

RISC User's Guide Errata Sheet

April, 2001

<u>Chapter/Section</u>	<u>Page</u>	<u>Paragraph</u>	<u>Revision</u>
1/1.2	1-3	4 th para	“No further action (NFA) letters are issued by the LUST Program upon conclusion of permanent closure. Risk-based closure letters are issued for releases addressed under the exposure prevention closure option. ”
3/3.0	3-2		Delete the 5 th paragraph, headed “ <u>Section 3.9</u> ” 6 th paragraph, change “ <u>Section 3.10</u> ” to “ <u>Section 3.9</u> ” 7 th paragraph, change “ <u>Section 3.11</u> ” to “ <u>Section 3.10</u> ”
3/3.1.3	3-4		Change “Appendix 4” to “Appendix 4.2”
Appendix 4.1	A.4.1-4		Benzo(b)fluoranthene, Commercial, change 111 to 110 Xylenes (mixed), Residential, change 290 to 280 Xylenes (mixed), Commercial, change 5,100 to 5,000

February 20, 2003

Please add the chemical Naphthalene to the list of polynuclear aromatic hydrocarbons (PAHs) contaminants to be screened for at High-End Liquid Hydrocarbon Fuels and Hydrocarbon Oils petroleum sites. The list of PAHs currently screened for by IDEM can be found in Appendix 4 of the RISC Users Guide and Appendix 2 of the RISC Technical Guide.

July 16, 2009

RISC total petroleum hydrocarbon guidance was updated on July 16, 2009. Please see the *Announcement of Updates to TPH Remediation Goals and Procedures* available online at http://www.in.gov/idem/files/risc_tph_announce_20090716.pdf for the most current TPH guidance.

September 9, 2009

User's Guide Appendix 4.1, *Chemicals of Concern for Site Contaminated with Petroleum Hydrocarbons*, discontinued. An update to RISC total petroleum hydrocarbon guidance was released on July 16, 2009. Chapter 8 of the RISC Technical Guide now provides the most up-to-date information regarding the chemicals of concern for sites contaminated with petroleum hydrocarbons.

June 2010

User's Guide Chapter 3 *UST, LUST, and ELTF Programs* was corrected for the following: web links in Table 2. *Program Web Sites* were updated, references to Table 7.1 in Chapter 8 of the *RISC Technical Resource Guidance Document* were changed to refer to Chapter 8 only, and some language was removed from section 3.5.1 *Default Subsurface Characterization* to reflect recent changes to IC 13-25-5-8.5. Please see the IDEM document *House Enrolled Act 1162 Interim Implementation Document* at http://www.in.gov/idem/files/risc_head_1162_20091207.pdf for more information related to the amendments of IC 13-25-5-8.5.

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Overview of Chapter 1

- ❖ Introduction
- ❖ RCRA Closure and Corrective Action, Subtitle C
- ❖ LUST Program
- ❖ VRP
- ❖ SCP

1.0 Introduction

In July 1994, the Indiana Department of Environmental Management (IDEM) decided that all of its cleanup programs should work together to develop consistent standards and procedures. As a result, IDEM has developed a comprehensive set of policies known as the Risk-Integrated System of Closure (RISC). RISC is a guidance policy and does not have the force of law; rather, it provides a framework within which to implement the laws and rules governing the remediation of sites in Indiana. RISC represents an extensive effort on the part of IDEM staff and external stakeholders to establish consistent standards across existing remediation programs while at the same time recognizing the unique requirements of each program. Consistent with this goal, RISC consists of two volumes. The [RISC Technical Guide](#) sets forth policies and procedures applicable to all of IDEM's remediation programs.

This User's Guide provides information on the use of RISC within each of the existing remediation programs: the Resource Conservation and Recovery Act (RCRA) Closure and Corrective Action Program, Subtitle C; the Leaking Underground Storage Tank (LUST) Program; the Voluntary Remediation Program (VRP); the State Cleanup Program (SCP), and the Brownfields Program. The User's Guide is designed to assist the Office of Land Quality's remediation programs in using a consistent, risk-based approach for addressing contaminated sites in compliance with regulatory requirements. The User's Guide is divided into five chapters. Each chapter provides details on individual program processes and the applicability of RISC to that program.

It should be noted that spill responses performed in accordance with 327 Indiana Administrative Code (IAC) 2-6.1 are not remedial actions and will not utilize RISC. If the spill response does not result in the complete removal of the released material, the incident may be turned over to the appropriate remediation program for further work. At that time, RISC would be applicable.

1.1 RCRA Closure and Corrective Action, Subtitle C

RCRA was enacted in 1976 as an amendment to the Solid Waste Disposal Act (SWDA). Federal regulations to implement RCRA were adopted in 1980. Indiana has adopted the federal regulations specified in [329 IAC 3.1](#). The principal objective of RCRA is "cradle-to-grave" management of hazardous wastes, from the point of generation

through final disposition. A primary component of RCRA is the issuance of permits to facilities that store, treat, or dispose of hazardous wastes to ensure proper management of hazardous waste, and to ensure closure of inactive hazardous waste facilities and post-closure care of closed units, if required. Regulatory requirements applicable to permitting, closure, and post-closure of hazardous waste management units are presented in Title 40 of the *Code of Federal Regulations* (40 CFR), [Parts 264, 265, and 270](#). These requirements are incorporated by reference into [329 IAC 3.1-9-1](#), [329 IAC 3.1-10-1](#), and [329 IAC 3.1-13-1](#), respectively.

In 1984, RCRA was amended by the Hazardous and Solid Waste Amendments (HSWA) to give the U.S. Environmental Protection Agency (U.S. EPA) authority to require treatment, storage, or disposal (TSD) facilities (including facilities no longer operating as TSDs and facilities that have or had interim status) to investigate and remediate contamination resulting from any activity at the facility, even if the activity preceded the enactment of RCRA. This investigation and remediation process is known as “corrective action.” Under the corrective action process, TSD facilities are required to implement corrective action for all releases of hazardous waste or constituents that may cause a threat to human health or the environment. Corrective action can also be required for releases of hazardous waste or constituents that have migrated beyond the owner or operator’s property boundary.

RISC supplements RCRA closure and corrective action standards by providing guidance in determining the cleanup levels necessary to control, minimize, or eliminate threats to human health and the environment. If further maintenance is necessary to control or minimize a threat to human health or the environment, the RCRA program initiates post-closure care requirements. Closure and post-closure standards are specific to the type of TSD unit, such as tanks, containers, waste piles, surface impoundments, and landfills.

1.2 LUST Program

In 1988, the scope of RCRA was broadened to include the regulation of most underground storage tanks (UST) containing petroleum and hazardous substances. Subsequently, the U.S. EPA promulgated rules in [40 CFR, Part 280](#), to prevent and minimize the impact of releases from USTs through the use of corrosion protection, spill and overflow prevention, leak detection, and corrective action. Indiana enacted [Indiana Code \(IC\) 13-23](#) (modeled after RCRA regulations) for petroleum and hazardous substances. IDEM then promulgated [329 IAC 9](#) to provide standards for regulating UST operation and

maintenance, corrective action, and closure. Later, the Indiana Legislature established the Excess Liability Trust Fund (ELTF) to reimburse UST owners and operators for the costs of corrective action through the assessment of annual fees for eligible regulated USTs.

IDEM's LUST Program receives release reports for regulated and unregulated tank owners and oversees compliance with corrective action and closure requirements for petroleum and hazardous substance releases. Hazardous waste release reports are referred to the RCRA Closure and Corrective Action Program for follow-up.

Typical UST sites include petroleum storage and dispensing facilities (such as gas stations), fleet fueling facilities, industrial manufacturers, and government installations. Federal regulations place liability for the costs of remediation on tank owners and operators.

RISC provides a set of preapproved procedures and cleanup goals designed to streamline a LUST Program participant's interaction with IDEM. This guidance should enable participants to better evaluate their options, facilitate cleanups, and receive ELTF reimbursements.

No further action (NFA) letters are issued by the LUST Program upon conclusion of permanent closure. ~~Risk-based closure letters are issued for releases addressed under the exposure-prevention closure option.~~ (April 2001)

1.3 VRP

The VRP was established in 1993 in response to a growing need for State review and oversight of voluntary investigation and remediation activities, particularly with respect to property transactions. IC 13-25-5, Voluntary Remediation of Hazardous Substances and Petroleum, created the VRP and gave IDEM broad authority to establish guidelines for the approval of remediation work plans. Indiana is therefore one of the first states to pass legislation that addresses liability issues associated with buying, selling, or developing property contaminated by petroleum or hazardous substances. The agency's guidelines include provisions for using risk assessments to determine cleanup goals.

The VRP provides a process for property owners, operators, and potential purchasers to voluntarily enter into an agreement with IDEM to remediate contaminated property. When the remediation is successfully completed, IDEM issues a Certificate of Completion and the Governor's office issues a Covenant Not To Sue to the applicant for the remediated property. These documents assure both the

applicant and future land owners that the voluntary remediation has been performed properly and that associated future liability is strictly limited. This assurance is important to prospective property purchasers and prospective lenders when property is being offered as collateral. Active participation in the VRP may facilitate the sale and reuse of industrial and commercial properties in the State, an important benefit to all Indiana residents. In addition, a memorandum of agreement between IDEM and U.S. EPA provides some assurance that U.S. EPA will also not pursue an enforcement action.

Any site, regardless of its operational status, is eligible to participate in the VRP program unless one or more of the situations below applies.

- A state or federal enforcement action concerning the proposed cleanup is pending.
- A federal grant compels IDEM to take enforcement action.
- Conditions at the site are considered to present an imminent and substantial threat to human health or the environment.
- The VRP application is incomplete.

Participants are required to pay for VRP costs.

The VRP process is expanded via RISC by providing procedures for site characterization and sampling as well as guidance for nondefault approaches. This expanded guidance is intended to further facilitate the VRP process as well as reduce transactional costs for participation in the program.

1.4 SCP

The SCP is similar to the federal Superfund program except it is solely a State program and not a joint federal and state effort. It also differs from the Superfund Program because it provides for jurisdiction over petroleum releases as well as hazardous substance releases. Examples of SCP sites include active or abandoned petroleum terminals and refineries, abandoned landfills, former lead smelting and battery recycling sites, and other active or abandoned industrial sites. SCP sites are evaluated using the Indiana Scoring Model (ISM), which is discussed in [329 IAC 7-1](#). The list of SCP sites is published in the Indiana Register as part of the [Indiana Commissioner's Bulletin](#). Responsible parties and the State's [Hazardous Substances Response Trust Fund](#) provide funding for these cleanups.

The legal authority for the SCP includes Indiana's "Superfund" law, the Hazardous Substances Response Trust Fund statute ([IC 13-25-4](#)). The law establishes a fund to clean up sites contaminated with hazardous substances, establishes liability for potentially responsible parties, and authorizes IDEM to recover costs associated with cleanups. [IC 13-24-1](#) governs petroleum releases and authorizes IDEM to require cleanup of petroleum contamination.

[IC 13-25-4](#) states that IDEM can recover the costs of removal or remedial actions consistent with the National Oil and Hazardous Substances Pollution Contingency Plan ([NCP](#)). The RISC policies supplement the NCP by providing a designated system for screening a site, assessing risk, and establishing closure levels.

Chapter 2 RCRA Closure and Corrective Action Program

2.0 Introduction

Overview of Chapter 2

- ◇ Definitions
- ◇ Closure Overview
- ◇ Corrective Action Plan
- ◇ Closure Plan Preparation
- ◇ Closure Options
- ◇ RCRA Corrective Action Process
- ◇ Sample Quality Assurances and Analytical Requirements
- ◇ RCRA Soil Sampling
- ◇ RCRA Ground Water Sampling

This chapter presents guidance from the Indiana Department of Environmental Management (IDEM) Office of Land Quality (OLQ) for preparing Resource Conservation and Recovery Act (RCRA) closure plans, cleanup plans, and corrective action work plans to meet the requirements of [329 Indiana Administrative Code \(IAC\) 3.1](#).

Although the RISC Technical Resource Guidance Document offers a flexible generic framework for remedial activities in Indiana, certain hazardous waste rules preclude the sole use of the RISC Technical Guide as a directive in achieving RCRA closure and corrective action requirements. This chapter is intended to provide default options for achieving RCRA closure, “No Further Action” (NFA) status for corrective action solid waste management units and areas of concern, and RCRA Corrective Action Completion Determinations. RCRA Corrective Action requirements (Hazardous and Solid Waste Amendments [HSWA] of 1984) pertain to RCRA Subtitle C permitted treatment, storage or disposal (TSD) facilities, facilities that at any time had RCRA interim status, and facilities that operated without a RCRA permit when they should have had one. An owner or operator of a facility regulated under HSWA is responsible for instituting corrective action as necessary to protect human health or the environment from releases of hazardous wastes or hazardous constituents.

This chapter is not intended to be all-inclusive in the discussion of requirements and responsibilities, or to limit the use of site-specific options that may differ from the default. The RISC Technical Resource Guidance Document establishes a framework for developing a non-default approach for RCRA closure or corrective action cleanup. Environmental requirements implemented by other programs (such as the Superfund Program and the Voluntary Remediation Program [VRP]) may still apply to a site or facility both before and after certification of RCRA closure.

Indiana is authorized to administer its hazardous waste management program in place of the federal program. To develop the hazardous waste program, the State has (with few exceptions and deletions) incorporated by reference the federal hazardous waste regulations in [Title 40 of the Code of Federal Regulations \(CFR\), Parts 260 through 270](#). These federal regulations are mandated by Subtitle C of RCRA. For convenience, federal regulations (when appropriate) are cited in this chapter. In addition, the acronym “RCRA” is used throughout this chapter as a general term for hazardous waste regulatory requirements.

Questions that arise and requests for other guidance should be directed to the site-specific OLQ or Office of Enforcement (OE) contact. The procedures outlined in this chapter are intended to clarify and standardize the RCRA closure and corrective action process. Owners or operators are encouraged to meet with IDEM staff as needed to develop plans for remediation, ground water monitoring, and decontamination.

IDEM recognizes that the costs of closure and remediation may be significant and intends to minimize these costs wherever possible. Therefore, obtaining OLQ approval of a closure or cleanup plan is strongly recommended before any closure or cleanup activity is implemented. Closure or cleanup activities conducted prior to OLQ approval may need to be altered or even repeated if the closure or cleanup activities do not conform with applicable regulations or fail to protect human health and the environment.

This guidance replaces the Non-rule Policy Document entitled Hazardous Waste Management Unit Closure Guidance, (identification number WASTE-0013-NPD).

2.1 Definitions

Many terms used in this non-rule policy document are defined in [329 IAC 3.1](#) and [40 CFR 260.10](#). The following additional definitions apply to facilities subject to regulation for RCRA hazardous waste permitting, corrective action, and closure only. These terms replace or supplement those in the [Glossary](#) of the RISC Technical Manual.

Active portion means the portion of a facility where TSD operations are being or have been conducted after the effective date of [40 CFR Part 261](#) and that is not a *closed portion* (see also *closed portion* and *inactive portion*).

Aquifer means a geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs.

Area of concern (AOC) means a unit or area that does not meet the definition of a *solid waste management unit* (SWMU) but that merits further investigation to determine the presence or absence of releases.

Certification means a statement of professional opinion based upon knowledge and belief.

Closed portion means the portion of a facility that an owner or operator has closed in accordance with the approved facility closure plan and all applicable closure requirements (see also *active portion* and *inactive portion*).

Closure of a hazardous waste (RCRA) facility means action taken to secure the hazardous waste management facility or unit(s) in a manner that will protect human health and the environment in accordance with the closure plan requirements of [40 CFR 265, Subpart G](#), and [40 CFR 264, Subpart G](#). Closure of a SWMU or AOC means that the owner or operator has demonstrated, either through investigation or remediation, that the unit or area does not warrant further action.

Closure by removal or decontamination means the decontamination, treatment, or removal of the following: all hazardous waste, hazardous waste constituents, hazardous constituents, leachate, contaminated run-on and runoff, waste decomposition products, liners, and contaminated soil (including ground water) that pose a substantial present or potential threat to human health or the environment. This standard is achieved by demonstrating attainment with one of the following closure levels.

- Estimated quantitation levels (EQL) for organic constituents, or the mean plus one standard deviation of background for non-organics. This type of closure is a “clean closure”.
- Default or non-default residential levels. This type of closure is a “residential closure”.
- Default or non-default industrial levels if the owner files an environmental restrictive covenant which limits the land use of the property and certain activities that can occur at the property (i.e. prohibition on drinking untreated groundwater) in accordance with the approved risk assessment. This type of closure is an “industrial closure”.

Closure in-place means leaving either waste in place (e.g. a landfill) or contamination in place after closure when contamination cannot be practicably removed during closure, and post-closure care of engineered structures or other facilities is needed. Closure in-place must comply with the applicable requirements for removing or stabilizing the waste, capping the hazardous waste management unit or utilizing other appropriate engineering controls, developing and

implementing a ground water monitoring plan, and providing a written post-closure care plan subject to IDEM approval.

Compliance point is a vertical surface located at the hydraulically down-gradient limit of the waste management area that extends down into the uppermost aquifer underlying the regulated unit(s). The waste management area can encompass more than one regulated unit (see [40 CFR 264.95](#)).

Directed sampling is the term for using professional judgment and prior site knowledge to choose sampling locations. It is synonymous with the term “judgmental sampling”.

Disposal means the discharge, deposit, injection, dumping, spilling, leak, or placement of any solid or hazardous waste into or on any land or water so that such solid or hazardous waste or any constituent thereof can enter the environment, be emitted into the air, or be discharged into any water, including ground water.

Disposal facility means a facility or part of a facility at which hazardous waste is intentionally placed into or on any land or water and at which waste will remain after closure. The term *disposal facility* does not include corrective action management units (CAMU) into which remediation wastes are placed.

Facility is defined as follows:

1. All contiguous land, structures, other appurtenances, and improvements on the land used for TSD of hazardous waste. A facility can consist of several TSD operational units (for example, one or more landfills, surface impoundments, or combinations of such units).
2. For the purposes of implementing corrective action under [40 CFR 264.101](#), all contiguous property under the control of the owner or operator seeking a hazardous waste management permit. This definition also applies to facilities implementing corrective action under Indiana Code ([IC](#)) [13-22-13](#).

Final closure or *total closure* means the closure of all hazardous waste management units at the facility in accordance with all applicable closure requirements so that hazardous waste management activities under [40 CFR, Parts 264 and 265](#), are no longer conducted at the facility unless subject to the provisions in [40 CFR 262.34](#).

Generator means any person, by site, whose actions or processes produce hazardous waste identified or listed in [40 CFR, Part 261](#), or whose actions first cause a hazardous waste to become subject to regulation.

Ground water means water located below the ground surface in interconnected voids and pore spaces in the zone of saturation.

Ground water protection standard means a concentration limit (as defined in [40 CFR 264.94](#)) established by the Commissioner in a facility permit for hazardous constituents (as defined in [40 CFR 264.93](#)) detected in ground water from the regulated unit in the uppermost aquifer at the *compliance point* (as defined in [40 CFR 264.95](#)) during the compliance period (as defined in [40 CFR 264.96](#)). To establish this concentration limit, the Commissioner must consider which hazardous constituents are from the regulated unit and their potential to harm human health and the environment.

Hazardous constituent means any constituent identified in [Appendix VIII of 40 CFR, Part 261](#).

Hazardous waste is defined in [40 CFR 261.3](#). For Corrective Action purposes, this term includes any chemical that poses or may pose a threat to human health or the environment (See IC 13-11-2-99).

Hazardous waste management unit is a contiguous area of land on or in which hazardous waste is placed, or the largest area in which there is significant likelihood of hazardous waste constituents mixing in the same area. Examples of hazardous waste management units include a surface impoundment, waste pile, land treatment area, landfill cell, incinerator, tank and its associated piping and underlying containment system, and container storage area. A container alone does not constitute a unit. The unit includes the containers and the land or pad upon which the containers are placed.

Industrial closure includes the decontamination, treatment, or removal from a unit of all hazardous waste, hazardous waste constituents, hazardous constituents, leachate, contaminated run-on and run-off, waste decomposition products, liners, and contaminated soil (including ground water) that pose a substantial present or potential threat to human health or the environment at closure levels exceeding default or non-default residential levels but below industrial levels.

In operation refers to a facility that is treating, storing, or disposing of hazardous waste.

Inactive portion means the portion of a facility that is not operated after the effective date of [40 CFR Part 261](#) (see also *active portion* and *closed portion*).

Inner liner means a continuous layer of material placed inside a tank or container that protects the construction materials of the tank or container from the contained waste or reagents used to treat the waste.

Leachate means any liquid, including any suspended components in the liquid, that has percolated through or drained from hazardous waste.

Liner means a continuous layer of natural or man-made materials beneath or on the sides of a surface impoundment, landfill, or landfill cell that restricts the downward or lateral escape of *hazardous waste*, *hazardous waste constituents*, or *leachate*.

Management or *hazardous waste management* means the systematic control of the collection, source separation, storage, transportation, processing, treatment, recovery, and disposal of hazardous waste.

No further action may be used in two slightly different ways in the corrective action process.

1. “No Further Action” status can be a determination used for individual SWMUs or AOCs. Once all activities required are completed at individual units at a facility, a “No Further Action” status may be granted to that specific SWMU or AOC.
2. “No Further Action” can also be used to describe a site-wide selected remedy. For example, if the RCRA Facility Investigation reveals that both the soil and ground water at all SWMUs and/or AOCs at a facility are below the RISC default residential levels for all COCs, and there are no ecological exposures of concern, the facility owner or operator may propose “No Further Action” as the final remedy for the entire facility.

On-site means the same or geographically contiguous property which may be divided by public or private right-of-way, provided the entrance and exit between the properties is at a crossroads intersection,

and access is by crossing as opposed to going along the right-of-way. Non-contiguous properties owned by the same person but connected by a right-of-way, which he controls and to which the public does not have access, is also considered on-site property.

Operator means the person responsible for the overall operation of a facility.

Owner means the person who owns a facility or part of a facility.

Partial closure means the closure of a hazardous waste management unit in accordance with applicable closure requirements in [40 CFR, Parts 264 and 265](#), at a facility that contains other active hazardous waste management units. For example, partial closure may include the closure of a tank (including its associated piping and underlying containment systems), landfill cell, surface impoundment, waste pile, or other hazardous waste management unit while other units of the same facility continue to operate.

Personnel or facility personnel means all persons who work at or oversee the operations of a hazardous waste facility and whose actions or failure to act may result in noncompliance with the requirements of [40 CFR, Part 264 or 265](#).

Point of compliance is a term used in RCRA but not in this User's Guide. To avoid confusion with similar terms, this chapter uses the term *compliance point*. The terms *point of compliance* and *compliance point* can be used interchangeably in RCRA.

Release means any spill, leak, pouring, emission, emptying, discharge, injection, pumping, escape, leaching, dumping, or disposal of hazardous wastes (including hazardous constituents) into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing hazardous wastes or hazardous constituents).

Remediation waste means all solid and hazardous wastes, all media (including ground water, surface water, soil, and sediment), and debris that contain listed hazardous wastes or hazardous constituents, or that themselves exhibit a hazardous waste characteristic and which is managed for the purpose of implementing Corrective Action requirements under [40 CFR 264.101](#) and [RCRA Sections 3004\(u\), 3004\(v\), and 3008\(h\)](#).

Representative sample means a sample of a universe or whole (for example, a waste pile, lagoon, or ground water) that can be expected to exhibit the average properties of the universe or whole.

Screening is a RISC term that refers to the initial sampling event of site characterization to determine the need for a broader investigation of the nature and extent of contamination.

Soil means unconsolidated earth material composing the superficial geologic strata (material overlying bedrock) consisting of clay, silt, sand, or gravel particles as classified by the U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS) or a mixture of such materials with liquids, sludges, or solids that is inseparable by simple mechanical removal processes and that is primarily composed of soil by volume based on visual inspection.

Solid waste is defined in [40 CFR 261.2](#).

Solid waste management unit (SWMU) means any discernable existing or historical unit (permitted or unpermitted) at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility where hazardous constituents have been routinely and systematically released.

Storage means the holding of hazardous waste for a temporary period at the end of which the hazardous waste is treated, stored, or disposed of elsewhere.

Treatment means any method, technique, or process, including neutralization, that achieves the following:

- Changes the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste, recover energy or material resources from the waste, or render such waste non-hazardous or less hazardous,
- Makes the waste safer to transport, store, or dispose of, or
- Makes the waste amenable for recovery or storage or reduces the volume of the waste.

Unit means either a *hazardous waste management unit* or a *SWMU* unless otherwise specified.

Unsaturated zone or zone of aeration means the zone between the land surface and the water table.

Uppermost aquifer means the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary.

2.2 Closure Overview

Closure levels, regulations, and agency review and public notice of closure plans are discussed below.

2.2.1 Closure Levels

Closure in this chapter is used to describe the process of taking a RCRA hazardous waste management unit (i.e. a treatment, storage, or disposal [TSD] unit) out of service. Closure is required for all hazardous waste management units following termination of interim status, after denial of an operating permit, or after facility closure.

With the development of the RISC Technical Guide, default closure levels have been established using conservative exposure assumptions. These levels have been determined to be protective of human health and the environment and are presented in Table A of [Appendix 1](#) of the RISC Technical Guide. The table provides constituent closure levels based on residential exposure assumptions and on industrial exposure assumptions.

There are two general types of closure:

1. closure by removal or decontamination, and
2. closure with waste or contamination remaining in place.

The premise of closure by removal or decontamination (hereafter referred to as "closure by removal") is that all hazardous waste has been removed from a RCRA TSD unit and any releases at or from the unit have been remediated so that further regulatory control under RCRA Subtitle C is no longer necessary to protect human health and the environment. Closure by removal is accomplished either by demonstrating that:

1. constituent levels in soil do not exceed the analytical method's EQL for organics and the mean plus one standard deviation of background levels for inorganics, or
2. constituent levels remaining in soil do not exceed default or non-default residential closure levels, or
3. constituent levels remaining in soil do not exceed default or non-default industrial levels if an environmental restrictive covenant has been placed on the property which limits the use of the property to land uses and/or activities consistent with the approved risk assessment.

Closure levels for ground water may be: the constituent concentrations listed in [40 CFR 264.94\(a\)](#); the Maximum Contaminant Limit (MCL) in [40 CFR 141](#); the alternate concentration limits (ACL) established in accordance with [40 CFR 264.94\(a\)\(3\)](#); or background levels for each constituent as specified in the permit, if applicable. A facility that meets industrial closure levels would not be subject to post-closure requirements.

However, an environmental restrictive covenant that limits the activities and/or land use consistent with the approved risk assessment must be established.

Industrial cleanup levels must be achieved throughout the closed unit and in any areas affected by releases from the unit. This scenario cannot be used at units where waste remains in place (such as land disposal units that closed in-place). Further information relating to industrial closure is presented in [Section 2.6.2](#) of this User's Guide.

Closure in-place involves leaving waste in place or leaving contamination exceeding industrial closure levels in place. This category includes all land disposal units and other units where contaminants in excess of industrial closure levels remain in place and engineering controls are needed to achieve the closure performance standard. Land disposal units require capping and maintenance (along with ground water monitoring) for the post-closure period. At other units where waste has been removed, but contamination remains, there is a need for some continuing engineering controls or other structures to insure that the exposure and land use assumptions remain valid. These units may be eligible for more limited post-closure care than land disposal units, depending on the circumstances. More information is provided in [Section 2.6.3.1](#) of this Guide.

2.2.2 Closure Regulations

IDEM regulates the management of hazardous waste under the authority of the Environmental Management Act, [IC 13](#), and the Indiana hazardous waste rules, [329 IAC 3.1 et seq.](#) These rules incorporate, by reference, [40 CFR Parts 260 through 270](#). Closure of hazardous waste facilities under interim status is regulated under [40 CFR 265, Subpart G](#), and [329 IAC 3.1-10 and 14](#). Closure of facilities that have Part B permits is regulated under [40 CFR 264, Subpart G](#); [40 CFR 270.1\(c\)\(5\)](#); and [329 IAC 3.1-9 and 15](#). Copies of [329 IAC 3.1 et seq.](#) can be obtained by calling the Legislative Services Agency at (317) 232-9581. Copies of [40 CFR Parts 260 through 299](#) can be obtained by writing to the following address:

U.S. Government Printing Office
Superintendent of Documents
Mail Stop: SSOP
Washington, DC 20402-9328

2.3 Corrective Action Overview

Corrective Action's goal is to evaluate the potential for release of hazardous constituents and remediate releases as necessary to protect human health and the environment. Corrective Action requirements pertain to any facility that is operating or had operated as a TSD facility. This includes facilities that had interim status at any time, as well as facilities that operated without a permit when they should have had one. Corrective Action can be initiated through either a permit, if applicable, or an order. Facilities can attempt to close hazardous waste management units at the same time they are addressing releases from SWMUs and AOCs. Under this situation, the facility can request to complete closure of the hazardous waste management unit through the RCRA corrective action process.

The RCRA Corrective Action process consists of five key elements:

- Potential source identification,
- Release assessment,
- Release investigation,

- Evaluation and selection of an appropriate remediation technology or technologies, and
- Remediation of the release(s).

Not all five elements need to be performed at all facilities. However, each facility subject to corrective action will be evaluated for its potential to release hazardous constituents. If the potential exists, the facility must perform a release assessment. The decision to proceed to subsequent elements depends on the level and type of hazardous constituent present. In order to achieve a “no further action at this time” determination for the facility, it must be demonstrated that either hazardous constituent levels do not exceed background levels or EQLs or that hazardous constituents do not pose unacceptable risks to human health or the environment. This determination can be performed either after the release assessment or the release investigation, or upon completion of remediation activities.

2.4 Closure Plan Preparation

In accordance with [40 CFR 264.112](#) and [265.112](#), the closure plan must identify steps necessary to perform partial or final closure of the facility at any point during its active life. To this end, the following sections detail the type of information that must be included in the closure plan.

2.4.1 Facility Description

A facility description must be provided that includes the following information:

1. Description of the type of industry,
2. Standard Industrial Code (SIC),
3. Products,
4. Location,
5. Size,
6. Other permitted activities occurring on site (for example, a discharge using a National Pollutant Discharge Elimination System [NPDES] permit), and

7. Other general summarized information.

2.4.2 Description of Waste Management Units

The closure plan should describe each container storage area, tank system, incinerator, land treatment unit, landfill, surface impoundment, waste pile, or other hazardous waste management unit that is to be addressed. For each unit, the following information must be provided:

1. A discussion of the types of waste management activities that occurred at the unit, including the capacity and the maximum inventory of the unit and the process code and unit of measure from the Part A permit application (if applicable),
2. Descriptions of each waste in the unit, including the common name(s) and U.S. EPA hazardous waste code(s),
3. A discussion of the time period of use, dimensions, capacity, topography, soil types (as appropriate), copies of past spill reports, and any other relevant information, and
4. A copy of the most recent Part A permit application, if applicable.

Plans for total closure must address all units at the facility. Plans for partial closure should indicate which units are to remain active. This information should also be indicated on the facility's Part A permit application.

The closure plan should state *verbatim* the Closure Performance Standard in [40 CFR 265.111](#) or [264.111](#).

2.4.3 Maps and Drawings

The closure plan should provide a topographic or county map indicating the location of the facility without obscuring the features. The topographic or county map should include features within 1,000 feet of each property line of the facility. The closure plan should provide detailed maps or diagrams of the facility itself; detailed drawings of each unit to be closed; and cross sectional drawings of secondary containment systems, landfills, and surface impoundments. Topographic features, well locations, and surface water run-on and

run-off directions should be discussed or included on the detailed maps, drawings, and diagrams.

Detailed maps or diagrams of the facility itself should also include, but not be limited to, the following information:

1. Map scale and date,
2. Orientation of the map (north arrow),
3. Legal boundaries of the facility,
4. Access control (fences and gates),
5. Surrounding land uses (residential, commercial, agricultural, and recreational),
6. On-site buildings and structures, including the entrances and exits of each,
7. Locations of each on-site hazardous waste management unit, including clear identification of units undergoing closure, and
8. The USDA SCS soils survey map of the area surrounding the units.

Detailed drawings of each unit to be closed should also include, but not be limited to, the following information:

1. Drawing scale and date,
2. Orientation of the drawing (north arrow),
3. Dimensions, entrances, and exits of buildings or structures located adjacent to the unit undergoing closure,
4. Unit dimensions,
5. Appurtenant structures or equipment of the unit, and
6. Relationship of the unit to other points or structures on the facility property.

Additional maps and drawings are discussed in [Section 2.9](#), RCRA Soil Sampling, for soil investigation.

2.4.4 Containment Description

The closure plan should provide a detailed description of the containment of each unit undergoing closure. The closure plan should describe how the unit, including the containment, was designed and operated to prevent the migration or escape of hazardous waste, hazardous constituents, leachate, and runoff from the unit.

For container and tank storage units and incinerators, the discussion should focus on secondary containment structure features (such as walls, berms, and slope), if any, for the entire unit, including ancillary equipment, if applicable. The discussion should include items such as capacity, dimensions, age, integrity, materials of construction, joints, fittings, coatings or sealants applied to the structure, and chemically resistant water stops used at joints.

For waste piles, landfills, surface impoundments, and land treatment units, the description should provide information on the liner and the cover system (if applicable). Specifically, information should include the following:

- Liner type, composition, manufacturer, dimensions, thickness, and age,
- Brief description of the original liner installation procedures, including seaming and quality assurance/quality control (QA/QC) checks,
- Brief description of any liner maintenance and inspection performed after installation, and
- Description of the structural condition of the unit, including cracks, tears, leaks, punctures, holes, or unsealed joints or seams of the secondary containment system, liner, or cover system.

If containment structures are not present or are inadequate, the closure plan should discuss the drainage features of the unit and its surroundings and where spilled waste would flow. This discussion should also describe the facility setting, including the attenuative properties of the soil between the unit, ground water, and surface

water and any other factors that would influence the mobility of hazardous waste or hazardous waste constituents and their potential to migrate to ground water and surface water.

2.4.5 Hazardous Waste List

The closure plan must provide a complete, detailed list of all hazardous wastes (chemical name and the U.S. EPA hazardous waste number) treated, stored, or disposed of at each unit. Common names or trade names should not be used when generic chemical names are available. For each unit, the closure plan should indicate the total volume or weight of each hazardous waste managed on site over the active life of the facility.

2.4.6 Air Emissions

When applicable, the closure plan should specify that air emissions problems related to closure will be eliminated or minimized, including nuisance problems such as dust or odors. Example problems include solvent emissions during remediation, transfers, and decontamination operations and dust problems related to decontamination, soil excavation, and solidification activities.

2.4.7 Personnel Safety and Fire Prevention

The closure plan should indicate that Occupational Safety and Health Administration (OSHA) and other government regulations will be followed to protect all personnel (including contractors and visitors) involved in the closure project and those who could be possibly exposed to hazardous waste by the closure activities.

2.4.8 Closure Schedule

According to [40 CFR 264.113\(a\)](#) and [265.113\(a\)](#), all hazardous waste must be treated, removed, or disposed of in accordance with the approved closure plan within 90 days after approval of the closure plan by IDEM or after receipt of the final volume of hazardous wastes for permitted units. Closure activities must also be completed in accordance with the approved closure plan within 180 days after approval of the closure plan or 180 days after receipt of the final volume of hazardous wastes for permitted units.

The plan should contain a timetable that shows all critical closure dates, including dates for waste removal, sampling, soil removal,

critical times for the independent engineer or his or her representative to be present on site, site restoration, times for survey plat (if applicable), independent engineer's certification, and other relevant activities. This timetable should generally start at the point of closure plan approval or some other definable date and should not be based on calendar dates.

IDEM may require that the owner or operator contact OLQ before conducting certain critical activities (such as soil sampling or removal, ground water monitoring well installation, or well sampling) to allow an inspector to be present to observe these activities.

Closure time periods longer than those listed above may be granted if detailed justification is provided that meets the requirements of [40 CFR 264.113\(a\)](#) or [40 CFR 265.113\(a\)](#). Extensions of the closure period are discussed in [40 CFR 264.112\(c\)\(2\)\(ii\)](#) and [265.112\(c\)\(2\)\(ii\)](#), which reference the permit modifications of [40 CFR 270.42](#). It should be noted that the time period for closure by removal should not exceed 3 years. If closure by removal cannot be achieved, a post-closure plan must be submitted for approval. Closure certification is due 60 days after closure completion.

2.4.9 Closure and Post-Closure Cost Estimates

The closure plan should include a closure cost estimate calculated in current dollars in accordance with [329 IAC 3.1-14-3](#) or [329 IAC 3.1-15-3](#). Closure costs should, at a minimum, include estimates for removal of inventory, decontamination, sampling and analysis, and closure certification. The costs should be based on a third party closing the facility. Closure costs should also include a contingency fee based on a percent of total costs to compensate for errors of omission and unforeseeable circumstances. For facilities that require post-closure, a separate post-closure cost estimate must also be provided in accordance with [329 IAC 3.1-14-13](#) and [329 IAC 3.1-15-5](#).

2.4.10 Financial Assurance

Financial assurance must be established for closure and post-closure based on the closure and post-closure cost estimates. Several options are available under [329 IAC 3.1-14](#) and [329 IAC 3.1-15](#) for establishing the appropriate financial mechanism. For enforcement-driven closure plans, the administration of this requirement is handled

by the OLQ through the Office of Enforcement. For other closure plans, the administration of this requirement is handled solely by OLQ.

2.5 Administrative Closure Procedures

The general process for, and exceptions to, closure activities are discussed below.

2.5.1 Agency Review and Public Notice of Closure Plans

When IDEM receives a closure plan, the closure plan is logged in and assigned to a reviewer. The closure plan is reviewed for completeness and technical adequacy. If the plan is inadequate, the owner or operator is sent a Notice of Deficiency (NOD) that specifies the plan's inadequacies. The plan must be revised to address the items in the NOD and resubmitted to IDEM. When IDEM receives a complete and technically adequate plan, IDEM will approve or modify the closure plan in accordance with [40 CFR 265.112 and 264.112](#). The number of copies of the closure plan required for review depends on the unit type undergoing closure. Guidance on the number of copies to be submitted will be given prior to closure plan submittal.

A Public Notice is then filed in a local newspaper, and the public will be given a 30-day opportunity to submit written comments and request modifications of the closure plan. A public hearing may be conducted at IDEM's discretion.

2.5.2 Request for Administrative Review

If the owner or operator wishes to challenge a closure plan modification that has been made by IDEM for the purpose of closure plan approval, a Petition for Administrative Review and a Petition for a Stay of Effectiveness must be submitted to the Office of Environmental Adjudication within 15 days of the date of receipt of the closure plan approval letter. The petition must include facts demonstrating that one is either the applicant, a person aggrieved or adversely affected by the decision, or likewise entitled to review by law. The petition must specifically identify the portions or conditions of the modified closure plan for which a stay or administrative review is being requested. Further information on this issue is presented in [IC 13-15-6 and IC 4-21.5-3](#).

2.5.3 Time Extensions During the Closure Period

Under [40 CFR 264.113 and 265.113](#), the Commissioner may approve an extension of the 180-day closure period if the owner or operator can demonstrate, among other things, that:

1. Closure activities will necessarily take longer than 180 days to complete, and
2. The owner or operator has taken and will continue to take all steps to prevent threats to human health and the environment from the unclosed but inactive facility.

For closures under interim status requirements, [40 CFR 265.113 \(b\) and \(c\)](#) state that an extension of the 180-day closure period must be requested at least 30 days prior to the expiration of the 180-day period. Justification for the time extension must be provided. For permitted facilities undergoing closure, [40 CFR 264.113\(d\)](#) requires that the permit be modified in accordance with [40 CFR 270.42](#).

As previously noted, the closure by removal time period should generally not exceed 3 years. If the facility is attempting a plume stability assessment according to RISC Appendix 3, or if the risk assessment requires longer than 3 years to complete, the closure period may be extended. If closure by removal cannot be achieved in the approved period, a post-closure plan must be submitted for approval.

2.5.4 Closure Plan Modifications

An owner or operator with an approved closure plan must submit a written request to IDEM to authorize a change to the approved closure plan. The written request must include a copy of the amended closure plan for approval by IDEM. The closure plan must be modified whenever unexpected events require changes to the plan.

The closure plan must be amended at least 60 days after an unexpected event has occurred that affects the closure plan. If an unexpected event occurs during the partial or final closure period, the owner or operator must amend the closure plan no later than 30 days after the unexpected event. These provisions also apply to owners or operators of surface impoundments and waste piles who intended to remove all hazardous wastes upon closure but who are required to close as landfills in accordance with [40 CFR 265.310](#). If the amendment to the

plan is a Class 2 or 3 modification according to the criteria in [40 CFR 270.42](#), the modification to the plan will be approved in accordance with the procedures in [40 CFR 265.112\(d\)\(4\)](#).

2.5.5 Closure Certification Procedures

Closure certification procedures and requirements are discussed below.

2.5.5.1 Submittal of Closure Plan and Certifications

All copies of the closure plan, certification, and any revisions (one with original signatures) should be submitted to the address below.

Section Chief
Hazardous Waste Permit Section
Office of Land Quality
Indiana Department of Environmental Management
100 North Senate Avenue
P. O. Box 6015
Indianapolis, IN 46206-6015

2.5.5.2 Signatory Requirements

The closure plan application, revisions, and reports are subject to the signatory requirements of [40 CFR 270.11](#). The application must be signed as follows:

1. For a corporation, by a responsible corporate officer defined as follows:
 - a. A president, vice president, treasurer, or secretary of the corporation in charge of a principal business function or any other person that performs a similar policy or decision-making function for the corporation, or
 - b. The manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures

2. For a partnership or sole proprietorship, by a general partner or the proprietor, respectively
3. For a municipality, state, federal, or other public agency by either a principal executive officer or ranking elected official defined as follows:
 - a. The chief executive officer of the agency, or
 - b. A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (for example, U.S. EPA regional administrators).

A duly authorized representative can also sign the application, but a written authorization must be signed by the appropriate officer as defined above, and the authorization must be on file with IDEM.

The Closure Plan Certification Statement in [Appendix 2.1](#) should be signed. At least one of the copies of the certification submitted to IDEM must have original signatures. Certification of closure constitutes a report as defined by [40 CFR 270.11\(b\)](#). Therefore, the certification must conform to the associated signatory requirements. The certification must be signed by the officer described in this section as well as a registered professional engineer (see “Certification of Closure” below).

2.5.5.3 Certification of Closure

All partial or total closures of hazardous waste management units must be certified by both the owner and operator and an independent registered professional engineer in accordance with [40 CFR 264.115](#) and [265.115](#). Certification is due 60 days after completion of closure activities and no more than 240 days from the date of closure plan approval (unless otherwise approved).

The independent engineer should be present during all critical, major closure activities. The independent engineer or the facility owner or operator may be required to notify IDEM in advance of any critical closure activity. These activities can include soil sampling, remediation, final cover placement, and other events. The frequency of inspections by the independent engineer should be sufficient to determine the adequacy of each critical activity. The responsibilities of the certifying engineer during closure are discussed in the preamble

of the [May 2, 1986, Federal Register](#) amending the closure and post-closure requirements of [40 CFR Parts 264 and 265](#).

A closure report should be submitted with the Closure Certification Statement (see [Appendix 1.4](#)). This report should include, but not be limited to, the following information:

1. Volume or weight of waste and waste residue removed,
2. Method of waste handling and transport,
3. Waste manifest numbers or copies of manifests from waste removal and waste residues,
4. Sampling and analytical methods used,
5. Chronological summary of closure activities,
6. Closure costs,
7. Photographic documentation of closure, and
8. Analytical results.

All analytical results must include the information listed in [Section 2.8.3](#) in order to be validated by IDEM. For partial closures, revised cost estimates for remaining closure activities and any affected financial assurance instruments should be submitted with the closure certification documents. If the certification is for total closure, the certification documents should include a request for release from financial assurance.

A completed Closure Certification Statement ([Appendix 2.2](#)) should be included with the certification report.

2.5.5.4 Status of Facility after Closure

The closure report and Closure Certification Statement should clearly state the status of the hazardous waste facility after closure is completed. For example, the report and certification should state if a storage facility is to be operated as a generator (less than 90-day accumulation). The report should also describe whether closure is partial or total. If closure is partial, the report or certification should name both the units covered by the closure report or certification as

well as units remaining in operation or covered by the permit. The report or certification should indicate whether the facility will continue to be permitted or if the facility status would be changed to a generator or transporter (if applicable).

The report or statement should also indicate which of the statements presented below describes the intended use of the facility.

1. The facility will continue to be permitted.
2. No TSD activities will occur at the facility.
3. The facility will continue to treat or store hazardous wastes under interim status requirements.
4. The facility will be a small-quantity generator of less than 1,000 kilograms per month of hazardous waste and accumulate the hazardous waste on site for less than 90 days.
5. The facility will generate more than 1,000 kilograms per month and will accumulate the hazardous waste on site for less than 90 days.
6. The facility will generate more than 100 kilograms per month, but less than 1,000 kilograms per month and accumulate the hazardous waste on site for less than 180 days (or 270 days, if applicable).
7. The facility will be exempt from TSD regulation under RCRA.
8. The facility will be a transporter of hazardous waste.

2.5.5.5 Part A Permit Modification and Withdrawals

This discussion applies only to facilities with permits or interim status. This discussion does not apply to facilities that are required to close by an enforcement action or other means and that did not have interim status.

The facility's Part A permit application must be revised in accordance with [40 CFR 270.71](#) when closure certification is submitted. Responsibility for a closed unit cannot be terminated completely upon closure. In the case of total closure that requires no post-closure care, the owner/operator should submit a letter requesting withdrawal of the

Part A permit application to the IDEM, along with their closure certification.

For partial closure, a revised Part A permit application must be submitted to include only the remaining units and, if necessary, corrected copies of the existing Part A permit. A cover letter discussing the closure and explaining the changes should also be included. Facilities should modify Part B permits in accordance with the requirements specified in [40 CFR 270.42](#).

2.6 Closure Options

Closure can be achieved in two ways:

1. by removal or decontamination, or
2. in-place.

Closure by removal or decontamination can be achieved in two ways:

1. clean closure, or
2. risk-based closure.

Clean closure levels are established as background levels or EQLs for the constituents set forth in [40 CFR 261, Appendix VIII](#). Risk-based closure is based on a default or non-default risk assessment that uses exposure assumptions consistent with the land use (i.e. residential or industrial). Table 2-1 below summarizes closure options.

Table 2-1. Summary of Closure Options

<i>Closure Types</i>	<i>Removal or Decontamination</i>			<i>Closure In-Place</i>	
	<i>Clean</i>	<i>Residential</i>	<i>Industrial</i>	<i>Contamination in Place (waste removed)</i>	<i>Land Disposal Units (waste remains)</i>
<i>Closure Levels</i>	<i>Background or EQL</i>	<i>RISC Default or Non-default</i>	<i>RISC Default or Non-default</i>	<i>Site Specific</i>	<i>NA</i>
<i>Post Closure Activities</i>	<i>None</i>	<i>None</i>	<i>None*</i>	<i>See Section 2.6.3.1</i>	<i>See Section 2.6.3.2</i>

* A restrictive covenant with land use and/or activity controls required

2.6.1 Closure by Removal or Decontamination

2.6.1.1 Decontamination Procedures

Before decontamination, all paved areas, concrete pads, containment systems, structures, and sumps should be visually inspected to identify any cracks, gaps, spills, stains, or damaged areas that may be present. This visual inspection should be documented in the closure certification report with notations of any identified problems. Any cracks, gaps, or damaged areas should be repaired by grouting or sealing before decontamination is performed in order to prevent the further release of contamination into underlying soil.

Decontamination of paved areas, containment systems, and sumps should include the following:

- Visual inspection,
- Waste removal,
- Mechanical cleaning (scraping or sweeping),
- Repair of damaged or unsealed areas,
- Low-volume, high-pressure washing (can include steam or detergent for more effective cleaning),

- Three successive low-pressure ambient-temperature water rinses, and
- Sampling and analysis of final rinsate to confirm decontamination.

The first two water rinses described above should remove both residual wastes and any detergents used during washing. The third or final rinse should provide the source of verification samples. Verification of decontamination must be provided to confirm that closure levels have been met.

At least two samples of the final rinsate from each unit undergoing closure should be analyzed for the hazardous constituents identified in the waste as defined in [40 CFR 261, Appendix VIII](#), or for hazardous waste constituents as defined in [40 CFR 260.10](#). The two rinsate samples are field duplicates for the rinsate. The final rinsate samples should be representative of the entire final rinse. Rinsate samples to be analyzed for metals should be filtered to remove solid particles prior to sample preservation. Whenever applicable, procedures for minimizing loss of volatile organic compounds (VOC) during sampling should be described in the closure plan.

Minimum closure levels for the rinsate that should be achieved for closure by removal are discussed further in [Section 2.9.1.2](#) below. Decontamination procedures will be repeated until closure levels are met. If closure levels are not met after two iterations of decontamination procedures, IDEM will provide further guidance. Specific decontamination procedures for typical closure by removal projects are discussed below.

Decontamination of Equipment, Structures, and Pads

In accordance with [40 CFR 264.114](#) and [265.114](#), the closure plan should describe all efforts to (1) remove hazardous waste, its residues, and hazardous waste constituents from tanks or (2) decontaminate paved areas, concrete pads, containment systems, equipment, structures, pipes, pumps, sumps, and any other appurtenances to the hazardous waste management unit. IDEM may request the owner or operator to use any reasonable means to clean or decontaminate the unit and its ancillary equipment, including scraping, pressure washing, solvent washing, and other means. Any equipment, including heavy earth-movers or small tools, should be scraped and washed to remove waste residues. These residues should be managed as hazardous

waste, and the procedure for cleaning and managing them should be described in detail in the closure plan.

Storage pads should be decontaminated in accordance with the procedures specified in [40 CFR 264.112\(b\)\(4\)](#). A typical pad decontamination procedure is presented below.

1. All wastes are removed from the pad and appropriately disposed of.
2. The pad is mechanically cleaned by scraping, sweeping, or other methods to remove all physical contamination.
3. The pad is inspected for cracks. If cracks are detected, items 10 and 11 may be performed at this point.
4. The cracks are sealed.
5. The pad is washed using a high-pressure steam cleaner with detergent or appropriate solvent to remove previously stored waste materials.
6. The pad is rinsed three times with water. Low-pressure, ambient-temperature rinses should be used.
7. The third (final) rinsate is collected separately, and two samples are analyzed to show that the pad's surface meets closure levels. For inorganic and certain organic parameters, closure levels will be based on the MCLs of the National Primary Drinking Water Regulations ([40 CFR 141](#)) in the rinsate. For organic parameters without MCLs, the closure levels of the rinsate will be based on the EQLs of the analytical methods as defined in SW-846. Analytical parameters will be based on wastes previously stored in the area.
8. Care is taken to prevent the migration of cleaning liquids from the pad area.
9. All residues and rinsates are collected and disposed of as hazardous waste unless the residues and rinsates are analyzed and determined to be non-hazardous.
10. Soil underlying cracks discovered during visual inspection is sampled for contamination. If contamination is found, the

vertical and horizontal extent of the contamination should be determined. Closure levels for soil are based on background levels for inorganic parameters and the EQLs of the analytical methods as defined in SW-846 for organic parameters, or the RISC closure levels. Background levels for inorganics are determined by sampling soil borings in four locations known to be located in an area unaffected by facility operations. Each boring will be sampled at the same depth intervals as the soil samples collected from under the pads. The 95% upper confidence limit (UCL) of the mean is calculated to be the cleanup level for each inorganic parameter for each pad depth interval.

11. Soil that does not meet cleanup levels is remediated or removed.
12. The pad is cleaned until closure levels have been met.

Tank Decontamination Procedures

Tanks containing hazardous waste are subject to all reasonable means of decontamination in order to meet closure levels. Procedures for decontamination include manual sludge removal, pressure or solvent washes, rinses, and other procedures. An independent, registered professional engineer should certify the methods used and that the level of decontamination is appropriate for each tank's final disposition (for example, disposal as a hazardous waste or storage of product). Tanks that will be reused after closure for product storage or storage of a different hazardous waste, and tanks to be dismantled for scrap metal, require decontamination. Tanks to be dismantled and disposed of as hazardous waste may not require decontamination but are subject to Land Disposal Restrictions ([40 CFR 268](#)). Some tank closures require a contingent post-closure care plan (see [40 CFR 264, Subpart J](#), and [40 CFR 265, Subpart J](#)).

Tanks that will be used for accumulation (not to exceed 90 days) of the same hazardous waste following closure should be drained, all visible contamination removed, and the tank inspected. Owners and operators of existing tank systems that will be used to accumulate hazardous waste should be aware of the assessment requirements in [40 CFR 262 and 265.191](#).

Underground tanks containing ignitable wastes should be removed in accordance with State Fire Marshall regulations, and underlying soil

should be sampled for the hazardous waste constituents stored in the tank. Tanks containing non-ignitable hazardous waste can be abandoned in-place if they are properly decontaminated, filled, and capped, and soil testing verifies the absence of soil contamination. Soil sampling requirements are discussed in [Section 2.9](#).

Sampling and analysis of the final rinse is required in order to confirm that closure levels have been met for tanks that are to be used after closure to store product or different hazardous waste. At least two samples of the final rinse should be analyzed for the hazardous constituents or hazardous waste constituents identified in the stored waste. The two rinsate samples are field duplicates for the rinsate. The final rinsate samples should be representative of the entire final rinse. When applicable, procedures for minimizing loss of VOCs during sampling should be described in the closure plan.

Decontamination procedures should be repeated until closure levels are met.

Care should be taken to prevent the migration of cleaning liquids from the containment area. All wash and rinse waters should be collected and managed as hazardous waste unless analysis shows that they are non-hazardous. The closure plan should describe how decontamination waste material (rinse water, decontamination equipment, personal protective equipment, and other materials) will be managed. An estimate of the volume of waste material to be generated should also be provided. Residues from listed hazardous waste must be managed as hazardous waste unless they are de-listed under the provisions of [40 CFR 260.22](#) or covered by the exemption of [40 CFR 261.4](#).

The tanks should be decontaminated in accordance with the procedures specified in [40 CFR 264.112\(b\)\(4\)](#). A typical tank decontamination procedure is presented below:

1. All wastes are removed from the tank.
2. The tank is mechanically cleaned by scraping, sweeping, or other methods to remove all physical contamination.
3. The tank is washed using a high-pressure steam cleaner with detergent or appropriate solvent to remove previously stored waste materials.

4. The tank is rinsed three times with water.
5. The third (final) rinsate from each tank is collected separately, and two samples are analyzed to show that the tank meets closure levels. For inorganic and certain organic parameters, closure levels will be based on the MCLs of the National Primary Drinking Water Regulations (40 CFR 141). For organic parameters without MCLs, the closure levels will be based on the EQLs of the analytical methods as defined in SW-846. Analytical parameters should be based on wastes previously stored in the tank.
6. Care is taken to prevent the migration of cleaning liquids from the tank area.
7. All residues and rinsates are collected and disposed of as hazardous waste unless the residues and rinsates are analyzed and determined to be nonhazardous.
8. The tank is cleaned until closure levels are met.

2.6.1.2 Soil Remediation

The closure plan for any facility attempting closure by removal must fully describe (1) each step taken to remove waste from the units and contaminated soil from the surrounding areas or (2) each method proposed for remediation of contaminated soil.

For removal, the plan should include a description of solidification/stabilization, accumulation of waste or reagents, equipment used, the soil removal pattern and excavation depth increments, loading areas, and any other information critical to soil removal. The plan should clearly discuss how soil will be removed, accumulated, loaded, and managed once it leaves the site. Covered and lined roll-off containers are recommended for accumulating and removing hazardous wastes. Accumulating contaminated soils on the ground is ill-advised, as this may constitute an illegal hazardous waste pile. The plan should describe backfill materials to be used. Analysis of backfill material should document that the backfill does not exceed land-use specific closure levels or otherwise violate the assumptions of the risk assessment.

Alternatively, soil containing certain hazardous waste constituents can be remediated to closure levels and allowed to remain in the unit or be

placed back into the unit. Bio-remediation and soil vapor extraction of organic constituents are examples of soil remediation processes. A complete remediation plan is required to be submitted for IDEM review as a proposed modification to the approved closure plan.

The remediation plan should include the following:

- Detailed description of treatment process(es),
- Justification of applicability and feasibility of this process to this site (including discussion of site conditions and contaminants),
- Schedule of activities,
- Expected timeframe to meet closure levels,
- Periodic testing to verify progress,
- Periodic status reports indicating progress made,
- Sampling (locations and depths) and analysis procedures for periodic and final verification, and
- Final verification sampling and analysis to confirm complete remediation to closure levels.

In addition, the remediation plan should discuss efforts to minimize air emissions, including volatiles and dust, when applicable.

A registered professional engineer should certify engineering studies and design drawings related to the remediation plan.

2.6.2 Industrial Closure

In order to provide consistency across program areas and to implement the principles of RISC, OLQ will use the approach discussed below to accept closure certification for hazardous waste management units, or to determine that no further action is required for SWMUs and AOCs. This approach is to be used at facilities where the owner or operator chooses to close to industrial levels through a risk-based decision process.

As the name implies, Industrial Closure is to be used only in locations which have been, and will remain, industrial. As addressed in the RISC Technical Guide, closure plans may use non-default risk assessments to determine site-specific industrial closure levels. Future land use and exposure assumptions must be made in the preparation of the risk assessment. Industrial areas will allow higher closure levels than residential areas, therefore, a specific set of criteria must be met to ensure that future land use and exposure assumptions used in the risk assessment remain valid.

Engineering controls are not allowed for industrial closure.

2.6.2.1 Industrial Closure Requirements

After the removal of all waste and liners, a risk assessment based on closure levels for an industrial facility can be conducted. The risk assessment evaluates the levels of hazardous constituents that remain in the soil and groundwater, and insures that the default or non-default land-use appropriate closure levels are achieved. After approval of the risk assessment, the facility can certify closure. In order for the closure certification to be accepted, the facility must maintain land use or activity restrictions, consistent with the approved risk assessment, through either an environmental restrictive covenant or other approved mechanism (see [Appendix 5](#) of the RISC Technical Guide). Once the site restrictions have been implemented and other elements of the approved closure plan have been successfully accomplished, the closure certification will be accepted.

The nature and extent of contamination in soil and ground water must be determined for all facilities using industrial closure levels. Facilities with multiple sources may follow the closure procedures described in [Chapter 5](#) of the RISC Technical Guide. In addition, ground water contamination associated with the facility must be below the default or approved non-default industrial levels at the perimeter of compliance and below the default residential levels at areas beyond the point of property control. This can be demonstrated by proving plume stability. Compliance schedules associated with these requirements will be determined in the closure plan. If at any time land-use specific closure levels are exceeded, remediation or corrective action must occur. Failure to remediate or implement corrective actions could result in an enforcement action.

If any waste or liners remain in place, or if waste and liners have been removed but contamination in excess of industrial closure levels remains in-place, remediation, corrective action and/or appropriate engineering controls will be required. The unit is not eligible for industrial closure and must be closed in-place. A hazardous waste management post-closure permit or other enforceable document is then required. The presence of hazardous constituents at levels below the land-use appropriate closure levels does not constitute waste or contamination remaining in place.

Industrial closure can be obtained by performing remediation (for example, excavation and hauling, soil vapor extraction, or other form of remediation) for areas exceeding industrial closure levels. Once the industrial levels are met (again, based on the additional confirmation sampling and analysis plan [SAP]), the owner/operator may certify that the unit meets the industrial closure scenario.

The only restriction that must remain in effect after achieving industrial closure is to file an environmental restrictive covenant consistent with the approved risk assessment. Such an environmental restrictive covenant might include (1) a land use restriction (e.g. the property cannot be used for residential purposes), and/or (2) activity restrictions, if applicable (e.g. groundwater at the site cannot be consumed). In these cases, the facility must record in the local recorder's office an environmental restrictive covenant that provides the appropriate land use and activity restrictions. No post-closure requirements, such as those applicable to land disposal units, would apply.

Future use of property subject to an industrial closure must be consistent with the exposure assumptions underlying the risk assessment. Property subject to industrial closure can be used for any legitimate future industrial use so long as the land use and exposure potential are consistent with the land use and exposure assumptions approved in the risk assessment.

2.6.2.2 Summary of Requirements for Industrial Closure

1. The approved closure plan must be successfully completed.
2. The owner or operator performing the industrial closure must record an appropriate environmental restrictive covenant on the property deed concerning the industrial land-use restriction. A title reference must be provided. The portion of the property

covered by the deed restriction must be clearly delineated on a survey plat.

3. Owners of the property after the restrictive covenant is recorded must:
 - a. comply with the terms of the covenant, and
 - b. notify future buyers that the facility's use is limited and must be consistent with the terms of the environmental restrictive covenant.

4. Before the land use can change, the owner or operator at the time the change is proposed must demonstrate that the remaining constituents meet levels consistent with the proposed use of the property. If IDEM agrees with the demonstration, the environmental restrictive covenant may be amended or terminated to reflect current conditions. In the case of termination, only the restriction is terminated. The fact that the deed was once restricted and then modified remains on the deed.

If an owner/operator does not comply with the terms of the environmental restrictive covenant, that owner/operator is subject to enforcement action in accordance with IC 13-14-2-6.

2.6.2.3 Notices

Sites that are closed to industrial levels are required to record an ***environmental restrictive covenant*** in the local recorder's office. This recorded document notifies future landowners that the property meets industrial health-protective levels but is not suitable for residential use and residential activities.

Within 60 days of certification of closure of the hazardous waste management unit, the owner or operator must record, in accordance with State law, an environmental restrictive covenant that will notify any potential future purchaser of the property that the property has been used to manage hazardous wastes and that certain restrictions apply to its use. The owner or operator must also submit to IDEM a certification signed by the owner or operator that the notation has been recorded, including a copy of the document in which the notation has been placed (See [40 CFR 264.119](#) and [265.119](#)).

If in the future the owner/operator wishes to demonstrate that the levels of constituents left in place meet the residential closure levels, a supplemental sampling and analysis plan for verification sampling must be sent to the IDEM for approval. A separate closure certification must then be submitted, stating that the verification sampling now indicates that the site meets residential closure levels. Following IDEM acceptance of the revised closure certification, the environmental restrictive covenant may be amended or terminated. As stated above, only the restriction can be terminated.

2.6.3 Closure in Place

2.6.3.1 Closure with Contamination in Place

In some cases, after the waste or liners are removed, contaminants may remain which exceed land-use specific closure levels. In these cases, the closure is not considered a closure by removal or decontamination, but is considered a closure in place. Where engineering controls or physical barriers (i.e. something more than an environmental restrictive covenant) are needed to meet the land use specific closure levels, an enforceable document is needed to ensure that the engineering control or physical barrier remains in place.

Limited post-closure care may be warranted, dependent upon the facts and circumstances of each case. In some cases, physical engineering controls (e.g. caps, fences, buildings) must be maintained to ensure that the land use and exposure assumptions made in the approved risk assessment remain valid. In other cases, appropriate groundwater monitoring schedules may need to be established. In these cases, the details and duration of the facility's post-closure requirements (stipulated in an order or post-closure permit) could be tailored to the specific facts and engineering controls being utilized. In some situations, it may be appropriate to combine monitoring or other features with other closure or corrective action activities at the facility. For example, the monitoring of a particular unit may be combined in some circumstances with an overall program in corrective action.

Facilities utilizing engineering controls to prevent exposure will require an order or post-closure permit which will include the stipulation that the control must be maintained appropriately and if damaged or rendered ineffective, must be repaired or replaced with other effective controls. The engineered control must also be described in the environmental restrictive covenant.

2.6.3.2 Closure In-Place - Land Disposal

Any unit where waste is to be left in place (such as landfills, tanks unable to achieve clean closure, waste piles, and surface impoundments to be closed as landfills) has several additional important considerations beyond those required for closure by removal or decontamination. These considerations include liners, final cap cover, vegetation, ground water monitoring, post-closure care, and permit requirements.

Full descriptions and detailed engineering drawings are required for each unit undergoing closure in-place. Details of liners, drainage layers, covers, vegetation, wells, final contours, construction QA, or any relevant structures or practices should be provided. A registered professional engineer should certify engineering studies and design drawings and specifications.

Several additional regulatory requirements for closed disposal units are specified in [40 CFR 265.197](#), [265.228](#), [265.280](#), and [265.310](#) for facilities. The requirements concern ground water monitoring, post-closure plans, post-closure care, notice to local land authority, and notice in the deed to property. More information on groundwater monitoring requirements is presented in [40 CFR 264 Subpart F](#) and [265 Subpart F](#), and more information on post-closure care and notices is presented below.

2.6.3.3 Post-Closure Care

The closure plan for any disposal unit must include a post-closure care plan in accordance with [40 CFR 265.117](#). For land disposal units that close after May 19, 1981, an application for a post-closure care permit must be submitted upon request from IDEM. Tank systems that do not have secondary containment must follow the procedures for post-closure care outlined in [40 CFR 265.197](#).

2.6.3.4 Location Documentation for Disposal Units

There are three notification requirements for facilities that close units in place with post-closure care. First, [40 CFR 265.116](#) states that at no later than the submission of the certification of closure of each hazardous waste disposal unit, an owner or operator must submit to the local zoning authority or county land-use authority and the IDEM Commissioner a survey plat indicating the locations and dimensions of landfill cells or other hazardous waste disposal units with respect to

permanently surveyed benchmarks. This plat must contain a note indicating the owner's or operator's obligation to restrict disturbance of the hazardous waste disposal unit in accordance with [40 CFR Part 265, Subpart G](#), regulations.

A copy of the survey plat and a copy of the document with the notation required by [40 CFR 265.116](#) must also be provided to the IDEM along with the closure certification.

Second, [40 CFR Part 265.119\(a\)](#) states that within 60 days of certification of each hazardous waste disposal unit, the owner or operator must submit to the zoning authority or county land-use authority and the IDEM a record of the types, locations, and amounts of hazardous wastes disposed of within each cell.

Third, [40 CFR Part 265.119\(b\)](#) states that within 60 days of certification of closure of the first and last hazardous waste disposal units, the owner or operator must record a notice in deed that the land was used to manage hazardous waste and must not be disturbed, and certify that this information was recorded and a copy of the information sent to the IDEM.

2.6.3.5 Certification of Completion of Post-Closure Care

Within 60 days after the completion of the established post-closure care period for each hazardous waste management unit, a certification must be submitted to IDEM that the post-closure care period for the hazardous waste unit was performed in accordance with specifications in the approved post-closure plan. The certification must be signed by the owner or operator and an independent, registered professional engineer. Documentation supporting the independent registered professional engineer's certification must be furnished to IDEM upon request until the owner or operator is released from the financial assurance requirements for post-closure care under [329 IAC 3.1-14 or 15](#).

2.7 RCRA Corrective Action Process

Facilities seeking a TSD permit and facilities that formerly operated as TSDs, that released hazardous constituents, must fulfill certain Corrective Action requirements in accordance with [IC 13-22-2-5\(6\)](#) and [IC 13-22-13-1](#). IDEM may initiate Corrective Action either through the RCRA permit, if applicable, or through an order. Alternatively, facilities may choose to address Corrective Action

obligations voluntarily (for example, through either an agreed order or the VRP with accompanying order). Regardless of how a facility enters corrective action, the goals are the same—facility-wide assessment for the presence of released hazardous waste and/or hazardous constituents followed by a demonstration that any such release at or from the facility does not pose unacceptable risks to human health or the environment.

The Corrective Action process consists of five basic elements:

- Potential source identification,
- Release assessment,
- Release investigation,
- Evaluation and selection of appropriate remediation technology or technologies, and
- Remediation of release(s).

These elements typically occur, to some degree, during most cleanups. They should be viewed as evaluations needed to make good cleanup decisions, not necessarily individual steps through the process. All five elements are briefly described below. Specific details are provided in the “Corrective Action Scope of Work,” which is available from IDEM.

Either a default or non-default risk assessment can be performed after either the release assessment or the release investigation, or upon completion of remediation activities. Upon satisfactory completion of corrective action requirements, IDEM will issue an acknowledgment that no further action (NFA) is required for the unit. Closure under the RISC Technical Guide can be used to demonstrate that the unit has attained no further action status.

IDEM recognizes recent reforms by the U.S. EPA to “streamline” Corrective Action. For facilities that meet EPA’s qualifying criteria, the IDEM will incorporate a streamlined Corrective Action process into permits and orders. In accordance with the streamlined approach, IDEM emphasizes that the details contained in the Corrective Action Scopes of Work referred to above should not be considered boilerplate provisions applicable to every site, but rather a menu of possible activities that may be appropriate for a particular facility or corrective action evaluation. Similarly, facility owners and operators are

encouraged to pursue interim corrective measures and presumptive remedies to accelerate the process of environmental improvement.

2.7.1 Potential Source Identification

During this stage of the process, the entire facility is evaluated for its potential to release hazardous wastes and hazardous constituents into the environment. The potential source identification is similar to the pre-sampling discussed in [Chapter 2](#) of the RISC Technical Guide. This evaluation is commonly referred to as the RCRA facility assessment (RFA). If the RFA reveals that the potential for releases exists or existed, a current conditions report is required for the facility that includes the following information:

- A summary of the facility's background, including the historical use of the facility and all known locations where solid or hazardous wastes were managed, regardless of when they were in use,
- A description of the known nature and extent of any contamination, including available monitoring data, potential migration pathways, and potential receptors, and
- A description of any measure that was or is being undertaken to mitigate any risks to human health or the environment.

2.7.2 Release Assessment

Release assessment is the first of two steps in the Corrective Action RCRA facility investigation (RFI) process. The default procedures for this assessment follow the screening procedures described in [Chapter 3](#) of the RISC Technical Guide. This assessment normally requires a work plan submitted for IDEM approval, unless IDEM has approved an alternate approach. Two additional requirements apply to the release assessment beyond those presented in [Chapter 3](#). First, the owner/operator must submit a community relations plan (CRP). The CRP will describe how the community will be kept apprised of conditions and ongoing work at the facility. Secondly, if an imminent threat to human health or the environment is discovered during the release assessment, interim measures are required to abate the threat.

2.7.3 Release Investigation

Release investigation is the second of two steps in the RFI process. It is similar to characterization of the nature and extent of contamination discussed in [Chapter 4](#) of the RISC Technical Guide. However, the owner/operator should refer to this chapter's Sample Quality Assurance and Analytical Requirements, RCRA Soil Sampling, and RCRA Ground Water Evaluation sections for additional requirements applicable to the RCRA program. All RISC requirements must be followed as well. Results of the release investigation and release assessment are usually presented in an RFI report.

2.7.4 Evaluation and Selection of Appropriate Remediation Technology

Upon IDEM's approval of the results of the release investigation, IDEM may require the evaluation of remediation technology alternatives. This evaluation is commonly referred to as a corrective measures study (CMS). The CMS's objective is to ensure that any technology ultimately selected will be capable of effectively achieving timely closure. The technology or technologies will also be evaluated for cost-effectiveness. It is important to note that "cost-effective" does not necessarily mean the least costly.

Evaluation of appropriate remediation technologies need not be a lengthy process. A presumed remedy (that is, a known, proven remedy) that meets the effectiveness and timeliness criteria can be proposed to IDEM. Regardless of how the potential remedy is chosen, its proposal must be made available for public comment.

2.7.5 Remediation of Releases

Upon termination of the public comment period, IDEM will select the remedy or combination of remedies to be implemented. Under the Corrective Action process, this element is called "Corrective Measures Implementation" (CMI). Once the remedy is selected, the owner or operator must submit a CMI work plan for approval that includes a remedial cost estimate and demonstrates financial assurance through one or more of the options listed in [40 CFR 264, Subpart H \(329 IAC 3.1-15-4\)](#). The following mechanisms are preferred by IDEM:

- Trust fund,
- Surety bond guaranteeing performance, or

- Letter of credit.

Insurance and surety bonds guaranteeing payment into a standby trust fund are not acceptable mechanisms (See [55 FR 30856, July 27, 1990](#)).

2.7.6 Corrective Action Completion Determinations

2.7.6.1 Introduction

This section provides guidance on acknowledging the completion of corrective action activities for Solid Waste Management Units and Areas of Concern, at RCRA treatment, storage, and disposal facilities (TSDs). It describes two types of completion determinations, “Corrective Action Complete Without Controls” and “Corrective Action Complete With Controls.” It also provides guidance on when each type of completion determination is appropriate, and discusses completion determinations for less than an entire facility. Finally, it provides procedures for making completion determinations for both permitted and non-permitted facilities, and sets out how IDEM intends to implement the statutory and regulatory provisions of Indiana’s authorized RCRA Corrective Action Program.

For Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs), there are two potential ways of achieving a Corrective Action Complete determination: 1) the owner/operator may demonstrate the remediation of any releases to naturally occurring background concentrations or 2) the owner/operator may make a demonstration that the concentrations of hazardous constituents remaining are protective of human health and the environment.

Regarding the first potential corrective action completion determination, when demonstrating that the hazardous constituents are naturally occurring at levels normally found in that area (background concentrations), the owner or operator must use the methods specified in [Chapter 3](#) of the RISC Technical Guide for determining site-specific background concentrations. Regarding the second potential determination, the owner or operator may use risk assessments to verify that no affected environmental media at the facility present a threat to neither human health nor the environment.

Remediation of the affected media may or may not be necessary to meet the protective concentrations established by the risk assessment,

to eliminate sources of ongoing or potential future releases, or to restore natural resources to productive use (such as groundwater in wellhead protection areas). For any remedy that relies on industrial land use exposure assumptions or activity restrictions at the site to protect human health or the environment, the owner or operator must record an environmental restrictive covenant to the property's deed. An environmental restrictive covenant, whether for specific activity restrictions or land use restrictions, is an example of an institutional control. Institutional controls are legal or administrative measures that limit human exposure to contaminants. Other examples of institutional controls include use control areas, easements, and zoning ordinances. Additional requirements for environmental restrictive covenants are discussed in [Appendix 5](#) of the RISC Technical Guide.

A site may be closed using engineering controls, which are physical measures such as landfill capping, waste containment, groundwater slurry walls, extraction wells, or treatment methods. Engineering controls are capable of managing environmental and health risks by reducing contamination levels or limiting exposure pathways, and encompass a variety of engineered remedies to contain or reduce exposure to contamination, and/or provide physical barriers intended to limit access to the property or the contaminants. In contrast, institutional controls are a variety of administrative or legal devices imposed to ensure that the engineered controls stay in place or, where there are no engineered controls, to ensure the restrictions on activities or land use stay in place. "Corrective Action Complete With Controls" implies that engineering and/or institutional controls were used to close the SWMUs or AOCs.

It is important to note, that [Section 2.7.6](#) does not address the corrective action requirements of [40 CFR 264.100](#) for regulated hazardous waste land disposal units, which is conducted in lieu of [40 CFR 264.101](#). Section 101 addresses SWMUs, AOCs, and potentially hazardous waste management units that were closed by decontamination and removal if new information reveals that unacceptable exposures exist. When corrective action is terminated under [40 CFR 264.100](#), as adopted by reference in [Title 329 of the Indiana Administrative Code \(IAC\) Article 3.1, Rule 1, Section 7, and Rules 9 and 13, \(329 IAC 3.1-1-7, 329 IAC 3.1-9 and 329 IAC 3.1-13\)](#), the owner or operator is required to return to the facility's groundwater monitoring and response program, and other ongoing permit requirements remain in force.

2.7.6.2 Background

IDEM and the United States Environmental Protection Agency (U. S. EPA) recognize the importance of an official acknowledgment that RCRA corrective action activities have been completed. An official completion determination, made through appropriate procedures, benefits the owner or operator of a facility, IDEM and the general public as well. Official recognition that corrective action activities are complete can, among other things, promote transfer of ownership of the property and, in some cases; help return previously used commercial and industrial properties, known as “Brownfields” back to productive use. Further, once IDEM makes a determination that corrective action activities are complete, it can focus agency resources on other facilities. Finally, because completion determinations are made through a process that provides for adequate public involvement, the public is assured an opportunity to review and comment on the proposed cleanup methods, the level of cleanup to be achieved, and any remaining activities that will be required. The public participation process also assures the community the opportunity to pursue available administrative and/or judicial challenges to any of IDEM’s decisions.

For these reasons as well as those listed below, IDEM and U. S. EPA entered into a Memorandum of Understanding (MOU) on December 17, 2001, which memorialized our agreement on the management and coordination of our RCRA Subtitle C corrective action activities. Of particular note, the MOU enhanced IDEM’s ability to bring idled hazardous waste management facilities into the Indiana Brownfields Program through the use of the various legal authorities of its remedial action programs.

IDEM received authorization for the RCRA Corrective Action Program from U. S. EPA on October 21, 1996. The remedial activities of Indiana’s authorized RCRA Corrective Action Program are administered by the Hazardous Waste Permits Section of the Permits Branch in IDEM’s Office of Land Quality (OLQ). OLQ’s Remediation Services Branch includes: the Indiana Brownfields Program, which was created by a merger of IDEM’s Brownfields Section and a portion of the Indiana Finance Authority in 2006; the Federal Programs Section, which oversees state lead Superfund National Priorities List sites and Department of Defense base closures, the State Cleanup Section, which uses state CERCLA-like authorities under [IC 13-25](#) to address hazardous substance releases and includes the authority to address petroleum contamination under [IC 13-24](#); the Leaking Underground Storage Tank Section, which closes sites under

[IC 13-23](#) and the Underground Storage Tank Rule [329 IAC 9](#); the Site Assessment Section, which scores sites for prioritization under [329 IAC 7-1](#), the Indiana Scoring Model; and the Voluntary Remediation Program, which has the authority to address both hazardous substances and petroleum under [IC 13-25-5](#).

The U. S. EPA, through the MOU, supports the option provided by IDEM for RCRA treatment, storage or disposal (TSD) facilities to address their corrective action obligations through IDEM's Voluntary Remediation Program. Corrective action activities may also be conducted through oversight by one or more of the other Remediation Services Branch programs. The MOU acknowledged EPA's agreement to generally not take federal RCRA corrective action enforcement actions against RCRA Subtitle C TSD facilities that successfully remediate their facilities through Indiana's various remediation programs. This was made possible by all of IDEM's remediation programs use of the RISC Technical and User's guides as their cleanup standard.

In 2004, the MOU was modified to provide the same protection for facilities addressing their RCRA corrective action obligations under the oversight of the U. S. EPA. The 2004 MOU added that IDEM will generally not take enforcement actions against TSD facilities that address corrective action under federal oversight. The MOU lists the conditions that facilities must meet in order to be protected by it, and the conditions under which IDEM and the U. S. EPA are not bound by it. A copy of the signed 2004 MOU is located in [Section 2.3 of Appendix 2](#). Pursuant to the MOU, U. S. EPA and IDEM have agreed to honor, to the extent possible, each other's completion determinations. Therefore, IDEM will accept completeness determinations made by U. S. EPA, Region 5, and U. S. EPA, Region 5 will accept completion determinations made by IDEM, barring any of the listed conditions in the MOU.

Under [40 CFR section 264.101](#), as adopted by reference in [329 IAC 3.1-1-7](#), [329 IAC 3.1-9](#), and [329 IAC 3.1-13](#), owners and operators seeking a permit for the treatment, storage or disposal of hazardous waste pursuant to [IC 13-15](#) and [IC 13-22](#), must conduct corrective action for any and all releases of hazardous constituents at or from their facility "as necessary to protect human health and the environment." This portion of the RCRA Corrective Action Program is carried out under the authorities of the Hazardous Waste Permit Section, through the issuance of operating and post-closure hazardous waste permits. RCRA corrective action is also an obligation of owners

and operators of facilities that have or once had “interim status,” and are thereby subject to corrective action as required by orders under IC 13-22-13. This portion of the RCRA Corrective Action Program is also carried out under the authority of the Hazardous Waste Permit Section. Regardless of the legal authority imposing these requirements, the requirements are the same and the ultimate goal of the RCRA Corrective Action Program is to satisfy the “protection of human health and the environment” standard. Thus, a determination by IDEM that corrective action activities are complete is an announcement that the “protection of human health and the environment” standard has been achieved. The universe of facilities subject to the corrective action requirements includes facilities that vary widely in complexity, extent of contamination, and the level of risk presented at the facility. To address this wide variation among corrective action facilities, multiple approaches have been developed to achieve the “protection of human health and the environment” standard.

Regardless of the implementing program, when conducting corrective action, one of the key distinctions among remedies is the extent to which they rely upon controls (engineering and/or institutional) to ensure that they remain protective. In some cases, a facility may propose a remedy that requires treatment and/or removal of waste and all contaminated media to levels that allow the facility to be used in an unrestricted manner. At these facilities, no additional oversight or activity is required following cleanup. When implementation of the remedy is completed successfully, protection of human health and the environment is achieved. These remedies are also referred to as “residential” cleanups; (i.e. residential exposure assumptions are used when calculating the cleanup levels). In other cases, a facility may propose a remedy that allows contamination to remain on-site with the requirement of ongoing obligations such as operation and maintenance of engineered controls (e.g., a landfill cap), and compliance with institutional controls (e.g., a restriction on the property’s deed that the land be used for industrial purposes only and that the cap not be disturbed). Thus, in this situation, the standard is achieved through use of an engineered remedy (i.e. containment), that allows some contamination to remain in place, and requires institutional controls (i.e. land use and activity restrictions), at the facility to prevent or limit the risk of exposure to the contamination that remains after cleanup activities are completed.

Following the remedy implementation (CMI) at RCRA corrective action facilities, maintenance of controls and continued corrective

action related activities are essential to meet the standard of “protection of human health and the environment.” An example of a situation where IDEM typically would approve a proposed remedy that relies on controls is a facility for which the reasonably foreseeable future land use is industrial. At those facilities, IDEM may allow the facility the option of achieving long-term protection of human health and the environment by selecting a remedy that allows higher levels of hazardous constituents to remain at the facility, but requires the use of controls to limit the risk of unacceptable exposure. This remedy is considered to be a final remedy; however, protection of human health and the environment at the facility is dependent on the maintenance of these controls.

2.7.6.3 Corrective Action Complete Without Controls Determination

As discussed above, a determination by IDEM that corrective action activities are complete is a statement by IDEM that protection of human health and the environment has been achieved at a facility. IDEM will consider different approaches to achieving protection of human health and the environment at facilities, depending on the site-specific circumstances. IDEM believes that it is appropriate to make the determination that Corrective Action is Complete Without Controls where the facility owner or operator has satisfied all corrective action obligations. This determination indicates that either there was no need for corrective action at the facility or, where corrective action was necessary, the remedy has been implemented successfully, and no further activity or controls are necessary to protect human health and the environment. Thus, the corrective action requirements can be eliminated. The facility will be eligible for release from financial assurance for corrective action, as no funds will be needed for future corrective action-related activities. In addition, because there are no longer any RCRA corrective action required activities at the facility, IDEM will have no concerns associated with transfer of the property, nor any reason to want to be informed of or take any action regarding that transfer.

2.7.6.4 Corrective Action Complete With Controls Determination

IDEM will generally make a Corrective Action Complete With Controls determination at a facility where each of the following has been demonstrated to IDEM’s satisfaction:

1. A full set of corrective measures has been defined,
2. The facility has completed construction and installation of all required remedial actions,
3. Site specific media cleanup objectives have been met, and
4. All that remains is performance of required operation and maintenance, monitoring actions, and/or compliance with and maintenance of any controls.

A Corrective Action Complete With Controls determination provides the owner or operator with recognition that protection of human health and the environment has been achieved, and will continue as long as the necessary operation and maintenance actions are performed, and any institutional controls are maintained and followed. An enforceable mechanism must be in place to ensure there is compliance with and maintenance of all controls.

Several enforcement mechanisms are available to require the necessary operation and maintenance activities associated with engineered controls. Operating permits, post-closure permits, remedial action permits and enforceable orders are examples of enforceable mechanisms. An environmental restrictive covenant will also be required for all engineered controls.

In addition to the enforcement mechanisms above, another enforceable mechanism is appropriate for implementing institutional controls alone in some instances, which are environmental restrictive covenants. [IC 13-14-2-6](#) gives IDEM the authority to enforce compliance with institutional controls in the form of environmental restrictive covenants. For the purposes of [IC 13-14-2-6](#), environmental restrictive covenants are defined in [IC 13-11-2-193.5](#), as any deed restriction, environmental covenant, environmental notice, or other restriction or obligation that: (1) limits the use of the land or the activities that may be performed on or at the land, or requires the maintenance of any engineering control on the land designed to protect human health or the environment; (2) by its terms is intended to run with the land and be binding on successors; (3) is recorded with the county recorders office in the county in which the land is located; and (4) explains how it can be modified. The mechanism referenced in [IC 13-14-2-6](#) is only appropriate for environmental restrictive covenants.

A permit or order will be required for engineering controls.

This is an approach that is supported by U.S. EPA; however, the decision as to which mechanism is appropriate for each hazardous waste facility rests with IDEM's Hazardous Waste Permit Section ([See Federal Register 68 FR 8757, February 25, 2003](#)). In addition, where necessary (e.g. Corrective Action Management Units (CAMUs) used for disposal), adequate financial assurance for corrective action will be required.

IDEM will periodically review facilities for compliance with all controls, and require notification in advance of any transfer of ownership of any portion or all of the facility. This will allow an opportunity for IDEM to assure that compliance with all corrective action requirements continue. (For more information, a copy of "Institutional Controls: A Site Manager's Guide to Identifying, Evaluating and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups", U. S. EPA 540BFB00B005, OSWER 9355.0B74FSBP, September 2000, can be found at <http://www.epa.gov/superfund/action/ic/guide/guide.pdf>).

It should be noted that some facilities that obtain a Corrective Action Complete With Controls determination, or subsequent facility owners, might later wish to obtain a Corrective Action Complete Without Controls determination if circumstances were to change. For example, the owner or operator at a facility cleaned up to industrial exposure levels could decide to conduct additional cleanup because of a desire to change the land use to unrestricted use levels, and/or because they no longer wish to maintain any engineering controls. Should a facility later seek a Corrective Action Complete Without Controls determination, IDEM will process that determination through the procedures described below. Whenever a Corrective Action Complete Without Controls determination is subsequently justified, it would be appropriate to remove whatever enforceable restrictions are in place and release the facility from financial assurance for corrective action, so long as there are no additional RCRA activities at the facility subject to the CAMU Rule or any permitting requirements.

2.7.6.5 No Further Action

The term "No Further Action" may be used in two slightly different ways in the corrective action process. First, "No Further Action" status can be a determination used for individual SWMUs or AOCs. Once all activities required are completed at individual units at a

facility, a “No Further Action” status may be granted to that specific SWMU or AOC, while work may continue at other areas of the facility.

Second, “No Further Action” (NFA), can also be used to describe a site-wide selected remedy. For example, if the RFA or the RFI reveals that both the soil and ground water at all SWMUs and/or AOCs at a facility are below the RISC default residential levels for all COCs, and there are no ecological exposures of concern, the facility owner or operator may propose “No Further Action” as the final remedy for the facility. If IDEM agrees with this proposal, this final remedy would be public noticed and the public participation process would begin.

2.7.6.6 Completion Determinations for a Portion of a Facility

IDEM may develop a number of distinct and separate remedies to address different areas of a facility or different media. This approach may be necessary because a facility includes areas and media that present a wide range of environmental risks. For example, an industrial facility may include areas that have never been used for industrial purposes or have never been otherwise contaminated. Alternatively, a facility may have contaminated groundwater undergoing corrective action years after the source of contamination has been removed and the soil has been cleaned up to unrestricted use levels. To ensure that a range of appropriate cleanup and land use options is available to the facility owner or operator, IDEM will consider, when appropriate, allowing a facility to legally subdivide a parcel from the remainder of the facility, consistent with the goals and objectives of the RCRA Corrective Action Program. In these situations, IDEM may select or approve a cleanup approach based on unrestricted use at parts of the facility, while cleanup at other parts of the facility may be based on restricted use assumptions, which would rely on engineering and/or institutional controls to maintain the protectiveness of the corrective action.

Alternatively, IDEM may select or approve a cleanup approach based on unrestricted use for the entire facility, with some parcels requiring a longer time period to achieve the same cleanup goals. Under this approach, a Corrective Action Complete Without Controls determination could be made for a portion of a facility when it qualifies for unrestricted use. A Corrective Action Complete Without Controls or a Corrective Action Complete With Controls

determination, as appropriate, could be made for remaining portions of the facility when those cleanup goals are achieved, and any necessary controls would then be implemented under an appropriate mechanism.

In some situations, following a Corrective Action Complete Without Controls determination for a portion of a facility, the owner would be allowed to subdivide and/or sell the portion that is no longer subject to corrective action. In these situations, IDEM will consider the long-term plan for the facility, the effect of the Corrective Action Complete Without Controls determination, and the effect of the sale of the property on the financial assurance established for corrective action. IDEM will require that adequate financial assurance remains available to address corrective action obligations at the remainder of the facility.

2.7.6.7 Procedures for Completion Determinations for the Entire Facility

The federal regulations in [40 CFR 260 through 270](#), as adopted by reference in [329 IAC 3.1](#), do not provide explicit procedures for recognizing completion of corrective action activities. Therefore, the U. S. EPA and IDEM have considerable flexibility in making completion determinations, and feel that it is important to provide meaningful opportunities for public participation as part of the completion determination process. Coordinated community planning and input are key components to these determinations.

It should be noted that if the Voluntary Remediation Program (VRP) is the program under which the facility wishes to address its corrective action obligations, the VRP does not dictate the scope of remedial activities proposed by the applicant. Because the VRP is voluntary, applicants to a certain extent are free to conduct whatever activities in whichever areas they choose. However, the scope of the environmental investigations conducted at RCRA TSDs under corrective action is crucial when making completion determinations. The MOU in [Section 2.3 of Appendix 2](#) sets out the scope, conditions and requirements for facilities that wish to carry out their RCRA corrective action obligations in the VRP. The Hazardous Waste Permits Section will be responsible for making completion determinations at all TSD facilities after the facility has received a Certificate of Completion from the VRP and a Covenant Not to Sue from the Office of the Governor of the State of Indiana. The Certificate of Completion and Covenant Not to Sue is very specific as to what constituents were investigated and in which areas confirmation samples were taken.

Pursuant to Indiana Code 13-25-5-1, participation in the Voluntary Remediation Program does not affect a person's RCRA obligations set forth in 42 USC 6901.

It is recommended that the facility coordinate their activities in the VRP with the Hazardous Waste Permit Section if they wish to carry out their RCRA Corrective Action Program obligations at the same time.

The procedures for processing completion determinations are dependent on various factors including: the status of the facility (permitted or interim status); the resulting future land use and proposed method of eliminating exposure pathways; and whether the determination applies to a portion of the facility or the entire facility.

2.7.6.7.1 Procedures for Determinations Without Controls

Procedures for Permitted Facilities

At permitted facilities, the Hazardous Waste Permits Section will use permit modification procedures to reflect the determination that corrective action is complete. In cases where no other permit conditions remain, the permit will be modified not only to reflect the completion determination, but also to change the expiration date of the permit to allow earlier permit expiration ([See 40 CFR 270.42 \(Appendix I\(A\)\(6\)\)](#)). The current regulations in [40 CFR 270.42](#), as adopted by reference in [329 IAC 3.1-1-7](#) and [329 IAC 3.1-13](#), provide procedural requirements for permit modifications.

In most cases, completion of corrective action will likely be a Class 3 permit modification, and IDEM will follow those procedures, including the procedures for public participation. However, Class 3 procedures may not be appropriate in all circumstances, and IDEM will evaluate each situation to determine whether a less extensive procedure would be adequate. For example, where IDEM has made extensive efforts throughout the corrective action process to involve the public and has received little or no interest, and/or the environmental problems at the facility were limited or nonexistent, more tailored public participation may be appropriate.

Procedures for Non-permitted Facilities

At non-permitted (interim status) facilities where facility-wide corrective action is complete, and all other RCRA obligations at the facility have been satisfied, the Hazardous Waste Permit Section will acknowledge completion of corrective action without controls by the following procedures. The written bases for IDEM's decision will be stated clearly and specifically include that:

1. There are no current treatment, storage, or disposal activities that require a hazardous waste permit,
2. All closure and post-closure requirements applicable at the regulated units have been fulfilled,
3. All potential sources of environmental contamination at the facility have been sufficiently investigated to determine the level of threat to human health and the environment, and have been appropriately remediated where necessary, and
4. All corrective action obligations have been met.

The following public involvement procedures set out the requirements for making corrective action completion determinations at non-permitted facilities.

1. IDEM will notice local officials, the county health department and any local environmental agency, and publish a public notice in a news paper of local distribution of the proposed completion determination. The notices will generally include the following:
 - a. Name,
 - b. Location,
 - c. Property legal description,
 - d. Current owners and/or operators,
 - e. Property ownership,
 - f. Operation history, and
 - g. A comprehensive summary that includes:

- (1) the current site conditions; and
 - (2) an explanation that these current site conditions do not pose a significant environmental concern.
2. IDEM will solicit correspondence regarding the proposed facility completion determination from:
 - a. local officials,
 - b. the county health department; and
 - c. any local environmental agency.
3. IDEM will provide the following as necessary:
 - a. responses to any comments received from the public or local officials, and
 - b. a forum for public meetings.
4. If a public hearing is requested, IDEM will conduct a hearing in a public forum to receive comments.
5. IDEM will consider all comments received.
6. After receipt of all comments, IDEM will notify all interested parties of the completion determination.
7. If IDEM determines that appropriate completion has been attained, a Notice of Completion of Corrective Action Without Controls will be issued to the owner/operator.

More detailed guidance on RCRA public participation can be found on U. S. EPA's website at:

<http://www.epa.gov/epaoswer/hazwaste/permit/pubpart/manual.htm>.

A copy of IDEM's Guide for Citizen Participation is located on our website at:

http://www.in.gov/idem/your_environment/community_involvement/publicparticipation/index.html.

2.7.6.7.2 Procedures for Completion Determinations With Controls

To process a Corrective Action Complete With Controls determination, IDEM will consider the regulatory status of the facility, among other factors. As stated above, permits and orders will continue to be used as enforceable mechanism options to assure compliance with any and all remaining engineering controls. IDEM's authority to enforce environmental restrictive covenants pursuant to [IC 13-14-2-6](#), may be sufficient to assure compliance with institutional controls, however, the decision as to which mechanism is appropriate for each facility rests with IDEM's Hazardous Waste Permits Section.

Procedures for Permitted Facilities

At permitted facilities, IDEM's permit modification procedures will be required for operating facilities, and an option for post-closure facilities. This determination generally will be made at facilities where the four conditions stated at the beginning of [Section 2.7.6.7.1](#) have been met.

For operating permitted facilities where engineering controls are used to eliminate or limit exposure to remaining contaminants, the specific requirements for operation and maintenance of such controls and any other associated required activities, will be specified in the operating permit as a Class 3 permit modification. For post-closure facilities, these requirements may be specified in a post-closure agreed order or a post-closure permit. Engineering controls will also require the use of one or more of the financial assurance mechanisms listed above under [Section 2.7.5](#).

For permitted facilities where institutional controls alone are used to limit exposure by land use or activity restrictions, the permit may be modified to simply reflect the completion determination. In cases where no engineering controls are used to limit exposure to contaminants, all land use specific cleanup objectives for each medium have been obtained, and no other permit conditions remain, the permit will be modified not only to reflect the completion determination, but also to change the expiration date of the permit to allow earlier permit expiration ([See 40 CFR 270.42 \(Appendix I \(A\)\(6\)\)](#)).

In all cases where the final remedy uses engineering controls, activity restrictions or land use restrictions to ensure compliance with the "protection of human health and the environment" standard, all such

restrictions and controls shall be recorded on the deed(s) to all of the property(ies) originally listed on the facility's Part A application.

Procedures for Non-permitted Facilities

For non-permitted facilities, the procedures for making the determination are the same as for Corrective Action Complete Without Controls for non-permitted facilities. This determination generally will be made at facilities where the four conditions in [Section 2.7.6.7.1](#) have been met.

For facilities where engineering controls are used to eliminate or limit exposure to remaining contaminants, the specific requirements for operation and maintenance of all such controls must be specified in an enforceable order or Remedial Action Permit (RAP), for as long as the controls are necessary to ensure the protection of human health and the environment. At facilities where engineering controls are implemented, the use of one or more of the financial assurance mechanisms listed in [Section 2.7.5](#), must be specified in the order or RAP for the operation and maintenance of all the controls used.

In cases where no engineering controls are used to limit exposure to hazardous constituents, and all site-specific media cleanup objectives have been met, the use of an environmental restrictive covenant on the property deed may be the only control to maintain.

In cases where the final remedy uses engineering controls, activity restrictions or land use restrictions to meet the "protection of human health and the environment" standard, all such restrictions and controls shall be recorded on the deed to the property, or deeds to all of the parcels of property originally listed on the facility's Part A application.

2.7.6.8 Procedures for Determinations for Less than the Entire Facility

As discussed above in [Section 2.7.6.6](#), IDEM may make a Corrective Action Complete determination for a portion of a facility, when corrective action activities are still required at the remaining portion. When IDEM makes this determination for a portion of the facility (with or without controls), it will do so using procedures that will not affect portions of the facility where corrective action requirements remain. For example, at a permitted facility, IDEM may make a Corrective Action Complete determination for a portion of the facility by modifying the permit following the procedures in [40 CFR 270.42](#),

as adopted by reference in [329 IAC 3.1-1-7](#) and [329 IAC 3.1-13](#). However, IDEM will not eliminate the permit if corrective action responsibilities (and possibly other RCRA responsibilities) remain at the facility.

At non-permitted facilities, the procedures for making the determination for a portion of the facility are the same as for Corrective Action Complete Without Controls for non-permitted facilities. However, it is important to note that interim status is not terminated by completion determinations made by IDEM. If the corrective action was implemented through an agreed order or final order, the order will remain in force until the facility satisfies all corrective action obligations required and ensures that any required controls will be maintained.

2.8 Sample Quality Assurance and Analytical Requirements

The sample QA and analytical requirements apply to the soil and ground water sampling discussed in [Sections 2.9 and 2.10](#) of this User's Guide. Sampling and analysis plans (SAPs), sampling QA, and analytical requirements are discussed below.

2.8.1 Sampling and Analysis Plans

An adequate SAP should include, at a minimum, the following information:

1. Media to be sampled,
2. Parameters to be analyzed,
3. Sampling locations and depths,
4. Background boring locations and depths for inorganic parameters (if applicable),
5. Soil boring methods, sample collection methods, and sampling equipment,
6. Procedures and equipment used to minimize volatilization in samples submitted for organic analysis,
7. Sample preservation techniques and containers,

8. Equipment decontamination procedures,
9. Analytical procedures used to achieve EQLs,
10. Statement indicating closure levels,
11. Sample chain-of-custody control procedures, including shipping procedures, and
12. A copy of the form that will be used to record and document soil descriptions and sampling information in the field.

The form identified under item 12 above should include the following information:

1. Facility or unit,
2. Purpose of sampling,
3. Sampling date and time,
4. Weather conditions,
5. Field personnel,
6. Sampling method and equipment,
7. Boring, test pit, or well location and identification (ID) number,
8. Soil mapping unit determined from the appropriate county soil survey published by USDA's SCS,
9. Sample number,
10. Sampling interval and depth,

11. Monitoring well static water level,
12. Monitoring well purging procedure,
13. Ground water field measurements (such as pH, specific conductance, and temperature),
14. USDA soil textural classification from the following reference:
USDA. 1962. *Soil Survey Manual*. Handbook No. 18. U.S. Government Printing Office. Washington, DC.,
15. Lithology,
16. Munsell soil color from the following reference:
Munsell Color. 1975. *Munsell Soil Color Charts*. Baltimore, MD.,
17. Sedimentologic features,
18. Miscellaneous observations, and
19. Evidence of contamination (such as discoloration, odor, or field instrument results).

Facilities are strongly advised to perform continuous soil borings and record descriptions in accordance with IDEM's Unconsolidated Descriptive Requirements.

2.8.2 Sampling Quality Assurance

Sampling methods and equipment used should follow guidance in U.S. EPA's "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846) and U.S. EPA's "RCRA Ground-Water Monitoring Technical Enforcement Guidance Document" (OSWER Directive No. 9950.1, Final, 1986). Field sampling methods not included in SW-846; [40 CFR 261, Appendix I](#); or the technical enforcement guidance document must be approved by OLQ before use. These methods include drilling, boring, and other sampling methods. When available, standard procedures as defined by U.S.EPA, IDEM, or the American Society for Testing and Materials (ASTM) should be followed.

IDEM recommends using the Data Quality Objective (DQO) process for all sampling and analysis performed in support of RISC. DQOs

establish the type, quality and quantity of data required to make and defend a particular decision. See [Appendix 4](#) of the Technical Guide for information on the DQO process. IDEM highly recommends collecting the various types of quality assurance samples. Each QA sample documents specific aspects and provides information about accuracy or precision throughout the sampling process. Proper decisions cannot be made without appropriate QA samples, and analytical results will be considered to be estimated, attributed to the sample, or may not meet the project DQO.

For each batch of 20 samples or less, IDEM recommends at least one field duplicate per matrix type must be collected. Control samples such as trip blanks (when VOC's are chemicals of concern) or equipment blanks (to demonstrate field decontamination procedures) should be collected for each day that samples are collected. In addition, for each batch, sufficient sample amounts must be collected of each matrix to allow the laboratory to prepare one matrix spike and either one matrix duplicate analysis or one matrix spike duplicate per analytical batch when appropriate for the method. The purpose of matrix spikes is to determine bias resulting from the sample matrix. Therefore, the spiked sample must be from the same project as the field samples. If the spiked sample is not from the same project, analytical results must be flagged as estimated. Samples identified as blanks do not meet the purpose of a spike and must not be spiked.

Samples collected for VOC analyses require specialized sampling and handling procedures. Soil samples should be collected with a split-spoon sampler or a sampler that uses removable liners made of stainless steel or some other material acceptable to the laboratory. IDEM recommends Method 5035A for collecting soil samples for VOC analysis. Preparation, decontamination, and sampling procedures should be performed in accordance with SW-846 and U.S. EPA's technical enforcement guidance document. Under no circumstances should soil samples for VOC analysis be mixed, composited, or otherwise aerated.

2.8.3 Analytical Requirements

A complete quality assurance project plan (QAPP) should be prepared to document sampling and analytical requirements. Guidelines for developing a QAPP are presented in [Appendix 4](#) of the RISC Technical Guide as well as SW-846, Chapter 1. [Appendix 4](#) of the RISC Technical Guide also details the data quality objectives (DQO) process. One project objective is that the analytical methods' EQLs

meet closure levels. [Appendix 2](#) of the RISC Technical Guide contains guidance on choosing analytical methods that will meet project objectives.

The QAPP should also specify analytical methods for each parameter, sample preparation and extraction methods, and EQLs for each analyte. Guidance for establishing EQLs, which are highly matrix-dependent, is provided in SW-846. The analytical methods in SW-846 should be used whenever possible. Other official U.S. EPA methods applicable for the sample matrix can be used, but any modification to these methods or the use of any other methods will require the submittal of the complete method for OLQ approval. The QA requirements specified in the individual methods must be performed by the laboratory to produce data of acceptable quality.

The use of common field screening instruments, such as combustible gas indicators, colorimetric indicator tubes, and photo-ionization detectors (such as the HNu™ or TIP™), is not an acceptable substitute for SW-846 methods. These screening tools can be used to determine the presence (but not the absence) of hazardous constituents. They are only appropriate and acceptable for screening samples. If portable field instruments are used, the results should be confirmed by laboratory analysis of the samples using SW-846 methods.

2.9 RCRA Soil Sampling

This section discusses soil sampling under the RCRA program, including the following:

- Soil sampling requirements,
- Background sampling,
- Sampling considerations,
- Sampling to determine the nature and extend of contamination,
- Closure or verification sampling, and
- Industrial closure soil sampling.

2.9.1 Soil Sampling Requirements

Hazardous waste management units having any evidence or possibility of a release or the potential for migration of a hazardous waste or hazardous constituent (see 40 CFR 261, Appendix VIII) at any time during the life of the unit must be investigated before closure. Soil, and potentially ground water, should be investigated to determine the presence of hazardous constituents. For Corrective Action purposes, the investigation must evaluate for the presence and concentrations of hazardous constituents. Investigation is required for container or tank storage areas located on soil, gravel, paved pads, or concrete pads. However, IDEM may, on a case-by-case basis, determine that alternate sampling is appropriate. Sampling should be performed in accordance with the sampling methods listed in 40 CFR 261, Appendix I, or SW-846, Chapter 9.

If soil is found to be contaminated, the closure plan, post-closure care plan, or corrective action provisions, if applicable, may require ground water monitoring to determine the nature and extent of contamination. Ground water monitoring applicable by regulation (40 CFR 264.90 and 40 CFR 265.90) has specific standards, and the closure plan must account for these standards (see [Section 2.10](#) for ground water monitoring requirements).

Constituent evaluation, closure levels, and screening sample locations are discussed below.

2.9.1.1 Constituent Evaluation

Parameters for soil analysis should include elements or compounds of the hazardous wastes, hazardous constituents (40 CFR 261, Appendix VIII), or hazardous waste constituents (as defined in 40 CFR 260.10). The owner or operator or IDEM can propose parameters. For Corrective Action purposes, the initial parameter list is comprised of any hazardous constituent used at the facility, as well as any breakdown product or by-product of a hazardous constituent used at the facility. With sufficient justification, parameters can be eliminated during SAP preparation. Parameters can also be eliminated depending on sampling results (see [Chapter 3](#) of the RISC Technical Guide).

Parameters should be determined not only based on knowledge of wastes or byproducts managed at the unit, but also on other potential elements such as raw materials, feed stocks and products used at the facility. These considerations are similar to those used by U.S. EPA for waste de-listings. For example, soil underlying a surface impoundment containing F006, electroplating wastewater treatment

sludge, could also be analyzed for 1,1,1-trichloroethane and trichloroethylene, solvents likely to be used at a metal plating facility. For purposes of corrective action investigations, product storage tanks, valves and pumping equipment are also potential source areas for routine and systematic releases. IDEM may also require additional parameters for analysis, such as breakdown products from chlorinated hydrocarbons.

2.9.1.2 Closure Levels

Closure requires analysis of final rinsates from the decontamination of pads, tanks, or structures to determine if the waste has been removed. Rinsate analytical results must meet (1) the MCLs of the National Primary Drinking Water Regulations ([40 CFR 141](#) and [40 CFR 264.94\[a\]\[2\]](#)) for inorganic and certain organic parameters with MCLs and (2) estimated quantitation limits (EQLs) as defined by SW-846 for the organic parameters without MCLs. RISC default closure levels are not appropriate for rinsates because the decontamination demonstration is not based on exposure.

Default closure levels for soil and ground water are listed in the RISC Technical Guide, [Appendix 1 Table A](#). These closure levels are based on appropriate land use.

Closure levels for soil can also be established using the non-default procedures presented in [Chapter 6](#) of the RISC Technical Guide. The alternate cleanup level proposal must document that the constituents left in soil will not adversely impact any other environmental medium (ground water, surface water, or atmosphere) and that direct contact through dermal exposure, inhalation, or ingestion will not result in threats to human health or the environment.

Closure levels for soil can be the analytical methods' EQLs for organic compounds and background levels for inorganic compounds. Background levels for inorganic compounds are calculated as the mean plus one standard deviation. If the coefficient of variation for the background samples exceeds 1.2, additional sampling may be necessary. (See [Chapter 3](#) of the Technical Guide).

2.9.1.3 Screening Sample Locations

Locations of screening soil borings and samples should be selected to determine with a high level of confidence whether any of the identified constituents are present. Random sampling can be performed using a

grid system. Directed sampling using the default screening procedures specified in [Chapter 3](#) of the RISC Technical Guide should be performed in areas of suspected contamination (such as cracked areas of a containment structure, areas of known spills, and suspected downslope, downwind, or runoff areas of a containment structure). As noted in the Technical Guide, screening in areas of known contamination is not recommended. If an area is known to be, or can be reasonably expected to be contaminated, screening should be skipped and you should proceed directly to a nature and extent of contamination investigation (See [Chapter 4](#) of the Technical Guide).

Other directed or systematic methods (such as sampling at uniform intervals) can be used if warranted on a site-specific basis. These methods may include a circular pattern of sampling around a central point or linear sampling along the drainage way, boundary, or perimeter of a container storage area. Grid sampling and directed sampling can both be used in the same closure plan. [Chapter 3](#) of the RISC Technical Guide discusses procedures for choosing sampling locations based on a random grid pattern for screening purposes.

2.9.2 Background Sampling

Determination of background concentrations is only necessary to establish closure levels (for example, when natural soil concentrations exceed closure levels) or to determine the vertical extent of contamination for organics. [Chapter 3](#) of the RISC Technical Guide provides details and requirements on background sampling.

All background boring locations should be adequately justified and are subject to approval and modification. Background samples must be taken in areas unimpacted by the facility, or other sources of contamination. Proposed background boring locations must be shown on a detailed map or diagram of the facility. Any deviations from the SAP resulting from problems encountered in the soil or based on knowledge of the area should be adequately justified and will be subject to review. Background soil sample results may also be subject to approval if the concentrations are not typical of local Indiana soil.

2.9.3 Sampling Considerations

The risk assessment process requires developing an overall project goal, developing a conception of the facility (a “conceptual site model”), collecting data (research or analytical) to support or enhance the conceptual site model, and evaluating the results. Physical

sampling of the facility is only part of the process. Sampling results may indicate the need to collect further data. The sampling process may go through several rounds requiring planning, data collection, and evaluation. It is possible that the project goal may change when more information becomes available during this iterative process. Throughout the process, the owner or operator should consider what types of sampling will be required to collect the data needed to make a final evaluation.

The RISC site evaluation process is summarized in Table 2-2 below.

Table 2-2. RISC Three-Step Site Evaluation Process

Step	Purpose	Comment
Screening	To determine if additional investigation is needed	Can include judgmental (directed) or random soil sampling as well as ground water screening
Determining Nature and Extent of Contamination	To identify contamination boundaries and amounts	May indicate that remaining constituents pose acceptable risks or that remediation is necessary
Verification of Closure Sampling	To confirm that remediation is complete	Must be repeated until closure levels are met

As stated above, area screening is optional. If an area is known to be contaminated, the owner or operator should proceed to determining the nature and extent of contamination or to remediation (for example, excavation of the area). Remediation requires adequate closure verification sampling results.

The owner or operator should consider all media when developing the conceptual site model. The SAP should detail the sampling strategy for each medium and consider several factors such as the waste and its constituents, site conditions, environmentally sensitive areas, soil types, possible preferential pathways to ground water or surface water, depth to ground water, and analytical methods required. The SAP must also consider both surface and subsurface soils as well as

possible ground water investigation. Area classification, random and directed sampling, and sampling at specific units are discussed below.

2.9.3.1 Area Classification

Areas are classified as unlikely to be contaminated, known to be contaminated, and possibly contaminated (See [Chapter 3](#) of the RISC Technical Guide for details on proper area classification). The sampling strategy may vary based on the investigative area classification.

RISC procedures limit a default risk assessment to a maximum source area of 0.5 acre for subsurface soil. This is the largest area for which default values were calculated. Subsurface source areas larger than 0.5 acre cannot be subdivided and require a non-default risk assessment. The simplest non-default risk assessment procedure for larger source areas is to use a smaller dilution attenuation factor in the equation to calculate a non-default closure level (see [Chapter 6](#) of the RISC Technical Guide). In all cases, both surface and subsurface soils must be investigated.

2.9.3.2 Random and Directed Sampling

The two basic options for soil screening to determine if a site will meet closure levels are random and directed sampling. Random sampling is used to determine if an area that may be contaminated is in fact contaminated and if the contamination exceeds default closure values. Directed sampling is used to determine if areas known to be impacted exceed default closure values. [Chapter 3](#) of the RISC Technical Guide discusses these sampling procedures.

The SAP can propose a combination of random and directed sampling and should describe the sampling strategy, which is subject to IDEM review and approval. Again, the owner or operator may choose not to screen and proceed to the nature and extent determination and/or remediation (with adequate verification sampling).

All soil analytical results, regardless of whether sampling is random or directed, must be evaluated against the lower of the direct exposure (surface soil) or migration to ground water (subsurface soil) default value. The entire soil column must meet the lower of the two values. The higher value can be used only if the owner or operator can validly demonstrate that its use will not result in an unacceptable exposure.

Random Sampling

Random sampling can be used in areas classified as “may be contaminated.” Sampling locations can be chosen using a random grid method if there is no evidence of releases. Random samples can be collected based on soil stratigraphy similar to the method discussed in [Chapter 3](#) of the RISC Technical Guide. Each soil stratum must be sampled because random sample results confirm the presence or absence of contamination.

Random sampling results should be statistically evaluated to determine if enough samples have been collected by following the procedures in [Chapter 3](#) of the RISC Technical Guide. The 95% UCL for each constituent is calculated and compared to the closure level. If the evaluation of random sample results exceeds appropriate closure levels, the nature and extent of contamination must be determined.

Directed Sampling

Generally, directed sampling should be performed at areas known or suspected to be impacted, such as in areas of cracks, runoff areas of a containment structure, or areas of known spills. The default procedures discussed in [Chapter 6](#) of the RISC Technical Guide should be used during directed sampling. The three borings sampled should be in the area of highest contamination (that is, all three results should be reasonably similar). Anomalous or “outlier” results should also be explained.

For volatile constituents, the average of each constituent of the three soil boring samples is calculated. This value is the “exposure point concentration” (EPC) for that constituent. For nonvolatile constituents, use only analytical results from strata that have constituents detected. Calculate the average of each constituent within each boring. This is the EPC. EPCs (for both volatile and non volatile constituents) are compared to closure levels. (See [Chapter 3](#) of the Technical Guide.) If all EPCs for a source area are less than closure levels, the source area is not considered to present an exposure risk for human health. Closure can be certified in this case at this point (assuming there are no groundwater issues). If any EPC exceeds the appropriate closure level, the nature and extent of contamination must be determined. (See [Chapter 4](#) of the Technical Guide.)

2.9.3.3 Sampling at Specific Units

Investigative soil sampling is required for storage areas or tanks located on soil or gravel. Sampling locations can be chosen using the random grid sampling strategy if no areas have evidence of releases. If evidence of a release exists, the default direct sampling procedures can be used. The paved or concrete pads of storage areas or tanks must be decontaminated and soils sampled (using default procedures) at areas of cracks, gaps or other damaged areas. Soil sampling at the edge of the pad is also required. Sample results are evaluated using the directed strategy (that is, all strata must be below closure levels) unless there is evidence of a release.

Sampling may not be required for storage areas or tanks in secondary containment. Default procedure sampling is only required if cracks, gaps, or damaged areas of the containment system existed. The secondary containment requires decontamination.

For closure of units other than aboveground tank systems, angled soil borings should be performed, with samples taken at the sides and below the bottom of the tank, and as close to the tank as possible. Additional borings should be located and oriented to allow sampling beneath the tank system. Soil below the bottom of the tank must be sampled in accordance with the procedures in [Chapter 3](#) of the RISC Technical Guide. However, if the tank is removed, soil verification samples only are required unless contamination is detected above closure levels.

Closure of waste piles and surface impoundments require the complete removal of waste, liners, leachate, and materials contaminated with waste or leachate. Soil sampling should be conducted on a random grid based on the assumption that the waste was homogeneous and evenly distributed. If the waste was not homogenous, directed default procedures can be used. These units also require Subpart F ground water monitoring, which is discussed in [Section 2.10](#).

2.9.4 Sampling to Determine the Nature and Extent of Contamination

If soil screening results indicate that EPCs exceed closure levels, a SAP to determine the complete nature and extent of soil contamination is required. The owner or operator should contact IDEM prior to submittal of such a SAP. Not only must the contamination boundaries (vertical and horizontal extent) be determined, a concentration gradient across the contaminated zone (the nature) must also be determined. This gradient will allow a more detailed estimate of risk.

(An accurate estimate of risk cannot be made unless it is known how much contamination is present and the location of the contamination.) [Chapter 4](#) of the RISC Technical Guide describes nature and extent determination requirements.

Once the nature and extent of contamination have been determined, a second set of EPCs is calculated based on the nature and extent determination results. These EPC values are compared with closure levels. If the EPCs are below closure levels, the unit is eligible for closure. Otherwise, options include either a non-default risk assessment or soil remediation. If a risk assessment is not feasible or remediation is not practicable (waste removal and decontamination to an appropriate standard), the unit must be closed in-place.

2.9.5 Closure or Verification Sampling

The RISC Technical Guide requires closure or verification sampling of surface and subsurface soils to demonstrate that contaminant concentrations are below closure levels for each impacted medium. [Chapter 6](#) of the RISC Technical Guide describes the minimum number of samples, sampling locations, and decision criteria for closure sampling.

2.9.6 Industrial Closure Soil Sampling

For industrial closures, it is assumed that the soil or ground water contaminant concentrations exceed residential closure levels. Unless the unit was closed through screening as provided in [Chapter 3](#) of the RISC Technical Manual, the nature and extent of contamination in soil must be determined for all units using industrial closure levels because it is necessary to define the extent of the soil contamination that might impact ground water above residential values. For facilities with multiple sources, the procedures in [Chapter 4](#) of the RISC Technical Guide may be followed. Ground water must be below default residential values at the boundary of property control.

2.10 RCRA Ground Water Sampling

As stated in [Subpart G of 40 CFR 264 and 265](#), closure is required at all contiguous areas of land on or in which hazardous waste is placed or the largest area in which there is significant likelihood of mixing hazardous waste constituents in the same area. Subpart G of the regulations requires the consideration of ground water when determining clean closure standards (See [53 FR 8705](#)). Therefore, the

owner or operator must demonstrate either that there is no evidence of release of hazardous constituents to ground water or that ground water does not pose potential harm to human health or the environment as a result of facility-related contamination. Ground water sampling refers to the sampling needed to determine the extent of decontamination necessary to satisfy closure performance standards.

Ground water protection is a major concern in regulatory strategy for hazardous waste land disposal. Therefore, in addition to ground water sampling to meet closure levels, ground water monitoring is required at surface impoundments, waste piles, and land treatment units or landfills (hereafter referred to as “Subpart F units”) that received hazardous wastes after July 26, 1982. Subpart F units must comply with Subpart F requirements for detecting, characterizing, and responding to releases to the uppermost aquifer and any hydraulically interconnected underlying aquifers.

This section clarifies the application of RISC Technical Guide procedures to the RCRA program and presents a discussion of how the procedures either comply with RCRA federal rules, or may necessarily be more stringent than RISC Technical Guide procedures. Within this chapter, ground water monitoring refers to the collection of samples required by [Subpart F of 40 CFR 264 and 265](#).

Ground water is dynamic and can have temporal and spatial contaminant changes. The possibility of missing a plume of ground water contamination is very likely if the site-specific hydrogeology is unknown. In addition, without significant sampling control, sampling techniques may not ensure the collection of samples representative of ground water within the media. Therefore, valid conclusions based solely on ground water data require strict sample collection control at pre-determined points in time and space based on knowledge of the characteristics of the ground water flow, and capability of obtaining representative samples.

This section discusses the following:

- SAP requirements,
- Ground water screening,
- Characterization of the nature and extent of contamination,
- Ground water closure sampling, and

- Ground water monitoring.

Where applicable, the discussion for each of these topics first addresses Subpart F unit requirements, followed by non-Subpart F unit guidelines.

2.10.1 Sampling and Analysis Plan Requirements

2.10.1.1 Subpart F Unit Requirements

Hazardous constituents under the RCRA program for ground water monitoring include those listed in [40 CFR 264, Appendix IX](#). The list of hazardous constituents to be analyzed for is based (1) on their presence in ground water ([40 CFR 270.14 \[c\]\[4\]\[ii\]](#)) and (2) their capability for harming human health or the environment ([40 CFR 264.93 \[b\]](#)). A hazardous constituent can be removed from the list of constituents to be analyzed if it can be demonstrated that the constituent is not present in ground water or is not present at concentrations that can pose a substantial present or potential future hazard to human health or the environment. This can be simply demonstrated by determining the total list of constituents in ground water samples. Otherwise, a hazardous constituent can be removed from the list of contaminants of concern if it is demonstrated that the constituent is not capable of posing a substantial present or potential future hazard to human health or the environment (See [40 CFR 264.93 \[b\]](#)).

2.10.1.2 Non-Subpart F Unit Requirements

Units not subject to Subpart F monitoring requirements must be sampled and analyzed using consistent procedures as described in [Chapter 4](#) of the RISC Technical Guide. DQOs must be achieved.

Parameters for ground water analysis should include elements or compounds of the hazardous waste, hazardous constituents (as defined in [40 CFR 261, Appendix VIII](#)), or hazardous waste constituents (as defined in [40 CFR 260.10](#)). Parameters can be proposed by the owner or operator or IDEM. For corrective action purposes, the initial parameter list is comprised of any hazardous waste or hazardous constituent used at the facility, as well as any breakdown products or by-product of a hazardous waste or hazardous constituent used at the facility. With sufficient justification, parameters can be eliminated

from the list during SAP preparation. Parameters can also be eliminated depending on sampling results. Parameters should be selected based on knowledge of wastes managed at each unit and may include other potential elements or compounds related to facility operations (such as breakdown products). This strategy is similar to U.S. EPA considerations for waste de-listing.

2.10.2 Ground Water Screening

2.10.2.1 Subpart F Unit Requirements

Screening under the RCRA ground water monitoring program is based on determining if a release has occurred from a unit to the uppermost aquifer at the compliance point. Subpart F units that meet the requirements of the indicator monitoring program of [40 CFR 265](#) and of the detection monitoring program of [40 CFR 264](#) satisfy the objectives of the screening process discussed in [Chapter 3](#) of the RISC Technical Guide. The nature and extent of ground water contamination does not have to be characterized to satisfy the requirements discussed in [Chapter 4](#) of the RISC Technical Guide if both of the situations below apply.

1. An adequate monitoring program at the unit has not yielded results that indicate a statistically significant indication of release during the unit's operation (including closure period).
2. Soil screening results indicate that hazardous constituents have not migrated from the unit to the uppermost aquifer.

If ground water monitoring results indicate detection of the presence of hazardous constituents from a Subpart F unit, an appropriate ground water monitoring program (that is, ground water quality assessment under [40 CFR 265](#) or compliance monitoring under [40 CFR 264](#)) must be implemented at the compliance point. Detection is defined by statistically significant evidence that contamination exists, determined by comparing data collected at the compliance point(s) to the background water quality data.

Subpart F requirements do not apply after closure if all waste, waste residues, contaminated containment system components, and contaminated subsoil including ground water are removed or decontaminated to land use appropriate levels at closure. [Chapter 6](#) of the RISC Technical Guide presents a methodology for demonstrating

that a unit meets the closure performance standards and presents no potential harm to human health or the environment.

The groundwater sampling requirements for closure by removal and in-place closure are discussed further in the following sections.

2.10.2.2 Non-Subpart F Unit Requirements

Ground water screening at units not subject to Subpart F can consist of the method for screening presented in [Chapter 3](#) of the RISC Technical Guide. In accordance with the strategy for ground water monitoring, as evidence increases that a release has occurred, additional sampling and analysis of ground water is needed to demonstrate that closure performance standards are not exceeded. Examples of situations that may require additional sampling of ground water include the following:

1. Detection of a hazardous constituent during ground water screening,
2. Detection of a VOC hazardous constituent at concentrations exceeding the residential level in a preferential pathway to ground water,
3. Detection of a VOC hazardous constituent at a concentration exceeding the residential level within the first sedimentary layer of similar texture and material above the saturated zone in soil screening,
4. Subsurface soil sampling results indicate the presence of a non-VOC hazardous constituent at a concentration exceeding the residential level and the constituent is detected within the first sedimentary layer of similar texture and material above the saturated zone, and
5. Subsurface soil sampling results indicate the presence of a non-VOC hazardous constituent at a concentration exceeding the residential level and the constituent is detected in saturated soil.

If ground water samples are collected, it may be beneficial to also collect saturated soil samples in order to describe the saturated soil as was done for other soil samples.

If no constituent levels exceed closure levels, no other aspects of the nature and extent determination described in [Chapter 4](#) of the RISC Technical Guide are necessary. If the closure performance standard for ground water is exceeded, characterization of the nature and extent of contamination (See [Section 2.10.3](#) below) is necessary to determine the extent of remediation necessary ([40 CFR 264.112 \[b\]\[4\]](#)).

2.10.3 Characterization of the Nature and Extent of Contamination

2.10.3.1 Subpart F Unit Requirements

To meet the requirements of a ground water quality assessment under [40 CFR, Part 265](#), or compliance monitoring under [40 CFR, Parts 264 and 270.14\(c\)\(3\) and \(4\)](#), ground water monitoring must continue at least until the compliance period is completed (See [40 CFR 264.92](#)). The compliance period is the number of years equal to the active life of the waste management area, including any waste management activities conducted prior to permitting and closure.

An adequate ground water quality assessment plan or compliance monitoring program should satisfy the objectives of the nature and extent determination outside the compliance point as discussed in [Chapter 4](#) of the RISC Technical Guide. However, to satisfy closure performance standards, it may be necessary to determine the nature and extent of contamination for the plume within the compliance point.

If the assessment of the quality of the ground water shows that the unit has released hazardous constituents to the uppermost aquifer, post-closure care is required unless there is an adequate closure by removal.

If the owner or operator can demonstrate that a source other than a regulated unit caused the release to the ground water or if the detection was an artifact caused by an error in sampling, analysis, statistical evaluation or natural variation in the ground water, they are released from the requirements of ground water quality assessment under [40 CFR 265](#) or compliance monitoring under [40 CFR 264](#).

Characterizing the contamination also requires knowledge of the hydrogeology of the area. The uppermost aquifer unit and any hydraulically interconnected underlying aquifers (that is, all likely subsurface flow paths for hazardous constituents that could be released

from the unit) should be identified. The hydrogeologic properties (for example, hydraulic gradient, ground water flow, rate, and direction), beneath the facility should be known and the supporting data used to identify this information (such as hydrogeologic investigation reports for the facility area) should be provided in the SAP. This information should be included in a report written by a qualified hydrogeologist on the hydrogeologic characteristics of the facility property supported by drilling logs for on-site borings and wells and available professional literature. A description of the regional geologic and hydrogeologic setting should also be included in the report. Guidance for establishing an adequate hydrogeology study is presented in U.S. EPA's 1986 "RCRA Ground-Water Monitoring Technical Enforcement Guidance Document" (OSWER Directive No. 9950.1) or 1992 "RCRA Ground-Water Monitoring: Draft Technical Guidance Document" (EPA/530-R-93-001).

2.10.3.2 Non-Subpart F Unit Requirements

For units not subject to Subpart F requirements, the guidance in [Chapter 4](#) of the RISC Technical Guide can be used to determine the extent of remediation necessary to meet the closure performance standards. One sampling event may not be adequate to define the characteristics of the nature and extent of contamination. Many times the investigation should proceed in phases, until the three-dimensional limit of the contaminant plume is defined. The final phase consists of conducting a controlled sampling program to determine the concentrations and movement of the contaminants within the plume. If the nature and extent procedure has shown that the unit released a listed hazardous waste into the ground water, the boundary between waste and contaminated media must be determined.

Groundwater containing one or more hazardous constituents may not constitute a "waste", but may be considered a contaminated medium.

The owner or operator may submit a justification of the distinction between hazardous waste and contaminated media. The use of U. S. EPA's "contained-in" policy will set out the requirements for this demonstration. For closure by removal or decontamination, the hazardous waste must be removed and affected media must meet the land-use specific closure performance standard.

2.10.4 Ground Water Closure Sampling

2.10.4.1 Subpart F Unit Requirements

This section clarifies the procedures necessary to ensure that closure activities are in compliance with RCRA Subpart F requirements and satisfy closure performance standards. If hazardous constituents are not detected in the uppermost aquifer at the compliance point for a Subpart F unit, a detection monitoring program in accordance with [40 CFR 264.98](#) must be established to demonstrate that applicable closure standards have been met. If hazardous constituents are detected from a Subpart F unit at the compliance point during ground water monitoring, a compliance monitoring program must be implemented. Under the RCRA ground water monitoring program, the point of initial discovery is the compliance point. The ground water protection standard for Subpart F units must be met at the compliance point until completion of the compliance period as described in [40 CFR 264.95](#).

Upon demonstration of closure by removal or decontamination, a closure certification must be submitted to verify that the approved closure plan has been followed and to document that the Subpart F unit is compliant with the requirements of Subpart F. Subpart F requirements no longer apply after IDEM accepts the closure certification.

Within the compliance point, it must be demonstrated that there has not been a release to ground water beneath the waste management boundary. When a release has occurred or there is a potential release that exceeds the residential ground water level, additional ground water sampling is required as described below for units not subject to Subpart F requirements. Any deviations from the SAP resulting from problems encountered in obtaining representative ground water samples or from knowledge of the area should be adequately justified and discussed with IDEM.

2.10.4.2 Non-Subpart F Unit Requirements

For hazardous waste management units, SWMUs, and AOCs not subject to [40 CFR 264.91](#) through [264.100](#), it may have to be demonstrated that ground water beneath the units does not have a plume containing hazardous wastes or hazardous constituents, or that the plume will not present potential harm to human health or the environment. Obviously, if all hazardous waste is contained in a material that is removed, the closure performance standard has been achieved. However, if contaminated media are left in place exceeding land use specific closure levels, the potential for ground water

degradation from soil leaching, or present ground water migration must also be determined.

When a hazardous waste or hazardous constituent from the unit is detected in ground water, the closure performance standard can be achieved by demonstrating maximum concentrations within the plume are below land use specific levels, and below residential levels at the point of property control. In addition, the owner or operator must demonstrate that the closure has controlled or minimized to the extent necessary to protect human health and the environment, post-closure escape of hazardous constituents or hazardous waste decomposition products to the groundwater.

Where there are multiple potential sources of particular hazardous wastes or hazardous constituents, or for large sites, the overall control of the groundwater plume may be consolidated into one monitoring program. The Office of Land Quality has a non-rule policy document that addressed the issue of multiple sources (WASTE-0015-NPD).

Maximum concentrations detected when determining the nature and extent of the plume in ground water may determine the length of time needed to demonstrate closure. In order to demonstrate that concentrations within the plume do not exceed land-use specific closure levels throughout the plume and residential levels at the point of property control, a sampling program must be established to demonstrate plume stability. The MAROS software program is used to demonstrate plume stability and is detailed in [Appendix 3](#) of the RISC Technical Guide.

If the statistical evaluation indicates that the land-use specific closure performance standard is achieved, the unit is eligible for closure by removal. If statistical evaluation indicates closure performance standards are exceeded, post-closure care (that is, post-closure permitting or corrective action) is required.

2.10.5 Contaminated Ground Water In-Place

When land-use specific levels are exceeded, additional sampling may be needed to demonstrate that the plume is controlled or minimized to the extent necessary to protect human health or the environment from hazardous constituents, or hazardous waste, or their decomposition products to the groundwater that may escape after closure. To satisfy the closure standard, it must be shown that the residential levels at the point of property control will not be exceeded and the land-use

specific levels will not be exceeded beyond the perimeter of compliance (compliance point). This can also be demonstrated by plume stability as described in [Appendix 3](#) of the RISC Technical Guide.

3.0 Introduction

Overview of Chapter 3

- ❑ Introduction
- ❑ UST Notification, Reporting, Fees and Closure Requirements
- ❑ LUST Process Flowchart
- ❑ Transition of LUST Sites to RISC
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- ❑ ELTF Overview

This section of the Risk Integrated System of Closure (RISC) User's Guide provides a stand-alone RISC resource for underground storage tank (UST) owners, operators, and consultants dealing solely with petroleum and regulated hazardous substance releases. As such, this chapter contains extensive guidance for regulated USTs, including information on initial notification, UST removal, release reporting, site characterization, corrective action, Excess Liability Trust Fund (ELTF) reimbursement, and closure.

In addition, this chapter describes how to achieve closure of sites with contaminated soil and ground water associated with leaking underground storage tanks, and is an update of the RISC User's Guide Chapter 3, dated February 15, 2001. The User's Guide applies to all UST closures and UST releases reported after February 15, 2002. However, rules and statutes that are referenced may have been amended, so the applicable rule or statute must be examined in conjunction with using this Guide.

Applicable Regulatory Programs Located Within the IDEM

Throughout the lifecycle of an UST system including site assessment and subsequent remedial activities that involve a substance release, it will be necessary to work with several different programs located within the Indiana Department of Environmental Management (IDEM) to achieve compliance and/or closure for your facility. The following is a brief introduction to each respective program's roles and responsibilities:

Underground Storage Tank Program

The UST program is responsible for the following –

- Processing "Notification of Underground Storage Tanks" form submittals
- Coordinating with the Department of Revenue regarding UST fee assessment
- Inspecting UST equipment and operation and maintenance of UST systems for compliance with the current standards
- Overseeing and reviewing UST closures
- Educating the regulated community regarding UST requirements.

Leaking Underground Storage Tank Program

The LUST program is responsible for the following –

- Receiving release reports for USTs
- Reviewing and commenting on technical reports including, but not limited to, 20-Day Abatement, Initial Site Characterization, Further Site Investigation, Corrective Action Plan, and Corrective Action Progress Reports submitted for LUST sites
- Ensuring substantial compliance with LUST requirements
- Reviewing site information for no-further-action determination
- Education of the regulated community regarding LUST requirements

Excess Liability Trust Fund Program

The ELTF program is responsible for the following –

- Determining ELTF eligibility for expenditures related to UST releases
- Reviewing “Notice of Intent” submittals for UST system property transfers
- Reviewing claims for eligible expenses
- Prioritizing claims for payment as necessary

The following tables provide contact numbers and web addresses to support/assist you when working within the different State programs:

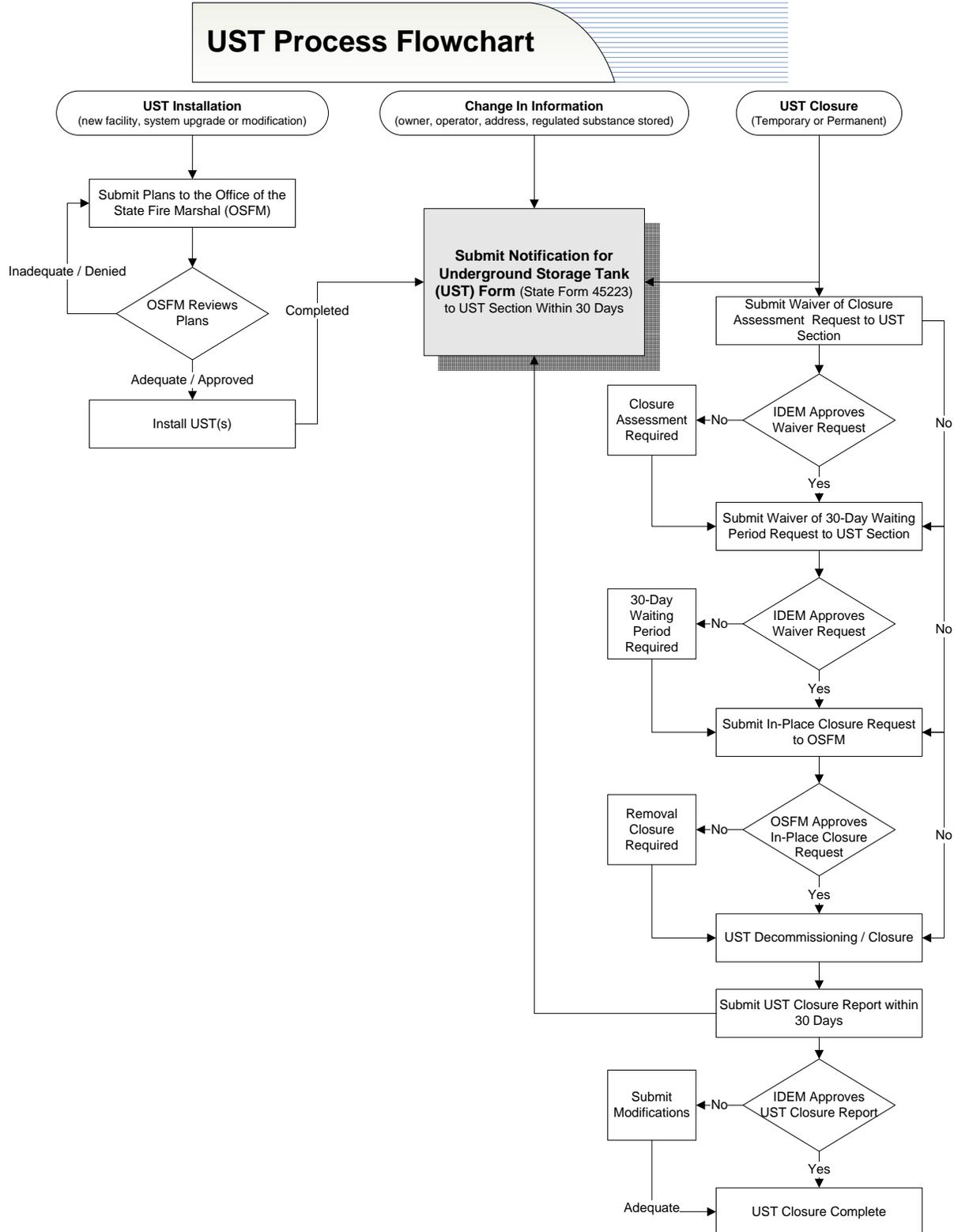
Table 1. Program and Related Topic Contact Information

Program	Telephone	Fax	Email
IDEM Hotline	317/232-8603 800/451-6027	Not available	Not available
Office of Land Quality	317/232-8941	317/234-0428	Not available
Emergency Response Spill Line	317/233-7745 888/233-7745	317/308-3063	Not available
Leaking UST release reporting and corrective action	317/232-8900	317/234-0428	LeakingUST@idem.in.gov
UST notification, reporting and closure	317/234-6923	317/234-0428	Not available
UST fee assessment	317/234-0343	317/234-0428	jmendel@idem.in.gov
ELTF notice of intent, eligibility and claims	317/234-0990	317/234-0428	ELTFclaims@idem.in.gov

Table 2. Program Web Sites

Program	Web Site
Underground Storage Tank (UST)	http://www.in.gov/idem/4999.htm
Leaking Underground Storage Tank (LUST)	http://www.in.gov/idem/4997.htm
Excess Liability Trust Fund (ELTF)	http://www.in.gov/idem/5063.htm
Risk Integrated System of Closure (RISC)	http://www.in.gov/idem/4153.htm

Figure 3-1 – UST Process Flowchart



3.1.1 Notification Requirements

General Notification

As described in 329 IAC 9-2-2 and 329 IAC 9-3-1, the owner/operator must complete a Notification for Underground Storage Tanks form (State Form 45223), within 30 days when:

- UST systems or tanks are brought into use
- UST systems are acquired by a new owner
- UST systems are upgraded (tank lining, piping replacement, leak detection system, or equipment installation, spill/overflow prevention equipment, or corrosion protection) or repaired (restoration of a tank or UST system component that has caused or could potentially cause a release of product from the UST system)
- UST systems are temporarily closed
- UST systems undergo a change-in-service
- UST systems are closed

Closure Notification

In accordance with 329 IAC 9-6-2.5 and 329 IAC 9-3-1, a request for closure should be provided to the IDEM UST Section at least 30 days before an UST system closure (removal, in-place, or change-in-service), UST system repair, or UST lining. Please use State Form 45223 Notification for Underground Storage Tanks form when requesting closure.

Within 30 days after an UST system closure, this form (Notification for Underground Storage Tanks, State Form 45223) must be submitted *again* with an UST System Closure Report. If these documents are not submitted *together*, they will be returned to the UST owner/operator as incomplete.

Document Submittal

In accordance with the requirements established in 329 IAC 9-2-2, all documents required by the UST Section must include an original signature *in ink* by either the owner/operator or an authorized representative. If an owner/operator authorizes a representative to sign forms, then a document must be submitted to authorize the representative. This authorization document must include the following:

- UST system facility name and address;

- Representative name and address;
- Listing of documents that the representative is authorized to sign; and
- Owner name signed *in ink*.

A copy of the authorization must accompany each document that is signed by the owner/operator's representative.

As the State requires that individuals/companies performing tank installations, closures, upgrades, removals, change-in-service, and testing be certified by the Office of State Fire Marshal (OSFM), the contractor must also sign and provide the OSFM certification number on the Notification for Underground Storage Tanks, State Form 45223.

3.1.2 Tank Fee Assessment Program

The Underground Storage Tank Fee Assessment Program was established in 1989 to collect tank fees from *owners* of regulated USTs. For the purposes of the Tank Fee Assessment Program, regulated USTs are defined as follows:

- Greater than 110 gallons in commercial or industrial use
- Greater than 1,100 gallons in agricultural or residential use
- Not otherwise exempt by State statute or rule

This assessment program pertains to USTs containing regulated petroleum products or hazardous substances as defined in Section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980. The list of hazardous substances is found at 40 CFR 302.4.

Fee Assessment and Use of Fee Monies

As described in IC 13-23-12, a regulated petroleum UST fee is \$90.00/year and a hazardous substance UST fee is \$245.00/year.

These fees are divided among three funds:

- \$45.00/tank/year of the petroleum UST fee goes to the Underground Petroleum Storage Tank Excess Liability Trust Fund (ELTF). The ELTF provides financial assurance for tank owners and operators, and reimburses them for cleanup of their sites in compliance with 40 CFR Part 280 and 329 IAC 9. In addition to cleanup costs, administrative costs of the ELTF Program are taken from this fund.
- \$45.00/tank/year of the petroleum UST fee goes to the Underground Petroleum Storage Tank Trust Fund (UPSTTF).

- The UPSTTF pays for State funded cleanup of abandoned leaking petroleum USTs (or for sites where the owner/operator is recalcitrant), administrative costs and state match for the LUST grant funding received from the U.S. Environmental Protection Agency.
- \$245.00/tank/year of the hazardous substances UST fee goes to the Hazardous Substances Response Trust Fund (HSRTF). The HSRTF pays for cleanup of uncontrolled hazardous waste sites, administrative costs, and state match for grant funding and federally funded cleanups.

Fee Assessment Period

Currently, the fee assessment period begins July 1 of each year and concludes on June 30 of the following year. The IDEM coordinates the Fee Assessment Program with the Indiana Department of Revenue's Special Tax Division. Although the assessment period begins on July 1, the Special Tax Division does not mail invoices until the fall of the year. Receipt of payment is due no sooner than 30 days after the assessment date. This due date is specified on each year's invoices (UST-1 form).

For questions regarding the processing of a payment, the Department of Revenue can be contacted.

Fee Payment

As described in IC 13-23-12, payment of tank fees can be made in two ways:

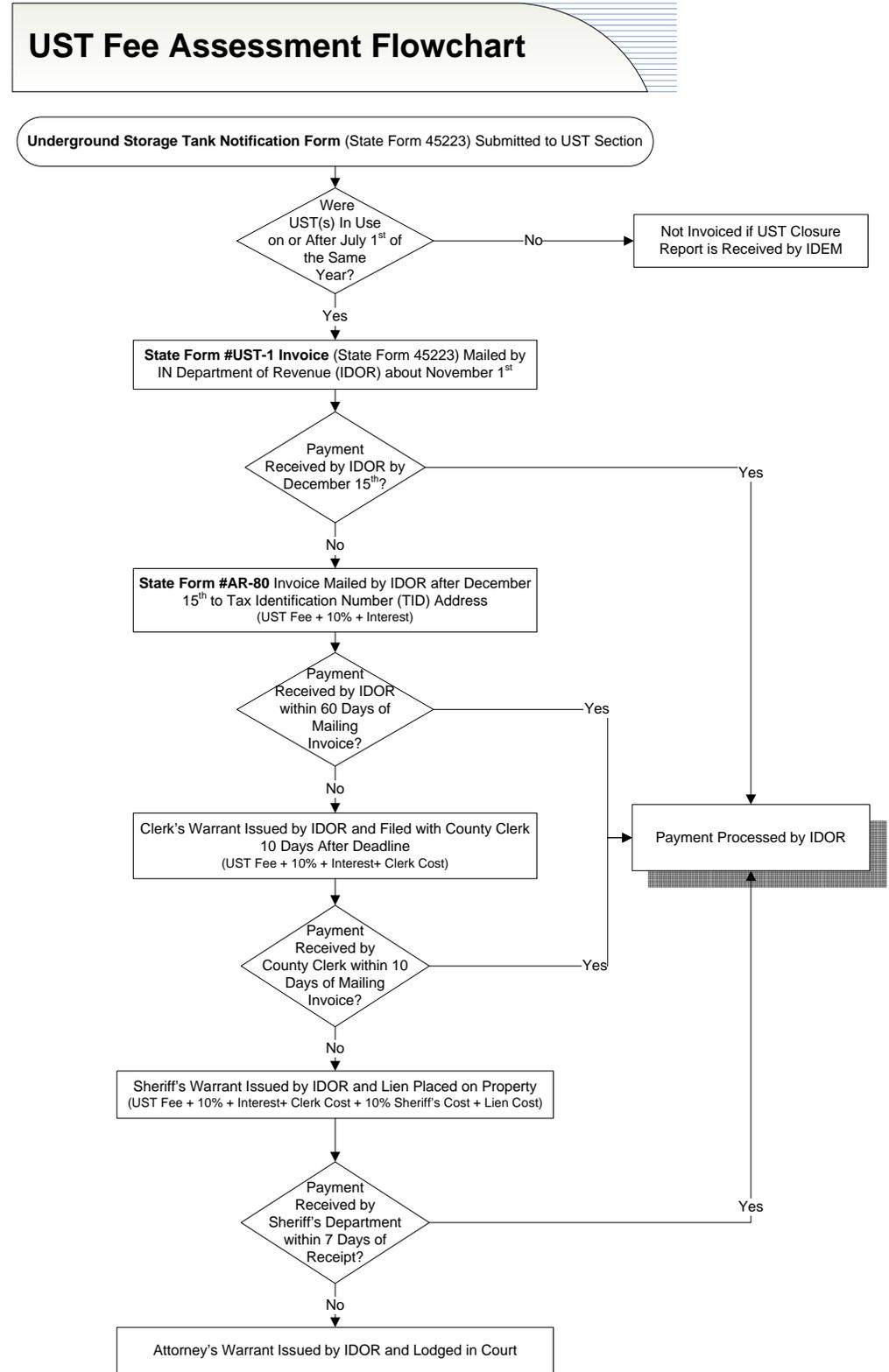
- Payment may be made in full on the due date specified on the invoice (UST-1 form).
- For owners whose tank fee exceeds \$500.00, payment may be made in four (4) equal installments. The applicable payment portion of the voucher sheet (UST-2 form) must be included with each installment payment.

Fee Assessment Information

The UST Section obtains fee assessment information on owners, facilities, and tanks from the IDEM's UST database. The database information is gathered from the Notification for Underground Storage Tanks form (State Form 45223), submitted by owners and operators. If there have been any changes in an UST facility since the last notification submittal (i.e., if a tank has been closed at a facility), this should be indicated on a Notification for Underground Storage Tanks form (State Form 45223) in order for accurate fee assessments to be made.

Figure 3-2 illustrates the UST fee assessment process.

Figure 3-2 – UST Fee Assessment Flowchart



For questions regarding why or how a tank fee was assessed, the UST Section of the IDEM should be contacted.

3.1.3 UST System Closure

In order to close a regulated UST system in Indiana, the following rules **must** be followed:

- 40 CFR 280 (Federal Regulations)
- 329 IAC 9 and 327 IAC 2-6.1 (State Rules)
- 675 IAC 22 (Indiana Fire Prevention Code)

Regulated vs. Unregulated Tank Status and Registration Requirements

Tanks closed or out of operation (a tank is considered out of operation if it is completely empty and the fill pipe is not accessible) on or before January 1, 1974, are **not regulated**. There are no notification requirements to the IDEM prior to closure, although the Fire Code still applies during removal activities. If at any time during the closure of unregulated USTs contamination is discovered, the contamination must be reported to IDEM Emergency Response and cleaned up as required by 327 IAC 2-6.1, IC 13-24-1, IC 13-25-4, etc.

All tanks in the ground before May 8, 1986 (unless taken out of operation), are **regulated**, but were **not required to have been registered**. You must notify the IDEM prior to closure and perform an UST closure assessment as required by 329 IAC 9-6-2.5.

All tanks in the ground on or after May 8, 1986, (unless taken out of operation) **are regulated**, and are **required to be registered**. You must notify the IDEM prior to closure and perform an UST closure procedure as required by 329 IAC 9-6-2.5.

If you are unable to determine the regulated status of a particular UST after consulting the applicable regulations, contact the IDEM, UST Section.

UST System Closures

There are **three types of regulated UST system closures**: removal, in-place closure, and change-in-service closure.

- **Removal** – A “removal” closure is when all USTs, piping and dispensers are physically removed.

- **In-place** – An “in-place” closure is when a portion or all of the USTs, piping, and dispensers are closed without removal. In-place closures require prior approval from IDEM. The conditions for obtaining approval include, but are not limited to, all or a portion is inaccessible due to buildings or structures.
- **Change-in-service** – A “change-in-service” closure is when a UST system is converted from being used to store regulated substances to unregulated substances. Change-in-service closures require prior approval from IDEM.

Notification Requirements Prior to Removal, In-place Closure and Change in Service

UST System Removal, In-place Closure, and Change in Service

- All UST systems in place after May 8, 1986, must be registered with the IDEM UST Section (completed Notification for Underground Storage Tanks form (State Form 45223)).
- For all tanks in place after January 1, 1974, Notification of intent to close must be given using the Notification for Underground Storage Tanks form (State Form 45223), at least 30 days before closure activity begins.
- IDEM UST Section will respond in writing with the closure approval date (closure approval letter will expire 90 days after date given).
- The closure approval letter must be kept onsite at all times during closure activities.
- A contractor or individual certified through the Office of State Fire Marshal (OSFM) must be used for closure (at least one certified person must be on site at all times).
- In addition to the 30-day notice, the IDEM UST Section, the OSFM and the local fire department should be given at least 14 days prior notice (by phone) of the intended closure date.
- An UST system closure site assessment must be performed to determine if contamination is present. Within 30 days after permanent closure, a completed Notification for Underground Storage Tanks form (State Form 45223), and an UST System Closure Site Assessment Report must be filed with the IDEM UST Section. (This will prevent improper assessment of annual UST system fees for permanently closed UST systems).
- An in-place closure or a change-in-service may not begin until the owner receives written approval from the IDEM UST Section.

UST System Closure Waiver

If a permanent closure is determined necessary due to a release or leak from an UST system, then a waiver of the 30 day period may be

granted. All UST systems must be registered with the IDEM UST Section prior to waiver approval. The following conditions apply when requesting a waiver:

- An IDEM Spill Number or LUST Incident Number is required before a waiver is given. Follow the reporting procedures outlined in Section 3.3
- The OSFM and local fire department must be notified prior to closure.
- Within 30 days following closure, a completed Notification for Underground Storage Tanks form (State Form 45223), and one copy of the UST System Closure Site Assessment report must be sent to the IDEM UST Section.

Requirements for the UST System Closure Environmental Site Assessment

An environmental site assessment is required for all regulated UST system closures and must be included into the UST System Closure Report. The report must be submitted to IDEM within 30 days after UST system closure completion. In addition, the site assessment must be consistent with RISC Technical Resource Guidance Document and User's Guide. The following is a summary of the requirements:

Soil sampling – Soil samples should always be collected from the area most likely to be contaminated based on visual observations, odor and appropriate field screening, e.g. photoionization detector (PID), flame ionization detector (FID) or gas chromatograph. Samples are required from the bottom of the excavation. Soil samples always must be collected from native soil (i.e., the soils that were in place at the site prior to tank installation). The only exception to this would be samples collected from excavated materials which typically consist of fill.

Specific UST soil sampling requirements are presented in the tables that follow:

UST Removal Soil Sampling Requirements

Bottom Soil Samples	USTs <10,000 gallons - two (2) within two (2) feet below both ends of the each UST
	USTs >10,000 gallons, one (1) additional within two (2) feet below the middle of the UST
Sidewall Samples	UST pit perimeter <80 feet – four (4) sidewall samples collected from half the distance between the surface and the bottom of the UST excavation or the area most likely to be contaminated based on field observation.
	UST pit perimeter >80 feet – one sidewall sample for every 20 linear feet collected from half the distance between the surface and the bottom of the UST excavation or the area most likely to be contaminated based on field observation.
Piping Samples	Pipe run <20 feet – one (1) sample half way between UST and dispenser or fill port
	Pipe run >20 feet - one (1) sample for every 20 linear feet of pipe run
	One sample under every piping elbow or connector
Dispenser Samples	One sample under each dispenser
Excavated Material	Sampling of excavated material must occur for every 50 cubic yards of material that is treated, disposed or returned to the excavation area as backfill. Soils with COCs exceeding the RISC IDCLs should not be returned to the excavation.

In-place Closure and Change-in-service Boring Placement and Soil Sampling Requirements

Tank Pit Samples (Samples obtained from one (1) continuously sampled boring within three (3) feet of the UST and then placed every 20 linear feet around the UST, with a minimum of four (4) borings and extended at least two (2) feet below the bottom of the UST)	Borings <15 feet – Two (2) samples: one at midpoint and one at bottom of boring
	Borings >15 feet – Three (3) samples: one at >1 foot below ground surface, one at the midpoint, and one at the bottom
Piping Samples (Samples obtained from borings placed within three (3) feet of and two (2) feet below pipe run, elbow or connector)	Pipe run <20 feet – one (1) sample half way between UST and dispenser or fill port
	Pipe run >20 feet - one (1) sample for every 20 linear feet of pipe run
	One sample under every piping elbow or connector
Dispenser Samples (Samples obtained from boring placed within three (3) feet of a dispenser island. The sample should be obtained from a depth of approximately 2 feet beneath each dispenser location)	One sample under each dispenser

Note: If the exact location of the UST and piping is not known, the borings locations should be determined based upon non-invasive methods such as ground penetrating radar (GPR).

Ground Water Sampling – If ground water is encountered during UST removals or change-in-services ground water samples are required to be collected.

Removal, In-place, and Change-in-Service

UST Excavation	One (1) ground water sample from each excavation where it is encountered (for removal only)
Soil Borings	A water sample must be collected within the first saturated zone located below the top of the UST. If ground water is not encountered at 30 feet or there is refusal, a soil sample should be collected at the base of the boring

Soil and Ground Water Sample Analyses— Groundwater and soil sampling requirements for gasoline range organics, diesel range organics, high end hydrocarbon oils, and waste oil are located in Chapter 8 (Table 7.1) of the RISC Technical Guide. Note: The IDEM reserves the right to modify these requirements dependent upon historical site conditions and the type and nature of the release.

If at any time, during the closure process, you suspect or confirm a release, you must report the release to IDEM within 24 hours:

UST System Closure Report

The following information is **required** in an UST Closure Report:

Responsible Party

- The UST system facility's owner/operator name, IDEM owner I.D. number (if known), address, phone number;
- The name of the UST system facility contact person, owner/operator affiliation, phone number; and
- Owner/operators for the past twenty-five years.

UST Contractor

- UST closure contractor company name and address; and
- Name and OSFM certification number of person(s) on site during closure.

UST Site

- Facility name, IDEM Facility I.D. number (if known), address and phone number;
- Type of facility and past and current operations;
- Coverage (turf, concrete, asphalt, etc.);
- History of any spill reports, by incident number;
- Site proximity to both human and environmentally sensitive areas;
- Site native soil texture (i.e., percent of sand, silt, and clay); and
- Site specific map(s) with appropriate scale and legends to show site details described below:
 - Illustrated legends and compass directions at appropriate scale;
 - Drainage features (surface slope/surface water runoff direction);
 - Identified above ground features (buildings, roadways, pump islands, utility lines, etc.);
 - Property lines;
 - Identified subsurface features (tanks and excavation pit, piping, utility conduits, etc.);
 - Locations of samples (S1, S2, etc.), soil borings (SB1, SB2, etc.), and monitoring wells (MW1, MW2, etc.);
 - Locations of previously closed tanks (if applicable); and
 - Site surroundings (adjacent buildings, land use, business descriptions).

Underground Storage Tank(s):

(The following information refers to the tanks being closed);

- Previous owner history (past 25 years)
- Number and volume of tank(s);
- Past and present contents of tank(s);
- Construction material of tank(s);
- Age and installation date of tank(s);
- Leak detection methods used;
- Records of tank tightness test results (most recent);
- Most current records of any other leak detection method results (inventory records, ground water or vapor monitoring results); and
- Information on any previously closed UST systems (date closed, number, size, and product stored).

Sample Results

- Data from analysis of soil samples presented in tabular format;
- Data from analysis of water samples presented in tabular format;
- A signed Laboratory Certificate of Analysis listing analytical method, preparation method, date of sample receipts, and date of analysis (data submission requirements explained in detail in Section 3.4.4 of this chapter);
- Proper sample numbers for cross reference to UST site maps;
- Chain-of-Custody documentation and data from analyses of soil and water;
- Decontamination procedures/sampling procedures and techniques; and
- Data from analysis of waste oil sampling (where applicable).
- Quality Assurance/Quality Control documentation.

Miscellaneous Closure Documentation

- Soil and water disposal documentation
- Remaining product and sludge documentation. Tank and piping disposal documentation
- LUST Referral Sheet for Closure (all sites with contamination must fill out a LUST Referral Sheet—this includes contaminated backfill sites and sites where over excavation occurs).

As stated previously, the closure report must be submitted to the UST Section of the IDEM within **30 days** of tank closure. The IDEM UST Section will review each closure report and supply the owner of the tanks with a System Closure Report Review Checklist (SCRRC) within six months of the UST Section's receipt of the UST Closure Report.

The SCRRC will document which areas have been sufficiently completed and those that are insufficient and require further documentation.

The SCRRC is only intended to document the completeness of the UST system closure and reporting activities. A SCRRC deemed “complete” in no way releases an owner/operator from performing additional environmental investigations in the event that a release has occurred.

LUST Referral and Incident Reporting

During **any** UST closure, if a release is suspected or discovered, it must be reported to the IDEM **within 24 hours**. The release must be reported to IDEM following the procedures outlined in Section 3.3. A copy of the Initial Incident Report Form can be obtained by calling the IDEM Leaking Underground Storage Tanks Section at 317/232-8900 (toll-free 800/451-6027, ext. 28900). If at any time during the closure process, an emergency condition is discovered such as explosive vapors found in buildings or utilities, call 911 and IDEM Emergency Response **immediately**. If conditions exist that require an immediate response such as non-explosive vapors in buildings or utilities or if free product is present on surface water, call the IDEM Emergency Response program **within 2 hours**.

Only releases from **regulated tanks** are reported to the LUST Section as described above. Releases from **non-regulated tanks** should be reported to the IDEM Emergency Response Program. Contact information for this program has been included in Table 1.

If a release is confirmed, under most circumstances, the nature and extent of contamination must be determined and corrective action is required.

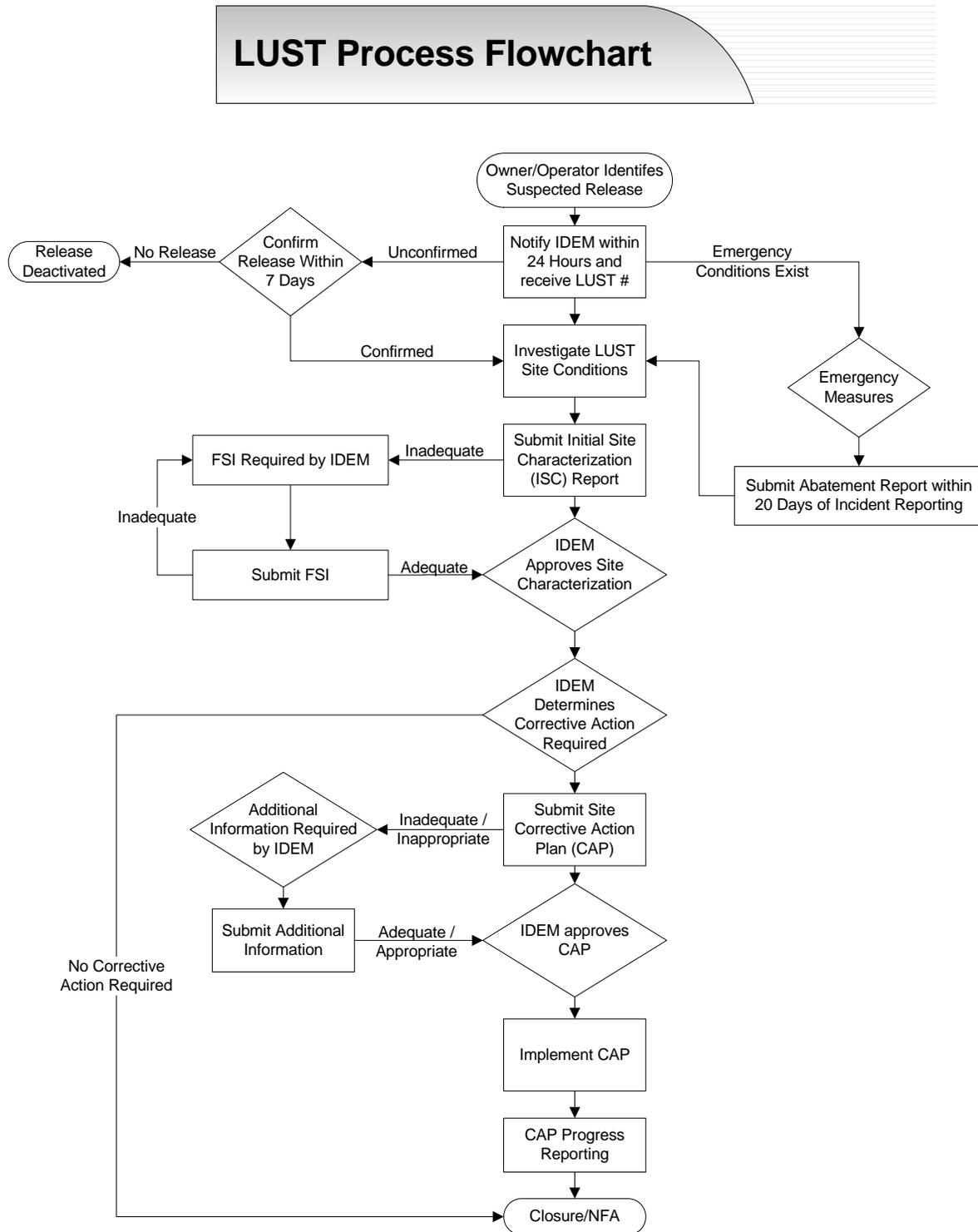
3.2 The LUST Process

The following sections describe how to achieve closure of petroleum- and regulated substance-contaminated soil and ground water associated with leaking underground storage tanks using RISC.

Note: the term “regulated substance” includes hazardous substances; however, this chapter **does not** apply to waste tanks regulated under RCRA.

The following flowchart provides a broad overview of the LUST process:

Figure 3-3 – LUST Process Flowchart



3.3 Initial Incidents and Releases

In accordance with 329 IAC 9-4-1 and 329 IAC 9-4-4, there are three basic release situations: Emergency conditions, suspected releases, and confirmed releases. **Initial incident and release reporting to IDEM is required for all suspected and confirmed releases. Failure to report your incident within the time frame specified by IDEM will affect future ELTF eligibility.** A copy of the Initial Incident Report Form can be obtained by calling the IDEM Leaking Underground Storage Tanks Section at 317/232-8900 (toll-free 800/451-6027, ext. 28900). Suspected and confirmed releases must be reported within **24 hours** of discovery to IDEM. This can be accomplished in one of three ways:

- Telephone – Report to LUST Program staff during normal business hours or Emergency Response Program staff after hours and weekends
- Fax – Send completed “LUST Release Report”
- E-mail – Send completed “LUST Release Report” to the LUST Program

See the contact information located in Tables 1 and 2 of this section for telephone and fax numbers as well as applicable e-mail addresses.

3.3.1 Emergency Conditions

If emergency conditions exist, such as vapors in a habitable building, product or vapors in utility conduits, free product on surface water, and surface spills and overfills exceeding 25 gallons, initial reporting must be made in accordance with 327 IAC 2-6.1 within **2 hours**. All applicable phone and fax numbers have been included in Table 1 of this Chapter.

ELTF claims may be reimbursable using “Confirmation of Emergency Measures Status” procedures included in the ELTF Application, State Form 47139 (R3/11-02). Claimants should coordinate with the assigned IDEM Project Manager.

3.3.2 Suspected Releases [329 IAC 9-4-1 and 329 IAC 9-4-3]

In accordance with 329 IAC 9-4-1 and 329 IAC 9-4-3, suspected releases are recognized by the following conditions:

- Erratic behavior of product-dispensing equipment
- Sudden loss of product through inventory control checks
- Tank tightness test failure (Two consecutive failed tank tightness tests is considered a confirmed release.)
- Water present in UST
- Free product present
- Vapors are reported in basements, buildings, or nearby utility conduits
- Discovery of off-site impacts in soils, surface water, or ground water

When obvious visual signs of contamination or odors are present, release notification should not be delayed by waiting for laboratory confirmation. Suspected release reports must be reported to IDEM within **24 hours** by telephone, fax or email. All applicable phone and fax numbers have been included in Table 1 of this Chapter.

In accordance with 329 IAC 9-4-3, suspected release reports should include information specified in Part A of the release reporting information provided in Section 3.3.5. Owners and operators then have **7 days** to negate or confirm suspected release reports by providing **written documentation** via facsimile or mail to the following address:

Indiana Department of Environmental Management
Leaking UST Section
100 North Senate Avenue, Room 1101
Indianapolis, IN 46204-2251

An incident number will be assigned at the time of the report. If information submitted negates the release report, the incident number will be “deactivated”.

3.3.3 Confirmed Release

A confirmed release must be reported to the IDEM within **24 hours** by either using one of the mechanisms outlined in Section 3.3.2.

A confirmed release is defined as follows:

4. Reason(s) for suspecting a release
5. Future investigative steps

Confirmed releases only

6. Location of release (piping lines, dispensing island, USTs, joint connections, etc.)
7. Knowledge of release (failed tank tightness test, analytical results, catastrophic spill, etc.)
8. Affected area(s) (backfill, natural soil, ground water, surface water, utility lines, basements, etc.)
9. Site-specific information (affected utility conduits, drinking water intakes, or detection of free product)

Upon receipt of an Initial Incident Report, IDEM will assign a LUST incident number. This number and the UST facility identification number (FID) should appear on all future correspondence to IDEM. Failure to include these numbers may delay document review.

3.3.6 LUST Site Prioritization

After initial incident reporting, the LUST site is prioritized so that the appropriate IDEM resources can be allocated to the project management. Site prioritization is based on the most appropriate site information typically available during initial LUST reporting. However, if site conditions change, the site priority could also change.

High-priority LUST sites are defined as sites with actual or potential receptor impacts that threaten human health or the environment through one or more of the following:

- Habitable buildings with vapors present
- Drinking water contamination
- Utility conduits with vapors or free product present
- Ecologically susceptible area affected
- Free product present
- Ground water contamination within a 1-year time of travel to a designated wellhead protection area

Medium-priority LUST sites are defined as sites where ground water has been affected, but no imminent threat to human health or the environment exists. The potential for receptor contamination will be evaluated for medium-priority sites.

Low-priority LUST sites are limited to sites where soil is contaminated but ground water contamination is not present or is unproven.

Factors used to rank sites within each priority category include the following:

- Type of product released
- Predominant soil type in the area
- Ground water flow direction and velocity

At times, site reprioritization may be necessary. For example, during tank removal, initial indications may show that only soil has been contaminated. However, further investigation may indicate ground water contamination as well. In this case, a site is reprioritized from low to medium priority. If a site requires higher prioritization, the owner or operator must notify IDEM within 24 hours of discovery.

3.4 The LUST Process and How it Relates to RISC

Once a release associated with an UST system is discovered, the nature and extent of contamination must be determined using the RISC process. The remaining sections of this chapter are devoted to explaining how to define the nature and extent of contamination and ultimately achieve closure of your facility using RISC.

3.4.1 Transition of LUST Sites from the 1994 Guidance to RISC

While all releases reported after February 15, 2002, are **required** to use the RISC process to achieve closure, it is also possible to transition a site with an earlier release into RISC.

Because the RISC process uses different sampling methods and different laboratory analyses than the 1994 LUST Guidance, a re-evaluation of the site is permitted; however, the owner should also be aware of the following:

- The IDEM may require a cost feasibility study prior to field activities as it is not always cost-effective for a site to be transferred into RISC. Also, once approved, the RISC evaluation should be conducted in one mobilization to the site. RISC evaluations requiring two or more mobilizations may be eligible for reimbursement under ELTF when approved by

IDEM. Under most circumstances, a Sampling Plan should be submitted to IDEM for review and approval prior to beginning field activities. You should consult the IDEM LUST Project Manager prior to proceeding with this plan.

- During the re-evaluation, all borings should be advanced in strict accordance with RISC sampling procedures (i.e., step-out) and analyzed for the appropriate RISC contaminants of concern unless otherwise approved by IDEM. Whenever possible, data obtained from previous investigations should be substituted in lieu of installing additional borings or submitting additional samples to the laboratory for analysis. Excessive boring and sampling efforts during this re-evaluation will not be eligible for reimbursement under ELTF.
- Finally, once a site has been transferred into RISC, and this transfer has been approved by the IDEM Project Manager, it **may not** be transferred back to the 1994 LUST Guidance at a later date.

Remember that sometimes it is easier to transfer to RISC earlier in the closure process rather than later. For example, if an owner decides to transfer to RISC during the Corrective Action Plan (CAP) development phase, the Site Characterization approved under the 1994 LUST Guidance may no longer be acceptable under RISC, and additional delineation may be necessary prior to the development of the CAP.

In some scenarios, this transition may enable a tank owner to achieve a more cost-effective and expeditious closure; however, prior to initiating the transition of an existing LUST site into RISC, it is **strongly recommended** that the tank owner or tank owner's representative contact IDEM technical staff to explore options and identify expectations before any field activities are conducted.

3.4.2 RISC Default vs. Nondefault Guidance

Most of the guidance presented in this Chapter contains default procedures for site characterization. The term “**default**” refers to the use of a standard constant, equation, or evaluation that is prescribed for *general application* within the RISC Technical Guide. Typically, the default procedures described in this section can streamline a site investigation as they attempt to be a “one size fits all” approach.

The IDEM does realize however, that this “one size fits all” approach may not always provide the most practical, cost-effective, or expeditious route to closing a LUST site. Therefore, nondefault options are also available for conducting site activities. The term “nondefault” is essentially defined as any constant, equation, model, process, strategy, or evaluation that is not prescribed for general application. Examples of nondefault approaches are presented in the RISC Technical Guide.

The nondefault process is not, by definition, superior or inferior to the default process. However, if a nondefault approach is employed, there will be a greater need to interact with IDEM technical review staff throughout the closure process. For example, a rationale for the technical validity of the nondefault application may be required (such as the technical rationale for sampling differently from the default approach while demonstrating that closure objectives have been obtained). It should also be noted that certain nondefault procedures will require greater technical sophistication on the part of the professional performing the evaluation.

Finally, the nondefault approach will generally require the development of a quality assurance project plan (QAPP). Below are some examples where QAPP development would be appropriate:

- Petroleum products that do not have standardized contaminants of concern (COCs).
- Nondefault screening and characterization methods are used.
- Nondefault closure sampling is performed.

Additional information on QAPPs is provided in the RISC Technical Guide.

Because of the greater uncertainty associated with the nondefault approach, IDEM **strongly recommends** that such approaches be reviewed in a meeting with IDEM technical staff to explore options and identify expectations prior to conducting the assessment.

3.4.3 Petroleum Contaminants of Concern (COCs)

The four (4) groups of petroleum hydrocarbons for which RISC has determined standard COCs are gasoline, mid-range liquid hydrocarbon fuels, hydrocarbon oils, and waste/used oil. [Table 7.1](#) in Chapter 8 of the RISC Technical Guide lists the petroleum COCs depending on the source type. For source types not listed in the table, call the IDEM Leaking Underground Storage Tank Section at 317/232-8900 or toll free at 800/451-6027 ext. 28900.

Some petroleum hydrocarbon products do not have standardized COCs. Contaminants are determined on a site specific basis for these contaminants. These sites require a complete and detailed QAPP to identify the COCs. All parts of the QAPP must be completed, including data quality objectives (DQOs), a health and safety plan, a sampling and analysis plan, and a data quality assessment. Additional information on QAPPs is presented in the RISC Technical Guide. Guidance on acceptable analytical methods for appropriate estimated quantitation limits (EQLs) is provided in the RISC Technical Guide. OLQ's Chemistry Section may be contacted for information regarding analytical requirements for other contaminants.

Occasionally, as new information becomes available, the IDEM may need to update the RISC Default Closure Level Tables. Generally, this is done every two years, but may be more frequent for specific COCs. If and when this happens, any remediation for which the IDEM has already received a submittal, or a notice of intent to apply as of the date of the new posting, will be allowed to use the pre-existing values if they choose to do so. Those submitting after the effective date of change will be subject to the new values. Certain transition policies may apply.

3.4.4 Data Submission Requirements

Proper sampling and laboratory analyses are required to verify site conditions. These requirements cover sample acquisitions, containers, preservation, shipping, holding times, storage, chain of custody, decontamination of equipment between samples, and sample analysis.

Sampling and analysis methods must be consistent with U.S. Environmental Protection Agency's (U.S. EPA) publication SW-846, "Test Methods for Evaluating Solid Wastes, Physical and Chemical Methods," Third Edition including all updates. Alternative laboratory methods should be approved by IDEM in advance. **Please note:** the IDEM requires that all soil analytical results be reported on a dry weight basis.

Quality Assurance/Quality Control (QA/QC) procedures outlined in the methods must be followed and the documentation should be available for submission to IDEM upon request. Laboratory detection limits for all analyses should be low enough to effectively evaluate contaminant concentrations against RISC residential default closure levels.

When submitting sampling and analysis documentation, you should follow the “Minimum Data Documentation Requirements” (pursuant to 329 IAC 9-5-5.1(b)(2)(F) discussed in the remaining parts of this section. The information that must be included with all analytical submittals is as follows:

Sampling Quality Assurance/Quality Control (QA/QC) Data and Information:

- Completed chain-of-custody form
- Date and time each sample was taken
- Map or diagram indicating sample locations
- Any notable observations (color, clarity, texture, reaction with preservatives, etc.)
- Identity of field duplicates (a minimum of one duplicate for every 20 or fewer samples)

As outlined in IDEM’s Minimum Data Documentation Requirements, IDEM requires the collection of various QA/QC samples throughout different stages of the site characterization, corrective action, and closure process. These samples are identified as follows: Matrix Spike/Matrix Spike Duplicate (MS/MSD), Equipment Blank, Field Duplicate, and Trip Blank. The QA/QC requirements may vary depending on the stage in the process and site-specific conditions.

The IDEM LUST section **requires** the submittal of a MS/MSD sample for both soil and ground water during initial site characterization activities. The MS/MSD samples are **not required** during further site investigative activities or corrective action monitoring activities unless otherwise directed by IDEM staff. Prior to requesting site closure (during confirmatory soil and ground water sampling) an additional MS/MSD sample (for all affected media) will be required.

The following table outlines IDEM’s QA/QC sampling requirements and rationale:

QA/QC Samples	Media Sampled	Comments
MS/MSD	Soil and Ground water	This sample should be collected in a location with the least amount of suspected contamination. This sample indicates whether the matrix that the sample was collected from (i.e., soil) interferes with the accuracy and precision of the analytical method. It compares the relative percent difference (RPD) of each sample result. The MS/MSD sample should be collected at a frequency of 1 per 20 samples.
Field Duplicate	Soil and Ground water	This sample should be collected in a location with suspected contamination. The duplicate collection should occur as close as possible in space and time to the original sample location. This sample documents the variability of the sampling process and matrix homogeneity. It compares the RPD between the two results. The field duplicate should be collected at a frequency of 1 per 20 samples.
Equipment Blank (Rinseate Blank)	Soil and Ground water	This sample is collected only when non-dedicated sampling equipment is used. It is used to determine if decontamination procedures were adequate for non-dedicated sampling equipment.
Trip Blank	Ground water	This sample is to be submitted to the laboratory only when volatile organic compounds (includes BTEX and MTBE) are being analyzed. It indicates whether storage, shipment, or ambient environment of sample collection could have contaminated samples. Only one trip blank per cooler containing ground water VOC samples should be submitted for laboratory analysis.

The following items must be included in every laboratory analytical report submitted to IDEM:

Laboratory Quality Control Data and Information:

- Completed chain-of-custody
- Date and time of receipt at the laboratory
- Condition of samples upon receipt at the laboratory (i.e., temperature)
- Sample identification number or designation
- Sample preparation, extraction, cleanup, or digestion method(s) and date(s)
- Analytical method (name, number, and source) and date of analysis
- Final analytical results
- Case narrative (Includes deviations from standard analytical or preparatory procedure(s); quality control problems encountered--whether stemming from system, instrumentation, analyst error, or sample matrix; corrective measures taken; if

corrective measures as called for in the method were not taken; results of corrective measures taken; etc.)

These QA/QC procedures only apply if you are using a default approach to achieve closure. If a **nondefault approach** is being employed, **more stringent** sample collection and laboratory analyses QA/QC may be required.

For additional information on the minimum documentation of analytical quality assurance/quality control required by IDEM, please visit the IDEM Office of Land Quality web site.

IDEM also requests that all sampling results be submitted electronically to LeakingUST@idem.in.gov. Guidance on formatting sampling results for electronic submittal is posted on the IDEM Office of Land Quality web site. At this time, IDEM is not requiring the electronic submittal of data, but is encouraging electronic submission to improve the quality and timeliness of technical reviews.

Any questions regarding sample handling and analysis should be directed to OLQ's Chemistry Section.

3.5 LUST Site Characterization

In accordance with 329 IAC 9-5-5.1, a LUST site characterization must be conducted at all UST sites where a release of a regulated substance (i.e., petroleum or hazardous substance) to soil or ground water is confirmed. The goals of the site characterization are as follows:

- Define the full nature and extent of soil and ground water contamination related to the release,
- Evaluate the potential pathways and receptors, and
- Evaluate the remediation alternatives.

The LUST Site Characterization includes the Initial Site Characterization (ISC) and, in most cases, one or more subsequent Further Site Investigations (FSIs).

Initial Site Characterization

The ISC must be completed and a report submitted to the IDEM within 60 days from the date the release is confirmed. No time extensions will be granted. The ISC report should include, but is not limited to, the following information:

- Site background
- Receptor evaluation
- Soil and ground water characteristics including ground water flow direction
- Environmental sampling results including a minimum of three soil borings with samples submitted for soil and ground water analysis
- Scaled maps
- Detailed description (work plan) of additional work to be completed for a FSI (including an ELTF Scope of Work (SOW) form if you are submitting claims for ELTF reimbursement)
- Health and safety plan

Note: although piezometers are acceptable for determining ground water flow direction during the ISC, monitoring wells are needed in order to do temporal monitoring of the ground water when ground water contamination is present.

Even though the ISC only requires three borings, the goal of the ISC is to fully determine the nature and extent of contamination. As such, an attempt should be made to completely define the soil and ground water plume by installing additional borings as time allows.

Note: All additional borings should be advanced following the default step-out procedures defined in Section 3.5.1.

If the ISC fails to fully define the nature and extent of contamination in the soil and ground water, a Further Site Investigation (FSI) may be necessary. An estimate of anticipated fieldwork required for the completion of a FSI should be included with the ISC Report.

Further Site Investigation

If IDEM then determines that a FSI is required in accordance with 329 IAC 9-5-6, it should be submitted within the timeframe required by IDEM. An extension may be granted if a written request is submitted to IDEM before the due date. The written request should include both a justification for the additional time needed and provide a date by which the report will be submitted to IDEM. When offsite access issues are encountered, the justification should include information required by the “Access to Third Party Property” Non-Rule Policy Document available on the IDEM Office of Land Quality web site. The FSI Report should include, but is not limited to, the following information:

- Details regarding soil borings and monitoring well installation and sample collection
- Environmental sampling results
- Scaled maps
- Detailed description (work plan) of additional work to be completed, including anticipated pilot study(s) as appropriate (an ELTF SOW form must be included if you have or plan to submit claims for ELTF reimbursement)
- An evaluation of remediation alternatives including effectiveness, ability to achieve cleanup, duration, reliability and permits (include estimated costs if you have or plan to submit claims for ELTF reimbursement)
- A Health and Safety Plan

The ISC and FSI reports must be submitted using the standardized templates included in Appendix 3.2 of this Chapter. All requirements of 329 IAC 9-5-5.1 and 6 must be met, in addition to the guidelines presented in this User's Guide and the RISC Technical Guide. If the standardized templates are not used, the IDEM may reject any non-standardized reports concerning the site characterization. Sites using the 1994 UST Branch Guidance Manual are also required to use these standardized forms.

As previously stated, if you wish to seek reimbursement under the ELTF program, once site characterization is complete and approved by IDEM, an ELTF Scope of Work Form for the CAP, detailing proposed corrective actions, pilot studies and their estimated level-of-effort must be submitted to IDEM for approval along with the CAP.

The following sections describe subsurface soil and ground water procedures used for default site characterization.

3.5.1 Default Subsurface Characterization

The RISC default characterization process outlined in this section is slightly abbreviated from the process presented and outlined in the RISC Technical Guide. This does not mean that steps in the RISC process are skipped or eliminated. The RISC Technical Guide was designed to deal with a wide variety of waste sites and to address an extensive list of contaminants. This, in turn, necessitated the creation of numerous mechanisms to deal with a variety of site characterization scenarios. For typical LUST sites, the release has a source area less than 0.5 acre in size and occurs in a known location with the main media of concern being subsurface soil and ground water.

As such, rarely would it be appropriate to screen the surface soil during a LUST investigation. And although area screening for subsurface soil is an option, its use at LUST sites is infrequent, as most LUST source locations are generally known. Accordingly, the ELTF may not approve reimbursement for subsurface screening.

If you do have a site where subsurface screening is necessary (i.e., unsure as to the presence/location of historical USTs, please refer to Chapter 3 of the RISC Technical Guide for guidance). Likewise, when either the UST vault or source area exceeds 0.5 acre, the nondefault, large source-size characterization in Chapter 7 of the RISC Technical Guide should be consulted.

Step-Out Procedure

This default site characterization process screens and determines the nature and extent of subsurface soil and ground water contamination. **It is called the Step-Out Procedure and is a two-step process.**

Step 1

Step 1 is typically performed in the event that a release is suspected at a facility. It consists of advancing five borings in the immediate area of the release (i.e., UST tank pit, dispenser island, etc.). One boring should be located at the spot expected to be the most contaminated (usually the center of the tank pit). Four borings should be placed at a uniform distance from the center boring (5 to 20 feet out) in each of the four general directions at perpendicular axes (see Figure 3-1). In areas where it may be impractical to use perpendicular axes, random orientation of the axes is acceptable. Wherever possible, an attempt should be made to orient one axis in line with the suspected or known ground water gradient.

Obviously, drilling a soil boring inside the center of an UST vault cannot occur when the USTs are present. So for screening that involves in-place UST systems, product lines, or dispenser islands these same steps should be followed with the exception that the center boring is to be omitted.

Note: While this step appears similar to the UST closure assessment, it is intended for screening purposes and different requirements apply.

Typically, one to two soil samples will be submitted from each soil boring for laboratory analysis. If possible, a ground water sample should also be collected from each boring.

Step 1 Soil Evaluation

Following receipt of laboratory analytical results, the highest concentration of each individual soil COC is assigned as the **boring concentration** for its respective boring location.

Boring concentrations are then evaluated for each COC as follows:

- If all five boring concentrations are below the RISC Residential Default Closure Levels (RDCLs) for subsurface soils (see note below), soil characterization is complete and the soil is eligible for residential closure.
- If the boring concentrations in the four outer borings are below the RDCLs but the concentration in the center boring is above, a potential exposure concentration (PEC) should be calculated as the mean of the boring concentrations in all five borings plus one standard deviation. If the PEC is less than the closure level, the soil is eligible for residential closure. If the PEC is greater than the RDCL, then additional investigation (Step 2) will be required.

Note: The PEC can only be calculated for contaminants in unsaturated soils and should always be compared to the appropriate source size and land use-specific closure levels included in the RISC Technical Guide.

Step 1 Ground Water Evaluation

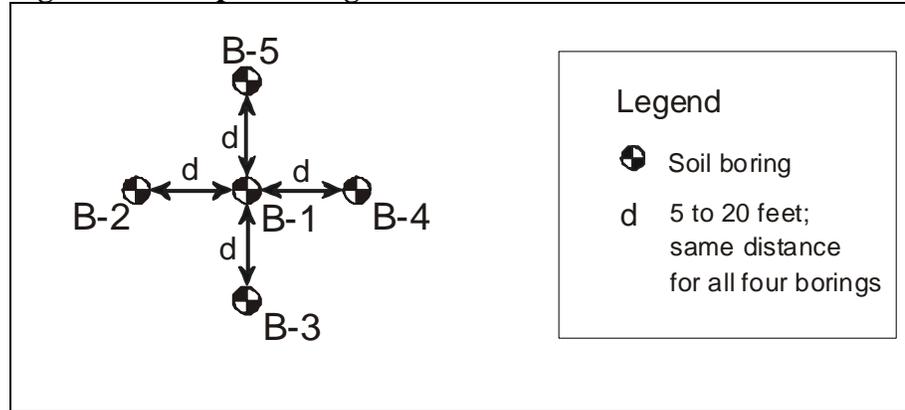
Ground water contamination is evaluated as follows:

- If all ground water COCs are below the RDCLs, ground water characterization is complete, and the ground water is eligible for residential closure.
- If the ground water COCs in the four outer borings are below the applicable RDCLs, and the COCs in the center boring are above the RDCLs but below the RISC Industrial/Commercial Default Closure Levels (IDCLs), the site may attempt immediate closure under industrial closure guidelines.
- If any of the perimeter ground water COCs are at or above the RDCLs, then additional delineation (Step 2) is required.

Note: if all soil and ground water COCs are below the laboratory detection limits during the Step 1 Process, then the IDEM should be notified, and the suspected release deactivated. Likewise, once

the presence of contamination is established, the IDEM must be notified, and the release confirmed.

Figure 3-4. Step 1 Boring Placement



Step 2

Step 2 is to be performed once the release is confirmed and accordingly, expands the sampling area to complete the nature and extent of characterization.

The Step 2 characterization consists of placing additional borings outward from the center boring in each direction where the residential default closure levels were exceeded. These borings should be continuously placed 5 to 20 feet from each other along the axis until the boring concentration is at or below the closure levels for each COC. Distances between all borings along the two lines should be equal, if possible.

Releases around pump islands and lines should be characterized following the same procedures as used for the tank pit area. Generally, four soil borings should be sampled around the suspected release area and continue outward until sampling results do not exceed residential closure levels. Source removal rather than characterization is an option, but approval will be made on a site-by-site basis.

In areas where the pump islands and lines are located directly over the tank pit, a separate sampling event is not necessary. Likewise, if portions of the pump islands or lines fall within areas of the tank pit, it is not necessary to conduct a separate sampling event.

If possible and/or necessary, ground water samples should be collected from all Step 2 soil boring locations in order to establish the nature and extent of the dissolved-phase contamination. In addition to determining nature and extent, ground water sampling from the source

area outward can also be useful for determining locations for plume stability wells and to evaluate the presence of free product in the source area. Plume characterization may be completed using any appropriate technology. For guidance regarding the installation of permanent ground water monitoring wells, you should refer to IDEM's Non-Rule Policy Document entitled "Drilling Procedures and Monitoring Well Construction Guidelines" located on the IDEM Leaking Underground Storage Tanks web site.

[**Note:** In this section, the IDEM has allowed the flexibility of stepping out 5 to 20 feet between boring locations so that it is possible to work around above- or underground obstacles that may be encountered in the vicinity of the source. This policy was not intended to encourage the practice of consistently stepping out the maximum distance of 20 feet between boring locations, as this may not accomplish adequate source characterization. Accordingly, it is **strongly recommended** that once the step-out procedure has potentially identified non-affected soils and/or ground water, that a conservative attempt be made to find the leading edge of the plume which may involve stepping back. Figure 3-5 illustrates an example of the Step 2 boring strategy for tanks that remain in place.]

Step 2 Soil Evaluation

Once the extent of soil contamination has been determined in all compass directions (~~note: all soil COCs must be delineated to RISC RDCLs before site characterization can be considered complete~~), the PEC can again be calculated. During Step 2, the PEC of each analyte is determined as the mean plus one standard deviation of all boring concentrations exceeding the residential closure level plus a *maximum* of four boring concentrations (one in each direction from the source and close to the source) less than the residential closure level. Samples below the estimated quantitation limits (EQL) are calculated as ½ the EQL.

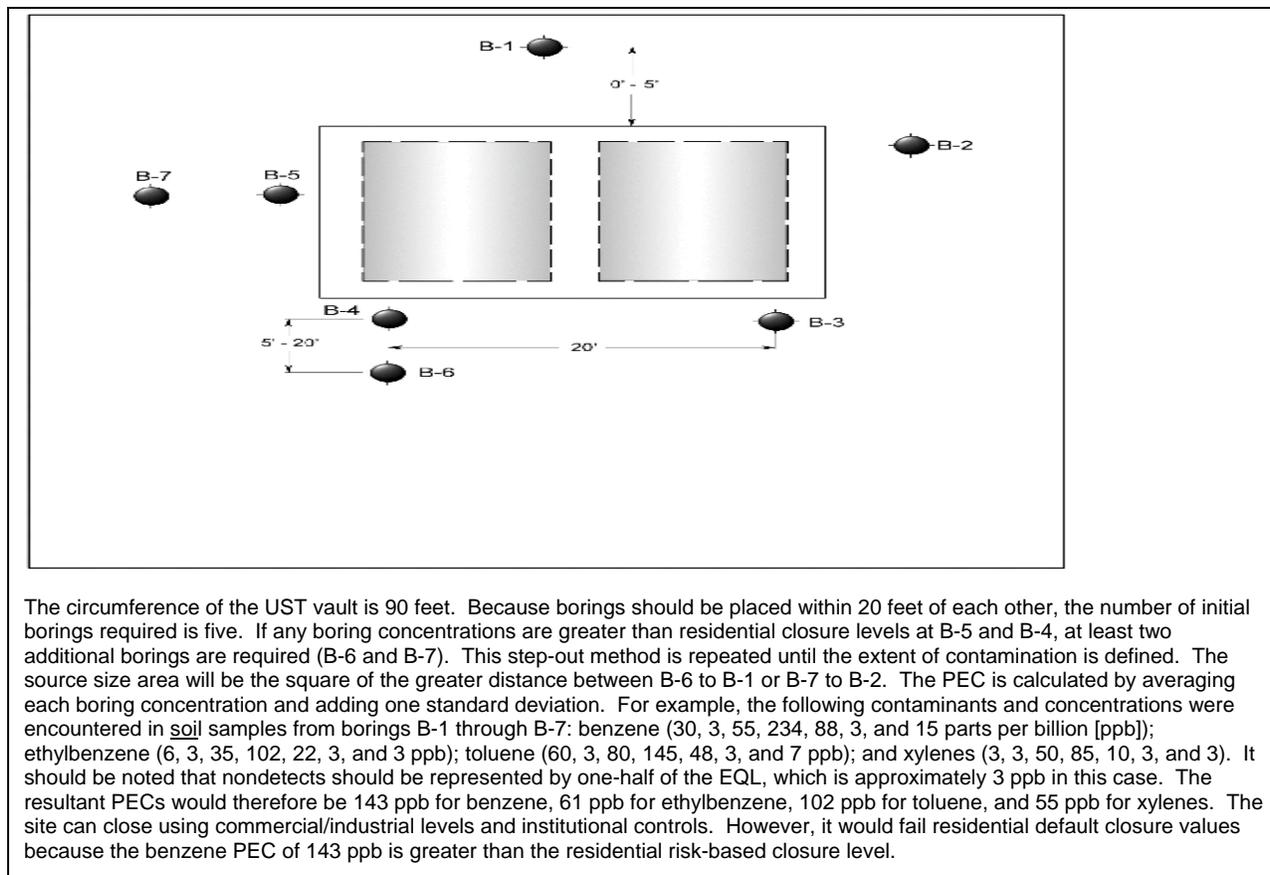
The PEC should be compared to the appropriate source size and land use-specific closure level defined in the RISC Technical Guide. The source size should be calculated by squaring the length of the longest transect. Source size categories are less than 0.25 acre and 0.25 to 0.5 acre.

- If the PEC is less than the appropriate default closure level, and the soil contamination is confined to the site, the site is eligible for soil closure. Be aware that if industrial closure is pursued, the site must also be prepared to have an institutional control in place (i.e., environmental restrictive covenant) which limits

access and prevents exposure to the contamination remaining at the facility.

- If the PEC exceeds the default closure level, a Corrective Action Plan must be developed so that the soils can be remediated to the appropriate default closure levels.

Figure 3-5: Illustration of Sampling Locations



Step 2 Ground Water Evaluation

After the nature and extent of ground water contamination has been determined in all compass directions (**note: all ground water COCs must be delineated to RISC RDCLs before site characterization can be considered complete**), remedial/closure options can be evaluated.

- If all ground water COCs are below the RDCLs, the site can be evaluated for immediate residential closure.

- If all ground water COCs are below the IDCLs, and the COCs are confined to the site, the facility may attempt immediate ground water closure using industrial closure guidelines. However, closure may not be possible until additional monitoring occurs and plume stability is demonstrated. Be aware that if industrial closure is pursued, the site must also be prepared to have an institutional control in place (i.e., environmental restrictive covenant) which limits access and prevents exposure to the contamination remaining at the facility.

- If ground water COCs exceed the RISC IDCLs in any one location, a Corrective Action Plan must be developed so that the ground water can be remediated to the appropriate default closure levels.

For information concerning the various ground water monitoring programs, please consult the RISC Technical Guide.

3.5.2 Smear Zone Characterization

The IDEM does not require smear zone sampling for the evaluation of the migration to ground water and direct contact pathways. If the smear zone is sampled, you would not use the analytical results for calculation of a potential exposure concentration (PEC). However, investigation of the smear zone is often an important consideration for selection of a remedial technology, and for evaluating progress in remediation. Also, it is often important to sample the smear zone when evaluating ground water impacts. Contaminant of concern concentrations in ground water can fluctuate seasonally. They can be present at safe concentrations (or perhaps below detection limits) during the dry periods of the year when the water table is low. During wetter periods when ground water levels are higher, COCs can exceed safe levels due to aquifer contact with the smear zone. If ground water concentrations fluctuate seasonally, IDEM staff may wish to evaluate the smear zone to determine if this is the source of the fluctuation. For these reasons, IDEM technical staff may require samples from the smear zone.

3.5.3 Soil Gas and Indoor Air Sampling

Sites with petroleum contamination may present a public health hazard if compounds volatilizing from ground water or soil migrate into a

building where people are exposed. The completion of this human exposure pathway from volatile organic compounds (VOCs) in the subsurface environment is termed “Vapor Intrusion”.

Though relatively rare at LUST sites, this human exposure pathway must be evaluated. Initial field observations can determine if your site is a potential candidate for soil gas or indoor air sampling. Some things to be evaluated before considering the possibility of soil gas and/or indoor air sampling are as follows:

- What contaminants are found at the site? Is benzene present?
- Are there noticeable petroleum odors or complaints of petroleum odors?
- Is ground water present within five feet of the basement, crawl space, slab, or ground surface?
- Do preferential pathways exist?
- What soil types are present?

IDEM approval and notification is required prior to any soil gas or indoor air sampling. Contact your IDEM project manager if (based upon the initial screening criteria) you believe this human exposure pathway exists at your facility.

3.5.4 Sampling Point Nomenclature and Mapping

Sampling Point Nomenclature

Consistent sampling point nomenclature should be used. The IDEM realizes that different consulting companies have different protocols concerning sampling point nomenclature and when a project is transferred to a new company, there is the potential for inconsistencies.

For sites regulated under the LUST and ELTF programs, the following prefixes are suggested:

GP-##	Used for all borings advanced using a direct-push (Geoprobe™) technology
SB-##	Used for all soil borings advanced using conventional drilling technologies (hollow-stem auger, air-rotary, etc.)
MW-##	Used for all permanent monitoring wells
PZ-##	Used for ground water observation points or other temporary ground water monitoring points
AS-##	Air-Sparge point
SVE-##	Soil vapor extraction point
DPE-##	Dual-phase extraction well
MPE-##	Multi-phase extraction well

When labeling wells numerically, no numbers should be skipped. Additionally, the suffix “R” should follow any replacement well or boring. For example: if monitoring well “MW-1” were destroyed during excavation events, its replacement would be labeled “MW-1R”. Please note: a well is typically considered a “replacement well” if it is installed within the same geologic unit approximately 10 ft of the original monitoring point.

The IDEM realizes that inevitably, variations will occur. However, every effort should be made to use this uniform naming system for each facility; one that is appropriate for the current work being performed as well as compatible with all previous work performed at the site.

Sampling Point Mapping

As required previously, all permanent monitoring wells and sampling points must be surveyed and presented on a scaled site map. The IDEM is now also requiring at least one Global Positioning System (GPS) reference point for every facility. This point should also be depicted on a site map so that it may be viewed relative to the sampling (borings and monitoring well) locations.

The IDEM has developed the following data field information as guidance to external sources of GPS data collectors so that data accurately and reliability can be verified and supported. The following information also facilitates future use of the data. IDEM would prefer copies of the data (data dictionary [if available], each [raw] data file, any base station files used for corrections, and the final product) as an electronic file in either text, Access, or Excel format(s).

GPS Reporting Parameters	
Identifier	Identification of the facility or unit that is being regulated or managed (FID Number, LUST Incident Number, etc.)
Collector Name	The name of the individual that collected the data
Time/Date Recorded	The time/date when the latitude and longitude were collected
Receiver Type	Description of the GPS receiver used to collect the locational coordinates
Total Positions	Number of GPS positions used to determine the locational coordinates of the feature
Feature Indicator	Describes the feature that was collected (access point, corner point of a boundary, boundary point (general), etc.
State Program of Facility	The state program the facility is regulated under (i.e., LUST)
Correction Status	Description of the correction method applied to the GPS data. (i.e., Differential Correction, Realtime Correction, No Correction, etc.)
Maximum PDOP	Position Dilution of Precision (GPS unit calculated measurement)
Data File Name	Name of the GPS rover file containing the locational data information
Standard Deviation	Measure of the variance within the positions used to calculate the feature coordinate
Datum	Name of the reference datum used to collect the latitude and longitude. (The standard state Datum is NAD83)
Projection	Describes the projection the latitude and longitude were collected in. (The standard Projection is UTM Zone 16N in meters)
Units	Describes the units the latitude and longitude were collected in. (feet, meters, dd:mm:ss, dd.dddd, etc.)
GPS Comments	Information concerning data collection—particularly if there is any offset information, important factors, nearby objects, etc.
Address	Street address of the facility or nearest intersection if address is not available
City Name	Name of the city in which the facility is located
County Name	Name of the county in which the facility is located
Zip Code	Five-digit zip code

3.6 Closure Options

RISC provides flexibility in selecting the type of remedy that best achieves closure goals for the site. Closure can be achieved with or without institutional controls.

The goal of RISC procedures is to reach closure, which is defined as: *IDEM's written recognition that a party has demonstrated attainment of specific remedial or screening objectives (closure levels) for COCs at a particular area.*

Closure options can differ for each medium. For example, even if site characterization demonstrates that no further action is needed for closure with unrestricted exposure for soil, closure with institutional controls may be necessary if the site has a stable ground water plume.

The following sections describe closure procedures both with and without institutional controls.

3.6.1 Closure With Institutional Controls

If engineering controls or restrictions of site activities are used to prevent exposure to site contamination, evidence of the suitability, effectiveness, and continued protection of those controls must be supplied. Institutional controls provide this evidence.

Closure with institutional controls generally requires the use of an Environmental Restrictive Covenant (ERC), that provides information on the nature and extent of residual contamination and the methods used to control that contamination. The ERC must stipulate that the exposure prevention mechanism established at the site will be maintained, and it must prohibit future changes to the site that would interfere with any such mechanism.

The Environmental Restrictive Covenant must be recorded on the deed of the affected property. **An ERC is also required for any property where industrial criteria were used to achieve closure.** Appendix 3.3 in the User's Guide provides more information on the Environmental Restrictive Covenant and ground water ordinance requirements. Nondefault institutional controls are discussed in the RISC Technical Guide.

Additional post-closure care activities are required for engineering controls and may be required for activity restrictions. In addition, property control must be obtained and demonstrated where a ground water plume has affected an off-site property. Sites where closure has been achieved with institutional controls may pursue closure with unrestricted exposure at any time by remediating contamination to default residential closure levels. Additionally, if contamination has attenuated over time down to the residential closure levels, a site can petition to have the ERC modified to reflect that the site is now safe for unlimited exposure.

3.6.2 Closure With Unrestricted Exposure

There are two ways to achieve closure with unrestricted exposure: either the site characterization must demonstrate that contamination is below residential closure levels, or active remediation must reduce contamination to residential closure levels. For closure utilizing remediation, a Corrective Action Plan (CAP) should be developed. For closure without remediation, the investigation report can serve as both the CAP and the closure report.

Please note: In accordance with 328 IAC 1-3-5(d)(13), the ELTF fund will only reimburse for remediation efforts to commercial/industrial closure levels. If a site in the ELTF program wishes to continue remediation efforts in order to achieve residential closure levels, they must do so at their own expense. Exceptions to this do occur, and are outlined in 328 IAC 1-3-5(d)(13)

3.7 Corrective Action Plans

Once the site characterization is approved by IDEM and corrective action is determined to be necessary, a CAP must be developed in accordance with 329 IAC 9-5-7. **A CAP will not be considered for review by IDEM unless an adequate site characterization has been completed.** The goal of the CAP is to design a remedial strategy to reduce contamination levels in the soil and ground water to levels that pose an acceptable risk for human health and the environment

The CAP must include, but is not limited to the following:

- Remedial design
- Scaled maps
- Listing of required permits

- Schedule for implementation including construction, operation and maintenance as appropriate
- Remedial monitoring and reporting program
- Health and safety plan
- ELTF SOW if you have submitted or plan to submit claims for ELTF reimbursement

Information should be current for items such as quarterly monitoring results, sampling results, and ground water flow maps. The CAP must discuss various available options and provide justification for the closure option selected.

The CAP will differ depending on which remedial option is selected and whether active remediation is used to achieve cleanup goals. Sites that demonstrate compliance with closure levels during characterization can include CAP information in the site investigation report. Sites where remediation is conducted to attain closure must also demonstrate that the selected remedial technology will be effective if not already addressed in the FSI.

Standardized reporting formats for the CAP have been provided in Appendix 3.2 of this Chapter. These templates are also available on the LUST website.

More information and more justification for proposed remedial options will be required for sites that are high priority, that impact an exposure pathway not considered by the default (such as surface water), and technologies that lack adequate information demonstrating effectiveness. These sites will also undergo a higher level of IDEM review. In addition, for the high priority sites with the potential to impact the surrounding community and in accordance with 329 IAC 9-5-8, the IDEM may decide to hold public meetings or solicit public comments concerning the proposed CAP.

3.7.1 Remediation Technology Evaluation

The IDEM recognizes a variety of proven effective remedial technologies for certain site conditions. These include, but are not limited to: soil vapor extraction (SVE), dual- or multi-phase extraction (DPE/MPE), oxygen release compounds (ORCs) injection, air sparging, soil excavation and disposal, etc.

Site-specific conditions determine which technology would be most effective at any given site and accordingly, every site must be

evaluated individually as there is no “one-size-fits-all” approach to remediation.

Land farming or land treatment of petroleum-contaminated soils is also a remediation option; however, this method should be approached with caution. If a land treatment cell is not constructed properly or, if it is placed in an inappropriate location (i.e., steep slope, topographic low-lying area, close vicinity to human receptors, close proximity to surface waters), it could inadvertently create additional environmental problems at a LUST site, and potentially delay closure. **Accordingly, written IDEM approval is required before any land treatment can occur.**

Note: The Land Treatment Guidelines (included in the 1994 LUST Guidance) should be used as a reference when designing a land treatment cell and a quarterly sampling program.

For assistance with selecting the most appropriate and cost-effective remedial technology for your site, you can visit US EPA’s Technology Innovation Program web site or the Hazardous Waste Clean-up Information (CLU-IN) web site. You also should consult the Geological Services program for new or innovative technologies at 317/234-0991.

3.7.2 CAP Implementation

A CAP must be implemented immediately in accordance with the schedule included in the CAP upon receipt of the approval letter from IDEM. Once CAP system installation and start up or construction is complete, a CAP Implementation Report documenting all implementation activities should be submitted within 60 days.

3.7.3 Quarterly Reporting

As described in 329 IAC 9-5-7(f)(1)(L), quarterly reporting is required under three circumstances:

- Quarterly monitoring prior to corrective action (should be submitted only when requested by IDEM)
- Corrective Action monitoring
- Monitored natural attenuation (MNA) and closure monitoring such as plume stability

The type and frequency of monitoring and reporting should be detailed in the CAP.

3.8 LUST Report Formatting, Signatures and Submittals

Formatting

All LUST reports should use the standardized report formats:

- LUST Initial Incident Report
- Suspected Releases Confirmation Steps Report
- 20-day Abatement and Free Product Removal Report
- Initial Site Characterization (ISC) Report
- Further Site Investigation (FSI) Report
- Corrective Action Plan (CAP)
- Corrective Action Implementation Report
- Corrective Action Progress Report (CAPR) for non-engineered approaches
- CAPR for engineered systems
- LUST Closure (No-Further-Action) Request Report

These forms are included in Appendix 3.2 and can be found at the LUST web site. Three copies of all submittals are required by IDEM unless otherwise directed by your project manager.

Signatures

All LUST reports must be signed by one of the following individuals registered or licensed in the State of Indiana:

- Professional Engineer
- Professional Geologist
- Certified Hazardous Materials Manager
- Professional Soil Scientist

Submittal

All LUST Reports should be sent to the following address:

Indiana Department of Environmental Management
Leaking UST Section
100 North Senate Avenue, Room 1101
Indianapolis, IN 46204-2251

For information about the form and number of reports to submit, consult the IDEM OLQ Project Managers

3.9 ELTF Eligibility and Claims Guidance

The ELTF is administered by the Excess Liability Trust Fund (ELTF) Program and was created under IC 13-23-7 through 9 (previously IC 13-7-20) to provide the following:

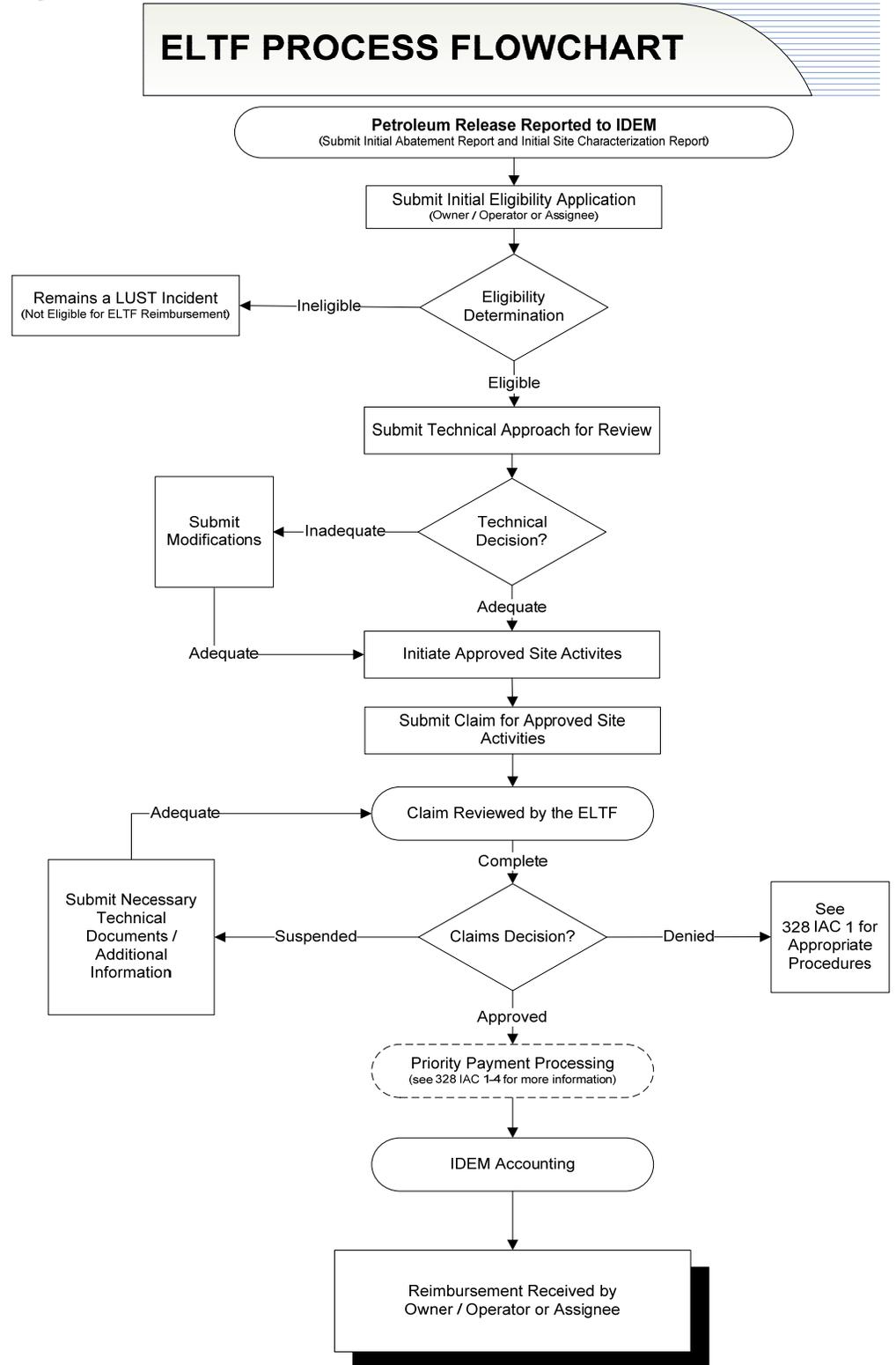
- A method to reimburse eligible tank owners for LUST cleanup costs and any third-party liability costs
- A method to help tank owners fulfill federally required financial assurance requirements
- A method to guarantee loans for tank owners who wish to upgrade their present systems but are unable to obtain financing

It is the ELTF Program's responsibility to ensure that ELTF-eligible remediation activities associated with characterization and corrective action are appropriate, cost-effective, and performed only as necessary to meet the clean-up objectives for the site. All investigation and corrective action activities must be consistent with the requirements of 329 IAC 9, and other applicable State and Federal laws and regulations. The applicable sections of 328 IAC 1 (including definitions) IC 13-23 and IC 13-11 (for statutory definitions) should always be consulted in conjunction with this chapter.

Once a release is discovered at a site, the responsible party is encouraged to file a claim as early in the LUST process as possible to determine ELTF eligibility status.

Figure 3-6 depicts the ELTF Claims Process.

Figure 3-6 -ELTF Process Flowchart



UST owners who want to make claims to the ELTF need to be aware of eligibility requirements that relate to their particular release. These requirements have changed since the original statute was passed and 328 IAC 1 has been amended. The current eligibility requirements are contained in 328 IAC 1-3-3 and are summarized below:

- All regulated USTs must have been registered with IDEM at the time of the discovery of the release. If unregistered tanks are present, a percentage-based reimbursement will be made depending on the number of tank fee payments that have been missed.
- All tank registration fees must be current. If tank fee payments have been missed, a percentage-based reimbursement will be made depending on the number of tank fee payments that have been missed. If less than 50 percent of the payments have been made, the claim will be deemed completely ineligible. The formula for reimbursement for owners and operators who have failed to pay tank fees due under IC 13-23-12-1 is available in 328 IAC 1-3-3(b).
- Any release from the UST system must be reported to IDEM and have an incident number assigned.
- Site Characterization or No Further Action have been approved in writing by IDEM, or a CAP for remediation of the site has been approved in writing by IDEM or deemed approved in accordance with IC 13-23-8-4.
- The UST owner or operator must have been in compliance with all applicable federal and State laws and regulations governing USTs by the date the requirements became effective.
- The UST owner or operator has not defaulted on a loan with the loan guaranty program.
- The deductible specified in IC 13-23-8 has been paid.

Note: Approved emergency measures are eligible for reimbursement from the fund prior to Site Characterization Approval.

Additional information relating to activities involved with the site remediation process can be obtained by sending a letter to the address below or calling (317) 234-0990.

Leaking Underground Storage Tank Section
Indiana Department of Environmental Management
100 North Senate Avenue, Room 1101
Indianapolis, IN 46204-2251

The following subsections discuss ELTF site prioritization, deductibles, examples of eligible expenses, examples of ineligible

expenses, and instructions for application for ELTF eligibility. Application packages are available by calling (317) 234-0990.

3.9.1 ELTF Site Prioritization

The ELTF has a **separate** ranking system to determine the priority with which release investigation and clean-up costs will be eligible for reimbursement. This ranking system allows IDEM to first reimburse for the releases that pose the greatest risk to human health and the environment. For more specific information, consult 328 IAC 1-4-1 and 1-4-1.5.

Site prioritization begins when the ELTF balance drops below \$25,000,000.00. Prioritization of claim payments begins when the ELTF balance drops below \$5,000,000.00. When this happens, Emergency Measures costs are paid first. Other costs are not reimbursable until Site Characterization approval, Corrective Action Plan approval, or until a No Further Action letter has been issued. Once one of these milestones is reached, claims are then paid according to the following prioritization:

- **Category 1 (Paid First)**
 - Concentrations of vapors in sewers or conduits are greater than 10% of the lower explosive limit (LEL)
 - Concentrations of vapors in habitable buildings are greater than long-term, risk-based exposure limits
 - Contaminants in the drinking water supply are greater than the RISC default residential closure level or maximum contaminant levels (MCLs)

- **Category 2**
 - Free product in a thickness of at least one (1) foot is present in any monitoring well
 - At least one (1) inch of free product is present in any two monitoring wells spaced 20 feet or more apart
 - Surface water contamination is present above the water quality standards defined by the rules of the Water Pollution Control Board defined in 327 IAC 2

- **Category 3**
 - Offsite contamination is present at concentrations greater than the RISC default cleanup objective appropriate for land use in soil (100 ppm TPH for sites using 1994 UST Branch Guidance) or ground water

- Free product with a thickness of at least 1/16 of an inch is present in any monitoring well
- On site ground water contamination is attributable to a gasoline release greater than the RISC default closure level based on the current land use

- **Category 4**
 - On site contamination is present at concentrations greater than the RISC default industrial cleanup objective in two or more monitoring wells that are spaced 20 feet or more apart
 - On site contamination is present at concentrations greater than the RISC default industrial cleanup objective (100 ppm TPH for sites using 1994 UST Branch Guidance) in two or more borings spaced 20 feet or more apart

- **Category 5**
 - Any other releases

All claims submitted under identical categories will be paid by priority ranking in chronological order according to the date and time received by the administrator.

3.9.2 Deductibles [IC 13-23-8-3]

The applicable deductible for petroleum UST involved in an incident for which claims are made is \$35,000 if the conditions below both apply.

- The UST is NOT in compliance with rules adopted by the Solid Waste Management Board concerning technical and safety requirements relating to the physical characteristics of petroleum USTs before the date the tank is required to be in compliance.
- The UST is in compliance with rules cited above on a date required in IC 13-23-8-4 at the time the release was discovered.

The deductible for a petroleum UST involved in an incident for which a claim is made is \$30,000 if the conditions below both apply.

- The UST is in compliance with rules adopted by the Solid Waste Management Board concerning technical and safety requirements relating to the physical characteristics of petroleum USTs before the date the tank is required to be in compliance.

- The UST is not a double-walled petroleum UST with double-walled piping.

The deductible for a petroleum UST involved in an incident for which a claim is made is \$25,000 if the conditions below both apply.

- The UST is in compliance with rules adopted by the Solid Waste Management Board concerning technical and safety requirements relating to the physical characteristics of petroleum USTs before the date the tank is required to be in compliance.
- The UST is a double-walled petroleum tank with double-walled piping.

If the owner or operator has 100 or fewer USTs, the owner or operator cannot receive more than a total of \$2,000,000 minus the deductible from the ELTF per year. If the owner or operator has more than 100 USTs, the owner or operator cannot receive more than a total of \$3,000,000 minus the deductible per year from the ELTF. The maximum amount allowed per occurrence (including 3rd party liability claims) is \$2,000,000 minus the deductible. [IC 13-23-8-2 and IC 13-23-8-8].

3.9.3 Examples of Eligible Expenses

The following partial list is provided to assist owners and operators in recognizing the types of expenses eligible for reimbursement under the ELTF program. A complete listing of reimbursable costs is available in 328 IAC 1-3-5.

- Costs incurred from releases first discovered or suspected on or after April 1, 1988.
- Administrative costs such as the following:
 - Travel, lodging, and per diem costs to be paid in accordance with the most current Indiana Department of Administration financial management circular covering State travel policies and procedures
 - Attorney fees if incurred by the owner or operator in defense of litigation in a third-party liability claim
 - Sales tax and governmental administrative fees for local, State, or federal permits necessary for corrective action.
- Investigation and remediation costs, such as the following:
 - Investigation costs, including environmental assessment, field time, report writing, and clerical support

- Costs for soil and water sampling of petroleum and petroleum constituents in accordance with IDEM guidelines
 - Expenditures for machinery and equipment¹
 - Materials and supplies, such as disposable protective equipment, building materials (e.g., piping and cement), and sample preservatives
 - Provision of alternate water supply²
- Markup on purchases based on unit rates or lowest bid of 10% with the exception of those listed in the “Ineligible Expenses”.
 - Miscellaneous costs, including any other costs deemed reasonable and necessary for corrective action or payment of third-party liability claims.

3.9.4 Examples of Ineligible Expenses

The following partial list is provided to assist owners and operators in recognizing the types of expenses that are not eligible for reimbursement under the ELF program.

- Capital improvement costs, such as the following:
 - New tanks or equipment
 - Installation of new tanks or equipment
 - Bedding material for new tanks or equipment (such as pea rock, sand, or special fills used to seat or bed tanks)
 - Concrete, asphalt, or other resurfacing materials reasonably necessary for restoration but in excess of 110 percent of the total surface dimensions of the original surface material or where surface material did not previously exist
 - Property improvement
 - Higher quality surfacing than previously existed (for example, replacement of 4-inch non-reinforced concrete with 6-inch reinforced concrete with a gravel base)
- Administrative costs such as the following:
 - Interest expenses and finance charges
 - Fines and penalties
 - Punitive or exemplary damage charges

¹ These costs must be prorated based on the normal expected life of the item and the length of time the item was used for a single corrective action. In no case will the ELTF pay for purchase of machinery and equipment in excess of the market cost of leasing the item.

² This must be included in a CAP approved by IDEM.

- Any other costs not directly related to corrective action or third-party liability or otherwise determined to not be reimbursable
- Administrative costs and application fees paid to IDEM for participation in the Voluntary Remediation Program (VRP)
- Environmental costs such as the following:
 - Laboratory work related to
 - Testing of tank contents (such as water, sludge, sand, and petroleum product) for disposal
 - Analysis using unapproved testing methods
 - Analysis of inappropriate constituents
 - Cleanup work related to
 - Removal of tank contents
 - Assessment of cleanup of any material other than gasoline, natural gas condensate, jet fuels, diesel fuels, heating fuels, kerosene, crude oils, waste oils, or mixed petroleum products
 - Excavation costs beyond the backfill area of the tank(s) unless part of an approved CAP.
 - Costs associated with remediation that exceeds the minimum requirements to bring a site into compliance with state environmental standards
 - Other items, such as consultant “markups” on
 - Subcontractor expenses
 - Travel
 - Utility bills
 - Per diem expenses
 - Equipment purchases that cannot be charged to a specific site, such as drilling rigs, earth-moving equipment, photoionization detectors, explosimeters, and hand tools.
- Miscellaneous costs such as the following:
 - Business down time
 - Any increased cost of cleanup with the goal of limiting business down time
 - Damage caused by excavation equipment or any other equipment
 - Contractor costs not directly related to corrective action activities, such as preparing cost estimates, preparing bids, accounting billing functions, computer use and time, and preparation of the ELTF application
- Credits, rebates and refunds given to the owner or operator for costs associated with the investigation or corrective action.
- Costs incurred more than 24 hours prior to the date and time of the release report to IDEM.

- Costs to cleanup a release beyond the required cleanup levels/objectives based on the appropriate cleanup guidance, i.e., 1994 UST Branch Guidance Manual or RISC.

3.9.5 Instructions for Application for ELTF Eligibility or Reimbursement

The eligibility determination process examines whether or not a person listed under 328 IAC 1-3-1 is eligible to receive reimbursement and, if so, what percentage will be reimbursed. The affected site must have an approved emergency action, site characterization, or corrective action plan before reimbursement will be made for claims relating to these plans. The owner/operator must be in compliance with the eligibility requirements as outlined in 328 IAC 1-3-3. Those seeking an eligibility determination or those seeking to receive reimbursement from the ELTF should submit two completed copies of the ELTF application to the address below:

Indiana Department of Environmental Management
Excess Liability Trust Fund
100 North Senate Avenue, Room 1101
Indianapolis, IN 46204-2251

Applicants will be informed by letter of the status of their eligibility for reimbursement. Any cost(s) that are not reimbursable will be identified.

3.10 Additional Resources on the Internet

Additional LUST guidance can be obtained by contacting the LUST Section or visiting the IDEM Office of Land Quality web site. The Indiana Department of Natural Resources and the U.S. Environmental Protection Agency Office of Underground Storage Tanks web sites also provide resources pertaining to leaking underground storage tanks.

Overview of Chapter 4

- η Introduction
- η Eligibility
- η Application Process
- η VRA
- η Program Limitations
- η Participant Benefits
- η VRP Project Considerations
- η VRP Project Activities

4.0 Introduction

This chapter discusses participation in the Voluntary Remediation Program (VRP). Requirements for VRP participation are established in Indiana Code (IC) 13-25-5, the Voluntary Remediation Agreement (VRA), the voluntary remediation work plan, and the Risk Integrated System of Closure (RISC) Technical Guide and User's Guide. Pursuant to IC 13-25-5-7, RISC provides the guidelines by which the Indiana Department of Environmental Management (IDEM) will evaluate investigation and voluntary remediation work plans. The VRP provides a process for property owners, operators, potential purchasers, and third parties (participants) to voluntarily enter into an agreement with IDEM to address contaminated property. IDEM issues a Certificate of Completion and the Governor's office issues a Covenant Not To Sue to VRP participants for successfully remediated properties. These documents provide assurance that the voluntary actions will not become the subject of future IDEM enforcement. In addition, a Memorandum of Agreement with the U.S. Environmental Protection Agency (U.S. EPA) provides increased assurance that U.S. EPA will not pursue an enforcement action under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or "Superfund").

The VRP was established in 1993 in response to the growing need for IDEM review and oversight of voluntary investigations and remedial actions. Indiana is thus one of the first states to pass legislation to address liability issues associated with buying, selling, and developing property contaminated by petroleum or hazardous substances. Facilitation of property transfers is a recognized benefit of successful completion of the VRP process.

Because participation in the VRP is optional, a participant can terminate a project at any point upon written notification to the VRP project manager. Property owners, potential real estate purchasers, lending institutions, and property developers benefit from the flexibility allowed for achieving project closure and the voluntary nature of the VRP. Program participation also benefits Indiana's environment through the identification and remediation of contaminated property that otherwise may not be addressed.

4.1 Eligibility

With the exceptions listed below, any person who has established property control or access and who wishes to investigate and remediate property that has been contaminated with petroleum or hazardous substances is eligible to participate in the VRP. Multiple parties can

apply to the program as co-applicants. Applicants may be deemed ineligible for VRP participation if one or more of the conditions below apply.

- A State or federal enforcement action is pending concerning the remediation of hazardous substances or petroleum described in the application.
- A federal grant requires an enforcement action at the site.
- The condition of the hazardous substances or petroleum described in the application constitutes an imminent and substantial threat to human health or the environment.
- The application form is not complete.

Applicants that have already completed remediation efforts are also potentially eligible for the VRP provided that none of the criteria listed above applies. Consistent with requirements in [IC 13-25-5-7\(c\)](#), participants must submit documentation that project closure activities satisfy VRP reporting and performance requirements and are consistent with RISC. If a project enters the VRP after remediation is complete or after an investigation suggests that no further action is required, IDEM still requires the collection of confirmation samples to determine if remedial objectives have been achieved. The purpose of confirmation sampling is not to recharacterize the area but to gather a limited number of samples to confirm previously submitted results.

4.2 Application Process

The first step in the VRP application process is to complete and submit a VRP application form with a \$1,000.00 application fee. Political subdivisions are not required to submit a fee. Application forms are available at IDEM's Office of Land Quality and online at <http://www.state.in.us/idem/olq/programs/vrp/index.html>. Upon receipt of the fee, the Cashier's Office will provide a receipt to the applicants. The VRP cannot process the application until the fee is received. This fee is held until project completion or termination, after which time it will either be refunded in full or applied toward any outstanding payments. The unexpended portion of the application fee will be refunded.

The second step in the application process begins with the assignment of a unique project number to the application form and concludes with an internal agency enforcement check concerning the proposed VRP project.

Information provided on the application is used to determine an applicant's eligibility in the VRP. It also identifies the VRP applicant, provides an initial summary of project conditions, and preliminarily

defines the scope of the investigation and remediation. Pursuant to [IC 13-25-5-2](#), the application is confidential until IDEM and the applicant sign the [VRA](#).

The VRP has 30 days to determine the eligibility of an applicant based on the criteria listed above. Incomplete applications will be returned to the participant within 45 days of receipt with missing information identified. After the appropriate revisions have been made, a participant may resubmit the application. A resubmitted application does not require an additional application fee. Upon application approval, the VRP will send a formal acceptance letter to the applicant contact person identifying the assigned VRP project manager.

4.3 Voluntary Remediation Agreement

Shortly after the participant is accepted into the program, the project manager will send the participant a standard VRA and a nonbinding VRP oversight cost estimate. The VRA is a standard document that identifies the obligations of both the participant and IDEM. During the investigation VRP participants are expected to adhere to the standards set forth in the VRA. The participant can sign the VRA and return it to the VRP for final approval or suggest a modified VRA. In some cases, IDEM may agree to make project-specific alterations to a standard VRA. Of course, many aspects of the program are governed by statutes and cannot be altered by the VRA. However, circumstances may make changes to the VRA mutually beneficial. One such case involves a non-owner VRP participant. If a previous owner wishes to remediate property currently owned by another party (or about to be purchased by a prospective purchaser), the VRA can be changed to extend temporary liability coverage to the current owner. Also, at the participant's discretion, the VRA can be revised to specify more stringent closure requirements. Such changes can be useful during property transfer.

The participant's name will be listed in the caption and signature block of the VRA. The VRA, Certificate of Completion, and Covenant Not To Sue will be issued in the name of the participant as it is indicated in the application. If the participant wishes to have the Certificate of Completion or the Covenant Not To Sue issued to a party other than the participant, the participant must indicate this preference on the application or on the VRA so that appropriate steps can be taken.

The participant must submit a proposed remediation work plan (see [Appendix 1.2](#) of the RISC User's Guide) no later than 180 days after the VRA is signed. An extension may be granted and reflected in the VRA if mutually agreed upon by the VRP and the participant. In addition, the participant will agree to reimburse IDEM for costs incurred to review work plans and reports and to provide project oversight. The VRA will provide the participant with an estimate of review and oversight costs and a payment schedule. The VRA also establishes deadlines for the completion of milestone tasks.

4.4 Program Limitations

Although the VRP can be used to address most contamination scenarios, it is inappropriate in some cases. All limitations are based on the program's statutory framework, which may prevent a participant from completing the VRP. Examples of such limitations are discussed below.

4.4.1 Off-Site Source of Contamination

If the participant cannot or does not desire to gain access necessary to remediate an off-site contamination source, the participant will have difficulty performing the investigation and remediation necessary to obtain a Certificate of Completion and a Covenant Not To Sue. If a source of ground water contamination is not on the participant's property and either property access or control is not desired or provided to the VRP participant, the participant's site may qualify under IDEM's "Property Containing Contaminated Aquifers" nonrule policies, [OER-0008-NPD, 20 Ind. Reg. 1674](#) (March 1, 1997) (for hazardous substances or petroleum), or [WASTE-0038-NPD, 23 Ind. Reg. 2141](#) (May 1, 2000) (for underground storage tanks [UST]). These policies state that if certain conditions are met, IDEM will decline to bring an action against a qualified site.

4.4.2 Resource Conservation and Recovery Act

The VRP may not be appropriate for meeting obligations or responsibilities under the Resource Conservation and Recovery Act (RCRA), [42 U.S.C. 6901 et seq.](#) (United States Code). Obligations that may preclude VRP participation can encompass the duty to meet any permit conditions, including, but not limited to, financial responsibility, closure, post-closure, or corrective action requirements. In addition, neither IC 13-25-5-18(e), the Certificate of Completion, nor the Covenant Not To Sue can prevent IDEM from bringing an enforcement action to compel the VRP participant to perform closure, post-closure, or corrective action, even if the remediation work plan addresses the contaminants or property. However, the VRP process

can be used in conjunction with formal or informal resolution of these issues.

4.4.3 Natural Resource Damages

Neither the VRA, the Certificate of Completion, nor the Covenant Not To Sue relieves the VRP participant of any natural resource damage liability under the following authorities: [42 U.S.C. 9601 *et seq.*](#) (CERCLA); [33 U.S.C. 2701 *et seq.*](#); [IC 13-25-4-8](#); and Indiana common law. Natural resource damage liability applies even if the remediation work plan or VRA addresses natural resource damages.

4.4.4 Other Limitations

The participant can be removed from the VRP for failure to (1) submit a remediation work plan in a timely manner, (2) substantially comply with the work plan, or (3) pay IDEM's administrative costs. Although the VRP does not require the participation of other regulatory programs, it may be possible to fulfill another program's requirements under the VRP. Because each regulatory program has its own requirements, prospective VRP participants should check with the appropriate program personnel or seek an attorney to discuss these requirements.

4.5 Participant Benefits

Program participants enroll in the VRP for different reasons, but a common goal of all participants is to reduce liability for property contaminated by petroleum or hazardous substances. The Certificate of Completion and the Covenant Not To Sue provide assurance that the voluntary actions will not become the subject of future IDEM enforcement. In addition, a Memorandum of Agreement with the U.S. Environmental Protection Agency (U.S. EPA) provides assurance that U.S. EPA will not pursue an enforcement action under the CERCLA with respect to remediation conducted under the VRP.

The flexibility of the VRP allows participants to choose to remediate less than all of the potential contamination on their properties and, within reason, set their own timetables for remediation completion. These considerations influence the resulting liability coverage and are best formulated prior to formal VRP enrollment. Participation in the VRP can increase the value of land and provide a means for responsible parties to address contamination caused on other properties. The VRP can also reduce the threat of federal enforcement actions and facilitate property transfers. Examples of such benefits are discussed below.

4.5.1 Reduce Threat of Federal Enforcement Actions

As stated above, the Memorandum of Agreement states that when an environmental project in Indiana has been issued a Certificate of Completion for the project, U.S. EPA Region 5 will not plan or anticipate any federal action under CERCLA. This assurance remains applicable unless exceptional circumstances cause the project to pose an imminent and substantial threat to human health or the environment. In all cases, the U.S. EPA Region 5 decision will be based strictly on information available at the time of IDEM's determination. This provision does not extend to sites listed on the National Priorities List (NPL) or currently subject to orders or enforcement actions under CERCLA. More information about the Memorandum of Agreement is available at the following Internet address: www.state.in.us/idem/olq/programs/vrp/vrp_moa.pdf.

U.S. EPA will continue to work with IDEM to address any concerns associated with federal activity under CERCLA so as to encourage the financing, transfer, and appropriate redevelopment and use of industrial and commercial properties. In addition, U.S. EPA will continue to provide technical assistance and, at its discretion, financial support to local and State government in order to facilitate the revitalization of contaminated or potentially contaminated properties in Indiana.

4.5.2 Facilitate Property Transfer

The VRP is useful for facilitating property transfers. The flexibility of the VRP allows the participant to propose a voluntary remediation work plan that will provide the desired level of coverage. It is up to the participant and other parties interested in the property transfer to (1) propose the scope of work associated with the property, (2) identify areas to be addressed (which determines liability coverage), and (3) decide when in the VRP process to transfer the property.

The VRA can be altered to allow the parties to reference the VRA in a property transfer agreement. In addition, VRP staff can provide interested parties with a letter that updates the status of the project.

4.6 VRP Project Considerations

In addition to an understanding of the VRP's administrative steps, knowledge of RISC is paramount in defining the contamination and evaluating the risks associated with the property and in projecting

investigation and remediation costs. VRP provides the following options for managing risks posed by environmental contaminants:

- Using traditional remediation methods to achieve default RISC closure levels
- Developing appropriate closure levels using default and nondefault risk assessments
- Allowing higher levels of contamination to remain in place when exposure can be prevented

Program participants must also consider both VRP oversight costs and environmental consultant costs necessary to document remediation efforts. VRP oversight may require IDEM contractor involvement. The extent of technical support will depend on the anticipated complexity of the investigation and remediation as described in the VRP application. Generally, increases in project complexity and scope result in increased cost in order to demonstrate that closure levels have been met.

VRP and contractor technical reviews are more cost-efficient when participants follow the standard report outlines in [Appendix 1](#) of the RISC User's Guide. Re-evaluating inadequate reports, expanding project scopes of work, and other additions all cause increased VRP oversight costs. The VRP remains sensitive to investigation and remediation cost burdens placed on participants and is committed to minimizing oversight costs.

VRP Process Overview

- ◇ Presampling Activities
- ◇ Optional Area Screening
- ◇ Investigation
- ◇ Remediation Work Plan Preparation
- ◇ CRP Preparation
- ◇ Remediation Work Plan Implementation
- ◇ Remediation Progress and Compliance Reporting
- ◇ VRP Closure Location Information
- ◇ Land-Use Restrictions
- ◇ Project Completion
- ◇ Closure Report Preparation
- ◇ Issuance of Certificate of Completion
- ◇ Issuance of Covenant Not To Sue

Because the VRP was designed to be a self-supporting program, participants will be assessed an additional amount of ten (10) percent of IDEM's total administrative costs. IDEM has determined that this is necessary for the effective implementation of VRP. Participants must pay all billed amounts before the Certificate of Completion and Covenant Not To Sue are issued. IDEM issues these documents as soon as the participant has performed the required work, regardless of whether final accounting of project costs has occurred. Therefore, project billing may continue even after the Certificate of Completion and Covenant Not To Sue have been issued.

If the VRP project is terminated for any reason, the participant agrees to reimburse IDEM for all of its administrative costs reasonably incurred to the time of project termination. IDEM agrees to reimburse the participant any unused portion of the application fee.

4.7 VRP Project Activities

VRP participants should begin project activities by determining which investigations and remediations are either required by regulations or warranted for the liability coverage sought. Presampling activities, area screening, and determination of the nature and extent of contamination are key in determining the appropriate course of action. Chapters 2, 3, and 4 of the RISC Technical Guide provide detailed guidance regarding these tasks. These and other VRP project activities are discussed below. In determining the scope of the project, participants should keep in mind that the Covenant Not To Sue will apply only to the chemicals and media addressed in the remediation work plan.

4.7.1 Presampling Activities

All appropriate RISC presampling activities discussed in [Chapter 2](#) of the RISC Technical Guide are required under the VRP. VRP participants are required to evaluate potential source areas by compiling existing information about the site and surrounding areas. Efforts must be made to gather pertinent information concerning past site management practices and potential related impacts on human health and the environment.

Much of this information can be gathered during a Phase I investigation such as the widely recognized American Society for Testing and Materials' (ASTM) Phase I investigation (ASTM E-1527-97 or E-1528-96). The ASTM Phase I investigation can supplement information required by RISC guidance. Although no formal report is submitted during presampling or Phase I activities, the VRP will require the bulk of this information in an investigation report (see [Appendix 1.1](#) of this User's Guide) or in the investigation portion of the voluntary remediation work plan.

Presampling activities can help define the project scope of work by identifying areas unlikely to be contaminated and areas known to be or that may be contaminated. Although the VRP Covenant Not To Sue will only cover areas actually investigated and, if necessary, remediated, presampling can be used to identify areas that do not pose a concern to parties involved in a real estate transaction. In addition, participants can focus their investigative and remediation efforts by considering area classifications along with the level of regulatory coverage desired and the type of remedy selected (such as project closure with or without institutional controls). Presampling activities can also preliminarily identify the size of contaminant source areas. This is an important consideration when using the RISC default closure tables (see [Appendix 1](#) of the RISC Technical Guide).

Contaminant source areas greater than 0.5 acre must either be characterized using the statistical methods discussed in [Chapter 7](#) of the RISC Technical Guide or by using alternative statistical methods identified in the work plan.

Presampling activities also include determining the level of liability coverage desired, evaluating existing information, area classification, selecting the chemicals of concern and environmental media.

4.7.1.1 Determining Level of Liability Coverage Desired

The liability coverage granted through the VRP Covenant Not To Sue is limited to the matters addressed in the voluntary remediation work plan. The participant should propose the scope of work of the remediation work plan based on the level of liability coverage desired. Contamination can be “addressed” through risk assessment, active remediation, or a combination of risk assessment and remediation. Participants may address less than the entirety of a source area if adequate demonstration is provided to exclude chemicals of concern or particular environmental media.

Specific areas and COCs to be addressed must be identified in the voluntary remediation work plan, which is incorporated into the Covenant Not To Sue. If liability coverage is desired for a specific area, independent laboratory confirmation sampling is necessary to verify that the area meets appropriate closure objectives.

The remediation work plan must address contamination that emanates from a participant’s facility, even if the contamination extends off of the “site” as specified in the VRP application. Although the VRP might not require remediation in all cases, the remediation work plan must identify and address all contamination exceeding residential closure levels. If the owner of a neighboring property will not grant property access for remediation, IDEM may work with the participant to gain access. If the participant cannot reasonably gain access to the neighboring property, IDEM may, at its discretion, allow the voluntary remediation work plan to address property controlled by the participant only. This will limit the resulting liability coverage to the work actually performed. This exception does not apply to off-site deed restriction or other land-use restriction requirements.

4.7.1.2 Evaluating Existing Information

To better identify applicable project objectives, the assessment of environmental conditions must address past and current site practices and associated environmental concerns. All existing data concerning environmental contamination should be assessed. Evaluating this information before sampling saves time and money because relevant information can lead to better project screening and sampling plans. Often, a Phase I environmental site assessment (ESA) has been performed on the property in accordance with ASTM guidelines (ASTM E-1527-97 or E-1528-96). An ESA report is an excellent source of background information. The ESA report can supplement additional information required by RISC guidance.

Participants may also use historical information to make management decisions concerning area classifications. A participant may choose to exclude parts of a site from sampling activities (such as screening, investigation, or confirmation) based on historical knowledge; however, the VRP will not extend liability coverage to the excluded areas. RISC allows the use of efficient and technically valid approaches to achieve either sitewide or incident-specific project closure.

4.7.1.3 Area Classification

During formulation of a project's investigation work plan, participants decide the classification of areas depending on the likelihood of contamination (known, unlikely, or may be). Area classifications should be initially based on historical records, knowledge of operational units and processes, and existing sampling information. This information can lead to more efficient sampling designs and can be modified as data become available. Based on the information gathered during the presampling investigation, all areas of the site must be classified into one of the following three categories:

- Areas unlikely to be contaminated
- Areas known to be contaminated
- Areas that may be contaminated

Areas unlikely to be contaminated are portions of a site where there is no reason to suspect contamination. Available historical site data is used to make this determination. Closure is not provided on these areas unless analytical information is obtained and made available for review.

Areas known to be contaminated are areas where contaminant releases are known to have occurred. Previous sampling data, records that document site contamination, visibly stained soils, soil odors, and other investigative data that indicate contamination can be used as a basis for this classification. If the nature and extent determination is complete, appropriate sampling data can be evaluated with regard to the direct contact and migration to ground water pathways. The variability of contaminant concentrations within a known area of contamination will dictate the scope of the sampling plan. Subsequent investigative efforts can focus on this area, providing a cost-effective means to limit future liability. Leaking underground storage tanks (LUST), past environmental spill locations, wastewater retention ponds, and aboveground storage tanks (AST) are all examples of common areas of known contamination or areas discovered to be contaminated during traditional environmental records research. As with other known areas of contamination, historical or currently known information (including information obtained through RISC screening) is often adequate to determine whether the areas will require additional investigation. Therefore, information required from VRP program participants primarily focuses on these sources of information.

Areas that may be contaminated are areas that cannot be classified in either of the other two categories. Significant data gaps or ambiguous or inconclusive information exists for these areas. Gas stations with UST closures, industrial process lines, and areas of unsubstantiated past environmental threats are all examples of areas that may be contaminated. Once identified as an area that may be contaminated, the area is screened and the screening results compared to RISC default closure levels to determine if further investigation is necessary. If the likelihood of RISC default level screening failure is great, the VRP participant may decide to skip area screening and proceed to defining the nature and extent of contamination (see [Chapter 7](#) of the RISC Technical Guide).

Although choosing to address areas known to be contaminated may provide the initial impetus for entry into the VRP, it does not preclude IDEM from requesting an expansion of the VRP participant's investigation to include other potential environmental threats or impacts. Information gathered from historical records, knowledge of waste streams, and operational practices may be deemed a cause for further investigation. The potential for threats to human health or the environment is also considered just cause for IDEM to request an expansion of the investigation scope.

VRP participants have the choice of addressing the entire facility or specific source areas. If sitewide coverage is desired, the VRP will

assume that all areas under all three classifications will be addressed in the remediation work plan. All contaminants detected within these areas will be considered part of the scope of the remediation work plan, which must fully encompass the specific contaminant conditions associated with each area.

The participant can use screening and other methods to exclude portions of the facility from investigation and remediation. However, liability coverage under the Covenant Not To Sue will only extend only to areas actually addressed through sampling and, if necessary, remediation.

4.7.1.4 Selecting Chemicals of Concern and Environmental Media

The VRP provides a means to develop a flexible yet reasonable approach to including or excluding particular chemicals and environmental media (such as soil and ground water) from further investigation and remediation. The VRP approach of selecting COCs and environmental media can also be used by buyers and sellers of property and other interested parties to determine which areas of a facility require investigation and remediation.

Successful VRP Project Formulation Steps

1. Correctly select an area(s) for a soil and ground water investigation
2. Identify an inclusive preliminary chemicals of concern list for soil & ground water
3. Successfully demonstrate the elimination process for certain chemicals of concern and media from further investigative work
4. Coordinating area(s) confirmatory sampling events with VRP for project closure

IDEM's flexibility in allowing the selection of media and chemicals targeted for investigation is aimed at balancing the benefits of flexibility in voluntary cleanups with efficient and effective protection of human health and the environment. An area, medium, or chemical has not been "addressed" unless it is targeted for investigation and possible remediation under the voluntary remediation work plan. The participant can choose to investigate and address these areas, media, or chemicals in order to obtain liability protection for them.

Ordinarily, VRP participants address all of a known contamination event. VRP participants may also pursue closure for an entire facility, including areas unlikely to be contaminant sources and areas that could be contaminated (but are not known to be). Because the VRP process allows participants to select specific areas for environmental investigation and remediation, liability coverage can be provided only for the areas that have been investigated and, if necessary, remediated. Given a particular source area, participants can eliminate from further consideration chemicals of concern, environmental media, or exposure pathways by providing an adequate demonstration that they do not present an undue risk. Adequate demonstration must be consistent with RISC guidance.

A participant choosing to address a specific area must begin by determining all chemicals known or reasonably suspected to have been

released to the soil and ground water. The participant then creates a list of COCs. This initial list should include compounds used, treated, stored, or disposed of at the specific area(s). Chemicals reasonably suspected to have been released include all chemicals typically found with the release to be addressed (for example, benzene, toluene, ethylbenzene, xylene, and possibly methyl-tertiary butyl ether (MTBE) for petroleum storage tank releases) and breakdown or “daughter” products for each chemical known to be released. [Appendix 4.1](#) of this User’s Guide discusses specific categories of COCs for LUST petroleum projects. Specific chemicals can then be eliminated from further investigation under a variety of situations. Examples of such situations include:

- screening or other investigation (either during the VRP process or before entry into VRP) demonstrates that the chemicals are not located above cleanup objectives in soil or detected in ground water.
- the risk of exposure of humans and the environment to the chemicals is low based on current and future land use, considering land-use controls, laws, or other restrictions
- the participant cannot reasonably gain access to off-site property where the chemicals are located
- remediation is not technically or economically feasible.
- the participant is neither responsible for the contamination nor liable for cleanup under State or federal law

Participants may “adequately demonstrate” the elimination from further consideration of a particular medium or exposure pathway by establishing one or more of the following:

- the current degree of contamination or site conditions effectively deter contaminant transport to a particular medium
- there is a lack of contribution to or liability for contamination, such as contamination from an off-site source
- ground water contamination presents minimal risk to human health and the environment, considering ingestion of water, dermal exposure, indoor air, and surface water resources
- soil contamination risks presents minimal risk to human health and the environment, considering direct contact, ingestion, inhalation, or ground and surface water resources
- future land or ground water use restrictions or ordinances will limit exposure

During the compilation of information required for VRP reporting, adequate criteria for eliminating from further consideration a particular media will become apparent. Sampling data, historical information, and other report information can help build a case for demonstrating

that certain environmental media or exposure pathways can be eliminated. Ecological risks posed by the area or site must also be considered. Unsupported decisions not to address particular chemicals, contaminated media, or exposure pathways resulting from a release or area to be addressed will not be accepted because such decisions are not sufficiently protective of human health or the environment.

Participants have “adequately demonstrated” that a medium does not warrant further investigation if the particular medium has passed RISC screening. If participants choose not to conduct screening, the full nature and extent of contamination must be determined for either the area of a facility or the entire facility. The nature and extent determination may demonstrate that the proposed scope of the investigation can eliminate from further consideration certain media or exposure pathways. If a particular source area impacts surface and subsurface soil and contaminant concentrations are high enough to warrant ground water investigation, the VRP project manager has the discretion to request an expanded scope of work.

Specific areas and contaminants to be addressed will be documented in the remediation work plan, which is incorporated into the Covenant Not To Sue. If liability coverage is desired for a specific area, independent laboratory confirmation sampling is necessary to provide verification that the specific area meets appropriate closure objectives.

4.7.2 Optional Area Screening

Area screening is an option for all VRP participants. This option involves comparing collected data to RISC default closure levels to determine if further investigative work is necessary. VRP participants must provide any and all screening information in the investigation report or remediation work plan as detailed in [Appendix 1](#) of the RISC User’s Guide. For sites involving petroleum contamination from a discrete source (such as an underground or above ground tank), [Appendix 4.2](#) of the RISC User’s Guide provides a two-step procedure for screening subsurface soils. Regardless of a VRP participant’s performance or nonperformance of area screening, confirmation sampling will still be required to verify environmental conditions to achieve VRP project closure through the Covenant Not To Sue.

The purpose of screening is to determine the presence of contaminants at concentrations exceeding the RISC closure levels. VRP participants with a high level of confidence that the proposed VRP project area will pass RISC default screening evaluations can proceed to obtain closure through area screening. Because only discrete (noncomposited) samples may be used for confirmation sampling of volatile chemicals,

the Chen Test is the default method for confirmation sampling of volatile compounds. For non-volatile compounds, either the Max Test or the Chen Test may be used. (See [Chapter 6](#) of the RISC Technical Guide.)

The VRP participants must coordinate split confirmation sampling. If confirmation sampling results demonstrate compliance with remediation objectives, the participant may achieve closure. In this case, the determination of the nature and extent of contamination is not required. Participants who have information that suggests that the area is contaminated at concentrations exceeding RISC default closure levels may forgo area screening and proceed to a determination of the nature and extent of contamination and eventually project closure. VRP participants who do not have a strong historical basis to judge an area's environmental concerns should conduct area screening to narrow the focus of any remedy required.

Ground water screening may not be necessary for projects with adequate demonstration that ground water liability coverage is not necessary. However, if ground water is to be included in liability coverage, a thorough determination of the nature and extent of possible ground water contamination and any necessary remediation must be completed prior to the issuance of a Certificate of Completion and Covenant Not To Sue. Ground water screening is insufficient for closure in VRP.

4.7.3 Investigation

All reporting requirements identified in the Investigation Report (see Appendix 1.1 of the User's Guide) apply. Any presampling or screening information should be included in the investigation report. VRP participants can either submit an investigation work plan or an investigation report (see Appendix 1.1). Regardless of which type of document is submitted, VRP participants are asked to provide three copies to the VRP project manager to facilitate technical review. The VRP will provide technical comments within approximately 60 days. VRP participants who elect not to submit an investigation work plan or investigation report must document the objectives, rationale, and procedures followed during the investigation, and investigation findings in the voluntary remediation work plan.

4.7.4 Remediation Work Plan Preparation

The primary purpose of the remediation work plan is to provide a basis for IDEM to evaluate the remedy proposed for the project. In addition, the remediation work plan is subject to a 30-day public notice period, which serves to inform interested parties of the remedial plans.

Participants must comply with any VRP public participation standards or guidance applicable to the VRP. The remediation work plan also establishes the schedule for implementation of remedial activities, which allows IDEM to coordinate oversight activities with the participant. VRP participants must submit four copies of the remediation work plan to the assigned VRP project manager for technical review. All reporting requirements identified in [Appendix 1.2](#) for the remediation work plan are also required.

The remediation work plan must specify project closure objectives. If the objectives are less stringent than residential standards (for example, commercial/industrial standards), the remediation work plan must also specify the property uses that must be restricted to be consistent with the assumptions used to generate the closure objectives. Satisfaction of the Ground Water Quality Standards Rule, [327 IAC 2-11](#), does not necessarily eliminate the need for property or land-use restrictions or other remedial action.

4.7.5 Community Relations Plan Preparation

Meaningful community participation is necessary for the success of any environmental remediation. Participants are encouraged to formulate a community relations plan (CRP), in cooperation with the IDEM project manager, in order to inform the community about the project as well as respond to public questions. In addition to the formal processes described in the CRP, many VRP participants find that informal meetings and discussions are effective in preventing complications sometimes caused by an uninformed public. Such meetings are especially appropriate for neighbors and sensitive community institutions. The CRP should address the needs of both the VRP participant and the community and must be consistent with the VRP's community relations nonrule policy, [OLQ-XXXX-NPD, 20 IC XXXX](#) (Month X, 2000).

4.7.6 Remediation Work Plan Implementation

The VRP participant must notify IDEM within 60 days of work plan approval of the intent to proceed with plan implementation. Commencement of the work contemplated in the work plan before the work plan is approved is done at the participant's risk. Oversight of the remediation work plan is accomplished through a combination of written progress reports and IDEM field oversight. A schedule for progress reporting is required in the remediation work plan.

4.7.7 Remediation Progress and Compliance Reporting

If remediation is necessary, all reporting requirements detailed in [Appendix 1.3](#), Remediation Progress Report, are required. However, if remediation is not warranted because constituents are present below either background or the closure levels specified in the remediation work plan, this reporting requirement is not applicable.

Remediation progress reports (see Appendix 1.3) update the VRP project manager and other interested parties about the remedial activities. These reports shall be submitted at least quarterly. Confirmation samples (split with the VRP) are required to be collected to verify that the specified closure levels have been achieved. Three copies of each remediation progress report should be submitted to the VRP project manager.

4.7.8 VRP Closure Site Location Information

Accurate site location information is required for all VRP sites before the Certificate of Completion can be issued. This information is used in the Certificate of Completion and its attachments to accurately identify the site location. For this purpose, a clean (absent of all headers, footers, and watermarks) legal description of the site must be provided. At a minimum, Universal Transverse Mercator (UTM) coordinates for property access points along the property boundary (such as a driveway or property gate) must be provided. Additionally, the participant must accurately delineate the source areas addressed in the remediation work plan, regardless of whether they are within or outside of the facility boundary.

Accurate information must be provided for all UTM coordinates, regardless of how they are collected. VRP staff may provide this service if requested by the participant. More information may be required for certain remedial projects.

The participant may either choose to professionally survey the specific area or request that the VRP establish the boundaries of the area(a) using a global positioning system (GPS) instrument. Manufacturer specifications and internal IDEM guidance on use of GPS instruments is on file at IDEM. Although IDEM's use of GPS instruments is not a registered professional survey, it will provide the area locations with acceptable accuracy.

4.7.9 Land Use Restrictions

The VRP requires a land-use restriction for all affected properties (both on-site and off-site) not demonstrated to have achieved residential cleanup objectives. A land-use restriction is a way to ensure the continuing viability of land use and exposure assumptions made during the selection of the remedy in the remediation work plan. A land-use restriction often comes in the form of a deed restriction, a land-use rights agreement (that is, the grant or surrender of ground water use or developmental rights), or, in some cases, a law or ordinance. At a minimum, future land use of the property should be restricted to industrial uses for sites that do not satisfy residential closure objectives.

Land-use restrictions proposed by a participant must be **enforceable** and must have a degree of **permanence**. In addition, a land-use restriction must provide the public with **constructive notice** about the existence of the land-use restriction. U.S. EPA's "Land Use in the CERCLA Remedy Selection Process" guidance document (Appendix 7 of the Technical Guide) provides further discussion.

Enforceability ensures that land use that violates the use restriction can be stopped. Constructive notice ensures that all people are deemed to have knowledge of the land-use restriction and is often accomplished by recording a document in the County Recorder's office. All people are deemed to have constructive notice of laws, administrative rules, and ordinances. Constructive notice (1) ensures that occupants, prospective purchasers, and lenders are aware of the use restriction and (2) facilitates use consistent with the land-use assumptions. Types of land-use restrictions that provide constructive notice include recorded instruments, laws, rules, and ordinances. Because an environmental notice is not enforceable, it typically is not sufficient for VRP purposes as a land-use restriction. Similarly, zoning, while an ordinance, is not permanent enough to qualify as a land-use restriction because zoning restrictions are easily changed and variances are often freely granted.

The remediation work plan must specify land-use assumptions made in remedy selection; however, the specific type of land-use restriction need not be specified. All land-use restrictions for off-site properties must be in place when the closure report is submitted. Land-use restrictions for on-site properties must be in place before the Certificate of Completion is issued except for restrictions that are recorded instruments.

The VRP allows on-site deed restrictions or other instruments to be recorded simultaneous with the Certificate of Completion. The VRP also allows the participant to decide when the land-use restriction is

put in place. Failure to secure a land-use restriction is a cause for denial of project closure. The VRP encourages participants to work with their project managers to select the appropriate land-use restriction for a site and to be inventive in developing use control strategies.

4.7.10 Project Completion

Closure Requirements

- ◇ Confirmation sampling
- ◇ Submission of Closure Report
- ◇ Initiation of any off-site institutional controls
- ◇ Recordation of Certificate of Completion and any on-site institutional controls

Guidance on closing VRP sites is presented in the RISC Technical Guide, [Chapter 6](#). Consistent with RISC policy, the VRP will issue a Certificate of Completion when a permanent remedy ensures that contaminant levels meet the respective closure values and when ground water monitoring demonstrates that the ground water continues to meet closure values after eight consecutive quarters of ground water monitoring. Closure with institutional controls may be granted when it is demonstrated that the ground water plume is stable or shrinking. Demonstration of plume stability requires 3 to 7 years of monitoring for petroleum releases and 7 years of monitoring for chemical releases. However, with IDEM concurrence, the participant may propose alternative models for plume dynamics to demonstrate a stable or shrinking plume in less time.

VRP policy requires that confirmation samples be split with IDEM for all project closures as an independent verification that conditions meet closure criteria. If a participant enters the VRP before the nature and extent of contamination has been determined, the participant may request that IDEM split samples with them during optional project screening or investigation activities if contaminant levels are not expected to exceed RISC default closure levels. This strategy will prevent the added expense of remobilizing sampling crews to demonstrate closure. Of course, if confirmation sampling results do not meet remediation objectives, more remediation work will be required, along with subsequent confirmation sampling. If remediation is required, confirmation samples will be collected after completion of the remedial process to confirm closure.

If a project enters the VRP after remediation is complete or after an investigation suggests that no further action is required, IDEM will still require the collection of a limited number of confirmation samples as an independent verification that conditions conform to closure levels. In this case, the intent of confirmation sampling is not to recharacterize the area(s) but rather to confirm previously submitted data.

Some VRP projects may require off-site land-use restrictions. Consistent with [Section 4.7.9](#) of this chapter, separate land-use restrictions are required under the VRP for all properties affected by on- and off-site contamination. Although the remediation work plan need only indicate what type(s) of land-use restrictions will be placed on the affected properties, evidence of the placement of off-site land-use restrictions must be submitted to IDEM before the Certificate of Completion is issued. On-site land-use restrictions may be recorded concurrent with the Certificate of Completion. Evidence of recording, such as an affidavit or file-stamped deed restriction, can be provided as proof that a deed restriction was recorded for all affected property.

4.7.11 Closure Report Preparation

When a project is completed, the VRP participant will be asked to submit a closure report (see Appendix 1.4). All itemized reporting requirements identified in the closure report outline format in [Appendix 1.4](#) apply. Three copies of the closure report must be submitted to the VRP project manager for review.

The primary purpose of the closure report is to document the completion of activities identified in the remediation work plan. The closure report must also demonstrate that all land-use restrictions for off-site affected property are in place. The closure report provides important information about the performance of the remediation system, how the project area was restored following remediation, and other information necessary to demonstrate that the remediation was successful. Section II of the closure report requires comparison between VRP-collected split sample results and participant-collected split sample results. Prior to closure report submission, the participant should contact the VRP project manager and request confirmation sample results. In addition to these reporting requirements, the participant must demonstrate the notification of parties as required by the community relations nonrule policy document, [OLQ-XXXX-NPD, 20 IC XXXX \(Month X, 2000\)](#). A copy of the written notification and a list of recipients must be provided as an attachment to the closure report.

Upon receipt of the closure report, IDEM may schedule a final site inspection. If the report and inspection confirm that remediation is complete, IDEM will prepare a Certificate of Completion and a Covenant Not To Sue for the remediated areas and activities.

4.7.12 Issuance of Certificate of Completion

Once the voluntary remediation project has been successfully completed and payments to IDEM have been made for all billed oversight costs, IDEM will issue the Certificate of Completion. The Certificate of Completion and any on-site land-use restrictions must be recorded with the County Recorder. Once IDEM has received proof of the recorded Certificate of Completion and all oversight payments, IDEM will prepare a Covenant Not To Sue for the Governor's Office. In accordance with [IC 13-25-5-18\(a\)](#), the Covenant Not To Sue bars suit against the participant and successors in title to the VRP site for claims arising under Chapter 13 of the Indiana Code for matters addressed in the remediation work plan. In addition, pursuant to [IC 13-25-5-20\(b\)](#), the program participant, upon receipt of the Certificate of Completion, is not liable for claims for contribution concerning matters addressed in the remediation work plan.

The provisions of the VRA are satisfied when IDEM gives the participant written notice, in the form of a Certificate of Completion, that it has demonstrated to IDEM's satisfaction that all of the terms of the VRA have been completed, including the selection and implementation of a remedial action. The participant remains responsible for record preservation and payment of any remaining administrative costs.

A person who receives a Certificate of Completion shall file a copy of the certificate and its attachments to the recorded deed for the property in the Recorder's Office of the county in which the remediation took place. In addition, the participant must ensure that any land use restrictions are in place. A deed restriction or other recorded land use restriction for on-site property can be recorded simultaneously with the Certificate of Completion. The County Recorder's Office for the county in which the VRP project is located can provide specific guidance on recording issues as well as written proof of the recording.

4.7.13 Issuance of Covenant Not To Sue

After successful project completion, the Governor's Office will issue the Covenant Not To Sue for the contaminants listed in the remediation work plan. Only listed contaminants will be reflected in the attachments to the Covenant Not To Sue. Prior to the issuance of the Covenant Not To Sue, proof of recording of the Certificate of Completion must be provided to the VRP project manager. Upon receipt of written proof of the recording, the VRP will prepare a Covenant Not To Sue and forward it to the offices of the Attorney General and the Governor for signature. By statute and by its own terms, the covenant protects the recipient of the Certificate of

Completion and any party who subsequently acquires the subject property. Upon issuance, neither IDEM nor a third party can bring an action against the participant under the State's environmental laws (Title 13 of the Indiana Code) for matters addressed in the remediation work plan.

The covenant does not relieve the participant of all liability. The participant may still be liable for post-closure or corrective action requirements under RCRA, natural resource damages, nuisance, trespass, and other common law claims, and criminal actions. In addition, the State may not release a participant from liability with regard to CERCLA claims. Although the Memorandum of Agreement states U.S. EPA's policy, it does not and cannot stop suits brought by third parties pursuant to CERCLA for contribution actions against a participant. However, an action for contribution under CERCLA can only be brought for actual response costs incurred by a third party. The likelihood of such a claim is slight for most VRP projects.

Overview of Chapter 5

- ✧ Introduction
- ✧ Indiana Scoring Model
- ✧ Indiana Commissioner's Bulletin
- ✧ Agreed Order
- ✧ Site Investigation and Remediation
- ✧ CRP
- ✧ Information Repository
- ✧ Record of Decision
- ✧ Administrative Record
- ✧ Split Sampling
- ✧ NRDA
- ✧ Site Closure
- ✧ Remediation of Emergency Response Sites
- ✧ Cleanup Guidance

5.0 Introduction

The State Cleanup Program (SCP) was created in 1989 to manage projects not included in the federal Superfund Program under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 *United States Code* (USC) 601 *et seq.* Although the SCP is modeled after the Superfund Program, it differs in many respects. First, unlike the Superfund Program, the SCP has jurisdiction over petroleum releases in addition to releases of hazardous substances. Also, the SCP follows aspects of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 *Code of Federal Regulations* (CFR), Part 300, as well as the Risk Integrated System of Closure (RISC). By applying components of all three programs, the SCP can handle sites of the same environmental magnitude as Superfund Program sites using a more streamlined approach. Finally, the SCP is administered by the State, with no federal involvement or funding. Examples of SCP sites include petroleum terminals and refineries, abandoned landfills, former lead smelting and battery recycling sites, and other industrial sites.

The legal authority for the SCP is Indiana's [Hazardous Substances Response Trust Fund](#), Indiana Code (IC) 13-25-4; Petroleum Releases, IC 13-24-1; and the Indiana Scoring Model (ISM), 329 Indiana Administrative Code (IAC) 7-1.

The Hazardous Substances Response Trust Fund is utilized for cleaning up sites contaminated with hazardous substances. It also establishes liability for potentially responsible parties. Responsible parties and the State's Hazardous Substances Response Trust Fund provide funding for these cleanups. In addition, IC 13-25-4 states that the Indiana Department of Environmental Management (IDEM) may recover the costs of removal or remedial actions when such actions are performed in accordance with the NCP. IC 13-24-1 authorizes IDEM to require cleanup of petroleum contamination. Both the Hazardous Substances Response Trust Fund and IC 13-24-1 also permit IDEM to enter into agreed orders (AO) with responsible parties involved in releases of petroleum or hazardous substances.

This chapter discusses the process for cleaning up sites under the SCP. More information about the SCP is available from the IDEM web page at <http://www.state.in.us/idem/olq/programs/statecleanup> or by calling (317) 234-0361.

5.1 Indiana Scoring Model

Sites qualify for the SCP through the use of a scoring model known as the Indiana Scoring Model (ISM). The ISM provides a regulatory mechanism for IDEM to address hazardous substance response sites that do not qualify for the National Priorities List (NPL). The ISM serves as the IDEM Commissioner's management tool for prioritizing sites that pose the most threat to human health and the environment and for ensuring that IDEM's resources are allocated accordingly.

The ISM combines three numeric scores assigned to a hazardous substance response site based on the potential for harm to human health or the environment from (1) the migration of a hazardous substance away from the site through ground water, surface water, or air; (2) substances that can explode or cause fires; and (3) direct contact with a hazardous substance at the site. Site scoring is a dynamic process, and scores are subject to change based on significant changes in site circumstances, receipt of additional information, or other relevant factors. The final score ranges from 1 to 100, with 100 being the highest. Sites scoring less than 10 are selected for remediation as resources allow.

5.2 Indiana Commissioner's Bulletin

Once a site has been scored, it is placed on the IDEM [Commissioner's Bulletin](#), which helps management determine which sites will be addressed. The Commissioner's Bulletin also ensures that State resources are allocated properly.

The Commissioner's Bulletin is published annually as a nonrule policy in the Indiana Register. The bulletin lists names of the sites along with the most recently available score assigned to each site. The bulletin also informs the public of the location of information used to determine the score for each site and how that information can be obtained. An introduction to the bulletin provides an explanation of the general meaning of the composite scores. A copy of the bulletin and the most recent available scores is mailed to the county health officer and to the county commissioners, town boards, and mayors, as applicable.

5.3 Agreed Order

Once a site is chosen from the Commissioner's Bulletin for remediation, most parties enter into an AO. The AO is a legal and binding document that states the findings of facts, the names of responsible parties, and a statement of the work that needs to be

performed. Under certain conditions, IDEM may conduct immediate removal actions without owner or operator consent.

5.4 Site Investigation and Remediation

RISC provides a model for investigating and remediating SCP sites. All itemized reports and reporting requirements discussed in [Appendix 1](#) are required to document SCP-related activities. Any presampling activities and optional screening data results should be incorporated into the investigation report. In addition, investigation and remediation of petroleum sites must be performed in accordance with the Petroleum Guidance provided in Appendix 4.

5.5 Community Relations Plan

Public participation and involvement is a critical component of a successful remedial action. It is the responsibility of the State to keep the public informed as well as allow for community input in the decision-making process with regard to SCP sites. The SCP follows the NCP's guidance for community relations plans (CRP). The NCP guidelines for the CRP design, implementation, and structure are presented in the NCP at 300.430(c) through 300.435(c).

The CRP guidance requires the State to conduct community interviews, prepare a formal CRP, and establish a local information repository. It also requires the State to publish a notice of availability and brief analysis of the proposed remediation plan, make the proposed plan available in the administrative record (AR) for the site, and provide a public comment period on the proposed plan. The State is also responsible for the following:

- Providing an opportunity for a public meeting
- Keeping a transcript of the public meeting
- Preparing a written summary of significant comments received during the public meeting, along with the State's responses
- Making the summary available in the record of decision (ROD) for the site

5.6 Information Repository

The CRP requires the establishment of an information repository located close to the SCP site location (usually the local library). The State maintains the information repository by adding key documents as they become available. The purpose of the information repository is to allow interested parties and concerned citizens the opportunity to review site documents at a convenient location.

5.7 Record of Decision

The ROD, which serves as the official decision document for a site's remedy selection, summarizes problems posed by the site, alternative remedies considered for addressing these problems, and an analysis of the alternatives. The ROD then identifies the selected remedy and provides the rationale for the selection.

The ROD serves three purposes. First, it describes the technical parameters and goals of the selected remedy. Second, it is a legal document that certifies that the remedy was selected in accordance with CERCLA and NCP requirements. Third, the ROD is a public document that provides a single comprehensive source of information about the site and the remedy. Guidance on ROD preparation is presented in *A Guide to Developing Superfund Records of Decision* (9335.3-02FS-1), May 1990.

5.8 Administrative Record

During site evaluation and remediation in the SCP process, the State is responsible for maintaining an AR. The AR consists of key decision documents and a complete record of site-related activities. The AR provides legal documentation of site-related activities.

5.9 Split Sampling

The State maintains the option to split samples whenever necessary. Split sampling is performed at the discretion of the SCP project manager. Split samples can consist of soil, sediment, ground water, or other environmental media. During a split sampling event, the project manager will collect samples from the same locations and at the same time as the responsible parties. The samples will be analyzed using the same methodologies at different laboratories to determine if analytical results are comparable.

5.10 Natural Resources Damage Assessment

Natural resources are defined in IC 13-11-2-137 as land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the State. CERCLA and the Oil Pollution Act (OPA), [33 USC 2701-2761](#), establish liability for damages associated with the loss or injury of natural resources caused by releases of hazardous substances or oil. CERCLA and OPA require the designation of certain federal and State officials to act on behalf of the public as trustees for natural resources.

The natural resource trustees designated for the State of Indiana include appointed representatives from IDEM, the Indiana Department of Natural Resources (DNR), the U.S. Department of Interior (DOI), and the U.S. Department of Commerce (DOC). The U.S. Fish and Wildlife Service (FWS) is designated to act on behalf of the DOI, and the National Oceanic and Atmospheric Agency (NOAA) is designated to act on behalf of the DOC. The trustees are responsible for seeking compensation for natural resource injuries and utilizing compensator funds for restoring, rehabilitating, replacing, or acquiring equivalent natural resources and any lost services.

A natural resource damage assessment (NRDA) assesses damages to natural resources from releases of hazardous substances or petroleum. The NRDA is used to pursue the recovery of damages and to allocate monies recovered for restoring, replacing, or acquiring equivalent natural resources. CERCLA and the NCP provide for prompt notification of and coordination with the trustees to ensure that remedial actions are selected that protect natural resources.

5.11 Site Closure

The goal of all remedial actions is to achieve closure. Closure can be achieved with or without institutional controls. RISC gives parties the flexibility to select the type of remedy that best achieves closure goals. In some cases, a party may choose to both remove the contaminant source in subsurface soil and restrict exposure to affected ground water. IDEM can invalidate closure upon discovery of new information that indicates a potential threat to human health or the environment.

RISC provides closure criteria for SCP sites. Site closure is explained in detail in the [RISC Technical Guide](#).

5.12 Remediation of Emergency Response Sites

The Emergency Response Section was established to provide a mechanism for dealing with spills and other environmental emergencies. [327 IAC 2-6.1](#) requires that the spilled material be removed or neutralized. To meet the intent of the rule and promote efficient spill response, released material must be immediately removed to background levels or nondetectable concentrations “to most effectively prevent a spill from entering waters of the state.”

5.12.1 Applicability

In 1998, it was recognized that a mechanism was needed to address long-term remediation needs at emergency response sites where spill responses failed to remove contaminant concentrations to background or nondetect levels. In these cases, the site may be turned over to the SCP. Under the SCP, the site becomes a “remedial response site.” Remedial response sites usually are not required to conform to all of the administrative requirements of the SCP. When the site is in a remedial response stage, the SCP may use RISC to close the site.

Emergency remedial response sites also fall under the same legal authority as other sites involved in the SCP: Indiana’s [Hazardous Substances Response Trust Fund, IC 13-25-4](#), and [Petroleum Releases, IC 13-24-1](#). Petroleum-contaminated emergency response sites forwarded to the SCP as remedial response sites may also fall under the legal authority of the Leaking Underground Storage Tank (LUST) Program. [Chapter 3](#) of this RISC User’s Guide provides LUST guidance and discusses applicable LUST legislation.

5.12.2 Process

Emergency remedial response sites referred to the SCP are logged into the State cleanup database, and a project manager determines whether it should remain in the SCP or be referred to the LUST Program. A site is referred to the LUST Program if contamination results from a release from an underground storage tank (UST) that held petroleum product after January 1, 1974. If all product was removed from the tank before January 1, 1974, the site should remain in the SCP for the duration of remedial activities. All other sites not involving USTs should remain in the SCP during remediation. Releases from unregulated USTs are usually remediated in accordance with the LUST guidance procedures described in [Chapter 3](#) and [Appendix 3](#) of this RISC User’s Guide.

For sites retained under the SCP, a letter requesting an initial spill report is sent to the responsible party. IDEM technical staff then review the report and recommend further actions. IDEM may request further site investigation to determine the extent of contamination. The next step depends on the extent of contamination and the contaminant(s). The LUST guidance in Chapter 3 can be used to establish cleanup criteria for petroleum-contaminated sites. In some cases, the site may be recommended for remediation under the Voluntary Remediation Program (VRP) (see [Chapter 4](#)) or scored using the ISM for possible inclusion in the Commissioner’s Bulletin. If a site is not scored using the ISM, it may be possible to apply for a no further action (NFA) letter. Requests for NFA letters are processed and evaluated on a site-by-site basis.

5.13 Cleanup Guidance

Cleanup guidances for each type of site that may interact with the SCP are summarized in Table 5-1 below. [Chapter 5](#) of the Technical Guide contains guidance on determining which constituents to consider at a site.

Table 5-1. Cleanup Guidance

Type of Site	Cleanup Guidance
SCP	Based on RISC Technical Guide
Remedial Response	Based on RISC Technical Guide
LUST	Based on Chapter 3 and Appendix 3 of this RISC User’s Guide and the RISC Technical Guide
Petroleum	Based on Chapter 3 and Appendix 4 of this RISC User’s Guide and the RISC Technical Guide
VRP	Based on Chapter 4 of this RISC User’s Guide and the RISC Technical Guide

Overview of Appendix 1

- ◇ Introduction
- ◇ Investigation Report
- ◇ Remediation Work Plan
- ◇ Remediation
- ◇ Progress Report
- ◇ Closure Report

A1.0 Introduction

This appendix provides general report outline formats to follow when submitting information to the Office of Land Quality (OLQ) under the Voluntary Remediation Program (VRP), Leaking Underground Storage Tank (LUST) Program, and State Cleanup Program (SCP). The purpose of the outline formats is to standardize and make information submitted to IDEM consistent. Program-specific chapters in the User's Guide discuss specific report additions and exclusions.

For the Brownfields Program, the investigation report outline in [Appendix 1.1](#) should be used as a template for conducting Brownfield Environmental Assessments. All site assessment procedures in RISC are recommended but are not necessarily required for brownfield sites.

All sampling and analysis procedures should be performed in accordance with the data quality objectives (DQO) discussed in Appendix 6 of the RISC Technical Guide. Routine reports and documents must comply with all documentation requirements specified in the RISC Technical Guide except with respect to raw data. Applicable quality assurance/quality control (QA/QC) documentation should be retained for all analytical work performed throughout the project, including raw data, chromatograms, recorder outputs, mass spectra, computer printouts, charts, graphs, bench sheets, and any other hard copies generated during sampling and analysis. This documentation must be available upon request.

Upon project completion, final confirmation sampling data must include all QA/QC documentation, including raw data. It is critical that sampling, sample screening, sample analytical methods, and analytical validation be performed in accordance with acceptable methods, such as SW-846, the Contract Laboratory Program (CLP) Statements of Work (SOW), and U.S. Environmental Protection Agency (U.S. EPA) national functional guidelines for the CLP. The data must be appropriate for the type of determination being made to evaluate the site. Chemicals of concern, media, and matrices should be taken into account before appropriate analytical methods are chosen to meet the DQOs. This information is also required for site characterization, health risk assessment, site remediation, legal requirements, RCRA and various remediation closures, and other relevant environmental investigations. If the required information is not available, resampling and re-analysis may be required.

Digital data submissions are requested for all sampling and monitoring information. Guidelines for digital data submission will be posted on the IDEM web page at

<http://www.in.gov/idem/land/datasubmittal/digdatasubmittal.html>

**Investigation Report
Overview**

- ❖ Introduction
- ❖ Site Background and Baseline Project Assessment
- ❖ Statement of Work
- ❖ Project Investigation
- ❖ Investigation Results
- ❖ Conclusions and Recommendations
- ❖ Referenced
- ❖ Appendices

A1.1 Investigation Report

This report outline format can be used for preparing both investigation reports and investigation work plans. Investigation work plans are applicable to projects where OLQ remediation program oversight is either required or desired. An investigation must be conducted for all areas of concern (suspected or confirmed areas of soil or ground water contamination), as required by each program. The investigation work plan is generally prepared **prior** to any field activities and describes the investigation to be undertaken.

The goal of the investigation report is to fully define the vertical and horizontal nature and extent of contamination based on land use-specific closure values. The vertical and horizontal extent of ground water contamination must be evaluated based on residential default closure levels or estimated quantitation limits (EQLs). If RISC default surface soil, subsurface soil, and ground water investigative procedures are followed, contaminant source size determinations and minimum definitive sample numbers must comply with the requirements in [Chapter 4](#) of the RISC Technical Guide. Chapters of the User's Guide discuss in more detail program-specific reporting deadlines and further guidance. Reporting requirements may differ slightly among programs. The information requested below is essential to understanding existing site conditions and developing an acceptable remediation plan.

All information requested or required by the State must be submitted by the reporting deadlines specified by each program. Although different programs may call reports by different names or have slightly different reporting requirements, the basic information outlined below for the investigation report is the same for all programs. Specific requirements for applicable program areas must also be followed. The investigation report should be submitted in the format presented below and in conformance with program-specific requirements.

I. Introduction

A. Project Identification

1. Site name, facility identification number(s), mailing address, and telephone number

2. Site location clearly marked on appropriate U.S. Geological Survey 1:24,000 scale topographic quadrangle map
 3. Current owner and operator, mailing address, and telephone number
 4. Site contact person or group responsible for the investigation
- B. Overview of Current Contamination Conditions
1. Date the spill, release, or other contamination occurred or was discovered
 2. How the spill, release, or other contamination was discovered
 3. Remediation or product recovery measures already taken, including the following:
 - a. Volume of product recovered
 - b. Name of product recovered
 4. Suspected source(s) of the spill, release, or other contamination
 5. Estimated volume(s) of the spill, release, or other contamination
 6. Approximate area impacted
 7. Date the incident was reported to IDEM and resulting incident number (if assigned)
 8. Existing deed restrictions, land-use restrictions, or environmental notice limitations

II. Site Background and Baseline Project Assessment

A. Site History

1. Type of facility, including description of past and current operations
2. Hazardous materials used or stored on site
3. Site ownership and operational history
4. Site spill, release, and contamination history
5. Previously completed investigations, including the following:
 - a. Reasons for previously completed investigations
 - b. Current status of site conditions that prompted or initiated previously completed investigations
6. Potential chemical(s) of concern

B. Geographic Information

1. Political geographic data

- a. County name(s)
 - b. Political township name(s)
 - c. Section (1/4,1/4,1/4), township, and range locations
 - d. Universal Transverse Mercator (UTM) coordinates
2. Physical geographic data
 - a. Topography and surface water flow and drainage patterns
 - b. Nearby surface waters (including wetlands and surface drainageways)
 - c. Nearby floodways and flood plains
- C. Geologic Information
1. Surficial and unconsolidated geology
 - a. Surface soil descriptions from U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS)
 - b. Type(s) of unconsolidated material
 - c. Thickness of unconsolidated material
 2. Bedrock geology
 - a. Depth to bedrock
 - b. Type of bedrock
 - c. Description of primary and secondary structural features, such as fractures, jointings, and solution cavities, that could impact contaminant migration and remediation efforts
 - d. Current status or future potential of aquifer underlying site as primary source aquifer
 3. Hydrogeology
 - a. Identification of regional aquifer(s)
 - b. Identification, location, and copies of the Indiana Department of Natural Resources-Division Of Water (IDNR-DOW) well records for all municipal water supply wells and other high- capacity (greater than 70-gallon per minute [gpm] yield) wells within a 2-mile radius of the site
 - c. Identification, location, and copies of IDNR-DOW records for low-volume (less than 70-gpm yield) wells within a 1-mile radius of the site
 - d. Regional depth to ground water and seasonal fluctuations
 - e. Regional ground water flow direction(s) and gradient(s)

- f. Summary of existing site-specific data
 - g. Other information, as necessary or appropriate
- D. Ecologic Information
- 1. Potentially affected species of flora and fauna
 - 2. Potentially affected species of flora and fauna on the Endangered Species List as published by the U.S. Fish and Wildlife Service and IDNR
 - 3. Potential or observed effects of contamination on vegetation or wildlife populations
- E. Preliminary Evaluation of Potentially Susceptible Areas
- 1. Drinking water source and wellhead protection areas
 - 2. Geologically susceptible areas, such as surface water bodies, karst bedrock areas, and other areas
 - 3. Socially susceptible areas, such as schools, parks, and hospitals
 - 4. Ecologically susceptible areas that include habitats of concern, such as wetlands, caves, and parklands
- F. Preliminary Evaluation of Possible Chemicals of Concern
- 1. Listed or actual chemical(s) of concern, including those with a Hazards Category, those listed on Material Safety Data Sheets (MSDS), and others
 - 2. Suspected chemical(s) of concern based on site operational history
 - 3. Description of hazards categories present
 - 4. Copies of all MSDSs
- G. Preliminary Evaluation of Potential Contaminant Transport Mechanisms
- 1. Discussion of surface water runoff (nonpoint mechanism)
 - 2. Transport mechanisms to surface water, such as drainage ditches, storm sewers, and underground utility trenches
 - 3. Discussion of ground water flow
 - 4. Transport mechanisms to ground water, such as well bores, sewers, underground utility trenches, and karst features

5. Other transport mechanisms, such as windblown particulates and physical tracking of soil by people, animals, or machinery

- H. Preliminary Evaluation of Potential Human Exposure Pathways
 1. Inhalation exposure pathway
 2. Ingestion exposure pathway
 3. Dermal absorption exposure pathway

- I. Preliminary Evaluation of Potential Ecological Exposure Pathways
 1. Potential impacts to aquatic life
 2. Potential impacts to wildlife and vegetation

- J. Identification of Existing Data Gaps that Must Be Addressed in the Site Investigation(s)
 1. Site-specific geologic information
 2. Site-specific hydrogeologic information
 3. Site-specific ecologic information

- K. Supporting Documentation

Full bibliographic information must be provided in the references for all documents used, referenced, and cited.

1. Previous applicable reports prepared for the site or the project
 2. Available data and other applicable documentation regarding either the site or the project
 3. Conceptual site model(s)
-
- L. Maps and Figures

All maps, figures, drawings, cross-sections, aerial photographs, and other such information must be submitted in Appendix B of the investigation report or work plan. The maps, drawings, and other items must include suitable scales, compass directions, and clearly illustrated legends. Figures must also be provided for sites where the current conditions do not accurately reflect conditions that existed at the time of the spill or release because of building renovations, underground storage tank (UST) system upgrades, and other changes. All maps and information on the maps must be legible and

reproducible. Maps and figures should provide the information listed below.

1. Site location clearly on indicated U.S. Geological Survey 7.5-minute topographic quadrangle map(s)
2. Current as well as past locations of physical features of the site, including the following:
 - a. Property lines
 - b. Building outlines
 - c. Sidewalks
 - d. Buildings with basements
 - e. Underground and overhead utility lines
 - f. Raw materials and bulk storage areas
 - g. Aboveground storage tanks
 - h. USTs
 - i. Tank piping trenches and associated dispenser islands
 - j. Roads
 - k. Pump island piping
 - l. Property access points
 - m. Gates and fences
 - n. Loading and unloading areas
 - o. On-site waste storage, treatment, and disposal areas
 - p. Surface water bodies
 - q. On-site ground water supply wells
3. Named facilities, property lines, property uses, current land-use status (such as agricultural, industrial, or commercial), ground water wells, surface water, and other environmentally sensitive areas within a 1-mile radius of the site
4. Locations and identification numbers for all municipal water supply wells and high-capacity (greater than 70-gpm yield) water wells identified in IDNR-DOW well records within a 2-mile radius of the site
5. Locations and identification numbers for all low-volume (less than 70-gpm yield) wells within a 1-mile radius of the site
6. Areas where past spills or releases have occurred, where remediation efforts are currently being conducted, or where remediation efforts have been conducted in the past
7. Soil boring and monitoring well locations
8. Horizontal extent of contaminant migration
9. Sampling locations, including sampling depths and analytical results

10. Potentiometric surfaces for all ground water monitoring events
11. Geologic and hydrologic cross sections that define the stratigraphy, vertical extent of contaminant migration, water table, and location of free product plume, if present
12. Environmentally sensitive areas

III. Statement of Work

This section is applicable to the investigation work plan only. Those preparing investigation reports should skip to [Section V](#).

A. Investigation Objectives

1. Describe area(s) to be investigated.
2. State the objectives of the investigation for each area.
3. Explain how the site investigation will be conducted and the objectives met for
 - a. Directed investigation that focuses on known or potential sources and
 - b. Undirected, sitewide investigation (when no historical or other information is available).
4. Provide the name, address, telephone number, and qualifications of the company performing the investigation work.
 - a. Provide the name, address, telephone number, and qualifications of that company's contact person in charge of the investigation.
 - b. Provide the name, address, telephone number, and qualifications of each subcontractor (such as a drilling firm or an analytical laboratory).
 - c. Provide the certifications of drillers, geologists, engineers, and other professional staff.

B. Investigation Schedule

1. State when the investigation report will be submitted to IDEM for review and evaluation. Submittal must fall within the time constraints imposed by the appropriate program area requirements, and the submittal must be complete and include all information and data required by the appropriate program area.
2. Provide an investigation schedule that defines expected milestones, including the following:
 - a. Mobilization of field crews and equipment,

- b. Completion of all field work, and
- c. Completion of all laboratory work.
3. Provide a projected date for submittal of the completed investigation report.

IV. Project Investigation

This section is applicable to the investigation work plan only. Those preparing investigation reports should skip to [Section V](#).

IDEM recognizes the benefits of various field techniques available to assist in defining the source area and the nature and extent of site contamination. These field techniques include blind drilling, test pit or trench excavation, electronic cone penetrating tests, and geophysical methods. Although such techniques can be used to augment or direct the placement of split-spoon soil borings and the installation of permanent ground water monitoring wells, IDEM does not recognize the results of these investigative techniques for final site confirmation. A sufficient number of soil and ground water samples must be analyzed by a laboratory to determine the full extent of contamination. Boring locations and sampling procedures should be conducted following the recommendations in Chapters 3, 4, 6 and 7 of the RISC Technical Guide.

A. Subsurface Geology Investigation

The subsurface geology investigation is conducted concurrently with the hydrogeology investigation. Subsurface geology conditions must be determined to adequately define the nature and extent of contaminant migration away from the source area and to develop a remediation plan.

1. Soil borings or push probe sample points may be placed as needed to define the vertical and horizontal extent of soil contamination. Locations must be accurately field surveyed with a horizontal closure of less than 1-foot error and accurately depicted on a scaled map of the site.
2. Physical descriptions for all soil samples must be provided and maintained in individual boring or probe logs by an Indiana licensed professional geologist. All boring or probe logs must use the same vertical scale, include a relative surface elevation, and be submitted in a complete and reproducible form. The following are also required:

- a. Continuous sampling from the top to the bottom of the hole
- b. Lithologic descriptions or USDA soil textures, degree of sorting, Munsell soil colors, locations of all sedimentary contacts, gas or vapor readings, moisture content, ground water remarks, visual indications of contamination, and other relevant information
- c. Any other pertinent information should be amended, as necessary, to describe subsurface site conditions
- d. Well driller's certification

B. Hydrogeology Investigation

As previously noted, the hydrogeology investigation is conducted concurrently with the subsurface geology investigation. Hydrogeologic conditions must be determined to adequately define the nature and extent of contaminant migration away from the source area. Because this information will be used during remediation design and development, remediation progress monitoring, and post-remediation monitoring, the ground water monitoring well network must be adequately designed during this stage of the investigation. [Section 4.4.2](#) of the RISC Technical Guide provides further recommendations regarding ground water investigations.

1. An adequate number of ground water monitoring wells, piezometers, or direct-push sampling points must be installed to adequately define the hydrology and extent of ground water contamination. Soil boring and direct-push sampling point locations can be used for well, piezometer, and ground water sampling locations. The location, sampling, and reporting requirements are the same as those outlined above for the subsurface geology investigation. The requirements below also apply.
 - a. Locations must be accurately depicted on a scaled map of the site.
 - b. Locations must be accurately field surveyed with a horizontal closure of less than 1-foot error and a vertical closure no greater than 0.01-foot error.
2. A complete boring log must be provided for each monitoring well as discussed above for the subsurface geology investigation. For nested wells, only the deepest well should be logged.

3. Ground water monitoring well installation, construction, and development procedures must follow the standards outlined in Indiana Rule, [Title 310 of the Indiana Administrative Code \(IAC\) 16-8-3\(a\) through \(m\)](#) (which is to be superseded by [312 IAC 13](#)).
4. Depending on their intended purpose, ground water monitoring wells must adhere to specific size requirements outlined in Indiana Rule [310 IAC 16-8-3\(b\)](#) (to be superseded by [312 IAC 13](#)).
 - a. Ground water wells used to monitor water quality must be at least 2 inches in diameter.
 - b. Piezometers used to monitor water levels must be at least 0.75 inch in diameter.
 - c. Sampling points resulting from the use of direct-push technologies can be used for preliminary screening purposes and for obtaining ground water grab samples to define the extent of ground water contamination. However, results from such screening and sampling are not valid substitutions for results obtained from sampling standard ground water monitoring wells.
5. The depth and interval of each well screen must be carefully planned to fulfill the intended purpose of the monitoring well and to obtain results for the chemicals of concern. When light nonaqueous-phase liquids (LNAPL) are involved, the guidelines below also apply.
 - a. For unconfined aquifer conditions, the well screen must straddle the interface between the nonsaturated and saturated zones and must be of sufficient length to account for seasonal fluctuations in ground water level.
 - b. For confined aquifer conditions, the well screen must be placed within only one water-producing horizon and must be of sufficient length to adequately monitor the entire thickness of the water-producing horizon. When dense nonaqueous-phase liquids (DNAPL) are involved, the screened intervals must be placed at the bottom of the monitored water-bearing zone(s).
6. Legible and reproducible construction logs with the same vertical scale must be submitted for each ground water monitoring well. Each construction log must include, but not necessarily be limited to, the following information:

- a. Identification and location details as outlined above for the subsurface geology investigation
 - b. Surface, top-of-casing, and bottom-of-casing elevations relative to all other elevations generated for the site
 - c. Stratigraphic horizons and depth intervals
 - d. Size and type of the monitoring well casing
 - e. Slot size of well screen
 - f. Depth and length of well screen
 - g. Type of backfill materials used in each interval
 - h. Well development description and records
- New ground water monitoring wells must not be sampled until at least 24 hours after installation and development are complete.
7. Initial and all subsequent sampling methodologies must be established and clearly stated. Sampling methods must follow the standards and guidelines established by the appropriate program area, and sampling frequency and reporting requirements must be defined.
 8. Hydrologic data from initial and subsequent regularly scheduled monitoring events should include, but not necessarily be limited to, the following information:
 - a. If present, the depth to and thickness of product
 - b. Depth to water, including a corrected depth to water if free product is present
 - c. Sounding to the bottom of each monitoring well casing
 - d. Field screening parameters, such as turbidity, dissolved oxygen, oxidation-reduction potential, temperature, and pH
 9. Depending on the site-specific geologic, hydrogeologic, and monitoring well conditions, standard purging, micropurging, or nonpurging methods can be used to obtain representative samples from the aquifer. Standard purging must be guided by field screening parameters, and screening results must be recorded.

Micropurging of each monitoring well must be designed on an individual basis. IDEM has a web site that provides guidance on micro purging at:
www.state.in.us/idem/olq/publications/papers/index.html

Micropurging can be used if the chemicals of concern are metals, DNAPLs, or hydrocarbons. The requirements below also apply to micropurging.

- a. An in-well pump must be used.

- b. Purging must be conducted at a very low pumping rates of 0.1 to 1.0 liter per minute (L/min).
- c. Purging must continue until field screening parameters exhibit steady-state conditions.
- d. Screening results must be recorded.

Nonpurge sampling can be used if chemicals of concern are limited to hydrocarbons; benzene, toluene, ethylbenzene, and xylene (BTEX); and methyl tertiary butyl ether (MTBE). Nonpurge sampling cannot be used when the chemicals of concern are metals, DNAPL, or other pollutants. The requirements below also apply to nonpurge sampling.

- a. Ground water is present in an unconfined aquifer.
 - b. Free product or a visible sheen is not present.
 - c. Dedicated sampling equipment is not stored within the well.
 - d. The water level at the time of sampling is not above the top of the screened interval.
 - e. Final confirmation sampling for site closure includes results from both purge and nonpurge methods for each well.
10. One ground water sample from each monitoring well must be collected and maintained for shipment to a qualified laboratory for analyses. The investigation report should provide the following information:
- a. Type of purging, sampling, sampling equipment, sample containers, and preservation techniques
 - b. Analytical methods, which must be appropriate for the chemicals involved
 - c. Sampling documentation and chain-of-custody record requirements, which should be maintained and submitted for IDEM review and evaluation
11. The sampling methodology and procedures must be detailed in the sampling section of each corrective action plan and progress report.

A. Ecological Evaluation of Susceptible Areas

[Chapter 5](#) of the RISC Technical Guide discusses ecological evaluation of susceptible areas. The investigation report should include, as appropriate, the following information:

1. Potentially affected endangered species
2. Environmentally sensitive areas or habitats of concern, such as surface waters, riparian areas, wetlands, and flood plains
3. Aquatic and riparian species present near the site, including potential exposure of aquatic and riparian species to site-related chemicals of concern and observed impacts to surface water quality and aquatic and riparian species
4. Area wildlife and vegetation
5. Potential wildlife and vegetation exposure pathways, including observed impacts on wildlife or vegetation

D. Background Concentration Assessment

Background concentrations are useful as a basis for determining the nature and extent of soil and ground water contamination. In some site- and program-specific cases, background concentrations are used to determine final cleanup levels. Section 3.3.4.1 of the RISC Technical Guide recommends procedures for background sampling. Background sampling procedures must be conducted in accordance with the quality assurance project plan (QAPP). [Chapter 3](#) of the RISC Technical Guide discusses QAPP requirements. The investigation report should include the following information with regard to background sampling:

1. Background investigation analytical methods
2. Methods used to collect background data (for example, sampling of soil borings or monitoring wells or reviews of existing data or literature)
3. Background sampling locations map
4. Background data in tabular form, including media, parameters, concentrations, and sampling depths and dates
5. Statistical evaluation of background results

V. Investigation Results

This section is applicable to the investigation report only. Those preparing investigation work plans should skip to Section VII.

The site investigation report should include the results of the subsurface geology and hydrogeology investigations and of laboratory analyses performed on collected samples. The results must be consistent with guidelines of the appropriate program area and be accurate and complete because the results will be used to interpret site

geology, hydrogeology, and the nature and extent of contaminant migration. Ultimately, the results will be used to develop conclusions and remediation recommendations. Tables, figures, and maps should be used whenever possible to summarize data and clearly present information or recommendations.

- A. Subsurface Geology and Hydrogeology Investigation Results
1. Provide an interpretation of sitewide stratigraphy based on soil encountered during drilling operations and described in boring logs, including the following:
 - a. Cross sections of the soil horizon correlated to soil and monitoring well borings
 - b. Physical characteristics of soils that could result in preferred contaminant migration pathways
 - c. Horizontal and vertical extent of soil contamination
 2. Provide an interpretation of sitewide hydrogeology based on conditions encountered during drilling operations and groundwater monitoring events, including the following:
 - a. Vadose zone depth, thickness, and seasonal fluctuations in depth and thickness
 - b. Horizontal and vertical extent of soil contamination in the vadose zone
 - c. Type(s), depth(s) to, and thickness(es) of aquifer(s) present
 - d. Physical description of aquifer(s) present, including the following:
 - Hydraulic conductivity
 - Porosity
 - Storativity
 - Specific yield
 - Aquifer test results
 - e. Ground water level measurements, including the following:
 - Ground water flow direction
 - Ground water flow gradient and velocity
 - Seasonal fluctuations in water levels and their effect on flow direction
 - Water table elevations and potentiometric surface
 - f. Ground water quality in all encountered aquifers, significant zones of saturation, and permeable zones, including the following:
 - Areal extent of free product plume(s)

- Horizontal and vertical extent of dissolved ground water contamination
- Velocity of contaminant movement in ground water

B. Laboratory Analytical Results

1. Include laboratory analytical reports in Appendix D.
2. Identify parameters detected above the action levels for the chemicals of concern.
3. Identify parameters detected below the action levels for the chemicals of concern.
4. Describe contamination in other affected media, such as sediment, surface water, and other media.

VI. Conclusions and Recommendations

This section is applicable to the investigation report only. Those preparing investigation work plans should skip to Section VII.

The investigation report must provide an overall assessment of the nature and extent of on- and off-site contamination, an initial assessment of potential risks associated with the contamination, and an assessment of any additional work required. If remediation is planned, the report should provide preliminary remediation alternatives to the extent possible. A tentative schedule for the submission of a remediation work plan must also be provided.

A. Summary of Results

1. Type(s) of chemical(s) encountered and concentrations exceeding appropriate action levels, including the following:
 - a. Tabulated field screening results
 - b. Table(s) of analytical methods, sample containers, and preservation procedures for each sample matrix and sampling location (see [Section VIII.A](#))
 - c. Table(s) presenting analytical results for all media where parameters exceeded method detection levels (see [Section VIII.A](#))
2. Type(s) of media impacted
3. Horizontal and vertical extent of contaminant migration, including the following:
 - a. Tabulated water level measurements
 - b. Geologic and hydrogeologic cross sections

- c. Site soil stratigraphy identification
 - 4. Data gaps
- B. Summary of Potential Risks Associated with Site
 - 1. Both long- and short-term human, ecological, and environmental risks
 - 2. Possible human, ecological, and environmental receptors
 - 3. Current and future land-use issues, if applicable
- C. Preliminary Remediation Alternatives

Feasibility studies must be taken into account when recommending remediation alternatives. The following requirements also apply to the discussion of each alternative:

- 1. Evaluation of overall effectiveness
 - 2. Ability to achieve cleanup criteria
 - 3. Expected treatment duration
 - 4. Demonstrated treatment reliability
 - 5. Permits required
 - 6. Cost and time requirements
- D. Recommended Remediation Method
 - 1. Chosen remediation method
 - 2. Schedule for submitting complete remediation work plan

VII. References

References used to prepare the investigation report or work plan or cited should be listed. Information should include author, full title, publisher, company, date, and other relevant publication information.

VIII. Appendices

- A. Tables (as applicable)
 - 1. Field screening results
 - 2. Analytical methods, sample containers, and preservation methods
 - 3. Analytical results from all media for parameters exceeding the method detection limit
 - 4. Tabulated water level measurements

B. Maps and Figures

[Section II.L](#) presents detailed guidance on preparing maps and figures.

C. Site-Specific QAPP

A QAPP is required for the investigation report only. QAPPs need not be prepared for investigation work plans. The QAPP should contain all elements discussed in [Chapters 3 and 4](#) of the RISC Technical Guide.

D. Laboratory Analytical Results

Guidelines for submitting laboratory analytical results for the investigation report are presented in [Section V.B](#).

A1.2 Remediation Work Plan

IDEM will evaluate the proposed remedy for each site. Information required to evaluate a selected remedy's effectiveness must be provided in the remediation work plan to demonstrate that it is the most effective remedy for the site. The remediation work plan must provide a complete description of the selected remedy, including the following:

**Remediation Work
Plan Overview**

- ✧ Introduction
- ✧ Investigation Activities
- ✧ Remediation Plan
- ✧ References
- ✧ Appendices

- Discussion of the proposed extent of remediation
- Anticipated volume of contaminated material
- Proposed treatment systems
- Transportation distances for removed contaminated media
- Selection of remedial alternatives
- Treatability study reports
- Design and equipment specifications
- Permit application and disposal approvals
- Monitoring and confirmation sampling results
- Progress reports
- Equipment certification
- Operation and maintenance (O&M) plan
- Community relations activities
- Schedule of the remedial activities planned
- Other pertinent information

Specific requirements are discussed below.

I. Introduction

Information provided in the introduction can simply summarize pertinent information provided in the investigation report. Additional information collected after the last investigation report was prepared must also be included in this section.

A. Project Background

1. Site name, address, and telephone number
2. Current owner identification and address information
3. Historical summary of site ownership
4. Type of facility, including description of past and current operations
5. Site contact person or group responsible for guiding the investigation project
6. Overview of initial discovery of contamination, spill history, and previous investigations conducted at the site

B. Supporting Documentation

1. Discussion of relevant previous reports
2. Description of available data and other applicable documentation regarding the site or project

C. Remedial Action Objectives

1. Remediation and cleanup objectives for all affected media, contaminants, and exposure pathways
2. Work items planned for the remediation

II. Investigation Activities

A. Summary of Information Used to Select Remedy

The remediation work plan should summarize all information used to develop conclusions and recommendations regarding the most appropriate remedy. This information should be a synopsis of results, conclusions, and recommendations from previously prepared documents.

1. Results of baseline assessment and literature search, including the following:
 - a. Geologic and hydrologic information summary

- b. Physical and political geographic information summary
 - c. Identification of susceptible areas (see [Chapter 5](#) of the RISC Technical Guide)
 - 2. Extent of the subsurface work performed during site investigation, including the following:
 - a. Copies of boring logs and monitoring well construction logs
 - b. Copies of maps showing boring and monitoring well locations
 - c. Field screening results for all soil samples collected
 - d. Sampling locations for soil samples submitted for laboratory analysis
- B. Summary of Site Investigation
 - 1. Identification of all contaminants, including the following:
 - a. Chemical and physical properties
 - b. Contaminant toxicological data
 - c. All potential effects of residual contamination
 - 2. Summary of site-specific geology and hydrogeology
 - 3. Discussion of identified sources of contamination
 - 4. Summary and map of full horizontal and vertical extent of contamination, including the following:
 - a. Impacted environmental media, such as soil, sediment, ground water, surface water, and air
 - b. Concentrations of contaminants detected in environmental media
 - c. Concentration trends if historical data are available
- C. Summary of Risks Associated with Site
 - 1. Human, ecological, and environmental risks for each contaminant and impacted media, including discussion of long- and short-term risks, environmentally sensitive areas, and endangered species
 - 2. Impact of current and future land-use issues, if applicable, including need for environmental notice and deed restrictions
- D. Summary of Background Concentration Assessment

Section 3.3.4.1 of the RISC Technical Guide recommends procedures for background concentration assessment. The summary can include field and laboratory results as well as statistical methods. In addition, the following information is required:

1. Summary of site-specific waste constituents or chemicals that occur naturally in the soil for each soil horizon or appropriate interval
2. Background data in tabular format and background sampling location map
3. Statistical comparison of background concentrations to concentrations in potentially contaminated media
4. Conclusions on the reliability of the background concentration information and its applicability in determining final cleanup values

E. Additional Field Investigation Requirements

1. Additional investigations required to effectively complete the design or the installation of the selected remedial method
2. Reasons for additional investigation
3. Complete description of additional investigation to be completed

III. Remediation Plan

Screening of potentially applicable technologies must include the evaluation of each technology's technical feasibility, protectiveness of human health and the environment, cost, need for treatability testing, ability to achieve proposed closure criteria, and community acceptance. The evaluation of alternatives must include cost estimates for completing the remediation. Estimates must include installation, startup, O&M, performance monitoring, and all sampling and analysis costs. IDEM will use this information to estimate review and oversight costs and to evaluate remediation progress.

A. Evaluation of Remedial Alternatives

1. The remedial alternatives evaluated must be identified, and the rationale for their selection must be provided. In addition, the remediation work plan should describe parameters evaluated for each of the selected alternatives. The parameters should include, but not necessarily be limited to, the following:

- a. Extent of remediation effort
- b. Technical feasibility to address physical and chemical characteristics of media
- c. Projected contaminant removal and treatment rates
- d. Protectiveness of human health
- e. Cleanup criteria
- f. Ability of each alternative to achieve cleanup criteria
- g. Community acceptance
- h. Anticipated volume of contaminated materials to be treated
- i. Ease of technology application or implementation
- j. Dimensions of major technologies and space limitations
- k. Process parameters
- l. Cleanup time frames
- m. Transportation distances
- n. O&M costs
- o. Any other special considerations
2. Summarize conclusions for each of the technologies evaluated, and provide reasons each technology would or would not be appropriate.
3. Identify the need for a treatability study or pilot test. Describe the treatability study or pilot test and the reasons it is required, and provide the following information:
 - a. Proposed study methodology
 - b. Clear statement of treatability study or waste characterization objectives
 - c. Proposed scale of the study (such as bench-scale or pilot-scale)
 - d. Data requirements and proposed data evaluation
 - e. Pilot plant startup and O&M
 - f. Anticipated date study report will be submitted
 - g. Remedial technologies to be tested and equipment required
 - h. Treatability study and waste characterization, as applicable
 - i. Proposed disposal arrangements for wastes generated during remediation, including approvals or other necessary documentation
 - j. Installation and startup procedures, including the following:

- Data requirements and analytical methods to be used
 - Pilot plant O&M requirements
 - Data analysis and interpretation of results to be used
 - Full-scale technology application requirements and identification of limitations and optimum operating conditions
- k. Statement of intention to submit report detailing treatability study or pilot test results
 - l. Description of review and evaluation of the treatability study or pilot test results
 - m. Estimated startup time of remediation system if results indicate that the chosen technology will work as designed
 - n. Alternative plans if results indicate that the chosen technology will not work as designed

B. Selected Remediation Technology

If more than one remedial alternative will be used to address different on-site areas, the remediation work plan must describe how the remediation system as a whole will work. A flow diagram, conceptual sketch, or other approach should be used to illustrate the components of the remediation system. Major equipment, such as pumps, air strippers, and in situ treatment equipment, must be indicated. The work plan should include a site map showing areas to be remediated and proposed locations of major equipment.

1. Identify which evaluated technology or combination of technologies will be implemented at the site, including the technical, economic, and social acceptance rationales for the final selection.
2. Identify the need for a risk assessment, and provide the following information:
 - a. Parameters to be addressed by the risk assessment
 - b. Proposed risk assessment methodologies
 - c. Potential exposure pathways
 - d. Exposure assumptions
 - e. Environmental fate and transport data development procedures
 - f. Table that lists the parameters and calculated cleanup levels

3. Provide a detailed description of the selected technology and system setup, including the following information:
 - a. Technical specifications of all equipment and processes
 - b. Proposed locations of all remediation equipment on a scaled site map, including piping runs and electrical wiring where applicable
 - c. State or federal permit requirements for the system
 - d. Waste disposal approvals needed to implement the system

C. Monitoring and Sampling Plan

A sampling plan must be developed to track remediation progress and eventually confirm that closure levels have been achieved. Well organized and well presented data contribute significantly to the efficient review and oversight of remediation projects. Tabular formats are preferred wherever possible. The frequency, content, and format of progress reports to be submitted to IDEM during implementation of the remediation work plan should also be discussed.

1. Provide sampling plan details (follow previously approved sampling guidelines) for the following information:
 - a. Sampling and monitoring parameters
 - b. Sampling and monitoring frequency
 - c. Schedule for submitting results to IDEM for review and evaluation (quarterly progress reporting is minimum requirement)
2. Provide data management details, including a discussion of how the monitoring and confirmation sampling data will be documented and reported, and the proposed format for progress reports.

D. Projected Work Schedule

It is critical that the remediation work plan include a detailed schedule for implementation. The schedule will enable IDEM to coordinate implementation oversight activities and the final site inspection with the applicant. The proposed schedule should allow sufficient time for review, public notice, and approval by IDEM before work begins. The schedule should identify the following:

1. Projected installation and startup schedule
2. Sampling and monitoring schedule
3. Contaminant removal and treatment rates, including remediation progress milestones and projected completion dates
4. O&M plan, including the following information:
 - a. Optimum operating conditions
 - b. Necessary O&M tasks, their frequency, replacement schedule, and planned O&M replacement events
 - c. Proposed inspection tasks and schedule
 - d. Potential problems and their remedies
 - e. Contingency plan indicating how the applicant plans to respond in the event of a system failure, including the following information:
 - Description of alternate operation procedures to prevent undue hazards if the system fails
 - Notification procedures in case of system shutdown or failure
 - System modification procedures

IV. References

References used to prepare the remediation work plan or cited in the plan should be listed. Information should include author, full title, publisher, company, date, and other relevant publication information.

V. Appendices

A QAPP is required for the remediation work plan. The QAPP should contain all elements discussed in Chapters 3 and 4 of the RISC Technical Guide. If a QAPP was already submitted as part of the investigation report, it need not be resubmitted.

A1.3 Remediation Progress Report

Remediation Progress Report Overview

- ◇ Introduction
- ◇ Regularly Scheduled Monitoring and Sampling Events

At a minimum, remediation progress reports summarizing sampling and monitoring results must be submitted on a quarterly basis. Results must be recorded on the Corrective Action Progress Report form, which is presented in [Appendix 3.4](#) of this User's Guide. At the end of the project, a final report must be filed to document that closure goals and objectives have been achieved.

I. Introduction

A. Project Identification

1. Site name, facility identification number(s), mailing address, and telephone number
2. Site location clearly marked on appropriate U.S. Geological Survey 1:24,000 scale topographic quadrangle map
3. Current owner and operator, mailing address, and telephone number
4. Site contact person or group responsible for the investigation
5. Sampling and monitoring dates

B. Brief Narrative of Remediation Process

1. Basic description of process(es) involved
2. Information about when the remediation system was started

II. Regularly Scheduled Monitoring and Sampling Events

A. Data from current and previous monitoring and sampling events

B. Graphical display of data to show remediation effectiveness and trends, including historical comparison with previous sampling results

C. Summary of O&M or downtime experienced during current reporting period, including the following:

1. Reasons for O&M problems or downtime
2. Length of downtime
3. Corrective measures taken to repair the system

D. Recommendations concerning need for additional monitoring and sampling events, including the following:

1. Continued monitoring and sampling if cleanup criteria have not been achieved
2. Final confirmation monitoring and sampling if cleanup criteria have been achieved, including a confirmation sampling plan for all impacted media, confirmation sampling locations, and confirmation sampling schedule

Closure Report
Overview

- ◇ Introduction
- ◇ Confirmation Sampling

A1.4 Closure Report

The primary purpose of the closure report is to document completion of activities identified in the remediation work plan (see [Appendix A1.2](#)). The report also provides information about the performance of the remediation system and indicates how the site was or will be restored following remediation.

I. Introduction

A. Project Identification and Site Background

1. Site name, facility identification number(s), address, and telephone number
2. Current owner and operator, mailing address, and telephone number
3. Site contact person or group responsible for guiding the remediation project(s)
4. Historical summary of site ownership
5. Type of facility, including description of past and current operations
6. Site location map and site layout drawing showing the following:
 - a. Property boundaries, roads, loading and unloading areas, and building outlines
 - b. Locations of treatment or disposal areas, remediated areas, ground water monitoring wells, ground water production wells, sampling points, and major remediation equipment
 - c. Raw materials and bulk storage areas
7. Overview of the initial discovery of contamination, spill history, investigations conducted at the site, and remediation history
8. List of previously completed reports concerning the site, and a discussion of other data and documentation available for the site

B. Remediation Effort

1. Description of the remediation system, including a block flow diagram or other conceptual illustration of the system as installed and major equipment used or installed
2. Evaluation of overall system performance, including discussion of procedures used to measure and document

- system performance, significant problems that occurred, and how the problems were addressed
3. Description of remedial action(s) undertaken at the site, including the following:
 - a. Summary of remedial activities performed
 - b. Description of wastes generated during remedial activities, including total volumes or amounts and final disposition
 - c. Description of time required to achieve full remediation

II. Confirmation Sampling

IDEM must receive advance notice before any confirmation sampling is conducted so that the sampling activities can be observed and duplicate samples can be collected, if appropriate. IDEM will not evaluate any requests for No Further Action, final closure, Covenant Not to Sue, or other actions until the final report has been approved and confirmation monitoring and sampling have been completed.

The closure report must describe confirmation sampling procedures as they were actually implemented. The actual numbers and locations of confirmation samples must be shown on a map. Analytical results must be presented in tabular form, addressing all sampling locations, affected media, and contaminants. The name, address, and telephone number of the laboratory or (laboratories) that performed the analyses must also be identified. Copies of laboratory reports and chain-of-custody forms should be provided in Appendices A and B.

- A. The confirmation monitoring portion of the closure report must include the information below.
 1. Data from most recent monitoring and sampling event
 2. Graphical display of data to show remediation effectiveness and trends, including historical comparison with previous sampling results
 3. Summary of O&M problems or downtime experienced during current reporting period, including the following:
 - a. Reasons for O&M problems or downtime
 - b. Length of downtime
 - c. Corrective measures taken to repair the system
 4. Recommendations concerning need for additional monitoring and sampling events, including the following:

- a. Continued monitoring and sampling if cleanup criteria have not been achieved, including re-evaluation of time required to achieve cleanup criteria and revised monitoring and sampling schedule
 - b. Final closure report submittal if cleanup criteria have been achieved, including the following:
 - Final confirmation monitoring and sampling report
 - Information that demonstrates that cleanup criteria have been achieved
 - Clear statement of expected future uses of the site after remediation is completed (such as residential or nonresidential)
 - Discussion of deed restrictions, land-use restrictions, or environmental notice requirements
- B. Completed Field Work and Laboratory Analysis
- 1. Summary of confirmation sampling performed, including the following:
 - a. Confirmation sampling procedures
 - b. Confirmation sampling locations on a plan view map
 - c. Rationales for sampling locations and number of samples collected
 - 2. Confirmation sampling results, including the following:
 - a. Tabulated or graphical representation of results for all affected media and contaminants, including historical comparison of contaminant concentrations
 - b. Laboratory reports in Appendix A, including the following:
 - List of analytical methods used and associated parameters
 - Name, address, and telephone number of laboratory
 - c. All chain-of-custody forms in Appendix B
- C. Evaluation of Confirmation Sampling Results
- 1. Comparison of confirmation sampling results with the agreed upon cleanup levels
 - 2. Acceptable cleanup criteria for all contaminants of concern and for all affected media

3. Demonstration that acceptable cleanup criteria have been met

D. Final Site Restoration

A description of work required to restore the site after remediation is required. Issues such as monitoring well abandonment and equipment dismantling must be addressed.

1. Summary of site restoration work, including the following:
 - a. Description of how disturbed areas have been or will be restored
 - b. Completion schedule for restoration activities
2. Description of remediation equipment dismantling and removal, including the following:
 - a. Description of decontamination procedures
 - b. Description of decontamination verification sampling
 - c. Description of waste disposal activities conducted

III. Appendices

- A. Copies of Laboratory Reports
- B. Chain-of-Custody Forms

APPENDIX 2

RCRA CLOSURE AND CORRECTIVE ACTION CERTIFICATIONS

- 2.1 CLOSURE PLAN CERTIFICATION STATEMENT**
- 2.2 CLOSURE CERTIFICATION STATEMENT**
- 2.3 2004 RCRA MOU**

CLOSURE PLAN CERTIFICATION STATEMENT

I certify, under penalty of law, that this document and all appendixes and attachments as applicable were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

U. S. EPA Identification No.

Facility Name

Signature of Owner or Operator

Name and Title

Date

CLOSURE CERTIFICATION STATEMENT

The hazardous waste management unit(s) at the facility described in the closure plan has (have) been closed in accordance with the specifications in the approved closure plan. I certify under penalty of law that this document and all appendixes and attachments as applicable were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons that manage the system or of persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

U. S. EPA Identification No.

Facility Name

Signature of Owner or Operator

Name and Title

Signature of Registered P.E.

Name of P.E. and Registration No.

Date

Memorandum of Understanding Between the United States Environmental Protection Agency and the Indiana Department of Environmental Management

This Memorandum of Understanding (MOU) is entered into between the Regional Administrator, United States Environmental Protection Agency (EPA), Region 5 (Region 5), and the Commissioner, Indiana Department of Environmental Management (IDEM), in order to implement the Resource Conservation and Recovery Act (RCRA) Subtitle C Corrective Action (CA) requirements, and to facilitate Brownfield redevelopment at subject facilities in Indiana.

I. Purpose

Region 5 and the IDEM agree to mutually exercise their respective legal authorities to: (1) facilitate timely implementation of CA requirements, and to meet the federal Government Performance Results Act (GPRA) implementation schedule; (2) facilitate the productive redevelopment of brownfields and other contaminated properties; and (3) meet each agency's mandate to protect human health and the environment. This MOU expresses the intentions of the Parties regarding how they intend to exercise their respective authorities. It does not have any legally binding effect, does not create any legal rights or obligations, and does not in any way alter either Party's authority under state or federal law. This MOU is intended to support Indiana's use of the Environmental Management Act (EMA), Indiana Code (IC) Title 13 authorities as amended, to achieve cleanups consistent with RCRA CA requirements.

II. Parties

The Regional Administrator of EPA, Region 5, and the Commissioner of IDEM are Parties to this MOU.

III. Authority

Region 5 enters into this MOU in furtherance of its statutory and regulatory responsibilities and authority under the RCRA Subtitle C CA requirements, 42 U.S.C. § 6901 *et seq.*, and other applicable federal laws and regulations. The IDEM enters into this MOU in furtherance of its statutory and regulatory responsibilities pursuant to IC 13, the EMA; Indiana Administrative Code (IAC) 329 IAC 3.1, the Hazardous Waste Management Permit Program and Related Hazardous Waste Management Requirements; and other applicable Indiana laws and regulations, including its authority as an authorized state under RCRA, 42 U.S.C. § 6926.

IV. Background

A. Mandate and Authorization

The State of Indiana and Region 5 are mandated to protect human health and the environment. EPA has authorized Indiana for the base RCRA program and CA. Region 5 and the IDEM acknowledge the potential benefits that can be achieved by clarifying the Parties' intentions and expectations regarding RCRA facilities addressed under Indiana law.

B. Goals

Both the IDEM and Region 5 acknowledge their mutual respect, positive working relationship, and commitment to the successful implementation of this agreement. In particular, the IDEM and Region 5 seek to increase the level of protection of human health and the environment by:

1. Supporting the use of Indiana's Voluntary Remediation Program (VRP) at facilities subject to CA requirements where a voluntary approach is appropriate for achieving timely and protective cleanups;
2. Providing coordinated and consistent technical assistance and information to allow for informed decision making by property owners, prospective purchasers, lenders, public and private developers, citizens, local units of government, and elected officials;
3. Ensuring cleanup of sites that protects human health and the environment, and promoting revitalization of contaminated property for appropriate use;
4. Facilitating the productive use of all authorities and resources in ways that are mutually complementary and not redundant; and
5. Promoting processes by which cleanups that are carried out under non-RCRA authorized programs, including the State Cleanup Program under IC 13-25-4 and IC 13-24, at facilities with CA obligations are performed in a manner which is consistent with CA objectives. The CA objectives are:
 - a. requiring the owner/operator to conduct facility-wide assessments in the CA context;
 - b. ensuring that all releases of hazardous wastes or hazardous constituents into the environment from all Solid

Waste Management Units (SWMUs) and Areas of Concern (AOCs) are addressed (on and off-site);

- c. implementation of remedies that are protective of human health and the environment; and
- d. ensuring that there are meaningful opportunities for public involvement at the site.

V. CA Implementation Agreement

A. Relevant State Authorities

1. Region 5 recognizes that the IDEM has been delegated or authorized to implement most major federal environmental programs. The IDEM's authority for implementing these programs is contained in the EMA. These programs are implemented by several offices within the IDEM under various parts of the EMA. Each part may have program-specific remediation processes and criteria.
2. The RCRA CA program in Indiana is authorized to be implemented by the Remediation Services Branch of the Office of Land Quality (OLQ) under IC 13-22 (Hazardous Waste Management), and by the Permits Branch of the OLQ under IC 13-22 and 329 IAC 3.1. Indiana's State Cleanup Program is implemented by the Remediation Services Branch of the OLQ under IC 13-24 (Petroleum), IC 13-25-4 (Hazardous Substances Response Trust Fund) and 329 IAC 7-1 (Indiana Scoring Model). Indiana's Voluntary Remediation Program is implemented by the Remediation Services Branch of the OLQ under IC 13-25-5. IDEM's various programs, laws, and regulations work together to achieve appropriate environmental remediation objectives.
3. Region 5 has reviewed and evaluated Indiana's Risk Integrated System of Closure (RISC) and Voluntary Remediation Program (VRP), and determined that IDEM's use of the RISC cleanup standards and related processes or EPA's Risk Assessment Guidance for Superfund (RAGS), as used in VRP under IC 13-25, is an acceptable way of achieving the objectives of the authorized CA program.

Region 5's evaluation of IDEM's VRP and the RISC Program is consistent with the EPA Guidance "Interim Approaches to Regional Relations with State Voluntary Cleanup Programs", November 14, 1996.

- a. Region 5 has determined that these cleanups will result in timely and appropriate response actions that protect human health and the environment, offer adequate opportunity for meaningful public involvement, and ensure adequate oversight and the availability of technical assistance;
 - b. Region 5 has determined that the cleanup program under VRP uses written mechanisms to approve work plans as well as to indicate completion of the approved response action; and
 - c. Region 5 has determined that the Remediation Services Branch of OLQ has adequate enforcement resources and authority to ensure completion of response actions if the volunteering party fails or refuses to complete the required actions.
4. Based on the assessment of the Programs' capabilities and authorities, as listed above (V. A. 3. a. through c.), Region 5 has determined that the use of RISC standards and process requirements, or RAGS for nondefault risk assessment guidance, under the VRP at RCRA facilities will result in cleanups that meet the CA objectives.
5. As an alternative to using the authorized CA program, IDEM intends to use, as appropriate, the VRP process, RAGS and/or RISC cleanup criteria for implementation of CA requirements at facilities subject to RCRA Subtitle C Corrective Action. To utilize this MOU, the owner/operator of a RCRA treatment, storage or disposal facility (TSD), shall identify each SWMU and AOC at the facility and ensure that all environmental impacts are addressed, both on-site and off-site, through the VRP investigation and remedial process. For these facilities, IDEM may rely on cleanup determinations made by different sections and branches within IDEM in its assessment of whether the owner/operator of a facility has completed the CA requirements for the facility. OLQ will actively coordinate within these different sections and branches, and ensure that cleanups at RCRA TSDs occur in a manner consistent with RCRA.
6. The RISC and RAGS cleanup criteria specified in the State Cleanup Program and VRP provide for land use based cleanups which may entail restrictive covenants or other restrictions in order to meet the criteria specified for each land use category.

IDEM will utilize criteria specified in the RISC Technical Guidance when reviewing and approving institutional controls.

7. For RCRA facilities undergoing CA under the State Cleanup Program or the VRP, IDEM intends to use, as appropriate, Indiana authority other than the RCRA-authorized authority. The IDEM acknowledges that any non-RCRA-authorized program used for purposes of determining whether specific SWMUs have met the appropriate cleanup criteria must address the CA objectives and ultimately result in a cleanup which is consistent with RCRA. This responsibility remains with IDEM.

B. Applicability

1. Generally, Region 5 does not anticipate taking action pursuant to RCRA CA Authorities at facilities being addressed by the IDEM under Indiana authorities pursuant to IC 13-24 and IC 13-25, except where one or more of the following circumstances apply:
 - a. Region 5 determines that the site may pose an imminent and substantial endangerment to public health, welfare, or the environment;
 - b. The facility owner or operator fails to properly implement a course of action required by IDEM;
 - c. The facility is subject to an existing federal (administrative or judicial) order for cleanup; or, prior to acceptance of the facility by Indiana's VRP, Region 5 begins preparation of an enforcement or response action at the facility, pursuant to CERCLA or RCRA;
 - d. The facility is listed on, or proposed for listing on EPA's National Priorities List (NPL); and sites where Region 5 has submitted a Hazard Ranking Scoring package to EPA Headquarters, unless the site is eligible for a deferral under the RCRA/CERCLA deferral policy dated July 1, 1995, EPA Doc. No. 540-R-95-002g; or
 - e. The exercise of federal authority is necessary for Region 5 to meet its legal responsibilities.
2. Region 5 will consult with the IDEM and provide the IDEM, where practicable and appropriate, an opportunity to take appropriate action within a timely manner, prior to making a

determination that federal action is necessary at any state-lead CA facility.

3. Generally, the IDEM does not anticipate taking action pursuant to Indiana authorities IC 13-22-13, IC 13-24 and/or IC 13-25, at facilities being addressed by Region 5 under federal RCRA CA Authorities except where one or more of the following circumstances apply:
 - a. IDEM determines that the site may pose an imminent and substantial endangerment to public health, welfare, or the environment;
 - b. The facility owner or operator fails to properly implement a course of action required by Region 5;
 - c. The facility is subject to an existing state (administrative or judicial) order for cleanup;
 - d. The exposure assumptions used in the approved risk assessment for whatever reason are no longer valid, or new information reveals unacceptable levels of hazardous constituents which pose a threat to human health or the environment; or
 - e. The exercise of state authority is necessary for IDEM to meet its legal responsibilities.
4. IDEM will consult with the U. S. EPA and provide Region 5, where practicable and appropriate, an opportunity to take appropriate action within a timely manner, prior to making a determination that state action is necessary at any federal-lead CA facility.

C. Coordination Between IDEM and Region 5

1. Region 5 and the IDEM have implemented a process for prioritizing CA implementation at subject facilities and determining which agency is primarily responsible for a particular site. Included in this process are steps to: rank the sites per the USEPA's National Corrective Action Prioritization System; agree on target facilities, their respective ranking, CA implementation schedule, and lead agency; identify specific CA work to be accomplished in each fiscal year's RCRA Performance Partnership Agreement; discuss and agree upon

any changes to the existing schedule and lead agency prior to either agency initiating work on a site; and keep each other apprised of progress on all CA facilities. Key to the success of this process is frequent communication between Region 5 and IDEM regarding CA facilities and implementation progress. As part of this process, the IDEM may request, and Region 5 may transfer to the IDEM, primary responsibility for overseeing CA activities at a given federal-lead facility. Region 5 and the IDEM hereby commit to continuing implementation and improvement of this process.

2. Frequent communication between Region 5 and the IDEM is critical to the success of the RCRA Subtitle C CA program. Region 5 and the IDEM commit to continuing to share information on CA facilities, implementation priorities, new program initiatives, cleanup criteria decisions, GPRA implementation, and other relevant issues.
3. Both agencies further commit to discussing any request for change in the designated lead agency for a site before the other agency initiates any action at a facility. Region 5 and the IDEM agree to reasonably consider and grant appropriate requests for change in the lead or priority of a facility based on requests from the regulated community for Brownfield redevelopment opportunities or changing state or federal program initiatives.
4. In order to achieve this level of communication, the IDEM and Region 5 shall conduct quarterly meetings or conference calls to discuss progress in implementing this MOU, the CA program in general, meeting GPRA commitments, and facility-specific concerns.
5. An issue of increasing concern to the regulated community and to the IDEM in Brownfield's redevelopment efforts is the inability of facilities to terminate CA liability, even after CA requirements have been fully implemented at a facility. IDEM and Region 5 have undertaken various steps to address this uncertainty. IDEM and Region 5 have developed this MOU to clarify their respective intentions regarding RCRA facilities in Indiana, subject to the limitations set forth herein.
6. EPA and IDEM will continue to work together to develop appropriate exit strategies for RCRA corrective action sites.

VI. Entry and Modification

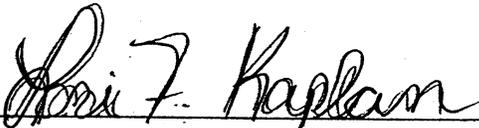
IDEM and Region 5 first entered into this MOU on December 17, 2001. The original MOU has been updated to provide for changes that have occurred since entering into the original MOU. In modifying the original MOU, IDEM and Region 5 agree to accept to the extent possible, each other's RCRA Corrective Action Completion Determinations as provided herein.

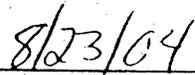
This MOU has been developed by mutual cooperation and consent, and hereby becomes an integral part of the working relationship between Region 5 and the IDEM.

Region 5 enters into this MOU based on a review of IDEM's VRP and RISC Program in its current format. IDEM agrees to provide EPA with prompt notice of changes to the Indiana laws, regulations and guidance, and practices that impact both the VRP and the RISC Program.

This MOU may only be modified by the mutual written agreement of both Parties, or it may be terminated by one Party after a 45-day notice to the other Party.

For the Indiana Department of Environmental Management

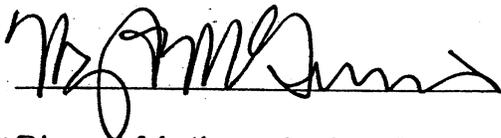


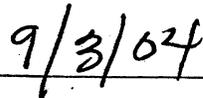


Lori F. Kaplan, Commissioner
Indiana Department of Environmental Management

Date

For the U.S. Environmental Protection Agency, Region 5





Bharat Mathur, Acting Regional Administrator
U.S. Environmental Protection Agency

Date

Chemicals of Concern for Site Contaminated with Petroleum Hydrocarbons Regulated Under IC 13-11 and 329 IAC 9

This appendix was discontinued on September 9, 2009. Updates were made to RISC total petroleum hydrocarbon guidance on July 16, 2009. Chapter 8 of the RISC Tech Guide (available at http://www.in.gov/idem/files/risc_tech_guidance.pdf) now provides the most up-to-date information regarding the chemicals of concern for sites contaminated with petroleum hydrocarbons. For additional information on the changes to RISC TPH policy, please see the *Announcement of Updates to TPH Remediation Goals and Procedures* document on the RISC webpage at http://www.in.gov/idem/files/risc_tph_announce_20090716.pdf.

Default Subsurface Soil Petroleum Characterization for Sites Regulated Under IC 13-11 and 329 IAC 9

Introduction

The RISC guidance includes a specific two-step procedure for screening and determining the extent of contamination within subsurface soil at petroleum release sites. This procedure constitutes a combined approach for screening and characterizing subsurface soil. Surface soil and ground water screening may still be necessary for petroleum release sites. Procedures for screening are the same as for chemical release sites.

Borings should be performed as outlined in [Chapter 3](#) of the RISC Technical Guide. If an unbreached, dense, and relatively low-permeability stratigraphic unit is present beneath the source area, a shallower investigation may be warranted. Highly permeable conditions may warrant a deeper investigation. For the purposes of evaluating the migration to ground water pathway, samples should not be collected from the smear zone.

Ground water screening should be conducted in accordance with the default guidance presented in Section 3.4.5 of the RISC Technical Guide.

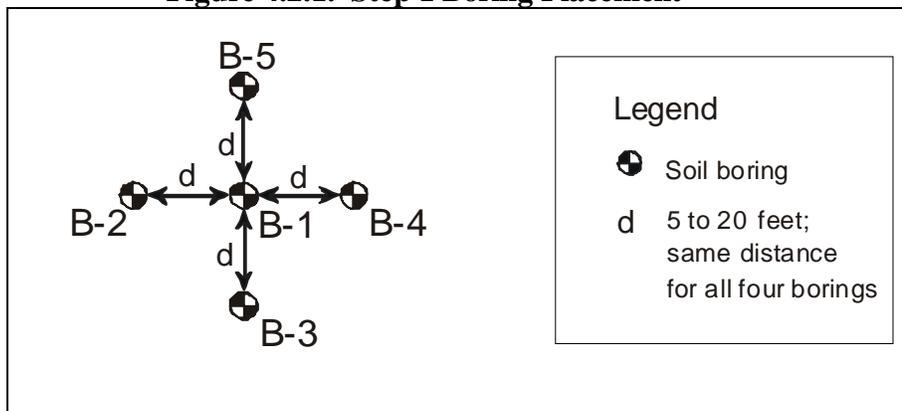
Step 1

Step 1 consists of advancing five borings in the immediate area of the release. For small releases, this procedure may define the outer limits of the source area. One boring should be located at the spot expected to be the most contaminated (the center boring) based on surface soil screening results or other information obtained during presampling activities. Four borings should be placed at a uniform distance from the center boring (5 to 20 feet out) in each of the four general directions at perpendicular axes (see Figure 4.2-1). In areas where it may be impractical to use perpendicular axes, random orientation of the axes is acceptable.

If chemical of concern (COC) concentrations from all five borings are below the residential default closure levels, characterization is complete and subsurface soil does not require remediation. If the COC concentrations in the four outer borings are below these default levels but the concentration in the center boring is above, a potential exposure concentration (PEC) should be calculated as the mean of the concentrations in all five borings plus one standard deviation. The standard deviation is calculated using the soil boring COC

concentration data as a sample of the population of available data. Because the source size in this scenario is less than 0.25 acre, the PEC should be compared to the 0.25-acre default closure level for the appropriate land-use category. If the PEC is less than the closure level, characterization is complete.

Figure 4.2.1. Step 1 Boring Placement



Step 2

If Step 1 did not indicate that soil COC concentrations in the four outer borings are at or below the residential default closure levels, the investigation proceeds to Step 2. Step 2 is a comparison value calculation based on results from regularly spaced borings along two intersecting lines that traverse the extent of the release.

The Step 2 investigation consists of placing additional borings outward from the center boring in each direction where the residential default closure levels were exceeded. These borings should be continuously placed 5 to 20 feet from each other along the axis until soil COC concentrations are at or below the closure levels for the COCs. Allowance can be made for above- or underground obstacles, but the distances between all borings along the two lines should be as close to the same as possible. Figure 4.2-2 illustrates an example of the Step 2 boring strategy

Once the extent of contamination in all four directions has been determined, the PEC can be calculated using data from all of the borings along all transects where Step 2 sampling was conducted. Samples below the EQL are calculated as $\frac{1}{2}$ the EQL. As noted above, the PEC is the mean of the soil COC concentrations from all borings plus one standard deviation calculated using the concentrations as a sample of the population of available data.

The source size should be calculated by squaring the length of the longest transect. Source size categories are less than 0.25 acre and 0.25 to 0.5 acre. The PEC should be compared to the appropriate source size and land use-specific closure level in [Tables 4.1-1 and 4.1-2](#) in Appendix 4.1. If the PEC is less than the appropriate default closure level, characterization is complete. If the PEC exceeds the default closure level, the site can be remediated to the default closure levels or a nondefault risk assessment can be conducted.

Figure 4.2-3 presents a flow chart describing the decision-making process involved in characterizing subsurface soil.

Figure 4.2.2: Step 2 Boring Placement

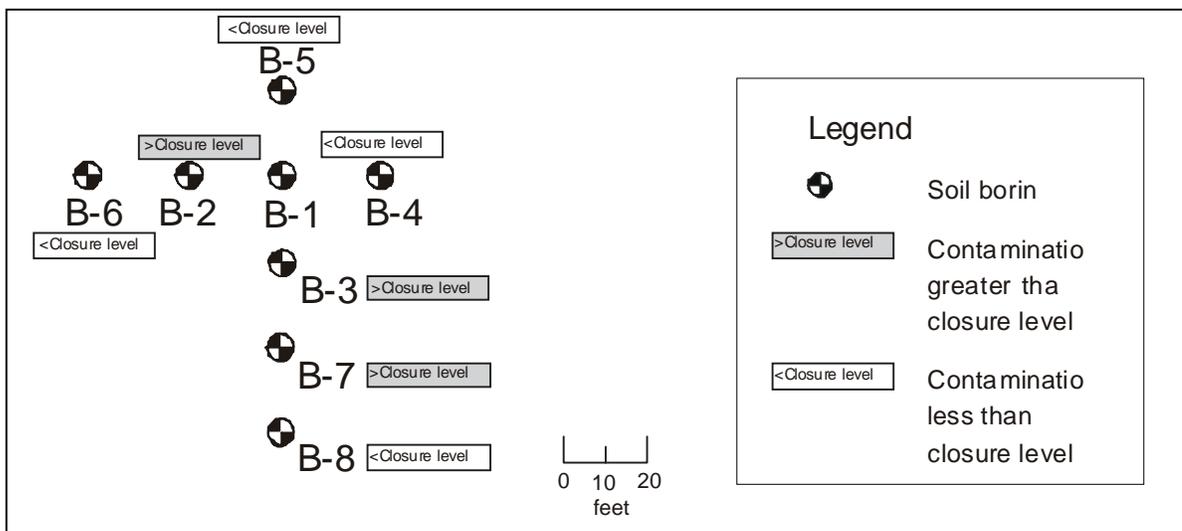
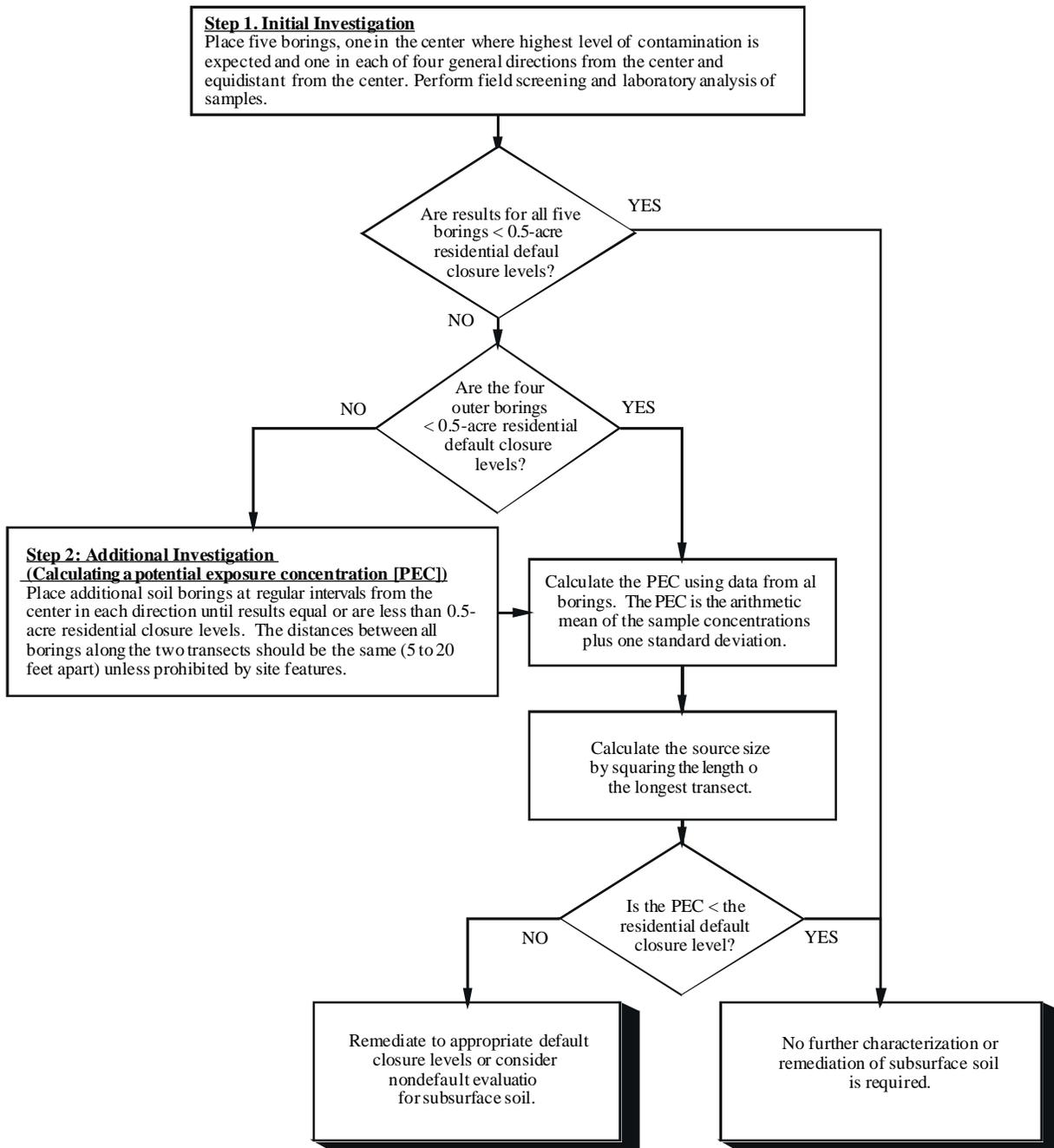


Figure 4.2-3. Flow Chart of Decision-Making Process for Petroleum Releases



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
NONRULE POLICY DOCUMENT

Title: Excess Liability Trust Fund/Risk Integrated System of Closure
Identification Number: Waste - 0039 - NPD
Date Originally Adopted: February 10, 2000
Dates Revised: December 14, 2000
Other Policies Repealed or Amended: None
Brief Description of Subject Matter: This document will address whether the Excess Liability Trust Fund (ELF) will reimburse eligible parties for the costs incurred in implementing a corrective action plan using the Risk Integrated System of Closure (RISC).
Citations Affected: IC 13-23-8, IC 13-23-9, 328 IAC 1-3-5

This nonrule policy document is intended solely as guidance and does not have the effect of law or represent formal Indiana Department of Environmental Management (IDEM) decisions or final actions. This nonrule policy document shall be used in conjunction with applicable laws. It does not replace applicable laws, and if it conflicts with these laws, the laws shall control. A revision to this nonrule policy document may be put into effect by IDEM thirty (30) days after the revised nonrule policy document is made available for public inspection and comment and is presented to the Financial Assurance Board. IDEM will submit revisions to the Indiana Register for publication.

The IDEM will be issuing a policy regarding the cleanup of sites using a risk based system [Risk Integrated System of Closure (RISC)]. This policy will replace the current policy for the remediation of leaking underground storage tanks, contained in the 1994 Underground Storage Tank Manual. Upon implementation of the RISC policy, there will be a transition period during which responsible parties will have to choose which policy they want to proceed under. This decision will be required on all sites undergoing corrective action. After the implementation of the RISC policy, responsible parties reporting releases must develop corrective action in accordance with the RISC policy.

There have been questions regarding whether the Excess Liability Trust Fund (ELTF) will reimburse responsible parties for corrective action costs under RISC and if so, under what conditions. IDEM does not intend to promulgate rules for this transition period because IDEM believes that the current rules are flexible enough to provide for reimbursement under RISC, as long as the responsible party has an approved Corrective Action Plan (CAP). Also, as the RISC policy is expected to be implemented in the second half of 2000, rules could not be promulgated quickly enough. Therefore, IDEM is issuing this nonrule policy document to explain how it intends to interpret the laws and rules concerning ELTF reimbursement.

IC 13-23-8-4(a)(5) requires that the responsible party have an approved CAP to be eligible for reimbursement from ELF. The CAP must be developed in accordance with the Underground Storage Tank Guidance Manual, *including the department's risk-based corrective action plan standards when the standards become effective*. Thus, IDEM has the authority to require and approve CAPs that are developed in accordance with IDEM's policies.

To ensure the solvency of the ELTF, IDEM will require owners/operators to submit cost comparison to show the cost benefit of changing a site currently undergoing remediation under the 1994 Underground Storage Tank Guidance to a RISC based clean-up approach. IDEM will review the comparison and make a determination as to which method of remediation would be most cost effective.

Schedule for the ELTF reimbursement of LUST costs for sites during the transition to the RISC Policy.

Eligible Costs

Costs incurred before the implementation and transition period of the RISC policy, including:

- Costs incurred in the implementation of an approved CAP that is consistent with the 1994 Underground Storage Tank Manual.**
- Costs associated with the collection of data that will be used in a decision as to which policy the responsible party wishes to use.**

Costs incurred throughout the transition period for the RISC policy, including:

- If the responsible party has an approved Corrective Action Plan (CAP), costs incurred for corrective action, regardless of whether the CAP is developed under the current guidance or under the RISC Guidance would be eligible.
- Costs associated with transitioning a site from the 1994 policy to the RISC policy.
- Costs associated with the collection of data necessary to make an informed decision as to which policy to proceed under.
- Costs incurred in acquiring environmental notices (these costs will be considered third party claims and will be processed in accordance with IC 13-23-9-3).

Costs incurred once the RISC policy transition period has ended, including:

- Costs incurred for corrective action at leaking underground sites which have approved CAPs.**
- Costs incurred in acquiring environmental notices (these costs will be considered third party claims and will be processed in accordance with IC 13-23-9-3).**

Ineligible Costs

Costs not reimbursable under any circumstance:

- Costs that are not eligible under 328 IAC 1-3-5.
- Costs that do not fall within the reasonable cost range established under 328 IAC1-3-5.
- Costs associated with the development of a CAP under the RISC policy before the policy has been implemented, other than those costs associated with the collection of data which will be used in a decision as to which policy the responsible party wishes to use.
- Costs associated with transitioning a site from RISC will not be paid for by the ELTF if these costs would be greater than the costs to complete the remediation under the 1994 Underground Storage Tank Manual.



FACT SHEET

EXCESS LIABILITY TRUST FUND (ELTF) AND RISK-INTEGRATED SYSTEM OF CLOSURE (RISC)

OFFICE OF ENVIRONMENTAL RESPONSE

JUNE 2000

Are RISC characterization activities and costs associated with RISC guidance cover under ELTF?

One of the eligibility criteria for ELTF reimbursement is an approved corrective action plan (CAP). The CAP details remedial action and goals to obtain closure. Therefore, whatever is in the IDEM-approved CAP is reimbursable. Funds for release characterization are also eligible for reimbursement. This can include costs associated with characterization using RISC guidance prior to CAP implementation.

What is IDEM's position on ELTF reimbursement for cleanups completed to less than risk-based levels? Some property owners may want to conduct cleanup to nondetect levels.

As stated above, costs associated with activities approved in the CAP are reimbursable. Costs incurred for activities conducted beyond what is in the CAP are **not** eligible for reimbursement. Generally, only land-use based default levels are acceptable remedial goals in approved CAPs. However, in certain situations, residential levels can be approved. For example, residential levels are acceptable if the property is leased and property control cannot be obtained for the site. Another example is a site that results in ecological impacts or that has a direct path to an ecological area, which may necessitate a lower cleanup level.

Who is responsible for reimbursement criteria?

The responsibility for CAP approval rests with IDEM. The responsibility for reimbursement criteria rests with the Financial Assurance Board (FAB). Through rulemaking, the FAB has established reasonable costs for most activities associated with corrective action.

What impact will RISC have on reimbursable costs under the Excess Liability Fund (ELF) Program?

The FAB has adopted a nonrule policy document (see [Appendix 5-2](#) of the User's Guide) that deals with ELTF's interaction with RISC. The FAB will also be promulgating rules which, in part, will implement RISC as part of ELTF.

What is the current mechanism for CAP approval?

There is a new mechanism for reviewing CAPs within the ELF Program. A private contractor has been awarded a contract to review both ELTF claims and CAPs. The contractor will perform a technical review of the CAP and forward this review to IDEM. IDEM will then approve or deny the CAP based on the technical information provided by the contractor.

How will RISC affect the contents of CAPs?

For permanent closure, the CAP will still detail remedial actions and goals. IDEM will review and approve CAPs as before. The main change is that if remedial goals are greater than residential standards, environmental notices will need to be in place prior to CAP approval. This requirement also applies to closure with institutional controls because closure with institutional controls depends on preventing exposure to contamination at concentrations that exceed human health-based levels. Therefore, the environmental notice is the key component of exposure prevention in the RISC guidance.

If environmental notices are not in place prior to CAP submittal, it will be difficult to determine whether closure with institutional controls can be utilized. For example, if closure with institutional controls is desired for a site with off-site ground water contamination and IDEM approves the CAP before off-site notice is obtained but no agreement can be reached regarding the environmental notice, the point of compliance (POC) could move from off site to the site property boundary. In this case, remedial action is required to bring the plume back to where property control ends. Now a CAP addendum must be submitted to IDEM to propose remedial action to bring the POC into compliance.

At this time, it is anticipated that CAP submittal and approval can be completed prior to the completion of 2 years of plume stability monitoring. If a CAP is submitted that proposes a closure with institutional controls for ground water **and** property control is documented, the CA can be reviewed and approved based on the information supplied. If the CAP is approved but the plume later fails the stability test, either a remedial plan can be prepared and implemented or plume stability can be modeled as a nondefault option.

Will the ELF Program reimburse costs associated with obtaining environmental notices for property not owned by the ELTF participant?

Costs associated with environmental notices can be included in third-party claims, which [IC 13-23-9](#) states that IDEM will reimburse. However, the Attorney General's office will review all third-party claims to determine whether they are reasonable. In other words, if an ELTF participant pays an amount that exceeds what the Attorney General considers to be reasonable, the participant will not be reimbursed for the full amount of the claim. The Attorney General's office may request additional documentation, such as appraisals or affidavits, to support a determination that the costs are reasonable.