



U. S. Army Corps of Engineers Remediation System Evaluation Checklist

Installation Name _____
Site Name / I.D. _____
Evaluation Team _____
Site Visit Date _____

This checklist provides general guidelines for evaluating the status of in-place remediation systems. It is divided into the following sections:

- 1) Evaluation team composition
- 2) Evaluation Objectives
- 3) Pre-Visit Review
- 4) Interview with Site "Owner"
- 5) Interview with Site Operator
- 6) Interview with Regulator
- 7) System Objectives and Criteria
- 8) Evaluation of Data Relative to Criteria
- 9) General Regulatory Issues
- 10) The Inspection Report

The checklist provides suggestions for information gathering, and space has been provided to record data and notes from the site visit. Supplementary notes, if required, should be numbered to correspond to the appropriate checklist sections.

1) Evaluation Team Composition

The following disciplines should be included in the evaluation team:

- Environmental Engineer (site visit, remediation system evaluation)
- Regulatory Specialist (regulatory requirements review)
- Cost Analyst (cost of alternatives)
- Risk Assessor (risk from alternatives or operating changes)

2) Evaluation Objectives

- Consider yourself as a member of the site owner's staff to work on their team. Avoid imposing undue burdens on the owner and operator.
- Identify problems and underlying root causes. Recommend solutions if possible.
- Determine the impact of your findings, and document all findings and recommendations.
- Avoid personality conflicts, and do not assign blame.

3) Pre-Visit Review

a) Document Review: Obtain and review copies of the Record of Decision (ROD), the Design Analysis (DA) Report, the current Operation and Maintenance (O&M) Manual, any operating permits, and the O&M Contract. These documents should all be on-site, and the O&M manual should be up to date and obviously used.

b) Costs: Review both construction and operational costs for the remediation system. The cost data may be available at headquarters or may need to be obtained from site personnel. O&M costs should be broken down by labor, utilities, consumables, repairs, analytical, and disposal of wastes generated.**c) Monitoring Data:** Review the operating and compliance data gathered to date for adequacy and relevance. These data include process monitoring and environmental monitoring data and includes both physical data (e.g. temperature) and chemical data.

d) Other: Review records of the Restoration Advisory Board (RAB) that addressed the site as well as any correspondence between the facility and the governing regulator(s).

4) Interview with Site “Owner”

At active military installations the “owner” would be the office responsible for the installation’s environmental programs. Other “owners” might be the EPA, State agencies for some Superfund Sites, or the Corps of Engineers for formerly used DoD sites. Do not contact any regulator, any member of the public, or any member of the RAB without the owner’s permission.

a) What is the “owner’s” name, organization, address, and telephone number?

b) Does the owner clearly understand the reason that the system was installed?

c) Have treatment goals been established? What are they?

d) How well does the owner think the system is operating and what are their major concerns with the operation?

e) How comfortable is the owner with the current operator?

f) Is it OK to talk to the operator, regulators, RAB members, or members of the affected local community? If not, what are the sensitive issues?

g) What is a good date for a site visit? Will a representative of the owner be at the site visit? _If So, Who?

h) Is there anyone else to coordinate with? _____

i) What specific requirements would the owner have for the Evaluation Report? (You may describe the suggested contents in the Reporting Checklist or show the Example Report)

j) How does the contractual arrangement hinder or facilitate optimization or improvement in the system? What changes in the contract would make improvements easier?

5) Interview with Site Operator (Omit if owner and operator are same.)

a) What is the operator's name, organization, and telephone number?

b) Was this interview cleared with the site owner? Yes___ No___

c) Does the operator appear to have the appropriate background and training?

d) Does the operator know the short term and long term goals for the system?

e) How are operational data evaluated against performance criteria, both for treatment and the subsurface?

f) How frequent are communications between the owner and the operator regarding the goals and performance criteria for the treatment system?

g) What is the staff's work schedule?

h) On what schedule are various inspections and maintenance activities conducted?

i) How does the contractual arrangement hinder or facilitate optimization or improvement in the system? What changes in the contract would make improvements easier?

j) Does the operator have suggestions for improving the operation? What are they?

6) Interview with Regulator

a) What are the regulator's name, organization, address, and telephone number?

b) Was this interview cleared with the site owner? Yes___ No___

c) Is the regulator satisfied that the installed remedy will be successful and that the site operator is competent?

d) What are the regulator's major concerns, if any?

e) Is the regulator familiar with the site closure criteria and performance criteria for the installed remediation system?

f) Have any Applicable or Relevant and Appropriate Requirements (ARARs) changed, or are about to change, in ways that might affect the site? Consider all three media: water, air, and soil.

g) From the regulator's perspective, are adequate operating and compliance data collected by the facility? If not, what additional data would be useful?

h) Does the regulator periodically inspect the site? If so, what are the purposes of the inspections, and are records of the inspections available to the public?

7) System Objectives and Criteria

Performance and closure criteria should be clearly stated in documents readily available to all parties, including the operator. "Performance criteria" are the objectives for successful ongoing operation of the system. "Closure criteria" are the objectives to be fully achieved before cessation of the remediation. These objectives should be known and understood by all involved parties (owner, operator, regulator, and possibly the public). There should be a process by which the observed monitoring data and site conditions are compared to the performance and closure criteria. The following questions should be answered through discussions with the owner, operator, regulator, and possibly others.

a) What are the specific objectives to be achieved in the subsurface, if applicable? (e.g., mass removal, migration control)

b) What are the performance criteria for the subsurface remediation processes?

c) Where are the compliance points (describe or attach a map)?

d) What are the performance criteria for the aboveground treatment processes, if applicable? What are the specific effluent discharge or emission limits?

e) Are there specific conditions that, when met, will allow the system to be turned off? Is there a process used to periodically evaluate whether the system can be turned off? Briefly describe the closure criteria and review process.

8) Evaluation of Data Relative to Criteria

8.1) Performance Criteria

a) Who is responsible for evaluating subsurface and treatment monitoring data relative to performance criteria? (i.e., analyze the data and compare it to the criteria)

b) Is this evaluation of data and comparison to performance criteria done on a regular basis?

c) Are appropriate and timely actions taken based on the evaluation results?

d) Is it clear who makes decisions regarding changes based on the performance evaluation?

e) Are adequate records kept regarding system performance and are they kept in a usable and permanent form?

f) Does the method of contracting for O&M allow/motivate the operator to adjust operations to improve efficiency?

8.2) Closure Criteria

a) Who is responsible for evaluating subsurface and treatment monitoring data relative to closure criteria? (i.e., analyze the data and compare it to the criteria)

b) Is the evaluation of data and comparison to closure criteria done on a regular basis?

c) Are the evaluation results documented? How are they documented?

d) Who reviews the evaluation results and makes decisions based the results?

e) Are the evaluation results reasonable? If not, why?

9) General Regulatory Issues

9.1) Off-site Disposal Facilities

a) Are any off-site disposal facilities used? Do they comply with the CERCLA off-site policy (40 CFR 300.440)?

b) Has the status of the disposal facility been checked since the initiation of off-site disposal?

c) Are RCRA hazardous wastes generated on-site?

d) Do RCRA hazardous wastes managed off-site meet Land Disposal Restrictions (LDRs)?

e) Is the option to conduct additional on-site treatment to meet LDRs feasible or cost effective?

f), Are on-site treatment (e.g., metals stabilization) or off-site Subtitle-D landfill disposal viable options for RCRA TCLP-characteristic wastes?

g) Are hazardous waste manifests, profiles, and LDRs maintained on-site or off-site?

9.2) Other Issues

a) Are stormwater best management practices (BMPs) in place to minimize run-on/run-off and to minimize contact stormwater that needs to be handled?

b) Is a spill response plan for wastes and commercial products in place?

c) Have any process areas or waste handling areas resulted in uncontrolled releases to the environment? If so, describe the each release and the facility's response.

10) The Evaluation Report

a) **Administrative** The report should:

- Be generated within 30 days of the primary site visit.
- Be as concise (e.g., < 25 pages) as possible but well written.
- Include drafted (e.g., CADD) or very neat hand drawn sketches or drawings.
- Be reviewed for technical adequacy and accuracy according to applicable QA procedures.
- Include neatly completed (preferably retyped) checklists, cost calculations, catalog cuts for suggested equipment changes, etc.
- Be coordinated through proper channels, according to the customer's wishes.

b) **Content** The report should address the following topics:

Team Composition

Documents Reviewed

Persons Contacted

Site Location, History, Characteristics (brief summary)

System Objectives, Performance and Closure Criteria, (including observations about the documentation and communication of these objectives and criteria)

Site Visit Summary

Findings:

System Performance (including comparison to closure criteria. Do not assign blame!)

Effectiveness of the System to Protect Human Health and the Environment (as required in a five-year review)

Component Performance (all various components)

Components or Processes that Account for Majority of Costs

Recurring Problems or Issues

Regulatory Compliance

Treatment Process Excursions and Upsets, Accidental Contaminant/Reagent Releases

Safety Record (if appropriate)

Recommendations

Technology Changes*

Component Changes**

Operating Parameter Changes

Recommended Changes in Retaining System Performance Data

Regulatory Changes or Actions (seeking waivers, alternative treatment residue disposal/recycle options, etc.)

Changes to O&M Contract Conditions/Approach

Recommended Studies Outside the Scope of the RSE

Cost Impacts of Suggested Changes

Capital Costs

O&M Costs

Comparison to Current Operations/Net Savings (on present-worth basis, or as desired by customer)

Estimated Costs for the Recommended Studies

Summary