

**STATE OF CONNECTICUT**

**DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION**

**VERIFICATION REPORT**  
**GUIDANCE DOCUMENT**



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## PREAMBLE

The Connecticut Department of Energy and Environmental Protection (DEEP) has revised the Verification Report Guidance Document (VRGD), originally developed on August 1, 2008 with collaboration from the Environmental Professionals' Organization of Connecticut. The revised VRGD provides guidance regarding the type and degree of information that is expected to be included in a verification report to support a verification rendered by an environmental professional licensed in the State of Connecticut.

Pursuant to sections 22a-133x and 22a-134a of the Connecticut General Statutes (CGS), verifications rendered by a licensed environmental professional (LEP) shall be submitted on a form prescribed by the Commissioner. DEEP has provided specific verification forms for specific types of verifications. These forms focus on the available provisions and application of the Remediation Standard Regulations (RSRs), sections 22a-133k-1 through -3 of the Regulations of Connecticut State Agencies (RCSA).

The Commissioner strongly recommends a verification report, as described in this VRGD, be submitted simultaneously with the verification form to support a verification. A verification report provides the relevant information that supports the applicability and use of the RSRs. Specifically, the verification report presents the relevant information regarding the environmental setting of the site, the LEP's final conceptual site model (CSM), and discusses all remedial actions completed to achieve compliance with the RSRs. The verification report also provides the written detail of the provisions used to achieve compliance and discusses the compliance data used to apply those provisions and the usability of such data.

It is not the purpose of the verification report to present all data and information that has been collected or generated from site investigation and remediation. It is only necessary to include the **relevant** information that supports the LEP's final and validated CSM and the LEP's application of the RSRs.

A verification rendered pursuant to CGS section 22a-133y and any other written opinion rendered by a LEP that has been authorized by law ("Verification") should use a verification report, as presented in this VRGD, to present the necessary relevant information that would support said verification.

Pursuant to section 133v-5b of the RCSA, the LEP shall use his or her seal on the verification report, as the verification report is a document pertaining to a verification.

A complete verification form and verification report will facilitate effective and expeditious decision-making by DEEP. Furthermore, a properly completed verification report, as described in this guidance document, will provide a standard form of documentation that will serve the needs of all stakeholders. A

verification that is submitted to the Commissioner without a verification report will likely be flagged for an audit.

If the documentation presented to support a verification does not provide sufficient relevant information, or if the documentation indicates that the verification may be invalid, a Notice of Audit or a rejection of the verification may be issued. If the verification report is a data dump and/or the relevant information that supports the application of the RSRs is buried in minutia, a Notice of Audit may be issued.

Some examples of insufficient documentation to support a verification include:

- an incomplete or missing verification report;
- the lack of a discussion of relevant information or insufficient detail;
- apparent significant data gaps in the Final CSM or an invalidated CSM;
- a review of other reports is necessary to obtain adequate information to understand the relevance of the LEP's Final CSM;
- appropriate receptor surveys/assessments have not been completed or reported;
- apparent misapplication of the RSRs or the means used to achieve/demonstrate compliance with applicable criteria is not explicit; and/or
- obvious or apparent violations of applicable statutes and/or regulations. In this case, not only would such violations likely result in issuance of a Notice of Audit or a rejection of the verification, but DEEP may pursue other actions, including potential legal actions, to resolve the most serious issues.

The revised VRGD presents key components of information that are relevant to document a valid verification. These key components include;

- (1) an introduction for the report;
- (2) the LEP's Final CSM with sufficient detail of relevant findings and rationale to support the LEP's verification that the investigation was completed in accordance with prevailing standards and guidelines<sup>1</sup>;

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<sup>1</sup> DEEP's Site Characterization Guidance Document provides detailed discussion of the multi-phased approach to site characterization using the conceptual site modeling process.

- (3) a discussion of receptor surveys/assessments;
- (4) a description and discussion of remedial actions;
- (5) a discussion of all means and methods used to demonstrate compliance in accordance with the RSRs;
- (6) a discussion of the results of laboratory data quality assessments and data usability evaluations;  
and
- (7) a list of references.

The content of the verification report should be of sufficient quality, and the key components should be presented in a manner that is most logical for the particular site and in a manner that can be understood by all stakeholders. The relevant findings should support the Final CSM and the LEP's determination that compliance with the RSRs has been achieved.

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## **1.0 VERIFICATION REPORT INTRODUCTION**

The introductory information in the verification report should include the following:

- the purpose of the verification report;
- an identification of the applicable certifying party, responsible party, or property owner;
- a discussion of the regulatory program under which the verification was rendered (e.g., Property Transfer Program, Voluntary Remediation Program, RCRA Corrective Action, Orders issued by the Commissioner, Emergency Response and Spill Prevention Division, or any other DEEP division in which a LEP is authorized by law to render a written opinion (“verification”));
- a discussion on the type of verification that is being rendered and the applicability of such;
- an identification of previously submitted verifications or Commissioner approvals of the investigation and remediation of the subject site and a discussion of the reliance on such, if applicable; and
- an inventory of existing/available documentation that supports the verification with a brief description of pertinent information, such as dates of reports and activities documented therein. Supporting documentation should also be listed in a reference section, as discussed in greater detail in Section 8.0 of this guidance.

## **2.0 FINAL CONCEPTUAL SITE MODEL**

The LEP’s Final CSM is the basis for his/her verification and, therefore, should be presented in the verification report. This is the LEP's description of what he/she knows and understands about the site (or portion of the site or release area, as applicable) after all necessary phases of investigation have been completed. The Final CSM should be supported by relevant facts (findings of the investigations) and described in sufficient detail in order to support the LEP’s conclusion that the investigation was completed in accordance with prevailing standards and guidelines.

It is not necessary to include in the verification report the multitude of iterations of the CSM. The Final CSM is the key to support the LEP’s remedial decisions and verification.

Information that has typically been identified by DEEP as relevant is described in the following subsections. As discussed earlier in this guidance document, this information may be presented in the verification report in an order that is logical for the site.

## **2.1 PHASE I ENVIRONMENTAL SITE ASSESSMENT FINDINGS AND CONCLUSIONS**

A discussion of relevant Phase I findings should include the following:

- the site's ownership history;
- the site's land use and operational history (types and duration [dates] of operations and activities, including substances and handling procedures of such substances used at the site through time);
- the regulatory compliance history;
- a discussion of the physical and cultural environmental setting, including site description, site and surrounding land use (current and historical), regional and site-specific geology, hydrogeology, groundwater classification, surface water identification and classification, and groundwater use;
- a description of areas of concern (AOCs), with historical context;
- the identification and nature of constituents of concern (COCs) for each AOC;
- a topographic map for the site and surrounding area;
- a site map depicting areas of current and historical operations, materials handling activities, and all AOCs;
- the LEP's conclusions regarding the Phase I findings and the applicability of the Phase I in achieving the goals of site characterization; and
- a discussion of the continued applicability of the most recently completed Phase I relative to the time of verification.

## **2.2 PHASE II INVESTIGATION FINDINGS AND CONCLUSIONS**

A properly executed Phase II investigation is essential in the multi-phased approach of site characterization and is of particular importance to support a future verification that is applied to the date the Phase II is completed. The Phase II investigation will result in a finding for each AOC that:

- a release occurred; or
- a release did not occur.

If a release did occur, it is not expected that the LEP present data or investigative information in this section of the verification report. In accordance with the multi-phased approach, a Phase III investigation will have been completed at all release areas. Therefore, a discussion of the relevant findings of any release in the subsequent Phase III investigation will be sufficient.

However, if the LEP concludes that a release to the environment did **not** occur, relevant information that supports this conclusion should be presented in this section of the verification report. Relevant information would include, but not necessarily be limited to:

- the potential release mechanisms;
- the likely contaminant migration pathways;
- the potential fate and transport of contaminants;
- the sampling rationale, sampling data, lines of evidences, and means used to support the conclusion that a release did not occur; and
- a discussion of the LEP's data quality objectives and how they were met, and the relevance and representativeness of the Phase II findings that support the conclusions made by the LEP.

Specific maps, figures, and tables should be strongly considered to support the relevant findings.

### **2.3 PHASE III INVESTIGATION FINDINGS AND CONCLUSIONS**

Relevant Phase III findings should include, but not necessarily be limited to, the following:

- the nature of the release area(s);
- the release mechanisms and timing;
- the contaminant migration pathways;
- the fate and transport of contaminants;
- the nature, degree, and three-dimensional spatial and temporal extent of pollution associated with each release identified at the site;
- the sampling rationale for the Phase III delineation of each release area;
- the groundwater investigation;

- a summary of sampling techniques (e.g., drilling methods, continuous sampling, discrete interval sampling, low-flow groundwater sampling, groundwater filtering) and the rationale describing how the techniques and methodologies were appropriate for the investigation;
- the physical environmental setting, including hydrogeology (e.g., depth to water table, aquifers, stratigraphic units), hydrology (e.g., permeability, conductivity, gradient, flow direction), and geology (e.g., overburden, bedrock, depth to bedrock);
- a discussion of how all relevant and compliance data points are representative for their intended use;
- the data quality objectives and how they were met;
- the LEP’s conclusions regarding the Phase III findings, including a discussion on the significance of any data gaps;
- a validated Final CSM; and
- the inclusion of appropriate maps, figures, and tables to convey the findings and support the conclusions made by the LEP.

### **3.0 RECEPTOR ASSESSMENTS**

The verification report should include a discussion of the types of receptor surveys/assessments that were completed, such as water supply well, surface water, vapor migration, ecological, etc. The discussion on receptor surveys/assessments should include, but not necessarily be limited to, a description of each survey/assessment that was completed and the findings thereof. This description should include the rationale for the identification of “at risk” receptors, receptor sampling results, conclusions, and measures taken to mitigate/abate exposure pathways. If an ecological receptor was identified, the verification report should include discussion of the level of ecological risk assessment conducted. The verification report should reference all documents that pertain to each survey/assessment.

If a notification was submitted to DEEP for a Significant Environmental Hazard (SEH) pursuant to CGS Section 22a-6u, the verification report should provide a summary of the hazard condition and the actions taken to mitigate or abate the hazard. Significant Environmental Hazards must be closed or mitigated, as applicable, prior to verification, or the verification will be considered invalid.. Closure means that the hazard condition has been abated and that the Commissioner has issued a Certification of Closure for the SEH. In the specific case of a drinking water well receptor only, a hazard condition may be considered “mitigated” when the source of pollution and the groundwater plume have been remediated to applicable

RSR criteria, yet pollutants remain in the drinking water receptor at concentrations below the Drinking Water Standard established by the Connecticut Department of Public Health. In this scenario, the verification report should provide evidence that pollutant levels in the water supply well are, and are expected to remain, below applicable criteria. Note: this is the only scenario in which mitigation is acceptable for verification instead of closure.

The LEP should include or reference appropriate documentation (Certification or equivalent documentation issued by DEEP) that the hazard has been abated or mitigated, as applicable.

#### **4.0 DESCRIPTION OF REMEDIAL ACTIVITIES**

The verification report should include a description of the remedial activities implemented at the site, the duration of remedial activities, and the analytical results of confirmation sampling and groundwater monitoring that demonstrate that the remedial activities were successful in achieving compliance with the RSRs. The following information should be included in the verification report:

- an evaluation of historical remedial activities conducted at the site, explained in the context of the Final CSM;
- a description of the approach to remediation and the LEP's rationale for using such approach, including, but not necessarily limited to, the type of remediation implemented (e.g., active or passive) and the applicability of such approach;
- the date remediation was initiated and completed for each release area;
- the publication date and copy of the Public Notice of Remediation, including comments received from the public and the LEP's responses;
- a discussion of the LEP's use of regulatory provisions to achieve compliance (e.g., alternatives, exemptions, exceptions, variances, environmental land use restrictions [ELURs], self-implementing RSR options, etc.);
- a summary of sampling techniques and an explanation of the appropriateness of the techniques and methodologies used to confirm the effectiveness of the remedial activities in achieving compliance with the applicable criteria;
- a discussion of mass-removal calculations, total mass removal, and justification for shut-down of remedial system, if applicable;

- the rationale for confirmation sampling of each remedial action (density, frequency, locations, and depths of samples used to apply RSR provisions and demonstrate compliance);
- a discussion of conclusions that demonstrate why remediation was considered complete; and
- the inclusion of appropriate maps, figures, and tables to convey the findings and support the conclusions of the LEP.

## **5.0 LABORATORY QUALITY ASSURANCE / QUALITY CONTROL**

The results of environmental analysis may contain an element of uncertainty and in some cases may be significantly biased, due to the nature of environmental media, limitations of analytical methods, characteristics of analytes, and human error. Therefore, analytical results may not be representative of the actual concentrations of the analytes in the environmental media. Consequently, an evaluation of the quality of the analytical data in relation to the intended use is important in order for the LEP to make decisions which are supported by data of known and sufficient quality.

There are many ways to evaluate the quality of analytical data in terms of precision, accuracy, representativeness, comparability, completeness and sensitivity in relation to the intended use of the data. DEEP has provided guidance<sup>2</sup> for this purpose, and the LEP should refer to this guidance for specific details. The verification report should include the findings of the data quality assessments and data usability evaluations for all data the LEP relied upon to demonstrate compliance with the RSRS, including, but not necessarily limited to, data quality assessment and data usability worksheets. If already provided to DEEP, reference to this documentation should be included.

## **6.0 DEMONSTRATION OF COMPLIANCE**

It is expected that all provisions of the RSRS marked on the Verification Form will be discussed in the verification report. It is also expected that the compliance data that was used for the application of such provisions will be presented and discussed in the verification report. The discussion of compliance is expected to include, but not necessarily be limited to, the following:

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<sup>2</sup> *Laboratory Quality Assurance and Quality Control Guidance - Reasonable Confidence Protocols; Laboratory Quality Assurance and Quality Control Guidance - Data Quality Assessments and Data Usability Evaluations; Guidance for Collecting and Preserving Soil Samples for Laboratory Determination of VOCs; and other Recommended Reasonable Confidence Protocols - Quality Assurance and Quality Control Requirements for various analytical methods.*

- a discussion of how all statutory and regulatory requirements that may affect the LEP's capacity to render a verification were addressed (e.g., RCRA Closure Plans, Orders issued by the Commissioner, Stewardship Permits, other permits, SEH abatement, etc.);
- a description of the applicable criteria, the regulatory provisions used to achieve compliance (e.g., alternatives, exemptions, exceptions, variances, ELURs, groundwater re-classification, self-implementing RSR options, etc.), and how compliance with applicable criteria was achieved (discussion of the compliance data used to apply those provisions);
- a presentation and discussion of compliance data that the LEP used to apply specific provisions of the RSRs and to demonstrate compliance with the Standards for Soil Remediation;
- a discussion on the relevance and representativeness of the groundwater data used to understand the seasonal and dimensional groundwater and plume conditions and to demonstrate compliance with the Groundwater Remediation Standards, including a presentation that:
  - the concentrations of all COCs, and all existing and potential breakdown products, at each representative sampling location that define the groundwater plume are less than applicable criteria and geochemically and spatially stabilized to the point that the concentrations of all polluting substances in the plume will continue to be less than the applicable criteria;
- a discussion of how the completed groundwater monitoring achieved the seasonal compliance requirements;
- a copy of any Commissioner Approvals or notices for additional polluting substances, alternative criteria, site-specific criteria, exceptions, variances, alternative methods for demonstrating compliance or alternative groundwater monitoring plans, and temporary/emergency authorizations, as applicable; and how the Commissioner's Approval(s) and the LEP's use of the approved alternatives, exceptions, and variances were utilized;
- a discussion of any engineered controls that may have been used to achieve compliance, including but not limited to a site map illustrating the location of the engineered control, copies of the Commissioner's Approval for the completed engineered control, and affirmation and documentation that the financial surety mechanism to monitor and maintain the engineered control is in place; and
- a discussion of the approved and recorded ELUR, if applicable. Such discussion should include a summary of the purpose of the ELUR, the applicability of the ELUR in achieving compliance with the RSRs, and a site map illustrating the location of the Subject Area(s). A copy of the Certificate of Title should be included to document the ELUR was recorded on the land records.

## 7.0 VERIFICATION SPECIFICS

There are unique circumstances / requirements for certain verifications that will require slight modification to the information that is reported in the verification report. For instance:

### 7.1 “PROPERTY” OR “BUSINESS ONLY” VERIFICATIONS

Verifications may be rendered for all types of Property Transfer and Voluntary Remediation verifications. The Introduction of the verification report should identify the specific focus of the verification and the relationship of the investigation and remediation of releases attributed to land use (property) or business operations to the verification.

### 7.2 APPLICABILITY OF VERIFICATIONS

Form III Verifications may be applicable to releases that occurred up to the date the Form III was filed with DEEP or the date the Phase II Investigation was completed, whichever is later. The Form III verification may also be applicable to releases that occurred up to the date of the verification. The applicability of the verification is to be indicated on the verification form.

The verification report should provide additional discussion and justification on the applicability of the verification. **All releases subsequent to such declared date will not be closed with the verification.**

### 7.3 PORTION OF ESTABLISHMENT VERIFICATIONS

Portion of Establishment Verifications may be rendered under the Form III filing only, and may be rendered when a portion of an establishment has been remediated. The requirements for investigation and remediation of a portion of an establishment are no different than for verification for an entire parcel. Full compliance with the RSRs at the portion of the establishment is required.

DEEP requires that the release areas within the portion of the establishment be clearly defined with an accurate survey. The verification report is to include the survey and a detailed discussion of the physical and environmental parameters of the ‘Portion’.

The Form III Certifying Party will remain obligated by law to comply with all applicable requirements of the Form III, pursuant to Section 22a-134a, until a final verification is rendered by a LEP for the entire establishment. The LEPs final CSM that will support a final Form III Verification must discuss the physical and environmental relationship of the Portion in relation to the final verification.

## 7.4 FORM III INTERIM VERIFICATIONS

A Form III Interim Verification provides for the rendering of verification when compliance with the Standards for Soil Remediation can be documented, but the Groundwater Remediation Standards have not yet been achieved and groundwater remediation is ongoing. A Form III Interim Verification must demonstrate that compliance with RSR criteria for all media have been achieved, with the exception that a selected remedy for groundwater pollution is in operation. Compliance groundwater monitoring is not considered groundwater remediation and, therefore, would not be applicable to a Form III Interim Verification scenario.

The Form III Interim verification report is expected to contain the key elements that support any verification, as discussed in this guidance document. The verification report should include a dedicated section that identifies the groundwater remedy and a discussion on why the selected groundwater remedy is appropriate for the environmental setting. In addition, the following specifics are to be provided:

- the estimated duration of the remedy;
- the ongoing operation and maintenance requirements of the remedy;
- the groundwater monitoring plan; and
- a discussion and confirmation that there are no current exposure pathways from contaminated groundwater to receptors that have not yet met the remediation standards.

The Form III filing will remain open, and the Certifying Party will remain obligated by law to comply with all applicable requirements pursuant to Section 22a-134a until a final Form III verification is rendered by a LEP for the entire establishment.

## 7.5 VOLUNTARY REMEDIATION (§22a-133x) VERIFICATION (RELEASE AREA)

Release Area Verifications may be rendered under the §22a-133x Voluntary Remediation Program only and are specific to a particular release area. The intent of the voluntary remediation is declared when the Applicant submits the statement of proposed actions for investigating and remediating the parcel or a release area and a schedule for implementing such actions.

DEEP requires that the subject release area be clearly defined with an accurate survey. The verification report is to include the survey and a detailed discussion of the physical and environmental parameters of the release area. The requirements for investigation and remediation of the release area are no different than for a Portion of Establishment Verification.

## 7.6 FORM IV (SUPPORTING) VERIFICATIONS

A verification rendered to support the filing of a Form IV must demonstrate that compliance with RSR criteria for all media have been achieved except that the following actions may be pending:

- monitored natural attenuation (MNA) of a groundwater plume; or
- the recording of an ELUR to achieve compliance with applicable criteria.

The verification report is expected to contain the key elements that support any verification, as discussed in this guidance document.

- If MNA is an ongoing groundwater remedy, the verification report should include a dedicated section that discusses the following:
  - all remedial actions for polluting substances have been concluded, other than natural attenuation of a groundwater plume;
  - the LEP has an appropriate seasonal and dimensional understanding of the groundwater and the plume;
  - the groundwater monitoring points are representative of the release area(s) and the plume, and define the extent and degree of the plume;
  - all substances in the plume are in a diminishing state;
  - there are no current exposure pathways to the areas of the plume that have not yet achieved compliance with the remediation standards;
  - a demonstration that sensitive receptors are not at risk;
  - that MNA is appropriate as a remedy;
  - the MNA monitoring plan, including, but not necessarily limited to, analytical parameters to monitor the attenuation and degradation of COCs, appropriate representation of monitoring points, and frequency of monitoring; and
  - a thorough discussion on the expected duration of the natural attenuation of the plume.
- If the recording of an ELUR is outstanding, the verification report should include documentation and discussion of the following:

- the intent to record an ELUR;
- the type of ELUR, its applicability, and how the recording of the ELUR will achieve compliance for the release area;
- a site map illustrating the location of the Subject Area(s);
- written acknowledgement and acceptance of the deed restriction from the property owner; and
- the status of the draft ELUR.

## 7.7 FINAL FORM IV VERIFICATIONS

A Final Form IV Verification is a verification focused on closure of a Form IV filing, and is an opinion rendered by a LEP that natural attenuation of a groundwater plume has achieved compliance with applicable groundwater standards and/or the intended ELUR (if applicable) has been recorded.

The verification report for a Final Form IV Verification does not have to recreate the level of documentation provided in the supporting Form IV verification report previously submitted to DEEP; however, the verification report to support a Final Form IV Verification should include, at a minimum, the following:

- a presentation of the introductory information (discussed in Section 2.0 of this guidance document);
- a summary of the environmental setting;
- a detailed discussion of any changes to the findings or conclusions presented in the original verification report (specific references to the original verification report must be included);
- a discussion of how MNA (if applicable) has been completed to the point of demonstrating compliance with the groundwater criteria, including, but not necessarily limited to:
  - the analytical parameters used to monitor the attenuation and degradation of COCs,
  - the appropriate representation of the plume(s) with the location of monitoring wells,
  - the concentration of all COCs, and all existing and potential breakdown products, at each representative sampling location that define the groundwater plume and how they will continue to naturally attenuate at concentrations less than the applicable criteria, and

- the methods used to demonstrate compliance;
- detailed discussion of any in-situ remediation that was used to “enhance” the attenuation of the plume and general or temporary discharge authorization permits, as applicable;
- documentation of any new (following the submittal of the supporting Form IV verification report) Commissioner Approvals or notices for additional polluting substances, alternative or site-specific criteria, exemptions from achieving background due to technical impracticability, variances due to technical impracticability of groundwater remediation, or groundwater reclassification, if applicable; and
- a discussion of an approved and recorded ELUR (if applicable) with a site map illustrating the location of the Subject Areas and a copy of the Certificate of Title recorded on the land records.

## **8.0 REFERENCES**

Previously submitted reports should not be attached to the verification report. However, reports which have been previously submitted to DEEP and which provide support for the verification should be referenced. References to previous reports to support a particular statement in the verification report should be specific (i.e., report name, date, author, and page number). Copies of any referenced documentation not previously submitted to DEEP should either be submitted under separate cover coincident with or before the verification report is submitted or appended to the verification report.

The verification report itself should allow DEEP to evaluate the adequacy of the verification. If review of the actual referenced or attached reports is necessary to evaluate the adequacy of the verification, a Notice of Audit will likely be issued.