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

PETROLEUM AND HAZARDOUS SUBSTANCE UST RELEASES

PETROLEUM NON-UST RELEASES

UST Section
North Carolina Department of Environmental Quality
Division of Waste Management

April 14, 2025 Version
Change 12 – 2025

Index of Changes

Document Title and Revised Pages	Version Date	Change Date	Change Number
Guidelines for Assessment and Corrective Action for UST Releases *(current version)*	July 15, 2008	October 1, 2012	Change 2
Guidelines for Sampling *(current version)*	July 15, 2008	May 1, 2012	Change 2
Guidelines for Ex Situ Petroleum Contaminated Soil Remediation *(current version)*	August 23, 2012		
Guidelines for Initial Response and Abatement, Assessment, and Corrective Action for Non-UST Releases of Petroleum *(current version)*	July 1, 2012		
Guidelines for Site Checks, Tank Closure, and Initial Response and Abatement for UST Releases	March 1, 2007		
Pages i to 81			
Pages iii, iv, 9, 10, 11, 14, 15, 19, 23-26, 37-41, 71-73, 81, 82, 84(del)		July 1, 2007	Change 1
Title Page, iii, vi, vii-viii, 1, 6, 8, 11, 13, 15, 18, 20, 22, 24, 25, 28, 30, 31-39, 40, 45, 59, 85, 88-93, 94, 95		July 15, 2008	Change 2
Pages 21, 24, 31-34, 38-39		December 1, 2008	Change 3
Title Page, iii-ix, 1-3, 28, 31-36, 37-50, 52-79, 83-87, 93-100		August 1, 2012	Change 4
Title Page, 37-50		December 1, 2013	Change 5
- *Changes in Text, Figures, Tables, and Appendices*		*March 1, 2017*	*Draft 6*
Comprehensive Changes in Text, Figures, Tables, and Appendices		May 1, 2017	Change 6
Title Page, Page 49, Figure 5		July 7, 2017	Change 7
Title Page, ix, 32, 33, 112, 113 (*Changes per Amendments to 15A NCAC 2T)*		January 9, 2018	Change 8
Title Page, 6		February 1, 2019	Change 9
Comprehensive Changes in Text, Figures, Tables, and Appendices		January 19, 2021	Change 10
Title Page, Page 9, 39-41, Figures 1-10		May 17, 2021	Change 11
Comprehensive Changes in Text, Figures, and Tables		April 14, 2025	Change 12

Table of Contents

Tables

(See Comprehensive Tables for Corrective Action Guidelines)

Appendices

See Comprehensive Appendices for Corrective Action Guidelines

Appendix A

1. Site Check Report
2. UST-3 - Notice of Intent: UST Permanent Closure or Change-in-Service
3. 24-Hour Release and UST Leak Reporting Form (UST-61 Form)
4. 24-Hour Notification of Discharge Form (UST-62 Form)
5. 20-Day Report
6. UST Closure Report (following UST-12 format) and Site Investigation Report for Permanent Closure or Change-in-Service of UST (UST-2 Form)
7. Site Investigation Report for Permanent Closure or Change-in-Service of UST
8. Initial Abatement Report (Site Check, UST Closure with UST-2 Form, Excavation, Post-Excavation Soil Contamination Assessment)
9. 45-Day Report (For non-petroleum UST releases only)
10. Free Product Recovery Report
11. Free Product Recovery System Specification Report
12. Limited Site Assessment Report
13. Request for Water Supply Well Information
14. Comprehensive Site Assessment Report
15. Soil Assessment Report
16. Corrective Action Plan
17. Soil Cleanup Plan
18. Monitoring Reports
19. System Enhancement Recommendation Report
20. New Technology Cleanup Plan
21. Soil Cleanup Report with Site Closure Request
22. Site Closure Report
23. Format of Individual Public Notice
24. Format of Public Notice by Posting (15 NCAC 02L .0409(a))
25. Format of Individual Public Notice for Non-Petroleum UST Releases
26. VPH (Aliphatics/Aromatics) Laboratory Reporting Form
27. EPH (Aliphatics/Aromatics) Laboratory Reporting Form

Appendix B – Reporting Tables

Definitions

Action Level: the concentration of a contaminant that if exceeded will require further regulatory action such as sampling, cleanup or monitoring. Action Levels may be screening values as well as regulatory levels. Screening analyses used as surrogate against regulatory standards may trigger exceedance of an Action Level if more comprehensive sampling information is not available.

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. (15A NCAC 02L .0102) Bedrock generally underlies soil or other unconsolidated, superficial material.

Catchment Basin: a contained area around the fill pipe designed to catch drips and small spills during fuel deliveries to prevent contamination (also known as a spill bucket)

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 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.

Contaminant: any substance occurring in concentrations which exceed the groundwater quality standards specified in 15A NCAC 02L .0202.

De Minimis Concentration: amount of a regulated substance which does not exceed one percent (1%) of the capacity of the tank, excluding piping and vent lines (15A NCAC 02N .0203).

Department: the North Carolina Department of Environmental Quality.

Discharge: a release (See also Release).

Distillate fuel oil**:** a general classification for one of the petroleum fractions produced in conventional distillation operations. It includes diesel fuels and fuel oils. Products known as No. 1, No. 2, and No. 4 diesel fuel are used in on-highway diesel engines, such as those in trucks and automobiles, as well as off-highway engines, such as those in railroad locomotives and agricultural machinery. Products known as No. 1, No. 2, and No. 4 fuel oils are used primarily for space heating and electric power generation.

Division: Division of Waste Management.

Ex Situ Soil: soil that has been excavated.

Free Product: free-phase petroleum, also known as liquid-phase hydrocarbon or phase-separated hydrocarbon (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 02L .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 §101 (14) of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 (but not including any substances regulated as a hazardous waste under RCRA 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 measurable 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 NCGS §143-215.94A(7) .

Operator: Per NCGS §143-215.94OO "Primary operator" means a person having primary responsibility for the daily on-site operation and maintenance of an underground storage tank system.

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 §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 quantities that exceed the soil-to-groundwater MSCC or the residential MSCC, whichever is lower, as established by 15A NCAC 02L .0411.

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 affected 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.)

Residual Soil: soil formed in place by the weathering and decomposition of the underlying bedrock, without being transported or moved from its original location.

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 (15A NCAC 02T .0103(38)).

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 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): a measure of hydrocarbon compounds grouped by the amount of carbon (C) in each, called carbon fractions. EPA Method 8015 provides C6-C10 alkanes labeled as Gasoline Range Organics (GRO) and C10-C28 alkanes labeled as Diesel Range Organics (DRO). The UST Section currently uses 50 milligrams per kilogram (mg/kg) for GRO and 100 mg/kg for DRO as surrogate thresholds for screening against the applicable soil standards. Note that TPH data are only used for screening and cannot supersede constituent-specific analytical results.

Transmissivity: the rate of groundwater flow through a one-unit width over the entire saturated thickness of a hydrogeologic unit, describing the ability of that unit to produce groundwater as a volume per day per unit width.

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 (For a full definition, see 15A NCAC 02N .0203).

Unrestricted Use Standards: land use restrictions for a property contaminated by a petroleum release are not required when soil contaminant concentrations are below residential maximum contaminant concentrations and groundwater contaminant concentrations are below the 2L Standards.

Under-Dispenser Containment: a containment area underneath the dispenser system designed to prevent leaks from the dispenser and piping within or above the UDC from reaching soil or groundwater

Unsaturated Zone: the portion of the subsurface above the groundwater table.

Used Oil: any oil that has been refined from crude oil, or any synthetic oil, that has been used and as a result of such use is contaminated by physical or chemical impurities.

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

Waste Oil: a generic term for oil that has been contaminated with substances that may or may not be hazardous. Any used oil or waste oil spill from a non-UST stored generator, transporter, recycler, etc. would fall under the jurisdiction of the Hazardous Waste Section if determined to be a hazardous waste.

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

Acronyms

AFVR Aggressive Fluid - Vapor Recovery

ASC Accelerated Site Characterization

AST Aboveground Storage Tank

CAB Corrective Action Branch (NCDEQ)

CAP Corrective Action Plan

CERCLA Comprehensive Environmental Response, Compensation and Liability Act

CFR Code of Federal Regulations

CSA Comprehensive Site Assessment

DEQ Department of Environmental Quality

DWM Division of Waste Management

EPA The Environmental Protection Agency

GCL Gross Contamination Level

GS General Statutes

HCl Hydrochloric Acid

HNO_3 Nitric Acid

HPT Hydraulic Profiling Tool

IAR Initial Abatement Report

IATA International Air Transport Association

ITRC Interstate Technology & Regulatory Council

L.G. Licensed Geologist (Professional Geologist P.G.)

LUR Land Use Restrictions

LIF Laser-Induced Fluorescence (Direct Push)

LSA Limited Site Assessment

LUST Leaking Underground Storage Tank

MADEP Massachusetts Department of Environmental Protection

MDL Method Detection Limit

MIP Membrane Interface Probe

MMPE Mobile Multi-Phase Extraction

MRL Minimum Reporting Limit

MSCC Maximum Soil Contaminant Concentration

MNA Monitored Natural Attenuation

NAPL Non-Aqueous Phase Liquid

NC North Carolina

NCAC North Carolina Administrative Code

NCDA&CS North Carolina Department of Agriculture & Consumer Services

NCGS North Carolina General Statutes

NCS Notice of Contaminated Site

NFA No Further Action

NORR Notice of Regulatory Requirements

NOV Notice of Violation

NPDES National Pollutant Discharge Elimination System

NRP Notice of Residual Petroleum

OPHSCA Oil Pollution and Hazardous Substances Control Act of 1978

PAH Polycyclic Aromatic Hydrocarbon

PCB Polychlorinated Biphenyl

P.E. Professional Engineer

PIB Permits and Inspection Branch (NCDEQ)

PID Photoionization Detector

POTW Publicly Owned Treatment Works

PQL Practical Quantitation Limit

PVI Petroleum Vapor Intrusion

QA/QC Quality Assurance/Quality Control

RCRA Resource Conservation and Recovery Act

ROD Record of Decision

RRD Reasonable Rate Document

SAR Soil Assessment Report

SCR/SCR Soil Cleanup Report/Site Closure Request

SM Standard Method

STIRA Guidelines for Site Checks, Tank Closure, and Initial Response and Abatement for UST Releases

STF State Trust Fund

SVE Soil Vapor Extraction

SVOC Semi-Volatile Organic Compounds

SW Solid Waste

TCLP Toxicity Characteristic Leaching Procedure (EPA Method SW-846 1311)

TOC Total Organic Carbon

TPH Total Petroleum Hydrocarbons

TPH-DRO Total Petroleum Hydrocarbons - Diesel Range Organics

TPH-GRO Total Petroleum Hydrocarbons - Gasoline Range Organics

UDC Under-Dispenser Containment

UST Underground Storage Tank

UVF Ultraviolet Fluorescence

USGS United States Geological Survey

VOA Volatile Organic Analysis

VOC Volatile Organic Compounds

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

1.0 Introduction

1.1 Purpose of the Guidelines

The purpose of the ***Guidelines for Site Checks, Tank Closure, and Initial Response and Abatement*** *(or* ***STIRA)***, hereafter referred to as the "***STIRA Guidelines****",* is to provide procedures for performing site checks for regulated UST systems, to investigate suspected releases of petroleum and hazardous substances, and to provide guidance for performing and reporting initial response and abatement actions. Releases covered by this document include petroleum USTs, hazardous substance USTs and petroleum non-USTs. Petroleum non-UST releases can include surface spills, releases from aboveground storage tanks (ASTs), and releases from associated conduits and piping.

This document replaces all previous guidance documents issued by the UST Section pertaining to initial response and abatement actions for regulated, unregulated, non-petroleum UST systems and non-UST petroleum releases. 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 *Assessment Guidelines* and *Corrective Action Guidelines,* current versions.

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 02L .0103(e). Furthermore, the title pages of the *20-Day Report* and the *Initial Abatement 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.

The guidelines do not imply or guarantee Trust Fund eligibility and/or reimbursement or in any way supersede any requirement of pre-approval.

Emergency actions should be taken as soon as a release is discovered, the following documents may be helpful:

- If initial release abatement efforts cannot restore the site to pre-release conditions, the assessment described in the *Assessment Guidelines* must be considered as the next step. The Assessment Guidelines assists tank owners, tank operators, landowners, and other 'responsible parties' in understanding the process of evaluating releases to meet the applicable statutes and administrative rules. Releases covered by the Assessment Guidelines include petroleum USTs, hazardous substance USTs and petroleum non-UST

releases. Petroleum non-UST releases can include surface spills, releases from aboveground storage tanks (ASTs), and releases from associated conduits and piping.

- If contamination remains above the goals established by the risk identified during assessment activities, corrective action must be considered the next step. The *Corrective Action Guidelines* assist tank owners, tank operators, landowners, and other responsible parties in understanding the process of remediating releases to meet the applicable statutes and administrative rules. Releases covered by the Corrective Action Guidelines include petroleum USTs, hazardous substance USTs and petroleum non-UST releases. Petroleum non-UST releases can include surface spills, releases from aboveground storage tanks (ASTs), and releases from associated conduits and piping. The Corrective Action Guidelines describe methods and procedures for performing corrective action procedures and tasks to reduce the levels of petroleum or other contamination and characterizing the risk posed to human health and the environment.

Electronic versions of all guidelines developed by the UST Section are available for download from the Division of Waste Management – Underground Storage Tank Section website. Questions concerning the information presented in this document should be directed to the UST Section Central Office at 919-707-8200. 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, of the central office and each regional office are provided on the Corrective Action Branch Map and can be found at the following website:
https://deq.nc.gov/about/divisions/waste-management/ust/corrective-action

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 up to the maximum rates allowed for these tasks is provided in the current version of the Reasonable Rate Document.

The State Trust Fund is authorized under Chapter 143, Article 21, Part 2a of the NCGS, and is regulated under Title 15A of the NCAC, 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 919-707-8200.

1.2 Statutory and Regulatory Background

The Department of Environmental Quality (DEQ or Department) has the authority to regulate the response to petroleum releases and does so through the Underground Storage Tank (UST) Section of the Department's Division of Waste Management (DWM). This regulatory authority and the responsible party's obligations to address a petroleum release are defined in 15A of the NCAC, under Subchapters 02L and 02N. In addition to petroleum releases, the UST Section is tasked with overseeing remediation of releases from hazardous substance UST systems under 40 CFR §280.60 and NCGS §143-215.78 Oil pollution control program. These NCGS state that the Department shall establish an oil pollution control program for the administration of this Article (Article 21A. Oil Pollution and Hazardous Substances Control Act (OPHSCA)). The rules establish criteria and standards that include the requirements and procedures for permanently closing UST systems, investigating suspected releases, and performing initial response and abatement actions for petroleum UST, petroleum non-UST and non-petroleum UST releases.

The Oil Pollution and Hazardous Substance Control Act (OPHSCA, NCGS §143-215.94A(10)**)** defines the term **'***petroleum*' or *'petroleum product'* as being crude oil or any fraction of crude oil that is a liquid at standard temperatures and pressures, including blended motor fuels that include alcohol, and excluding anything that would be defined as a 'hazardous substance' covered under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), or a 'hazardous waste' covered under the Resource Conservation and Recovery Act of 1976 (RCRA).

De minimus concentration - is defined in 15A NCAC 02N .0203 as the amount of a regulated substance that does not exceed one percent of the capacity of a tank, excluding piping and vent lines.

The term '*oil*' is defined by OPHSCA (NCGS §143-215.77(8)) as any type of oil or 'liquid hydrocarbon' commonly used as fuel for motor vehicles or heating, oil used for lubrication, oil refuse and sludges, and petroleum-related products, by-products, or mixtures with other substances, etc. Common petroleum substances include the following:

- Motor fuels
- Jet fuels
- Distillate fuels oils
- Residual fuel oils
- Lubricants
- Petroleum solvents (Stoddard solvent, Varsol™ mineral spirits, naphtha)
- Automatic transmission fluid
- Used oils

If the substance released is not naturally occurring (or is naturally occurring but exceeds the naturally occurring standard), it must comply with the assessment and corrective action requirements of 15A NCAC 02L .0106.

Petroleum releases from USTs and other non-UST sources are governed by the North Carolina Environmental Management Commission (EMC) per the OPHSCA, as incorporated in Article 21A of Chapter 143 of the NCGS (§§143-215.75 through 143-215.104AA).

1.3 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 02N, specifically petroleum (including but not limited to gasoline, diesel and used/waste oil) or a hazardous substance (to be considered a hazardous substance, it must be included on the EPA list called the Consolidated List of Lists). The following common systems are considered to be hazardous substance USTs and are regulated if greater than 110 gallons:

- Ethylene glycol
- Naphthalene
- Alcohols including allyl alcohol (2-propen-l-ol, 1-butanol (n-butyl alcohol, Iso butyl alcohol (2 methyl-1-propanol, and methanol (methyl alcohol)
- Tetrachloroethene (Perchloroethylene, "perc", or PCE)
- Trichloroethene (TCE)
- Hexane
- Formaldehyde

Because hazardous substance USTs are regulated, they are subject to tank fees. Because they do not contain petroleum products, they are not eligible for the Leaking Underground Storage Tank Trust Fund.

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 02N .0203, and examples of regulated and non-regulated USTs are presented in **Table 23**.

1.4 Commercial USTs vs. Noncommercial USTs

Tanks are further designated as either "commercial" or "noncommercial". A "commercial UST" is defined in 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 petroleum tanks must also be *commercial* tanks, while all *noncommercial* petroleum 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 02N, there are other requirement 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.

1.5 Hazardous Substance UST Releases Overview

Hazardous substance UST releases are subject to the initial response and abatement, assessment and corrective action requirements of both 15A NCAC 02N .0700 and 15A NCAC 02L .0106. The responsible party for a hazardous substance UST release is required to:

- Submit a *UST-61 - 24-Hour Release and UST Leak Reporting Form* to report the release;

- Prepare and submit at 14-days a *Free Product Recovery Report*, if necessary;
- Prepare and submit a *20-Day Report* to report progress of initial actions;
- Prepare and submit a *45-Day Report* to report preliminary assessment and receptor information;
- Prepare and submit a *Comprehensive Site Assessment (CSA) Report* and
- Prepare and implement a *Corrective Action Plan (CAP)* to address contamination.

(See **Appendix A** for report formats).

If cleanup is achieved the responsible party may request a No Further Action determination at any point. The most stringent cleanup levels may apply to hazardous substance releases (even if comingled with a petroleum UST release). Therefore, groundwater contaminated by hazardous substance releases should be cleaned up to the groundwater quality standards in 15A NCAC 02L .0202 and soil should be cleaned up to levels protective of groundwater quality, the soil to groundwater MSCCs (See **Table 1**).

However, in accordance with NCGS §130A-310 , risk-based remediation is available for hazardous substance releases (). Risk-based remediation is allowed as a cleanup option at contaminated sites where the use of remedial actions and land-use controls can reliably ensure that affected properties are safe for their intended use. In addition to DEQ's Underground Storage Tank, Dry Cleaning Solvent Cleanup Act, and the Pre-Regulatory Land Fill Programs, risk-based remediation can now be considered in all DEQ environmental cleanup programs, except those subject to remediation pursuant to the Coal Ash Management Act of 2014 and the requirements of animal waste management systems. Any responsible party seeking to conduct risk-based assessment and cleanup efforts at hazardous substance sites should follow the guidance offered by the Department at: https://deq.nc.gov/permits-regulations/risk-based-remediation.

Other state agencies also responsible for overseeing remediation of these types of releases are provided in **Appendix E** of the *Comprehensive Appendices for Corrective Action Guidelines*.

TA single flowchart summarizing the regulatory requirement for hazardous substance (regulated non-petroleum) UST releases is presented in **Figure 6.**

1.6 Non-Regulated Non-Petroleum UST Releases (Expand this discussion)

Non-regulated, non-petroleum UST releases are subject to the initial response and abatement requirements of 15A NCAC 02L .0106. Non-regulated non-petroleum UST releases (e.g., , vegetable oil, or propylene glycol UST releases) are subject, if the substance released is not naturally occurring (or is naturally occurring but exceeds the naturally occurring standard), to comply with the site assessment and corrective action requirements of 15A NCAC 02L .0106. Non-petroleum products, such as ethanol or other alcohol fuels, that are denatured by petroleum products alters the classification of the UST system. Denatured alcohol products used as motor fuels are classified as petroleum regulated UST systems**.** For these denatured product tanks, the responsible party should contact the Corrective Action Branch of the UST Section for site specific guidance.

The responsible parties must take immediate action to terminate and control the release, mitigate any hazards resulting from exposure to the pollutants or from fire, explosion, or vapors; determine and remove, treat, or control primary and secondary pollution sources. The responsible party is required to perform assessment and submit a contamination assessment and to submit and implement corrective action to address contamination. More detailed guidance for action at non-regulated non-petroleum UST releases is not provided as such guidance is contaminant specific. The responsible party should contact the Corrective Action Branch of the UST Section for specific guidance. Some non-regulated non-petroleum UST releases (e.g., hazardous waste UST releases) do not fall under the regulatory authority of the UST Section; **Appendix E** provides a list of the appropriate agencies to contact.

1.7 Petroleum Non-UST Releases

For a petroleum release from a non-UST source, the scope of work defined in 15A NCAC 02L .0504 is similar to the requirements for commercial USTs (See **Figure 7**). **Within 24 Hours** of the discovery of a non-UST petroleum release, the responsible party must comply with the release response requirements of 15A NCAC 02L .0504(1). In accordance with the NCGS §143-215.85(b), a release is reportable when:

- the volume of the petroleum that is discharged is 25 gallons or more
- the petroleum causes a sheen on nearby surface water
- the petroleum is discharged at a distance of 100 feet or less from any surface water body
- the volume of the petroleum that is discharged is less than 25 gallons and is not cleaned up within 24 hours

Within 20 days of the discovery of a non-UST petroleum release, the responsible party must provide the Department with information about the ongoing response in a progress report called a *20-Day Report*. At a minimum, this information must include a description of the incident response, site history, results of the abatement measures taken to that point, and steps taken to evaluate whether additional actions are required.

Within 90 days of discovery of a non-UST petroleum release, an *Initial Abatement Report* must be provided to the Department that details information gained from the initial investigation and assessment efforts and reports the results of the initial abatement actions.

Within 120 days of discovery of a non-UST petroleum release, the responsible party must submit the *Limited Site Assessment Report* to the appropriate regional office of the Corrective Action Branch of the UST Section for a release that has not been fully remediated during initial abatement. The *Limited Site Assessment Report* format is presented in the *Assessment Guidelines*.

2.0 UST Site Check Guidelines for Regulated UST Systems

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 02N .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 02N .0602, if the UST system is suspected to be the source of a release that is discovered off site.

2.1 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 if:

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:
    a. 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.
    b. **this applies even where tightness test results for the UST system are within acceptable parameters;**
2) the applied method of leak detection indicates a suspected release and a follow-up tightness test confirms that result; and/or
3) 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 for information about reimbursement.

2.2 Site Check Requirements

In accordance with 15A NCAC 02N .0703 and .0704, site check procedures must include:

1. soil samples 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 **Section 3.7.2:** Removal of UST(s) underlain by a concrete pad;
2. one soil sample collected in native soils under any catchment basin at the fill port for each UST, as described in **Section 3.7.6,** to document overfills;

3. soil samples collected in native soils 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 **Section 3.7.6**.

Note that for #2 and #3 above the following applies:

- ***If a component is in direct contact with fill material and not soil fill material, soil samples must be collected from native residual soil beneath the gravel fill.***
- ***In the case of fill port catchment basins (i.e., spill buckets, see Figure 1), when gravel fill and not soil fill material is beneath the basin, a groundwater monitoring well must be installed as close to and downgradient of the spill bucket, if possible. A groundwater sample must be collected and submitted for laboratory analysis, and***
- ***For Spill buckets and other areas requiring groundwater samples: Drilling should not exceed more than 30 feet below the bottom of the source area or area of over-excavation (whichever is deeper, not to exceed 40 feet bgs) without evidence of unsaturated zone soil contamination (e.g., 30 feet below the deepest unsaturated soil contamination) with no more than 20-foot screen into the water table.***
- ***If groundwater is not encountered 30 feet below the deepest unsaturated soil contamination (not to exceed 40 feet bgs), then a groundwater sample may not be necessary. Evidence of soil contamination may include one or more of the following; observation, UVF, PID, and/or olfactory which must be confirmed through TPH testing (UVF or Laboratory Analyses). If the responsible party elects to sample the source area monitoring well soil samples for contaminant specific constituents, then only unsaturated soil samples should be analyzed for contaminant specific constituents.***
- ***If groundwater is not initially present in the monitoring well, check the monitoring wells a week or more after drilling to confirm the presence of groundwater for sampling.***
- ***If groundwater is not present at 40 feet bgs, an unsaturated soil sample can be taken below the base of the gravel angled underneath the UST or continue drilling to encounter groundwater. If TF reimbursement is anticipated drilling footage beyond 40 feet would not be reimbursed.***
- ***All monitoring well boreholes should be logged and soil samples taken for TPH analyses every 5 to 10 feet as required for source area wells and other analytes as appropriate. Drilling should continue to a depth of 30 feet below the deepest unsaturated soil contamination, not to exceed 40 feet bgs.***

4. ***In the case of components that intersect the water table, that are installed on bedrock, surrounded by gravel fill, and/or where required by the UST Section based on other site-specific data, a permanent monitoring well, constructed according to 15A NCAC 02C, 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.***soil samples analyzed by TPH-equivalent methods (EPA 8015 GRO

and/or, 'Typing' UVF for GRO, MADEP VPH: GRO Range, 'Typing' UVF for DRO) as described in **Table 3**, for which the results of can calculated using **Table 10**. Groundwater samples must be analyzed for constituent-specific petroleum and metals analyses, as described in **Table 5**, for which the results of can calculated using **Table 11.** Groundwater samples must also be analyzed for ethanol, oxygenates, and associated degradation products at active facilities.

Oxygenates and degradation products include:

Oxygenates	
Non-Degradation Products	**Degradation Products**
Methanol	Tert butyl alcohol (TBA)
Isopropyl ether (IPE) or diisopropyl ether (DIPE)	1-propanol (propyl alcohol)
Ethyl tert butyl ether (ETBE)	
Tert amyl methyl ether (TAME)	
Amyl alcohol	
Iso amyl alcohol	
Ethyl acetate	
Methyl ethyl ketone (MEK)	
Tert amyl alcohol	

Please note that 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. Also, note that if there are no standards established within 2L, MSCCs, or IMAC, then the PQL becomes the assumed standard.

When onsite screening via 'Typing' UVF is not available during emergency situations at releases where Trust Fund reimbursement is anticipated, the increased costs for a twenty-four-hour turn-around for laboratory analysis of closure and site check samples must be pre-approved.

Analytical costs are to be based only on the soil and groundwater samples required to be taken by the guidelines.

If the results of the site check indicate that:

- soil contamination does *not* equal or exceed the action levels currently set at 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 MSCCs (See **Table 1**). groundwater contamination does *not* equal or exceed the groundwater quality standard established in 15A NCAC 02L .0202, and
- NAPL is not present,

then the results must be reported to the UST Section in a Site Check Report (See **Appendix A**).

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**) 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**. If the three bulleted 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 the action levels currently set at 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 (See **Table 1**). Contact the UST Section Central Office if no MSCC is established),
- groundwater contamination does equal or exceed any 2L Standards, or
- free product is present,

then **initial response and abatement actions, including excavation of contaminated soil, are required.** A flowchart illustrating the requirements for releases discovered during site checks is presented as **Figure 2**.

Initial response actions which are required include submittal of a Form UST-61 - 24-Hour Release and Reporting Form (**Appendix A**) 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.

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 02N .0601 following evidence of an on-site release. 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 02N .0602 following the discovery of off-site contamination that appears to be related to a potential on-site release.

Where reimbursement is anticipated, any discovery of a new release during an eligible Site Check would transition into the Initial Abatement phase, and any findings would be reported within the subsequent Initial Abatement Report.

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 for more information about reimbursement.

3.0 UST Closure

3.1 Regulated 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 02N .0800. These requirements incorporate the federal underground storage tank requirements by reference in accordance with 40 CFR §280.71.

3.2 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, that all soil contaminated in exceedance of the lower of the soil-to-groundwater or residential MSCCs (See **Table 1**) has been removed from that area.

In accordance with 15A NCAC 02N .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. A new or replacement UST system component installed in contaminated soil or free product may result in the required removal of the new or replacement UST system in order to excavate the contaminated soil. For installation guidance please contact the Permits and Inspection Branch of the UST Section.

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.

3.3 Non-Regulated UST Closure Requirements

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 (olfactory, visual, etc.). If there is no evidence of a release and a Notice of No Further Action is needed, soil samples must be collected and submitted to the Department for review to provide proof of a clean closure. For purposes of changing the status of a commercial UST that is registered with the state from current to permanently closed and terminating assessment of annual tank fees, a ***UST-2 Form*** must be submitted to the Permits & Inspection Branch showing that the UST was removed or closed in place (filled with an inert substance).

- For **non-regulated noncommercial USTs,** soil and groundwater samples are not required at the time of closure. Initial abatement 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 6.7** for additional details on this topic.).
- For **non-regulated non-petroleum USTs (USTs e.g. , vegetable oil and propylene glycol USTs, etc.),** soil or groundwater samples are not required at the time of closure UNLESS a release is suspected or has been confirmed (See **Section 6.0** for additional details on this topic).

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

Per 15A NCAC 02N .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 and there is no other evidence of release, then no further action will be required. If a release is determined, then initial response and abatement actions, including excavation of contaminated soil, are required. Flowcharts illustrating UST closure and initial release response and abatement actions for regulated petroleum USTs (**Figure 3**) and for regulated hazardous substance USTs (**Figure 6**) are presented at the end of this document.

A change-in-service or closure notification is required when (see UST-3 form which can be found in **Appendix A**):

- the continued use of a UST system that was previously used to store a regulated substance that is modified to store a non-regulated substance;
- closure by removal or approved in-place closure of a system;

Converting a non-regulated UST system to a regulated UST system, requires bringing existing systems into compliance with current standards. This includes an upgrade or replacement of any component of the system. The Permits and Inspection Branch should be contacted for additional information. An example of a change in service is a UST system that stores ethylene glycol, a regulated substance used for de-icing airplanes, changed to store propylene glycol, a non-regulated substance also used for de-icing airplanes. 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. This includes all notifications and reporting, emptying and cleaning the UST system, and conducting a site assessment. In this situation, 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 02N .0501. Flowcharts illustrating a change-in-service and initial release response and abatement actions for regulated petroleum USTs (**Figure 3**) and for regulated hazardous substance USTs (**Figure 6**) are presented at the end of this document.

If any portion of a tank system (except the vent or fill lines, and dispensers) that is visible above the ground surface or is inside a floored vault it may be considered an aboveground storage tank system.

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 may result in cleanup requirements defaulting to those applicable for aboveground storage tanks and a denial of access to the State Trust Fund.

Please refer to the current version of the Reasonable Rate Document
Per NCGS §143-215.94B(d)(2) and 15A NCAC 02P .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 02N .0602 (see Section 4.3).

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

3.5 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. Effective January 1, 2021, the responsible party must also file a UST-3 Form - Notice of Intent: UST Permanent Closure or Change-in-Service ***(Appendix A) with the appropriate UST Section regional office, 30 days before closure activities begin. The responsible party must also submit a separate copy of the*** UST-3 Form ***to the Permits and Inspection Branch and the Trust Fund Branch at the UST Section Central Office. If there is a previous release on the property, refer to the Reasonable Rate Document (RRD) or contact the appropriate regional office to determine if preapproval of soil excavation activities is required.***

3.6 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) must be removed. In-place closure of USTs associated with a release though filling with an inert solid material may be conducted only with the written approval of the UST Section confirming that 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 or some other unique situation exists preventing removal of a UST). Approval may be granted based on a statement of how the foundation's integrity would be affected. This statement must be provided and sealed by a professional engineer familiar with this type of work.

If a UST is replaced with a new UST, the existing piping and dispensers may continue to be used only if the piping and dispensers meet all applicable requirements of 15A NCAC 02N .0900 and if closure soil samples collected from those areas in accordance with **Section 3.7.6** 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 which can be found in* **Table 1***).* 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. All product, water and sludge generated during the closure activities must be properly stored, labeled, transported, and disposed. 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, and are in violation of 15A NCAC 13B .0201 (Disposal of Solid Waste at a permitted facility) and OPHSCA, as incorporated in Article 21A of Chapter 143 of the NCGS (§143-215.75 through §143-215.104AA). UST, product, water, and sludge manifests must be submitted to the Department as part of the closure report (See **Appendix A**). The responsible party will be held liable for the cleanup of any environmental damage that occurs from improperly disposed UST components, and such work 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, *Closure of* Undergr*ound Petroleum Storage Tanks*. (No free versions available.)
  - Standard 2015, *Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks*.

- Publication 2217A, *Guidelines for Safe Work in Inert Confined Spaces in the Petroleum and Petrochemical Industries*
- Recommend Practice 2219, *Safe Operation on Vacuum Trucks Handling Flammable and Combustible Liquids in Petroleum Service*.
- Recommended Practice 2003, *Protection Against Ignition Arising Out of Static, Lightening and Stray Currents.*

- **National Fire Protection Agency (NFPA)**
  - 70B, *Standard for Electrical Equipment Maintenance* *https://www.nfpa.org/codes-and-standards/nfpa-70b-standard-development/70b*
  - 326, *Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair*. https://www.nfpa.org/codes-and-standards/nfpa-326-standard-development/326
  - 327, *Standard Procedures for Cleaning or Safeguarding Small Tanks and Containers* https://www.nfpa.org/product/nfpa-327-standard/p0327code
- **The National Institute for Occupational Safety and Health**,
  - *Criteria for a Recommended Standard: Working in Confined Spaces*.
  - https://www.cdc.gov/niosh/docs/80-106/default.html
  - https://www.osha.gov/confined-spaces
- **Occupational Safety and Health Administration**
  - 29 Code of Federal Regulations Part 1910 (Occupational Safety and Health Standards). https://www.osha.gov/laws-regs/regulations/standardnumber/1910/

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 prior to the start of any work onsite (See Section 5.0 and Section 7.0). The excavation of soil in the proposed corrective action footprint, separate from any ineligible tank removal area footprint also requires preapproval.,

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 6.0 and 7.0 below. This also applies for any surface spill or overfill release discovered in the shallow soils, including those in soils located immediately above any system component.

3.7 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. Soil samples must be collected in non-gravel backfill beneath spill buckets or in "native" soil beneath all other UST system components.

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.

Pursuant to NCGS §143-215.94E, if evidence of a release is detected, reasonable efforts should be made to **remove** contamination and restore the condition of the property in that area to pre-release conditions**.**

3.7.1 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 **Section 3.7.6**. (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 from 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

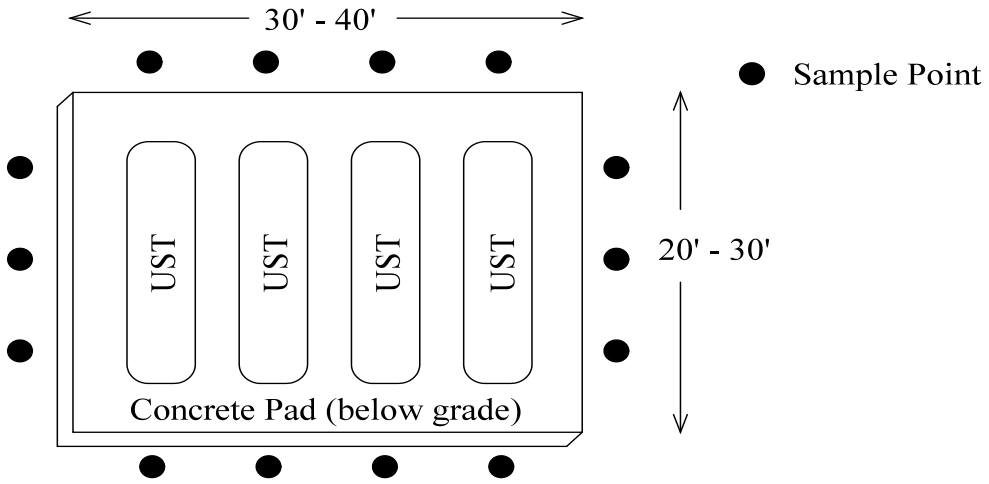
3) The UST Section may direct that a permanent monitoring well, constructed according to 15A NCAC 02C Well Construction Standards, be installed in the pit or, if that is not technically possible, as close as possible to and within 5 feet of the UST(s) in a downgradient direction (and/or under product 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 **Sections 3.7.4** and **3.7.5** below for information on high water table or bedrock tank sites, respectively.)

3.7.2 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 **Section 3.7.5**; 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 02C 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**.

3.7.3 In-Place Closure (or Change-in-Service) of USTs

The UST Section may provide written approval for in-place closure of USTs after receipt of a sealed statement from a professional engineer licensed to make structural determinations that the

assessment and cleanup of the release will not require system removal, or that system removal would otherwise be unreasonable or impracticable. DEQ may not concur with the professional engineer's recommendation for in-place closure. In those cases, a discussion with the regional office will be necessary to resolve the issue. Only those USTs which are determined to be inaccessible (i.e., located under or in close proximity to substantial structures such as buildings) will be approved for in-place closure. Note that non-structural items such as dispenser islands or canopies do not constitute substantial structures for these purposes.

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 **Section 3.7.2**, 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 beneath the fill port/spill bucket of each UST to document overfills. No sample is required when pea gravel is present beneath the spill bucket;
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 **Section 3.7.6** (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 15A NCAC 02C 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 7** and **9;** 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 to facilitate sampling directly under the UST is hazardous. If this procedure is performed, all applicable safety measures should be observed, subject to compliance with all federal, state and local requirements, and with approval of the local fire marshal.

3.7.4 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 **Section 3.7.6**; and

3) A permanent monitoring well, constructed according to 15A NCAC 02C 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 5 and 7**. *Pit water grab samples will not be accepted.*

3.7.5 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

If soil samples cannot be collected beneath the tanks due to the presence of bedrock, soil samples must be collected in the sidewalls of the excavation immediately above the bedrock. 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) 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 **Section 3.7.6**; and,

3) Permanent monitoring well, constructed according to 15A NCAC 02C 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 7 and 9**. 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.

3.7.6 Sampling Under Product Lines, Dispensers or Dispenser Islands, and Fill Ports or Spill Buckets during UST Closure or Change-in-Service

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 overfill 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 **Section 3.7.4** above.

3.8 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 the current action levels of 50 mg/kg TPH GRO or 100 mg/kg TPH DRO (*or, where tested, the soil-to-groundwater MSCCs found in **Table 1**, or the PQL 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 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 Version B* (**Appendix A**), 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 the current action levels of 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 found in **Table 1**, or the PQL 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 Report* (Appendix A), must be submitted instead. The *Initial Abatement Report* incorporates the requirements of the *UST Closure Report*, as previously described, and also presents post-excavation soil assessment information required under 15 NCAC 02L .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 or by contacting the UST Section Permits and Inspection Branch at 919-707-8200.

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 found in **Table 1** (*or the PQL 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 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 Version B* (**Appendix A**), 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 of the UST Closure Report to the Permits and Inspections Branch, if required by a UST inspector). See note below for further information regarding the submittal of the UST-2 Form.

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

- soil contamination does equal or exceed any soil-to-groundwater MSCCs (See **Table 1**) (*or the PQL 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, and 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://deq.nc.gov/about/divisions/waste-management/ust/pib) or by contacting the UST Section Permits and Inspection Branch at 919-707-8200.

3.9 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 (olfactory, visual, etc.).

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 3.0** for regulated UST closure *do* apply, as do initial response and abatement action requirements, including excavation (**Sections 5.0**). 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 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 3.7.**

To close a nonregulated noncommercial petroleum UST incident without land use restrictions, you must comply with the assessment and reporting requirements of 15A NCAC 2L .0405 within the timeframes specified. You must provide proof demonstrating that soil contamination is below the lower of the residential or soil to groundwater MSCCs referenced in 15A NCAC 2L .0411, and groundwater contamination is below the groundwater quality standards established in 15A NCAC 2L .0202. Contact the applicable regional office of the Corrective Action Branch of the UST Section for additional guidance, if needed.

4.0 Initial Response and Abatement Actions

4.1 Initial Response and Abatement Requirements

See **Section 6.0** *for additional actions and report requirements.*

Regulated USTs

- For **regulated, commercial petroleum USTs (e.g., gasoline or diesel USTs, etc**.), the responsible party is required to comply with the release response requirements of 15 NCAC 02N .0702, .0703, and .0705, and 15 NCAC 02L .0404(1), and thus perform specific initial response and initial abatement actions, including excavation of contaminated soil.
- For **regulated hazardous substance USTs (e.g., halogenated solvent USTs, etc.),** the responsible party is required to comply with the release response requirements of 15A NCAC 02N .0702, .0703, and .0705**,** and thus to perform specific initial response and initial abatement actions, including excavation of contaminated soil.

Non-Regulated USTs:

- For **non-regulated, commercial petroleum USTs (e.g., heating oil USTs greater than or equal to 1,100 gallons)**, the responsible party is required to comply with the release response requirements of 15A NCAC 02N .0702, .0703, and .0705, and 15 NCAC 02L .0404(1), and thus perform specific initial response and initial abatement actions, including excavation of contaminated soil.

- For **non-regulated noncommercial petroleum USTs (e.g., heating oil USTs less than 1100 gallons and meets the defintion of a non-regulated tank described in Section 1.3)**, 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. The responsible party is required to comply with the initial response and initial abatement action requirements of 15A NCAC 02N .0702, .0703, and .0705, and 15 NCAC 02L .0404(1), when specifically directed to by the Department based upon the risk posed by the release.
- For **non-regulated non-petroleum USTs (e.g., alcohol, vegetable oil, or propylene glycol USTs , etc.),** 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 15 NCAC 02L .0106, and thus perform initial response and initial abatement actions.

  More specific procedural guidance 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) 707-8200. 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 (see Appendix **E**). *A flowchart illustrating the requirements for releases from non-regulated non-petroleum USTs is presented as* ***Figure 6****.*

.

Non-petroleum products, such as ethanol or other alcohol fuels, that are denatured by petroleum products alters the classification of the UST system. Denatured alcohol products used as motor fuels are classified as petroleum regulated UST systems**.** For these denatured product tanks, the responsible party should contact the Corrective Action Branch of the UST Section for site specific guidance at (919) 707-8200.

4.2 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 02N .0702 and/or 15A NCAC 02L .0404(a) **within 24 hours** of the discovery of a release. 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).

Non-regulated Noncommercial USTs: For discharges and releases from non-regulated noncommercial USTs, the responsible party is required to comply with the reporting requirements 15 NCAC 02L .0404(b) **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).

Petroleum releases from non-UST sources: For petroleum discharges and releases from aboveground storage tanks and other non-UST sources, the responsible party must comply with the release response requirements of 15 NCAC 02L .0504(1) **within 24 hours** of the discovery of the release.

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 for information regarding eligibility and documentation requirements related to the emergency response.

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

4.2.1 24-Hour Release Report

This notification is required for *all* UST releases and non-UST petroleum 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 (See **Table 1**). Any detection above the PQL is reportable.

Regulated and Non-regulated Commercial USTs: 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 commercial UST system, the suspected release must be reported to the UST Section **within 24 hours**, per 15A NCAC 02N .0601. The responsible party for a UST release must complete *Form UST-61 - 24-Hour Release and UST Leak Reporting Form* (**Appendix A**) and submit the form to the appropriate regional office of the Corrective Action Branch of the UST Section and a separate copy to the Permits and Inspections Branch , 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.

Non-regulated Noncommercial USTs: 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 a noncommercial UST system, the suspected release must be reported to the UST Section **within 24 hours**, per 15A NCAC 02L .0404(b). The responsible party must complete *Form UST-61 - 24-Hour Release and UST Leak Reporting Form* (**Appendix A**) and submit the form to the appropriate regional office of the Corrective Action Branch of the UST Section by mail, fax, courier, or email (or transmit the information by phone if other methods are unavailable) **within 24 hours** of release discovery.

Petroleum releases from non-UST sources: Following the discovery of any evidence of a petroleum release (including odor or vapor, free product, stained soil, analytical data indicating contamination of soil or groundwater, etc.) from any AST system or other source (i.e., all types and classifications) the suspected release must be reported to the UST Section **within 24 hours**, per 15 NCAC 02L .0504(1). The responsible party for a non-UST petroleum release must complete *Form UST-62 - 24-Hour Notice of Discharge Form* (**Appendix A**) and submit the form to the appropriate regional office of the Corrective Action Branch of the UST Section by mail, fax, courier, or email (or transmit the information by phone if other methods are unavailable) **within 24 hours** of release discovery.

4.2.2 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.
- submit appropriate reports regarding equipment failures and repairs to the Permits and Inspections Branch (PIB)

The responsible party for a release from a regulated UST (petroleum/commercial and hazardous substance), a non-regulated commercial UST, or a petroleum release from ASTs or other non-UST source 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 release from 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 release.

4.2.3 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 and/or Maximum Contaminant Levels (MCLs), then the sampling results **must be sent immediately** to the appropriate regional office of the UST Section and the responsible party must provide**an emergency alternate water supply to the well user** as a necessary mitigation of an exposure hazard under 15 NCAC 02L .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, a surface water body, and/or seeping from a vertical wall, then NAPL control and recovery s must be commenced **within 24 hours**.

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 02P .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. A failure by the RP 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.

4.2.4 Identification and Mitigation of Fire, Explosion, and Vapor Hazards

The responsible party for all UST types and any non-UST petroleum release 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) risk in adjacent structures may be addressed as presented the most recent version of the *Interstate Technology and Regulatory Council (ITRC) guidance: Petroleum Vapor Intrusion: Fundamentals of Screening, Investigation, and Management* .

4.3 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 15 NCAC 02L .0404(1) and/or 15A NCAC 02N .0703 and .0705.

For discharges and releases from non-regulated noncommercial (petroleum) USTs, no immediate action or initial abatement actions are required **with the exception** of the emergency conditions described in **Section 4.2** unless specifically directed by the Department based on the risk classification.

Initial abatement actions include:

- determination of the source of the release (if not previously identified);
- investigation and removal of free product;
- continued mitigation and monitoring of fire, explosion, and vapor hazards;
- remediation of hazards posed by exposed contaminated soil;

excavation of contaminated soil to the maximum extent possible (**Section 5.0**), followed by confirmation sampling as described in **Section 7.0** and in **Table 3**; and submittal of a *20-Day Report* and *Initial Abatement Report* (**Appendix A**) to the UST Section

If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document for information about reimbursement.

Please note that proper initial abatement efforts associated with a new release at a site with no prior release are exempted from preapproval as an emergency response action under 15A NCAC 02P .0402(b)(9).

If a site has a pre-existing release, initial abatement is not considered to be an emergency response and therefore must receive preapproval based on known site conditions to remain eligible for reimbursement.

Additionally, work conducted at a new release that extends beyond the 90-day initial abatement reporting deadline may not be considered an emergency and may require preapproval to remain eligible for reimbursement.

4.3.1 Completion of Investigation to Confirm Presence of Environmental Contamination and Determine Source of Release

The responsible party for regulated UST and non-regulated commercial UST releases 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 to determine the source of the release. 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.

4.3.2 Investigation and Recovery of Free Product

Regulated and Non-regulated Commercial USTs: Upon release discovery, where required by 15A NCAC 02N .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 report describing the free product recovery system specifications ***(If State Trust Fund reimbursement is anticipated, see below)***.

In this report, the responsible party must evaluate recovery system options and propose a recovery plan which incorporates the most appropriate option. The recovery 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 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 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 to prevent fire or explosion. (See **Section 6.0** for a discussion of reports.)

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 or floor) **within 24 hours** of discovery. Except when directed by the Department based upon other evidence related to incident risk, there is no requirement for the responsible party for a nonregulated 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 (0.01 feet) 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 property 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). The Section may require water supply wells within 150ft be sampled.*

Non-UST Petroleum Releases: The responsible party for a non-UST petroleum release must act to control and recover any petroleum contamination causing an emergency condition (including ponding or running across the ground surface, contaminating a surface water body, or weeping from a vertical wall) **within 24 hours** of discovery as required by OPHSCA (NCGS §§143-215.75 – 143-215.104AA) and supported by 15A NCAC 02L .0504. e However, if measurable NAPL greater than 1/8 of an inch in thickness (0.01 feet) is found in a monitoring well or in an excavation below the water table, and the location of that discovery is within one year of travel to a downgradient water supply well on an adjacent property then an emergency response to the NAPL is required to protect the property owner. (*Note that any impact to a water supply well from a non-UST petroleum release constitutes an emergency that must be addressed immediately, whether it results from either the presence of NAPL or dissolved-phase contamination.)*

If State Trust Fund reimbursement is anticipated, please refer to Section 2.0 Free Product Vapor Recovery Systems in the current version of the Reasonable Rate Document for information about reimbursement.

Please note that an initial NAPL recovery event may qualify as an emergency response (as defined in the Reasonable Rate Document) 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.

An emergency response is also specified in Section 2.0 of the current version of the Reasonable Rate Document described above.

4.3.3 Continued Mitigation and Monitoring of Fire, Explosion, and Vapor Hazards

The responsible party for *all* UST system types and non-UST petroleum releases, 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 **Section 4.2.4** above.

4.3.4 Remediation of Hazards Posed by Exposed Contaminated Soil

Regulated and Non-Regulated Commercial USTs: 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 **Appendix D** for guidance on disposal of contaminated soil from excavations.

Non-Regulated Noncommercial USTs: Although the responsible party for non-regulated noncommercial USTs is not required to perform any initial abatement actions except when 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.

Non-UST Petroleum Releases: The responsible party 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 **Appendix D** for guidance on disposal of contaminated soil from excavations.

If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document for information about reimbursement.

Please note that proper initial abatement efforts associated with a new release at a site with no prior release or a new isolated release (not associated with the previous release) are exempted from preapproval as an emergency response action under 15A NCAC 02P .0402(b)(9).

If a site has a pre-existing comingled release, initial abatement is not considered to be an emergency response and therefore must receive preapproval based on known site conditions to remain eligible for reimbursement.

Additionally, work conducted at a new release that extends beyond the 90-day initial abatement reporting deadline may not be considered an emergency and may require preapproval to remain eligible for reimbursement.

Please also note that, as described in Section 3.6 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.)

4.3.5 Reporting

The final results of the initial abatement actions for a petroleum release (with no preexisting releases on site) must be reported in an *Initial Abatement Report* (**Appendix A**), 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 Assessment Guidelines; 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 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**) should be submitted as part of the *Initial Abatement Report.* The reporting requirements are described in **Section 6.0**, and the outline of the format is presented in **Appendix A**.

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

- soil contamination does *not* exceed the lower of the soil-to-groundwater or residential MSCCs (See **Table 1**),
- 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 Standards,

then no further action will be required.

However, if there are no prior releases on site and the *Initial Abatement Report* indicates that post-excavation:

- soil contamination does equal or exceed the lower of the soil-to-groundwater or residential MSCCs (See **Table 1**) 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 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 *UST Section Assessment Guidelines;* current version.

However, if there are prior releases on site and the ***sampling results*** indicate that:

- soil contamination does equal or exceed the lower of the soil-to-groundwater or residential MSCCs (See **Table 1**) 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 Standards,

then the risk of the site will determine the next actions.

4.3.6 Submittal of 20-Day Report

The responsible party for regulated USTs and non-regulated commercial USTs, and non-UST petroleum releases must submit a 20-Day Report (**Appendix A**) 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). This report should be included in the initial abatement report if possible.

The responsible party for non-regulated noncommercial USTs is not required to perform any initial abatement actions or additional reporting (including the *20-Day Report*) except where directed by the Department based on the risk posed by the site.

4.3.7 Submittal of 45-Day Report (for hazardous substance USTs)

The responsible party for regulated, hazardous substance USTs must prepare and submit a *45-Day Report* to the appropriate regional office **within 45 days** of confirmation of a release. This report documents the results of the free product investigation, a receptor survey and initial site characterization activities. The priority ranking of a non-petroleum UST release will be based on the information in this report.

An extension of the 45-day deadline may be granted upon written request with sufficient documentation. Per 15A NCAC 02N .0704, the Department may consider the following factors:

1. the extent to which the request for additional time is due to factors outside of the control of the tank owner or operator;
2. the previous history of the tank owner or operator submitting the report in complying with deadlines established under the rules;
3. the technical complications associated with an initial site characterization; and
4. the necessity for action to eliminate an imminent threat to public health or the environment.

5.0 Excavation of Contaminated Soil After Petroleum and Hazardous Substances Releases

The following guidance related to initial excavation efforts is required of a responsible party for regulated USTs, non-regulated commercial USTs, non-UST petroleum releases, and hazardous substance UST releases.

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 if he risk classification is determined to be "High" by the Department and/or the responsible party does not wish to record a land use restriction on the deed for incident closure.

5.1 Excavation of Contaminated Soil

The responsible party must comply with the initial abatement requirements in 15 NCAC 02L .0106(f)(2) and (4)(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 15 NCAC 02L .0404 and .0504, and 15A NCAC 02N .0703, (prevention of further migration of the released substance into surrounding soils and groundwater).

5.1.1 Requirements for Excavation

Initial abatement excavation actions should be conducted 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). 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 . Initial abatement excavation needs to be conducted **within the 90-day** initial abatement period.

Upon determining that a new release at a site (where the risk has not been previously determined), excavation is required when soil contaminant concentrations are equal to or greater than the current action levels or appropriate MSCCs (See **Table 1**). The soil samples must be analyzed by the approved (or equivalent) methods listed in **Table 3**. The current TPH action levels are:

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

If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document 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 02P .0402(b)(9). However, for a site with a pre-existing release, initial abatement actions are considered to be corrective action efforts and are not exempted by this rule, and must therefore 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.

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***.***

[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.]

5.1.2 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:

A. Pre-approval not required (See Figure 8). For initial abatement of a new release at a site with no prior release in which the site risk assessment has not been evaluated and the USTs are being permanently removed and are not being replaced, the over-excavation should be limited to the lesser of:

1) all soils above the UST screening limits of 50 ppm TPH-GRO and 100 ppm TPH-DRO, as determined by laboratory or on-site laboratory analysis, safely 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) one of the following thresholds is reached without additional authorization obtained:

a. 533 cubic yards or 800 total tons of soil has been removed for which reimbursement will be requested. (For Example, if 400 tons of soils are removed to facilitate the removal of the UST System and these soils DO NOT meet the UST screening limits, then these soils are not eligible for reimbursement and the 800-ton limit will start with the first evidence of contaminated soils as supported with analytical testing by laboratory or on-site laboratory analysis. If the overburden soils are contaminated, then the 800-ton limit includes these soils); or

b. up to an additional 267 cubic yards or 400 total tons of soil removed with written Incident Manager authorization based on field screening from a lab or mobile lab (UVF, MIP, Mobile GC, etc.) indicating a reasonable likelihood of clean closure (even if clean closure is ultimately not obtained within the allowed limit); or

c. a formally preapproved amount greater than 800 cubic yards / 1200 total tons is reached following Incident Manager and Trust Fund Branch Staff preapproval of additional soils based on field screening from a lab or mobile lab indicating a reasonable likelihood of clean closure (even if clean closure is not ultimately obtained within the preapproved limit).

B. Pre-approval required (See Figure 9). For initial abatement of a new, isolated release at a site with a risk assessment for a prior, non-commingled release elsewhere onsite where the USTs are being permanently closed or do not impede the excavation, the over-excavation should be limited as follows:

1) High or Intermediate Risk –

a. minimum of 100 tons of soil for the first 10,000 gallons of UST volume and then 10 tons per 1,000 gallons thereafter has been removed.

b. up to an additional 50% of the total tons of soil removed in part (a) with written Incident Manager authorization based on field screening from a lab or mobile lab (UVF, Mobile GC, etc.) indicating a reasonable likelihood of clean closure (even if clean closure is ultimately not obtained within the allowed limit); or

c. a formally preapproved amount greater than the sum of part (a) and (b) total tons is reached following Incident Manager and Trust Fund Branch staff preapproval of additional soils based on field screening from a lab or mobile lab indicating a reasonable likelihood of clean closure (even if clean closure is not ultimately obtained within the preapproved limit).

d. In the case where pre-assessment has been conducted, the pre-approved amount.

For Option (b), (c) or (d), the Incident Manager (and Trust Fund Branch staff) 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 is necessary under risk-based closure standards. Soils necessary to remove the USTs that are more than the UST screening limits and cannot be placed back into the excavation may only be reimbursed the cost of transport and disposal.

C. Pre-approval required (See Figure 9). For initial abatement of a new, commingled release at a site with a risk assessment for the prior release where the USTs are being permanently closed or do not impede the excavation, the over-excavation should be limited as follows:

1) High or Intermediate Risk –

a. minimum of 100 tons of soil for the first 10,000 gallons of UST volume and then 10 tons per 1,000 gallons thereafter has been removed.

b. up to an additional 50% of the total tons of soil removed in part (a) with written Incident Manager authorization based on field screening from a lab or mobile lab (UVF, Mobile GC, etc.) indicating a reasonable likelihood of clean closure (even if clean closure is ultimately not obtained within the allowed limit); or

c. a formally preapproved amount greater than the sum of part (a) and (b) total tons is reached following Incident Manager and Trust Fund Branch staff preapproval of additional soils based on field screening from a lab or mobile lab indicating a reasonable likelihood of clean closure (even if clean closure is not ultimately obtained within the preapproved limit).

d. In the case where pre-assessment has been conducted, the pre-approved amount.

For Option (b), (c) or (d), the Incident Manager (and Trust Fund Branch staff) 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 is necessary under risk-based closure standards. Soils necessary to remove the USTs that are more than the UST screening limits and cannot be placed back into the excavation may only be reimbursed the cost of transport and disposal.

D. Pre-approval required. For any release more than 90 days from the discovery of the release: No initial abatement is eligible as the 90-day reporting window from 15A NCAC 2L .0404(3) has expired. Any excavation would require preapproval as a corrective action. (Per Task 2.300)

5.1.3 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 **Section 5.1.2** above for State Trust Fund screening requirements for contaminated soils).

5.1.4 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 TPH DRO (or, where tested, the soil-to-groundwater MSCCs found in **Table 1** 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.

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 current versions of EPA 8260 and/or 8270 and MADEP VPH and/or EPH) as directed in **Table 3**, for which the results of can calculated using **Table 10**. 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). 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. A set of post-excavation confirmation samples must be collected from each excavation at the site. If there are multiple 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. A monitoring well must be installed in the source area and the results included in the *Initial Abatement Report*. If multiple source areas exist, the need for multiple monitoring wells should be evaluated.

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 State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document for information about reimbursement.***
>
> ***For Trust Fund reimbursement, field screening using mobile lab technologies is required to justify authorization or preapproval of any initial abatement excavation beyond the initial eligible volume limits.***
>
> ***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 919-707-8200 for additional information.

5.1.5 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 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 6.0** and the outline of the report format is presented in **Appendix A**.

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

The discharge or release can be classified as Low risk and no further action will be required, if the *Initial Abatement 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 MSCC (**Table 1**), 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 2L Standards, then no further action will be required.

If the *Initial Abatement Report* indicates that:

- soil contamination remains that equals or exceeds the lower of the soil-to-groundwater or residential MSCC (See **Table 1**) 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 Standards,

then the responsible party must perform a Limited Site Assessment (15 NCAC 02L .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 current version of the *UST Section Assessment Guidelines*.

5.2 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 02N .0700 and 15 NCAC 02L .0400 and therefore become subject to the requirements for assessment and cleanup specified therein.

5.2.1 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 6.0** for regulated petroleum USTs. (See flowchart illustrating non-regulated commercial petroleum UST release response in **Figure 4**.)

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**)

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, in an effort to obtain a no further action determination with unrestricted use. The reporting should be as close to the requirements presented in **Section 6.0** as is practicable.

5.2.2 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 MSCC (See **Table 1**), the incident 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 incident 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 continues to exceed the lowest MSCCs, or if groundwater contamination exceeds the 2L Standards , then the responsible party must perform a Limited Site Assessment as described in **Section 6.11**. 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 5.1.4 above.

***** Please be aware as of October 1, 2015 -State Trust Fund reimbursement is no longer available for noncommercial releases.*****

5.3 Excavation of Contaminated Soil from Regulated Non-Petroleum (Hazardous Substance) UST Releases

5.3.1 Requirements, Limits, Sampling, and Reporting for Regulated Non-Petroleum UST Excavations

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 02N .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 6**. (See flowchart illustrating the requirements for regulated hazardous substance UST releases in **Figure 6**.)

The Department Risk-Based Remediation does not use the UST program's risk-based values. Session Law 2015-286 allows risk-based remediation as a cleanup option at contaminated sites where the use of remedial actions and land-use controls can reliably ensure that affected properties are safe for their intended use. In addition to DEQ's Underground Storage Tank, Dry-cleaning Solvent Cleanup Act, and the Pre-Regulatory Land Fill Programs, risk-based remediation can now be considered in all DEQ environmental cleanup programs, except those subject to remediation pursuant to the Coal Ash Management Act of 2014 and the requirements of animal waste management systems. More information can be found on the NCDEQ website at https://deq.nc.gov/permits-regulations/risk-based-remediation.

5.3.2 Post-Excavation for Regulated Non-Petroleum (Hazardous Substance) UST Release Reporting and Actions

For a known or suspected release from an underground storage tank (UST) system a **24-Hour Release and UST Leak Reporting Form** (*UST-61*) should be completed and submitted to the UST Section's regional office. This form is required to be submitted **within 24 hours** of discovery of a known or suspected release (See **Appendix A**).

If groundwater contamination does not exceed the 2L Standards and any remaining soil contamination is below the Soil to Groundwater MSCC (See **Table 1**), the incident may be closed with unrestricted use.

After final excavation, if soil contamination continues to exceed the soil to groundwater MSCCs, or if groundwater contamination exceeds the groundwater quality standard limits, then the responsible party must perform further assessment and corrective actions.

If free product is present, a *Free Product Recovery Report* should be prepared and submitted within 14 days as required by 15A NCAC 02N .0703: This report presents information on free product recovery activities following the initial and any subsequent recovery event.

The RP 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.

The RP must prepare and submit a *45-Day Report* to the appropriate regional office **within 45 days** of confirmation of a release. This report documents the results of the free product investigation, a receptor survey and initial site characterization activities. The priority ranking of a non-petroleum UST release will be based on the information in this report. An extension of the 45 day deadline may be granted upon written request with sufficient documentation (15A NCAC 02N .0704).

The Department will direct additional work if the site is determined to be intermediate or high priority. The RP may proceed to corrective action to pursue unrestricted use, or the RP has the option to utilize the Departments Risk Based Program.

If the site's risk is classified as Low under the Department's risk-based program, and a Notice of Residual Contamination is filed with the Register of Deeds in the county in which the release is located by the responsible party, a no further action determination may be requested from the Department.

5.4 Disposal of Contaminated Soil and Groundwater from Excavations

Excavations may not be back-filled with contaminated soil. As of January 1, 2018, 15A NCAC 2T .1502(4) defines soil as contaminated with petroleum if analytical results from samples collected during the assessment or from the stockpile show the presence of contaminants at concentrations above the soil-to-groundwater or residential MSCC (See **Table 1**), whichever is lower. Therefore, soil is not defined as "petroleum contaminated soil" if concentrations are below the soil-to-groundwater or residential MSCCs, or below the current surrogate TPH Action Levels of 50 mg/kg (TPH-GRO) and 100 mg/kg (TPH-DRO).

Once "petroleum contaminated soil" is excavated, it is considered a waste and must be properly disposed. 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 transported offsite for treatment/disposal, then disposal manifests are required submitted with the applicable report.

Contaminated soil, impacted by non-petroleum contamination, may be considered hazardous waste and must be evaluated and disposed of accordingly. Excavations should 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. Segregated overburden, benching, or other marginal excavated soils that, when properly screened, are not indicative of 'petroleum-contaminated soils' as defined in 15A NCAC 02T .1504, and are not hazardous wastes as defined in 15A NCAC 13A, may be re-used as fill in the excavation from which that soil was removed.

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 must be disposed of according to 15A NCAC 02T .0113, as presented in **Appendix D**.

Please Note: Confirmation of contamination in excess of contaminant levels allowed to remain in situ is to be provided by the analytical results of the truck waste characterization samples.

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

If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document for information about reimbursement.

TPH must be collected from the contaminated soil waste stream at appropriate intervals to document the claimed soil disposal volume. It should accurately represent 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 (1) accessing contaminated soils for excavation (e.g., benching, cover, etc.), (2) managing and disposing of soils contaminated with non-petroleum hazardous wastes, and (3) 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 919-707-8200 for additional information.

Stockpile sampling should be performed at the conclusion of UST closure activities. If the stockpile samples indicate that the soils are not contaminated (as described above), then reimbursement for soil removal and/or purchase of new back fill will not be allowed.

If contaminated soil cannot be weighed because it is being treated or disposed on the site, a North Carolina registered professional surveyor must measure and seal the calculations for the volume of the stockpiled soil or the excavation. The total volume (cubic yards) should be converted to tons by multiplying by 1.5 if excavation was surveyed or 1.25 if stockpile was surveyed. The cost for stockpiling soil must not exceed the cost of transport and disposal. The total tonnage must be documented in order to reimburse for costs associated with excavation during UST closure activities. A surveyor's calculations may not be used in lieu of weight tickets for soils removed from the site for disposal.

6.0 Reporting Requirements

6.1 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**) 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 found in **Table 1** or the MDL if no MSCC is established),
- groundwater contamination does *not* equal or exceed the groundwater quality standard established in 15 NCAC 02L .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 *the UST-2 Form*, should be submitted as part of the *Site Check Report* **(Appendix A)**.

The results of a site check required by the UST Section must be incorporated within the *Initial Abatement Report* (**Appendix A**) if the investigation results indicate that:

- soil contamination equals or exceeds 50 mg/kg TPH GRO or 100 mg/kg TPH DRO for petroleum (or where tested, *such as for regulated hazardous substances,* exceeds the soil-to-groundwater MSCC found in **Table 1** or the PQL if no MSCC is established),
- groundwater contamination equals or exceeds the groundwater quality standard established in 15 NCAC 02L .0202, *or*
- NAPL is present.

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 02N .0601 following evidence of an on-site release. However, reimbursement of some or all investigation costs may be available for a tank owner or operator who is directed by the Department to conduct a site check.

If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document for more information.

6.2 24-Hour Release Leak Reporting Forms

The responsible party must submit a *24-Hour Release Reporting Form* on discovery of a release for any of the following:

- a petroleum release from a regulated or non-regulated commercial UST;
- a hazardous substance (non-petroleum) UST release (i.e., ethylene glycol, TCE, PCE);
- a non-UST petroleum release (i.e., ASTs, roadside spills);
- a non-regulated non-commercial UST release (i.e, residential heating oil UST with a capacity of 1100 gallons or less); or
- A non-regulated, non-petroleum UST release (i.e., propylene glycol, vegetable oil)

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 *UST-61 - 24-Hour Release and UST Leak Reporting Form* (**Appendix A**) must be completed and submitted to the appropriate regional office of the Corrective Action Branch of the UST Section.

Evidence (e.g., odor, free product, stained soil) of discovery of a release from all non-UST petroleum incidents must be reported to the UST Section **within 24 hours**. A *UST-62 - 24-Hour Notification of Discharge Form* (**Appendix A**) must be completed and submitted to the appropriate regional office of the Corrective Action Branch of the UST Section.

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

The responsible party must submit a *Notice of Intent: UST Permanent Closure or Change-in-Service Form* before closure (or a change in service) for (See **Section 3.2** for details):

- a petroleum release from a regulated commercial UST; or
- a hazardous substance (non-petroleum) UST release

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) 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).

6.4 A Free Product Recovery Report

The *Free Product Recovery Report* presents information on free product recovery activities following the initial and any subsequent recovery event whenever the timing is appropriate. This report should be prepared and submitted only when reporting of free product recovery cannot not be achieved within a reasonable time period by incorporation in the *20-Day Report, Initial Abatement Report, Limited Site Assessment Report, Comprehensive Site Assessment Report, Corrective Action Plan, or routine Monitoring Reports*. A separate *Free Product Recovery Report* is required only when a more comprehensive report is not due simultaneously.

6.5 20-Day Report

The responsible party for regulated USTs, non-regulated commercial USTs and petroleum non-UST releases 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. For regulated and non-regulated commercial USTs, this report must not be submitted as separate report after the 20-day limit. The outline of the report format is presented in **Appendix A**.

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 Report within 90 days of release detection, may affect the appropriateness and reimbursement of this report.

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

The responsible party must submit a *UST Closure Report (following UST-12 Format) with a UST-2 Form* documenting clean closure for:

- a regulated commercial UST;
- a non-regulated commercial UST if an NFA is desired, otherwise only the UST-2 is required; or
- a hazardous substance (non-petroleum) UST.

For a clean closure, a responsible party must prepare a *UST Closure Report,* following the *UST-12 Format*, and a *UST-2A (Registered USTs) or UST-2B Form (Unregistered USTs)-Site Investigation Report for Permanent Closure or Change-in-Service of USTs* (**Appendix A**). The closure report must be submitted to the appropriate regional office of the Corrective Action Branch of the UST Section **within 30 days** for a regulated UST or non-regulated commercial UST. The definition of a clean closure is when soil contamination is less than the 50 mg/kg TPH GRO and 100 mg/kg TPH DRO action levels for petroleum (or the soil-to-groundwater MSCC found in **Table 1** for regulated hazardous substance), groundwater and bedrock are *not* encountered in the pit, or groundwater contamination does *not* exceed the 2L Standards where encountered).

*(**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. T. This is necessary to change the permit status to "permanently closed" and prevent the continued accumulation of permit fees.*

To locate the proper inspector for the UST system, please refer to the UST Inspector Assignments Map or by contacting the UST Section Permits and Inspection Branch at 919-707-8200.)

6.7 Closure of a Non-regulated Noncommercial UST

For closure of a non-regulated noncommercial USTs, a responsible party is not required to remove a tank or conduct confirmation sampling. If there is a suspected release, the Department may direct further action based on an evaluation of the risk that would be posed by a release.

If the responsible party requests a *No Further Action* without a deed restriction determination, confirmation sampling must be completed. This sampling should follow the recommended guidance in **Section 3.7** 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.

6.8 UST Closure Report with Release

For a commercial tank closure with a release, a responsible party must incorporate the information for a *UST Closure Report* in the *Initial Abatement Report* following the *UST-12 Format*, and a *UST-2A (Registered USTs) or UST-2B Form (Unregistered USTs) Site Investigation Report for Permanent Closure or Change-in-Service of USTs* (**Appendix A**). The closure report must be submitted to the appropriate regional office of the Corrective Action Branch of the UST Section **within 30 days** for a regulated UST or non-regulated commercial UST. The definition of a release is when soil contamination is more than the 50 mg/kg TPH GRO and 100 mg/kg TPH DRO action levels for petroleum (or the soil-to-groundwater MSCCs for regulated hazardous substance), groundwater and bedrock are *not* encountered in the pit, or groundwater contamination does *not* exceed the 2L Standards where encountered).

*(**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 or by contacting the UST Section Permits and Inspection Branch at 919-707-8200.)

For a tank closure with a release from a non-regulated noncommercial USTs, a responsible party is not required to remove a tank or conduct confirmation sampling. However, if there is a release, the Department may direct further action based on an evaluation of the risk that would be posed by a release (See 15 NCAC 02L .0406).

Noncommercial UST releases are classified as either an acceptable risk (Low) or an unacceptable risk (High) per Session Law 2015-241. If the Department classifies the release as High risk, the responsible party must mitigate the risk to the receptor(s) in order to reduce the risk classification to Low. If a property transfer occurs before a release is mitigated to unrestricted use standards a *Notice of Residual Petroleum* must be recorded on the property in accordance with NCGS §143B-279.11.

For a Low risk release, if the responsible party desires a *No Further Action* determination without land use restrictions, confirmation sampling to show that the release has been remediated to unrestricted use standards must be completed. The sampling should follow the recommended guidance in **Section 3.7** and reporting should follow the general format of the *UST Closure Report*. If unrestricted use standards cannot be achieved, a *Notice of Residual Petroleum* must be recorded on the property to obtain a *No Further Action* determination or prior to a property transfer. Contact the applicable regional office of the Corrective Action Branch of the UST Section for additional guidance.

6.9 45-Day Report (for non-petroleum UST releases only)

The responsible party must prepare and submit the *45-Day Report* to the appropriate regional office **within 45 days** of confirmation of a release. This report documents the results of the free product investigation, a receptor survey and initial site characterization activities. The priority ranking of a non-petroleum UST release will be based on the information in this report. The information required in the report includes the reporting of site check and/or UST closure activities and related assessment; determination of the source and nature of the release; initial abatement actions including free product investigation and recovery, confirmation of groundwater contamination; location of water supply wells, wellhead protection areas, and surface water; potential land use; and any other investigative or remedial activities undertaken soil excavation and post-excavation assessment; and potential receptor and land use information. The format is presented in the **Appendix A**.

An extension of the 45-day deadline may be granted upon written request with sufficient documentation per the requirements in 15A NCAC 02N .0704.

6.10 Initial Abatement Report

The responsible party must submit an *Initial Abatement Report* on completion of initial abatement action **within 90 days** following the date of discovery of release for:

- a petroleum release from a regulated or non-regulated commercial UST or
- a non-UST petroleum release.

The purpose of the *Initial Abatement 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 Report* is intended to fulfill:

- the requirement for regulated UST systems under 15A NCAC 02N .0603 that a report be submitted following a site check;
- the requirement for regulated UST systems under 15A NCAC 02N .0405 that a UST closure report be submitted following closure or change-in service;
- the requirement for regulated and non-regulated commercial UST systems under 15 NCAC 02L .0404 or non-UST petroleum releases under 15 NCAC 02L .0504 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 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**.

The *Initial Abatement Report* presents the assessment results from any site check conducted by incorporating the requirements for a *Site Check Report* (**Appendix A**). It also presents the results

from any UST closure conducted (for regulated systems) following the ***UST-12*** Format and a completed *UST-2A* or *UST-2B* Form - *Site Investigation Report for Permanent Closure or Change-in-Service of USTs* (**Appendix A**). The *Initial Abatement Report* incorporates the results of any free product investigation and recovery actions.

*[See also the note under **Section 6.6** 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 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 MSCCs (**Table 1**), 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 Standards), then the discharge or release can be classified as low risk, and no further action will be required.

Releases from regulated and non-regulated commercial USTs will require a *Limited Site Assessment* if:

- soil contamination remains following the excavation to the maximum extent practicable exceeds the lowest MSCCs (See **Table 1**),
- bedrock or groundwater was encountered in the excavation and no groundwater sampling was conducted (for any reason), or
- groundwater sampling was conducted and contamination exceeds the 2L Standards.

If groundwater or bedrock 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 Report.*

For releases from non-regulated noncommercial USTs, the *Initial Abatement 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, 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 5.2**. Contact the applicable regional office of the Corrective Action Branch of the UST Section for additional guidance.

6.11 Limited Site Assessment Report

The responsible party must conduct a *Limited Site Assessment* on completion of initial abatement actions if soil contamination is not remediated successfully as described below for:

- a petroleum release from a regulated or non-regulated commercial UST or
- a non-UST petroleum release.

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 Standards, then the responsible party must submit a *Limited Site Assessment Report* as described in the **most recent version of the** *Assessment Guidelines*. 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 **Appendix A**. **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.**

In accordance with 15 NCAC 02L .0106 **for releases from non-petroleum USTs, the RP must proceed to the *Comprehensive Site Assessment* as described in the most recent version of the *Assessment Guidelines* (for report format see Appendix A).**

6.12 Other Reports and Actions

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 seeping from a vertical wall. Additionally, if measurable 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.

7.0 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 current version of the *Guidelines for Sampling*. See also Tables 1-10.

8.0 References

American Petroleum Institute Recommended Practice 1604, *Removal an 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

International Air Transport Association. *Dangerous Goods Regulations.* Issued annually. Available on the Internet at http://www.iata.org/publications/dgr/Pages/index.aspx

Leaking Underground Fuel Tank Guidance Manual. California State Water Resources Control Board, September 2012 (Updated December 2015). Available on the Internet at http://www.waterboards.ca.gov/ust/luft_manual.shtml .

Massachusetts Department of Environmental Protection. *Method for the Determination of Extractable Petroleum Hydrocarbons.* May 2004. Available on the Internet at http://www.mass.gov/eea/agencies/massdep/cleanup/regulations/iv-petroleum-hydrocarbon-methods.html

Massachusetts Department of Environmental Protection. *Method for the Determination of Volatile Petroleum Hydrocarbons.* May 2004. Available on the Internet at http://www.mass.gov/eea/agencies/massdep/cleanup/regulations/iv-petroleum-hydrocarbon-methods.html

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

The National Institute for Occupational Safety and Health *Criteria for a Recommended Standard: Working in Confined Spaces,* December 1979. Available on the Internet at https://www.cdc.gov/niosh/docs/80-106/

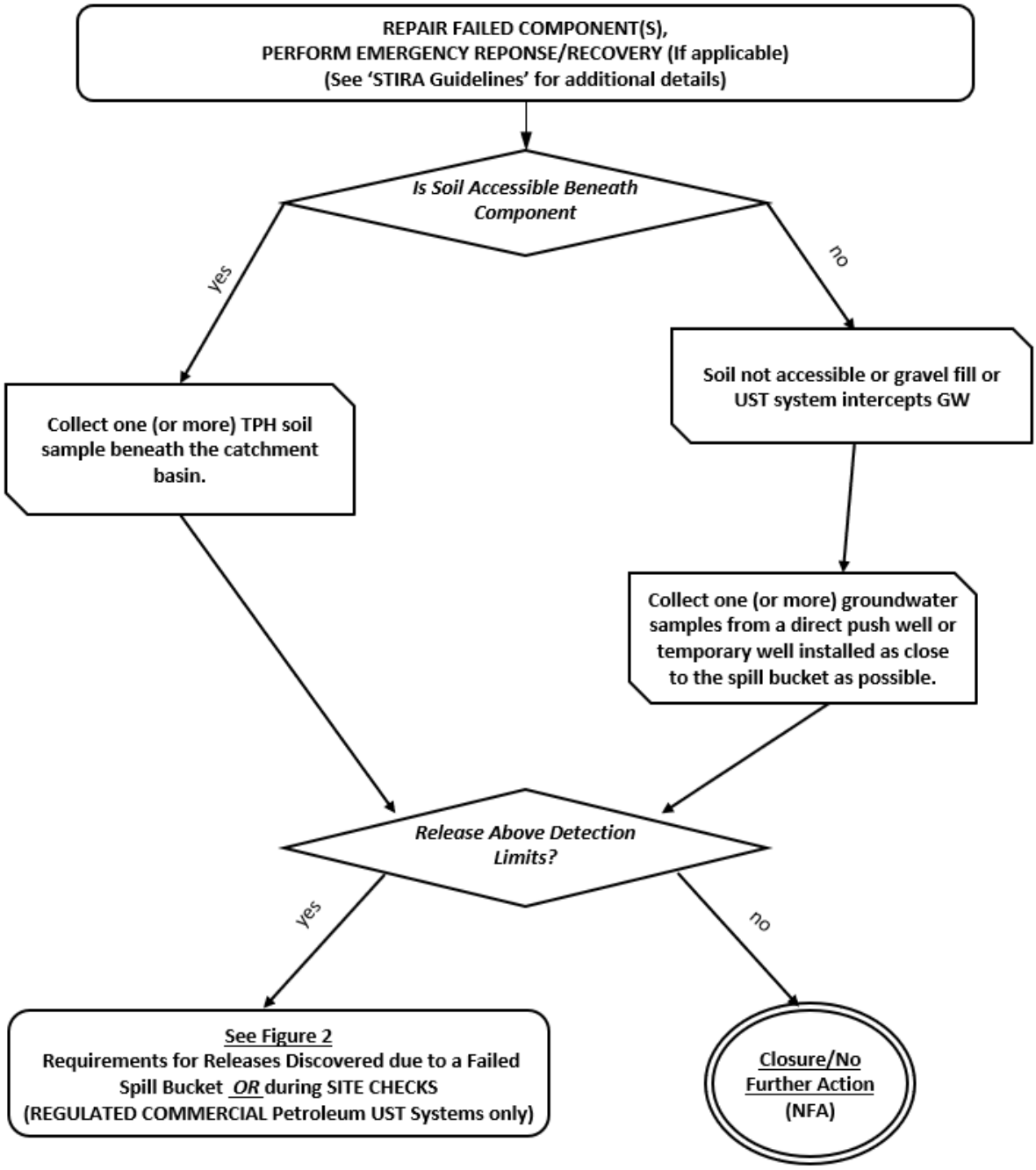
U.S. EPA. *The SW-846 Compendium.* Available on the Internet at https://www.epa.gov/hw-sw846

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

Figure 1

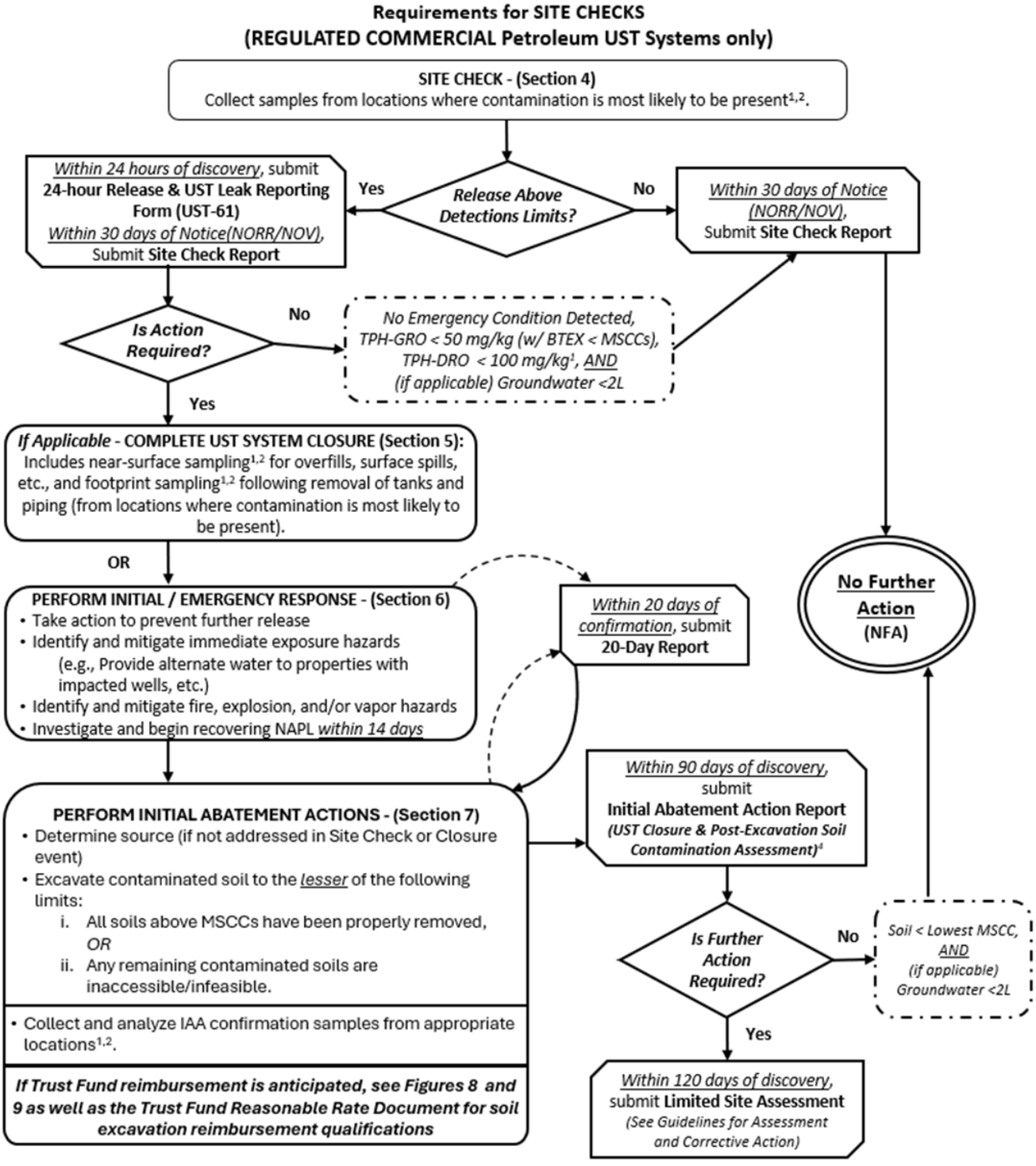
Sampling Requirements for Failed Catchment Basin Tests at Commercial UST Systems



Notes:

1. Catchment Basin: a contained area around the fill pipe designed to catch drips and small spills during fuel deliveries to prevent contamination (also known as spill bucket)
2. See the most recent version of the *Guidelines for Site Checks, Tank Closure, and Initial Response and Abatement for UST Releases (STIRA Guidelines)* for additional Information on locating soil borings and/or groundwater grab locations in proximity to existing tank systems.

Figure 2

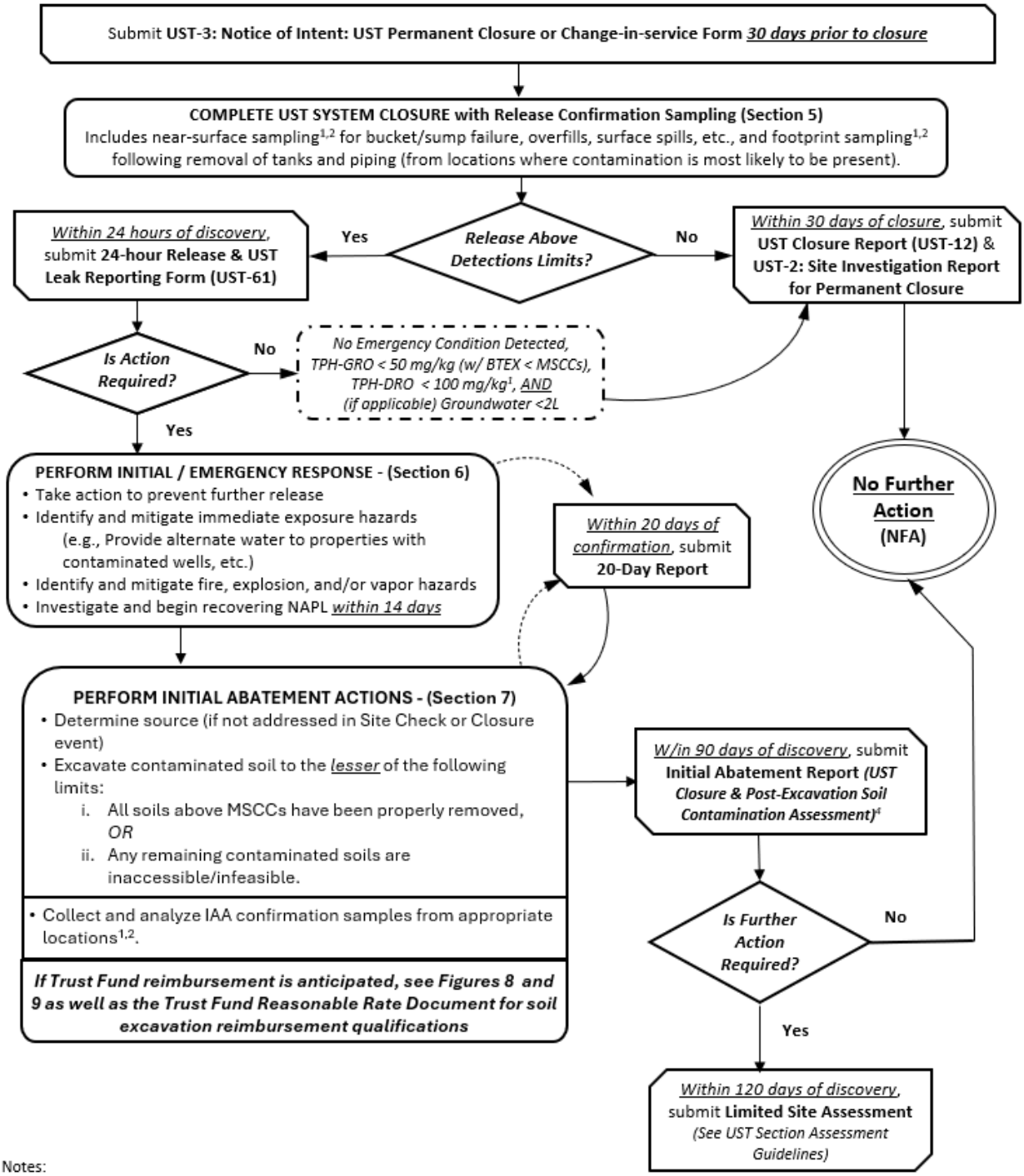


Notes:

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 3

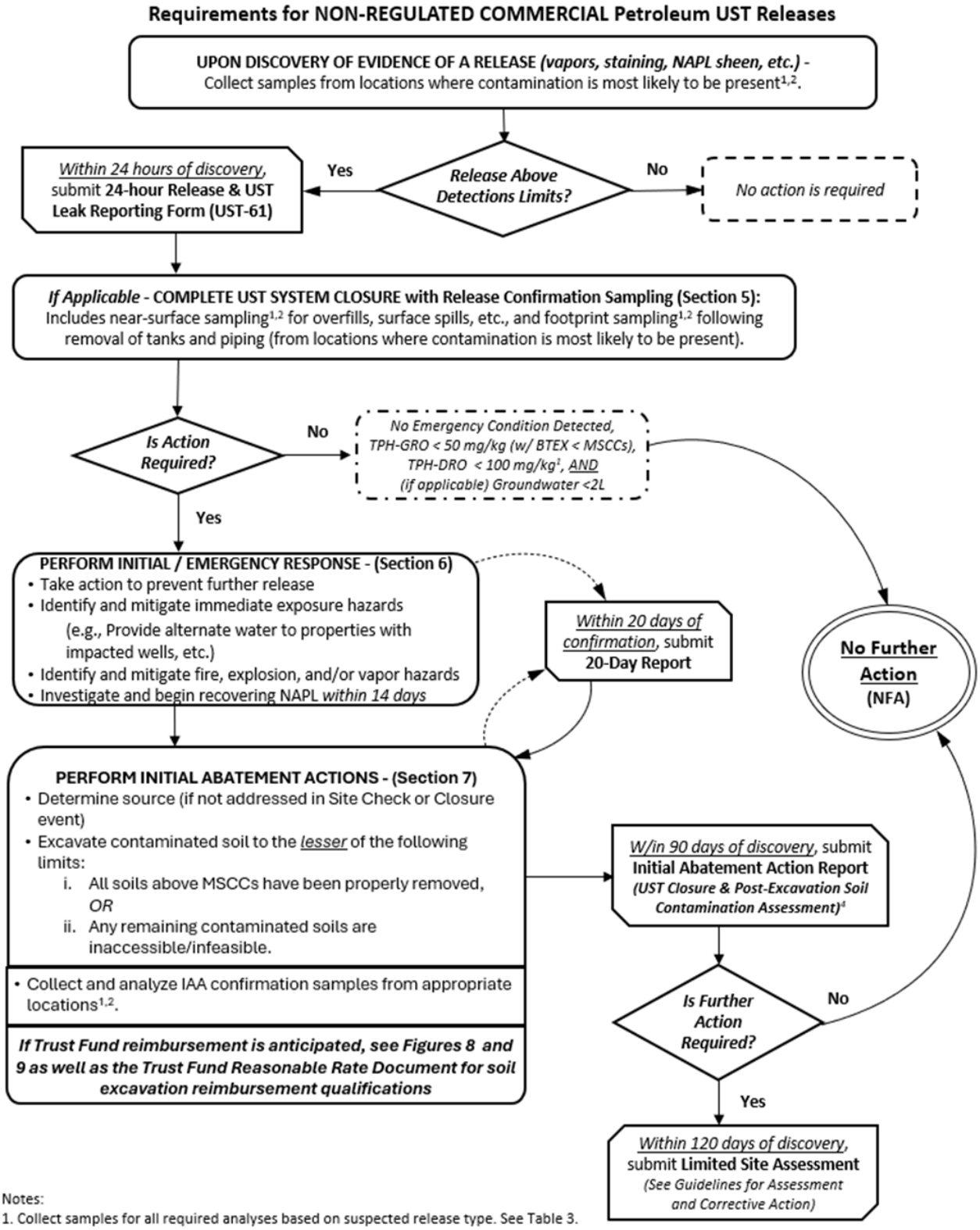
Requirements for Closure (or Change-in-Service) and Initial Release Response and Abatement for REGULATED COMMERCIAL Petroleum UST Systems



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.

Figure 4

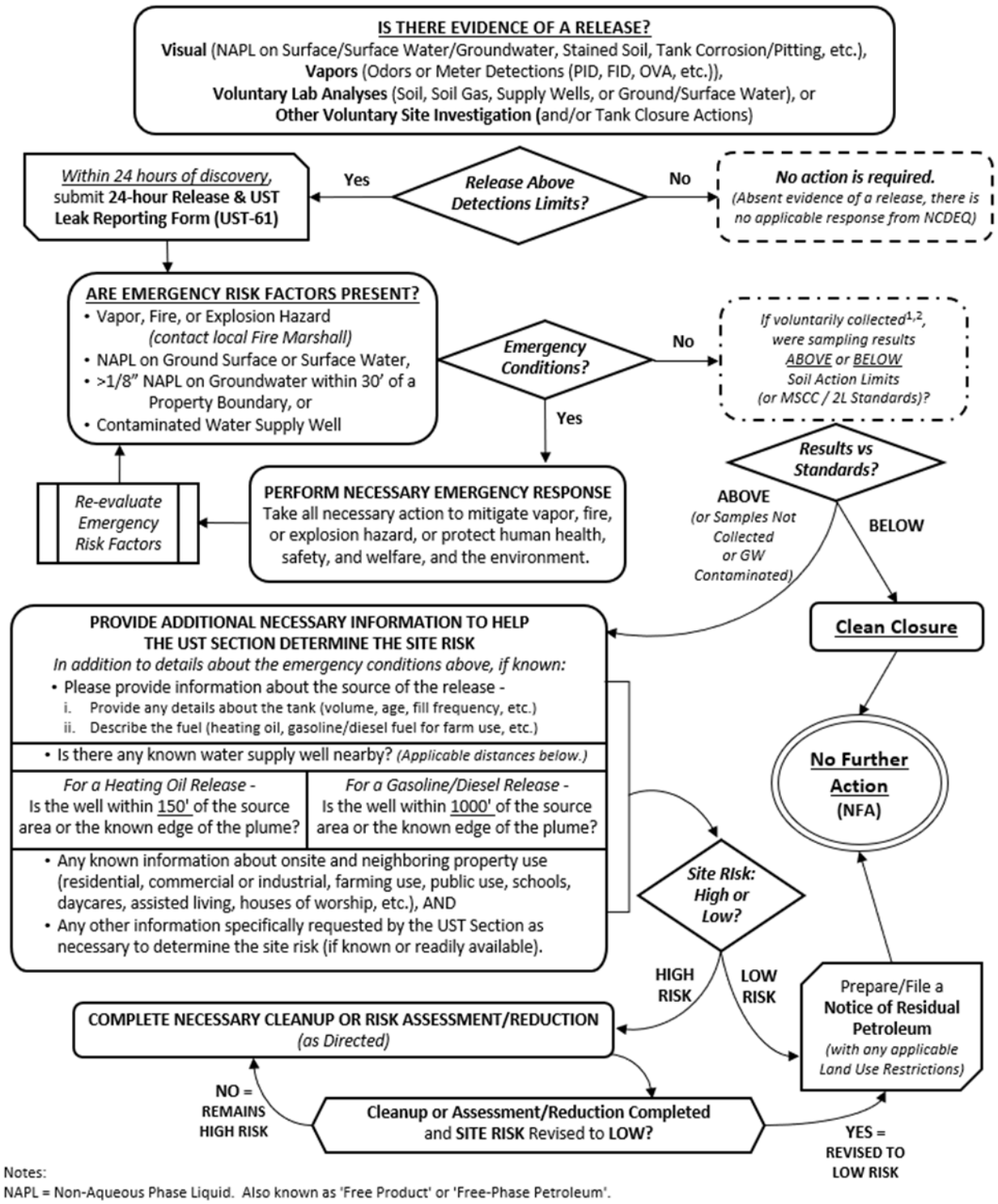


Notes:

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

Requirements for NON-REGULATED NONCOMMERCIAL Petroleum UST Systems



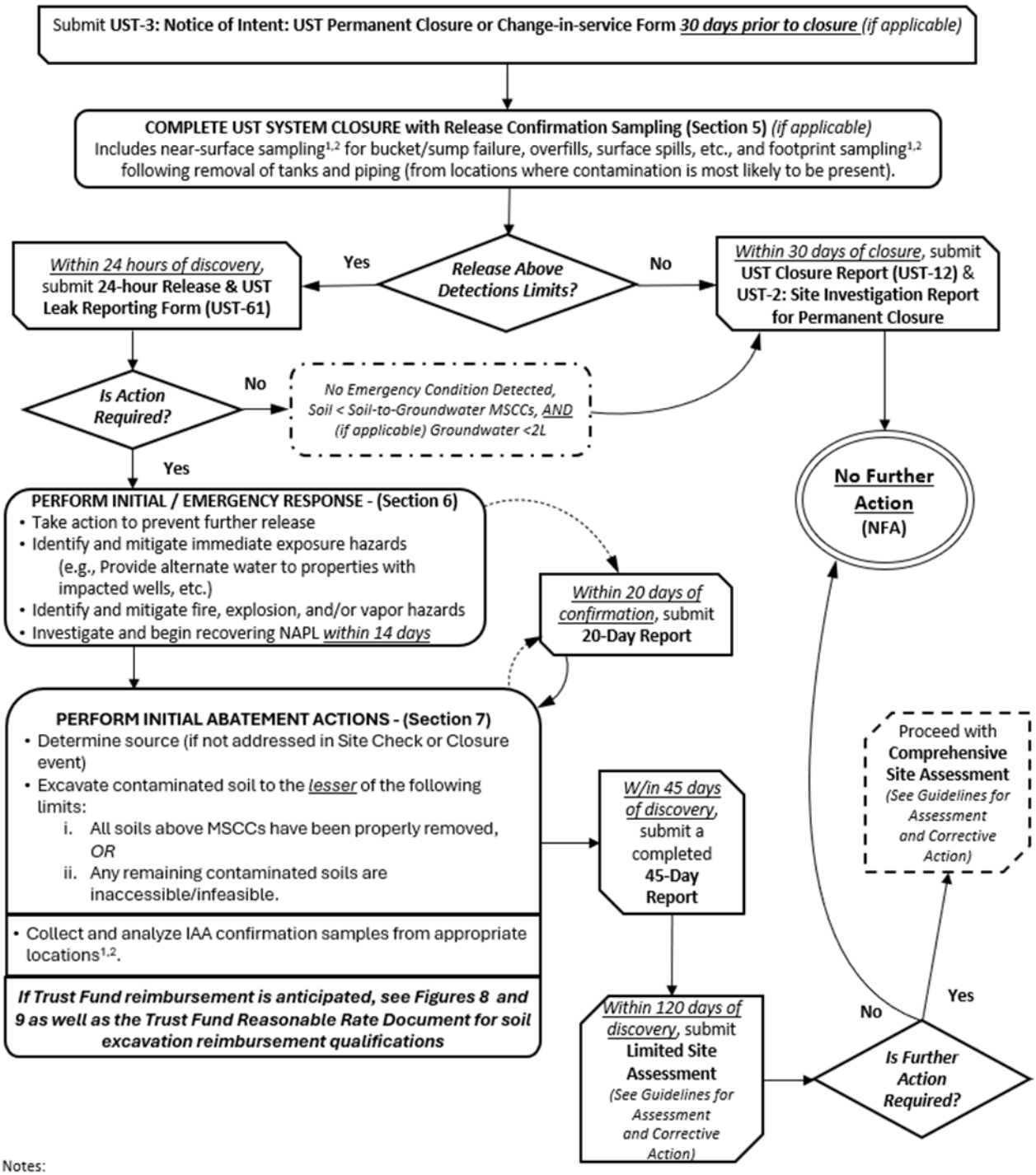
Notes:

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

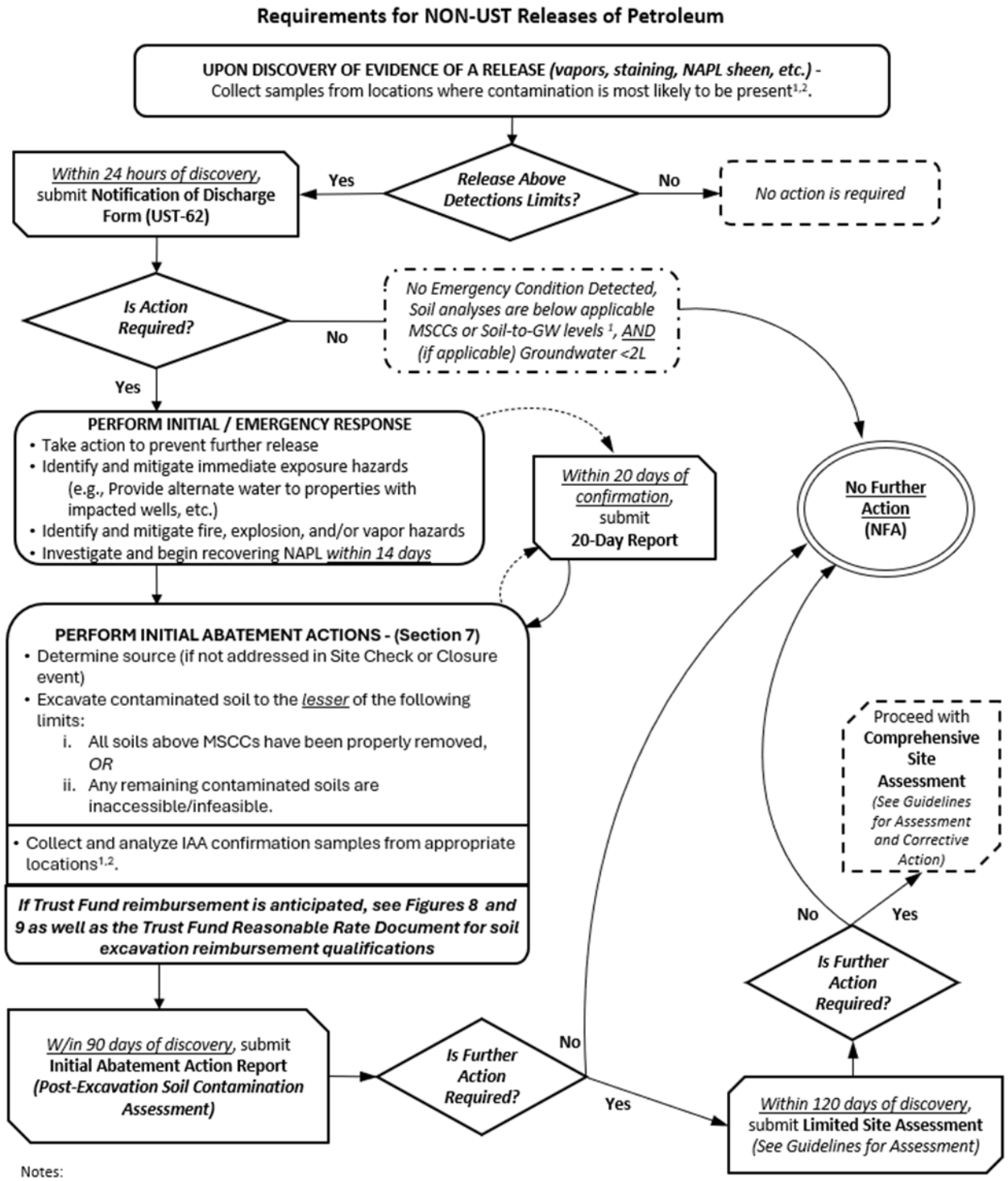
Requirements for Closure (or Change-in-Service) and Initial Release Response and Abatement for REGULATED HAZARDOUS SUBSTANCE UST Systems



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 7

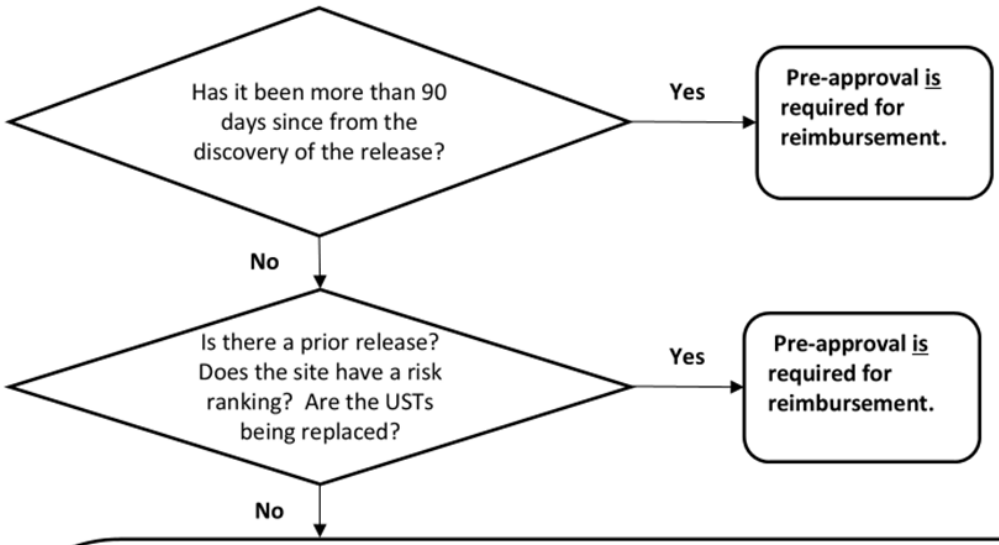


Notes:

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.) may be used.

Figure 8

Soil Excavation for Initial Abatement of a New Release at a Site with No Prior Release AND Unknown RISK AND USTs Being Permanently Closed (or do not Impede Soil Excavation) – Pre-approval Not Required



The over-excavation should be limited to the lesser of:

1) all soils above the UST screening limits of 50 ppm TPH-GRO and 100 ppm TPH-DRO, as determined by laboratory or on-site laboratory analysis; **OR**

2) the point where it is reasonably determined that residual soils cannot feasibly be removed due to obstructions, access issues, or technologically and economically infeasible; **OR**

3) one of the following thresholds is reached without additional authorization obtained:

a. **533 cubic yards or 800 total tons** of soil has been removed for which reimbursement will be requested. (For Example, if 400 tons of soils are removed to facilitate the removal of the UST System and these soils DO NOT meet the UST screening limits, then these soils are not eligible for reimbursement and the 800-ton limit will start with the first evidence of contaminated soils as supported with analytical testing by laboratory or on-site laboratory analysis. If the overburden soils are contaminated, then the 800-ton limit includes these soils); **OR**

b. up to an additional 267 cubic yards or 400 total tons of soil removed with written Incident Manager authorization based on field screening from a lab or mobile lab (UVF, MIP, Mobile GC, etc.) indicating a reasonable likelihood of clean closure (even if clean closure is ultimately not obtained within the allowed limit); **OR**

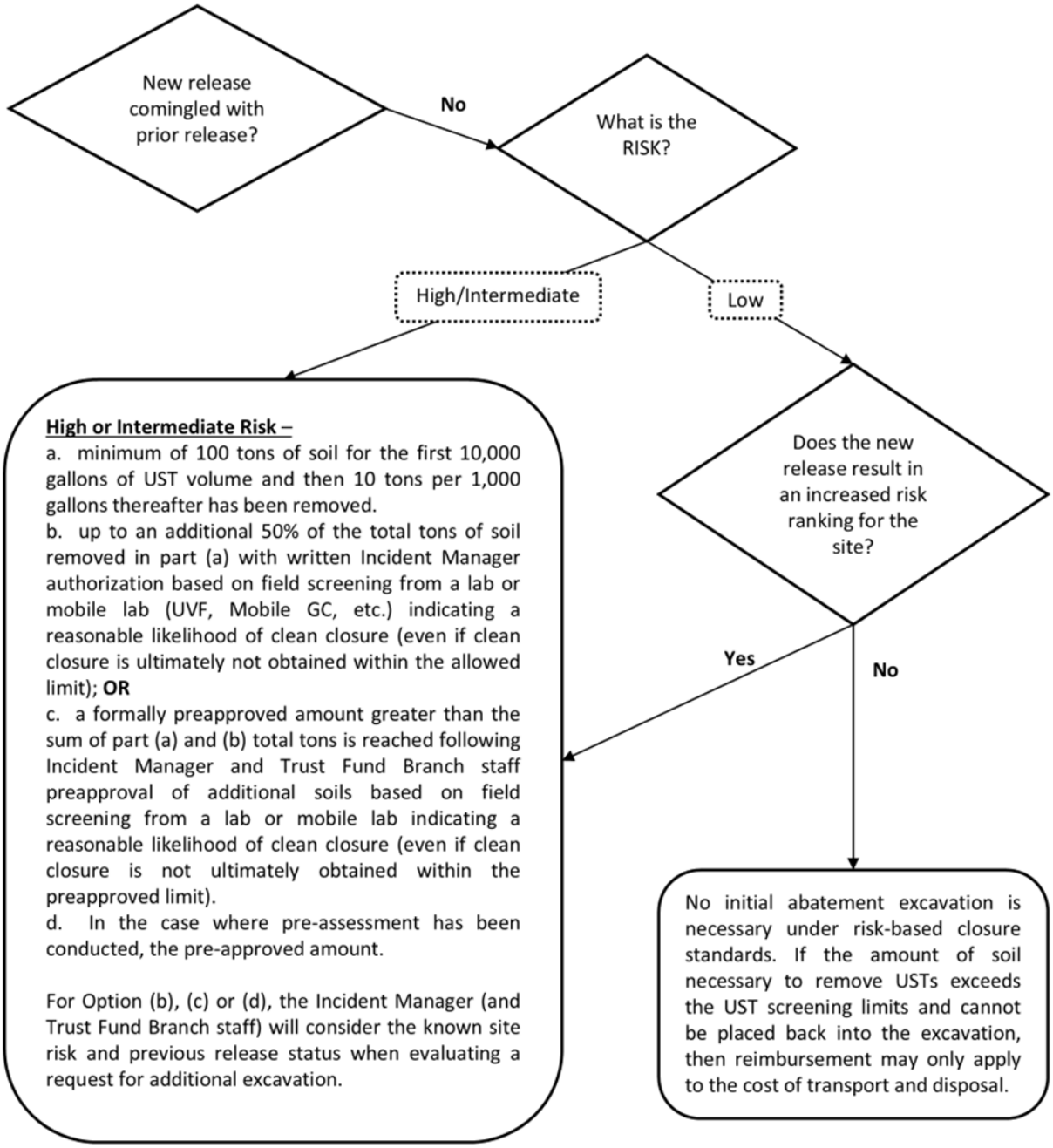
c. a formally preapproved amount greater than 800 cubic yards / 1200 total tons is reached following Incident Manager and Trust Fund Branch Staff preapproval of additional soils based on field screening from a lab or mobile lab indicating a reasonable likelihood of clean closure (even if clean closure is not ultimately obtained within the preapproved limit).

Notes

1. Trust Fund eligibility must be determined prior to claim submittal. Eligibility and reimbursement are only for releases from commercial regulated UST systems. Please see most recent version of the Reasonable Rate Document.

Figure 9

Soil Excavation for Initial Abatement of a NEW ISOLATED OR NEW COMINGLED Release at a Site with a Prior Release, Risk Ranking, AND USTs Being Permanently Closed (or do not Impede Soil Excavation) – Pre-approval Required



Notes

1. Trust Fund eligibility must be determined prior to claim submittal. Eligibility and reimbursement are only for releases from commercial regulated UST systems. Please see most recent version of the Reasonable Rate Document.