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## **SECTION I. OVERVIEW**

### **A. What the Land Recycling Program Has to Offer**

#### **1. Benefits of Involvement Through the Land Recycling Program**

The Land Recycling Program is the result of a bipartisan effort to solve the problem of unused and abandoned industrial sites within the Commonwealth. The program has three purposes: to clean up contaminated sites based on sound science, to return these sites to productive reuse, and to preserve farmland and greenspace. The Land Recycling Program promotes voluntary partnerships among local businesses, government, financial institutions and the Department of Environmental Protection (hereafter "Department" or "DEP").

The four cornerstones of the program are uniform cleanup standards based on health and environmental risks, standardized review procedures, relief from liability, and financial assistance. The establishment of uniform standards enables the remediator to clearly understand the extent and cost of site cleanup. The selection of standards assures that a site is protective of its reuse. A property used for industrial development need not be as clean as a playground or residential site. Consistent reporting requirements and standardized review procedures provide a definite time frame for remediation. Relief from liability, which extends to future owners, addresses the concerns that previously inhibited site redevelopment and sale of properties. Financial assistance, available to those who did not cause or contribute to contamination at the site, reduces the cost of site assessment and remediation.

#### **2. How to Use this Manual**

The Department has developed this manual to assist you in satisfying the requirements of Act 2 and the regulations, Chapter 250. The manual provides suggestions and examples of how to best approach site characterization and remediation. The manual is divided into five sections:

- Section I provides an overview for determining which standard or which other statutes may be applicable to your site.
- Section II outlines the procedures for meeting the requirements of each standard. As each standard is discussed, you will be referred to other sections for additional information or clarification.
- Section III discusses the appropriate interfaces with other applicable statutes.
- General technical guidances augmenting the information in Section II are provided in Section IV.
- Hyperlinks to other helpful documents are listed in Section V.

This manual is available on the Department's web site as an entire downloadable document, or for online use. Ease of use is facilitated in both versions of this

manual by way of links to the section of interest, and cross links to other parts of the manual, or sections in the regulations, or statute.

The Department of Environmental Protection's staff is another valuable resource available to assist you. We can clarify information provided herein or address any questions regarding issues specific to your site. Regional office contacts are provided in [Section V.I.2](#).

## **B. The Voluntary Nature of Act 2**

Act 2 establishes the environmental remediation standards for cleanups related to certain environmental laws ([Act 2, Section 106](#)). Remediation, and the resulting liability relief under [Act 2, Chapter 5](#), is specific to the contamination identified as part of a specific site or sites in the approved final report. Thus, there may be multiple sites on a property, or a single site may include all or part of one or more properties. Examples of sites are an area of specific contamination related to a metal processing unit, or a specific environmental release such as a tank spill. Although the liability protection is NOT necessarily universal to the entire property, remediators may voluntarily submit multiple Notices of Intent to Remediate (NIRs), or amend the scope of a single NIR, to address any or all contamination they feel is present on their property. It is strongly advised that the remediator postpone drafting the NIR until enough characterization is completed on the property to distinguish the site or sites desired for inclusion in the NIR.

If the Department is aware of contamination on the property which is not part of a proposed remediation under a voluntarily submitted NIR, the Department may suggest that the remediator include that contamination as part of the NIR. However, if the remediator declines to include that contamination, the Department will still approve a final report for the contamination described in the NIR, if it otherwise meets the requirements of Act 2. The Department always reserves the right, as a separate action, to exercise its enforcement discretion under the environmental laws of the Commonwealth to require remediation of any known spill or release of a regulated substance on the property which was not addressed by voluntary cleanup through the Act 2 process or where the voluntary remediation fails to proceed through the Act 2 process. However, the exercise of such enforcement discretion is intended to be based on DEP's knowledge derived from, for example, citizen complaints, DEP inspections, sampling results, or spill reporting requirements under applicable regulations of the degree to which the known contamination may represent a threat to human health and/or the environment, requiring Department oversight such as through contamination of public or private water supplies, degradation of surface waters or direct exposure to hazardous waste on the ground.

## **C. Improving Service through Program Consistency**

With more than six years of success, the Land Recycling Program is still exploring additional ways to improve the program. Our users have indicated to us that consistency of application of the program with the published rules and across the six Regional offices is an important issue to them. Therefore the program is instituting a number of changes intended to improve our service through consistency of program implementation. The seven changes below will be instituted immediately.

### **1. DEP Central Office Program to Approve Initiation and Final Execution of Remediation Agreements**

The initiation of any enforcement or remediation agreements will require the approval of central office and program counsel. These agreements will include Consent Orders and Agreements (CO&As), buyer/seller agreements and Special Industrial Area (SIA) agreements. Both field and central office counsel will sign the final agreement.

### **2. DEP Central Office Program Collaboration on Regional Actions on Deed Restrictions**

The Department will require both regional and central offices to approve the use of deed restrictions as part of either an on or off-property remedy under Act 2. The Department believes this approval procedure will help maintain consistency in the use of deed restrictions as one of a number of institutional control measures which may be applied in conjunction with the Act 2 remediation (see [Section II.C.9](#))

### **3. DEP Central Office Program Collaboration on Report Disapprovals or Withdrawal Requests.**

In an effort to meet the expectations presented by statutory review timeframes, the Department requires that regional Environmental Cleanup Program managers must collaborate with the central program office prior to denying or honoring requests to withdraw submitted reports for required Act 2 submissions.

### **4. Issue Review Panel**

An Issue Review Panel has been established to minimize program implementation and application inconsistencies. The panel is comprised of the Central Office Land Recycling Program Manager, a neutral regional ECP Manager, and a representative of the executive staff of the Department. The panel will meet as needed. To request panel review of an issue where the interpretation of the regional staff reviewer is inconsistent with the interpretation of the remediator, a description of the issue and department action must be provided to the central office program manager. A meeting of the panel will be scheduled if the manager is unable to resolve the interpretational disagreement. The documentation provided shall characterize the remediator's

interpretation and shall cite the provision within the Act, regs or technical guidance manual that is the subject of the interpretational difference.

A meeting of the panel will be scheduled within two weeks of receipt of the written documentation of the issue. Every effort will be made to render a decision on the issue within the statutory review timeframes stipulated in Act 2. The person requesting the review may be present to address the panel, but attendance during the review session is not required. If the remediator chooses to be present, then regional staff associated with the project will also be requested to attend.

If the issue is raised late in the review period provided by Act 2, the remediator and the department may agree to an extension to accommodate the necessary review. The decision rendered by the panel is binding only on the department, not on the voluntary remediator. The panel will attempt to render a decision on the issue at the time of the meeting, or at least within a week after the meeting date. Additional time to review the issue may be mutually agreed to if objective technical review becomes necessary. The department's legal counsel for the program will provide advice on any matters involving legal interpretation or analysis.

#### **5. Focused Outreach to Consultants**

The program will provide greater focus for outreach to consultants who have demonstrated problems in submitting reports consistent with program rules and guidance. Such outreach may be counseling, initiation of scheduled training sessions or possibly individualized training. Having our rules and guidance understood and used in a consistent manner will help our users and save time and money.

#### **6. Brownfield Action Teams**

The Land Recycling Program will offer optional technical assistance on site characterization and cleanup plan development through the establishment of brownfield action teams. These teams will be put together on an as-needed basis and will include a mix of field office and central office staff. Their goal will be to provide consistent and time-critical decisions and advice on projects where such help is warranted. If you would like your site to be considered for such a team, contact Tom Fidler, Chief of the Land Recycling and Cleanup Program (tfidler@state.pa.us )

#### **7. FAQ Posted on Website**

The Land Recycling Program website will include Frequently Asked Questions and a process whereby persons can submit questions via the web. This mechanism will provide guidance and interpretation of the regulations and help fill the gap by providing answers to questions that may not be directly addressed in guidance and regulation.

## D. Applying Land Recycling to Your Property

### 1. Classifying your Site and Considering Options for Remediation

In order to select a standard for your site, a site assessment is needed to determine site conditions which may require remediation of a release. Characterization of a release includes the identification of specific contaminant concentrations throughout soil and groundwater media, discharges to surface water and air, and any other conditions which may pose a risk to human health and the environment associated with the release. The site characterization may reveal that the remediator needs to interface with other environmental laws and/or Act 2. Under Act 2, the appropriate standard or combination of standards (*i.e.*, background, Statewide health or site-specific) must be determined. The Department will accept NIRs for properties on which a release of regulated substances can be documented, or for properties affected by off-property releases of regulated substances for which the remediator is not responsible. The background, Statewide health and site-specific standards may be used at any site. Only certain sites qualify as special industrial areas.

A person with a property with multiple distinct areas of contamination may submit a Notice of Intent to Remediate (NIR) for a single area, or for multiple individual areas. A distinct area of contamination includes the volume of all media affected by the release causing the contamination. For example, if soils were contaminated and that contamination migrated to groundwater, both the contaminated soil and groundwater would be part of the distinct area of contamination associated with the release. In some cases, the Department may agree that characterizing all contaminated media as a distinct area is not practical and may approve a site characterization limited to a single medium. One example of this situation is when a remediator completes a soil media cleanup and an associated groundwater cleanup will take a period of years before attainment can be demonstrated. In this case, the remediator could receive approval of a final report for soils alone (and the associated liability relief), and later when the groundwater is remediated to a point where attainment can be demonstrated, the remediator could submit a separate final report for the groundwater. A second example is the case where a remediator may be approaching multiple areas of concern on the property over a period of years such as multiple areas of concern of soil, and groundwater unit which is a combination of the effects of the various soil areas of concern (AOC). Here the remediator could submit NIRs/final reports for individual soil areas of concern and at some time in the future when the source areas (all the soil AOCs) have been remediated, submit an NIR for the groundwater unit. The liability protection afforded under Chapter 5 of Act 2 is for contamination identified in the approved final report. Therefore, *the more extensive and thorough site characterization is, the more extensive the liability protection.* This is true in terms of both size of area included as the site, and in the listing of regulated substances which are a part of the site. By example, the lower the censoring level chosen in the site characterization, the larger the area and more regulated substances

would likely be included in the site. (see [Section I.D.7.c](#) for an example of applying site characterization to a site).

The Department will specify details of the site, in the final report approval letter and attachments, which describe the extent of the liability protection provided under Act 2.

**a) Background**

A person cleaning up a site to the background standard must document that the concentration of any regulated substances remaining are at a level not related to any release of regulated substances at the site. Samples are required both in the area shown to be contaminated by onsite releases (*i.e.*, the site) and in an appropriate background reference area to demonstrate attainment of the background standard. This standard is useful in cases of releases migrating from off-property, and for widespread or naturally occurring contamination.

**b) Statewide Health**

The regulations, Chapter 250, establish Statewide health standards for regulated substances in each environmental medium. These standards are referred to as medium specific concentrations (MSCs) that must be achieved in order to demonstrate attainment of the Statewide health standard. In addition to demonstrating that a site is protective of human health, an ecological screen is part of the Statewide health standard to provide protection of ecological receptors.

**c) Site-specific**

Cleanup levels may be developed which pertain specifically to the unique exposure pathways at a site. This is a more detailed process, both technically and administratively. The human and ecological receptors at the site need to be addressed either through the elimination of the exposure pathways or a risk assessment. A site-specific cleanup also provides an opportunity for public participation.

**d) Combination of Standards**

A cleanup may be performed by using any combination of the three standards. The remediator may select any one or a combination of standards by regulated substance, by medium of concern, or by distinct area of contamination (see [Section I.D.1](#)). Combinations must satisfy the requirements of each standard used. For example, in using any combination of standards which includes the site-specific standard, the risk assessment should include only those regulated substances for which site-specific numeric standards are being developed, and for these substances, the cumulative risk requirements of [Section 304](#) of Act 2 must be met. Attainment of these site-specific numeric standards must be demonstrated in the final report. In addition, all of the requirements of the site-specific standard, including the reporting requirements, apply. All of the regulated substances, media, or distinct areas of contamination meeting another



standard (*e.g.*, the Statewide health standard) must meet the requirements of that standard. Therefore, in addition to a combination of numerical standards there will be combinations of requirements for reporting, attainment tests, and points of compliance.

### **e) Special Industrial Areas**

The special industrial area designation was created by Act 2 to provide special remediation requirements for a distinct set of sites which were used for industrial activity. These sites are properties where there is no financially viable responsible party, or where the property is located within an enterprise zone. Enterprise zones are designated by the Department of Community and Economic Development. The remediator and the reuser afforded these special requirements must demonstrate that he/she did not cause or contribute to releases of regulated substances at the property. In order to make use of the special industrial area designation, the remediator must enter into a consent order and agreement with the Department.

## **2. Immediate Response**

If an immediate hazard exists or is discovered at a site, prompt action is necessary to abate the hazardous condition and prevent future or further release of regulated substances. Leaking tanks or drums, conditions presenting a fire or explosion threat, or a situation involving a threat to human health or the environment warrant a prompt response. Act 2 does not prevent or impede an immediate response to such emergencies. [Section 307](#) of Act 2 provides that the provisions under Chapter 3 of the statute, relating to remediation standards and review procedures including special industrial area cleanups, shall not prevent or impede applicable emergency or interim responses. Final remediation shall comply with that chapter, which will not be prejudiced by the mitigation measures (emergency or interim response) undertaken to that point [See [Act 2 Section 307\(a\) and \(b\)](#)]. It is the responsibility of the appropriate person to act in a timely manner to abate immediate threats. The remediator still needs to follow the notification requirements of the Clean Streams Law or Solid Waste Management Act. However, if the final report demonstrating attainment of a standard is submitted within 90 days of the release, the Notice of Intent to Remediate is not required to be filed, and no public notice is required.

## **3. Regulated Storage Tank Release Sites**

Storage tank cleanups conducted pursuant to the Storage Tank and Spill Prevention Act (Act 32 of 1989, as amended) which meet one or more of the standards under Act 2 are Act 2 cleanups. [Section 904\(c\)](#) of Act 2 preserved the corrective action process for the remediation of releases from storage tanks regulated by Act 32. Regulated storage tanks include a wide range of underground and aboveground tanks containing petroleum products and hazardous substances.

The corrective action process applies to releases from regulated tanks for which remediation (anything beyond notification) was initiated on or after August 5, 1989, the effective date of Act 32. Persons who take corrective action under Act 32, and can demonstrate attainment of one or more of the standards under Act 2, will qualify for liability protection. Where Act 32 applies, persons cleaning up these releases are not subject to the notice, fee and Department approval provisions contained in Act 2. Likewise, the mandatory Department review times and the “deemed approved” provisions of Act 2 are not applicable for cleanups involving these releases; instead, the review times and deemed approval provisions of Chapter 245 apply.

Those persons who initiated cleanup prior to their tanks becoming deregulated by Act 16 of 1995 (which amended Act 32) should continue to implement the corrective action process, along with use of the Act 2 remediation standards, to receive liability protection.

Where the tank is not governed by Act 32, adherence to the Act 2 administrative process and cleanup standards will be required in order to receive liability protection. When releases of petroleum products occur at sites with both Act 2 and Act 32 storage tanks, the remediator may elect to address the tanks together, or to address them separately on a dual track of the Act 2 and Act 32 processes. If the person elects to address the tanks together, combined reports and notices that satisfy the requirements of each statute, as they apply to the particular tanks, may be submitted. Department reviews will also be conducted to satisfy the requirements of both statutes.

For example, a person may submit a combined site characterization/remedial investigation report that contains the information required under the corrective action process and under Act 2, and it will serve a dual function under both Act 2 and Act 32. It should be submitted on a time frame that meets both statutes; thus if there is no specified time required to submit the remedial investigation report under Act 2, but a site characterization report under Act 32 is required within 180 days of reporting the release, the site characterization/remedial investigation report should be submitted within 180 days. Compliance with Act 2 notice and public participation requirements will be necessary for liability protection for tanks governed by Act 2.

#### **4. Short List of Petroleum Products**

[Table IV-9](#) contains an abbreviated list of regulated substances for specified products (e.g. gasoline). This short list may be used under any standard as long as the following conditions are met:

- Use of the short list is limited to remediations resulting from releases of the listed petroleum products that are uncontaminated from other sources.
- For soil media attainment, there must be no free liquids left in the soil based on visual inspection, and the soil should not create any odor nuisance.

- For groundwater media attainment, there must be no measurable free floating product (0.01 ft-[EPA]) at the point of compliance. (usually the property line).

The rationale for the last two conditions is that, presuming the remediator chose to analyze for all regulated substances in the mixture (e.g. several hundred) for the Statewide health standard which is capped at saturation and solubility limits, then the result would be soil with no visible product and groundwater with no measurable product.

What is the difference in using the short list, say for gasoline (which lists 8 substances) as opposed to the remediator choosing a list of 24 substances to represent the gasoline release?

If a remediator does not utilize the short list but rather chooses a subset of 24 substances in the gasoline (which actually has over 400), the relief from liability is relevant to those 24 substances where the soil was contaminated by the gasoline spill.

If all eight substances from the short list were included, and all three conditions of the short list were documented, then beyond the Act 2 liability coverage, the remediator will have satisfied Department's concern with the spill of the gasoline product as a whole.

If the conditions of the short list are not met, then only the Act 2 liability relief covering the 24 substances applies.

If the remediator chooses to utilize the short list directly, and meets all the conditions, then the final report approval will stipulate that Act 2 liability coverage is for the 8 substances, and the DEP will require no further remediation for the spill of gasoline product documented in the final report.

## **5. Solid Waste Facilities**

If your site includes a solid waste facility see [Section III.A](#) of this manual.

## **6. HSCA/CERCLA Sites**

The Hazardous Sites Cleanup Act (HSCA) is the state cleanup law that provides for the remediation of sites contaminated with hazardous substances. Certain sites are designated by the Department as HSCA sites. This is a limited set of sites that has been officially designated by the Department as meeting the criteria for response action under HSCA. Before any site is designated as a HSCA site, the site undergoes a review and approval process that officially documents senior management approval of the HSCA designation. The Department notifies all known responsible parties associated with a site prior to listing it on the Pennsylvania Priority List (PPL). To determine if the site under Act 2 consideration has been designated by the Department as a HSCA site, contact the Environmental Cleanup Program Manager in the Department's regional office where the site is located. Additional information about the relationship between Act 2 and HSCA is included in [Section III.E.1](#) of this manual.

The Comprehensive Environmental Response Compensation and Liability Act (CERCLA) is the federal Superfund law. Sites may come under the jurisdiction of the EPA CERCLA program, in which case the Department's approval of a final report demonstrating attainment of an Act 2 standard cannot provide automatic relief from CERCLA liability. To determine if the site under consideration is a CERCLA site, contact the EPA regional office in Philadelphia, Office of Superfund Programs, at 215-566-3120. Additional information about the relationship between Act 2 and CERCLA is included in this document in [Section III](#).

## 7. Site Characterization

### a) Importance of Site Characterization Step

Site characterization under Act 2 is a description of contaminated media, including geometry, and chemical and physical characteristics, that affect movement of regulated substances in environmental media. Site characterization is the process for determining the site under Act 2; i.e., the volume of contaminated media resulting from an environmental release of regulated substances within which attainment of one or a combination of standards will be demonstrated. The site is, in turn, the basis for the Act 2 Chapter 5 liability protection when the final report is approved. In brief, the liability protection is only as good as the site characterization. This can be illustrated by the example at the end of this section.

The site characterization activities conducted must result in a thorough investigation which meets the requirements of [Section 250.204](#) and which provides information in sufficient detail to support decisions in remediation and documenting attainment using the selected Act 2 standard. **A complete and accurate site characterization, including fate and transport analysis, and its documentation in the final report is very important, as it is the basis for making remediation decisions and is used later in identifying the appropriate area for demonstrating attainment. Except for sites involving the excavation option for petroleum-contaminated soil, without a proper site characterization, attainment requirements cannot be met and the final report will be disapproved by the Department.**

A remediator must keep in mind the definition of a site in the Land Recycling Program. As defined in Act 2, a site is "[t]he extent of contamination originating within the property boundaries and all areas in close proximity to the contamination necessary for the implementation of remediation activities to be conducted under the act." Thus, a site often does not coincide with a property...a site may occupy several properties, and conversely, a property may contain more than one site. In this manual, whenever the term "site" is used in connection with the Land Recycling Program, it is used strictly in the sense as defined in the Act.

DEP Regional Office staff are a valuable resource and want to assist as needed in evaluating your site characterization information. Although not required,

working with the Department in many cases can help to facilitate approval of the submitted reports. Always feel free to contact the Department's Regional Environmental Cleanup Program staff when you have a question about the requirements of site characterization of a property for the Land Recycling Program.

#### **b) Scope of Characterization**

The scope of the site characterization should be designed to help the person conducting the cleanup select an appropriate remedy that will meet the attainment requirements of the selected Act 2 standard. The requirements that a full site characterization must meet are described in the regulations at [Section 250.204](#). During this phase of the application of Act 2, the remediator should evaluate other applicable regulatory requirements (See [Section III](#) of this manual), since information required by other programs may best be collected during the site characterization phase. The reporting requirements for the standard selected (background, Statewide health or site-specific in Act 2 and Chapter 250 of the regulations) must be met by the person conducting the cleanup. Section II of this Guidance describes in detail the reporting requirements for each of the standards available under Act 2. The procedures documents, and required fees for each standard are included in [Section I.D.9](#). (Notice Requirements and Procedures).

Characterization of sites which may require remediation begins with an evaluation of any existing historical information about the release that identifies specific regulated substances.

#### **i) Soils**

In soils, the characterization must be at least to a concentration sufficiently below the selected numeric standard, or to where it can be demonstrated that the pathway elimination measure is adequate to protect public health and the environment, to insure that all areas containing regulated substances at or above the selected numeric standard have been adequately characterized, and that is sufficient to support a fate and transport analysis which shows where the contamination is currently located and those areas to which it is moving. The remediator determines the concentration level for characterization below the minimal level stated above. The remediator must state what factors were used in determining the level used to define the site boundaries

#### **ii) Groundwater**

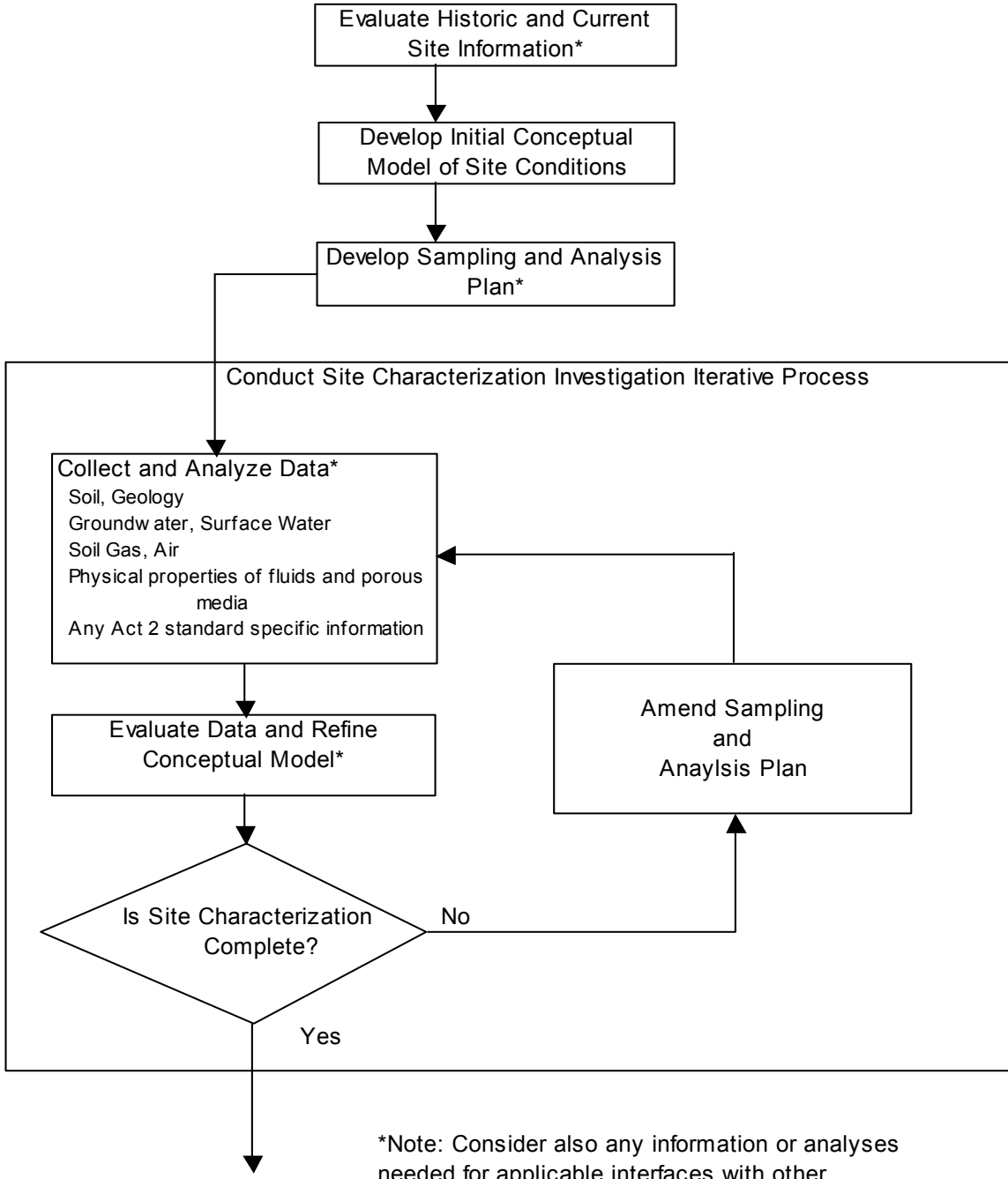
If groundwater is impacted by a release based on knowledge of the site or as a result of soil sampling, a similar process as used for soils to determine the extent of the release into groundwater may be employed based on knowledge of the site, groundwater monitoring, and fate and transport analysis. A common mistake is to take a limited set of groundwater measurements from a single sampling event and conclude that since the concentrations are below the Statewide health standard that no further work is needed to obtain Act 2 liability

relief. This is not true. Proper characterization requires more than one round of sampling ([250.204 \(e\)](#)). In addition, attainment sampling and demonstration are required even if characterization samples are below the Statewide health standard ([250.704\(a\)](#)). For further guidance, see [Section IV.B](#).

**iii) Conceptual site model including soil and groundwater**

When complete, the site characterization should enable the development of a conceptual site model. The conceptual site model is a written and graphical representation of the site environmental system and the processes that control the transport and movement of regulated substances through the environmental media and how they interact. Depending on the size and complexity of the site, the investigation portion of the site characterization typically is an iterative process which expands and builds as the information is gathered (see [Fig I-1](#)). EPA guidance or American Society for Testing Materials (ASTM) guidance appropriate for the site may be used as a source for general

**Figure I-1  
Site Characterization Flow Chart**



\*Note: Consider also any information or analyses needed for applicable interfaces with other environmental statutes (See Section III)

guidance when conducting the site characterization investigation. The [DEP Groundwater Monitoring Guidance Manual](#) is also appropriate.

The data objectives of the site characterization will differ somewhat depending on whether soil or groundwater is being investigated.

A good site characterization where the soil is a medium of concern should be able to provide the following information derived from field investigations:

- The types of regulated substances that are present, their concentrations and the spatial variation in concentration of the regulated substances both horizontally and vertically.
- The physical characteristics of the soil in which the regulated substances are present and through which they may be moving. These include the soil type (texture), dry bulk density, permeability, organic carbon content, porosity, and possibly moisture content. Documentation of these properties and any significant variability over the site may be very important later in developing a fate and transport analysis.

Where groundwater is a medium of concern, the following information at a minimum should be provided by a good site characterization:

- The direction of groundwater flow,
- The hydraulic gradient,
- The permeability of the aquifer material(s) through which the groundwater moves,
- The porosity of the aquifer, and
- The types of regulated substances present, their concentrations and the spatial variation in concentration of the regulated substances both horizontally and vertically.

This information is not only necessary to describe and evaluate conditions at the site, but also is often vital to fate and transport analysis, especially when it requires a quantitative approach.

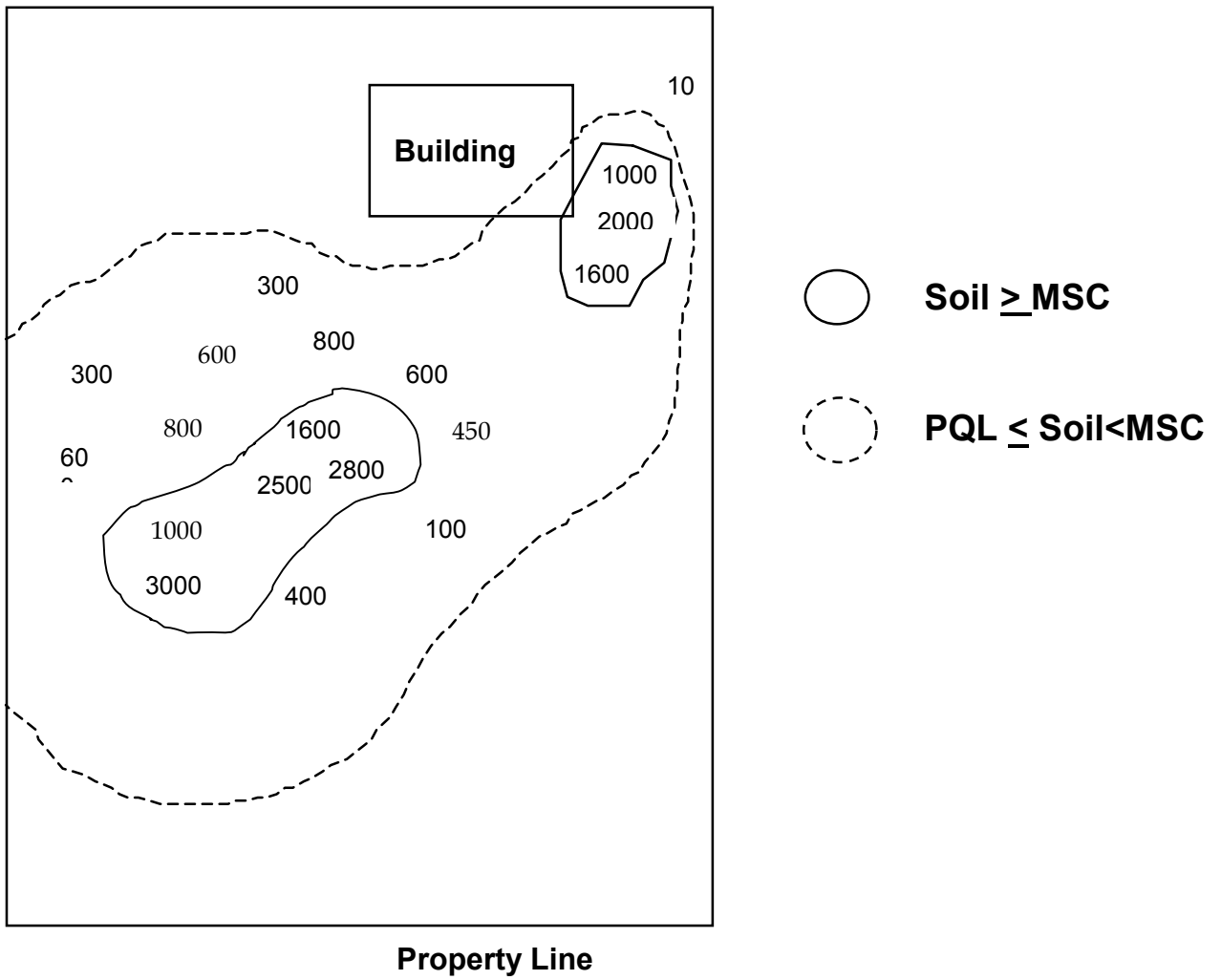
Fate and transport analysis is part of site characterization as well as demonstration of attainment and is required under all three Act 2 standards. Failure to have a fate and transport analysis in any final report is reason for disapproval based on this deficiency. See [Section IV.A](#) for guidance for conducting fate and transport analyses.

### **c) Applying Site Characterization to an Act 2 NIR – Example**

The true characterization of soil contamination is shown in [Figure I-2](#). This example considers a large property with several smaller environmental releases. There are two general areas where environmental releases occurred. The remediator has initial results which suggest these two areas of concern for further study. Furthermore, the remediator of this property wished to obtain Act 2 liability relief for this release so that the property can be more easily



Figure I-2  
Site Characterization



sold. With this objective in mind, he plans a site characterization and weighs his options. The following are considerations that must be made.

In addition to factors that will help to characterize the hot spots, the remediator must consider, first in designing further investigations and later in finalizing the site characterization, what is the concentration of regulated substance(s) in soil that will represent the boundary of the site. It is technically more difficult and more expensive to define the extent of the contamination to lower concentrations than it would be to define hot spots. However, the Act 2 liability protection only applies to the site, and if the extent of the site is very limited, so is the liability protection.

In order to apply attainment in soils, the remediator must at a minimum define the volume which exceeds the selected standard [[Section 250.703\(b\)](#)]. Sampling beyond the initial phase indicates that two areas exceed the Statewide health standard MSCs. The remediator reasons that, by choosing the boundary of the site to be concentrations much lower than the standard, the area of the liability protection is increased. He considers 25% of the standard, 10% of the standard and the Practical Quantitation Limit (PQL) of the substance(s) as resolution objectives. He finally decides that the extra cost of characterization is in his interest so he can maximize the site area (and consequently the liability protection) by choosing the PQL and applying it across the entire property. Within this site area, he also characterizes factors of the media and regulated substance(s) which affect movement (See [Section IV.A, Fate and Transport Analysis](#)). Another remediator may have made a different choice and ended up with several smaller areas of liability protection.

In considering the definition of the site in groundwater (i.e., the plume), some phase of the assessment must determine if the contamination extends beyond the property boundary at levels exceeding the selected standard [[Section 250.704](#)]. If the determination is that levels off the property do not exceed the standard, then the remediator determines all areas that equal or exceed the concentration found at the Point of Compliance (POC). He may choose to define the plume to lower levels for purposes of liability protection. [Figure I-3](#) illustrates this situation.

If the contamination extends beyond the property boundary at levels exceeding the selected standard, then the boundary of the site in groundwater must include the contamination exceeding the appropriately selected standard off the property. [Figure I-4](#) illustrates this situation. A remediator must remember that if the plume exists on both residential and nonresidential properties, different numeric standards would apply at those properties in most cases. In cases of organics and many inorganics, this generally means defining the plume to the PQL of the substance(s). Background values may also be determined [[Section 250.707\(a\)\(2\)](#)].

Once the extent of contamination in groundwater is established utilizing properly constructed monitoring wells [[Section 250.204\(e\)](#)], then two or more rounds of sampling and analysis must be performed [[Section 250.204\(e\)](#)].

**Figure I-3**  
**Groundwater Characterization**  
**No off-property Levels > MSC**

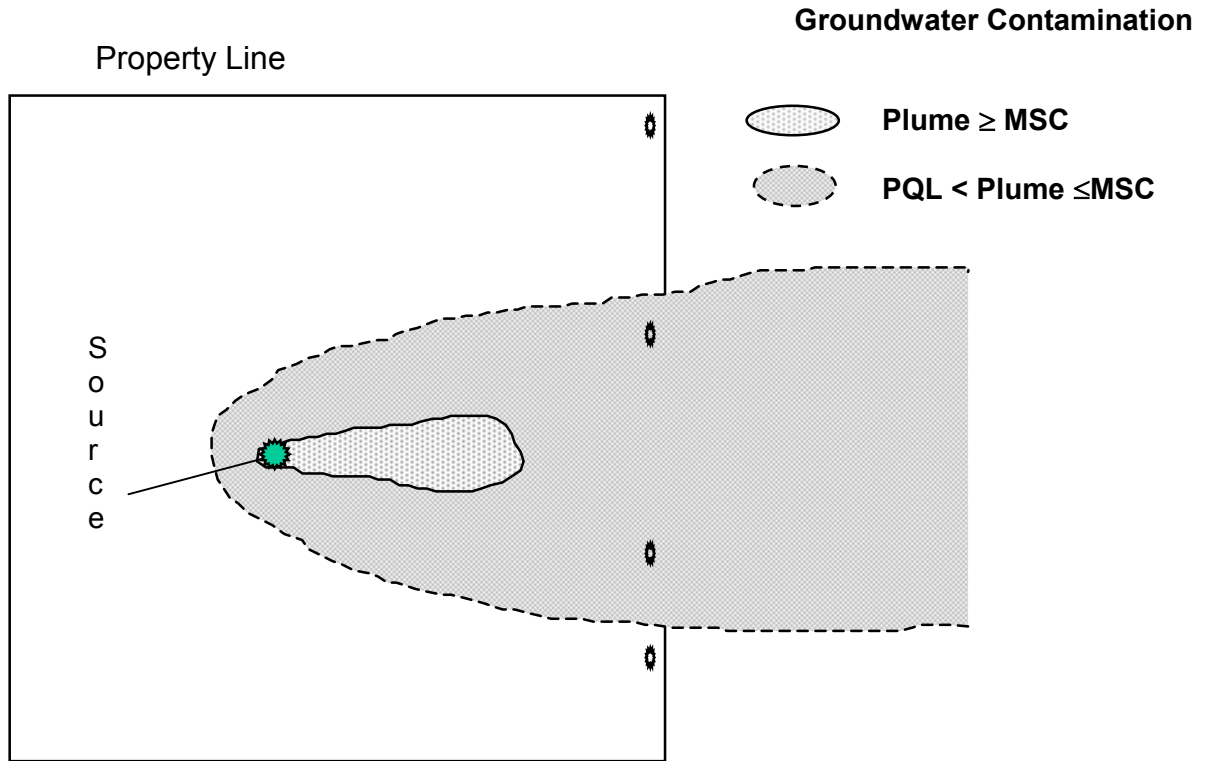
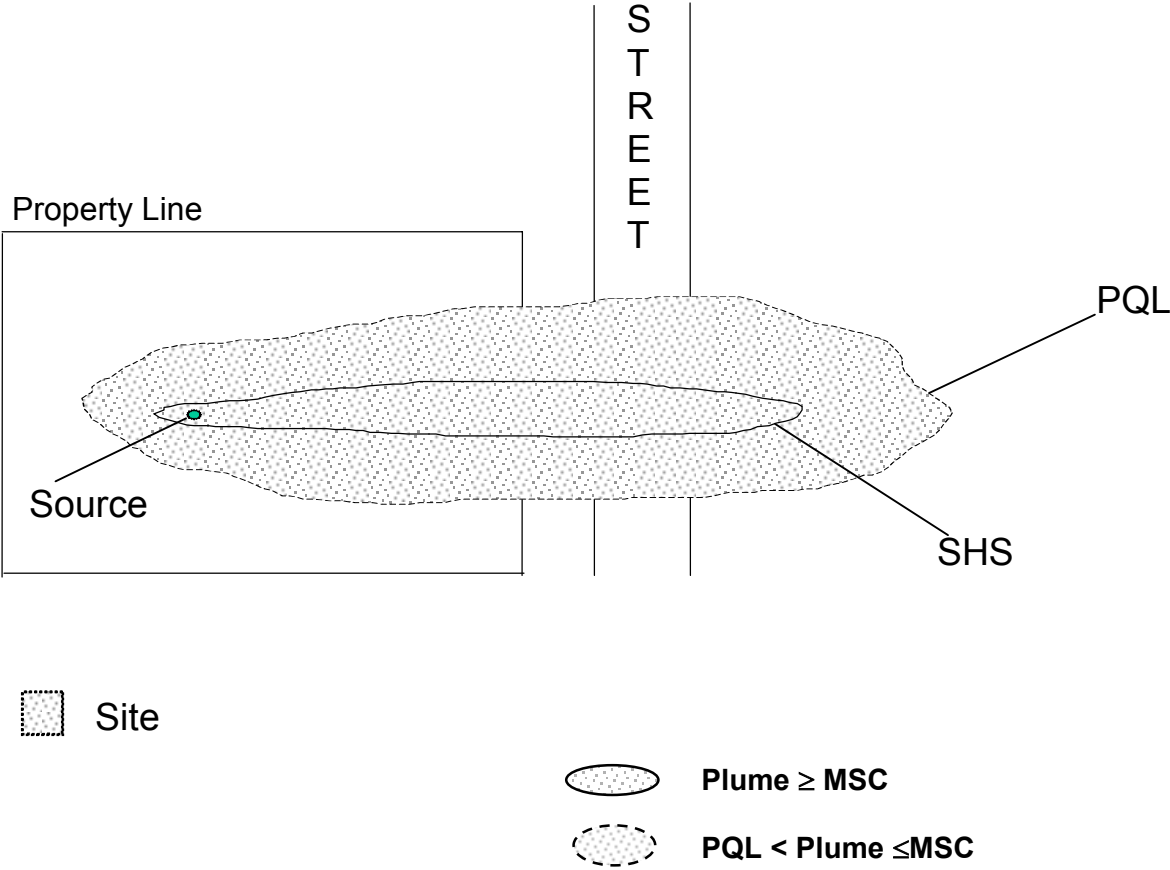


Figure I-4  
Groundwater Contamination



If no groundwater remediation is needed (e.g., both rounds of sampling are below the selected standard), the remediator may use the site characterization sampling as part of the required attainment demonstration. With justification under [Section 250.704\(d\)](#), the Department may approve a reduction in the number of quarters of sampling needed to demonstrate attainment from eight quarters to four quarters, or less.

#### **8. Management of Separate Phase Liquid (SPL) under Act 32 (The Storage Tank and Spill Prevention Act of 1989) and Act 2**

The presence of Separate Phase Liquids (SPL) at contaminated sites does affect the responsibility of the remediator and limit the standards under which he may remediate.

When a pure liquid such as gasoline is released to the environment at a sufficiently high rate, accumulations of the liquid as a separate phase may occur within soil or bedrock. Depending on the density of the liquid relative to water, the liquid will migrate under gravity through the unsaturated soil and/or bedrock column and either float on the water table or sink through the water column and accumulate on impermeable surfaces lower in the aquifer. Substances that are less dense than water, like most petroleum products, tend to float on the water table and are called Light Non-Aqueous Phase Liquids or LNAPLs. Substances such as chlorinated solvents which sink through the groundwater column are called Dense Non-Aqueous Phase Liquids or DNAPLs. SPL is encountered primarily where concentrated sources of the regulated substance are released into the environment such as at leaking tank sites.

The presence of SPL in soil, on or within the aquifer, on surface water, or in sediments, if not removed, is a serious long term management concern at sites undergoing remediation. SPL, if not removed, constitutes a continuing source of contamination, may result in explosive, toxic or irritating vapors, will greatly increase the time and cost for post closure care monitoring, and introduces complex fate and transport issues and uncertainties regarding the future impact and migration of contamination at a site.

##### **a) Interim Remedial Actions under Chapter 245, Subchapter D (relating to releases from storage tanks regulated by Act 32 of 1989) and Interim Response under Chapter 250**

Section [245.306\(a\)\(3\)\(ii\)](#) requires that SPL recovery resulting from releases from regulated storage tanks be initiated immediately upon its discovery. [Section 245.306\(b\)\(1\)](#) requires that SPL removal be conducted in a manner that prevents the spread of contamination into uncontaminated areas. These requirements apply to releases from regulated storage tanks where SPL is present regardless of whether the Statewide health or site-specific standard is selected for remediation of the site. SPL should be recovered to the maximum extent practicable with the minimum objective of preventing its migration into uncontaminated parts of the site, and eliminating threats to human health, safety, and the environment.

While Act 2 and Chapter 250 do not specifically mandate SPL recovery within the property, the Department encourages removal of SPL within the property to the maximum extent practicable for many reasons as an immediate or interim response under Act 2. In cases relying on natural attenuation, removal of SPL will simplify and shorten requirements for postremediation care monitoring, fate and transport analyses will be simplified, and therefore, the time to attain a standard and eliminate postremediation care is likely to be greatly shortened at many sites. A suggested reference for dealing with SPL at tank sites is the EPA Guidance (web link <http://www.epa.gov/OUST/cat/freeprod.htm>).

**b) Maximum Extent Practicable**

Generally, for Act 2 remediations using the Statewide health standard, the Department urges removal of SPL throughout the plume to the maximum extent practicable. For sites being remediated under Chapter 245, the Department will require the removal of SPL throughout the SPL plume to the maximum extent practical. The Department recognizes that the amount of SPL that can be removed will depend on the hydrogeologic framework of the site, the type of product, the remediation technology employed and the effort put into it. Following EPA, the Department has not quantified the term “maximum extent practicable.” For sites being remediated under Act 32, remediators are referred to the publication [EPA 510-R-96-001](#), “How to Effectively Recover SPL at Leaking Underground Storage Tank Sites”. This publication provides general criteria for terminating recovery operations. The Department will recognize these guidelines in determining compliance with the SPL removal requirements under Chapter 245.

For sites being remediated under Act 2, the Department considers the extent of SPL removal to be a determination of the responsible party in accordance with the standard the remediator wishes to attain and demonstrate, after immediate threats to human health and safety and the environment have been mitigated by SPL removal as an interim remedial response.

**c) Relationship of Separate Phase Liquid to Compliance with Act 2 Standards**

**i) Background standard**

The background standard is available at sites where SPL is migrating onto the property from an off-site source. Responsible parties will be required to demonstrate through the use of monitoring and fate and transport analysis that they have removed an amount of SPL equivalent to the mass contributed by the release from their site.

**ii) Statewide health standard**

- Groundwater-

The Department has determined by policy that the Statewide health standard is not available where SPL, as LNAPL or DNAPL, is present in property line compliance wells at sites being remediated under Act 2 or Act 32. The reason for this policy decision is that the rationale behind development of the saturation and solubility caps under the promulgated Statewide health MSCs was that no SPL should be present at the point of compliance at attainment. Given that assumption, the DEP feels it is more forthright to have a policy prohibiting the presence of SPL at the POC rather than provide the means for a person to analyze a sample, which DEP already presumes will fail the attainment test.

At sites where SPL remains within the interior of the property, remediators should document that presence in the deed to the property voluntarily (although not required by law under a residential Statewide health standard cleanup). This will provide notice to future landowners.

- Soil-

In addition, within the property, the lesser of the direct contact number to a depth of fifteen feet for chemicals of concern and the soil-to-groundwater pathway number throughout the entire soil column must be attained in soil that is saturated with the SPL. This soil requirement applies to all sites including both those where the SPL has been removed and those where some amount remains.

At sites where applicable soil standards have been attained, and the responsible person has determined that unrecoverable SPL remains, the responsible person will need to establish through monitoring and fate and transport modeling that any remaining SPL will not migrate to compliance points before a release of liability under the Statewide health standard will be conveyed. Where light phase SPL is present, monitoring will be required as part of the postremediation care program until the SPL has either dissipated or the Department concurs that monitoring and fate and transport analysis have established that any remaining SPL is stationary and diminishing.

### **iii) Site-specific standard**

The site-specific standard is an important option when the remediator has determined that, for technical or economic reasons, attainment of either the Statewide health standard or the background standard is not feasible because of the presence of SPL. Attainment under the site-specific standard when SPL is present at the POC is permissible as long as there is no discharge to surface water and there is no unacceptable exposure (based on risk) to the contamination.

## 9. Notice Requirements and Procedures

### a) Notice of Intent to Remediate

Performance of a site remediation under the provisions of Act 2 requires municipal, public, and Department notification. The intent of notification is to make the municipality, public, and Department aware that a person intends to remediate a site. The formal process for conducting remediation under Act 2 is initiated with submission of the Notice of Intent to Remediate (NIR) to the Department. The NIR and instructions are available online at <http://www.dep.state.pa.us/dep/deputate/airwaste/wm/landrecy/Forms/LRWM0019.doc>. Submission of the NIR will initiate the notification procedures.

The Act provides that any person, firm, corporation, or other entity who proposes, or is required, to respond to the release of a regulated substance at a site, shall comply with public notification requirements in order to qualify for liability protection under Act 2. All remediation activities are conducted to attain compliance with one or more of the three remediation standards or special industrial area criteria.

The NIR provides basic information on the applicant and the site. The NIR shall include a brief description of the site, ownership information, a listing of the contaminants involved and media affected, proposed remediation (if applicable), and the proposed future use of the site. The NIR may address all of the affected property or may only address those distinct areas of contamination which the remediator chooses to address, which then become sites. In order to obtain sufficient site information to determine the scope of any site contamination and the remediation standard selection, some site characterization is recommended prior to submission of an NIR. Communication with the Department staff in the region where the site is located to discuss procedures, assessment and remediation aspects is encouraged. The following are the procedures for a Notice of Intent to Remediate:

- Complete the NIR and submit it in duplicate to the Department's Regional Environmental Cleanup Program (ECP) office in the region where the site is located. Submission of site characterization reports with the NIR is encouraged. Provide the name and address of a contact person to which correspondence or communication can be addressed. Include the newspaper name and anticipated date that the NIR submission notice will appear. Provide a copy of the NIR to the owner of the property if the NIR is being prepared and/or submitted by someone other than the property owner. Liability protection is provided to owners of a property. If the area of contamination includes more than one property, all owners of the properties affected should be included.
- At the same time the NIR is submitted to the Department, provide notice of submission of the NIR to the municipality and to the public. Municipal notice is accomplished by:



- Sending a copy of the NIR to the municipality, or municipalities, where the site is located. Submit a copy of the NIR to the municipality with an accompanying cover letter.
  - Publish a summary of the NIR in a newspaper of general circulation in the area of the site. This summary should be a legal notice and developed following the model format in this manual.
- Provide the Department proof of the public and municipal notification of the NIR by submitting a copy of the newspaper proof of publication document (or a photocopy of the published notification showing the publication date) and a copy of both the municipality certified mail receipt card and cover letter. These are required to be submitted with the plan and reports required for remediation.
  - If remediation is pursued by use of a site-specific standard or at a special industrial area, a 30-day period following submission of the NIR is required during which the municipality can request to be involved in the development of remediation and reuse plans for the site [Act 2, Section [304\(n\)](#) and [305\(c\)](#)]. The applicant shall inform the municipality of the 30-day comment period when submitting the NIR above. Also inform the municipality of the provision of Act 2 for requesting a public involvement plan. If the municipality requests involvement in the remediation, the person seeking remediation must implement a public involvement plan. The newspaper notice shall also provide a statement about the 30-day comment period and the right of a municipality to request involvement in the development of the remediation and reuse plan for the site. The municipality will have received notice prior to publication. The publication date of the NIR notice in the newspaper starts the 30-day comment period. If the model format previously mentioned is used, it will ensure the 30-day comment period and public involvement plan information has been provided. The DEP will not accept reports until after the 30-day comment period. Comments received from the public or a public involvement plan, along with the remediator's responses to the comments must be submitted with the appropriate final report. A public involvement plan is described below in [Section I.D.9.c](#).
  - If an NIR is submitted for a combination of standards, the municipal and public notification requirements of each standard used apply.
  - Persons submitting an NIR for background, Statewide health, or a combination of these standards, who later decide to pursue cleanup to a site-specific standard or as a special industrial area, must renounce the cleanup according to the appropriate notice provisions.
  - The Department Regional ECP office may acknowledge receipt of the NIR and will publish acknowledgment of receipt of the NIR in the *Pennsylvania Bulletin*.

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SECTION I - OVERVIEW

D. Applying Land Recycling to Your Property

The Department may comment on an NIR if the form is incomplete. An incomplete NIR may not have sufficient information to initiate the Act 2 process. The Department does have enforcement authority to require assessment and remediation on sites for which a person does not voluntarily initiate a cleanup under Act 2.

Public notification of submission of the NIR to the Department, the municipality, and the public via the newspaper notice, and publication in the *Pennsylvania Bulletin* are not required for background or Statewide health standard remediations if the final report demonstrating attainment of the standard is submitted within 90 days of the release.

#### **b) Notice of Proposal for Nonuse Aquifer Determination**

Any time a person is proposing to the Department that a site be eligible for a nonuse aquifer determination, notice must be given to the associated municipalities and local water suppliers servicing that area. The notice is similar to that of an NIR in that it is a letter format and identifies “who” and “where” the proposal is associated with. In addition a copy of the actual proposal being sent to the Department for approval should be attached to these notice letters. Under general conditions, the municipalities and community water suppliers will have 45 days to review this material and if desired provide the Department with any information relative to the nonuse aquifer determination requirements specified in [Section 250.303\(c\)](#). These conditions will be those upon which the Department will base its approval decision. In the specific case where a municipality has in place an ordinance meeting the performance criteria of TGM [Section II C.9](#) (relating to institutional controls), the 45 day review period is waived.

#### **c) Public Involvement Plan**

Persons selecting to use the site-specific standard or the provision of special industrial areas, must provide an NIR to the Department, municipality and to the public (through notice in a newspaper serving the general area of the site). A 30-day comment period is to be included as part of the initial notice to solicit comments on whether the municipality wishes to be involved in the development of the cleanup and reuse plans for the site. If the municipality requests involvement during the comment period, the person performing the remediation of the property shall prepare a public involvement plan which meets the provisions of [Section 304\(o\)](#) of Act 2. All persons doing cleanups are encouraged to develop programs with a proactive approach to involving communities in their plans. This plan shall propose measures to involve the public in the development and review of the remedial investigation report, risk assessment report, cleanup plan, and final report for site-specific standard remediations; and the baseline remedial investigation for special industrial areas. Public involvement measures may include:

- Development of a proactive community information and consultation program that includes door step notice of relevant activities.

- Public meetings located within the county where the site is located.
- Roundtable discussions.
- Public access for document review and discussion, and designation of a single contact person to address questions from the community. Such access should be at locations adjacent to primary highways for the convenience of the public wishing to review the material.
- Formation of a community based group to solicit suggestions and comments.
- Where needed, retention of a qualified independent third party to facilitate meetings and discussions and to perform mediation services.

The person can use these or other appropriate methods to ensure the community has ample notice of intended remedial/reuse actions and the appropriate public concerns are properly addressed. The reports and plans submitted to the Department must include the comments received from the public and the municipality, as well as responses to those comments. The Department will consider the comments as part of its review of the plans and reports .

#### **d) Remediation Report Notification Requirements**

##### **i) Background and Statewide health standards**

Under the background and Statewide health standards, when a final report is submitted, the remediator should provide two copies of the final report to the Department's Environmental Cleanup Program regional office where the site is located. A complete submission consists of the report, a [Transmittal Sheet](#), a printout of the online [final report summary](#), the [checklist](#) and the appropriate fee. The name and address of a contact person to which correspondence or communication can be addressed shall be provided. The Department will acknowledge receipt of the final report. When the final report is submitted to the Department, the remediator shall provide municipal and public notification that a final report has been submitted. This notification is accomplished by:

- Sending a notice to the municipality that a final report has been submitted to the Department. ([Click here](#) to see a model format for this notification.)
- Providing a notice of submission of the final report to a newspaper of general circulation in the area of the site. This notice shall be a legal notice and developed following the [model format](#) or other appropriate format provided by the newspaper which will provide the required information.
- Providing the Department proof of the public and municipal notification by submitting a copy of the newspaper proof of publication document (or a photocopy of the published notification showing the publication date), and proof of municipal notification of submission of the final report by submitting a copy of the certified mail receipt card and cover letter of the municipal notice to the Department.

The Department has a 60-day review period for the final report and shall notify the remediator of deficiencies. It is the intent of the Department to notify the remediator of both approvals and deficiencies of the final report. Should the Department not respond within 60 days, the final report shall be deemed approved.

The Department Regional ECP office will publish acknowledgment of receipt of the final report in the *Pennsylvania Bulletin*.

Public notification of submission of the final report to the Department, the municipality, the public via the newspaper notice, and publication in the *Pennsylvania Bulletin* is not required for background or Statewide health standard remediations if the final report demonstrating attainment of the standard is submitted within 90 days of the release.

## ii) **Site-specific standard**

Under the site-specific standard, when a remedial investigation report, risk assessment report, cleanup plan, or a final report is submitted, the remediator should provide two copies of the document to the Department's Environmental Cleanup Program regional office where the site is located. A complete submission consists of the document, a [Transmittal Sheet](#), [the checklist](#) and the appropriate fee(s). In addition, the submission of a final report must include a printout of the online [final report summary](#). The name and address of a contact person to which correspondence or communication can be addressed shall be provided. The Department will acknowledge receipt of the submission. When the plan and/or reports are submitted to the Department, the remediator shall provide municipal and public notification of the submission. This notification is accomplished by:

- Sending a notice by certified mail to the municipality that a specific plan and/or report has been submitted to the Department. ([Click here](#) to see a model format for this notification.)
- Providing a notice summarizing the findings and recommendations of the plan or report, along with the comments and responses, to a newspaper of general circulation in the area of the site. This notice shall be a legal notice or other appropriate format provided by the newspaper which will provide the required information.
- Provide the Department with proof of the public and municipal notification by submitting a copy of the newspaper proof of publication (or a photocopy of the published notification showing the publication date), and proof of municipal notification of submission of the plan and/or report by submitting a copy of the certified mail receipt card and cover letter of the municipal notice to the Department.

Remedial investigation reports, cleanup plans, and risk assessment reports may be submitted together or separately.

The Department has a 90-day review period for the plan and/or report and shall notify the remediator of deficiencies. It is the intent of the Department to notify the remediator of both approvals and deficiencies of the final report. Should the Department not respond within 90 days, the plan and/or report shall be deemed approved.

**iii) Special industrial areas**

Municipal and public notification is required for submission of an NIR to the Department, but is not required for submission of a baseline environmental report.

**e) Fees**

The Department is required to collect fees to cover some of the costs of the Land Recycling Program. [Section 703](#) of Act 2 specifies the appropriate fees involved for submission of plans and reports. [Section 250.7](#) of the regulations provides further specification on fees.

A fee of \$250 is required for the review of final reports for the background and Statewide health standards; and \$250 for each remedial investigation, risk assessment report, and cleanup plan for the site-specific standard. A fee of \$500 is required at the time of submission of the final report for site-specific standard remediations. No fee is required for submission of the work plan or baseline environmental report required for special industrial area remediation.

Resubmission of any of the above required plans and reports will require payment of the above fee upon resubmission. The Department will disapprove a plan or report that does not have the appropriate fee.

Checks are to be made payable to the **Commonwealth of Pennsylvania**.

A [Transmittal Sheet for Plan/Report Submission](#) (2500-FM-LRWM0023) is available for submission of the appropriate fee with the submittal and should be used with all plan/report submissions to the Department. This form may be obtained by following the hyperlink above, or a copy may be requested from the Department's Regional office where the site is located or from the Department's Central office. See [Section V.I.2](#) for the regional contact or central office address.

## **E. Resources and Assistance**

### **1. Program Contacts**

Information on contacts within the Department of Environmental Protection and the Department of Community and Economic Development is listed in [Section V.I](#). This attachment provides a good source of general information and is a good starting point for finding specific information on any DEP program. In addition, [Section V.I.3](#) provides a listing of contacts for the various enterprise zones that have been established across the Commonwealth by the Department of Community and Economic Development. [Section V.I.4](#) identifies sources for obtaining technical publications cited in this manual.

Also, various links in [Section V](#) of this manual also provide information on contacts that are particularly applicable to the technical area being discussed.

### **2. Financial Assistance**

Act 2 established an account known as the Industrial Sites Cleanup Fund. The purpose of this fund is to provide financial assistance to persons assessing and remediating property used for industrial activity, and who did not cause or contribute to the contamination. Act 4, titled the Industrial Sites Environmental Assessment Act, was created concurrently with Act 2 and provides money for environmental assessments of industrial sites.

Act 2 provides financial assistance to municipalities, authorities, development agencies, and eligible members of the public for assessment and remediation of contaminated sites. Applicants may be eligible for a grant and/or loan from the fund up to 75% of the site characterization and remediation costs, subject to additional eligibility requirements established by Act 2 and the Department of Community and Economic Development. Act 4 provides grants to municipalities, local authorities, and economic development agencies for sites located in distressed communities, and specified classes of cities for environmental assessment of industrial sites. The maximum amount of any assessment project under Act 4 will be up to 75% of the total cost of assessment, or \$200,000, in a single fiscal year, whichever is less. To qualify, a party must not have caused or contributed to the contamination on the property and be performing a voluntary cleanup. For the purpose of administering these funds, the requirements of the two acts were combined by the Department of Community and Economic Development (DCED) into the Industrial Sites Reuse Program (ISRP) and this program is administered by DCED. Grant and loan eligibility requirements are specified in [Chapter 7](#) of Act 2, in [Act 4](#), and eligibility and application procedures are also specified in the Industrial Sites Reuse Program guidelines in [Section V.E](#) of this manual.