



Section 3.0
REMEDIAL ACTION REPORT



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SECTION 3.0 REMEDIAL ACTION REPORT

INTRODUCTION

After remedial action is complete at the site, the applicant will submit a Remedial Action Report (RAR). The RAR is a stand-alone document that has three primary functions:

- 1) To document the remedial activities
- 2) To demonstrate that the Remedial Action Objectives (RAOs) described in the Remedial Action Plan (RAP) have been met
- 3) To identify any deviations from the RAP

This section of the guidance is designed to help facility owners and/or environmental consultants prepare a RAR to address these issues in a consistent and thorough manner. The RAR should include all of the information identified in sections 3.1 – 3.8 in the sequence listed in this guidance. At the end of the report, it should contain the appropriate figures, tables, and/or analytical results so that NDEQ and the public can understand and evaluate the conclusions of the RAR. The checklist at the end of this section should be used to make sure the RAR contains all the necessary information (see Attachment 3-1). The checklist should be completed and submitted as part of the RAR.

3.1 EXECUTIVE SUMMARY

The first part of the RAR should be an Executive Summary that presents an overview of the report. In this section you should do the following:

- State the RAOs
- Describe the remedial actions completed
- Explain any deviations from the remedial actions planned in the RAP
- Briefly demonstrate that the RAOs have been met
- Summarize the future land use plans and any institutional controls
- Describe any on-going performance monitoring that will continue at the site

The length of the executive summary will depend on the nature of contamination and the complexity of remedial actions at the site. However, a 2-3 page summary is generally recommended.

3.2 SITE SETTING, HISTORY, AND OPERATIONS

Since the RAR is meant to be a stand-alone document, it should include a brief summary of the setting, history, and operations of the site. Typically, you should include a 1-2 page summary of the following information:

- Identification of the property, the owner, and the consultants involved in developing the RAR



- Location, physical setting, and operational history of the site
- Findings of the investigation as reported in the RAP
- A brief summary of the site's VCP history, including the dates of application, submittal and approval of the RAP, and the beginning and ending of remedial actions

3.3 REMEDIAL ACTION OBJECTIVES

This section should state and explain the RAOs that were defined in the RAP. Refer to these RAOs in descriptions of remedial actions throughout the rest of the report.

3.4 OVERVIEW OF REMEDIAL ACTIONS

This section should contain an overview of the remedial actions conducted at the site. The overview should focus on important elements of the cleanup, including the remediation approach or approaches employed, the type(s) of remedial action(s) conducted, and the volumes of environmental media removed or treated.

The type of information to be provided in this section includes, but is not limited to:

- A table showing the chronology of events and remedial actions taken at the site
- A table providing the RGs selected as cleanup levels, including the RG for each COC, whether the RG represents a residential or commercial exposure, and the rationale for that selection.
- Extent, depth, and volume of soil excavated
- Total volume of soil treated and volumes of treatment chemicals used
- A figure showing areas of soil excavation or in-situ soil treatment
- Total volume of groundwater treated and volumes of treatment chemicals used
- Estimated volume of naturally attenuated contaminants
- Volume of remediation-derived waste generated, controlled, contained, transported, treated, and/or disposed
- Photographic logs of remedial activities
- Copies of relevant property deeds or other documentation of institutional controls implemented

The narrative should summarize the information and refer to the locations of the tables, figures, photos, and other documents in the RAR.



3.5 COMPLIANCE WITH RAOS

An important purpose of the RAR is to demonstrate that the RAOs described in the RAP have been achieved so that NDEQ can issue an NFA letter. To do this, you should present a summary of *all* environmental sampling and monitoring results collected during the time between approval of the RAP and submittal of the RAR. As part of the RAP, you should have developed a strategy for conducting these sampling and monitoring activities (see Section 2.3.3.7 of this guidance). These activities will vary from site-to-site. For example, if the monitoring strategy in the RAP included three years of quarterly sampling, all three years of data should be included in the RAR. In this section, provide a narrative to explain why the analytical results show that the RAOs have been achieved, and refer to the documents that contain this data. The analytical data should be documented at the same level of detail as data collected during the investigation. The following information should be included:

- Figures and maps showing sample locations and depths
- Summary of collection methods and dates and any supporting tables or figures
- Figures and maps showing post-remedial action conditions, such as groundwater potentiometric surface(s), remaining contamination, and/or remaining free-product
- Soil boring and monitoring well construction logs
- Table containing results of field screening
- Analytical results and reference to laboratory reports for soil or groundwater sampling, including target compounds and contaminant concentrations detected
- Summary of QA/QC results and reference to attached lab reports
- Table of data validation qualifiers
- Explanatory text and updated version of the CSM, with concentrations and locations of remaining contamination, if applicable. The CSM should demonstrate that all exposure pathways at the site have been eliminated.
- Previously submitted startup reports or monitoring reports
- Other information as appropriate for the implemented remedies to verify that RAOs have been achieved

The narrative should summarize the information and refer to the locations of supporting tables, figures, reports, and other documents in the RAR.

3.6 DEVIATIONS FROM RAP

If any deviations from the RAP are necessary after it has been approved, you should contact NDEQ as soon as possible. These deviations should be approved by NDEQ *prior* to submittal of the RAR. However, the review and approval of deviations will slow the overall process. You are encouraged to submit a complete and thorough RAP so that you can minimize the chance that you will need to request deviations later on.



If deviations from the RAP are approved by NDEQ, a revised RAP may be required and it may be necessary for NDEQ to reissue public notice of the changes. For example, if the deviation involves changing from a pump and treat cleanup system to chemically enhanced bioremediation, issuing a new public notice would likely be required. However, if the deviation was adding another groundwater extraction well to an existing pump and treat system, a new public notice would probably not be needed.

In this section of the RAR, you should include a summary of the timing and nature of deviations from the RAP. If changes to the proposed remedial action occurred, the following information should be included:

- Description and rationale for any changes to the proposed remedial action
- Copies of any correspondence with NDEQ concerning any of these changes

If there weren't any deviations to the remedial action, this section should state so.

3.7 DEVIATIONS IN PERFORMANCE MONITORING

For some sites, performance monitoring data will be collected and submitted in reports to NDEQ after the RAR has been approved and the NFA has been issued (see Section 2.3.4 of the RAP technical guidance). The monitoring plan will have been approved as part of the RAP; however, if changes to this plan are needed, these changes should be described in this section.

Update the monitoring strategy by including the following information:

- Explanation of new or modified sampling and monitoring objectives
- Explanation of new or modified sampling and monitoring methods
- Reference to maps showing new or modified monitoring and sampling locations
- Reference to cross sections and/or diagrams showing new or modified subsurface monitoring and sampling intervals
- Description of new or modified monitoring schedule
- Description of new or modified analytical parameters and reference to any supporting tables

If deviations from the RAP are approved by NDEQ, a revised RAP may be required and it may be necessary for NDEQ to reissue public notice of the changes. For example, a reduction in the number of wells sampled, the frequency of sampling, or a change in sampling parameters will likely require that a new public notice be published. However, a change in sampling methodology (e.g., changing from bailers to passive diffusion bag samplers) would likely not require a new public notice.

If there weren't any deviations to the monitoring strategy, this section should state so.



3.8 APPENDICES

Figures, tables, and other documents should be included in the appendices to support the description and documentation of remedial action. The tables should be clearly labeled and written so that they are easily legible and understandable. All maps should include standard map information, including a north arrow, graphical scale, and map legend. Cross sections should include vertical and horizontal scale bars and legends. All figures should be shown at an appropriate scale such that text, labels, and patterns are clearly legible. Only one document or “type” of information should be provided per appendix. NDEQ recommends that numbered tab dividers be used between appendices for ease of review.

The appendices should include:

- Analytical laboratory reports and chain-of-custody sheets
- Monitoring well construction information
- As-built diagrams of all remedial systems
- Maps of all site features such as ponds; parking lots; buildings; green space; and subsurface structures such as utilities, parking garages, basements, and tunnels
- Copies of any legal documents used for institutional controls
- Documentation of actions related to the disposal of water and/or soil waste generated as part of the remedial action





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