

UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF OHIO  
WESTERN DIVISION

STATE OF OHIO, ex rel.  
BETTY D. MONTGOMERY  
ATTORNEY GENERAL OF OHIO,

Plaintiff,

vs.

D.H. HOLDINGS CORPORATION

Defendant.

8:0107817

JUDGE KATZ

CONSENT ORDER

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## APPENDICES

- A. RI/FS STATEMENT OF WORK (ONCE DEVELOPED)
- B. RI/FS WORKPLAN
- C. PROCEDURES FOR PREFERRED PLAN/DECISION
- D. RD/RA STATEMENT OF WORK
- E. GUIDANCE DOCUMENTS
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## INTRODUCTION

Plaintiff State of Ohio by its Attorney General, Betty Montgomery, at the written request of the Director of the Ohio Environmental Protection Agency, together with Defendant hereby consent to the entry of this Consent Order.

WHEREAS, D.H. Holdings Corporation is in the process of completing a Remedial Investigation and Feasibility Study (“RI/FS”) for the Fayette Tubular site (“Site”), the objectives of which are: (1) to complete a remedial investigation of the Site to determine the nature and extent of alleged contamination at the Site; and (2) to develop and evaluate an appropriate response to the alleged contamination employing sound scientific engineering and construction practices; and (3) to select a recommended remedy for the Site; and

WHEREAS, upon approval of Defendant’s RI/FS Report, the Ohio Environmental Protection Agency (“Ohio EPA”) will select a remedy for the Site set forth in the Decision Document. In selecting the remedy and issuing the Decision Document, Ohio EPA will follow the procedures set forth in Appendix C, Procedures for Preferred Plan/Decision.

NOW, THEREFORE, without trial of any issues of fact, without admission of liability, and upon the consent of the parties hereto, it is ADJUDGED, ORDERED, and DECREED as follows:

### I. OBJECTIVES OF PARTIES AND PURPOSE OF CONSENT ORDER

1. In entering into this Consent Order, the mutual objectives of the State of Ohio and Defendant include: (1) completion of a Remedial Investigation and Feasibility Study (“RI/FS”) for the Site; (2) implementation of the remedy contained in the Decision Document which is protective of human health and the environment and which shall be consistent with federal, state and local law;

(3) monitoring, operation, and maintenance of the remedy at the Site; (4) implementation of interim actions as additional work if Ohio EPA determines that an immediate substantial threat to public health or safety is posed by air or water pollution or soil contamination originating from the Site; and (5) providing for the payment of past and future Response Costs to the State of Ohio that are not inconsistent with the NCP as more fully described herein.

2. This Consent Order requires the completion of the RI/FS for the Site and implementation of the remedy contained in the Decision Document from Remedial Design/Remedial Action (RD/RA) through Operation and Maintenance (O&M), if any, of the Site as provided in this Consent Order.

## **II. JURISDICTION AND VENUE**

3. This Court has personal jurisdiction over the parties and the subject matter of this action. Venue is proper in this Court for purposes and duration of this Consent Order. Defendant waives any rights to challenge the underlying Complaint for any reason, and Defendant hereby waives service of summons. In signing this Consent Order the Defendant waives any rights it may have to an adjudication hearing under Ohio Revised Code Chapters 119 and 3745 for any act or action of the Ohio Environmental Protection Agency performed under the terms of this Consent Order, except for rulemaking, permitting or an order for work not otherwise required by this Consent Order.

## **III. DEFINITIONS**

4. Unless otherwise stated, all terms used in this Consent Order and the Appendices shall have the same meaning as used in Ohio Revised Code (hereinafter "R.C.") Chapters 3734 and

6111 and the regulations adopted thereunder. In addition, the following terms are defined as follows:

- A. "Additional Work Workplan" means those documents which are to be submitted to Ohio EPA by Defendant pursuant to Section XII of this Consent Order. Each workplan required to be submitted to Ohio EPA pursuant to Section XII of this Consent Order shall include a detailed description of the proposed activities; a time schedule for conducting those activities; and personnel and equipment needs.
- B. "Contractor" means a contractor retained by Defendant pursuant to this Consent Order and any subcontractor, representative, agent, employee, or designee thereof.
- C. "CERCLA" shall mean the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq., as amended.
- D. "Certification of Completion" shall mean the approval of Defendant's construction completion report pursuant to Section 3.4.3. of the RD/RA SOW.
- E. "Decision Document" means the document issued by Ohio EPA after the public notice and comment period of the Preferred Plan has occurred that sets forth the Remedial Action requirements for the Site, which is to be incorporated herein.
- F. "Defendant" means D.H. Holdings Corporation.
- G. "Deliverables" means any document which must be submitted to Ohio EPA under this Consent Order or its appendices.
- H. "Document" means any record, report, notes, logs, journals, photograph, videotape, correspondence, computer disk or tape, recorded or retrievable information of any kind, including raw data, narrative reports, and any and all documentary evidence, relating to the treatment, storage or disposal, and concerning the investigation and remediation of, hazardous wastes, solid wastes, industrial wastes, other wastes, hazardous substances, hazardous constituents and radioactive wastes at the Site. "Document" shall be construed broadly to promote the effective sharing between Defendant and Ohio EPA of information and views concerning the work to be performed pursuant to this Order.
- I. "Site" means the physical facility located between Railroad and Gamber

Streets, Fayette, Ohio, where alleged treatment, storage, placement, or disposal of hazardous waste or industrial waste or other waste has occurred, and/or discharge into waters of the State of industrial waste or other waste is alleged to have occurred, including any other area where such hazardous wastes, including industrial wastes, and/or other wastes have migrated or threaten to migrate.

- J. "Feasibility Study" ("FS") means the development, evaluation, and analysis of remedial alternatives for cleanup action conducted by Defendant in accordance with applicable State and Federal environmental laws and regulations, the NCP (40 CFR Part 300) and this Consent Order.
- K. "National Contingency Plan" or "NCP" means the National Oil and Hazardous Substances Pollution Contingency Plan, referred to in the Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA") as the National Contingency Plan, and codified at 40 CFR Part 300.
- L. "O.A.C." means Ohio Administrative Code.
- M. "Ohio EPA" means the Ohio Environmental Protection Agency and its designated representatives.
- N. "Operation and Maintenance" ("O&M") means all activities required to ensure that the response actions remain operational and functional. These operation and maintenance activities shall be described in an operation and maintenance workplan submitted by Defendant and approved by Ohio EPA.
- O. "Parties" means collectively the Plaintiff and Defendant.
- P. "Plaintiff" means the State of Ohio on the relation of its Attorney General who brought this action upon the written request of the Director of the Ohio EPA.
- Q. "Preferred Plan" means the document prepared by the Ohio EPA, Division of Emergency and Remedial Response (DERR), which presents to the public DERR's preferred alternative for remediation of the Site in accordance with the procedures outlined in Appendix C. The Preferred Plan shall include a brief summary of the alternatives evaluated in the detailed analysis of the Feasibility Study, highlighting the key factors that led to the identification of the preferred alternative.
- R. "RD/RA" means the remedial design and remedial action including operation

and maintenance of the Site to be performed under this Consent Order.

- S. "Remedial Investigation" ("RI") means the investigation conducted in accordance with applicable State and Federal environmental laws and regulations, and the NCP (40 CFR Part 300) by Defendant, to determine the nature and extent of contamination at the Site, and includes the gathering of all necessary data to support the Feasibility Study.
- T. "Remedial Design" means the detailed engineering plans, specifications and construction drawings which are in compliance with NCP (40 CFR Part 300) and sufficient to implement the selected remedial action.
- U. "Remedial Action" means any action, or part there of, selected by the Ohio EPA that abates or reduces the threat posed by a placement or disposal or threatened disposal of hazardous substances to prevent present or future harm to the public health or welfare or to the environment and is consistent with applicable local, State and Federal laws and regulations, the NCP (40 CFR Part 300), and this Order.
- V. "Response Action" includes "Remedial Action" as defined above and "removal", as defined by Section 101(23) of CERCLA, 42 U.S.C. 9601(23) and any related actions to address the disposal of hazardous waste, hazardous constituents, pollutants, industrial wastes and/or other wastes.
- W. "Response Costs" means all direct and indirect costs, "not inconsistent with the NCP," incurred by the State, pursuant to this Consent Order, for verifying the Work, doing the Work or otherwise implementing or enforcing this Consent Order, including, but not limited to, wages, contractor costs, travel costs, oversight costs, laboratory costs, and costs of reviewing or developing plans, reports or other items.
- X. "RI/FS" means "Remedial Investigation" and "Feasibility Study" together.
- Y. "Section" means a portion of this Consent Order identified by a Roman numeral.
- Z. "Statement of Work" ("SOW") means the statement of work for the implementation of the RI/FS and RD/RA as set forth in Appendices A and C to this Consent Order.
- AA. "Waste Material" shall mean (1) any "hazardous waste" as that term is defined under R.C. Section 3734.01(J); (2) any "solid waste" as that term is defined

under R.C. Section 3734.01(E); (3) any "industrial waste" as that term is defined under R.C. Section 6111.01 (E); (4) any "other wastes" as that term is defined under R.C. Section 6111.01(D); (5) any "hazardous substances" as that term is defined under Section 101(14) of CERCLA, 42 U.S.C. Section 9601(14); and (6) any "hazardous waste constituent" as that term is defined under O.A.C. Section 3745-50-10(A)(43).

- BB. "Work" means all activities Defendant is required to perform under this Consent Order.
- CC. "Workplans" means those documents detailing the requirements necessary to complete RI/FS and implement RD/RA and O&M, as more fully described in the Attachments to this Consent Order.

#### **IV. PARTIES BOUND**

- 5. The provisions of this Consent Order shall apply to and be binding upon the Defendant, its successors in interest, assigns, receivers, officers, agents, servants, employees, and those acting in concert, privity, or participation with them and the State of Ohio.
- 6. The Defendant shall provide a copy of this Consent Order to each Contractor, subcontractor and consultant employed to perform any of the Work itemized or referenced herein. Defendant shall condition all contracts entered into for performance of the Work contemplated herein upon performance of the Work in conformity with the terms of this Consent Order. Defendant shall ensure that its contractors and subcontractors perform the Work contemplated herein in accordance with this Consent Order.
- 7. No change in Corporate ownership or status of Defendant, including, without limitation, any transfer of assets or real or personal property, shall in any way alter Defendant's obligations under this Consent Order. Defendant shall provide a copy of this Consent Order to the current owner of the Fayette Tubular property located between Railroad and Gamber Streets, Fayette,

Ohio.

#### **V. CALCULATION OF TIME**

8. Unless otherwise stated in this Consent Order, where this Order requires actions to be taken within a specified period of time (e.g. "within thirty days"), this time period shall begin the day after the entry of this Consent Order unless the time is otherwise stated to start at another point in time. In computing any period of time under this Consent Order, where the last day would fall on a Saturday, Sunday or State of Ohio or federal holiday, the period shall run until the end of the next day that is not a Saturday, Sunday or legal holiday.

#### **VI. DESIGNATION OF SITE COORDINATORS**

9. Within ten (10) days of the entry of this Consent Order, Defendant shall designate a Site Coordinator to oversee and implement the Work required by this Consent Order and to coordinate with the Ohio EPA Site Coordinator. Defendant may also designate an alternate Site Coordinator. Within ten (10) days, Defendant shall inform Ohio EPA in writing of its choice of Site Coordinator and alternate. To the maximum extent practicable, communications between Defendant and Ohio EPA concerning the activities performed under this Consent Order shall be through the Site Coordinators. Each Party's Site Coordinator shall be responsible for assuring that communications from the other Party are appropriately disseminated and processed.

10. For the duration of this Consent Order, Defendant's designated Site Coordinator or alternate shall be on-site or on-call during all hours of Work to be performed pursuant to this Consent Order at the Site. The absence of the Ohio EPA Site Coordinator from the Site shall not be cause for stoppage of work unless otherwise provided.

11. Defendant or Ohio EPA may change their Site Coordinator or alternate by notifying the other party at least five (5) days prior to the change, unless impractical, but in no event later than the actual day the change is made.

12. Without limiting any authority conferred by law on the Ohio EPA, the authority of the Ohio EPA Site Coordinator includes, but is not limited to:

- a. Taking samples and directing the type, quantity and location of samples to be taken by Defendant pursuant to an approved Work Plan;
- b. Observing, taking photographs, or otherwise recording information related to the implementation of this Consent Order, including the use of any mechanical or photographic device;
- c. Directing that work stop whenever the Site Coordinator for Ohio EPA reasonably determines that the activities at the Site may create or exacerbate a threat to public health or safety, or threaten to cause or contribute to air or water pollution or soil contamination;
- d. Conducting investigations and tests related to the implementation of this Consent Order;
- e. Inspecting and copying records, operating logs, contracts and/or other documents related to the implementation of this Consent Order; and
- f. Assessing Defendant's compliance with this Consent Order.

#### **VII. PERMANENT INJUNCTION**

13. Defendant is ordered and enjoined to perform the Work detailed in this Consent Order and to fully comply with all other requirements of this Consent Order.

#### **VIII. COMPLETION OF RI/FS**

14. All work to be performed by Defendant pursuant to this Section shall be under the direction and supervision of a qualified environmental engineer, geologist or architect

with expertise in hazardous waste site investigation and remediation. Defendant shall complete the RI/FS for the Site in accordance with the following provisions:

- a. Within fifteen (15) days of entry of this Consent Order, Defendant shall submit a workplan for the completion of the investigatory work and presentation of the Remedial Investigation results and implementation of the Feasibility Study for the Site ("RI/FS Workplan"). The RI/FS Workplan shall be developed after consultation with the SOW (Appendix B), the guidance documents listed in Appendix E, and the NCP, and in conformance with state law including R.C. Chapters 3734, 3704 and 6111 and the regulations promulgated thereunder.
- b. After Ohio EPA's approval of the RI/FS Workplan, Defendant shall implement the work detailed therein in accordance with the schedule contained in the approved RI/FS Workplan.
- c. Should Defendant identify any inconsistency between any of the laws and regulations and guidance documents they are required to follow by this Consent Order, Defendant shall notify the Ohio EPA in writing of each inconsistency and the effect of the inconsistencies upon the Work to be performed. Defendant shall also recommend, along with a supportable rationale justifying each recommendation, the requirement Defendant believes should be followed. Defendant shall implement the affected Work as approved by the Ohio EPA.
- d. The RI/FS Workplan, reports required by this Consent Order, any amendments to the approved RI/FS Workplan, and any other submittals required by the Workplan or SOW shall be subject to the review, approval or disapproval by Ohio EPA in accordance with the provisions set forth in Section XIV of this Consent Order.

#### **IX. PUBLIC NOTICE AND COMMENT PERIOD OF THE REMEDY**

15. Upon completion of the RI/FS and approval by Ohio EPA, Ohio EPA will prepare a Preferred Plan for the Site that contains the Recommended Remedy developed for this Site. Ohio EPA agrees to public notice and provide for public comment of the Preferred Plan following the procedures of the Interim Final Policy titled "Preferred Plans and Decision Documents" attached

hereto as Appendix C to this Consent Order and any applicable requirements of state and/or federal law and the NCP. As set forth in Appendix C, Ohio EPA will propose a remedy for the Site in the Preferred Plan. Ohio EPA agrees to provide a public comment period of thirty (30) days, at which time the Defendant may submit any comments it may have regarding the proposed remedy to Ohio EPA. Ohio EPA agrees to resubmit a Preferred Plan for an additional public comment period if significant changes are made to the proposed remedy after consideration of the comments received during the initial public comment period.

16. Upon completion of the public comment period described in this Section and consideration of the comments received during that time period, Ohio EPA agrees to set forth a Decision Document that describes the remedial alternatives to be implemented at the Site. Once finalized, the Decision Document shall be incorporated into and made an enforceable part of this Order as Appendix F.

17. The specific dispute resolution procedures set forth in Section XXI shall govern any issues Defendant may raise regarding Ohio EPA's selection of the final remedy after the public notice and comment period has ended. However, if a party not bound by this Consent Order appeals the Director's issuance of the Decision Document to the Environmental Review Appeals Commission ("ERAC"), then any issues that Defendant has regarding the final remedy shall be resolved through the ERAC proceeding and not by the dispute resolution procedures set forth in Section XXII. In the event that such an occurrence should happen, Defendant shall be entitled to and the State shall support the right of Defendant to intervene in that ERAC proceeding.

## X. RD/RA AND O&M WORK

18. All work to be performed by Defendant pursuant to this Section shall be under the direction and supervision of a qualified environmental engineer, geologist or architect with expertise in hazardous waste site investigation and remediation. Defendant shall perform a Remedial Design/Remedial Action, and any Response Actions, at the Site in accordance with the following provisions:

- a. Within thirty (30) days of the date of receipt of the Decision Document, Defendant shall submit a Workplan for the implementation of the complete RD/RA, and any Response Actions, at the Site. The RD/RA Workplan shall provide for the design and implementation of the Remedial Action, and any Response Actions, as set forth in the Decision Document issued by Ohio EPA. The RD/RA Workplan shall be developed in conformance with this Consent Order, the Generic RD/RA Statement of Work (herein incorporated as Appendix D to this Order), state law including R.C. Chapters 3734, 3704 and 6111 and the regulations promulgated thereunder, the NCP, 40 CFR Part 300, and the most current version of the guidance documents specified in Appendix E to this Consent Order. If, during the Workplan development stage, Ohio EPA determines that any guidance documents in addition to those specified in Appendix E to this Consent Order affect the Work to be performed, Ohio EPA will notify Defendant and any affected Workplan or reports shall be modified accordingly.
- b. Within thirty (30) days of Ohio EPA's approval of the RD/RA Workplan, Defendant shall implement the work detailed therein in accordance with the schedule contained in the approved RD/RA Workplan.
- c. By ninety (90) days prior to the scheduled completion date of the Remedial Action, and any Response Actions, as specified in the approved RD/RA Workplan, Defendant shall submit, for Ohio EPA review and approval, a plan for implementation of O & M at the Site. The O&M Workplan shall be developed in conformance with this Consent Order, the Generic RD/RA Statement of Work (herein incorporated as Appendix D to this Order), state law including R.C. Chapters 3734, 3704 and 6111 and the regulations promulgated thereunder, the NCP, 40 CFR Part 300, and the most current

version of the guidance documents specified in Appendix E to this Consent Order.

- d. The RD/RA Workplan, reports required by this Consent Order, any amendments to the approved RD/RA Workplan and the O&M Workplan shall be subject to the review, approval or disapproval by Ohio EPA in accordance with the provisions set forth in Section XIV of this Consent Order.

19. Defendant shall perform or shall ensure performance of all Operation and Maintenance measures and tasks referenced in the O&M Workplan necessary to achieve the effectiveness, implementation and long-term maintenance of the response actions which occur at the Site pursuant to this Consent Order and the RD/RA generic SOW.

#### **XI. SAMPLING AND ANALYSIS PLAN**

20. Within fourteen (14) days, or as otherwise agreed to by the Parties, of the effective date of this Consent Order, Defendant shall submit to Ohio EPA for review and approval a Sampling and Analysis Plan (SAP). The SAP shall be used by Defendant to obtain monthly drinking water samples of both raw (two wells) and treated water from the Village of Fayette's public water supply. Ohio EPA will review the SAP pursuant to the procedures set forth in Section XIV,

DELIVERABLES AND APPENDICES. The SAP shall include, at a minimum, the following:

- a. Qualifications of the person(s) designated by Defendant to collect samples;
- b. Sampling procedures, including well purging, point of sample collection, containers, preservation methods, storage, transport, holding times, duplicates, trip blanks, etc.;
- c. Chain-of-custody procedures, including example chain-of-custody forms, with room for signature, description of samples, sample number, etc.;
- d. Forms, notebooks and procedures to be used to record sample location, sampling conditions, and sample tracking from time of sample collection to time of analysis;

- e. Conditions for the preparation of sampling equipment and containers to avoid sample contamination; and
- f. Methods for decontamination of sampling equipment.

21. Defendant shall seek permission from the Village of Fayette, in accordance with Section XV., Paragraph 36 to sample the Village's drinking water wells in accordance with paragraph 20. Within twenty (20) days of receiving approval of the SAP from Ohio EPA, Defendant shall implement the sampling in accordance with the SAP. The samples from the Village of Fayette's drinking water wells shall be analyzed for VOC's using U.S. EPA Method 524.2, as described in O.A.C. Rule 3745-81-27(B)(2)(b). The collected samples shall be analyzed by a laboratory approved by the Plaintiff for this specific drinking water analysis and shall be analyzed by using U.S. EPA Method 524:2, Defendant shall notify Ohio EPA of sampling activities for the Village water wells in accordance with Section XIX, Paragraph 47. All sampling results shall be provided to Ohio EPA within ten (10) days of receipt of such results by Defendant.

22. The staffs of the Division of Emergency and Remedial Response ("DERR") and the Division of Drinking and Ground Water ("DDAGW") shall review the sample results, and after consultation with the Defendant, will determine if any interim measures are necessary to address a substantial threat to public health or safety and to assure adequate supplies of water to the Village of Fayette that does not violate the Safe Drinking Water Act. If DERR and DDAGW determine that interim measures beyond those measures already approved in the RI/FS are necessary, the Defendant shall be informed of that determination in writing and shall be provided the basis for such determination. The Defendant shall prepare a work plan outlining the interim measure necessary to

assure adequate supplies of uncontaminated water to the Village of Fayette. The interim measures work plan shall be submitted to Ohio EPA within thirty (30) days of receipt of notice from Ohio EPA that interim measures are necessary. Ohio EPA will review the interim measures work plan pursuant to the procedures set forth in Section XIV., DELIVERABLES AND APPENDICES. Defendant shall implement the interim measures work plan within fifteen (15) days of its approval by Ohio EPA.

**XII. PERIODIC REVIEW TO ASSURE PROTECTION OF  
HEALTH AND THE ENVIRONMENT**

23. If the Work performed by the Defendant pursuant to this Consent Order results in any Waste Material remaining at the Site, the Ohio EPA may review the Work at least once every five (5) years after approval by Ohio EPA of Certification of Completion of the Remedial Action, and any Response Actions, to evaluate whether the Remedial Action, and any Response Actions, continue to be protective of human health and the environment. This section shall terminate after ten (10) years after completion of all operation and maintenance (O&M) activities at the Site.

24. Defendant shall conduct studies and investigations with regard to the periodic review noted in paragraph 23, as requested in writing by Ohio EPA, in order to assist Ohio EPA in its review of the Remedial Action, and any Response Actions. Ohio EPA shall review such studies and investigations, and after consultation with the Defendant, will determine if further response actions are necessary.

25. If Ohio EPA determines that further Response Action not inconsistent with the NCP is appropriate for protection of human health and the environment at the Site, then Ohio EPA may take any appropriate action, including any of the following actions: 1) requiring Defendant to

perform Additional Work under Section XIII., ADDITIONAL WORK; 2) exercise any lawful authority under this Consent Order or in any other proceeding, including issuance of an administrative order or initiation of judicial proceedings, to compel Defendant and/or any other person to perform additional response action to ensure protection of human health and the environment not inconsistent with the NCP; or 3) institute proceedings against Defendant to recover the Plaintiff's Response Costs in doing remediation activities not inconsistent with the NCP at the Site or in overseeing Work performed by the Defendant.

### **XIII. ADDITIONAL WORK**

26. Should Ohio EPA determine that additional Work not inconsistent with the NCP is necessary to achieve the purposes of this Consent Order as set forth in Section I., OBJECTIVES OF PARTIES AND PURPOSE OF CONSENT ORDER, Ohio EPA may notify Defendant in writing of the need for such additional Work. Within thirty (30) days of the receipt of such notification from Ohio EPA, Defendant shall prepare and submit to Ohio EPA for review and approval a Workplan for the performance of the additional Work ("Additional Work Workplan"). For any required Workplan that includes sampling as an element, the Workplan shall include a sampling plan together with a rationale for the sampling activities, locations, quantity and frequency of sampling, constituents for analysis, and quality control/quality assurance procedures.

27. Defendant shall submit the Additional Work Workplan for review and approval pursuant to Section XIV., DELIVERABLES AND APPENDICES. Upon approval of the Additional Work Workplan by Ohio EPA, Defendant shall implement the Additional Work Workplan in accordance with the schedules contained therein.

of any submission, Defendant shall proceed to take any action required by the submission as approved, conditionally approved, or modified by Ohio EPA.

32. In the event that Ohio EPA initially disapproves a submission, in whole or in part, and notifies Defendant of the deficiencies, Defendant shall within fourteen (14) days, or such longer period of time as specified by Ohio EPA in writing, correct the deficiencies and resubmit to Ohio EPA for approval a revised submission. The revised submission shall incorporate all of the uncontested changes, additions, and/or deletions specified by Ohio EPA in its notice of deficiency. Notwithstanding the notice of deficiency, Defendant shall proceed to take any action required by a non-deficient portion of the submission.

33. In the event that Ohio EPA disapproves a revised submission, in whole or in part, Ohio EPA may again require Defendant to correct the deficiencies and incorporate all changes, additions, and/or deletions within fourteen (14) days, or such period of time as specified by Ohio EPA in writing. Or, in the alternative, Ohio EPA retains the right to terminate this Consent Order, perform any additional remediation, conduct a complete or partial remedial investigation and feasibility study, and/or enforce the terms of this Consent Order.

34. In the event that Ohio EPA approves a portion of a Workplan, report, or other item, the approved portion shall be deemed to be incorporated in and made an enforceable part of this Consent Order. The following documents are appended to this Consent Order and incorporated by reference at the time of entry of this Consent Order, and are an enforceable part of this Consent Order:

Appendix A - RI/FS Workplan (once developed)

Appendix B - RI/FS Statement of Work

Appendix C - Procedures for Preferred Plan/Decision

Appendix D - RD/RA Statement of Work

Appendix E - Guidance Documents

Appendix F - Decision Document (once developed)

#### **XV. INSPECTIONS AND ACCESS**

35. Ohio EPA, its employees, contractors and agents shall not be denied access by Defendant at all reasonable times to the Site and any other property to which access may be needed for the implementation of this Consent Order. Access under this Consent Order shall be for the purposes of conducting any activity necessary for the implementation of this Consent Order including, but not limited to the following:

- a. Monitoring the Work;
- b. Conducting sampling;
- c. Inspecting and copying records, operating logs, contracts, and/or other documents related to the implementation of this Consent Order;
- d. Conducting investigations and tests related to the implementation of this Consent Order;
- e. Verifying any data and/or other information submitted to Ohio EPA;
- f. Doing the Work required under this Consent Order; and
- g. No provision of this Consent Order shall be construed to eliminate or restrict any right of the State to seek access to the Site which it may otherwise have under Federal or State law, nor shall any provision of this Consent Order be construed to eliminate or restrict any right or the rights of the Defendant under

the State or U.S. Constitutions.

36. Defendant shall use its best efforts to secure from property owners access for Defendant and the Ohio EPA as necessary to effectuate this Consent Order. Copies of all access agreements obtained by Defendant shall be provided promptly to Ohio EPA. If any access required to effectuate this Consent Order is not obtained within thirty (30) days of the effective date of this Consent Order, or within thirty (30) days of the date Ohio EPA notifies Defendant in writing that additional access beyond that previously secured is necessary, Defendant shall promptly notify the Ohio EPA in writing of the steps Defendant has taken to attempt to obtain access. Ohio EPA may, as it deems appropriate, assist Defendant in obtaining access.

#### **XVI. SAMPLING AND DATA AVAILABILITY**

37. Upon the request of Ohio EPA, Defendant shall make available to Ohio EPA the results of all sampling, tests or other data, including raw data, generated by Defendant or on its behalf related to this Site. Defendant shall allow split or duplicate samples to be taken by Ohio EPA of all samples collected by Defendant. Accordingly, Defendant shall notify the Ohio EPA site coordinator at least fourteen (14) days in advance of any sample collection called for under this Consent Order.

38. Defendant shall submit all raw data and all original reports of analytical procedures and results to Ohio EPA within twenty (20) days of receipt of written request.

39. Defendant shall submit to Ohio EPA within five (5) days after Defendant's receipt, any interpretive reports and written explanations concerning such raw data and original laboratory reports.

40. Should Defendant, following submission of any report or document pursuant to this Consent Order, discover any error in any report or raw data, Defendant shall within twenty (20) days of discovery, notify Ohio EPA of such discovery and provide to the Ohio EPA the basis for the error, and the corrected information.

#### **XVII. ACCESS TO INFORMATION**

41. Defendant shall provide to Ohio EPA, upon request, copies of all non-privileged documents and information within its possession or control or within possession or control of its contractors or agents relating to events or conditions at the Site including, but not limited to manifests, reports, correspondence, or other documents or information related to the Work.

42. Defendant may assert a claim that documents or other information submitted to the Ohio EPA pursuant to this Consent Order is confidential under the provisions of O.A.C. Rule 3745-50-30(A) or R.C. Section 6111.05(A). If no such claim of confidentiality accompanies the documents or other information when it is submitted to the Ohio EPA, it may be made available to the public without notice to Defendant.

43. Defendant may assert that certain documents or other information are privileged under the attorney-client or any other privilege recognized by applicable law. If Defendant asserts that certain documents or information is privileged or confidential under applicable law it shall provide Ohio EPA with the following: the basis of confidentiality being asserted by Defendant, and the basis for the assertion.

44. No claim of confidentiality or privilege, including but not limited to, claims made pursuant to R.C. Section 3745.70 through 3745.73, shall be made with regard to any data gathered

pursuant to this Consent Order, including but not limited to, all sampling, analytical monitoring, or laboratory reports.

45. Defendant shall preserve for the duration of this Consent Order and for a minimum of five (5) years after its termination, all documents and other information within its possession or control, or within the possession or control of its contractors or agents, which in any way relate to the Work notwithstanding any document retention policy to the contrary. Defendant may preserve such documents by microfiche, or other electronic or photographic device. Defendant shall notify Ohio EPA at least sixty (60) days prior to the destruction of these documents or other information; and upon request, shall deliver such documents and other information to Ohio EPA.

#### **XVIII. MONTHLY PROGRESS REPORTS**

46. Defendant shall submit written progress reports describing the activities which have been undertaken during the previous month, and activities which are scheduled for the next month, to Ohio EPA by the twentieth day of every month after the entry of this Consent Order. At a minimum, these reports shall:

- a. Identify the Site and activity;
- b. Describe the status of work at the Site and progress to date;
- c. Demonstrate the percentage of work completed;
- d. Describe difficulties encountered during the reporting period;
- e. Describe actions taken to rectify problems;
- f. Describe activities planned for the next month;
- g. Identify changes in key personnel;

- h. List target and actual completion dates for each element of activity, including the project completion;
- i. Provide an explanation of any deviation from the milestones in the Workplan Schedules and actions taken to correct the deviation from the milestones;
- j. Describe any data obtained during the reporting period which shows contamination of the Site with Waste Material;
- k. Identify by media, quantity, and location, wastes(s) that were generated, treated and disposed.

### **XIX. NOTICES**

47. All document(s), including correspondence, progress reports, notifications, or other submissions, required to be submitted under this Consent Order shall be submitted to the following:

Ohio EPA (1 copy)  
P.O. Box 1049  
Columbus, Ohio 43266-0149  
Attn: Technical and Programs Division of Emergency and Remedial Response

Ohio EPA (4 copies)  
Northwest District Office  
347 North Dunbridge Road  
Bowling Green, Ohio 43402  
Attn: Fayette Tubular Site Coordinator or his or her successor

by certified mail or overnight mail unless the Consent Order specifically provides otherwise.

48. Either Party may change the name and/or address of its contact person(s) by sending written notice of the change(s) to the other Parties.

### **XX. DEED NOTICE, LAND USE AND CONVEYANCE OF TITLE**

49. Defendant shall use best efforts to acquire whatever agreement is necessary from the owner(s) of the Site to ensure that no portion of the Site shall be used in any manner which could

adversely affect the integrity of any Response Action implemented pursuant to this Consent Order. Defendant shall use best efforts to acquire whatever agreement is necessary from the owner(s) of the Site to ensure that any title, easement or other interest has a legally recorded provision for continued operation and maintenance of any Response Action implemented pursuant to Sections IX, X and XIII of this Consent Order. Defendant shall use best efforts to acquire whatever agreement is necessary from the owner(s) of the Site to ensure that an appropriate notice shall be put in the deed and legally recorded as to the condition of the property, said notice shall first be approved by Ohio EPA.

50. If the selected remedy for the Site includes a restriction on the use of the property, Defendant shall use best efforts to acquire whatever agreements are necessary from the owner(s) of the Site in order to implement that use restriction. In addition, the following responsibilities shall be undertaken by the Defendant with regard to a use restriction as part of the remedy; Defendant shall use best efforts to: (1) ensure that the use restriction is recorded legally and promptly; (2) monitor compliance with the use restriction; and (3) ensure that enforcement of the use restriction occurs if there is a violation.

51. Any conveyance of any title, easement or other interest by Defendant shall not relieve Defendant of its obligations under this Consent Order.

## **XXI. PAYMENTS AND REIMBURSEMENTS OF COSTS**

### **Past Costs:**

52. No later than sixty (60) calendar days after entry of this Consent Order, Defendant shall pay to the State, Eighty-Five Thousand Dollars (\$85,000.00) in reimbursement for all past unpaid Response Costs incurred by the State through December 31, 2001. This amount shall be paid in a

certified check made payable to "Treasurer, State of Ohio."

**Future Costs:**

52. Defendant shall reimburse the State for all Response Costs not inconsistent with the NCP incurred by the State from December 31, 2001 and continuing through the termination of the Consent Order. Ohio EPA will submit an itemized statement of Ohio's Response Costs to Defendant on an annual basis. Defendant shall pay Ohio EPA's Response Costs for the previous year within thirty (30) days of receipt of such itemized statement.

53. The Dispute Resolution Section (Section XXII) of this Consent Order shall apply only to disputes over the accuracy of the State's request for reimbursement, claims on whether the costs are "not inconsistent" with the National Contingency Plan set forth in 40 CFR Part 300, and/or whether the costs are related to work beyond the objectives of this Consent Order as set forth in Section I, paragraph 1. In the event of a dispute over Response Costs, Defendant shall not be required to pay the contested amount of Response Costs until the dispute is resolved.

54. Defendant shall remit payments to Ohio EPA pursuant to this Section by making payment to and forwarding it to Fiscal Officer, Ohio EPA, Lazarus Government Center, 122 S. Front Street, P.O. Box 1049, Columbus, Ohio 43216-1049. Defendant shall send a copy of the checks and transmittal letters to the Assistant Attorney General and the Ohio EPA Site Coordinator.

**XXII. DISPUTE RESOLUTION**

55. This Dispute Resolution Section shall only be applicable to the following portions of this Consent Order: Section VIII., COMPLETION OF RI/FS, Section IX. PUBLIC NOTICE AND COMMENT PERIOD OF THE REMEDY, paragraph 22 of Section XI. SAMPLING AND

ANALYSIS PLAN, paragraph 25 of Section XII. PERIODIC REVIEW TO ASSURE PROTECTION OF HEALTH AND THE ENVIRONMENT, Section XIII. ADDITIONAL WORK, Section XIV. DELIVERABLES AND APPENDICES, and paragraph 52 of Section XXI. PAYMENTS AND REIMBURSEMENTS OF COSTS.

56. The Site Coordinators and/or the alternate Site Coordinators shall, whenever possible, operate by consensus. In the event that a disagreement exists about either the adequacy or disapproval of any Workplan, report, or other item required to be submitted by Defendant pursuant to this Consent Order or, the need for Additional Work or, the accuracy of the State's request for reimbursement of costs, then the Site Coordinators shall have fifteen (15) days from the date the dispute arises to negotiate in good faith in an attempt to resolve the differences. The dispute arises when either the Ohio EPA Site coordinator provides a brief written notice of dispute to the Defendant's site coordinator, or the Defendant's Site Coordinator provides a brief written notice of dispute to the Ohio EPA Site Coordinator. This fifteen (15) day period may be extended by mutual agreement of the parties, up to an additional seven (7) days.

57. In the event that the Site Coordinators and/or the alternate Site Coordinators are unable to reach consensus on the dispute, then each Site Coordinator and/or the alternate Site Coordinator shall reduce his or her position to writing within thirty (30) days of the end of the goodfaith negotiations referenced in the preceding paragraph. Those written positions shall be immediately exchanged by the Site Coordinators. Following the exchange of written positions, the parties shall have an additional seven (7) days to resolve their dispute. If the Ohio EPA concurs with the position of the Defendant, then the Workplan, report or other item required to be submitted

pursuant to this Consent Order or, any statement for purposes of reimbursement of costs, shall be modified as provided for by Ohio EPA. If necessary, either party may petition this Court for modification of the Consent Order to include any required extensions of time or variances of required Work.

58. If Ohio EPA does not concur with the position of the Defendant, the Ohio EPA Site Coordinator will notify Defendant in writing. Upon receipt of such written notice, the Parties shall have seven (7) days to forward a request for resolution of the dispute, along with a written statement of the dispute, to the Assistant Chief of the Division of Emergency Response and Remediation ("DERR"). The statement of dispute shall be limited to a concise presentation of the Parties position on the dispute. The Assistant Chief of DERR, or his/her designee, will resolve the dispute based upon and consistent with this Consent Order; State law, including R.C. Chapters 6111 and 3734, and the regulations promulgated thereunder; the National Contingency Plan, 40 CFR Part 300; and other appropriate state and federal laws.

59. If Defendant and the Ohio EPA do not agree on a resolution of the dispute within fourteen (14) days of the decision reached by the Assistant Chief for DERR, either party may institute an action in this Court to resolve the dispute under this Consent Order. In this Court proceeding, Defendant shall have the burden of demonstrating by a preponderance of the evidence that the decision by the Ohio EPA is unlawful and/or unreasonable.

60. The pendency of dispute resolution set forth in this Section shall not affect the time period for completion of Work to be performed under this Consent Order, except that upon written mutual agreement of the parties, any time may be extended as appropriate under the circumstances.

Elements of Work not affected by the dispute will be completed in accordance with the schedules contained in the RI/FS, RD/RA and O&M Workplans and other deliverables

61. Within thirty (30) days of resolution of a dispute regarding disapproval or inadequacy of a submittal or the need for Additional Work, Defendant shall incorporate the resolution and final determination into the Workplan, report, or other item required to be submitted under this Consent Order and proceed to implement this Consent Order according to the amended Workplan, report, or other item required to be submitted under this Consent Order.

62. Within thirty (30) days of resolution of a dispute regarding any inaccurate statement issued for reimbursement of costs, the Plaintiff will make any necessary corrections to the statement and reimburse to Defendant any overpayment of costs made by Defendant which may have arose as a result of the inaccurate statement being issued to Defendant.

63. Within thirty (30) days of resolution of a dispute regarding a change or modification of the remedy set forth in the Preferred Plan, Ohio EPA agrees to follow the procedures for additional public notice and comment as set forth in the interim final policy titled "Preferred Plans and Decision Documents" attached as Appendix C to this Consent Order and any applicable requirements of State and/or Federal law and the NCP.

64. Unless otherwise expressly provided for in this Consent Order, the dispute resolution procedures of Section XXI. shall be the exclusive mechanism to resolve disputes arising under or with respect to those matters set forth in paragraph 55 of this Consent Order.

### **XXIII. INDEMNITY**

65. Defendant agrees to indemnify, save, and hold harmless the State from any and all

claims or causes of action arising from, or related to, events or conditions at the Site, except where the claims or causes of action result from negligent, reckless or intentionally tortious conduct by the State occurring outside of the State's exercise of its discretionary functions. Discretionary functions of the State include, but are not limited to, the State's review, approval, or disapproval of work performed pursuant to the Consent Order. The State agrees to provide notice to Defendant within thirty (30) days of receipt of any claim which may be the subject of indemnity as provided in this Section, and to cooperate with Defendant in the defense of any such claim or action against the State. The State shall not be considered a party to and shall not be held liable under any contract entered into by Defendant in carrying out the activities pursuant to this Consent Order.

#### **XXIV. SATISFACTION OF LAWSUIT; NO ADMISSION**

66. Except as provided otherwise in paragraph 68 of this Consent Order, compliance with the terms of this Consent Order shall constitute full satisfaction and a complete release of any civil liability for costs, damages, fines, expenses, penalties, or enumeration of any kind, of Defendant, its receivers, officers, directors, shareholders, agents, servants, employees, and those acting in concert, privity, or participation with them, including its indemnitee, for the claims alleged in the State's Complaint up through the date of entry of this Consent Order. Nothing in this section shall apply to new conditions at or new information about the Site, or to any violations arising out of acts or omissions first occurring after the date of entry of this Consent Order. This Consent Order is not to be interpreted as an admission on the part of any party of any liability or wrongdoing whatsoever and it is expressly understood that no party admits liability of any sort.

## **XXV. RESERVATION OF RIGHTS**

67. This Consent Order shall not be construed to limit the authority of the State to seek relief for claims or conditions not alleged in the Complaint. This Consent Order reserves all rights as to the Defendant for any violations or conditions which occur after the entry date of this Consent Order, and by entering into this Consent Order the Defendant does not waive any rights, claims or defenses which it may have in any such action or against any others not a party to this action.

68. Nothing in this Consent Order shall be construed to limit the authority of the State to undertake any action against any entity, including Defendant, to eliminate or mitigate conditions which may present an imminent threat to the public health, welfare or environment and to seek cost reimbursement for any such action. Nothing in this Consent Order shall be construed to limit the authority of the State to seek relief for claims for damage to natural resources, and by entering into this Consent Order the Defendant does not waive any rights, claims or defenses which it may have in any such action. This reservation also explicitly includes any and all claims the Plaintiff may have concerning any disposal of Waste Material by Defendant at any location other than the Site. This Consent Order in no way waives any defenses or rights which Defendant may have as to such additional claims.

69. Nothing in this Consent Order shall relieve Defendant of any obligation to comply with R.C. Chapters 3734 and 6111 including, without limitation, any regulation, license or order issued under these Chapters, and any other applicable federal, state or local statutes, regulations, or ordinances, including but not limited to permit requirements.

70. The State reserves the right to seek legal and/or equitable relief to enforce the

requirements of this Consent Order, including penalties against Defendant for noncompliance with this Consent Order. This Consent Order in no way waives any defenses or rights which Defendant may have as to such additional claims.

71. The State reserves the right to terminate this Consent Order and/or perform all or any portion of the Work or take any other measures it deems necessary to protect public health and the environment, including recovery of all response costs “not inconsistent” with the NCP, in the event that the requirements of this Consent Order are not wholly complied with within the time frames required by this Consent Order.

#### **XXVI. OTHER CLAIMS**

72. Nothing in this Consent Order shall constitute or be construed as a release from any claim, cause of action, or demand in law or equity against any person, firm, partnership, or corporation, not subject to this Consent Order for any liability arising from, or related to, events or conditions at the site, and Defendant has not purported to or held itself out as representing another person, firm, partnership, or corporation. Defendant expressly denies that it is the agent for, represents or otherwise has the authority to represent or serve the interests of another person, firm, partnership, or corporation.

#### **XXVII. TERMINATION**

73. This Consent Order shall terminate upon joint motion of the Parties, and approval of the Court, following completion of all activities, including any Operation and Maintenance Activities, required under this Consent Order. This Section, and the Sections of this Consent Order on Reservation of Rights, Satisfaction of Lawsuit; No Admission, Deed Notice/Land Use and

Conveyance of Title, and Sampling and Document Availability and Retention, shall survive this Termination Provision.

**XXVIII. MODIFICATION**

74. No modification shall be made to this Consent Order without the written agreement of the Parties and the Court.

**XXIX. RETENTION OF JURISDICTION**

75. This Court shall retain jurisdiction of this matter for the purpose of enforcing Defendant's compliance with this Consent Order and the Dispute Resolution Section of this Consent Order.

**XXIX. COURT COSTS**

76. Defendant shall pay the court costs of this action.

**XXXI. STIPULATED PENALTIES**

77. In the event that any Ohio EPA approved deadline contained in the schedule of any approved submittal is not met, Defendant is ordered and enjoined to pay stipulated penalties which shall accrue in the amount of \$100 per day for the first seven days of non-compliance; \$250 per day for the 8th through 14th day of noncompliance; \$500 per day, for the 15th day through the 30th day of non-compliance; and \$1,000 per day, per violation for violations lasting beyond 30 days and thereafter.

78. Any payment of stipulated penalties accrued under the provisions of paragraph 77 above shall be made by delivering to the Environmental Enforcement Section of the Ohio Attorney General, State Office Tower, 30 East Broad Street - 25th Floor, Columbus, Ohio 43215-3428, Attn:

Jena Suhadolnik, or her successor, a certified check(s) for the appropriate amounts(s), within fourteen (14) days from the date the default is cured, made payable to "Treasurer, State of Ohio" to be deposited into the Hazardous Waste Clean-up Account, created pursuant to R.C. Section 3734.28.

### **XXXII. POTENTIAL FORCE MAJEURE**

79. If any event occurs which causes or may cause a delay in Defendant's compliance with any requirement of this Consent Order, Defendant shall notify Ohio EPA in writing within fourteen (14) days from when the Defendant knew, or by the exercise of due diligence should have known, of the event, describing in detail the anticipated length of the delay, the precise cause or causes of delay, the measures taken and to be taken by Defendant to prevent or minimize the delay and the timetable by which those measures will be implemented. Defendant will adopt all reasonable measures to avoid or minimize any such delay.

80. In any action by the State to enforce any of the provisions of this Consent Order, or in a dispute resolution under Section XXII. DISPUTE RESOLUTION, Defendant may raise at that time the question of whether they are entitled to a defense that its conduct was caused by circumstances beyond its control, such as, by way of example and not limitation, acts of god, strikes, acts of war, civil disturbances. While the State does not agree that such a defense exists, it is, however, hereby agreed by the Defendant and the State that it is premature, at this time, to raise and adjudicate the existence of such a defense and that the appropriate point at which to adjudicate the existence of such a defense is at the time, if ever, that a proceeding to enforce this Consent Order is commenced by the State or during dispute resolution pursuant to Section XXII. DISPUTE RESOLUTION. At that time the burden of proving any delay was or will be caused by

circumstances beyond the control of Defendant shall rest with Defendant. Failure of Defendant to timely comply with the notice requirement of this Section shall constitute a waiver by Defendant of any right it may have to raise such defense. Changes in Defendant's financial circumstances shall not in any event constitute circumstances beyond the control of the Defendant.

**XXXIII. AUTHORITY TO ENTER INTO THE CONSENT ORDER**

81. By signing this Consent Order, each of the undersigned Parties represents and warrants that he/she has completely read the foregoing, fully understands its contents, and intends to be bound thereby.

82. In addition, in the case of corporations, each signatory represents and warrants that he/she has been duly authorized to sign this document and so bind the corporation to all terms and conditions thereof.

**XXXIV. ENTRY OF CONSENT ORDER AND FINAL JUDGMENT BY CLERK**

83. The Parties agree and acknowledge that this Consent Order is being made available for public participation under state requirements and in a manner consistent with 40 CFR 123.27(d)(2)(iii), by providing for notice of the lodging of this Consent Order, opportunity for public comment and the consideration of any public comment.

84. Upon signing of this Consent Order by the Court, the Clerk of Courts is hereby directed to enter it upon the journal.

**XXXIV. EFFECTIVE DATE**

85. This Consent Order shall be effective upon the date of its entry by the Court.

ENTERED THIS \_\_\_\_\_ DAY OF \_\_\_\_\_ 2002.

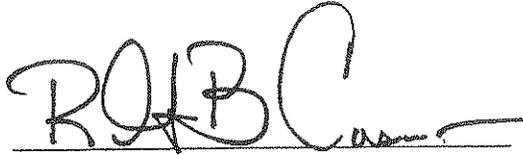
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JUDGE

APPROVED BY:

**D.H. Holdings Corporation**

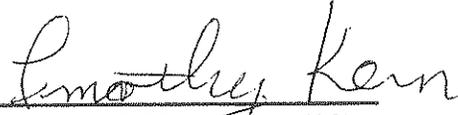
Carl A. Grabowski (By RBC)  
Title: ASST. SECY, CORR. COUNSEL  
Defendant D.H. Holdings Corporation





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DERR-00-RR-006

GENERIC STATEMENT OF WORK  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY  
STATE VERSION

Issued - 05/26/92  
Revised Final - 09/14/99

PURPOSE:

The purpose of this remedial investigation/feasibility study (RI/FS) is to investigate the nature and extent of releases of hazardous waste or constituents, pollutants, wastes, industrial wastes or contaminants at the Site, assess the potential risk to human health and the environment, and develop and evaluate potential remedial alternatives. The RI and FS are interactive and may be conducted concurrently so that the data collected in the RI influences the development of remedial alternatives in the FS, which in turn affects the data needs and the scope of treatability studies.

The Respondent shall conduct this RI/FS and shall produce an RI and FS report that are in accordance with this statement of work, the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (RI/FS Guidance) (U.S. EPA, Office of Emergency and Remedial Response, October 1988), and any other guidances that Ohio EPA uses in conducting an RI/FS (a list of the primary guidances is attached), as well as any additional requirements in the administrative order. The RI/FS Guidance describes the report format and the required report content. The Respondent shall furnish all necessary personnel, materials, and services needed, or incidental to, performing the RI/FS, except as otherwise specified in the administrative order.

At the completion of the RI/FS and the terms of this Order, the Ohio EPA shall be responsible for the selection of a site remedy. The remedial action alternative selected by the Ohio EPA shall be protective of human health and the environment, shall be in compliance with applicable or relevant and appropriate requirements of other laws, will be cost-effective, shall utilize permanent solutions and alternative treatment technologies or resource recovery technologies, to the maximum extent practicable, and shall address the statutory preference for treatment as a principal element. The final RI and FS reports, as approved by the Ohio EPA, shall, with the administrative record, form the basis for the selection of the site's remedy and will provide the information necessary to support the development of a decision document.

The Ohio EPA shall provide oversight of the Respondent's activities throughout the RI/FS. The Respondent shall support the Ohio EPA's initiation and conduct of activities related to the implementation of oversight activities.

TASKS/DELIVERABLES:

The Remedial Investigation/Feasibility Study consists of eleven tasks:

TASK 1 -- Scoping of the RI/FS

- A. Site Background/Site History
- B. Current or Previous Interim/Emergency Actions

TASK 2 -- Work Plan Requirements

- A. RI/FS Work Plan
- B. Quality Assurance Project Plan
- C. Field Sampling Plan
- D. Health and Safety Plan

TASK 3 -- Interim Actions

TASK 4 -- Community Relations

TASK 5 -- Remedial Investigation

- A. Environmental Setting
- B. Source Characterization
- C. Contamination Characterization
- D. Ecological Assessment
- E. Potential Receptor Identification
- F. RI report

TASK 6 -- Human Health Baseline Risk Assessment

- A. Conceptual Site Model
- B. Human Risk Assessment Report

TASK 7 -- Environmental Baseline Risk Assessment

- A. Conceptual Site Model
- B. Environmental Risk Assessment Report

TASK 8 -- Development and Screening Alternatives

- A. Remedial Action Objectives
- B. Technologies Screening
- C. Alternatives Array

TASK 9 -- Treatability Study

- A. Treatability Study Work Plan
- B. Treatability Study Evaluation Report

TASK 10 -- Detailed Analysis of Alternatives

- A. Detailed Analysis of Alternatives Report
- B. Feasibility Study Report

TASK 11 -- Monthly Progress Reports

TASK 1 -- SCOPING OF THE RI/FS

The Respondent shall describe the background of the Site, its history and current condition and outline the purpose and need for remedial investigation of the Site. Data gathered during previous investigations, site inspections and other relevant activities shall be used. Previous investigations shall be summarized and referenced. This information shall be documented in the RI/FS Work Plan (Task 2.A.).

A. Site Background/Site History

The Respondent shall review and analyze all existing site background information and will conduct a site visit to assist in planning the scope of the RI/FS.

1. Collect and analyze existing data and document the need for additional data

Before planning RI/FS activities, all existing site data will be thoroughly compiled and reviewed by the Respondent. Specifically, this will include presently available data relating to the varieties and quantities of hazardous, industrial and/or other wastes at the Site, and past disposal practices. This

will also include results from any previous sampling events that may have been conducted. The Site background may reference applicable existing reports. The Respondent shall provide, at a minimum, the following:

- a. Map(s) depicting property lines, topography and surface drainage, all known active or past treatment, storage or disposal areas, all known past and present product and waste underground storage tanks and associated piping, surrounding land use and location of wells;
- b. A history and description of ownership and operation;
- c. A summary of past and present permits requested and/or received;
- d. A summary of known or suspected source areas; and
- e. A summary of any previous response action conducted by state, local, federal or private parties.

The Respondent shall refer to Table 2-1 of the RI/FS Guidance for a comprehensive list of data collection information sources. This information will be utilized in determining additional data needed to characterize the Site, better define potential applicable requirements, and develop a range of preliminarily identified remedial alternatives. Data Quality Objectives (DQOs) will be established subject to Ohio EPA approval which specify the usefulness of existing data. Decisions on the necessary data and DQOs will be made by the Ohio EPA.

The Respondent shall provide an annotated bibliography of existing reports for the Site, including reports relevant to the RI/FS.

## 2. Conduct Site Visit

The Respondent shall conduct a site visit during the project scoping phase to assist in developing a conceptual understanding of sources and areas of contamination as well as potential exposure pathways and receptors at the site. During the site visit the Respondent shall observe the Site's physiography, hydrology, geology, and demographics, as well as natural resources, ecological and cultural features and receptors. This information will be utilized to better scope the project and to determine the extent of additional data necessary to characterize the site, better define potentially applicable requirements and narrow the range of preliminarily identified remedial alternatives.

## B. Implementation of Interim/Emergency Actions.

1. The Respondent's report shall document any interim or emergency action which were or are being undertaken at the Site. This shall include:
  - a. Objectives of the interim or emergency actions: how the action has mitigated or is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long term remedial action at the Site;
  - b. Design, construction, operation and maintenance requirements;
  - c. Schedules for design, construction and monitoring; and
  - d. Schedule for progress reports.

Respondent shall submit a report to the Ohio EPA documenting the results of Tasks 1.A.1., 1.A.2. and 1.B.1. as part of the of the RI/FS Work Plan.

## TASK 2 -- RI/FS WORK PLAN REQUIREMENTS

At the conclusion of the scoping phase, the Respondent will submit an RI/FS work plan, a field sampling plan, a Quality Assurance Project Plan (QAPP), and a site health and safety plan. The RI/FS work plan, field sampling plan, and QAPP must be reviewed and approved by Ohio EPA prior to the initiation of field activities.

### A. RI/FS Work Plan

A work plan documenting the decisions and evaluations completed during the scoping process will be submitted to Ohio EPA for review and approval. The work plan should be developed in conjunction with the QAPP, field sampling plan and the site health and safety plan, although each plan may be delivered under separate cover. The RI/FS Work Plan will also include a comprehensive description of the work to be performed as outlined in this SOW, including the methodologies to be utilized, as well as a corresponding schedule for completion. In addition, the work plan must include the rationale for performing the required activities.

In the RI/FS Work Plan, the Respondent shall present the justification for the proposed omission of any tasks of this SOW because of work that has already been performed or work that is not appropriate to the Site.

The RI/FS Work Plan will present a statement of the real or potential problem(s) posed by the Site and the objectives of the RI/FS. Furthermore, the plan will include a site background summary setting forth the Site description including the geographic location of the Site, and to the extent possible, a description of the Site's physiography, hydrology, geology, demographics, ecological, cultural and natural resource features; a synopsis of the site history and a description of previous responses that have been conducted at the site by local, state, federal, or private parties; a summary of the existing data in terms of physical and chemical characteristics of the contaminants identified, and their distribution among the environmental media at the site.

In addition, the plan will include a description of the site management strategy developed during scoping and data needs for evaluation of remedial alternatives. The plan will reflect coordination with treatability study requirements. The RI/FS Work Plan shall provide sufficient information for the Ohio EPA to identify applicable or relevant and appropriate Federal and state requirements (chemical-specific, location-specific and action-specific).

The RI/FS work plan shall provide a detailed description of the tasks to be performed, information needed for each task (e.g., for human health and environmental risk evaluation), information to be produced during and at the conclusion of each task, and a description of the work products that will be submitted to the Ohio EPA. This includes the deliverables set forth in the remainder of this statement of work: a schedule for each of the required activities; the conceptual site model for and the human health baseline risk assessment; the conceptual site model for and the environmental baseline risk assessment; the RI report; the FS report and required interim deliverables; monthly reports to the Ohio EPA; and meetings and presentations to the Ohio EPA at the conclusion of each major phase of the RI/FS.

Because of the unknown nature of the Site and iterative nature of the RI/FS, additional data requirements and analyses may be identified throughout the process. The Respondent will submit a technical memorandum documenting the need for additional data, and identifying the DQOs whenever such requirements are identified. In any event, the Respondent is responsible for fulfilling additional data and analysis needs identified by the Ohio EPA consistent with the purposes and objectives of this RI/FS.

#### B. Quality Assurance Project Plan

The Respondent shall prepare a plan to document all monitoring and investigation procedures: sampling, field measurements, sample analysis, toxicity testing, bioassays, and all modeling performed during the investigation to characterize the environmental setting, source(s), contamination, and human and biological receptors to ensure that all information, data and resulting decisions are technically sound, statistically valid and properly documented. This plan shall comport with Ohio EPA's Guidelines and Specifications for Preparing Quality Assurance Projects Plans, policy number DERR-00-RR-008. As required by Section VIII, Paragraph C, of this Order, Respondent shall schedule a meeting with this Agency to discuss the requirements of this plan.

#### 1. Data Collection Strategy

The strategy section of the (QAPP) shall include but not be limited to the following:

- a. Description of the types and intended uses for the data, relevance to remediation or restoration goals, and the necessary level of precision, accuracy, and statistical validity for these intended uses;
- b. Description of methods and procedures to be used to assess the precision, accuracy and completeness of the measurement data;
- c. Description of the rationale used to assure that the data accurately and precisely represent a characteristic of a population, variation of physical or chemical parameters throughout the Site, a process condition or an environmental condition. Factors which shall be considered and discussed include, but are not limited to:
  - i) Environmental conditions at the time of sampling;
  - ii) Sampling design (including number, location and distribution);
  - iii) Representativeness of selected media, exposure pathways, or receptors; and
  - iv) Representativeness of selected analytical parameters.
  - v) Representativeness of testing procedures and conditions; and
  - vi) Independence of background or baseline from site influences.

- d. Description of the measures to be taken to assure that the following data sets can be compared quantitatively or qualitatively to each other:
  - i) RI data collected by the Respondent over some time period;
  - ii) RI data generated by an outside laboratory or consultant employed by the Respondent versus data collected by the Respondent, and;
  - iii) Data generated by separate consultants or laboratories over some time period not necessarily related to the RI effort.
  - iv) Data generated by Ohio EPA or by an outside laboratory or consultant employed by Ohio EPA;
- e. Details relating to the schedule and information to be provided in quality assurance reports. These reports should include but not be limited to:
  - i) Periodic assessment of measurement data accuracy, precision and completeness;
  - ii) Results of performance audits;
  - iii) Results of system audits;
  - iv) Significant quality assurance problems and recommended solutions; and
  - v) Resolutions of previously stated problems.

## 2. Sample Analysis

The Sample Analysis section of the Quality Assurance Project Plan shall specify the following:

- a. Chain-of-custody procedures, including:
  - i) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment and verify the data entered onto the sample custody records;

- ii) Provision for a laboratory sample custody log consisting of serially numbered lab-tracking report sheets; and
  - iii) Specification of laboratory sample custody procedures for sample handling, storage and dispersement for analysis.
- b. Sample storage procedures and storage times;
- c. Sample preparation methods;
- d. Analytical procedures, including:
  - i) Scope and application of the procedure;
  - ii) Sample matrix;
  - iii) Potential interferences;
  - iv) Precision and accuracy of the methodology;
  - v) Method detection limits;
  - vi) Special analytical services required to ensure contract required detection limits do not exceed known toxicity criteria; and
  - vii) Verification and reporting of tentatively identified compounds.
- e. Calibration procedures and frequency;
- f. Data reduction, validation and reporting;
- g. Internal quality control checks, laboratory performance and systems audits and frequency, including:
  - i) Method blank(s);
  - ii) Laboratory control sample(s);
  - iii) Calibration check sample(s);
  - iv) Replicate sample(s);
  - v) Matrix-spiked sample(s);

- vi) "Blind" quality control sample(s);
  - vii) Control charts;
  - viii) Surrogate samples;
  - ix) Zero and span gases; and
  - x) Reagent quality control checks.
- h. Preventative maintenance procedures and schedules;
  - i. Corrective action (for laboratory problems); and
  - j. Turnaround time.

### 3. Modeling

The Modeling section of the Quality Assurance Project Plan shall apply to all models used to predict or describe fate, transport or transformation of contaminants in the environment and shall discuss:

- a. Model assumptions and operating conditions;
- b. Input parameters; and
- c. Verification and calibration procedures.

### 4. In Situ or Laboratory Toxicity Tests

The Toxicity Test section of the Quality Assurance Project Plan shall apply to all tests or bioassays used to predict or describe impacts of contaminants on a population, community, or ecosystem level.

### 5. Data Record

The QAPP shall also provide the format to be used to present the raw data and the conclusions of the investigation, as described in a, b, and c below:

- a. The data record shall include the following:
  - i) Unique sample or field measurement code;

- ii) Sampling or field measurement location and sample or measurement type;
- iii) Sampling or field measurement raw data;
- iv) Laboratory analysis ID number;
- v) Property or component measured; and
- vi) Result of analysis (e.g., concentration).

b. Tabular Displays

The following data shall be presented in tabular displays:

- i) Unsorted (raw) data;
- ii) Results for each medium, organism, or for each constituent measured;
- iii) Data reduction for statistical analysis;
- iv) Sorting of data by potential stratification factors (e.g., location, soil layer, topography, vegetation form);
- v) Summary data (i.e., mean, standard deviation, min/max values, and sample number); and
- vi) Comparisons with background or reference data.

c. Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

- i) Display sampling locations and sampling grid;
- ii) Indicate boundaries of sampling area, and areas where more data are required;
- iii) Display levels of contamination at each sampling location or location from which organism was taken;

- iv) Display geographical extent of contamination;
- v) Display contamination levels, averages and maxima;
- vi) Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters;
- vii) Indicate features affecting intramedia transport and show potential receptors;
- viii) Compare nature and extent of contamination with results of ecological or biological sampling or measurements; and
- ix) Display comparisons with background or reference analyses or measurements.

### C. Field Sampling Plan

#### 1. Sampling

The Sampling section of the Field Sampling Plan shall discuss:

- a. Sufficient preliminary sampling to ensure the proper planning of b through o below;
- b. Selecting appropriate sampling locations, depths, vegetation strata, organism age, etc. and documenting relevance of sample for intended biological toxicity tests or analyses;
- c. Providing a sufficient number of samples to meet statistical or other data useability objectives;
- d. Measuring all necessary ancillary data such as ambient conditions, baseline monitoring, etc.;
- e. Determining environmental conditions under which sampling should be conducted;
- f. Determining which media, pathways, or receptors are to be sampled (e.g., ground water, air, soil, sediment, biota, etc.);
- g. Determining which parameters are to be measured and where;

- h. Selecting the frequency and length of sampling period;
- i. Selecting the sample design (e.g., composites, grabs, random, repeated, etc.);
- j. Selecting the number, location, media or organisms for determining background conditions or reference conditions (refer to Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part A), Interim Final, EPA/540/1-89/002, December 1989);
- k. Measures to be taken to prevent contamination of the sampling equipment and cross contamination between sampling points;
- l. Documenting field sampling operations and procedures, including;
  - i) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters and adsorbing reagents);
  - ii) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;
  - iii) Documentation of specific sample preservation method;
  - iv) Calibration of field devices;
  - v) Collection of replicate and field duplicate samples;
  - vi) Submission of field-biased and equipment blanks, where appropriate;
  - vii) Potential interferences present at the site or facility;
  - viii) Construction materials and techniques associated with monitoring wells and piezometers;
  - ix) Field equipment listing and sample containers;
  - x) Sampling order; and
  - xi) Decontamination procedures.

- m. Selecting appropriate sample containers;
- n. Sample preservation; and
- o. Chain-of-custody, including:
  - i) Standardized field tracking reporting forms to establish sample custody in the field prior to and during shipment;
  - ii) Sample sealing, storing and shipping procedures to protect the integrity of the sample; and,
  - iii) Pre-prepared sample labels containing all information necessary for effective sample tracking.

## 2. Field Measurements

The Field Measurements section of the Field Sampling Plan shall discuss:

- a. Selecting appropriate field measurement locations, depths, organism age etc.;
- b. Providing a sufficient number of field measurements that meet statistical or data useability objectives;
- c. Measuring all necessary ancillary data such as ambient or baseline environmental conditions;
- d. Determining conditions under which field measurement should be conducted;
- e. Determining which media, pathways, or receptors are to be addressed by appropriate field measurements (e.g., ground water, air, soil, sediment, biota, etc.);
- f. Determining which physical, chemical, or biological parameters are to be measured and where;
- g. Selecting the frequency and duration of field measurement; and
- h. Documenting field measurement operations and procedures, including:

- i) Procedures and forms for recording raw data and the exact location, time and Site specific considerations associated with the data acquisition;
  - ii) Calibration of field devices;
  - iii) Collection of replicate measurements;
  - iv) Submission of field-biased blanks, where appropriate;
  - v) Potential interferences present at the Site;
  - vi) Construction materials and techniques associated with monitoring wells and piezometers used to collect field data;
  - vii) Field equipment listing;
  - viii) Order in which field measurements were made; and
  - ix) Decontamination procedures; and
- i. Selecting the number, location, media, and organisms for determining background or reference conditions.

D. Health and Safety Plan.

The Respondent shall develop a Health and Safety plan to protect the health and safety of personnel involved in the site investigations and the surrounding community.

- 1. Major elements of the Health and Safety Plan shall include:
  - a. Facility or site description including availability of resources such as roads, water supply, electricity and telephone service;
  - b. Description of the known hazards and an evaluation of the risks associated with the incident and with each activity conducted;
  - c. Listing of key personnel (including the site safety and health officer) and alternates responsible for site safety, response operations, and for protection of public health;
  - d. Delineation of work area, including a map;

- e. Description of levels of protection to be worn by personnel in the work area;
  - f. Description of the medical monitoring program for on-site responders;
  - g. Description of standard operating procedures established to assure the proper use and maintenance of personal protective equipment;
  - h. The establishment of procedures to control site access;
  - i. Description of decontamination procedures for personnel and equipment;
  - j. Establishment of site emergency procedures;
  - k. Availability of emergency medical care for injuries and toxicological problems;
  - l. Description of requirements for an environmental monitoring program. (This should include a description of the frequency and type of air and personnel monitoring, environmental sampling techniques and a description of the calibration and maintenance of the instrumentation used.);
  - m. Specification of any routine and special training required for responders; and
  - n. Establishment of procedures for protecting workers from weather-related problems.
2. The Health and Safety Plan shall be consistent with:
- a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
  - b. Section 111(c)(6) of CERCLA;
  - c. EPA Order 1440.3 -- Respiratory Protection;
  - d. EPA Order 1440.2 -- Health and Safety Requirements for Employees Engaged in Field Activities;

- e. EPA Occupational Health and Safety Manual;
- f. EPA Interim Standard Operating Safety Procedures and other EPA guidance as developed by EPA;
- g. OSHA regulations particularly in 29 CFR 1910 and 1926;
- h. State and local regulations; and
- i. Site or facility conditions.

The Safety Plan should identify problems or hazards that may be encountered and their solution. Safety procedures to be followed to protect third parties, such as visitors or the surrounding community, should also be provided.

### TASK 3 -- INTERIM ACTIONS

- A. At any time during the Remedial Investigation, the Respondent may propose to conduct or the Ohio EPA may require that the Respondent conduct an interim remedial action(s). Any interim remedial action proposed by the Respondent for the Site must be approved by the Ohio EPA prior to implementation. The following factors shall be considered in determining the appropriateness of an interim remedial action:
  - 1. Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous wastes or substances;
  - 2. Actual or potential contamination of drinking water supplies or sensitive ecosystems;
  - 3. Hazardous waste or substances in drums, barrels, tanks or other bulk storage containers that may pose a threat of release;
  - 4. High levels of hazardous waste or substances in soils largely at or near the surface that may migrate;
  - 5. Weather conditions that may cause hazardous waste or substances to migrate or be released;
  - 6. Threat of fire or explosion; and

7. Other situations or factors that may pose threats to public health, welfare or the environment.
- B. The Respondent shall develop and submit for approval an Interim Action Work Plan that includes, but is not limited to, the following:
1. A discussion of the technical factors of importance for implementing the Interim Action;
  2. A justification for selection of the preferred action and/or system modification based on its ability to meet the interim action criteria of preventing, minimizing or mitigating a substantial threat to the public health or the environment;
  3. Treatment, storage or disposal of contaminated media in a manner that complies with federal and state laws, requirements and guidance documents adopted thereunder. Respondent shall obtain any permits necessary for implementation of the Interim Action. Ohio EPA shall consider, in a timely manner, such permit applications which Respondent may be required to submit pursuant to the Interim Action Work Plan;
  4. A schedule of tasks, length of tasks and completion times, including any permits, permits-to-install and permits-to-operate, according to calendar days;
  5. A monitoring strategy to determine the effectiveness of the Interim Action;
  6. A Quality Assurance Project Plan (QAPP) for the Interim Action;
  7. a Health and Safety Plan (HASP) for the Interim Action.
- C. Within twenty (20) calendar days following Ohio EPA approval of the Interim Action Work Plan, Respondent shall commence implementation of the work as approved and in accordance with the schedule contained therein.
- D. Progress on the Interim Action shall be reported in the Monthly Progress Report per Task 11.

#### TASK 4 -- COMMUNITY RELATIONS

This task shall be completed by the Ohio EPA.

#### TASK 5 -- REMEDIAL INVESTIGATION

The Respondent shall conduct those investigations necessary to: characterize the site (Environmental Setting); define the source (Source Characterization); define the degree and extent of contamination (Contamination Characterization and Ecological Assessment); and identify actual or potential receptors (Ecological and Human Risk Assessment).

The investigations should result in data of adequate technical quality to support the development of the Human Health Baseline Risk Assessment and the Ecological Risk Assessment and the evaluation of remedial action alternatives of the Feasibility Study.

Remedial Investigation activities shall follow the plans set forth in Task 2. All sampling, analyses, and measurements shall be conducted in accordance with the QAPP. All sampling and measurement locations shall be documented in a log and identified on a detailed site map.

##### A. Environmental Setting

The Respondent shall collect information to supplement and verify existing information on the environmental setting at the site as well as the environmental setting adjacent to and surrounding the Site. The Respondent shall characterize the following:

##### 1. Regional Hydrogeology

The Respondent shall conduct a program to evaluate the regional hydrogeologic characteristics surrounding the facility. Regional information can be obtained as described in Task 1. This shall include but not be limited to:

- a. Depth to bedrock and lithology;
- b. Characteristics of major stratigraphic units and the depositional environment;
- c. Identification of regional aquifer(s);

- d. Identification of all residential, municipal, industrial and agricultural wells within a four (4) mile radius of the Site. Include any available information such as well logs, construction details, average yield and chemical analyses;
- e. Direction of ground water flow in the regional aquifer(s);
- f. Identification and characterization of recharge and discharge areas, with amount of recharge and discharge;
- g. Description of regional geomorphology, including locations of surface water bodies and floodways, etc. This description should include an analysis of any topographic features that may influence the ground water flow system; and
- h. Description of structural features such as jointing, faulting and folding.

## 2. Site Hydrogeology and Soil Characteristics

The Respondent shall conduct a program to evaluate site-specific hydrogeologic characteristics and soil characteristics at the Site. This description shall be based on data collected from bore holes, piezometers, laboratory and field tests. The description shall include:

- a. An accurate classification and description of the consolidated and unconsolidated stratigraphic units beneath the Site. This shall include:
  - i) Hydraulic conductivity (vertical and horizontal);
  - ii) Porosity, effective porosity, and bulk density;
  - iii) Rock and soil (ASTM 2488 and 2487) classification;
  - iv) Grain size distribution (sieve and hydrometer) curves;
  - v) Thickness;
  - vi) Lateral extent;

- vii) Moisture content;
  - viii) The attenuation capacity and mechanisms of attenuation of the natural earth material and/or fill (i.e., ion exchange capacity, base saturation, organic carbon content, mineral content, soil sorptive capacity, storage capacity);
  - ix) Soil Ph;
- b. The Respondent shall conduct a program to characterize the near surface soil and rock units. This shall include:
- i) SCS soil classification;
  - ii) Surface soil distribution;
  - iii) Infiltration;
  - iv) Evapotranspiration;
- c. A discussion of the local occurrence of ground water including:
- i) Identification of all aquifer systems, including depth from the surface and lateral and vertical extent. (Aquifer system means one or more geologic unit or formation that is wholly or partly saturated with water and is able to store, transmit and yield significant amounts of water to wells or springs.);
  - ii) Identification of all significant saturated zones above the aquifer systems;
  - iii) Depth to the water table;
  - iv) Ground water flow direction and rates in the aquifers and all strata above the aquifers;
  - v) Effects of stratification on saturated and unsaturated flow;
  - vi) Description of the interconnection between the saturated zones and the aquifers, surface water, seeps and springs;

- vii) Description of recharge and discharge areas within the site boundaries. This shall include any relationship between ground water and springs, streams and other surface water features;
  - viii) Temporal fluctuations (i.e., seasonal and man-made) in ground water levels and their effects on ground water flow direction; and
  - ix) Identification of zones of high permeability that may act as a migration route for contaminants.
- d. Hydrogeologic cross sections showing the extent (depth, thickness and lateral extent) of each hydrogeologic unit shall be developed. Cross sections shall be developed in various orientations across the Site (e.g., in the direction of ground water flow and orthogonal to ground water flow). At a minimum the following shall be identified:
- i) Structures such as zones of fracturing or channeling likely to influence contaminant migration in the consolidated or unconsolidated deposits;
  - ii) Zones of higher permeability, such as sand and gravel deposits, that might direct the flow of contaminants;
  - iii) Zones of low permeability that may restrict and/or attenuate the flow of contaminants; and
  - iv) Water-bearing zones above the confining layer that may serve as pathways for contaminant migration including perched zones of saturation.
- e. Based on data obtained from ground water monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring including:
- i) Water level contour and/or potentiometric surface maps;
  - ii) Hydraulic cross sections showing vertical gradients;
  - iii) Flow nets, including the vertical and horizontal components of flow and the interconnection between waterbearing strata; and

- iv) Any temporal changes in hydraulic gradients and flow directions due, for example, to seasonal or man-made influences.
- f. A description of man-made influences that may affect the hydrogeology of the Site, identifying:
  - i) Active and inactive water supply and production wells with appropriate pumping schedules; and
  - ii) Man-made structures such as pipelines, french drains, ditches, unlined and lined ponds, lagoons, septic tanks, NPDES permitted outfalls, retention areas and utility lines.
- g. An area-specific description of the geomorphology at the Site. At a minimum this shall include;
  - i) An analysis of any topographic feature that may influence the ground water flow system;
  - ii) A surface topography map depicting (at a minimum) streams, wetlands, topographic depressions and springs. The topographic map shall be constructed by a qualified professional and shall provide contour intervals at a level of detail appropriate for the site specific hydrogeologic investigation (e.g., two-foot intervals). The map shall depict the location of all borings, monitoring wells and cross sections.
- h. An area-specific description of the structural geology at the Site;
- i. The RI report shall document the methods and procedures used to gather and evaluate the hydrogeologic data. These methods and procedures shall be in accordance with Ohio EPA and U.S. EPA guidance. This may include but is not limited to:
  - i) The drilling and soil sampling methods used in characterizing the soil and hydrogeologic characteristics of the Site (including all boring logs and raw data);
  - ii) The analytical procedures and methods used to characterize the soil and rock materials obtained from the borings and/or test pits;

- iii) The methods, equipment and procedures used to define the aquifer systems and all significant zones of saturation above the uppermost aquifer system including:
  - 1) Well and piezometer location, depth, construction and installation specifications (including diagrams);
  - 2) Water level measurements and procedures;
  - 3) Ground water seepage observations during drilling; and
  - 4) Pumping tests and slug tests (including type, description and rationale for its use, raw data and method of interpreting the results).
- iv) A description, rationale and raw data of indirect methods such as soil survey, geophysical and modeling. (These methods can be used to infer ground water characteristics and support or guide direct methods. However, no site remedial investigation can be based strictly on these methods.)

### 3. Surface Water and Sediment

The Respondent shall conduct a program to characterize any surface water bodies in the vicinity of the Site. Such characterization shall include, but not be limited to, the following activities and information:

- a. Description of the temporal and permanent surface water bodies including:
  - i) For lakes and estuaries: location, elevation, surface area, inflow, outflow, depth, temperature stratification and volume;
  - ii) For impoundments: location, elevation, surface area, depth, volume, freeboard and purpose of impoundment;
  - iii) For streams, ditches, drains, swamps and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations and flood zones (i.e., 50 and 100 year events);
  - iv) Drainage patterns;
  - v) Evapotranspiration; and

- vi) Any other known discharges including those permitted by NPDES.
- b. Description of the chemistry of the surface water and sediments. This includes determining the Ph, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients, chemical oxygen demand, total and dissolved organic carbon, specific contaminant concentrations, etc.
- c. Description of sediment characteristics including:
  - i) Deposition area, patterns, and rates;
  - ii) Thickness profile; and
  - iii) Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity, Ph, etc.)

#### 4. Air

The Respondent shall provide information characterizing the climate in the vicinity of the Site in general, and at the time of the investigation(s). Such information shall include, but not be limited to:

- a. A description of the following parameters:
  - i) Annual and monthly rainfall averages;
  - ii) Monthly temperature averages and extremes;
  - iii) Wind speed and direction;
  - iv) Relative humidity/dew point;
  - v) Atmospheric pressure;
  - vi) Evaporation data;
  - vii) Development of inversions; and
  - viii) Climate extremes that have been known to occur in the vicinity of the facility, including frequency of occurrence.

- b. A description of topographic and man-made features which affect air flow or emission patterns, including:
  - i) Ridges, hills or mountain areas;
  - ii) Canyons or valleys;
  - iii) Surface water bodies (e.g. rivers, lakes, bays, etc.);
  - iv) Wind breaks and forests; and
  - v) Buildings; and
  - vi) Any other features that may affect air flow or emission patterns.

## B. Source Characterization

The Respondent shall collect analytical data to completely characterize the wastes and the areas where wastes have been placed, collected, came to be located or removed including: type (hazardous, solid, residential, industrial, etc.); quantity; physical form; disposition (containment or nature of deposits); and Site characteristics affecting release (e.g., Site security and engineering barriers). Data shall include all information referenced in the Remedial Investigation Work Plan (Task 2). This shall include quantification of the following specific characteristics, at each source area:

### 1. Unit/Disposal Area characteristics:

- a. Location of unit/disposal area;
- b. Type of unit/disposal area;
- c. Design features;
- d. Operating practices (past and present);
- e. Period of operation;
- f. Age of unit/disposal area;
- g. General physical conditions; and
- h. Method used to close the unit/disposal area.

2. Waste Characteristics:

- a. Type of waste placed in the unit;
  - i) Hazardous classification (e.g., listed, flammable, reactive, corrosive, oxidizing or reducing agent);
  - ii) Quantity; and
  - iii) Chemical composition.
- b. Physical and chemical characteristics;
  - i) Physical form (solid, liquid, gas);
  - ii) Physical description (e.g., powder, oily sludge);
  - iii) Temperature;
  - iv) Ph;
  - v) General chemical class (e.g., acid, base, solvent);
  - vi) Molecular weight;
  - vii) Density;
  - viii) Boiling point;
  - ix) Viscosity;
  - x) Solubility in water;
  - xi) Cohesiveness of the wastes;
  - xii) Vapor pressure; and
  - xiii) Flash point.
- c. Migration and dispersal characteristics of the waste;
  - i) Sorption;

- ii) Biodegradability, bioconcentration, biotransformation;
- iii) Photodegradation rates;
- iv) Hydrolysis rates;
- v) Chemical transformations;
- vi) Chemical interactions; and
- vii) Products of all such reactions or processes.

The Respondent shall document the procedures used in making the above determinations.

### C. Contamination Characterization

The respondent shall collect analytical data on air, ground water, soils, surface water, sediment and subsurface gas contamination in the vicinity of the Site. This data shall be sufficient to define the extent, origin, direction and rate of movement of contaminants. Data shall include all information referenced in the Remedial Investigation Work Plan (Task 2). The Respondent shall address the following types of contamination at the Site:

#### 1. Ground Water Contamination

The Respondent shall conduct a ground water investigation to characterize the nature and extent of any plumes of contamination at the Site. The investigation shall include a description and quantification of ground water quality in the aquifer systems and all significant zones of saturation or permeable zones that may act as pathways for contaminant migration. This investigation shall at a minimum provide the following information:

- a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Site;
- b. The horizontal and vertical direction of contamination movement;
- c. The velocity of contaminant movement;
- d. The horizontal and vertical concentration profiles of Appendix VIII constituents in the plume(s);

- e. An evaluation of site specific factors influencing the plume movement;
- f. An extrapolation of future contaminant movement; and
- g. An investigation to characterize the nature and extent of contamination of residential, municipal, industrial and agricultural wells within the vicinity of the Site.

The Respondent shall document the procedures used in making the above determinations (e.g., well design, well construction, geophysics, modeling, etc.). These procedures shall comport with appropriate U.S. EPA and Ohio EPA guidance.

## 2. Soil Contamination

The Respondent shall conduct an investigation to characterize the nature and extent of contamination of the soil and rock units in the vicinity of the contaminant release. The investigation shall include the following information:

- a. A description of the vertical and horizontal extent and pattern of contamination;
- b. A description of contaminant and soil chemical physical, and biological properties within the contaminant source area and plume. This includes a site specific discussion of contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradation, hydrolysis, photolysis, oxidation and other factors that might affect contamination migration and transformation;
- c. Specific contaminant concentrations;
- d. The velocity and direction of contaminant movement; and
- e. An extrapolation of future contaminant movement.

The Respondent shall document the procedures used in making the above determinations.

### 3. Surface Water and Sediment Contamination

The Respondent shall conduct a investigation to characterize the nature and extent of contamination in surface water bodies and sediment resulting from contaminant releases at the Site. The investigation shall include, but not be limited to, the following information:

- a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Site, and the extent of contamination in underlying sediments;
- b. The horizontal and vertical direction of contaminant movement in surface water and sediment;
- c. The contaminant velocity;
- d. An evaluation of the physical, biological and chemical factors influencing contaminant movement;
- e. An extrapolation of future contaminant movement; and
- f. A description of the chemistry of the contaminated surface waters and sediments. This includes determining the Ph, total dissolved solids, specific contaminant concentrations, etc.

Respondent shall document the procedures used in making the above determinations.

### 4. Air Contamination

The Respondent shall conduct an investigation to characterize the nature and extent of particulate and gaseous contaminants released into the atmosphere. The investigation shall provide the following information:

- a. A description of the horizontal and vertical direction and velocity of contaminant movement;
- b. The rate and amount of the release;
- c. Chemical and physical nature of contaminated particulates including respirable portion, source emission rates, contaminant concentrations in respirable portions;

- d. Existing or potential human or biological receptors, of air contaminants, including respirable contaminant concentrations at known or potential receptors; and
- e. The chemical and physical composition of the contaminant(s) released, including vertical and horizontal concentration profiles; and
- f. Environmental factors that alter or mitigate fate and transport of contaminants in the atmosphere.

The Respondent shall document the procedures used in making the above determinations.

#### 5. Subsurface Gas Contamination

The Respondent shall conduct an investigation to characterize the nature and extent of subsurface gases emitted from buried hazardous, industrial and/or other waste and hazardous constituents in the soil and/or ground water. This investigation shall include the following information:

- a. A description of the horizontal and vertical extent of subsurface gases migration;
- b. The chemical composition of the gases being emitted from the subsurface or surface;
- c. The rate, amount, and density of the gases being emitted; and
- d. Horizontal and vertical concentration profiles of the subsurface gases emitted.

The Respondent shall document the procedures used in making the above determinations.

#### D. Ecological Assessment

The Respondent shall conduct an investigation to characterize any adverse effects to flora and fauna, at the population, community or ecosystem level, that is or has been caused or influenced by contamination from the facility. The data from this investigation shall be collected in a manner that is compatible and concurrent with the other sections of Task 4. The activities described for this section may be

performed iteratively and/or in a phased approach as more data is gathered during other portions of the remedial investigation. Therefore, parts of the work plans(s) for this section may be submitted as separate deliverables from Task 2.C., Phase I Ecological Assessment.

#### 1. Site Characterization

Based on existing data and limited field work, the respondent shall consider the following:

- a. See Task 1.A. (Site Background/Site History);
- b. Identification of potential and probable ecological receptors including threatened and endangered species, unique and sensitive habitats or resources, etc.;
- c. Identification of potential or probable exposure points for ecological receptors;
- d. Document known or suspected effects of site contaminants to biota; and
- e. Additional data needed for site characterization and the rationale for its necessity.

#### 2. Additional Site Characterization (Phase Ib Ecological Assessment)

Based on evaluations from Task 5.D.1. above, if existing information is insufficient to determine the extent and magnitude of adverse impacts and whether a Phase II Ecological Assessment is warranted, the Respondent shall develop work plans for and implement the following in keeping with the requirements of Tasks 2.B. and 2.C.:

- a. Identification and evaluation of habitats that are or may be exposed to contamination;
- b. Semiquantitative surveys of flora and fauna that are or may be exposed to contamination, which shall include, but not be limited to:
  - i) All vegetative strata;
  - ii) Flora and fauna in all contaminated media;

- iii) Population parameters (e.g., density, frequency, age distribution);  
and
  - iv) Community parameters (e.g., diversity, structure, stability).
- c. Identification of background or reference area for each exposed population, community or ecosystem and completion of surveys for comparison to Tasks 5.D.2.a. and 5.D.2.b. above; and
  - d. Sampling of media or biota for accumulation or intake studies and toxicity tests to determine the extent of toxicity as related to areas of known or potential contamination.
3. Initial Toxicity Assessment (to be performed in conjunction with 5.D.1. and 5.D.2. above, as applicable)

The respondent shall perform a literature review of information regarding the toxicity, fate and transport characteristics, ecological effects, and likely biological receptors for the contaminants of concern.

4. Preliminary Ecological Assessment

The respondent shall combine the results of Tasks 5.D.1. to 5.D.3., above in order to define or evaluate the following on a site-specific basis:

- a. Initial identification of exposure pathways and ecological receptors;
  - b. The existence of or potential for current and future adverse effects to occur on a population, community or ecosystems level; and
  - c. Determine if the results of the Phase I Ecological Assessment indicate the need for further ecological studies.
5. Phase II Ecological Assessment

Respondent shall prepare and implement, following Ohio EPA approval, a detailed work plan for further site investigations that shall be compatible with requirements listed in 4.D.3, but also include the following:

- a. Study objectives and relevance to risk assessment objectives;
- b. Identification of ecological measurement endpoints, assessment endpoints, and endpoint selection criteria;

- c. Semiquantitative and quantitative surveys of flora and fauna;
- d. Chemical sampling in potentially exposed habitats and reference sites;
- e. Laboratory and in situ toxicity testing; and
- f. Tissue analyses.

6. Ecological Assessment Report

The respondent shall prepare a report including all results from Tasks 5.D.1. to 5.D.5. above for incorporation into the Environmental Risk Assessment (see Task 6).

Special Note: Because seasonal effects can impart a profound influence on the results of biological or ecological sampling, the Ohio EPA requires that all sampling or testing of flora and fauna shall take place between April 1 and October 30 unless otherwise approved by the Site Coordinator.

E. Potential Receptor Identification

The Respondent shall collect data describing the human populations, plant and animal populations, communities, and ecosystems that are or may be susceptible to contaminant exposure from the Site. Chemical analysis of biological samples or data on observable effects in ecosystems may be needed to properly identify biological receptors. Some of this information shall be obtained from information gathered during the Ecological Assessment (see Task 5.D.). The following characteristics shall be identified:

1. Local current and potential future uses of ground water:
  - a. Type of use (e.g., municipal or residential, agricultural, domestic/non-potable and industrial, nonagricultural use by flora and fauna); and
  - b. Location of ground water users including wells and discharge areas.
2. Local current and potential future uses of surface waters in the vicinity of the Site:

- a. Type of use (e.g., municipal or residential, agricultural, domestic/non-potable and industrial, nonagricultural use by flora and fauna); and
  - b. Location of surface water users or use areas.
3. Use of or access by humans or biota to the site or facility and adjacent lands, including but not limited to:
- a. Recreational;
  - b. Hunting;
  - c. Residential;
  - d. Commercial;
  - e. Zoning;
  - f. Nonagricultural use by flora and fauna; and
  - g. Future land use or access.
4. A demographic profile of the people who use or who have access to the facility and adjacent land including, but not limited to age, sex and sensitive subgroups.

F. RI Report

The Respondent shall prepare a Remedial Investigation (RI) Report to present Task 5, above, and Tasks 6 and 7, described below. The RI Report shall be developed in draft form for Ohio review and approval (refer to Section XIV of this Order, Review of Submittals). The report shall describe the nature and extent of contamination (qualitative/quantitative) in relation to background areas indicative for the area.

TASK 6 -- HUMAN HEALTH BASELINE RISK ASSESSMENT

The Respondent shall prepare a thorough analysis and summary of all Site investigations and their results. The objective of this task will be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to adequately describe the nature and extent of contamination,

actual and potential future threats to human health and/or the environment and to support the feasibility study.

The results and data from all site investigations shall be organized and presented logically so that the relationships between and among remedial investigations for all media and receptors are apparent.

A. Conceptual Site Model.

In order to expedite review and approval of the Human Risk Assessment by the Ohio EPA the Respondent shall prepare a Conceptual Site Model (CSM) prior to completing the Human Risk Assessment Report. The CSM is an interim document that shall briefly describe the following in tables or lists based on pre-existing site information and information gathered to date during the RI:

1. Goals of the assessment;
2. Types and sources of information or data that will be used in the assessment;
3. Major assumptions or limitations influencing the application of the assessment;
4. Criteria for selecting chemicals of concern;
5. Exposure pathways, scenarios, and assumptions; and
6. Other interim deliverables.

B. Human Risk Assessment Report.

Based upon the CSM, the Respondent shall prepare a risk assessment which shall contain a discussion of and present the data required in the tasks outlined below:

1. Selection of Contaminants of Concern. Respondent shall:
  - a. Evaluate data based on approved data useability procedures (e.g., laboratory or data validation qualifiers, frequency and contaminant concentrations);

- b. Further reduce the number of chemicals of concern based on chemical toxicity to human and biological receptors, number of chemicals, environmental mobility, background data, etc.; and
    - c. Develop a final list of Contaminants of Concern.
  2. Estimate of Exposure Point Concentrations of Indicator Chemicals. Respondent shall:
    - a. Combine site monitoring data and environmental modeling results to:
      - i) identify exposure pathways;
      - ii) estimate exposure point concentrations; and
      - iii) compare these concentrations to requirements, standards and criteria.
  3. Estimate of Chemical Intakes. Respondent shall:
    - a. Provide estimates of chemical intakes from:
      - i) Air
      - ii) Ground water
      - iii) Surface water
      - iv) Other exposure pathways (soils, food-stuffs, recreation, etc.)
    - b. Combine pathway-specific intakes to yield total oral and total inhalation routes.
  4. Respondent shall evaluate critical toxicity values (i.e., numerical values describing a chemical toxicity) and review general toxicological information for the indicator chemicals.
  5. Risk Characterization. Respondent shall provide a detailed characterization of the risk posed by releases of toxic chemicals from the site. The characterization shall include the following elements:

- a. Noncarcinogenic effects using the Hazard Index approach, where:

$$HI = E(1)/RL(1) + E(2)/RL(2) + \dots E(i)/RL(i)$$

E(i) = Exposure level (or intake) for the (i)th toxicant

RL(i) = Reference level (or intake) for the (i)th toxicant

- b. Potential carcinogenic effects using the predicted risk approach, where:

$$\text{Risk} = \text{CDI} \times \text{Carcinogenic Potency Factor}$$

CDI = Chronic Daily Intake

It is assumed that risks are additive and there is independence of action by the compounds involved. Therefore, the following equations are used:

$$\text{Carcinogenic risk for chemical X} = [\text{CDI (inhalation)} \times \text{PF (inhalation)}] + [\text{CDI (oral)} \times \text{PF (oral)}]$$

Total carcinogenic risk = (carcinogenic risk for chemical 1 + carcinogenic risk for chemical 2 + ... + carcinogenic risk for chemical (i))

- c. Uncertainties.

Respondent shall provide a discussion of the uncertainties and assumptions made in the assessment process.

#### TASK 7 -- ENVIRONMENTAL BASELINE RISK ASSESSMENT.

The Respondent shall prepare a risk assessment which shall contain a discussion of present and future potential risk to ecosystems and populations exposed to contamination; information necessary to evaluate the environmental impact of proposed remedial alternatives; and information that can be utilized for the development of subsequent cleanup criteria in the tasks outlined below (note the Site Coordinator may approve combination of Tasks 6 and 7 into a single set of deliverables):

A. Conceptual Site Model.

The respondent shall prepare an interim document as defined in Task 6.A. above with emphasis on site ecology and biological receptors.

B. Environmental Risk Assessment Report

1. Briefly Describe the Site and Study Area:

- a. Describe physical and chemical factors that impact site ecology (e.g., fate and transport of contaminants, bioavailability, etc.);
- b. Describe past or current practices, disturbances, or stresses that impact(ed) site ecology;
- c. Describe the areal extent of environmental assessment;
- d. Provide a full account of ecosystems and populations potentially exposed to contamination; and
- e. Describe current and projected land use in and around the site as relevant to site ecology.

2. Describe Contaminants and Ecological Endpoints of Concern:

- a. (See Task 6.B.1);
- b. Specifically consider contaminants that pose toxicity or bioaccumulation potential to biological receptors and/or are available for exposure to populations and ecosystems; and
- c. Measurement and assessment endpoints and indicator species and rationale for their selection.

3. Characterize Exposure:

- a. Combine site data, environmental modeling results and peer reviewed scientific literature to:
  - i) identify exposure pathways; and
  - ii) estimate exposure point concentrations by species, habitat, and exposure scenario; and

- iii) identify site specific fate and transport processes.
- b. Verify exposure to populations or ecosystems:
  - i) show correlations between concentrations and appropriate ecological endpoints (e.g., toxicity tests and population studies) along likely exposure pathways; and
  - ii) compare data from other toxicity tests, population studies, modeled uptakes, or reference areas to show exposure has occurred.
- 4. Characterize Risk or Threat.

The Respondent shall discuss and reduce the uncertainty over the receptor populations, communities, or ecosystems that are or may be affected; the estimation that adverse effect(s) will or are occur(ring); the magnitude of such an effect(s); and the temporal character of such an effect(s) by:

- a. Identifying requirements, standards and criteria;
- b. Identifying relevant, peer reviewed literature toxicity values or toxicological effects where the above are lacking;
- c. Comparison of exposure concentrations to a. and b. above, using suitable uncertainty factors and considering both chronic and acute endpoints;
- d. Presenting the number and magnitude of exceedances of a and b above;
- e. Presenting supporting evidence of risk from:
  - i) contaminant concentrations in biota;
  - ii) toxicity test results;
  - iii) supporting literature;
  - iv) field surveys of receptor populations;
  - v) measures of community structure and ecosystem function;

- vi) comparison with reference or background data or observations; and
  - f. Discussing adverse or potential adverse effects under future use conditions.
5. Summary and Conclusions:
- a. Summarize effects or potential effects of contamination to biological populations, communities or ecosystems under current and future use conditions;
  - b. Describe future effects in absence of remedial action; and
  - c. Describe population, community or ecosystem characteristics that may impact the nature of remedial actions.
6. Assessment of Uncertainties and Limitations:
- a. Describe all sources of uncertainty (e.g., variance estimates, underlying model assumptions, lack of toxicity information, unexpected influences on ecological assessment, etc.), their magnitude and direction of impact on estimation of risk; and
  - b. Describe assessment limitations (e.g., deviations from intended goals, data gaps, etc.).

#### TASK 8-DEVELOPMENT AND SCREENING OF REMEDIAL ALTERNATIVES

The development and screening of remedial alternatives is performed to develop an appropriate range of waste management options that will be evaluated. This range of alternatives should include as appropriate, options in which treatment is used to reduce the toxicity, mobility, or volume of wastes, but varying in the types of treatment, the amount treated, and the manner in which long-term residuals or untreated wastes are managed; options involving containment with little or no treatment; options involving both treatment and containment; and a no-action alternative. The following activities will be performed by the Respondent as a function of the development and screening of remedial alternatives.

The Respondent will begin to develop and evaluate a range of appropriate waste management options that at a minimum ensure protection of human health and the environment, concurrent with the RI site characterization tasks.

## A. Remedial Action Objectives

### 1. Develop and document remedial action objectives

The Respondent shall develop preliminary remedial objectives, specifying the contaminant(s) and media or medium of interest, exposure pathway and preliminary remediation goals that establish a range of treatment and containment alternatives to be evaluated.

These remedial action objectives shall be based on information gathered during the Remedial Investigation, pertinent Ohio EPA guidance, chemical specific ARAR's, when available other information (e.g., Rfds) and site specific factors, and shall be not inconsistent with section 300.430 of the NCP. Final remediation goals shall be determined by the Ohio EPA at or after the point the remedy is selected and are not part of this order.

In order to expedite review and approval of the Feasibility Study, the Respondent shall prepare a technical memorandum outlining the remedial action objectives.

## B. Technologies Screening

### 1. Develop general response actions

The Respondent shall develop general response actions for each medium of interest defining containment, treatment, excavation, pumping, or other actions, singly or in combination, to satisfy the remedial action objectives.

### 2. Identify areas or volumes of media

The Respondent shall identify areas or volumes of media to which general response actions may apply, taking into account requirements for protectiveness as identified in the remedial action objectives. The chemical and physical characterization of the Site will also be taken into account.

### 3. Identify, screen, and document remedial technologies

The Respondent shall identify and evaluate technologies applicable to each general response action to eliminate those that cannot be implemented at the Site. General response actions will be refined to specify remedial technology types. Technology process options for each of the technology types will be identified either concurrent with the identification of technology

types, or following the screening of the considered technology types. Process options shall be evaluated on the basis of effectiveness, implementability, and cost factors to select and retain one or, if necessary, more representative process for each technology type. Evaluation should typically focus on effectiveness factors at this stage with less effort directed at the implementability and cost factors. The technology types and process options will be documented for inclusion in the Alternatives Array Report as described below under Task 8.C.4. The reasons for eliminating technologies must be specified.

## C. Alternatives Array

### 1. Assemble and document alternatives

The Respondent shall assemble selected representative technologies into alternatives for each affected medium or operable unit. Together, all of the alternatives will represent a range of treatment and containment combinations that will address either the Site or the operable unit as a whole. A summary of the assembled alternatives will be prepared by the Respondent for inclusion in the Alternatives Array Report described below. The reasons for eliminating alternatives during the preliminary screening process must be specified.

### 2. Refine alternatives

The Respondent shall refine the remedial alternatives to identify contaminant volume addressed by the proposed process and sizing of critical unit operations as necessary. Sufficient information will be collected for an adequate comparison of alternatives. Remedial action objectives for each medium will also be refined as necessary to incorporate any new risk assessment information being generated from the remedial investigation. Additionally, Ohio EPA will update ARARs as the remedial alternatives are refined.

### 3. Conduct and document screening evaluation of each alternative

The Respondent may perform a final screening process based on short and long term aspects of effectiveness, implementability, and relative cost. Generally, this screening process is only necessary when there are many feasible alternatives available for detailed analysis. If necessary, the screening of alternatives will be conducted to assure that only the alternatives with the most favorable composite evaluation of all factors are retained for further analysis.

As appropriate, the screening will preserve the range of treatment and containment alternatives that was initially developed. The range of remaining alternatives will include options that use treatment technologies and permanent solutions to the maximum extent practicable, and minimize media transfer. The Respondent shall prepare a summary of the results and reasoning employed in the screening, the assembly of alternatives that remain after screening. The summary will be submitted with the Alternatives Array Report as described below.

#### 4. Alternatives Development and Screening Deliverables

In order to expedite review and approval of the Feasibility Study, the Respondent will prepare an Alternatives Array Report summarizing the work performed in and the results of each activity described above under Task 8, including an Alternatives Array summary. These alternatives shall be modified by the Respondent, if required by Ohio EPA's comments to assure identification of a complete and appropriate range of viable alternatives to be considered in the detailed analysis. This interim deliverable will document the methods, rationale, and results of the alternatives screening process. The Respondent will refer to the U.S.EPA Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA for an outline of the report format and the required report contents. This report will become a major portion of the Feasibility Study Report to be submitted as part of Task 10.B.

Based upon the Alternatives Array Report, the Ohio EPA shall identify and provide to the Respondent ARARs for the range of alternatives presented. These ARARs may be modified by the Agency based upon the results of other tasks of this SOW.

### TASK 9 -- TREATABILITY STUDY

#### A. Treatability Study Work Plan

1. Determining the Need for Treatability Studies
  - a. Ohio EPA Required Treatability Studies

The Respondent shall conduct any necessary laboratory and treatability study(ies) required by the Ohio EPA to determine the applicability of remedial technologies.

b. Respondent-Proposed Treatability Studies

Upon approval by the Ohio EPA, the Respondent may conduct any laboratory and treatability study(ies) that it has proposed to the Agency to determine the applicability of remedial technologies.

2. Treatability Study Work Plan

When required or approved of by the Ohio EPA, the Respondent shall develop and submit to this Agency for approval a testing work plan identifying the type(s) and goal(s) of the treatability study(ies), the level of effort needed, the experimental design, and the procedures to be used for data management, validation and interpretation. This work plan shall comport with U.S. EPA's guidance document, Guide for Conducting Treatability Studies Under CERCLA (Interim Final) EPA/540/2-89/058.

The work plan shall include the following elements:

- a. Establishing data quality objectives
- b. Selecting a contracting mechanism
- c. Issuing the Work Assignment
- d. Compliance with regulatory requirements
- e. Execution of the study
- f. Analyzing and interpreting the data
- g. Reporting the results
- h. Sampling and Analysis Plan
- i. Health and Safety Plan

B. Treatability Study Evaluation Report

1. Conducting a Treatability Study

The Respondent will perform the treatability study in accordance with the approved work plan in a systematic fashion to ensure that the data generated can support the remedy evaluation process.

## 2. Submission of Treatability Study Evaluation Report

Upon completion of the treatability study(ies), the Respondent will prepare a treatability study evaluation report. The Respondent will follow U.S. EPA's guidance document, Guide for Conducting Treatability Studies Under CERCLA (Interim Final) EPA/540/2-89/058, for the appropriate format and content.

## TASK 10 -- DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES

### A. Detailed Analysis of Alternatives Report

The detailed analysis will be conducted by the Respondent to provide the Ohio EPA with the information needed for the selection of a site remedy. Respondent shall conduct a detailed analysis of the alternatives that pass through the initial screening. This detailed analysis shall consist of an analysis of each option against a set of eight evaluation criteria and a comparative analysis of all options using the same evaluation criteria as a basis for comparison.

The detailed analysis shall consist of the following elements:

#### 1. Detailed Description

The detailed description of each remaining alternative shall include as a minimum:

- a. Description of appropriate treatment and disposal technologies;
- b. Special engineering considerations required to implement the alternative, e.g., pilot treatment facility or additional studies needed to proceed with final remedial design;
- c. Operation, maintenance and monitoring requirements of the completed remedy;
- d. Off-site disposal needs and transportation plans;
- e. Temporary storage requirements;

- f. Safety requirements for remedial implementation, including both on-site and off-site health and safety considerations;
- g. An analysis of how the alternatives could be phased into individual operations and a discussion of how these operations could best be implemented (individually or in groups) to produce significant environmental improvement;
- h. A review of any off-site treatment or disposal facilities to ensure compliance with RCRA, TSCA and State requirements, both current and proposed; and
- i. An analysis of the projected performance and expected results of the alternative with emphasis on potential for further future release of hazardous substances.

## 2. Environmental Assessment

An Environmental Assessment (EA) shall be performed for each alternative including, as a minimum, an evaluation of each alternative's environmental effects, an analysis of measures to mitigate adverse effects, physical or legal constraints and compliance with Federal and State regulatory requirements.

Each alternative will be assessed in terms of the extent to which it will mitigate damage to or protect public health, welfare and the environment, in comparison to the other remedial alternatives.

The no action alternative will be fully evaluated to describe the current site conditions and anticipate environmental conditions if no actions are taken. The no action alternative will serve as a baseline for the Environmental Assessment.

## 3. Apply Eight Criteria and Document Analysis

The respondent shall apply the eight evaluation criteria described below to the assembled remedial alternatives.

### a. Overall Protection of Human Health and the Environment.

Alternatives shall be assessed as to whether they can adequately protect human health and the environment from unacceptable risks posed by hazardous substances, pollutants or contaminants present at the site by eliminating, reducing or controlling exposures to levels

established during development of remediation goals. This is a threshold requirement and the primary objective of the remediation program.

b. Compliance with Applicable or Relevant and Appropriate Requirements.

The alternatives shall be assessed as to whether they attain applicable or relevant and appropriate standards, criteria and requirements of state and federal environmental and public health laws.

c. Long-term Effectiveness and Permanence.

Alternatives shall be assessed for the long-term effectiveness and permanence they afford, along with the degree of certainty that the alternative will prove successful. Factors that shall be considered, as appropriate, include the following:

- i) Nature and magnitude of total residual risks; potential for exposure of human and environmental receptors; concentrations of hazardous substances, pollutants or contaminants remaining following implementation of remedial alternative, considering the persistence, toxicity, mobility and propensity to bioaccumulate of such hazardous substances and their constituents;
- ii) The type, degree and adequacy of long-term management required for untreated substances and treatment residuals, including engineering controls (such as containment technologies), institutional controls, monitoring and operation and maintenance;
- iii) Long-term reliability of the engineering and institutional controls, including uncertainties associated with land disposal of untreated hazardous substances, pollutants and contaminants, as well as treatment residuals, and;
- iv) Potential need for replacement of the remedy, as well as the continuing need for repairs to maintain the performance of the remedy.

d. Reduction of Toxicity, Mobility or Volume.

The degree to which alternatives employ treatment that reduces toxicity, mobility or volume of contaminants shall be assessed. Alternatives which, at a minimum, address the principal threats posed by the site

established during development of remediation goals. This is a threshold requirement and the primary objective of the remediation program.

b. Compliance with Applicable or Relevant and Appropriate Requirements.

The alternatives shall be assessed as to whether they attain applicable or relevant and appropriate standards, criteria and requirements of state and federal environmental and public health laws.

c. Long-term Effectiveness and Permanence.

Alternatives shall be assessed for the long-term effectiveness and permanence they afford, along with the degree of certainty that the alternative will prove successful. Factors that shall be considered, as appropriate, include the following:

- i) Nature and magnitude of total residual risks; potential for exposure of human and environmental receptors; concentrations of hazardous substances, pollutants or contaminants remaining following implementation of remedial alternative, considering the persistence, toxicity, mobility and propensity to bioaccumulate of such hazardous substances and their constituents;
- ii) The type, degree and adequacy of long-term management required for untreated substances and treatment residuals, including engineering controls (such as containment technologies), institutional controls, monitoring and operation and maintenance;
- iii) Long-term reliability of the engineering and institutional controls, including uncertainties associated with land disposal of untreated hazardous substances, pollutants and contaminants, as well as treatment residuals, and;
- iv) Potential need for replacement of the remedy, as well as the continuing need for repairs to maintain the performance of the remedy.

d. Reduction of Toxicity, Mobility or Volume.

The degree to which alternatives employ treatment that reduces toxicity, mobility or volume of contaminants shall be assessed. Alternatives which, at a minimum, address the principal threats posed by the site

through treatment shall also be identified. Factors that shall be considered, as appropriate, include the following:

- i) The treatment or recycling processes the alternatives employ and materials they will treat;
- ii) The amount of hazardous substances, pollutants or contaminants that will be destroyed, or treated, or recycled;
- iii) The degree of expected reduction in toxicity, mobility or volume of the waste due to treatment or recycling and the specifications of which reduction(s) are occurring;
- iv) The degree to which the treatment is irreversible;
- v) The type and quantity of residuals that will remain following treatment, considering the persistence, toxicity, mobility and propensity to bioaccumulate;
- vi) The degree to which treatment will reduce the inherent hazards posed by the principal threats at the Site; and
- vii) The degree to which the treatment processes employed reduce the transfer of contaminants between environmental media.

e. Short-term Effectiveness.

The short-term impacts of the alternatives during the construction and implementation phase, and until the objectives of the remedial action have been met, shall be assessed considering the following:

- i) Short-term risks that may be posed to the community during construction and implementation of an alternative and until the remedial action objectives have been met;
- ii) Potential impacts on workers during remedial action and with the objectives of remedial action have been met, the effectiveness and reliability of protective measures;
- iii) Potential environmental impacts that may result from the remedial action and the effectiveness and reliability of mitigative measures during implementation and until the objectives of the remedial action have been met; and

iv) Time until response action objectives are achieved.

f. Implementability.

The technical and administrative feasibility of implementing the alternatives shall be assessed by considering the following types of factors, as appropriate:

i) Technical Feasibility

- Degree of difficulty or uncertainty associated with construction and operation of the alternative;
- Expected operational reliability of the alternative;
- Ease of undertaking, additional remedial action(s); and
- Ability to monitor the effectiveness of the remedy.

ii) Administrative Feasibility

- Activities needed to coordinate state, local, and federal agencies (e.g., obtaining necessary approvals and permits, right-of-way for construction)

iii) Feasibility of Obtaining Services and Materials

- Capacity and location of adequate treatment, storage, and disposal services;
- Availability of necessary equipment and specialists and provisions to ensure any necessary additional resources;
- Availability of services and materials; and
- Availability of prospective technologies

g. Cost.

The types of costs that shall be assessed include the following:

- i) Direct and indirect capital costs, including contingency and engineering fees;

- ii) Annual operation and maintenance costs; and
  - iii) Net present value of capital and O&M costs.
- h. Community Acceptance.

This assessment includes determining which components of the alternatives interested persons in the community support, have reservations about, or oppose. This assessment, which will be completed by the Ohio EPA, will occur throughout the implementation of this RI/FS and will be completed after comments on the proposed remedy are received. It is not part of this order.

4. Compare Alternatives Against Each Other and Document the Comparison of Alternatives

The Respondent will perform a comparative analysis between the remedial alternatives. That is, each alternative will be compared against the others using the evaluation criteria as a basis of comparison. Identification and selection of the preferred alternative are reserved by the Ohio EPA and are not part of this Order. The comparative analysis will be documented and presented in the Feasibility Study Report described below.

B. Feasibility Study Report

The Respondent will submit a draft feasibility study report to the Ohio EPA for review, comment, and approval. This report will include the results of Tasks 9 and 10. The respondent will refer to the U.S.EPA Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA for an outline of the report format and the required report content. Upon satisfactorily addressing Ohio EPA's comments, the Respondent will prepare and submit a final feasibility study report.

TASK 11 – Monthly Progress Reports

Monthly Technical Progress Reports are required of the Respondent. For each on-going work assignment, Respondent shall submit progress reports with the following elements:

1. Identification of site and activity.
2. Status of work at the site and progress to date.

3. Percentage of completion.
4. Data generated to date
5. Difficulties encountered during the reporting period.
6. Actions being taken to rectify problems.
7. Activities planned for the next month.
8. Changes in personnel.

The monthly progress report will list target and actual completion dates for each activity including project completion and provide an explanation of any deviation from the milestones in the work plan schedule.

SUBJECT: PREFERRED PLAN AND DECISION DOCUMENT PROCEDURES

**PURPOSE:** This policy describes Preferred Plans and Decision Documents, which are used by the Ohio Environmental Protection Agency (Ohio EPA) to meet the statutory requirements of Chapter 3734 of the Ohio Revised Code (ORC) and to facilitate public participation in the identification of the preferred alternative for cleanup at a state lead site. This policy also sets forth the roles and responsibilities of the Division of Emergency and Remedial Response (DERR), the Public Information Center (PIC), and the Legal staff in preparing, distributing and issuing Preferred Plans and Decision Documents.

**BACKGROUND:** Section 3734.20 of the ORC provides that the Director of Ohio EPA has the authority to initiate appropriate action under Chapters 3704, 3734, or 6111 of the ORC to abate pollution or contamination or to protect public health or safety if the Director determines that conditions at a hazardous waste facility, solid waste facility, or other location where waste was treated, stored, or disposed of constitute a substantial threat to public health or safety or are causing or contributing to or threatening to cause or contribute to air or water pollution or soil contamination.

According to Section 3734.21 (B) of the ORC, prior to beginning the cleanup of a hazardous waste facility, the Director shall develop a plan for the cleanup, which includes those measures necessary to abate conditions at the facility that are causing or contributing to pollution or contamination or that constitute a substantial threat to public health or safety.

Section 3734.22 of the ORC provides that before Ohio EPA begins the cleanup of a facility, the Director shall endeavor to enter into an agreement with the owner of the land on which the facility is located, or the owner of the facility. The agreement shall specify the measures to be taken and provide authorization to the Director and Ohio EPA employees to enter upon the land and perform the specified measures. Preferred Plans and Decision Documents

explain to the public the evaluation of alternatives that has taken place in the development of measures and plans that will result in cleanup at a state lead site.

To ensure Ohio EPA's capability to recover the costs of activities outlined in this procedure, all activities outlined in this procedure should be conducted so they are not inconsistent with the National Contingency Plan (NCP).

**DEFINITIONS:** As used in this policy, the term Preferred Plan means a document prepared by DERR that presents to the public Ohio EPA's preferred alternative for cleanup at a site. This document includes a brief summary of the alternatives evaluated in the detailed analysis of the Feasibility Study, highlighting the key factors that led to the identification of the preferred alternative.

Decision Document means the report that documents Ohio EPA's final cleanup plan for a site. Any comments received on the Preferred Plan are taken into consideration during preparation of the Decision Document.

**PROCEDURES:** The following are the procedures that shall be followed by DERR in the development of Preferred Plans and Decision Documents. The Public Participation Policy (DERR-00-DI-006) shall be consulted to insure efficient coordination of public participation activities with PIC.

(A) Preferred Plans

- (1) The Preferred Plan shall be drafted by the Site Coordinator and approved by the District Office Supervisor and Manager. The Preferred Plan shall include at a minimum the following information:
  - (a) Environmental conditions at the site as determined by the Remedial Investigation (RI);
  - (b) Remedial alternatives evaluated in the Feasibility Study (FS);

- (c) Ohio EPA's preferred alternative;
  - (d) Identification and summary of applicable statutory and regulatory requirements and any proposed waivers of those requirements;
  - (e) A brief analysis of the preferred alternatives discussed in terms of the eight evaluation criteria; and
  - (f) Remedial action goals or performance standards.
- (2) The draft Preferred Plan shall be distributed to the Manager, Remedial Response Section, Central Office, and the assigned attorney for the Site. Comments on the Preferred Plan shall be coordinated through the assigned staff person in the Remedial Response Section, Central Office, to the Site Coordinator for revision.
  - (3) The final Preferred Plan shall be sent to the Chief, DERR, with attached sign-off sheet through the following individuals: District Office Manager; assigned attorney; and Manager, Remedial Response Section, Central Office.
  - (4) A copy of the final Preferred Plan shall be distributed by the District Office to the following individuals: Manager, Remedial Response Section, Central Office and assigned attorney. The District Office will coordinate a public meeting on the final Preferred Plan with PIC.
  - (5) Once approved by the Chief, DERR, the Preferred Plan shall be public noticed by CO, Administration Section.
  - (6) The public notice shall include sufficient information to provide a clear explanation of the Preferred Plan. The notice shall emphasize that Ohio EPA is soliciting public comment on all of the alternatives evaluated in the detailed analysis of the FS as well as the preferred alternative. The notice shall inform the public of its role in the remedy selection process and shall provide the following information:
    - (a) The location of the information repositories and administrative record file (see the Public Participation Policy for information on establishing the document repository and administrative record files);

- (b) The methods by which the public may submit comments;
  - (c) The dates of the public comment period, which shall not be shorter than thirty (30) calendar days.
  - (d) The date, time and place of the public meeting.
- (7) During the public comment period, PIC shall (hold or facilitate) a public meeting. The first portion of the meeting shall be used to explain the Preferred Plan and answer questions. The Site Coordinator and other agency staff (as required) shall participate. The second portion of the meeting shall be a formal hearing to record comments on the Preferred Plan. A transcript shall be taken of the hearing and made available to the public in the information repository. A news release shall be prepared and issued by PIC to announce the public meeting.
- (8) After the public comment period, a final preferred alternative shall be selected by DERR. The preferred alternative shall be selected on the basis of analysis presented in the Preferred Plan and RI/FS reports, comments received from the public and any other new and significant information received or generated.
- (9) DERR may reevaluate the preferred alternative in light of comments and any new information received. DERR may change a component of the preferred alternative or choose to implement a remedy other than the preferred alternative. If a change is made in the Preferred Plan, the change shall be explained in the Decision Document. Significant changes may warrant issuance of a revised Preferred Plan and additional public comment. Significant changes include those changes that modify the preferred alternative or change the preferred alternative to another. Changes to the preferred alternative shall be coordinated among the District Office, Central Office, and Legal Office. The final decision regarding any changes to the preferred alternative shall be made by the Chief, DERR.

(B) Decision Documents

- (1) The Decision Document shall be drafted by the Site Coordinator and approved by the District Office Supervisor and Manager. It shall consist of three components:
- (a) The Declaration, which shall be an abstract of the key information;

(b) The Decision Summary, which shall provide an overview of the site characteristics and the remedy selected;

(c) The Responsiveness Summary, which shall address public comments received on the Preferred Plan, RI/FS report, and other information in the administrative record.

- (2) The draft Decision Document shall be forwarded to the Manager, Remedial Response Section, and the assigned attorney for review and comment. The assigned staff person in the Remedial Response Section, shall communicate comments to the Site Coordinator.
- (3) The Site Coordinator shall make necessary revisions to the Decision Document and forward a final draft to the Director after sign-off by the following individuals: District Office Manager; the assigned attorney; Manager, Remedial Response Section, and Chief, DERR.
- (4) A copy of the final Decision Document shall be distributed by the District Office to the following individuals: Manager, Remedial Response Section and assigned attorney.
- (5) Once signed by the Director, the Decision Document shall be public noticed by CO, Administration Section.
- (6) The public notice shall include sufficient information to provide a clear explanation of the Decision Document. The notice shall inform the public of the appeal process.
- (7) The final Decision Document shall be placed in the Administrative Record Files (see the Public Participation Policy for information on establishing the document repository, the administrative record files and communication of the contents of the Decision Document to the public) and shall be incorporated into any administrative orders for remedial action.

(C) Modification or Amendment to Decision Documents

- (1) There are two options available if a change to a Decision Document is needed. The options are a modification (*i.e.*, similar to an Explanation of Significant Difference per the NCP) or amendment (*i.e.*, similar to a ROD Amendment per the NCP) to the Decision Document. The District Office will recommend which process will be used and forward that recommendation and justification to DERR's Enforcement Committee for concurrence. Generally, when there is a significant change to the remedy, but not a fundamental alteration with respect to scope, performance or cost, the change will be handled as a modification. If there is a fundamental alteration of the basic features of the remedy, it will be handled as an amendment. More detailed guidance on how to determine which is the appropriate action may be found in *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and other Remedy Selection Decision Documents* (EPA 540-R-98-031, OSWER 9200.1-23P, PB98-963241, July 1999)
  - (A) A Decision Document Modification shall be drafted by the Site Coordinator and approved by the District Office Supervisor and Manager.
    - (i) The Decision Document Modification shall be routed to the Chief, DERR, with attached sign-off sheet through the following individuals: District Office Manager; assigned attorney; and Manager, Remedial Response Section, Central Office.
    - (ii) Once signed by the Chief, DERR, the Decision Document Modification shall be public noticed by CO, Administration Section.
    - (iii) The public notice shall provide sufficient information to provide a clear explanation of the modification to the Decision Document.
  - (B) A Draft Decision Document Amendment shall be drafted by the Site Coordinator and approved by the District Office Supervisor and Manager.
    - (i) The draft Decision Document Amendment shall be distributed to the Manager, Remedial Response Section, Central Office and the assigned attorney. Comments on the draft Decision Document shall be coordinated through the assigned staff person in the Remedial Response Section.

(ii) A copy of the draft Decision Document Amendment shall be routed to the Chief, DERR, with attached sign-off sheet through the following individuals: Manager, Remedial Response Section, and assigned attorney.

(iii) Once approved by the Chief, DERR, the draft Decision Document Amendment shall be public noticed by CO, Administration Section.

(iv) The public notice shall include sufficient information to provide a clear explanation of the draft Decision Document Amendment. The notice shall emphasize that the Agency is soliciting public comment. The notice shall provide the following information:

(a) The location of the information repositories and administrative record file (see the Public Participation Policy for information on establishing the document repository and administrative record files);

(b) The methods by which the public may submit comments;

(c) The dates of the public comment period, which shall not be shorter than thirty (30) calendar days.

(v) After the public comment period, a final draft Decision Document Amendment, including a Responsiveness Summary addressing public comments received, shall be drafted by the Site Coordinator, considering comments received, and any other new and significant information received.

(vi) A final draft Decision Document Amendment will be sent to the Director after sign-off by the following individuals: District Office Manager; assigned attorney; Manager, Remedial Response Section; and Chief, DERR.

(vii) A copy of the final Decision Document Amendment will be distributed by the District Office to the following individuals: Manager, Remedial Response Section and assigned attorney.

(viii) Once signed by the Director, the Decision Document Amendment shall be public noticed by CO, Administration Section.

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(ix) The public notice shall include sufficient information to provide a clear explanation of the Decision Document Amendment. The notice shall inform the public of the appeal process.

- (2) Modifications and/or Amendments to Decisions Documents shall be included in the Administrative Record Files in the document repository.

**STATE OF OHIO  
MODEL STATEMENT OF WORK FOR  
THE REMEDIAL DESIGN AND REMEDIAL ACTION  
AT**

[Site Name]  
[Location]

**1.0 PURPOSE**

The purpose of this Remedial Design/Remedial Action Statement of Work (RD/RA SOW) is to define the procedures the Respondent(s) shall follow in designing and implementing the selected remedy for the \_\_\_\_\_ Site as described in this SOW and the Director's Final Findings and Orders (Orders) to which it is attached. The Division of Emergency and Remedial Response (DERR) documented the selection of a remedy for the site in a Decision Document dated \_\_\_\_\_. The intent of the remedy is to protect the public health and/or the environment from the actual or potential adverse effects of the contaminants discovered at and related to the site. Further guidance for performing the RD/RA work tasks may be found in the U.S. EPA Superfund Remedial Design and Remedial Action Guidance document (OSWER Directive 9355.0-4A). All applicable regulatory requirements pertaining to the selected remedy and RD/RA activities shall be followed.

The Ohio EPA shall provide oversight of the Respondent's activities throughout the RD/RA. The Respondent's shall support the Ohio EPA's initiatives and conduct of activities related to the implementation of oversight activities.

**2.0 DESCRIPTION OF THE REMEDIAL ACTION/ PERFORMANCE STANDARDS**

Performance standards and specifications of the major components of the remedial action to be designed and implemented by the Respondent(s) are described below. Performance standards shall include cleanup standards, standards of control, quality criteria, and other requirements, criteria or limitations as established in the Decision Document, this SOW and the Orders to which it is attached.

**[List each component of the remedy as an individual subsection, i.e. 2.1 Security Fence, 2.2 RCRA Compliant Cap, etc. Each component should be described in**

sufficient detail so that an assessment can be made of the adequacy of the component. Cleanup standards should be provided for each environmental medium of concern. When appropriate, points of compliance for the cited standards should be specified. Contingencies should also be provided for actions to be taken in the event that cleanup standards cannot be achieved.]

OR

See Appendix A, Decision Document, for description of the remedial action components and associated performance standards.

### **3.0 SCOPE OF THE REMEDIAL DESIGN AND REMEDIAL ACTION**

The Remedial Design/Remedial Action (RD/RA) shall consist of seven principal tasks described below. Each task shall be completed and required documentation shall be submitted in accordance with the schedules established in the Orders and in the RD/RA Work Plan approved by Ohio EPA. All work related to this SOW shall be performed by the Respondent(s) in a manner consistent with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) as amended, 42 USC 9601, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300 (1990), and other applicable federal and state rules and regulations.

#### Task Summary

- 3.1 Task I: RD/RA Work Plan
  - 3.1.1 Site Access
  - 3.1.2 Pre-Design Studies Plan
  - 3.1.3 Regulatory Compliance Plan
  - 3.1.4 Natural Resource Damage Assessment
- 3.2 Task II: Pre-Design Studies
- 3.3 Task III: Remedial Design
  - 3.3.1 General Requirements for Plans and Specifications
  - 3.3.2 Design Phases
  - 3.3.3 Estimated Cost for Remedial Action
  - 3.3.4 Remedial Action Implementation Plan
  - 3.3.5 Community Relations Support
- 3.4 Task IV: Remedial Action Construction
  - 3.4.1 Preconstruction Inspection and Conference
  - 3.4.2 Design Changes During Construction
  - 3.4.3 Remedial Action Construction Completion and Acceptance
  - 3.4.4 Community Relations Support

- 3.5 Task V: Five-Year Reviews
- 3.6 Task VI: Operation and Maintenance/Performance Monitoring
  - 3.6.1 Reporting During Operation and Maintenance
  - 3.6.2 Completion of Remedial Action Report
- 3.7 Task VII: Reporting Requirements
  - 3.7.1 Monthly Progress Reports during RD and RA Construction
  - 3.7.2 Summary of Reports and Submittals

### **3.1 TASK I: RD/RA WORK PLAN**

The Respondent(s) shall submit a work plan for the Remedial Design and Remedial Action (RD/RA) to the Ohio EPA for review and approval, which presents the overall strategy for performing the design, construction, operation, maintenance and monitoring of the Remedial Action (RA). The work plan shall provide a detailed discussion of the specific tasks necessary to implement the selected remedy, including a description of the technical approach, personnel requirements, plans, specifications, permit requirements and other reports described in this SOW.

The work plan shall document the responsibilities and authority of all organizations and key personnel involved with the development and implementation of the RD/RA. The qualifications of key personnel directing the RD/RA tasks, including contractor personnel, shall be described.

The work plan shall include schedules fixed in real time for the development of the (RD) and implementation of the RA, including milestones for the submittal of the document packages for Ohio EPA review and meetings for discussion of the submittals. The RD/RA Work Plan must be reviewed and approved by the Ohio EPA prior to initiation of field activities or proceeding with the RD.

Specific requirements to be addressed by the RD/RA Work Plan are described in the following sections.

#### **3.1.1 Site Access**

All site access agreements necessary to implement the RD and RA shall be obtained by the Respondent(s) prior to the initiation of any activities to be conducted under the Work Plan. Site access agreements shall extend for the duration of all remedial activities and shall include allowances for all operation and maintenance considerations and State oversight activities. The work plan shall describe the activities necessary to satisfy these requirements.

### 3.1.2 Pre-Design Studies Plan

The Respondent(s) shall develop a plan to complete the following pre-design studies, which are required to design and fully implement the remedial action.

**[Describe any pre-design studies required to support the RD/RA.]**

The Pre-Design Studies Plan (PDSP), as a component of the RD/RA Work Plan, will identify and describe, in detail, activities necessary to conduct the pre-design studies identified above. The plan shall include sufficient sampling, testing, and analyses to develop quantitative performance, cost and design data for the selected remedy.

At the discretion of the Site Coordinator for the Ohio EPA, the PDSP may be submitted for review and comment under separate cover from the work plan in accordance with the schedule established in the Orders. The PDSP must be approved by the Ohio EPA prior to initiation of associated field activities or treatability studies.

The Pre-Design Studies Plan shall include, as necessary, a Field Sampling Plan (FSP), a Quality Assurance Project Plan (QAPP) and a Health and Safety Plan (HSP). Section 4.0 of this SOW describes the required content of supporting plans such as the Field Sampling Plans, Quality Assurance Project Plans and Health and Safety Plans.

Prior to development of the Pre-Design Studies Plan, there shall be a meeting of the Site Coordinator for the Ohio EPA and the Project Manager representing the Respondent(s) to discuss scope, objectives, quality assurance and quality control issues, resources, reporting, communication channels, schedule, and roles of personnel involved. Other personnel representing the Respondent(s) and Ohio EPA, who may be needed to fully discuss the issues involved, should also participate in this meeting. Guidance documents to be consulted in developing the Pre-Design Studies Plan include U.S. EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies (EPA/540/G-89/004, October 1988) and Guide for Conducting Treatability Studies Under CERCLA (EPA/540/2-89/058, December 1989), as well as others listed in Appendix A, attached to this SOW.

The pre-design studies will be conducted as described under Task II.

### **3.1.3 Regulatory Compliance Plan**

It shall be the responsibility of the Respondent(s) to ensure compliance with all applicable regulatory state and federal requirements for the RD/RA activities to be conducted at the site. The Respondent(s) shall develop a plan to identify and to satisfy all applicable state and federal laws and regulations for the RD/RA. The plan will include the following information:

- 1) Permitting authorities
- 2) Permits required to conduct RD/RA activities
- 3) Time required by the permitting agency(s) to process permit applications
- 4) Identification of all necessary forms
- 5) Schedule for submittal of applications
- 6) All monitoring and/or compliance testing requirements

The Respondent(s) shall identify in the plan any inconsistencies between any regulatory requirements or permits that may affect any of the work required. The plan shall also include an analysis of the possible effects such inconsistencies may have on the remedial action, recommendations, and supporting rationale for the recommendations. The Regulatory Compliance Plan shall be submitted to the Ohio EPA as part of the RD/RA Work Plan.

### **3.1.4 Natural Resource Damage Assessment**

If natural resources are or may be injured as a result of a release, the Respondent(s) shall ensure that the trustees of the effected natural resources are notified. The trustees will initiate appropriate actions and provide input into the RD/RA in order to minimize or mitigate natural resource damages in accordance with the NCP and 43 CFR part 11. Trustees define "injury" as "a measurable adverse change, either long- or short-term, in the chemical or physical quality of a natural resource resulting either directly or indirectly from exposure to a discharge of oil or release of a hazardous substance. The Respondent(s) shall make available to the trustees all necessary information and documentation needed to assess actual or potential natural resource injuries.

## **3.2 TASK II: PRE-DESIGN STUDIES**

The Respondent(s) shall schedule and detail the work necessary to accomplish the pre-design studies described in the Pre-Design Studies Plan submitted with the RD/RA Work Plan. The requirements of this section shall apply to studies undertaken to refine the

understanding of the nature and extent of contamination at the site, as well as to bench and pilot scale treatability studies.

For any such studies required, the Respondent(s) shall furnish all services, including necessary field work, materials, supplies, labor, equipment, supervision, and data interpretation. Sufficient sampling, testing, and analyses shall be performed to provide the technical data necessary to support the remedial design effort with the goal of optimizing the required treatment and/or disposal operations and systems.

The Respondent(s) shall submit a draft Pre-Design Studies report for Ohio EPA's review and comment when the investigation and/or testing required by the Pre-Design Studies Plan is complete. The draft report shall present investigation/testing data and results along with an analysis of the implications those results have on the RD/RA, including a cost analysis, when appropriate. The draft report shall be submitted prior to the preliminary design submittal in accordance with the schedule specified in the Orders and approved RD/RA Work Plan. After making any required corrections or modifications based on Ohio EPA comments, the Respondent(s) shall submit the final report with the Preliminary Design Report, unless otherwise specified in the approved RD/RA Work Plan.

#### **3.2.1. Reporting Requirements for Groundwater data.**

The Respondent(s) shall submit all groundwater data and monitoring well construction data. The Respondent(s) shall implement a groundwater monitoring program as identified in the RD workplan or as required by Ohio EPA. Respondent(s) shall submit all groundwater data and monitoring well construction data on a 3.5 inch diskette using the most current version of the U.S.EPA developed Ground Water Information Tracking System (GRITS) database software. GRITS is free software, and can be obtained by calling EPA office of Research and Development (ORD), at 513-569-7562, ask for Document # EPA/625/11-91/002. Respondent(s) shall submit one copy of each round of sampling data on printed paper in addition to the diskette format. The printed copy will be the official copy of the data.

### **3.3 TASK III: REMEDIAL DESIGN**

The Respondent(s) shall prepare and submit to the Ohio EPA, in accordance with the schedule set forth in the compliance schedule of the Orders, construction plans, specifications and supporting plans to implement the remedial action at the Site as defined in the Purpose and Description of the Remedial Action sections of this SOW, the Decision Document, and/or the Orders.

### **3.3.1 General Requirements for Plans and Specifications**

The construction plans and specifications shall comply with the standards and requirements outlined below. All design documents shall be clear, comprehensive and organized. Supporting data and documentation sufficient to define the functional aspects of the remedial action shall be provided. Taken as a whole, the design documents shall demonstrate that the remedial action will be capable of meeting all objectives of the Decision Document, including any performance standards.

The plans and specifications shall include the following:

- 1) Discussion of the design strategy and design basis including:
  - a. Compliance with requirements of the Decision Document and the Orders and all applicable regulatory requirements;
  - b. Minimization of environmental and public health impacts;
- 2) Discussion of the technical factors of importance including:
  - a. Use of currently accepted environmental control measures and technologies;
  - b. The constructability of the design;
  - c. Use of currently accepted construction practices and techniques;
- 3) Description of the assumptions made and detailed justification for those assumptions;
- 4) Discussion of possible sources of error and possible operation and maintenance problems;
- 5) Detailed drawings of the proposed design including, as appropriate:
  - a. Qualitative flow sheets;
  - b. Quantitative flow sheets;
- 6) Tables listing equipment and specifications;
- 7) Tables giving material and energy balances;
- 8) Appendices including:
  - a. Sample calculations (one example presented and clearly explained for significant or unique calculations);
  - b. Derivation of equations essential to understanding the report;
  - c. Results of laboratory tests, field tests and any additional studies.

### **3.3.2 Design Phases**

The Respondent(s) shall meet when necessary with Ohio EPA representatives to discuss design issues. The design shall be developed and submitted in the phases outlined below to facilitate progression toward an acceptable and functional design.

Submittals shall be made in accordance with the compliance schedule in the Orders, and the schedule in the approved RD/RA Work Plan.

### 3.3.2.1 Preliminary Design

A Preliminary Design, which reflects the design effort at approximately 30% completion, shall be submitted to the Ohio EPA for review and comment. At this stage of the design process, the Respondent(s) shall have verified existing conditions at the site that may influence the design and implementation of the selected RA. The Preliminary Design shall demonstrate that the basic technical requirements of the remedial action and any permits required have been addressed. The Preliminary Design shall be reviewed to determine if the final design will provide an operable and usable RA that will be in compliance with all permitting requirements and response objectives. The Preliminary Design submittal shall include the following elements, at a minimum:

- Preliminary plans, drawings and sketches, including design calculations;
- Results of treatability studies and additional field sampling;
- Design assumptions and parameters, including design restrictions, process performance criteria, appropriate unit processes for treatment systems, and expected removal or treatment efficiencies for both the process and waste (concentration and volume);
- Proposed cleanup verification methods, including compliance with applicable laws and regulations;
- Outline of design specifications;
- Proposed sitting/locations of processes/construction activity;
- Expected long-term operation and monitoring requirements;
- Real estate and easement requirements;
- Preliminary construction schedule, including contracting strategy.

The supporting data and documentation necessary to define the functional aspects of the RA shall be submitted with the Preliminary Design. The technical specifications shall be outlined in a manner that anticipates the scope of the final specifications. The Respondent(s) shall include design calculations with the Preliminary Design completed to the same degree as the design they support.

If the Pre-Design Studies Report required under Task II have not been submitted prior to submission of the Preliminary Design, it shall be submitted with the Preliminary Design. Any revisions or amendments to the Preliminary

Design required by the Ohio EPA shall be incorporated into the subsequent design phase.

### **3.3.2.2 Intermediate Design**

Complex project designs necessitate preparation and Ohio EPA review of design documents between the preliminary and prefinal design phases. The Respondent(s) shall submit intermediate design plans and specifications to the Ohio EPA for review and comment when the design is approximately 60% complete in accordance with the schedule in the approved RD/RA Work Plan. All plans, specifications, design analyses and design calculations submitted to the Ohio EPA shall reflect the same degree of completion. The Respondent(s) shall ensure that any required revisions or amendments resulting from the Ohio EPA's review of the Preliminary Design are incorporated into the Intermediate Design.

The Intermediate Design submittal shall include the following components:

- Design Plans and Specifications
- Draft Construction Quality Assurance Plan
- Draft Performance Standard Verification Plan
- Draft Operation and Maintenance Plan
- Health and Safety Plan

The design shall include a Construction Quality Assurance Plan, a Performance Standard Verification Plan, an Operation and Maintenance Plan, and a Health and Safety Plan. The Performance Verification Plan shall include a Field Sampling Plan and a Quality Assurance Project Plan, as necessary. Section 4.0 of this SOW describes the required content of the supporting plans. The final Pre-Design Studies Report shall also be included, if it has not already been submitted. Revisions or amendments to the Intermediate Design required by Ohio EPA shall be incorporated into the Prefinal Design.

### **3.3.2.3 Prefinal Design**

The Respondent(s) shall submit a Prefinal Design for Ohio EPA review in accordance with the schedule in the approved RD/RA Work Plan when the design effort is at least 90% complete. The Respondent(s) shall ensure that any modifications required by the Ohio EPA's prior review of related Pre-design Studies Reports, technical memoranda, the Preliminary and Intermediate Designs, and the QAPP and HSP are incorporated into the

Prefinal Design submittal. The Prefinal Design submittal shall consist of the following components, at a minimum:

- Design Plans and Specifications
- Construction Quality Assurance Plan
- Performance Standard Verification Plan
- Operation and Maintenance Plan
- Remedial Action Implementation Plan
- Cost Estimate
- Health and Safety Plan

General correlation between drawings and technical specifications is a basic requirement of any set of working construction plans and specifications. Before submitting the remedial design specifications with the Prefinal Design, the Respondent(s) shall: (1) Coordinate and cross-check the specifications and drawings; (2) Complete the proofing of the edited specifications and required cross-checking of all drawings and specifications.

The Respondent(s) shall prepare and include in the technical specifications governing any treatment systems; contractor requirements for providing appropriate service visits by qualified personnel to supervise the installation, adjustment, startup and operation of the treatment systems; and appropriate training on operational procedures once startup has been successfully accomplished.

The Ohio EPA will provide written comments to the Respondent(s) indicating any required revisions to the Prefinal Design. Comments may be provided as a narrative report and/or markings on design plan sheets. Revisions to the plans and specifications required by Ohio EPA shall be incorporated into the Final Design. At the discretion of the Site Coordinator, the Respondent(s) shall also return to Ohio EPA all marked-up prints as evidence that the plans have been completely checked. The Prefinal Design submittal may serve as the Final Design, if Ohio EPA has no further comments and notifies the Respondent(s) that the Prefinal Design has been approved as the Final Design.

#### **3.3.2.4 Final Design**

Following incorporation of any required modifications resulting from the Ohio EPA's review of the Prefinal Design submittal, the Respondent(s) shall submit to the Ohio EPA the Final Design which is 100% complete in accordance with the approved schedule described in the RD/RA Workplan.

The Final Design submittal shall include all the components of the Prefinal Design and each of those components shall be complete. At the discretion of the Site Coordinator, any marked-up prints or drawings, which the Ohio EPA may have provided by way of comments on previous design submittals shall be returned to the Ohio EPA, if they have not already been returned.

The Respondent(s) shall make corrections or changes based on Ohio EPA comments on the Final Design submittals. The revised Final Design shall then be submitted in their entirety to the Ohio EPA for approval as the completed Final Design. Upon approval of the Site Coordinator, final corrections may be made by submitting corrected pages to the Final Design design documents. The quality of the Final Design submittal should be such that the Respondent(s) would be able to include them in a bid package and invite contractors to submit bids for the construction project.

### **3.3.3 Estimated Cost of the Remedial Action**

The Respondent(s) shall refine the cost estimate developed in the Feasibility Study to reflect the detailed plans and specifications being developed for the RA. The cost estimate shall include both capital and operation and maintenance costs for the entire project. To the degree possible, cost estimates for operation and maintenance of any treatment system shall be based on the entire anticipated duration of the system's operation. The final estimate shall be based on the final approved plans and specifications. It shall include any changes required by the Ohio EPA during Final Design review, and reflect current prices for labor, material and equipment.

The refined cost estimate shall be submitted by the Respondent(s) with the Prefinal Design and the final cost estimate shall be included with the Final Design submittal.

### **3.3.4 Remedial Action Implementation Plan**

The Respondent(s) shall develop a Remedial Action Implementation Plan (RAIP) to help coordinate implementation of the various components of the RA. It shall include a schedule for the RA that identifies timing for initiation and completion of all critical path tasks. The Respondent(s) shall specifically identify dates for completion of the project and major interim milestones in conformance with the approved RD/RA Workplan schedule. The Remedial Action Implementation Plan is a management tool which should address the following topics:

- 1) Activities necessary to fully implement each of the components of the RA;

- 2) How these activities will be coordinated to facilitate construction/implementation in accordance with the approved schedule;
- 3) Potential major scheduling problems or delays, which may impact overall schedule;
- 4) Lines of communication for discussing and resolving problems, should they arise;
- 5) Common and/or anticipated remedies to overcome potential problems and delays.

The Remedial Action Implementation Plan shall be submitted with the Prefinal Design for review and comment by the Ohio EPA. The final plan and RA project schedule shall be submitted with the Final Design for review and approval.

### **3.3.5 Community Relations Support**

A community relations program will be implemented by the Ohio EPA. The Respondent(s) shall cooperate with the Ohio EPA in community relations efforts. Cooperation may include participation in preparation of all appropriate information disseminated to the public, and in public meetings that may be held or sponsored by the Ohio EPA concerning the Site.

## **3.4 TASK IV: REMEDIAL ACTION CONSTRUCTION**

Following approval of the Final Design submittal by the Ohio EPA, the Respondent(s) shall implement the designed remedial action(s) at the Site in accordance with the plans, specifications, Construction Quality Assurance Plan, Performance Standard Verification Plan, Health and Safety Plan, Remedial Action Implementation Plan, Quality Assurance Project Plan, and Field Sampling Plan approved with the final design. Implementation shall include the activities described in the following sections.

### **3.4.1 Preconstruction Inspection and Conference**

The Respondent(s) shall participate in a preconstruction inspection and conference with the Ohio EPA to accomplish the following:

- Review methods for documenting and reporting inspection data
- Review methods for distributing and storing documents and reports

- Review work area security and safety protocol
- Discuss any appropriate modifications to the Construction Quality Assurance Plan to ensure that site specific considerations are addressed. The final CQAP shall be submitted to the Ohio EPA at this time, if it has not already been submitted.
- Introduce key construction contractor, engineering and project management personnel and review roles during construction activities
- Conduct a site walk-around to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations

The Respondent(s) shall schedule the preconstruction inspection and conference to be held within 10 days of the award of the construction contract. The preconstruction inspection and conference shall be documented by a designated person and minutes shall be transmitted to all parties by the Respondent(s) to all parties in attendance.

#### **3.4.2 Design Changes During Construction**

During construction, unforeseen site conditions, changes in estimated quantities of required construction materials and other problems associated with the project are likely to develop. Such changing conditions may require either major or minor changes to the approved final design. Certain design changes will require approval of the Ohio EPA prior to implementation to ensure that the intent and scope of the remedial action is maintained. Changes, which could alter the intent or scope of the RA, may require a revision to the Decision Document and a public comment period.

Changes to the remedial design which require Ohio EPA written approval prior to implementation include:

- Those that involve the deletion or addition of a major component of the approved remedy (e.g. changing one treatment system for another; deleting any designed layer of a multi-layer cap)
- Those that result in a less effective treatment for wastes associated with the site

- Any changes that may result in an increase of the exposure to chemicals of concern and/or risk to human health or the environment as compared to the goals for the completed remedial action as stated in the Orders and this SOW
- Those that result in a significant delay in the completion of the RA
- Any other changes that alter or are outside of the scope or intent of the approved remedial design

Ohio EPA shall be notified of other changes made during construction through daily inspection reports and monthly progress reports.

### **3.4.3 Remedial Action Construction Completion and Acceptance**

As the construction of the remedial action nears completion, the following activities and reporting shall be completed by the Respondent(s) to ensure proper project completion, approval, closeout and transition to the operation and maintenance/monitoring phase.

#### **3.4.3.1 Prefinal Construction Conference**

Within seven days of making a preliminary determination that construction is complete, the Respondent(s) shall provide written notification to the Ohio EPA and a prefinal construction conference shall be held with the construction contractor(s) to discuss procedures and requirements for project completion and closeout. The Respondent(s) shall have responsibility for making arrangements for the conference. Participants should include the Project Manager for the Respondent(s), the Site Coordinator for the Ohio EPA, all contractors involved with construction of the remedial action(s) and the remedial design agent (person(s) designed the remedy), if requested.

A list of suggested items to be covered at the conference includes, but is not limited to the following:

- Final Operation and Maintenance (O&M) Plan submission, if it has not been submitted already
- Cleanup responsibilities
- Demobilization activities
- Security requirements for project transfer
- Prefinal inspection schedule
- Operator training

The prefinal conference shall be documented by a designated person and minutes shall be transmitted to all parties in attendance by the Respondent(s).

#### **3.4.3.2 Prefinal Inspection**

Following the prefinal construction conference, a prefinal inspection of the project will be conducted. The prefinal inspection will be led by the Ohio EPA with assistance from the party with primary responsibility for construction inspection, if requested.

The prefinal inspection will consist of a walk-through inspection of the entire site. The completed site work will be inspected to determine whether the project is complete and consistent with the contract documents and the approved RD/RA Work Plan. Any outstanding deficient or incomplete construction items should be identified and noted during the inspection.

When the RA includes construction of a treatment system, the facility start-up and "shakedown" shall have been completed as part of the RA. "Shakedown" is considered to be the initial operational period following start-up during which adjustments are made to ensure that the performance standards for the system are reliably being achieved. The contractor shall have certified that the equipment has performed to meet the purpose and intent of the contract specifications. Retesting shall have been successfully completed where deficiencies were revealed. Such shakedown may take several months. Determination of remedy effectiveness for other types of remedial actions will be based on the Performance Standard Verification Plan (PSVP).

If construction of major components of a remedial action is performed in distinct phases or under separate contracts due to the complex scope of the site remedy, it may be appropriate to conduct the prefinal inspections of those components separately. The approved RAIP should identify those projects and components, which should be handled in that manner.

Upon completion of the prefinal inspection, an inspection report shall be prepared by the Respondent(s) and submitted to Ohio EPA with the minutes from the prefinal conference. A copy of the report will be provided to all parties in attendance at the inspection. The report will outline the outstanding construction items, actions required to resolve those items,

completion date for those items and a date for the final inspection. Ohio EPA will review the inspection report and notify the Respondent(s) of any disagreements with it.

#### **3.4.3.3 Final Inspection**

Within seven days following completion of any outstanding construction items, the Respondent(s) shall provide written notification to the Ohio EPA and schedule a final inspection. A final inspection will be conducted by the Ohio EPA with assistance from the party having primary responsibility for construction inspection, if requested.

The final inspection will consist of a walk-through inspection of the project site focusing on the outstanding construction items identified during the prefinal inspection. The Prefinal Inspection Report shall be used as a checklist. The contractor's demobilization activities shall have been completed, except for equipment and materials required to complete the outstanding construction items. If any items remain deficient or incomplete, the inspection shall be considered a prefinal inspection requiring another prefinal inspection report and final inspection.

As with the prefinal inspection, it may be appropriate to conduct final inspections of major components of a remedial action separately. Such projects and components should be identified in the approved Remedial Action Implementation Plan.

#### **3.4.3.4 Construction Completion Report and Certification**

Upon satisfactory completion of the final inspection, a Construction Completion Report shall be prepared by the Respondent(s) and submitted to the Ohio EPA within 30 days after the final inspection. The report shall include the following elements:

- 1) A brief description of the outstanding construction items from the prefinal inspection and an indication that the items were satisfactorily resolved;
- 2) A synopsis of the work defined in the approved RD/RA Work Plan and the Final Design and certification that this work was performed;

- 3) An explanation of any changes to the work defined in the approved RD/RA Work Plan and Final Design, including as-built drawings of the constructed RA facilities, and why the changes were necessary or beneficial for the project;
- 4) Certification that the constructed RA or component of the RA is operational and functional.

The construction completion report will be reviewed by the Ohio EPA. If Ohio EPA's review indicates that corrections or amendments to the report are necessary, comments will be provided to the Respondent(s). The Respondent(s) shall submit a revised construction completion report based on Ohio EPA comments to the Ohio EPA within 30 days of receipt of those comments. Upon determination by the Ohio EPA that the report is acceptable, written notice of Ohio EPA's approval of the construction completion report will be provided to the Respondent(s).

#### **3.4.4 Community Relations Support**

The Respondent(s) shall provide support for Ohio EPA's community relations program during remedial action implementation as described in Section 3.3.5.

### **3.5 TASK V: FIVE-YEAR REVIEWS**

At sites where contaminants will remain at levels that will not permit unrestricted use of the site, a review will be conducted no less frequently than once every five years to ensure that the remedy continues to be protective of human health and the environment. This is known as the "five-year review". The Respondent(s) shall complete Five-Year Review Reports no less often than every five years after the initiation of the remedial action or until contaminant levels allow for unrestricted use of the site. Further guidance for performing five-year review work tasks may be found in the U.S. EPA OSWER Directive 9355.7-02, Structure and Components of Five-Year Reviews.

The more specific purpose of the reviews is two-fold: (1) to confirm that the remedial action as specified in the Decision Document and as implemented continues to be effective in protecting human health and the environment (e.g., the remedy is operating and functioning as designed, institutional controls are in place and are protective); and (2) to evaluate whether original cleanup levels remain protective of human health and the environment. A further objective is to evaluate the scope of operation and maintenance, the frequency of repairs, changes in monitoring indicators, costs at the site, and how each of these relates to protectiveness.

Fifteen months prior to the due date for completion of a five-year review, the Respondent(s) shall meet with Ohio EPA to discuss the requirements of the five-year review. The review must be completed within five years following the initiation of the remedial action. The scope and level of review will depend on conditions at the site. The scoping effort should include a determination by the Site Coordinator and Respondent(s) as to whether available monitoring data and other documentation will be sufficient to perform the five-year review or whether a field sampling effort will be a necessary component of the review. Within three months of the meeting, the Respondent(s) shall develop and submit a workplan to Ohio EPA that shall describe, at a minimum, the following activities and documentation:

1. Document Review
  - a. Background Information
    1. Decision Document
    2. Decision Document Summary
    3. Administrative or Judicial Order for RD/RA
    4. Completion of Remedial Action Report
  - b. Design Review
  - c. Maintenance and Monitoring
    1. O&M Manual
    2. O&M Reports
    3. Groundwater Monitoring Plan
    4. Monitoring Data and Information
2. Standards Review
  - a. Specific performance standards required by Decision Document
  - b. Changing Standards
    1. Laws and Regulations applicable to conditions and activities at the site
  - c. Risk Assessment
    1. As summarized in the Decision Document
    2. Review for changes in exposure pathways not previously evaluated
3. Interviews
  - a. Background Information
    1. Previous Staff Management
    2. Nearest Neighbors, Respondent(s)
  - b. Local Considerations
    1. State Contacts
    2. Local Government Contacts

- c. Operational Problems
  - 1. Plant Superintendent
  - 2. O&M Contractors
- 4. Site Inspection/Technology Review
  - a. Performance and Compliance
    - 1. Visual Inspection
  - b. Offsite Considerations
  - c. Recommendations
- 5. Report
  - a. Background
    - 1. Introduction
    - 2. Remedial Objectives
    - 3. Review of Applicable Laws and Regulations
  - b. Site Conditions
    - 1. Summary of Site Visit
    - 2. Areas of Noncompliance
  - c. Risk Assessment
  - d. Recommendations
    - 1. Technology Recommendations
    - 2. Statement on Protectiveness
    - 3. Timing and Scope of Next Review
    - 4. Implementation Requirements

If sampling and analysis of environmental samples is required under the five-year review, the Respondent(s) are required to prepare and submit with the workplan other supporting plans. Supporting plans may include a Quality Assurance Project Plan, Field Sampling Plan and Health and Safety Plan. The purpose and content of these supporting plans are discussed in Section 4 of this SOW. The Five-Year Review Workplan must be reviewed and approved by the Ohio EPA prior to initiation of field activities or proceeding with the five-year review.

The Five-Year Review Report will be reviewed by the Ohio EPA. If Ohio EPA's review indicates that corrections or amendments to the report are necessary, comments will be provided to the Respondent(s). The Respondent(s) shall submit a revised Five-Year Review Report based on Ohio EPA comments to the Ohio EPA within 30 days of receipt of those comments.

### **3.6 TASK VI: OPERATION AND MAINTENANCE/PERFORMANCE MONITORING**

The Respondent(s) shall implement performance monitoring and operation and maintenance procedures as required by the approved Performance Standard Verification Plan and approved Operation and Monitoring (O&M) Plan for the RA once it is demonstrated that the RA components are operational and functional.

#### **3.6.1 Reporting During Operation and Maintenance**

##### **3.6.1.1 Operation and Maintenance Sampling and Analysis Data**

Unless otherwise specified in the approved O&M Plan, sampling, analysis, and system performance data for any treatment system or other engineering systems required to be monitored during the O&M Phase shall be submitted by the Respondent(s) to the Ohio EPA on a monthly basis. These monthly submittals will form the basis for the annual progress report described below in Section 3.6.1.2

##### **3.6.1.2 Progress Reports During Operation and Maintenance**

The Respondent(s) shall prepare and submit annual progress reports during the operation and maintenance/performance monitoring phase of the RA. When appropriate, the RD/RA Work Plan shall specify progress reports during O & M to be submitted more frequently.

The O&M progress reports shall contain the same information as required for the monthly progress reports for the RD and RA construction phases, as specified in Section 3.6.1 of this SOW. It shall also include an evaluation of the effectiveness of any treatment and engineering systems in meeting the cleanup standards, performance standards and other goals of the RA as defined in the Orders, this SOW, the RD/RA Work Plan and the approved Final Design.

#### **3.6.2 Completion of Remedial Action Report**

At the completion of the remedial action, the Respondent(s) shall submit a Completion of Remedial Action Report to the Ohio EPA. The RA shall be considered complete when the all of the goals, performance standards and cleanup standards for the RA as stated in the Decision Document, this SOW, and the approved Final Design (including changes approved during construction) have been met. The report shall document that the project is consistent with the design

specifications, and that the RA was performed to meet or exceed all required goals, cleanup standards and performance standards. The report shall include, but not be limited to the following elements:

- 1) Synopsis of the remedial action and certification of the design and construction;
- 2) Listing of the cleanup and performance standards as established in the Decision Document and the Orders, any amendments to those standards with an explanation for adopting the amendments;
- 3) Summary and explanation of any changes to the approved plans and specifications. An explanation of why the changes were necessary should be included and, where necessary, Ohio EPA approval of the changes should be documented.
- 4) Summary of operation of treatment systems including monitoring data, indicating that the remedial action met or exceeded the performance standards or cleanup criteria;
- 5) Explanation of any monitoring and maintenance activities to be undertaken at the site in the future as outlined in Section 3.0 of this RD/RA SOW.

### **3.7 TASK VII: REPORTING REQUIREMENTS**

The Respondent(s) shall prepare and submit work plans, design plans, specifications, and reports as set forth in Tasks I through V of this SOW to document the design, construction, operation, maintenance, and performance monitoring of the remedial action. Monthly progress reports shall be prepared, as described below, to enable the Ohio EPA to track project progress.

#### **3.7.1 Monthly Progress Reports during RD and RA Construction**

The Respondent(s) shall at a minimum provide the Ohio EPA with monthly progress reports during the design and construction phases of the remedial action containing the information listed below. When appropriate, the RD/RA Work Plan shall specify progress reports to be submitted more frequently.

- 1) A description of the work performed during the reporting period and estimate of the percentage of the RD/RA completed
- 2) Summaries of all findings and sampling during the reporting period
- 3) Summaries of all changes made in the RD/RA during the reporting period, indicating consultation with Ohio EPA and approval by the Ohio EPA of those changes, when necessary

- 4) Summaries of all contacts with representatives of the local community, public interest groups or government agencies during the reporting period
- 5) Summaries of all problems or potential problems encountered during the reporting period, including those which delay or threaten to delay completion of project milestones with respect to the approved work plan schedule or RAIP schedule
- 6) Summaries of actions taken and being taken to rectify problems
- 7) Summaries of actions taken to achieve and maintain cleanup standards and performance standards
- 8) Changes in personnel during the reporting period
- 9) Projected work for the next reporting period
- 10) Copies of daily reports, inspection reports, sampling data, laboratory/monitoring data, etc.

### 3.7.2 Summary of Reports and Submittals

A summary of the information reporting requirements contained in this RD/RA SOW is presented below:

- **Draft RD/RA Work Plan**  
Health and Safety Plan (HSP)  
Regulatory Compliance Plan
- **Final RD/RA Work Plan**  
HSP  
Regulatory Compliance Plan
- **Draft Pre-Design Studies Plan**  
Quality Assurance Project Plan (QAPP)  
Field Sampling Plan (FSP)
- **Final Pre-Design Studies Plan**  
QAPP  
FSP
- **Pre-Design Studies Reports - Draft**
- **Preliminary Design Documents**
- **Pre-Design Studies Reports - Final**
- **Intermediate Design Documents**  
Draft Construction Quality Assurance Plan (CQAP)  
Draft Performance Standard Verification Plan (PSVP)  
Draft O & M Plan  
Health and Safety Plan

- **Prefinal Design Documents**
  - CQAP
  - PSVP
  - O & M Plan
  - Draft Remedial Action Implementation Plan (RAIP)
  - Health and Safety Plan
- **Final Design Documents**
  - CQAP
  - PSVP
  - O & M Plan
  - Draft RAIP
  - Health and Safety Plan
- **Preconstruction Inspection and Conference Report**
- **Monthly Progress Reports During RD/RA**
- **Notification of Preliminary Completion of Construction**
- **Final O & M Plan**
- **Prefinal Inspection Report**
- **Notification for Final Inspection**
- **Construction Completion Report**
- **O & M Sampling Data**
- **Progress Reports during O&M/Performance Monitoring period**
- **Completion of Remedial Action Report**
- **Five-Year Review Workplan**
- **Five-Year Review Report**

#### **4.0 CONTENT OF SUPPORTING PLANS**

The documents listed in this section shall be prepared and submitted as outlined in Section 3.0 of this SOW to support the activities necessary to design and fully implement the RA. These supporting documents include a Quality Assurance Project Plan (QAPP), a Field Sampling Plan (FSP), a Health and Safety Plan (HSP), a Construction Quality Assurance Plan (CQAP) and a Performance Standard Verification Plan (PSVP). The following sections describe the required contents of each of these supporting documents.

#### **4.1 QUALITY ASSURANCE PROJECT PLAN**

The Respondent(s) shall prepare a site-specific Quality Assurance Project Plan (QAPP) to cover sample analysis and data handling based on guidance provided by the Ohio EPA. Refer to the list of Ohio EPA and U.S. EPA guidance documents in Exhibit A attached to this SOW. A QAPP shall be developed for any sampling and analysis activities to be

conducted as pre-design studies and submitted with the Pre-Design Studies Plan for Ohio EPA review and approval.

During the remedial design phase the Respondent(s) shall review all remedial design information and modify or amend the QAPP developed for the Pre-Design Studies Plan, as necessary, to address the sampling and analysis activities to be conducted during implementation of the Remedial Action, including activities covered by the PSVP and O&M Plan. An amended QAPP shall be submitted with the Intermediate Design documents for review and comment by Ohio EPA. A final Quality Assurance Project Plan, which incorporates comments made by the Ohio EPA, shall be submitted for approval with the Final Design documents. Upon agreement of the Site Coordinator, the Respondent(s) may submit only the amended portions of the QAPP developed for the PDSP with the Intermediate, Pre-Final and Final Design documents.

The Respondent(s) shall schedule and attend a pre-QAPP meeting with representatives of Ohio EPA to discuss the scope and format of the QAPP. For sites where the Site Coordinator and Project Manager agree that a pre-QAPP meeting is not needed, this meeting may be omitted. The QAPP shall, at a minimum, include:

1. Data Collection Strategy - The strategy section of the QAPP shall include but not be limited to the following:
  - a. Description of the types and intended uses for the data, relevance to remediation or restoration goals, and the necessary level of precision, accuracy, and statistical validity for these intended uses;
  - b. Description of methods and procedures to be used to assess the precision, accuracy and completeness of the measurement data;
  - c. Description of the rationale used to assure that the data accurately and precisely represent a characteristic of a population, variation of physical or chemical parameters throughout the Site, a process condition or an environmental condition. Factors which shall be considered and discussed include, but are not limited to:
    - i) Environmental conditions at the time of sampling;
    - ii) Sampling design (including number, location and distribution);
    - iii) Representativeness of selected media, exposure pathways, or receptors; and
    - iv) Representativeness of selected analytical parameters.
    - v) Representativeness of testing procedures and conditions; and
    - vi) Independence of background or baseline from site influences.

- d. Description of the measures to be taken to assure that the following data sets can be compared quantitatively or qualitatively to each other:
  - i) RD/RA data collected by the Respondent over some time period;
  - ii) RD/RA data generated by an outside laboratory or consultant employed by the Respondent versus data collected by the Respondent, and;
  - iii) Data generated by separate consultants or laboratories over some time period not necessarily related to the RD/RA effort.
  - iv) Data generated by Ohio EPA or by an outside laboratory or consultant employed by Ohio EPA;
- e. Details relating to the schedule and information to be provided in quality assurance reports. These reports should include but not be limited to:
  - i) Periodic assessment of measurement data accuracy, precision and completeness;
  - ii) Results of performance audits;
  - iii) Results of system audits;
  - iv) Significant quality assurance problems and recommended solutions; and
  - v) Resolutions of previously stated problems.

2. Sample Analysis - The Sample Analysis section of the Quality Assurance Project Plan shall specify the following:

- a. Chain-of-custody procedures, including:
  - i) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment and verify the data entered onto the sample custody records;
  - ii) Provision for a laboratory sample custody log consisting of serially numbered lab-tracking report sheets; and
  - iii) Specification of laboratory sample custody procedures for sample handling, storage and dispersment for analysis.
- b. Sample storage procedures and storage times;
- c. Sample preparation methods;
- d. Analytical procedures, including:
  - i) Scope and application of the procedure;
  - ii) Sample matrix;
  - iii) Potential interferences;
  - iv) Precision and accuracy of the methodology;
  - v) Method detection limits;

- vi) Special analytical services required to ensure contract required detection limits do not exceed known toxicity criteria; and
  - vii) Verification and reporting of tentatively identified compounds.
  - e. Calibration procedures and frequency;
  - f. Data reduction, validation and reporting;
  - g. Internal quality control checks, laboratory performance and systems audits and frequency, including:
    - i) Method blank(s);
    - ii) Laboratory control sample(s);
    - iii) Calibration check sample(s);
    - iv) Replicate sample(s);
    - v) Matrix-spiked sample(s);
    - vi) "Blind" quality control sample(s);
    - vii) Control charts;
    - viii) Surrogate samples;
    - ix) Zero and span gases; and
    - x) Reagent quality control checks.
  - h. Preventative maintenance procedures and schedules;
  - i. Corrective action (for laboratory problems); and
  - j. Turnaround time.
3. Modeling - The Modeling section of the Quality Assurance Project Plan shall apply to all models used to predict or describe fate, transport or transformation of contaminants in the environment and shall discuss:
- a. Model assumptions and operating conditions;
  - b. Input parameters; and
  - c. Verification and calibration procedures.
4. In Situ or Laboratory Toxicity Tests - The Toxicity Test section of the Quality Assurance Project Plan shall apply to all tests or bioassays used to predict or describe impacts of contaminants on a population, community, or ecosystem level.
5. Data Record - The QAPP shall also provide the format to be used to present the raw data and the conclusions of the investigation, as described in a, b, and c below:
- a. The data record shall include the following:
    - i) Unique sample or field measurement code;
    - ii) Sampling or field measurement location and sample or measurement type;
    - iii) Sampling or field measurement raw data;
    - iv) Laboratory analysis ID number;

- v) Property or component measured; and
  - vi) Result of analysis (e.g., concentration).
- b. Tabular Displays - The following data shall be presented in tabular displays:
- i) Unsorted (raw) data;
  - ii) Results for each medium, organism, or for each constituent measured;
  - iii) Data reduction for statistical analysis;
  - iv) Sorting of data by potential stratification factors (e.g., location, soil layer, topography, vegetation form);
  - v) Summary data (i.e., mean, standard deviation, min/max values, and sample number); and
  - vi) Comparisons with background or reference data.
- c. Graphical Displays - The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):
- i) Display sampling locations and sampling grid;
  - ii) Indicate boundaries of sampling area, and areas where more data are required;
  - iii) Display levels of contamination at each sampling location or location from which organism was taken;
  - iv) Display geographical extent of contamination;
  - v) Display contamination levels, averages and maxima;
  - vi) Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters;
  - vii) Indicate features affecting intramedia transport and show potential receptors;
  - viii) Compare nature and extent of contamination with results of ecological or biological sampling or measurements; and
  - ix) Display comparisons with background or reference analyses or measurements.

## 4.2 FIELD SAMPLING PLAN

1. Sampling - The Sampling section of the Field Sampling Plan shall discuss:
  - a. Sufficient preliminary sampling to ensure the proper planning of items b. through o. below;

- b. Selecting appropriate sampling locations, depths, vegetation strata, organism age, etc. and documenting relevance of sample for intended biological toxicity tests or analyses;
- c. Providing a sufficient number of samples to meet statistical or other data useability objectives;
- d. Measuring all necessary ancillary data such as ambient conditions, baseline monitoring, etc.;
- e. Determining environmental conditions under which sampling should be conducted;
- f. Determining which media, pathways, or receptors are to be sampled (e.g., ground water, air, soil, sediment, biota, etc.);
- g. Determining which parameters are to be measured and where;
- h. Selecting the frequency and length of sampling period;
- i. Selecting the sample design (e.g., composites, grabs, random, repeated, etc.);
- j. Selecting the number, location, media or organisms for determining background conditions or reference conditions (refer to Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part A), Interim Final, EPA/540/1-89/002, December 1989);
- k. Measures to be taken to prevent contamination of the sampling equipment and cross contamination between sampling points;
- l. Documenting field sampling operations and procedures, including;
  - i) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters and adsorbing reagents);
  - ii) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;
  - iii) Documentation of specific sample preservation method;
  - iv) Calibration of field devices;
  - v) Collection of replicate and field duplicate samples;
  - vi) Submission of field-biased and equipment blanks, where appropriate;
  - vii) Potential interferences present at the site or facility;
  - viii) Construction materials and techniques associated with monitoring wells and piezometers;
  - ix) Field equipment listing and sample containers;
  - x) Sampling order; and
  - xi) Decontamination procedures.
- m. Selecting appropriate sample containers;

- n. Sample preservation; and
  - o. Chain-of-custody, including:
    - i) Standardized field tracking reporting forms to establish sample custody in the field prior to and during shipment;
    - ii) Sample sealing, storing and shipping procedures to protect the integrity of the sample; and,
    - iii) Pre-prepared sample labels containing all information necessary for effective sample tracking.
2. Field Measurements - The Field Measurements section of the Field Sampling Plan shall discuss:
- a. Selecting appropriate field measurement locations, depths, organism age etc.;
  - b. Providing a sufficient number of field measurements that meet statistical or data useability objectives;
  - c. Measuring all necessary ancillary data such as ambient or baseline environmental conditions;
  - d. Determining conditions under which field measurement should be conducted;
  - e. Determining which media, pathways, or receptors are to be addressed by appropriate field measurements (e.g., ground water, air, soil, sediment, biota, etc.);
  - f. Determining which physical, chemical, or biological parameters are to be measured and where;
  - g. Selecting the frequency and duration of field measurement; and
  - h. Documenting field measurement operations and procedures, including:
    - i) Procedures and forms for recording raw data and the exact location, time and Site specific considerations associated with the data acquisition;
    - ii) Calibration of field devices;
    - iii) Collection of replicate measurements;
    - iv) Submission of field-biased blanks, where appropriate;
    - v) Potential interferences present at the Site;
    - vi) Construction materials and techniques associated with monitoring wells and piezometers used to collect field data;
    - vii) Field equipment listing;
    - viii) Order in which field measurements were made; and
    - ix) Decontamination procedures; and

- i. Selecting the number, location, media, and organisms for determining background or reference conditions.

#### 4.3 SITE HEALTH AND SAFETY PLAN

The Respondent(s) shall submit a Health and Safety Plan (HSP) to the Ohio EPA with the RD/RA Work Plan for any on-site activities taking place during the design phase. The Respondent(s) shall review the remedial design information and modify the HSP developed for the RD/RA Work Plan, as necessary, to address the activities to be conducted on the site during implementation of the Remedial Action. It shall be designed to protect on-site personnel and area residents from physical, chemical and other hazards posed by the construction, operation and maintenance activities of the Remedial Action.

The Respondent(s) shall prepare a site HSP which is designed to protect on-site personnel and area residents from physical, chemical and all other hazards posed by RD/RA activities. The HSP shall address the following topics:

1. Major elements of the Health and Safety Plan shall include:
  - a. Facility or site description including availability of resources such as roads, water supply, electricity and telephone service;
  - b. Description of the known hazards and an evaluation of the risks associated with the incident and with each activity conducted;
  - c. Listing of key personnel (including the site safety and health officer) and alternates responsible for site safety, response operations, and for protection of public health;
  - d. Delineation of work area, including a map;
  - e. Description of levels of protection to be worn by personnel in the work area;
  - f. Description of the medical monitoring program for on-site responders;
  - g. Description of standard operating procedures established to assure the proper use and maintenance of personal protective equipment;
  - h. The establishment of procedures to control site access;
  - i. Description of decontamination procedures for personnel and equipment;
  - j. Establishment of site emergency procedures;
  - k. Availability of emergency medical care for injuries and toxicological problems;

- l. Description of requirements for an environmental monitoring program. (This should include a description of the frequency and type of air and personnel monitoring, environmental sampling techniques and a description of the calibration and maintenance of the instrumentation used.);
  - m. Specification of any routine and special training required for responders; and
  - n. Establishment of procedures for protecting workers from weather-related problems.
2. The Health and Safety Plan shall be consistent with:
- a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
  - b. CERCLA Sections 104(f) and 111(c)(6)
  - c. EPA Order 1440.3 -- Respiratory Protection;
  - d. EPA Order 1440.2 -- Health and Safety Requirements for Employees Engaged in Field Activities;
  - e. EPA Occupational Health and Safety Manual;
  - f. EPA Interim Standard Operating Safety Procedures and other EPA guidance as developed by EPA;
  - g. OSHA regulations particularly in 29 CFR 1910 and 1926;
  - h. State and local regulations; and
  - i. Site or facility conditions.

#### **4.4 CONSTRUCTION QUALITY ASSURANCE PLAN**

The Respondent(s) shall develop a Construction Quality Assurance Plan (CQAP) based on the plans and specifications and performance standards for the RA. The CQAP is a site specific document that shall specify procedures to ensure that the completed remedial action work meets or exceeds all design criteria and specifications. A draft CQAP shall be submitted with the Intermediate Design submittal for review and comment by the Ohio EPA. Subsequent drafts shall be submitted with the Prefinal and Final Design submittals that incorporate comments made by the Ohio EPA. Certain aspects of the CQAP, for example personnel names and qualifications, may not be known at the time of design approval. A complete and final CQAP shall be submitted to Ohio EPA for approval prior to the start of construction. At a minimum, the CQAP shall address the elements listed below.

#### **4.4.1 Responsibility and Authority**

The responsibility and authority of all organizations (i.e. technical consultants, construction firms, etc.) and key personnel involved in the construction of the remedial action(s) shall be described fully in the CQAP. The Respondent(s) shall provide a copy of the approved CQAP to each organization with responsibility and authority for implementing the CQAP. The Respondent(s) shall also identify a CQA officer and the necessary supporting inspection staff.

#### **4.4.2 Construction Quality Assurance Personnel Qualifications**

The qualifications of the Construction Quality Assurance officer and supporting inspection personnel shall be presented in the CQAP to demonstrate that they possess the training and experience necessary to fulfill their identified responsibilities.

#### **4.4.3 Inspection Activities**

The observations and tests that will be used to monitor the construction and/or installation of the components of the remedial action shall be described in the CQAP. The plan shall include scope and frequency of each type of inspection. Inspections shall verify compliance with the design, applicable requirements of state and federal law and performance standards. Inspections shall also ensure compliance with all health and safety standards and procedures. The CQAP shall include provisions for conducting the preconstruction, prefinal and final inspections and associated meetings as described in Section 5.4 of this SOW.

#### **4.4.4 Sampling Requirements**

The sampling activities necessary to ensure that the design specifications and performance standards are achieved shall be presented in the CQAP. The description of these activities shall include sample sizes, sample locations, frequency of sampling, testing to be performed, acceptance and rejection criteria, and plans for correcting problems as addressed in the design specifications.

#### **4.4.5 Documentation**

Reporting requirements for CQA activities shall be described in detail in the CQAP. This shall include such items as daily summary reports, meeting reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports and final documentation. Provisions for the storage of all records shall be presented in the CQAP.

#### **4.5 PERFORMANCE STANDARD VERIFICATION PLAN**

A Performance Standard Verification Plan (PSVP) shall be prepared to consolidate information for required testing, sampling and analyses to ensure that both short-term and long-term performance standards for the RA are met. Performance standards may include clean-up standards for contaminated environmental media as well as the measurement of the effectiveness of engineering controls or other controls used to control migration of or exposure to contaminants. For example, the containment of a plume of contaminated ground water by pumping wells would be a performance standard requiring verification. The PSVP should describe the measurements to be taken, such as water levels in monitoring wells and piezometers, along with any analyses to be conducted on the data obtained, such as ground water modeling, to verify that the plume is contained. The PSVP shall include a FSP and a QAPP for any sampling and analyses to be conducted.

The Draft PSVP shall be submitted with the Intermediate Design for review and comment by the Ohio EPA. The final PSVP, which fully addresses comments made by the Ohio EPA must be submitted with and approved as part of the Final Design.

#### **4.6 OPERATION AND MAINTENANCE PLAN**

The Respondent(s) shall prepare an Operation and Maintenance Plan (O&M Plan) to cover long term operation and maintenance of the RA. Operation and maintenance for all components of the remedial action, shall begin after it is demonstrated that those components are operational and functional. The plan, at a minimum, shall be composed of the elements listed below.

1. Normal Operation and Maintenance
  - a. Description of tasks for operation
  - b. Description of tasks for maintenance
  - c. Description of prescribed treatment or operating conditions
  - d. Schedules showing the frequency of each O&M task
  
2. Potential Operating Problems
  - a. Description and analysis of potential operating problems
  - b. Sources of information regarding potential operating problems
  - c. Description of means of detecting problems in the operating systems
  - d. Common remedies for operating problems
  
3. Routine Monitoring and Laboratory Testing
  - a. Description of monitoring tasks

- b. Description of required laboratory tests and interpretation of test results
- c. Required QA/QC procedures to be followed
- d. Schedule of monitoring frequency and provisions to discontinue, if appropriate

Note: Information on monitoring and testing that is presented in the PSVP should be referenced, as appropriate, but should not be duplicated in the O&M Plan.

- 4. Alternative O&M
  - a. Description of alternate procedures to prevent undue hazard, should systems fail
  - b. Analysis of the vulnerability and additional resources requirements should a failure occur
- 5. Safety Plan
  - a. Description of safety procedures, necessary equipment, etc. for site personnel
  - b. Description of safety tasks required in the event of systems failure (may be linked to the Site Safety Plan developed for the RD/RA)
- 6. Equipment
  - a. Description of equipment necessary to the O&M Plan
  - b. Description of installation of monitoring components
  - c. Description of maintenance of site equipment
  - d. Replacement schedule for equipment and installed components
- 7. Annual O&M Budget
  - a. Costs for personnel
  - b. Costs for preventative and corrective maintenance
  - c. Costs of equipment and supplies, etc.
  - d. Costs of any contractual obligations (e.g., lab expenses)
  - e. Costs of operation (e.g., energy, other utilities, etc.)
- 8. Records and Reporting Mechanisms Required
  - a. Daily operating logs
  - b. Laboratory records
  - c. Records for operating costs
  - d. Mechanism for reporting emergencies
  - e. Personnel and maintenance records
  - f. Monthly/semi-annual reports to Ohio EPA

The Respondent(s) shall submit a draft O&M Plan to the Ohio EPA for review and comment with the Intermediate Design submittal. Subsequent drafts of the O&M Plan shall be submitted with the Prefinal and Final Design submittals, which reflect the refined plans and specifications of those submittals and any comments made by the Ohio EPA. The final O&M Plan shall be submitted by the Respondent(s) prior to or at the completion of construction of the remedial action and shall incorporate any modifications or corrections required by the Ohio EPA.

## EXHIBIT A

### OHIO EPA AND U.S. EPA GUIDANCE DOCUMENTS FOR REMEDIAL DESIGN / REMEDIAL ACTION

1. Background Guidance, Final, Ohio EPA, Division of Emergency and Remedial Response, July 26, 1991
2. Structure and Components of Five-Year Reviews, OSWER Directive 9355.7-02, May 1991
3. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final, OSWER 9355.3-01, EPA/540/G-89/004, October 1988
4. Technical Guidance Manual for Hydrogeologic Investigations and Ground Water Monitoring Programs, Ohio EPA, Division of Drinking and Ground Waters, Final, February 1995
5. Guidance for Remedial Actions for Contaminated Ground Water at Superfund Sites, OSWER Directive 9283.1-2, EPA/540/G-88/003, December 1988, Interim Final
6. Data Quality Objectives for Remedial Response Activities, Volume I - Example Scenario, OSWER Directive 9355.0-7B, EPA/540/G-87/004, March 1987
7. Superfund Remedial Design and Remedial Action Guidance, OSWER 9355.0-4A, June 1986
8. Guidelines and Specifications for Preparing Quality Assurance Project Plans, Ohio EPA, Division of Emergency and Remedial Response, Policy No. DERR-00-RR-008, March 1990
9. CERCLA Compliance With Other Laws Manual - Part I, OSWER Directive 9234.1-01, EPA/540/G-89/006, August 1989, Interim Final
10. CERCLA Compliance With Other Laws Manual - Part II, OSWER Directive 9234.1-02, EPA/540/G-89/009, August 1989, Interim Final

11. U.S. EPA Integrated Risk Information System (IRIS) Data Base
12. U.S. EPA Health Effects Assessment Summary Tables, Office of Emergency & Remedial Response, published annually
13. Guide for Conducting Treatability Studies Under CERCLA, EPA/540/2-89/058, December 1989, Interim Final
14. Final Covers for Hazardous Waste Landfills and Surface Impoundments, EPA/530/SW-89/047, July 1989
15. Requirements for Hazardous Waste Landfill Design, Construction, and Closure, EPA/625/4-89/022, August 1989
16. Technical Guidance Document: Construction Quality Assurance for Hazardous Waste Land Disposal Facilities, EPA/530/SW-86/031, October 1986
17. Technical Guidance Document: Inspection Techniques for the Fabrication of Geomembrane Field Seams, EPA/530/SW-91/051, May 1991
18. Technical Guidance for Corrective Measures - Subsurface Gas, EPA/530/SW-88/023, March 1985
19. Technical Guidance Document: Quality Assurance and Quality Control for Waste Containment Facilities, EPA/600/R-93/182, September 1993

## Appendix E

### OHIO EPA AND U.S. EPA GUIDANCE DOCUMENTS

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#### Statement of Purpose and Use of This Guidance Document List:

The purpose of this list of Ohio EPA and U.S. EPA policies, directives and guidance documents is to provide a reference of the documents which provide essential direction and guidance for conducting investigations, evaluating alternative remedial actions, and designing and implementing selected remedial actions at sites for which the Division of Emergency and Remedial Response has authority over such activities. Certain sites may have contaminants or conditions which are not fully addressed by the documents in this list. There is an evolving body of policy directives, guidance and research documentation which should be utilized, as necessary, to address those conditions and contaminants not encompassed by the documents in this list. For sites where activities are conducted in response to an administrative or judicial order, this list would be an attachment to the order and would govern the work conducted pursuant to it. When entering into or issuing an order for a particular site, Ohio EPA reserves the right to modify this list to fully address the site conditions.

#### OHIO EPA POLICIES AND GUIDANCE DOCUMENTS

1. Best Available Treatment Technologies (BATT) for Remedial Response Program Sites, Ohio EPA Policy No. DERR-00-RR-016, Final, October 23, 1992
2. Guidelines and Specifications for Preparing Quality Assurance Project Plans, Ohio EPA, Division of Emergency and Remedial Response, Policy No. DERR-00-RR-008, March 1990
3. Procedures for Evaluation of Response Action Alternatives and Remedy Selection for Remedial Response Program Sites, Ohio EPA Policy No. DERR-00-RR-019, Final, October 23, 1992
4. Technical Guidance Manual for Hydrogeologic Investigations and Ground Water Monitoring Programs, Ohio EPA, Division of Drinking and Ground Waters, Final, February 1995
5. Wastewater Discharges Resulting from Clean-Up of Response Action Sites Contaminated with Volatile Organic Compounds, Ohio EPA Policy No. DSW-DERR 0100.027, Final, September 22, 1994

Revised July, 1999

Also, if there are any aquatic ecological concerns for the site under investigation please consult the following Biological Criteria documents:

- 6a. Biological Criteria for the Protection of Aquatic Life: Volume I. The Role of Biological Data in Water Quality Assessment. Ohio EPA, Division of Surface Water, 1987
- 6b. Biological Criteria for the Protection of Aquatic Life: Volume II. Users Manual for Biological Field Assessment of Ohio Surface Waters. Ohio EPA, Division of Surface Water, 1987
- 6c. Addendum to Biological Criteria for the Protection of Aquatic Life: Volume II. Users Manual for Biological Field Assessment of Ohio Surface Waters. Ohio EPA, Division of Surface Water, 1989
- 6d. Biological Criteria for the Protection of Aquatic Life: Volume III. Standardized Biological Field Assessment of Ohio Surface Waters. Ohio EPA, Division of Surface Water, 1989
- 6e. Rankin, E.T. 1989. The Qualitative Habitat Evaluation Index (QHEI): Rationale, Methods, and Application. Ohio EPA, Division of Surface Water, 1990

#### **U.S. EPA GUIDANCE DOCUMENTS AND OTHER USEFUL GUIDANCE**

7. CERCLA Compliance with Other Laws Manual - Part I, OSWER Directive 9234.1-01, EPA/540/G-89/006, August 1988, interim final
8. Use of monitored Natural Attenuation at Superfund, RCRA, Corrective Action, and Underground Storage Tank Sites, OSWER 9200.4-17, Interim Final, November 1997
9. Technical Guidance Document: Construction Quality Assurance and Quality Control for Waste Containment Facilities, EPA/600/R-93/182, September 1993
10. CERCLA Compliance with Other Laws Manual - Part II, OSWER 9234.1-01, EPA/540/G-89/006, August 1988, interim final
11. A Compendium of Technologies Used in the Treatment of Hazardous Wastes, EPA/625/8-87/014, September 1987

12. A Rationale for the Assessment of Errors in the Sampling of Soils, EPA/600/4-90/013, July 1990
13. Assessment of Technologies for the Remediation of Radioactively Contaminated Superfund Sites, EPA/540/2-90/001, January 1990
14. Closure of Hazardous Waste Surface Impoundments, SW-873, September 1980
15. Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites, OSWER Directive 9355.3-11, EPA/540/P-91/001, February 1991
16. Data Quality Objectives Process for Superfund, Interim Final Guidance, OSWER Directive 9355.9-01, EPA540-R-93-071, September 1993
17. Ecological Assessments of Hazardous Wastes Sites: A Field and Laboratory Reference, EPA/600/3-89/013, March 1989
18. Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, September 26, 1994
19. Exposure Factors Handbook, EPA/600/8-89/043, March 1990
- 20.\* Guidance for Remedial Actions for Contaminated Ground Water at Superfund Sites, OSWER Directive 9283.1-2, EPA/540/G-88/003, December 1988, interim final
21. Guidance for Conducting Remedial Investigation and Feasibility Studies under CERCLA, Interim Final, OSWER 9355.3-01, EPA/540/G-89/004, October 1988
- 22.\* Guidance on Remedial Actions for Superfund Sites with PCB Contamination, OSWER Directive 9355.4-01, EPA/540/G-90/007, August 1990
23. Guidance Document on the Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities, EPA, 1989
24. Guidance on Applying the Data Quality Objectives Process for Ambient Air Monitoring Around Superfund Sites (Stages 1 & 2), EPA/450/4-89/015, August 1989
25. Guidance for Data Usability in Risk Assessment, OSWER Directive 9285.7-05,

- EPA/540/G-90/008, October 1990, interim final
- 26.\* Guide for Decontaminating Buildings, Structures, and Equipment at Superfund Sites, EPA/600/2-85/028, March 1985
  27. Guide for Conducting Treatability Studies Under CERCLA: Soil Vapor Extraction, EPA/540/2-91/019A, September 1991, interim guidance
  28. Guide for Conducting Treatability Studies Under CERCLA: Aerobic Biodegradation Remedy Screening, EPA/540/2-91/013A, July 1991, interim guidance
  29. Guide for Conducting Treatability Studies Under CERCLA, EPA/540/2-89/058, December 1989, interim final
  30. Handbook - Permit Writer's Guide to Test Burn Data - Hazardous Waste Incineration, EPA/625/6-86/012, September 1986
  - 31.\* Handbook - Quality Assurance/Quality Control (QA/QC) Procedures for Hazardous Waste Incineration, EPA/625/6-89/023, January 1990
  32. Handbook - Dust Control at Hazardous Waste Sites, EPA/540/2-85/003, November 1985
  - 33.\* Handbook - Guidance on Setting Permit Conditions and Reporting Trial Burn Results - Volume II of the Hazardous Waste Incineration Guidance Series, EPA/625/6-89/019, January 1989
  34. Handbook on In Situ Treatment of Hazardous Waste-Contaminated Soils, EPA/540/2-90/002, January 1990,
  35. Handbook for Stabilization/Solidification of Hazardous Wastes, EPA/540/2-86/001, June 1986
  36. Handbook - Hazardous Waste Incineration Measurement Guidance Manual - Volume III of the Hazardous Waste Incineration Guidance Series, EPA/625/6-89/021, June 1989
  37. Leachate Plume Management, EPA/540/2-85/004, November 1985
  38. Preparation Aids for the Development of Category 1 Quality Assurance Project Plans,

EPA/6008-91-003, February 1991

39. Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures, Interim Final, EPA/540/G-90/004, April 1989
40. RCRA Ground Water Monitoring Technical Enforcement Guidance Document (TEGD), OSWER Directive 9950.1, September 1986
41. Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part A), Interim Final, EPA/540/1-89/002, December 1989
42. Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part B), "Development of Risk-based Preliminary Remediation Goals," OSWER Directive 9285.7-01B, December 1991, Interim
43. Risk Assessment Guidance for Superfund: Volume II - Environmental Evaluation Manual, OSWER Directive 9285.7-01, EPA/540/1-89/001A, March 1989, interim final
44. Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors," OSWER Directive 9285.6-03, March 1991, interim final
45. Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part C), "Risk Evaluation of Remedial Alternatives," OSWER Directive 9285.7-01C, December 1991, Interim
- 46.\* Seminar Publication - Requirements for Hazardous Waste Landfill Design, Construction, and Closure, EPA/625/4-89/022, August 1989
47. SW 846, Test Methods for Evaluating Solid Waste, 3rd Edition and appropriate updates, November 1986.
48. Stabilization/Solidification of CERCLA and RCRA Wastes - Physical Tests, Chemical Testing Procedures, Technology Screening and Field Activities, EPA/625/6-89/022, May 1989
49. Standard Methods for the Examination of Water and Wastewater, American Public Health Association, 18th Edition, 1992

- 50.\* Superfund Remedial Design and Remedial Action Guidance, OSWER 9355.0-4A, June 1986
51. Superfund Exposure Assessment Manual, OSWER Directive 9285.5-1, EPA/540/1-88/001, April 1988
52. Superfund Ground Water Issue: Ground Water Sampling for Metals, EPA/540/4-89/001, March 1989
53. Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action and Underground Storage Tank Sites, OSWER Directive 9200.4-17P, 1999
- 54.\* Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments, EPA/530-SW-89-047, July 1989
- 55.\* Technical Guidance Document: Inspection Techniques for the Fabrication of Geomembrane Field Seams, EPA/530/SW-91/051, May 1991
56. Technical Guidance for Corrective Measures - Subsurface Gas, EPA/530-SW-88-023, March 1985
57. U.S. EPA Integrated Risk Information System (IRIS) Data Base
58. U.S. EPA Health Effects Assessment Summary Tables, Office of Emergency & Remedial Response, published annually
59. U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA-540/R-94-013, February 1994
60. U.S. EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA-540/R-94-012, February 1994
61. User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings (Revised). Prepared for USEPA Office of Emergency and Remedial Response. Environmental Quality Management, Inc. December, 2000.
62. Wildlife Exposure Factors Handbook, Volume I of II, EPA/600/R-93/187a, December 1993

63. Wildlife Exposure Factors Handbook, Appendix: Literature Review Database, Volume II of II, EPA/600/R-93/187b, December 1993

#### **INNOVATIVE TECHNOLOGY AND REGULATORY COOPERATION PROTOCOLS**

1. Multi-State Evaluation of Expedited Site Characterization Technology, Site Characterization and Analysis Penetrometer System-Induced Fluorescence (SCAPS-LIF)-Final-May 1996
2. Multi-State Evaluation of Expedited Site Characterization Technology, Site Characterization and Analysis Penetrometer System-Volatile Organic Compounds (SCAPS-VOC) Sensing Technologies-Final-December 1997
3. Technology Review of SCAPS Thermal Desorption VOC Sampler-Final-
4. ISB Protocol Binder and Resource Document for Hydrocarbons-Final-June 1996
5. Natural Attenuation of Chlorinated Solvents in Groundwater-Principles and Practices-Draft Version 3.0-August 1997
6. Closure Criteria Focus Group-Final-March 1998
7. Cost & Performance reporting for In-Situ Bioremediation Technologies-Final-December 1997
8. Technical and Regulatory Guidelines for Soil Washing-Final-December 1997
9. Regulatory Guidance for Permeable Barriers Designed to Remediate Chlorinated Solvents-Final-December 1997
10. Design Guidance for Application of Permeable Barriers to Remediate Dissolved Chlorinated Solvents-Final-February 1997
11. Regulatory Guidance for Permeable Barriers to Remediate Inorganics and radionuclides-Draft-October 1998
12. Technical Requirements for On-site Low Temperature Thermal Treatment of Non-Hazardous Soils Contaminated with Petroleum/Coal Tar/ Gas Plant Wastes-Final-1996

13. Technical Requirements for On-Site Thermal Desorption of Solid Media Contaminated with Hazardous Chlorinated Solvents-Final-September 1997
  14. Technical Requirements for On-Site Thermal Desorption of Solid Media Contaminated and Low Level Mixed Waste Contaminated with Mercury and/or Hazardous Chlorinated Organics-Final-September 1997
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Notes:

- 1) Documents and guidances denoted by an asterisk (\*) are those which may be important to the Remedial Design/Remedial Action phase of a project but generally will have limited relevance to the Remedial Investigation/Feasibility Study process.
- 2) This list of guidance documents is updated periodically. You should check with Ohio EPA to verify that this list is the most current available.
- 3) The ITRC documents can be downloaded from the itrc web site, [www.sso.org/ecos/itrc](http://www.sso.org/ecos/itrc).