in which clean soil or bedrock is encountered or in which excavation would threaten to harm a substantial structure, and generally should cease in the vertical direction when groundwater is encountered.

(Note: Excavation into shallow groundwater to abate contamination trapped within the smear zone may be appropriate under certain circumstances. Complications related to proper handling and containment for loading and hauling, and authorization as a reasonable abatement strategy where State Trust Fund reimbursement is anticipated, should be addressed before excavating into the water table.)

Where State Trust Fund reimbursement is anticipated for initial abatement of a new release at a site with no prior risk assessment, the excavation should be limited to the lesser of:

- 1) all soils above MSCCs properly removed in any accessible direction;
- 2) the point where it is reasonably determined that residual soils cannot feasibly be removed due to obstructions, access issues, or lack of cost-effectiveness; or
- 3) the point where one of the following thresholds is reached:
 - a. a total volume of 533 cubic yards / 800 total tons of contaminated soil has been removed based on routine field screening methods (such as handheld photo-ionization detectors, etc.) at the discretion of the licensed individual supervising the excavation;
 - b. an additional volume of up to 267 cubic yards / 400 tons of contaminated soil removed with written Incident Manager authorization based on field screening (or prescreening) using a mobile lab (UVF, MIP, Mobile GC, etc.) that indicates a reasonable likelihood of clean closure possible within the combined volume limit (even if clean closure is ultimately not obtained); or
 - c. any total volume greater than 800 cubic yards / 1200 tons of contaminated soil removed with formal written preapproval by the Incident Manager and Trust Fund Auditor based on field screening from a mobile lab indicating a reasonable likelihood of clean closure possible within the preapproved limit (even if clean closure is not ultimately obtained).

For initial abatement of a new, isolated release at a site with a risk assessment for a prior, non-commingled release elsewhere onsite, the excavation should be limited as follows:

- 1) High or Intermediate Risk – Same as with the new release above. For Option 3(b) or (c), the Incident Manager (and Trust Fund Auditor) will consider the known site risk and previous release status when evaluating a request for additional excavation;
- 2) Low Risk – Unless the new release results in an increase in site risk*, no initial abatement excavation would be necessary under risk-based closure standards.

For initial abatement of a new, commingled release at a site with a risk assessment for the prior release, the excavation should be limited as follows:

- 1) High or Intermediate Risk – The Incident Manager must authorize any excavation based upon known site conditions, with a maximum volume of initial abatement excavation not to exceed 133 cubic yards / 200 tons without written preapproval from an Incident

Manager and Trust Fund Auditor of a projected corrective action volume based on prior assessment or field screening from a mobile lab;

- 2) *Low Risk – Unless the new release results in an increase in site risk*, no initial abatement excavation would be necessary under risk-based closure standards.*

For any release more than 90 days from the discovery of the release:

*No initial abatement is eligible as the 90-day initial abatement reporting window has expired per **15A NCAC 2L .0404(3)** (Section 8.6 below). Any excavation after this date would require preapproval as a corrective action.*

*Note: This also applies to **any** release response conducted **more than 90-days** following release discovery, such as during an Environmental Site Assessment (or other property transaction screening event) or during a pre-screening event conducted prior to a tank removal. Written preapproval would be required for any corrective action excavation performed after 90 days in response to a discovery of this type.*

** This determination may require additional soil and/or water assessment within the Initial Abatement phase to evaluate the potential for NAPL in the soil or to satisfy the intermediate risk triggers under **15A NCAC 2L .0406(2)(d)&(e)**. Please contact the appropriate regional office of the Corrective Action Branch to discuss any potential assessment necessary to address a new release at an existing low risk site prior to conducting the tank closure activities.*

7.1.C Sampling during and at Completion of Excavation

The licensed individual responsible for an excavation should use proper judgement to ensure that only the minimum amount of soil necessary to abate the release is removed, or otherwise determine that abatement is infeasible, regardless of whether State Trust Fund reimbursement is anticipated or not.

As releases usually migrate vertically downward from the source of the release, excavation should normally be directed vertically downward from the source area, and widened only to allow for proper benching or stabilization. Clean stockpiles generated from slope or benching efforts must be segregated for reuse as backfill. During over-excavation, any type of sample screening to segregate clean and contaminated stockpiles may be used at the discretion of the licensed individual (See the note below and in 7.1.D above for State Trust Fund screening requirements for contaminated soils).

If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document (which is available in electronic format from the UST Section's web page at <https://deq.nc.gov/about/divisions/waste-management/underground-storage-tanks-section/trust-fund-branch/reasonable-rate-documents>) for information about reimbursement.

Field screening using mobile lab technologies is required by the UST Section to justify authorization or preapproval of excavation beyond the initial eligible volume limits, as described in 7.1.B above, for any initial abatement excavation for which reimbursement will be sought.

Additionally, TPH must be collected from the waste stream at appropriate intervals to document the claimed soil disposal volume accurately represents the volume of contaminated soil that required removal and disposal. Alternatively, mobile lab field screening (or prescreening)

results may be substituted for TPH for this purpose. Please contact the UST Section Trust Fund Branch at 919-707-8171 for additional information.

Final confirmation sampling and analysis must be conducted using the approved analytical methods described in Section 9.1 and listed in Table 3. A sample is required from the base of each excavation and from each of the sidewalls. A set of base and sidewall post-excavation confirmation samples must be collected from each excavation at the site.

If there are several excavations, then a separate set of samples is required from each excavation.

Samples must be collected from sidewall and base locations where contamination is most likely to be present. One sample must be collected from each sidewall of the excavation. The sample(s) collected from the base of the excavation should be collected directly underneath the location(s) of any highly-contaminated sample(s) collected previously during the site check or UST closure efforts. If, following tank (or line) removal, several distinct areas of contaminated soil are found within a large, four-sided tank pit (or in a long, four-sided product line trench), four sidewall samples and a representative number of base samples should be collected from the subsequent over-excavation of that pit (or trench) and analyzed by the methods appropriate to the contamination at each location.

7.1.D Post-Excavation Reporting and Actions

At the completion of excavation and **within 90 days** of the date of release discovery, the responsible party must submit an ***Initial Abatement Action Report*** to the appropriate regional office of the Corrective Action Branch of the UST Section (and to the Permits and Inspections Branch, if the investigation was initiated by a UST inspector). The reporting requirements are described in Section 8.0 and the outline of the report format is presented in Appendix A, p. 89.

The purpose of the ***Initial Abatement Action Report*** is to report and describe all initial abatement actions performed, including the over-excavation process and the post-excavation soil contamination assessment.

If the ***Initial Abatement Action Report*** demonstrates that:

- Soil contamination in samples from the remaining unsaturated soil in the sidewalls and at the base of the excavation does not equal or exceed the soil-to-groundwater or the residential maximum soil contaminant concentration (MSCC), whichever is lower,
- Neither groundwater nor bedrock was encountered in the excavation, and
- Groundwater contamination (if assessed due to the presence of groundwater or bedrock in the excavation, or any other reason) does not equal or exceed the groundwater quality standards,

then, the discharge or release can be classified as low risk and no further action will be required.

However, if the *Initial Abatement Action Report* indicates that:

- soil contamination remains that equals or exceeds the lower of the soil-to-groundwater or residential MSCCs following excavation to the maximum extent practicable,
- either groundwater or bedrock was encountered, *and* groundwater contamination was not assessed or
- groundwater contamination equals or exceeds the 2L groundwater quality standards,

then the responsible party must perform a Limited Site Assessment (15A NCAC 2L .0405). The *Limited Site Assessment Report* must be submitted to the appropriate UST Section regional office within 120 days of the discovery of the release. The outline of the report format is presented in the *Guidelines for Assessment and Corrective Action for UST Releases*, current version.

7.1.E Installation of New or Replacement UST Systems in Former UST System Locations

New or replacement USTs, piping, or dispensers should not be installed in a former UST system location until it has been demonstrated, based on sampling procedures and concentration limits established in this section, that all soil contaminated in exceedance of the lower of the soil-to-groundwater or residential MSCCs has been removed from that area.

In accordance with 15A NCAC 2N .0901(h), UST systems or UST system components may not be installed or replaced in areas where they will be in contact with contaminated soil or free product. Failure to excavate the contaminated soil prior to installing a new or replacement UST system component may result in the required removal of the new or replacement UST system in order to excavate the contaminated soil.

Where State Trust Fund reimbursement of an initial abatement or corrective action excavation is anticipated, the preapproved or claimed excavation volume and/or dimensions cannot be expanded or adjusted for the purpose of obtaining a margin of clean soils as required for the installation of a new UST system.

7.2 Excavation of Contaminated Soil from Non-Regulated Petroleum UST Releases

Once a release has been discovered or confirmed the cleanup actions for non-regulated commercial petroleum UST releases (including many large heating oil UST releases) become regulated in accordance with 15A NCAC 2N .0700 and 15A NCAC 2L .0400 and therefore become subject to the requirements for assessment and cleanup specified therein.

7.2.A Requirements, Limits, Sampling, and Reporting for Non-regulated UST Excavations

Non-regulated commercial USTs (greater than or equal to 1,100-gallon capacity, including heating oil for five or more households): When a release is discovered prior to or during the

removal of a non-regulated commercial UST system with a tank of capacity greater than 1,100 gallons, the responsible party must remove the contaminated soil in accordance with the soil excavation guidance and the assessment and reporting requirements presented in Section 7.1 for regulated petroleum USTs. (See flowchart illustrating non-regulated commercial petroleum UST release response in Figure 4, p. 48.)

Non-regulated noncommercial USTs (less than 1,100-gallon capacity, or heating oil used by four or fewer households): When a release is discovered prior to or during the removal of a non-regulated noncommercial UST system with a tank of capacity less than 1,100 gallons (which includes most home heating oil tanks), the responsible party must report the release to the Department **within 24-hours**, but the RP is not required to remove the contaminated soil unless directed by the Department based on the risk posed by the site. (See flowchart illustrating non-regulated noncommercial petroleum UST release response in Figure 5, p. 49)

If a responsible party for a non-regulated noncommercial UST chooses to continue initial abatement of the release to obtain a no further action determination with unrestricted land use, their efforts should attempt to remove all contaminated soil above the lesser of the Soil-to-Groundwater or Residential Maximum Soil Contaminant Concentration levels. Excavation should cease in any direction in which clean soil or bedrock is encountered or in which excavation threatens to harm a substantial structure and generally should cease in the vertical direction when groundwater is encountered. If groundwater is encountered in the excavation, the responsible party may elect to have a monitoring well installed at the location of the release source, and a sample of the groundwater collected for analysis. Assessment and reporting should be as close to the requirements presented in Section 7.1 as is practicable.

7.2.B Post-Excavation Actions at Non-regulated UST Releases

If groundwater contamination does not exceed the 2L standards and any remaining soil contamination is below the lowest MSCCs, the discharge or release may be closed with unrestricted use. If the site's risk is classified as low by the Department, and soil or groundwater contamination exists above the applicable MSCCs and/or 2L standards, then the discharge or release may be closed with a notice of residual petroleum filed by the responsible party and a no further action determination by the Department.

However, if following final excavation for a release from a non-regulated commercial UST soil contamination does remain exceeds the lowest MSCCs, or if groundwater contamination exceeds the groundwater quality standard limits, then the responsible party must perform a Limited Site Assessment as described in Section 7.1. For a release from a non-regulated, noncommercial UST, the Department will direct additional work if the site is determined to be high risk.

Note: For commercial, non-regulated tanks, the responsible party should follow the guidance in the State Trust Fund box under Section 7.1 above.

***** Please be aware that State Trust Fund reimbursement is no longer available for non-commercial releases.*****

7.3 Excavation of Contaminated Soil from Regulated Non-Petroleum UST Releases

Once a release has been confirmed, initial abatement actions for releases from regulated, non-petroleum USTs (including USTs containing hazardous substances such as halogenated solvents) are subject to the corrective action requirements of **15A NCAC 2N .0700**. Thus, contaminated soil must be excavated to the maximum extent practicable, and post-excavation confirmatory soil samples must be collected and analyzed using approved analytical methods, as specified in Table 5, p. 61. (A flowchart illustrating the requirements for regulated hazardous substance UST releases is presented as Figure 3 on p. 47.)

7.4 Disposal of Contaminated Soil and Groundwater from Excavations

Excavations may not be back-filled with contaminated soil. Pursuant to **15A NCAC 2T .1502 (4)**, soil is contaminated if analytical results from samples collected during the assessment or from the stockpile show the presence of contaminants at concentrations above the method detection limit (MDL). Once contaminated soil is excavated, it is considered a waste and must be properly disposed of, even if the contaminant concentrations are below applicable cleanup levels. A permit issued by the DWM is required if excavated contaminated soil is to be treated on site, and a certificate of approval is required if excavated contaminated soil is to be temporarily stored on site (See *Guidelines for Ex Situ Petroleum Contaminated Soil Remediation*, current version.). If soil is to be hauled offsite for treatment/disposal, then disposal manifests are required.

Contaminated soil, impacted by non-petroleum contamination, may be considered hazardous waste and must be evaluated and disposed of accordingly.

Excavations must be filled with clean compacted fill that is similar to the native soil removed from the excavation. If gravel or some other permeable material is to be used, then a low permeability fill material must be used to cap the excavation.

If the tank pit or the excavation requires de-watering, the contaminated water must be properly treated to meet discharge levels allowed in a POTW or NPDES permit, or must be transported offsite for proper disposal at a permitted facility.

Groundwater from well development, as well as drilling mud and cuttings generated from monitoring wells installed as part of the Site Check or Initial Abatement Action confirmation sampling must be disposed of according to **15A NCAC 2T .0113**, as presented in Appendix E.

If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document (which is available in electronic format from the UST Section's web page at <https://deq.nc.gov/about/divisions/waste-management/underground-storage-tanks-section/trust-fund-branch/reasonable-rate-documents>) for information about reimbursement.

TPH must be collected from the contaminated soil waste stream at appropriate intervals to document the claimed soil disposal volume accurately represents the volume of contaminated

soil that required removal and disposal. Alternatively, mobile lab field screening (or prescreening) results may be substituted for TPH for this purpose.

State Trust Fund reimbursement for costs associated with managing clean soils removed for the purpose of accessing contaminated soils for excavation (e.g., benching, cover, etc.), managing and disposing of soils contaminated with non-petroleum hazardous wastes, and managing and disposing of dewatering or well construction/development liquids may be limited and/or require additional controls and justifications. Please contact the UST Section Trust Fund Branch at 919-707-8171 for additional information.

More comprehensive guidance on the proper disposal of contaminated soil and groundwater is presented in Appendix E – Disposal of Contaminated Soil and Groundwater.

8.0 Reporting Requirements

8.1 *Site Check Report*

As described in Section 4.3, the results of a site check required by the UST Section must be reported in a *Site Check Report* (Appendix A, p. 68) if the investigation results indicate that:

- soil contamination does not equal or exceed 50 mg/kg TPH GRO or 100 mg/kg TPH DRO for petroleum (or where tested, *such as for regulated hazardous substances*, does not exceed the soil-to-groundwater MSCC or the MDL if no MSCC is established),
- groundwater contamination does not equal or exceed the groundwater quality standard established in 15A NCAC 2L .0202, *and*
- NAPL is not present.

The *Site Check Report* must be submitted to the appropriate regional office of the Corrective Action Branch of the UST Section (as well as a separate copy to the Permits and Inspections Branch, if the site check was required by a UST inspector. The *Site Check Report* must be received by the UST Section within 30 days of the receipt of the *Notice of Regulatory Requirements* or the *Notice of Violation*.

If the removal of all or part of the UST system was necessary to allow access for site check sampling, then the required *UST Closure Report* elements, including the *UST-12 Format* with *UST-2 Form*, Appendix A, p. 82) should be submitted as part of the *Site Check Report*.

Per NCGS 143-215.94B(b)8, State Trust Fund reimbursement may be available for investigative costs if a site investigation is required by the Department to determine if a release has occurred. If State Trust Fund reimbursement is anticipated, please refer to the note in Section 4 and the current version of the Reasonable Rate Document (available in electronic format from the UST Section's web page at <https://deq.nc.gov/about/divisions/waste-management/underground-storage-tanks-section/trust-fund-branch/reasonable-rate-documents>) for more information.

8.2 24-Hour Release and UST Leak Reporting Form (Form UST 61)

Evidence (e.g., odor, free product, stained soil) of discovery of a release from all UST types must be reported to the UST Section **within 24 hours**. A ***Form UST-61 - 24-Hour Release and UST Leak Reporting Form*** (Appendix A, p. 75) must be completed and submitted to the appropriate regional office of the Corrective Action Branch of the UST Section with a separate copy submitted to the Permits and Inspections Branch at the UST Section Central Office.

8.3 Notice of Intent: UST Permanent Closure or Change-in-Service Form (UST-3 Form)

Before closure (or a change in service) of a regulated UST is initiated, the responsible party must contact the local fire marshal and/or local county or city municipality for special closure or permit requirements. The responsible party must also file a ***UST-3 Form - Notice of Intent: UST Permanent Closure or Change-in-Service*** (Appendix A, p. 73) with the appropriate UST Section regional office **30 days before closure** activities begin. A copy of the ***UST-3 Form*** also must be submitted to the Permits and Inspection Branch at the UST Section Central Office (or directly to the appropriate UST system inspector, if known). [Exception: If a professional engineer (P.E.) or licensed geologist (L.G.) is supervising the closure, a UST-3 Form may be submitted **at least five (5) working days** before the UST closure.]

8.4 20-Day Report

The responsible party for regulated USTs and non-regulated commercial USTs must submit a ***20-Day Report*** summarizing the initial abatement actions that were performed **within 20 days** following release confirmation to the appropriate regional office of the Corrective Action Branch of the UST Section (and to the Permits and Inspections Branch, if the investigation was initiated by a UST inspector). The intent of this report is to summarize the initial response and abatement steps taken within the first 20 days and document any data or information that has been obtained within that time period. The outline of the report format is presented in Appendix A, p. 78.

The responsible party for non-regulated noncommercial USTs is not required to perform any initial abatement actions or additional reporting except where directed by the Department based on the risk posed by the site.

If State Trust Fund reimbursement is anticipated, please note that a failure to provide this report in a timely fashion, both with respect to the 20-day deadline and to the subsequent completion of initial abatement actions and submittal of the associated Initial Abatement Action Report within 90 days of release detection, may affect the appropriateness and eligibility of this report.

8.5 UST Closure Report (following UST-12 Format) with UST-2 Form

Within 30 days after a clean closure has been completed for a regulated UST or non-regulated commercial UST (i.e., soil contamination does *not* equal or exceed 50 mg/kg TPH GRO and 100 mg/kg TPH DRO for petroleum (or the soil-to-groundwater MSCCs for regulated hazardous

substances, where tested), and groundwater and bedrock are *not* encountered in the pit, or groundwater contamination does *not* exceed the 2L standards where encountered), a ***UST Closure Report*** following the ***UST-12 Format***, and a ***UST-2A or 2B Form - Site Investigation Report for Permanent Closure or Change-in-Service of USTs*** (Appendix A, p. 82) must be completed and submitted to the appropriate regional office of the Corrective Action Branch of the UST Section.

*[Note: Whenever a regulated or commercial UST closure is reported to the Corrective Action Branch, a separate copy of the report and **UST-2A or UST-2B Form** must be submitted to the proper UST System inspector for the system location, or directly to the Permits and Inspection Branch in the UST Section Central Office. This is necessary in part so the permit status for the system will be changed to “permanently closed” so no additional permit fees for that system are incurred by the tank owner.*

To locate the proper inspector for the UST system, please refer to the UST Inspector Assignments Map (available in electronic format at this address: <https://ncdenr.s3.amazonaws.com/s3fs-public/Waste%20Management/DWM/UST/PIB/Inspector%20Map.pdf>) or by contacting the UST Section Permits and Inspection Branch at 919-707-8171.]

Tank removal and confirmation sampling are not required for non-regulated noncommercial USTs, except where directed by the Department based on an evaluation of the risk posed by the release. If a tank owner chooses to pursue a ***No Further Action*** determination without any deed recordation or land use restrictions, where there is no formal requirement to do so, then voluntary sampling during closure should follow the recommended guidance in Section 5.3 and reporting should follow the general format of the ***UST Closure Report***. Contact the applicable regional office of the Corrective Action Branch of the UST Section for additional guidance.

8.6 Initial Abatement Action Report

On completion of initial abatement actions for petroleum releases from a regulated commercial or non-regulated commercial UST, the responsible party must submit an ***Initial Abatement Action Report***. The purpose of the ***Initial Abatement Action Report*** is to document the initial investigation which resulted in the discovery of the release (site check and/or UST closure) and all initial abatement actions performed, including determination of source(s), removal of free product, over-excavation, post-excavation soil contamination assessment, and groundwater assessment (if applicable).

Thus, ***Initial Abatement Action Report*** is intended to fulfill:

- the requirement for regulated UST systems under 15A NCAC 2N .0603 that a report be submitted following a site check;
- the requirement for regulated UST systems under 15A NCAC 2N .0405 that a UST closure report be submitted following closure or change-in service; and
- the requirement for regulated and non-regulated commercial UST systems under 15A NCAC 2L .0404(3) that a soil contamination report be submitted to show if the soil contamination was successfully cleaned up at the completion of the over-excavation.

The responsible party must submit the ***Initial Abatement Action Report*** within 90 days following the date of discovery of the release to the appropriate regional office of the Corrective Action Branch of the UST Section (and to the Permits and Inspections Branch, if the investigation was initiated by a UST inspector). The outline of the report format is presented in Appendix A, p. 89.

The ***Initial Abatement Action Report*** presents the assessment results from any site check conducted by incorporating the requirements for a ***Site Check Report*** (Appendix A, p. 68). It also presents the results from any UST closure conducted (for regulated systems) following the ***UST-12*** Format and a completed ***UST-2A/2B Form - Site Investigation Report for Permanent Closure or Change-in-Service of USTs*** (Appendix A, p. 82). The ***Initial Abatement Action Report*** incorporates the results of any free product investigation and recovery actions.

[See also the note under Section 8.5 regarding tank closure reporting and the submittal of a copy of the UST-2A/2B Forms to the Permits and Inspection Branch for proper permit status updates.]

If the ***Initial Abatement Action Report*** demonstrates that remaining unsaturated soil in the sidewalls and at the base of the excavation does not contain contaminant levels which exceed the soil-to-groundwater or the residential maximum soil contaminant concentrations (MSCCs), whichever is lower, and that no bedrock or groundwater was encountered in the excavation (or, if so, that groundwater contamination does not exceed the 2L groundwater quality standards), then the discharge or release can be classified as low risk, and no further action will be required.

For releases from regulated commercial USTs, if soil contamination remains following excavation to the maximum extent practicable that does exceed the lowest MSCCs, if bedrock or groundwater was encountered in the excavation and no groundwater sampling was conducted, or if groundwater sampling was conducted and contamination does exceed the 2L groundwater quality standards, then a Limited Site Assessment will be required.

For releases from non-regulated commercial USTs only, if groundwater is encountered in the excavation, a monitoring well must be installed at the location of the release source, and groundwater must be sampled and the results reported in the ***Initial Abatement Action Report***. If soil contamination remains following excavation to the maximum extent practicable that does exceed the lowest MSCCs, if bedrock was encountered in the excavation and no groundwater sampling was conducted, or if groundwater sampling was conducted (for any reason) and contamination does exceed the 2L standards, or then a Limited Site Assessment will be required.

For releases from non-regulated noncommercial USTs, the ***Initial Abatement Action Report*** and the associated tasks described above are not required, except where directed by the Department based upon the risk posed by the release. If a responsible party voluntarily chooses to continue initial abatement of the release on their own discretion, an attempt should be made to remove all contaminated soil to the maximum extent possible. Although not required, where the responsible party decides to continue cleanup to meet the standards for clean closure with unrestricted use, post-excavation confirmatory soil samples must be collected and analyzed using approved analytical methods as described in Section 9.2.C, below. Contact the applicable regional office of the Corrective Action Branch of the UST Section for additional guidance.

8.7 *Limited Site Assessment Report*

If the soil contamination was not remediated successfully at completion of a regulated commercial or non-regulated commercial UST closure and subsequent excavation, or if groundwater or bedrock was encountered during closure or excavation and groundwater assessment was either not performed or showed contamination in excess of the 2L groundwater quality standards, then the responsible party must submit a ***Limited Site Assessment Report***. The responsible party must submit the ***Limited Site Assessment Report*** within 120 days following the date of discovery of the release to the appropriate regional office of the Corrective Action Branch of the UST Section. The outline of the report format is presented in the *Guidelines for Assessment and Corrective Action for UST Releases*, current version.

The ***Limited Site Assessment Report*** and the associated scope **are not required for releases from non-regulated noncommercial USTs**, except where directed by the Department based upon the risk posed by the release.

8.8 *Other Reports (Free Product Recovery Report, 45-Day Report, Etc.)*

For releases from regulated commercial and non-regulated commercial USTs: NAPL investigation and removal are required as initial abatement actions for releases from regulated commercial and non-regulated commercial USTs. Therefore, NAPL assessment and removal performed during the initial abatement phase following discovery of a petroleum release must be reported in the ***20-Day Report*** and/or in the ***Initial Abatement Action Report***, as applicable. Reporting of NAPL assessment and removal conducted during the initial risk assessment phase, after the submittal of the ***Initial Abatement Action Report*** should be incorporated into the ***Limited Site Assessment Report***. The formats of each of these reports incorporates the minimum reporting requirements for the assessment and recovery of NAPL (See Appendix A, and the *Guidelines for Assessment and Corrective Action for UST Releases*, current version).

Reporting of NAPL assessment and, where applicable, removal activities conducted during any other routine monitoring phase should be incorporated into the next scheduled ***Monitoring Report*** or ***Corrective Action Performance Report***. A separate ***Free Product Recovery Report*** is required for NAPL reporting only where directed by the UST Section based on site specific conditions. See the *Guidelines for Assessment and Corrective Action for UST Releases*, current version, for more information about these report formats.

Following the completion of no more than four (4) authorized NAPL recovery events, the responsible party must submit a ***Free Product Recovery System Specification Report*** in which an appropriate long-term recovery plan is proposed. The formats of the ***Free Product Recovery Report*** and the ***Free Product System Specification Report*** are presented in the *Guidelines for Assessment and Corrective Action for UST Releases*, current version.

For releases from non-regulated noncommercial USTs: Please note that NAPL assessment and recovery **are required** for releases from non-regulated noncommercial USTs where the NAPL is pooled or running across the ground surface, is floating on the surface of a surface water body, or is weeping from a vertical wall. Additionally, if measureable NAPL greater than 1/8 of an inch

(0.01 ft) in thickness is found in an excavation below the water table or in any installed well, and the location of that discovery is within 30 feet of the boundary with an adjacent property owned by someone other than the responsible party, then additional emergency response to the NAPL, which may include recovery, is required to protect the neighboring third-party property owner.

For non-regulated noncommercial UST releases that satisfy none of these conditions, subsurface free product recovery and the associated report are not required, except where otherwise directed by the Department based upon the risk posed by the release.

For releases from regulated hazardous substance USTs: The responsible party is required to submit a **45-Day Report within 45 days** of release discovery to complete reporting of initial abatement actions in the period following the **20-Day Report** and to present the initial site characterization. (See Figure 3.) The information required in the report includes the reporting of site check and/or UST closure activities and related assessment; determination of the source of the release; initial abatement actions including free product investigation and recovery, soil excavation and post-excavation assessment; and potential receptor and land use information. The format is presented in the *Guidelines for Assessment and Corrective Action for UST Releases*, current version.

9.0 Sampling Guidelines

If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document (which is available in electronic format from the UST Section's web page at <https://deq.nc.gov/about/divisions/waste-management/underground-storage-tanks-section/trust-fund-branch/reasonable-rate-documents>) for information about reimbursement.

9.1 *Soil and Groundwater Samples Collected at Site Checks and Regulated Commercial UST Closure and following Excavation of Contaminated Soil: Approved Methods*

9.1.A Sampling: Site Checks and Regulated Petroleum UST Closures

When site checks are performed, soil samples must be collected by the assessment procedures described in Section 4.3. When petroleum UST systems are closed, soil samples must be collected immediately following closure by the assessment procedures described in Section 5.3. Site check and closure samples must be analyzed using TPH-equivalent methods (EPA 8015C GRO and/or, 'Typing' UVF for GRO, MADEP VPH: GRO Range, Calculated GRO Range from EPA 8260B and/or EPA 8015C DRO, 'Typing' UVF for DRO), or constituent-specific petroleum and metals analyses, as described in Table 3, p. 59.

To expedite activities during emergency situations at State Trust Fund eligible releases, the reimbursement of increased costs for a twenty-four hour turn-around for laboratory analysis of closure and site check samples may be pre-approved, but only where onsite screening via 'Typing' UVF is not available.

9.1.B Sampling: Over-Excavation following Site Checks or Regulated Commercial UST Closure

If the results for any site check or closure sample equal or exceed 50 mg/kg TPH GRO or 100 mg/kg TPHDRO (or, where tested, the soil-to-groundwater MSCCs, or the MDL if no MSCC is established,) then excavation of the contaminated soil in the unsaturated zone (and, where applicable, accessible areas of the smear zone) followed by the collection of confirmatory samples, is required (as described in Section 7.1).

For post-excavation confirmation sampling, soil samples must be collected from the sidewalls and from the base of the excavation and analyzed using risk-based methods (commonly EPA 8260B and/or 8270D and MADEP VPH and/or EPH) as directed in Table 3, p. 59. A sample must be collected from a location on each sidewall of the excavation where contamination is most likely to be present. The sample(s) collected from the base of the excavation must be collected directly underneath the location(s) of each highly contaminated site check or closure sample(s). Thus, if there was more than one highly contaminated closure sample location in a large tank pit, **a representative number of samples** must be collected from the base of the subsequent over-excavation and analyzed by the risk-based methods appropriate to each location.

A set of post-excavation confirmation samples must be collected from each excavation at the site. If there are several excavations, then a separate set of samples is required **from each excavation**.

During the over-excavation of contamination from a regulated petroleum UST release, if groundwater or bedrock is encountered, then groundwater sampling is necessary as a surrogate for the pit bottom soil samples, as defined in Sections 5.3.D and 5.3.E, or else a Limited Site Assessment will be required.

Please note that a failure to assess groundwater where bedrock or groundwater was encountered during an Initial Abatement Action excavation may lead to a denial of reimbursement for the Limited Site Assessment, if groundwater contamination is not detected during the LSA.

9.1.C Sampling: Approved Analytical Methods

All soil samples required at petroleum UST closures and site checks and for post-excavation confirmatory sampling must be analyzed using approved analytical methods, as specified in Table 3, p. 59. Metals analysis **will not be required** to confirm contamination from releases of virgin gasoline and fuel oils (medium/high boiling point fuels such as kerosene and diesel fuel) that are **not blended from used oil**. The contamination is assumed to be free of metals or to contain concentrations of metals below the allowable limits. Metals analysis **will be required** to confirm contamination from releases of used/waste oil or fuel oil **blended with used oil** (both motor oil and industrial oil).

All groundwater samples required at petroleum UST closures and site checks must be analyzed using approved analytical methods, as specified in Table 4, p. 60. Sample containers and preservation methods are listed for soil in Table 7, p. 62, and for groundwater in Table 8, p. 63.

9.1.D Sampling: Excavated Contaminated Soil Waste Stream at Regulated Commercial UST Releases

[This sampling may be required at the request of a disposal facility or to document the total contaminated soil volume for State Trust Fund Reimbursement, and should follow guidance provided by either of those entities, whichever is directing the work.]

If State Trust Fund reimbursement is anticipated for the hauling/treatment/disposal of excavated contaminated soil, soil samples must be collected from the soil waste stream in accordance with the requirements in the current version of the Reasonable Rate Document (which is available in electronic format from the UST Section's web page at <https://deq.nc.gov/about/divisions/waste-management/underground-storage-tanks-section/trust-fund-branch/reasonable-rate-documents>.)

9.2 Soil and Groundwater Samples Collected at Non-Regulated UST Releases following Excavation of Contaminated Soil: Approved Methods

9.2.A Sampling: Over-Excavation following Non-Regulated Commercial UST Releases.

For initial abatement of a release from a non-regulated commercial UST, contaminated soil must be excavated to the maximum extent possible and post-excavation confirmatory soil samples must be collected and analyzed using approved analytical methods as described in Section 9.1 and specified in Table 3, p. 59.

During over-excavation of contamination from a non-regulated commercial UST release, if bedrock or groundwater is encountered in the excavation, the groundwater must be assessed as a surrogate for the pit bottom soil samples, as defined in Sections 5.3.D and 5.3.E, and the results reported in the *Initial Abatement Action Report*, or a Limited Site Assessment will be required.

All groundwater samples must be analyzed using approved analytical methods as described in Section 9.1 and specified in Table 4, p. 60. Sample containers and preservation methods are listed for soil in Table 7, p. 62, and for groundwater in Table 8, p. 63.

9.2.B Sampling: Excavated Contaminated Soil Stockpile at Non-Regulated Commercial UST Releases

[This sampling may be required at the request of a disposal facility or to document the total contaminated soil volume for State Trust Fund Reimbursement, and should follow guidance provided by either of those entities, whichever is directing the work.]

If State Trust Fund reimbursement is anticipated for the hauling/treatment/disposal of excavated contaminated soil, soil samples must be collected from the soil waste stream in

accordance with the requirements in the current version of the Reasonable Rate Document (which is available in electronic format from the UST Section's web page at <https://deq.nc.gov/about/divisions/waste-management/underground-storage-tanks-section/trust-fund-branch/reasonable-rate-documents.>)

9.2.C Sampling: Excavated Contaminated Soil Stockpile at Non-Regulated Noncommercial UST Releases

Except where in the case of an emergency condition related to fire, explosive, or vapor hazards, or where specifically directed by the Department based on the risk posed by the release, initial abatement is not required for a release from a non-regulated noncommercial UST.

If a responsible party chooses to continue initial abatement of the release based upon their own discretion, an attempt should be made to remove all contaminated soil to the maximum possible. Although not required, where the responsible party decides to continue cleanup to meet the standards for clean closure with unrestricted use, post-excavation confirmatory soil samples must be collected and analyzed. At a minimum, TPH-equivalent methods (EPA 8015C GRO and/or, 'Typing' UVF for GRO, MADEP VPH: GRO Range, Calculated GRO Range from EPA 8260B and/or EPA 8015C DRO, 'Typing' UVF for DRO) must be analyzed along the excavation sidewalls and pit bottom. At one or more location(s) showing the highest TPH detection(s), a sample must be analyzed for constituent-specific, risk-based analyses (EPA 8260B and/or 8270D and MADEP VPH and/or EPH), as described in Table 7, p. 62.

Additionally, for a clean closure with unrestricted use, if bedrock or groundwater is encountered in the excavation, the groundwater must be assessed using approved analytical methods as described in Section 9.1 and specified in Table 4, p. 60.

Sample containers and preservation methods are listed for soil in Table 7, p. 62, and for groundwater in Table 8, p. 63.

9.3 Soil and Groundwater Samples Collected at Regulated Hazardous Substance UST Closure and following Excavation of Contaminated Soil: Approved Methods

9.3.A Sampling: Hazardous Substance UST Closure

When regulated hazardous substance USTs are closed, soil samples must be collected immediately following closure by the assessment procedures described under Section 5.3, and analyzed as directed in Table 5, p. 61. All groundwater samples collected at non-petroleum UST closures must be analyzed using the approved analytical methods specified in Table 6, p. 61.

A set of samples must be collected following UST closure from each distinct part of the UST system (from each UST pit, each dispenser or group of dispensers, each product line, etc., located in a distinctly separate area of the site). If parts of the system are located in different areas, then a separate set of samples is required **from each area**.

9.3.B Sampling: Over-Excavation following Hazardous Substance UST Closure

If the results for the most highly-contaminated closure sample exceed the soil-to-groundwater MSCCs, then excavation of the contaminated soil in the unsaturated zone, and, where applicable, accessible areas of the smear zone, followed by the collection of confirmatory samples, is required (as described in Section 7.3).

9.4 Reference for Sampling: “Guidelines for Sampling”

Soil and groundwater samples required for UST closures, site checks and over-excavation must be collected, transported and analyzed in accordance with the *Guidelines for Sampling*, current version (available in electronic format from the UST Section’s web page at <http://portal.ncDEQ.org/web/wm/ust/guidance>). See also Tables 1-10 and Appendix D - Collecting Soil Samples.

10.0 References

American Petroleum Institute Recommended Practice 1604, *Removal and Disposal of Used Underground Petroleum Storage Tanks*, third edition, March 1996. Available on the Internet at <http://publications.api.org/documents/1604-PubAcc/html5.html>

American Petroleum Institute Publication 2015, *Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks*. Available on the Internet at <http://publications.api.org/Safety-Fire-Protection.aspx>

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Massachusetts Department of Environmental Protection. *WSC-99-415 - Preservation Techniques for Volatile Organic Compound (VOC) Soil Sample Analyses*. Available on the Internet at <http://www.mass.gov/eea/agencies/massdep/toxics/reports/petroleum-hydrocarbons.html>

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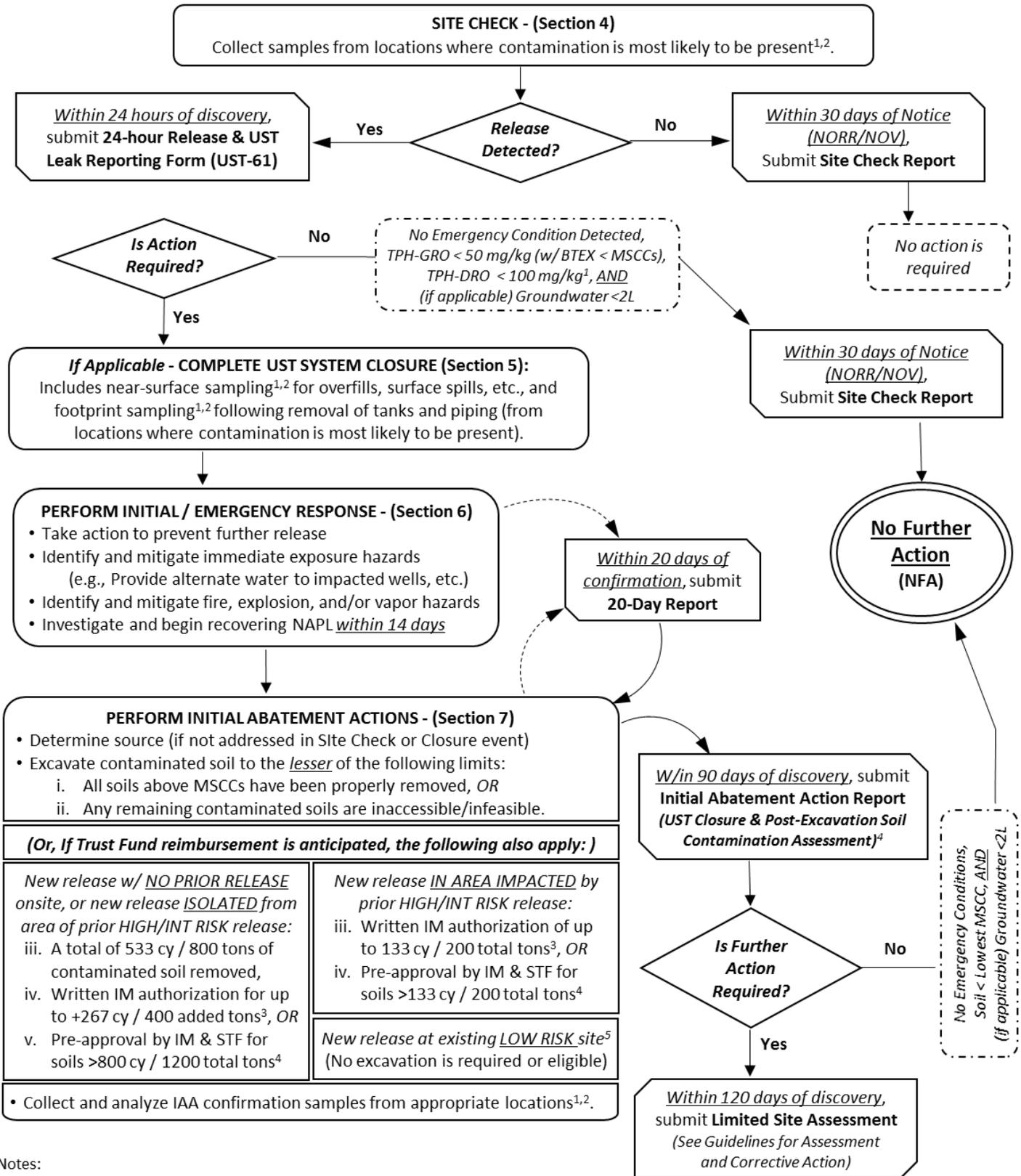
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U.S. EPA Office of Solid Waste. Memorandum. *Clarification Regarding Use of SW-846 Methods*. August 1998. Available on the Internet at <https://www.epa.gov/hw-sw846/memorandum-clarification-regarding-use-sw-846-methods>

Figures

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- Figure 2 Flowchart of Requirements for Closure (or Change-in-Service) and Initial Release Response and Abatement for Regulated Commercial Petroleum UST Systems
- Figure 3 Flowchart of Requirements for Closure (or Change-in-Service) and Initial Release Response and Abatement for Regulated Hazardous Substance UST Systems
- Figure 4 Flowchart of Requirements for Non-Regulated Commercial Petroleum UST Releases
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Figure 1
Flowchart of Requirements for Releases Discovered during Site Checks
for REGULATED COMMERCIAL Petroleum UST Systems

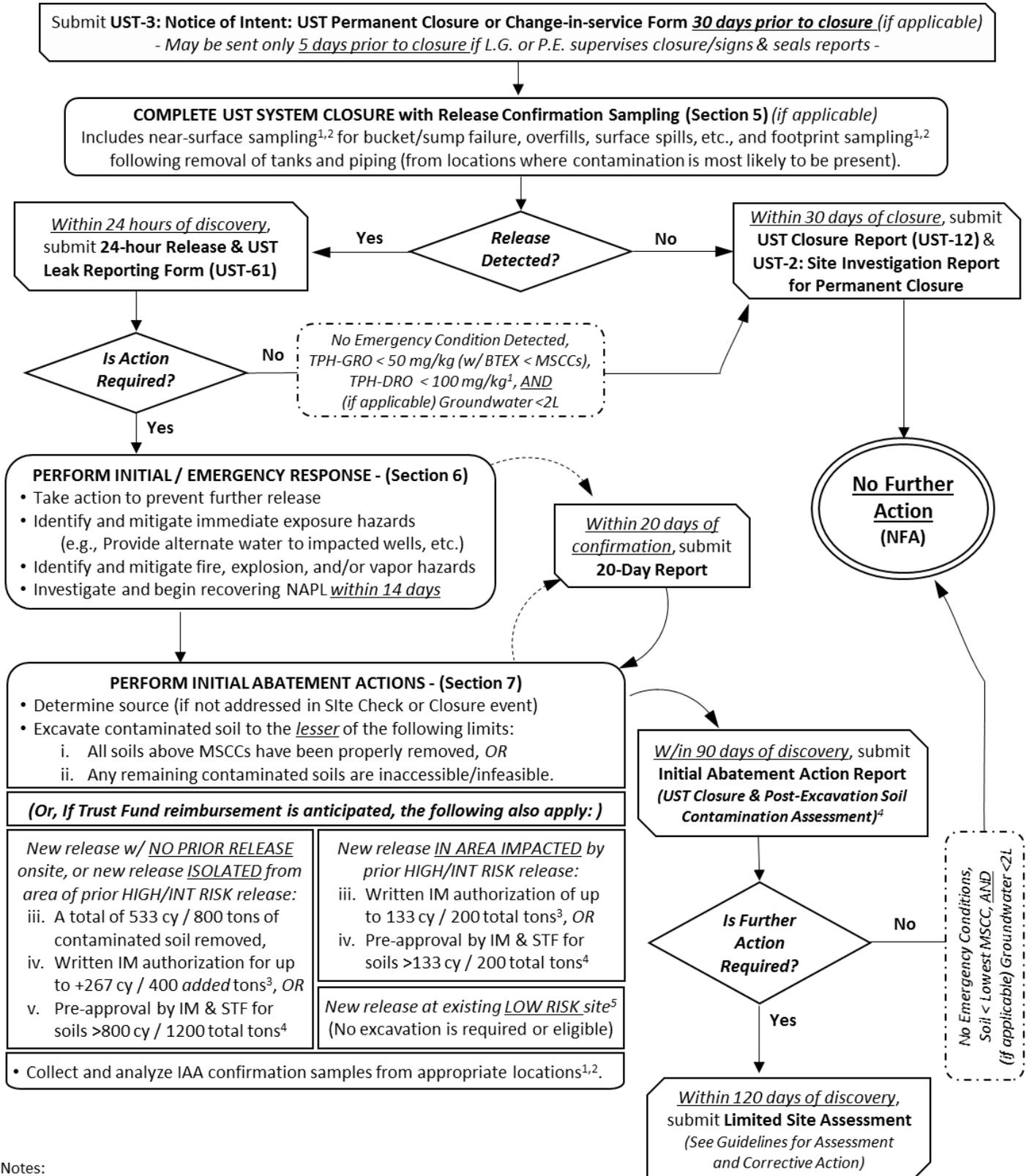


Notes:

1. Collect samples for all required analyses based on suspected release type. See Table 3.
2. Where system removal or over-excavation intersects ground water or bedrock, a groundwater sample from a monitoring well (or similar) must be collected and analyzed for the applicable parameters from Table 4 as a surrogate for the footprint and/or pit-bottom sample(s).
3. A projected endpoint based on field screening using mobile lab or similar technologies (UVF, MIP, Mobile GC, etc.) is required for additional volume.
4. Corrective action excavations may exceed the volume limits or 90-day IAA deadline, if pre-approved by the Incident Manager & State Trust Fund.
5. Only if the new release does not change the site's Risk classification in some way. If Risk changes, refer to guidance relative to that revised Site Risk.

Figure 2

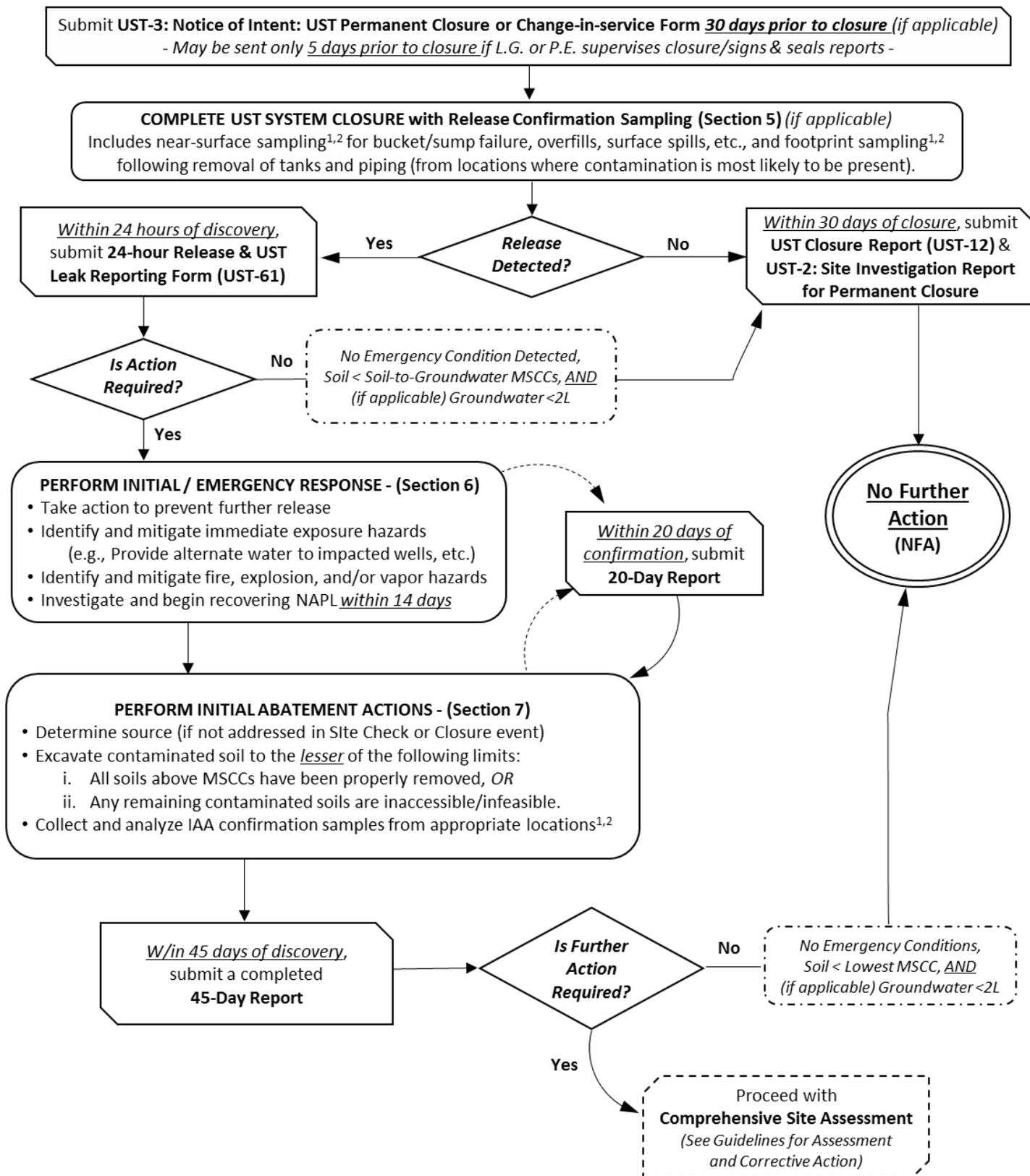
Flowchart of Requirements for Closure (or Change-in-Service) and Initial Release Response and Abatement for REGULATED COMMERCIAL Petroleum UST Systems



Notes:

1. Collect samples for all required analyses based on suspected release type. See Table 3.
2. Where system removal or over-excavation intersects ground water or bedrock, a groundwater sample from a monitoring well (or similar) must be collected and analyzed for the applicable parameters from Table 4 as a surrogate for the footprint and/or pit-bottom sample(s).
3. A projected endpoint based on field screening using mobile lab or similar technologies (UVF, MIP, Mobile GC, etc.) is required for additional volume.
4. Corrective action excavations may exceed the volume limits or 90-day IAA deadline, if pre-approved by the Incident Manager & State Trust Fund.
5. Only if the new release does not change the site's Risk classification in some way. If Risk changes, refer to guidance relative to that revised Site Risk.

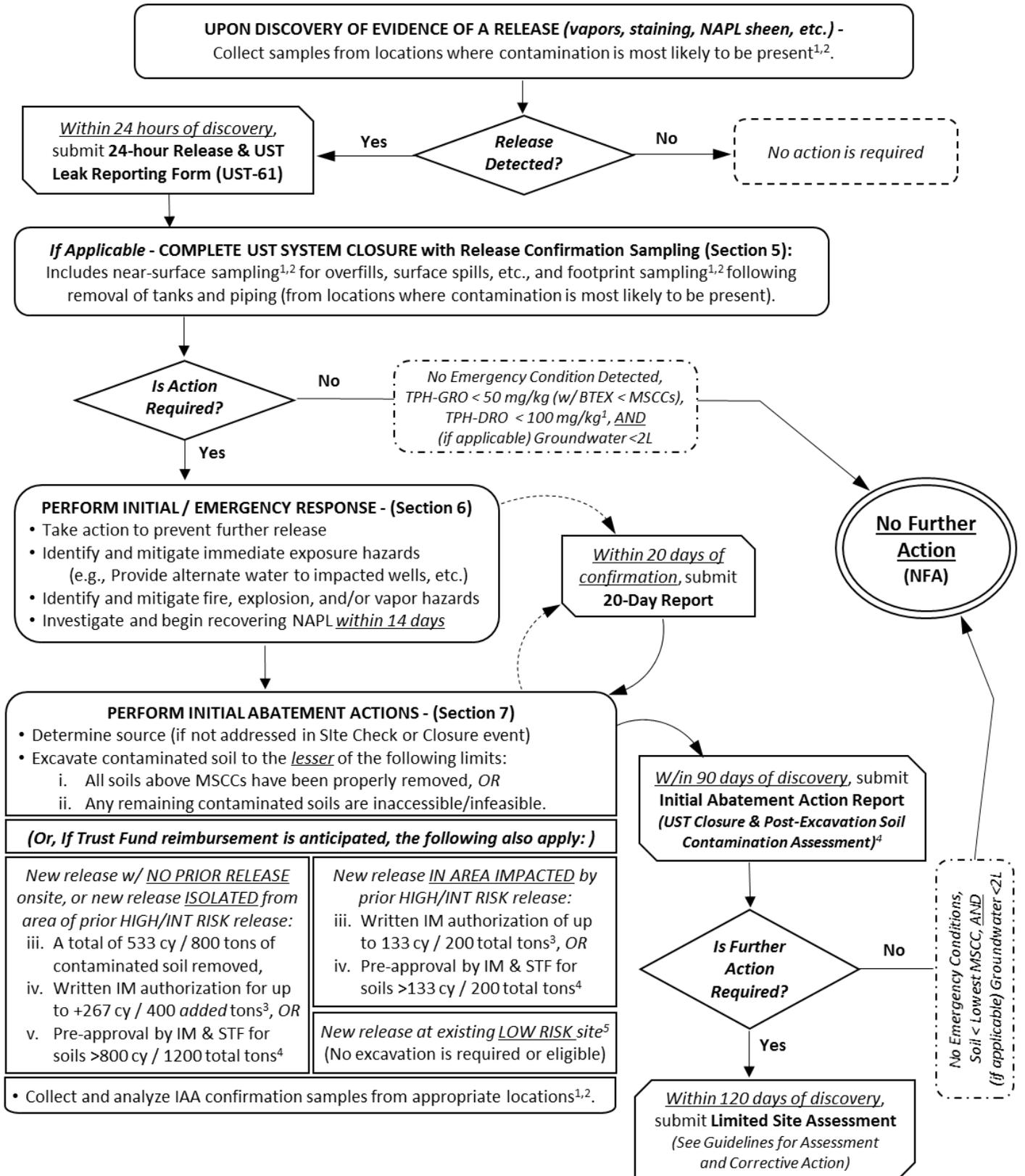
Figure 3
Flowchart of Requirements for Closure (or Change-in-Service) and
Initial Release Response and Abatement for REGULATED HAZARDOUS SUBSTANCE UST Systems



Notes:
 1. Collect samples for all required analyses based on suspected release type. See Table 3.
 2. Where system removal or over-excavation intersects ground water or bedrock, a groundwater sample from a monitoring well (or similar) must be collected and analyzed for the applicable parameters from Table 4 as a surrogate for the footprint and/or pit-bottom sample(s).

Figure 4

Flowchart of Requirements for NON-REGULATED COMMERCIAL Petroleum UST Releases

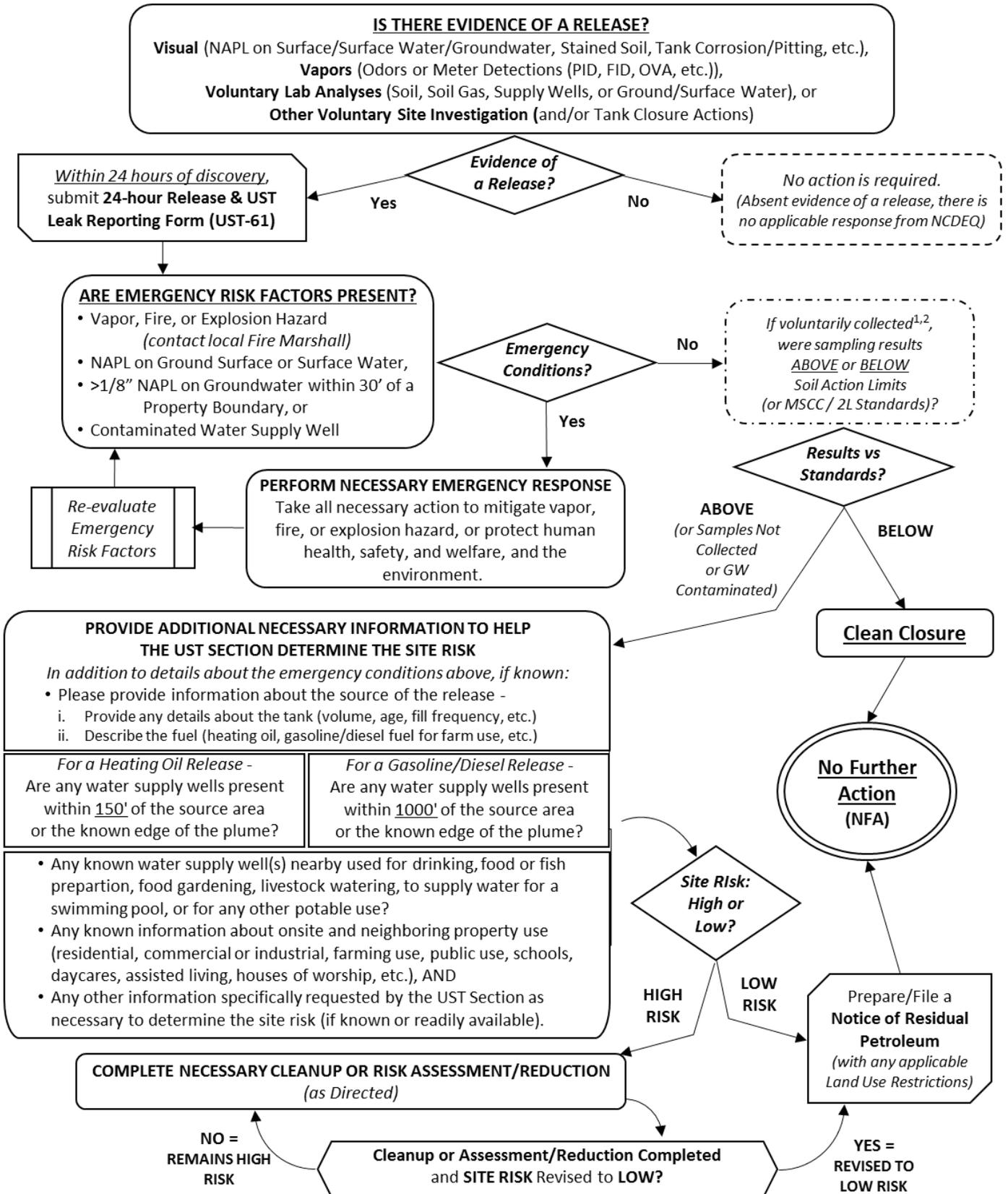


Notes:

1. Collect samples for all required analyses based on suspected release type. See Table 3.
2. Where system removal or over-excavation intersects ground water or bedrock, a groundwater sample from a monitoring well (or similar) must be collected and analyzed for the applicable parameters from Table 4 as a surrogate for the footprint and/or pit-bottom sample(s).
3. A projected endpoint based on field screening using mobile lab or similar technologies (UVF, MIP, Mobile GC, etc.) is required for additional volume.
4. Corrective action excavations may exceed the volume limits or 90-day IAA deadline, if pre-approved by the Incident Manager & State Trust Fund.
5. Only if the new release does not change the site's Risk classification in some way. If Risk changes, refer to guidance relative to that revised Site Risk.

Figure 5

Flowchart of Requirements for NON-REGULATED NONCOMMERCIAL Petroleum UST Releases



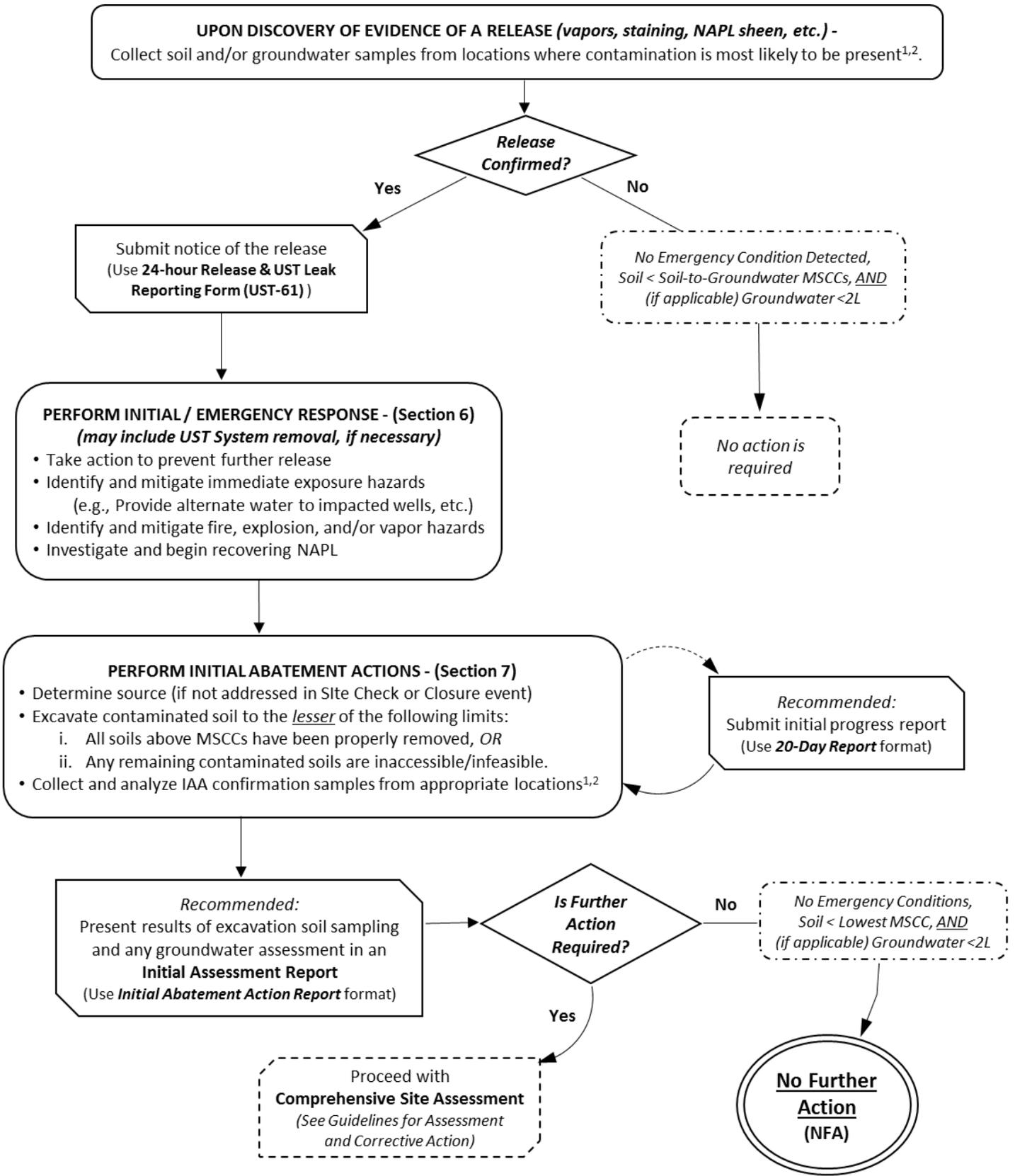
Notes:

NAPL = Non-Aqueous Phase Liquid. Also known as 'Free Product' or 'Free-Phase Petroleum'.

1. Samples would have to be voluntarily collected for the required analyses based on suspected release type. See Sections 5 and 7, and Table 3.
2. Where system removal or over-excavation intersects ground water or bedrock, a groundwater sample from a monitoring well (or similar) would need to be collected and analyzed for the applicable parameters from Table 4 as a surrogate for the footprint and/or pit-bottom sample(s).

Figure 6

Flowchart of Requirements for NON-REGULATED NON-PETROLEUM UST Releases



Notes:
 1. Collect samples for all applicable analyses based on suspected release type. See Table 3.
 2. Where system removal or over-excavation intersects ground water or bedrock, a groundwater sample from a monitoring well (or similar) must be collected and analyzed for the applicable parameters from Table 4 as a surrogate for the footprint and/or pit-bottom sample(s).

