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UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION I

IN THE MATTER OF: Olin Chemical Superfund Site Wilmington, Middlesex County, Massachusetts	ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY
American Biltrite Inc., Olin Corporation, and Stepan Company,	U.S. EPA Region I CERCLA Docket No. 01-2007-0102
Respondents	Proceeding Under Sections 104, 107 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. §§ 9604, 9607 and 9622.

RI/FS ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT

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ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT
FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY

I. JURISDICTION AND GENERAL PROVISIONS

1. This Administrative Settlement Agreement and Order on Consent ("Settlement Agreement") is entered into voluntarily by the United States Environmental Protection Agency ("EPA") and American Biltrite Inc., Olin Corporation, and Stepan Company ("Respondents"). The Settlement Agreement concerns the preparation and performance of a remedial investigation and feasibility study ("RI/FS") at the Olin Chemical Superfund Site located at 51 Eames Street, in Wilmington, Massachusetts ("Site") and the reimbursement for future response costs incurred by EPA in connection with the RI/FS.

2. This Settlement Agreement is issued under the authority vested in the President of the United States by Sections 104, 107 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. §§ 9604, 9607 and 9622 ("CERCLA"). This authority was delegated to the Administrator of EPA on January 23, 1987, by Executive Order 12580, 52 Fed. Reg. 2926 (Jan. 29, 1987), further delegated to Regional Administrators on May 11, 1994, by EPA Delegation Nos. 14-14-C and 14-14-D, and further delegated to the Director, Office of Site Remediation & Restoration, by EPA Region I Order No. 1200, dated June 30, 1995.

3. In accordance with Sections 104(b)(2) and 122(j)(1) of CERCLA, 42 U.S.C. §§ 9604(b)(2) and 9622(j)(1), EPA notified the U.S. National Oceanic and Atmospheric Administration, the U.S. Department of the Interior, and the Massachusetts Executive Office of Environmental Affairs on June 19, 2006, of negotiations with potentially responsible parties regarding the release of hazardous substances that may have resulted in injury to the natural resources under Federal and/or State trusteeship.

4. EPA and Respondents recognize that this Settlement Agreement has been negotiated in good faith and that the actions undertaken by Respondents in accordance with this Settlement Agreement do not constitute an admission of any liability. Respondents do not admit, and retain the right to controvert in any subsequent proceedings other than proceedings to implement or enforce this Settlement Agreement, the validity of the findings of fact, conclusions of law and determinations in Sections V and VI of this Settlement Agreement. Respondents agree to comply with and be bound by the terms of this Settlement Agreement and further agree that they will not contest the basis or validity of this Settlement Agreement or its terms.

II. PARTIES BOUND

5. This Settlement Agreement applies to and is binding upon EPA and upon Respondents and their successors and assigns. Any change in ownership or corporate status of a

Respondent including, but not limited to, any transfer of assets or real or personal property shall not alter such Respondent's responsibilities under this Settlement Agreement.

6. Respondents are jointly and severally liable for carrying out all activities required by this Settlement Agreement. In the event of the insolvency or other failure of any one or more Respondents to implement the requirements of this Settlement Agreement, the remaining Respondents shall complete all such requirements.

7. Respondents shall ensure that their contractors, subcontractors, and representatives receive a copy of this Settlement Agreement and comply with this Settlement Agreement. Respondents shall be responsible for any noncompliance with this Settlement Agreement.

8. Each undersigned representative of Respondents certifies that he or she is fully authorized to enter into the terms and conditions of this Settlement Agreement and to execute and legally bind Respondents to this Settlement Agreement.

III. STATEMENT OF PURPOSE

9. In entering into this Settlement Agreement, the objectives of EPA and Respondents are: (a) to determine the nature and extent of contamination and any threat to the public health, welfare, or the environment caused by the release or threatened release of hazardous substances, pollutants or contaminants at or from the Site, by conducting a Remedial Investigation as more specifically set forth in the Statement of Work ("SOW") attached as Appendix A to this Settlement Agreement; (b) to identify and evaluate remedial alternatives to prevent, mitigate or otherwise respond to or remedy any release or threatened release of hazardous substances, pollutants, or contaminants at or from the Site, by conducting a Feasibility Study as more specifically set forth in the SOW in Appendix A to this Settlement Agreement; and (c) to recover response and oversight costs incurred by EPA with respect to this Settlement Agreement.

10. The Work conducted under this Settlement Agreement is subject to approval by EPA and shall provide all appropriate and necessary information to assess Site conditions and evaluate alternatives to the extent necessary to select a remedy that will be consistent with CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300 ("NCP"). Respondents shall conduct all Work under this Settlement Agreement in compliance with CERCLA, the NCP, and all applicable EPA guidances, policies, and procedures.

IV. DEFINITIONS

11. Unless otherwise expressly provided herein, terms used in this Settlement Agreement that are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are

used in this Settlement Agreement or in the appendices attached hereto and incorporated hereunder, the following definitions shall apply:

a. "CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. § 9601 *et seq*.

b. "Commonwealth" shall mean the Commonwealth of Massachusetts.

c. "Day" shall mean a calendar day. In computing any period of time under this Settlement Agreement, where the last day would fall on a Saturday, Sunday, or federal holiday, the period shall run until the close of business of the next working day.

d. "Effective Date" shall be the effective date of this Settlement Agreement as provided in Section XXIX.

e. "EPA" shall mean the United States Environmental Protection Agency and any successor departments or agencies of the United States.

f. "Engineering Controls" shall mean constructed containment barriers or systems that control one or more of the following: downward migration, infiltration or seepage of surface runoff or rain; or natural leaching migration of contaminants through the subsurface over time. Examples include caps, engineered bottom barriers, immobilization processes, and vertical barriers.

g. "Future Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States incurs in reviewing or developing plans, reports and other items pursuant to this Settlement Agreement, verifying the Work, or otherwise implementing, overseeing, or enforcing this Settlement Agreement, including but not limited to payroll costs, contractor costs, travel costs, laboratory costs, Agency for Toxic Substances and Disease Registry ("ATSDR") costs, the costs for technical assistance grants, the costs for performance of reuse assessments, and the costs incurred pursuant to Paragraph 53 (costs and attorneys fees and any monies paid to secure access, including the amount of just compensation), Paragraph 39 (emergency response) and Paragraph 82 (work takeover). Such Future Response Costs do not include costs of remedial action or natural resource damages.

h. "Institutional controls" shall mean non-engineered instruments, such as administrative and/or legal controls, that help to minimize the potential for human exposure to contamination and/or protect the integrity of a remedy by limiting land and/or resource use. Examples of institutional controls include easements and covenants, zoning restrictions, special building permit requirements, and well drilling prohibitions.

i. "Interest" shall mean interest at the rate specified for interest on investments of the EPA Hazardous Substance Superfund established by 26 U.S.C. § 9507, compounded annually, in accordance with 42 U.S.C. § 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year.

j. "MassDEP" shall mean the Massachusetts Department of Environmental Protection and any successor departments or agencies of the Commonwealth of Massachusetts.

k. "NCP" shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, and any amendments thereto.

l. "Olin Property" shall mean the approximately 50-acre parcel located at 51 Eames Street, Wilmington, Massachusetts.

m. "Paragraph" shall mean a portion of this Settlement Agreement identified by an Arabic numeral.

n. "Parties" shall mean EPA and Respondents.

o. "RCRA" shall mean the Resource Conservation and Recovery Act, also known as the Solid Waste Disposal Act, as amended, 42 U.S.C. § 6901 *et seq.*

p. "Respondents" shall mean American Biltrite Inc., Olin Corporation ("Olin"), and Stepan Company.

q. "Section" shall mean a portion of this Settlement Agreement identified by a Roman numeral. References to sections in the SOW will be so identified; for example as "SOW Section V."

r. "Settlement Agreement" shall mean this Administrative Settlement Agreement and Order on Consent, the SOW, all appendices attached hereto (listed in Section XXVII) and all documents incorporated by reference into this document including without limitation EPA-approved submissions. EPA-approved submissions (other than semi-annual status reports) are incorporated into and become a part of the Settlement Agreement upon approval by EPA. In the event of conflict between this Settlement Agreement and any appendix or other incorporated documents, this Settlement Agreement shall control.

s. "Site" shall mean the Olin Chemical Superfund Site in Middlesex County, Massachusetts, comprising (i) the approximately 50-acre property at 51 Eames Street in Wilmington, Middlesex County, Massachusetts (defined above as the Olin Property), (ii) the

contaminated groundwater that extends from the Olin Property to other areas, including the Maple Meadow Brook Aquifer, and (iii) all other areas contaminated by hazardous substances disposed of at 51 Eames Street.

t. "Statement of Work" or "SOW" shall mean the Statement of Work for development of an RI/FS for the Site, as set forth in Appendix A to this Settlement Agreement. The Statement of Work is incorporated into this Settlement Agreement and is an enforceable part of this Settlement Agreement as are any modifications made thereto in accordance with this Settlement Agreement.

u. "Waste Material" shall mean (1) any "hazardous substance" under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (2) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); (3) any "solid waste" under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27); and (4) any "hazardous material" under Massachusetts General Laws Chapter 21E, section 2.

v. "Work" shall mean all activities Respondents are required to perform under this Settlement Agreement, except those required by Section XIV (Retention of Records).

V. FINDINGS OF FACT

12. The Site comprises the Olin Property (i.e., the approximately 50-acre parcel at 51 Eames Street in Wilmington, Massachusetts) and adjoining areas contaminated by hazardous substances from this parcel. The northern part of this property was formerly the site of a chemical manufacturing facility.

13. The chemical manufacturing facility was constructed in approximately 1953 and was operated by National Polychemicals, Inc. ("NPI"). Between approximately 1959 and 1968, three different entities -- American Biltrite Rubber Co., Fisons Limited and Fisons Corporation (now known as NOR-AM Agro LLC) -- owned stock in and, among other connections with the facility, had a relationship with NPI, or with another corporation that came to hold title to the facility after NPI. In 1968, Stepan Chemical Company bought the business and continued to operate the facility until 1980, when the facility was purchased by Olin. Olin closed the facility in 1986. The facility was used to manufacture chemical blowing agents, stabilizers, antioxidants and other specialty chemicals for the rubber and plastics industry.

14. The former manufacturing processes generated liquid wastes which contained sulfuric acid, sodium chloride, sodium sulfate, ammonium chloride, ammonium sulfate, chromium sulfate and other constituents. Between 1953 and approximately 1970, all liquid wastes generated at the chemical factory were disposed of in unlined pits on the northern half of the property. In approximately 1970, lined lagoons and an acid treatment and neutralization system were added to the Olin Property to replace the unlined pits. The acid treatment and

neutralization system initially discharged to ditches draining off the property. In approximately 1972, the system was connected to a municipal sewer. The lined lagoons were periodically dredged of calcium sulfate, and this substance was disposed of on the southwest corner of the property in an area known as the Calcium Sulfate Landfill. According to monitoring data from the late 1970s, the lined lagoons were leaking. They were re-lined in approximately 1981 and 1983. Leaks in sewer lines were also repaired in approximately 1983 and 1984.

15. Since 1953, disposal activities at the facility are believed to have caused contamination of soil, sediments, surface water and groundwater on and off the Olin Property.

16. Ammonia, chromium compounds, chloride, sodium, sulfate and n-nitrosodimethylamine ("NDMA") have been detected at the Site.

17. As a result of the detection of NDMA in the Maple Meadow Brook Aquifer, the Town of Wilmington shut down the Butters Row #1, Butters Row #2, Chestnut Street #1, Chestnut Street #1A and Chestnut Street #2 drinking water wells. While no NDMA was detected in the Town Park drinking water well, this well was shut down as a precautionary measure.

18. The Site has been subjected to many years of investigations and cleanups carried out by Olin and supervised by MassDEP under Chapter 21E of the General Laws of Massachusetts and the Massachusetts Contingency Plan ("MCP"). The Site has been a "Priority" site under the MCP since 1993, and a "Tier I" site since 1994. In addition to other investigations and cleanups, Olin has completed a Phase II Field Investigation Report and several investigatory supplements (including a study of the Maple Meadow Brook Aquifer), removed buried drums, excavated soils and sediments, constructed and operated a groundwater pump-and-treat system, built a subsurface containment system (including a slurry wall and a temporary cap) around the contaminated groundwater on the Olin Property, and installed a network of wells monitoring groundwater on and off the Olin Property. Olin has recently sought MassDEP's approval under state solid waste regulations to close the Calcium Sulfate Landfill, which is located on the southern portion of the Olin Property.

19. The Site was listed on the National Priorities List ("NPL") pursuant to CERCLA Section 105, 42 U.S.C. § 9605 on April 19, 2006 (71 FR 20,016).

20. The current or former owners and/or operators of the Site are as follows:

(a) Respondent American Biltrite Inc. was the owner and operator of the Olin Property at a time when hazardous substances were disposed of there, and/or is a successor to an entity that was the owner and operator of the Olin Property at a time when hazardous substances were disposed of there.

(b) The Biltrite Corporation was the owner and operator of the Olin Property at a time when hazardous substances were disposed of there, and/or is a successor to an entity that was the owner and operator of the Olin Property at a time when hazardous substances were disposed of there.

(c) Fisons Limited was the owner and/or operator of the Olin Property at a time when hazardous substances were disposed of there, and/or is a successor to an entity that was the owner and/or operator of the Olin Property at a time when hazardous substances were disposed of there.

(d) NOR-AM Agro LLC was the owner and/or operator of the Olin Property at a time when hazardous substances were disposed of there, and/or is a successor to an entity that was the owner and/or operator of the Olin Property at a time when hazardous substances were disposed of there.

(e) Respondent Olin Corporation is the current owner and operator of the Olin Property, and was the owner and operator of the Olin Property at a time when hazardous substances were disposed of there.

(f) Respondent Stepan Company was the owner and operator of the Olin Property at a time when hazardous substances were disposed of there, and/or is a successor to an entity that was the owner and operator of the Olin Property at a time when hazardous substances were disposed of there.

VI. CONCLUSIONS OF LAW AND DETERMINATIONS

Based on the Findings of Fact set forth above, EPA has determined that:

21. The Olin Chemical Superfund Site is a "facility" as defined in Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

22. The contamination found at the Site, as identified in the Findings of Fact above, includes "hazardous substances" as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

23. The conditions described in the Findings of Fact above constitute an actual and/or threatened "release" of a hazardous substance from the facility as defined in Section 101(22) of CERCLA, 42 U.S.C. § 9601(22).

24. Each Respondent is a "person" as defined in Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

25. Each Respondent is a responsible party under Sections 104, 107 and 122 of CERCLA, 42 U.S.C. §§ 9604, 9607 and 9622. Each Respondent is the current owner and/or operator of a facility at the Site, was the owner/operator of a facility at the Site at a time when hazardous substances were disposed of there, and/or is a successor to an entity that was the owner and/or operator of a facility at the Site at a time when hazardous substances were disposed of there. Each Respondent therefore may be liable under Section 107(a) of CERCLA, 42 U.S.C. § 9607(a).

26. The actions required by this Settlement Agreement are necessary to protect the public health, welfare or the environment, are in the public interest, 42 U.S.C. § 9622(a), are consistent with CERCLA and the NCP, 42 U.S.C. §§ 9604(a)(1), 9622(a), and will expedite effective remedial action and minimize litigation, 42 U.S.C. § 9622(a).

27. EPA has determined that Respondents are qualified to conduct the RI/FS within the meaning of Section 104(a) of CERCLA, 42 U.S.C. § 9604(a), and will carry out the Work properly and promptly, in accordance with Sections 104(a) and 122(a) of CERCLA, 42 U.S.C. §§ 9604(a) and 9622(a), if Respondents comply with the terms of this Settlement Agreement.

VII. SETTLEMENT AGREEMENT AND ORDER

28. Based upon the foregoing Findings of Fact and Conclusions of Law and Determinations, it is hereby Ordered and Agreed that Respondents shall comply with all provisions of this Settlement Agreement, including, but not limited to, all appendices to this Settlement Agreement and all documents incorporated by reference into this Settlement Agreement.

VIII. DESIGNATION OF CONTRACTORS AND PROJECT COORDINATORS

29. Selection of Contractors, Personnel. All Work performed under this Settlement Agreement shall be under the direction and supervision of qualified personnel. Within 30 days of the Effective Date, Respondents shall notify EPA in writing of the names, titles, and qualifications of the personnel, including contractors, subcontractors, consultants and laboratories to be used in carrying out such Work. With respect to any proposed contractor, Respondents shall demonstrate that the proposed contractor has a quality system which complies with ANSI/ASQC E4-1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs" (American National Standard, January 5, 1995, or most recent version), by submitting a copy of the proposed contractor's Quality Management Plan ("QMP"). The QMP should be prepared in accordance with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, March 2001 or subsequently issued guidance) or equivalent documentation as determined by EPA. The qualifications of the persons undertaking the Work for Respondents shall be subject to EPA's review, for verification that such persons meet minimum technical background and experience

requirements. This Settlement Agreement is contingent on Respondents' demonstration to EPA's satisfaction that Respondents are qualified to perform properly and promptly the actions set forth in this Settlement Agreement. If EPA disapproves in writing of any person's technical qualifications, Respondents shall notify EPA of the identity and qualifications of the replacements within 30 days of the written notice. If EPA subsequently disapproves of the replacement, EPA reserves the right to terminate this Settlement Agreement and to conduct a complete RI/FS, and to seek reimbursement for costs and penalties from Respondents. During the course of the RI/FS, Respondents shall notify EPA in writing of any changes or additions in the personnel used to carry out such Work, providing their names, titles, and qualifications. EPA shall have the same right to disapprove changes and additions to personnel as it has hereunder regarding the initial notification.

30. Within 30 days after the Effective Date, Respondents shall designate a Project Coordinator who shall be responsible for administration of all actions by Respondents required by this Settlement Agreement and shall submit to EPA the designated Project Coordinator's name, address, telephone number, and qualifications. To the greatest extent possible, the Project Coordinator shall be present on Site or readily available during Site Work. EPA retains the right to disapprove of the designated Project Coordinator. If EPA disapproves of the designated Project Coordinator, Respondents shall retain a different Project Coordinator and shall notify EPA of that person's name, address, telephone number and qualifications within 30 days following EPA's disapproval. Respondents shall have the right to change their Project Coordinator, subject to EPA's right to disapprove. Respondents shall notify EPA 30 days before such a change is made. The initial notification may be made orally, but shall be promptly followed by a written notification. Receipt by Respondents' Project Coordinator of any notice or communication from EPA relating to this Settlement Agreement shall constitute receipt by Respondents.

31. EPA has designated James DiLorenzo of the Office of Site Remediation & Restoration, Region I, as its Remedial Project Manager ("RPM"). EPA will notify Respondents of a change of its designated RPM. Except as otherwise provided in this Settlement Agreement, Respondents shall direct all submissions required by this Settlement Agreement to the RPM at 1 Congress Street, Suite 1100 (HBO), Boston, Massachusetts 02114-2023.

32. EPA's RPM shall have the authority lawfully vested in an RPM and On-Scene Coordinator ("OSC") by the NCP. In addition, EPA's RPM shall have the authority consistent with the NCP, to halt any Work required by this Settlement Agreement, and to take any necessary response action when he determines that conditions at the Site may present an immediate endangerment to public health or welfare or the environment. The absence of the EPA RPM from the area under study pursuant to this Settlement Agreement shall not be cause for the stoppage or delay of Work.

33. EPA shall arrange for a qualified person to assist in its oversight and review of the conduct of the RI/FS, as required by Section 104(a) of CERCLA, 42 U.S.C. Section 9604(a). Such person shall have the authority to observe Work and make inquiries in the absence of EPA, but not to modify the RI/FS Work Plan.

IX. WORK TO BE PERFORMED

34. Respondents shall conduct the RI/FS in accordance with the provisions of this Settlement Agreement, the SOW, CERCLA, the NCP and EPA guidance, including but not limited to the "Interim Final Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (OSWER Directive # 9355.3-01, October 1988 or subsequently issued guidance), "Guidance for Data Useability in Risk Assessment" (OSWER Directive #9285.7-09B, May 1992 or subsequently issued guidance), and guidance referred to therein, and guidances referred to in the SOW, as may be amended or modified by EPA. The Remedial Investigation ("RI") shall consist of collecting data to characterize site conditions, determining the nature and extent of the contamination at or from the Site, assessing risk to human health and the environment and conducting treatability testing as necessary to evaluate the potential performance and cost of the treatment technologies that are being considered. The Feasibility Study ("FS") shall determine and evaluate (based on treatability testing, where appropriate) alternatives for remedial action to prevent, mitigate or otherwise respond to or remedy the release or threatened release of hazardous substances, pollutants, or contaminants at or from the Site. The alternatives evaluated must include, but shall not be limited to, the range of alternatives described in the NCP, and shall include remedial actions that utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In evaluating the alternatives, Respondents shall address the factors required to be taken into account by Section 121 of CERCLA, 42 U.S.C. § 9621, and Section 300.430(e) of the NCP, 40 C.F.R. § 300.430(e). Unless the RPM agrees otherwise, Respondents shall submit in electronic form all portions of any plan, report or other deliverable Respondents are required to submit pursuant to provisions of this Settlement Agreement.

35. Modification of the RI/FS Work Plan.

a. If at any time during the RI/FS process, Respondents identify a need for additional data, Respondents shall submit a memorandum documenting the need for additional data to the EPA RPM within 21 days of identification. EPA in its discretion will determine whether the additional data will be collected by Respondents and whether it will be incorporated into plans, reports and other deliverables. EPA also reserves the right to require collection of additional data in the absence of a memorandum from the Respondents. Any additional data collection shall be carried out pursuant to Section 3.V.B or Section 4.IV of the SOW.

b. In the event of unanticipated or changed circumstances at the Site, Respondents shall notify the EPA RPM by telephone within 24 hours of discovery of the

unanticipated or changed circumstances. In the event that EPA determines that the immediate threat or the unanticipated or changed circumstances warrant changes in the RI/FS Work Plan (this Work Plan is described in the SOW), EPA shall modify or amend the RI/FS Work Plan in writing accordingly. Respondents shall perform the RI/FS Work Plan as modified or amended.

c. EPA may determine that in addition to tasks defined in the initially-approved RI/FS Work Plan, other Work may be necessary to accomplish the objectives of the RI/FS. Respondents agree to perform these response actions in addition to those required by the initially-approved RI/FS Work Plan, including any approved modifications, if EPA determines that such actions are necessary for a complete RI/FS.

d. Respondents shall confirm their willingness to perform the additional Work in writing to EPA within 14 days of receipt of the EPA request. If Respondents object to any modification determined by EPA to be necessary pursuant to this Paragraph, Respondents may seek dispute resolution pursuant to Section XV (Dispute Resolution). The SOW and/or RI/FS Work Plan shall be modified in accordance with the final resolution of the dispute.

e. Respondents shall complete the additional Work according to the standards, specifications, and schedule set forth or approved by EPA in a written modification to the RI/FS Work Plan or written RI/FS Work Plan supplement. EPA reserves the right to conduct the Work itself at any point, to seek reimbursement from Respondents, and/or to seek any other appropriate relief.

f. Nothing in this Paragraph shall be construed to limit EPA's authority to require performance of further response actions at the Site.

36. Off-Site Shipment of Waste Material. Respondents shall, prior to any off-site shipment of Waste Material from the Site to an out-of-state waste management facility, provide written notification of such shipment of Waste Material to the appropriate state environmental official in the receiving facility's state and to EPA's Designated RPM. However, this notification requirement shall not apply to any off-site shipments when the total volume of all such shipments will not exceed 10 cubic yards or 150 gallons.

a. Respondents shall include in the written notification the following information: (1) the name and location of the facility to which the Waste Material is to be shipped; (2) the type and quantity of the Waste Material to be shipped; (3) the expected schedule for the shipment of the Waste Material; and (4) the method of transportation. Respondents shall notify the state in which the planned receiving facility is located of major changes in the shipment plan, such as a decision to ship the Waste Material to another facility within the same state, or to a facility in another state.

b. The identity of the receiving facility and state will be determined by Respondents following the award of the contract for the remedial investigation and feasibility study. Respondents shall provide the information required by Subparagraph 36.a and 36.c as soon as practicable after the award of the contract and before the Waste Material is actually shipped.

c. Before shipping any hazardous substances, pollutants, or contaminants from the Site to an off-site location, Respondents shall obtain EPA's certification that the proposed receiving facility is operating in compliance with the requirements of CERCLA Section 121(d)(3), 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. Respondents shall only send hazardous substances, pollutants, or contaminants from the Site to an off-site facility that complies with the requirements of the statutory provision and regulation cited in the preceding sentence.

37. Meetings. Respondents shall make presentations at, and participate in, meetings at the request of EPA during the initiation, conduct, and completion of the RI/FS. In addition to discussion of the technical aspects of the RI/FS, topics will include anticipated problems or new issues. Meetings will be scheduled at EPA's discretion.

38. Status Reports. In addition to the plans, reports and other deliverables set forth in this Settlement Agreement, Respondents shall provide to EPA semi-annual status reports to be submitted beginning no later than six months following the Effective Date. These reports shall have the form and substance prescribed in section 2.II.C of the SOW.

39. Emergency Response and Notification of Releases.

a. In the event of any action or occurrence during performance of the Work which causes or threatens a release of Waste Material from the Site that constitutes an emergency situation or may present an immediate threat to public health or welfare or the environment, Respondents shall immediately take all appropriate action. Respondents shall take these actions in accordance with all applicable provisions of this Settlement Agreement, including, but not limited to, the Health and Safety Plan, in order to prevent, abate or minimize such release or endangerment caused or threatened by the release. Respondents shall also immediately notify the EPA RPM or, in the event of his unavailability, the Regional Duty Officer of the Emergency Planning and Response Branch, EPA Region I, telephone (617) 918-1236 of the incident or Site conditions. In the event that Respondents fail to take appropriate response action as required by this Paragraph, and EPA takes such action instead, Respondents shall reimburse EPA all costs of the response action not inconsistent with the NCP pursuant to Section XVIII (Payment of Response Costs).

b. In addition, in the event of any release of a hazardous substance from the Site, Respondents shall immediately notify the EPA RPM or in the event of the RPM's unavailability

the Regional Duty Officer of the Emergency Planning and Response Branch, EPA Region I, telephone (617) 918-1236 and the National Response Center at (800) 424-8802. Respondents shall submit a written report to EPA within 7 days after each release, setting forth the events that occurred and the measures taken or to be taken to mitigate any release or endangerment caused or threatened by the release and to prevent the reoccurrence of such a release. This reporting requirement is in addition to, and not in lieu of, reporting under Section 103(c) of CERCLA, 42 U.S.C. § 9603(c), and Section 304 of the Emergency Planning and Community Right-To-Know Act of 1986, 42 U.S.C. § 11004 *et seq.*

X. EPA APPROVAL OF PLANS AND OTHER SUBMISSIONS

40. After review of any plan, report or other item that is required to be submitted for approval pursuant to this Settlement Agreement (including the SOW), in a notice to Respondents EPA shall: (a) approve, in whole or in part, the submission; (b) approve the submission upon specified conditions; (c) modify the submission to cure the deficiencies; (d) disapprove, in whole or in part, the submission, directing that Respondents modify the submission; or (e) any combination of the above. However, EPA shall not modify a submission without first providing Respondents at least one notice of deficiency and an opportunity to cure within 10 days, except where to do so would cause serious disruption to the Work or where previous submission(s) have been disapproved due to material defects.

41. In the event of approval, approval upon conditions, or modification by EPA, pursuant to Subparagraph 40(a), (b), (c) or (e), Respondents shall proceed to take any action required by the plan, report or other deliverable, as approved or modified by EPA subject only to their right to invoke the Dispute Resolution procedures set forth in Section XV (Dispute Resolution) with respect to the modifications or conditions made by EPA. Following EPA approval or modification of a submission or portion thereof, Respondents shall not thereafter alter or amend such submission or portion thereof unless directed by EPA. In the event that EPA modifies the submission to cure the deficiencies pursuant to Subparagraph 40(c) and the submission had a material defect, EPA retains the right to seek stipulated penalties, as provided in Section XVI (Stipulated Penalties).

42. Resubmission.

a. Upon receipt of a notice of disapproval, Respondents shall, within 10 days or such longer time as specified by EPA in such notice, correct the deficiencies and resubmit the plan, report, or other deliverable for approval. Any stipulated penalties applicable to the submission, as provided in Section XVI, shall accrue during the 10-day period or otherwise specified period but shall not be payable unless the resubmission is disapproved or modified due to a material defect, as provided in Paragraphs 43 and 44.

b. Notwithstanding the receipt of a notice of disapproval, Respondents shall proceed to take any action required by any non-deficient portion of the submission, unless otherwise directed by EPA. Implementation of any non-deficient portion of a submission shall not relieve Respondents of any liability for stipulated penalties under Section XVI (Stipulated Penalties).

c. Respondents shall not proceed further with any subsequent activities or tasks until receiving EPA approval, approval on condition or modification of the following deliverables: Interim Response Steps Work Plan, Focused RI Report, RI/FS Work Plan, Draft Remedial Investigation Reports, Treatability Study Work Plan, Engineering Evaluation and Cost Analysis Work Plan, Engineering Evaluation and Cost Analysis Report, Development and Initial Screening of Alternatives Report, Risk Assessment Interim Deliverables, Draft Baseline Risk Assessment Reports, and Draft Feasibility Study Reports. Notwithstanding the foregoing, while awaiting EPA approval, approval on condition or modification of these deliverables, Respondents shall proceed with all other tasks and activities which may be conducted independently of these deliverables, in accordance with the schedule set forth under this Settlement Agreement.

d. For any deliverables not listed above in subparagraph 42.c, Respondents shall proceed with all subsequent tasks, activities and deliverables without awaiting EPA approval on the submitted deliverable. EPA reserves the right to stop Respondents from proceeding further, either temporarily or permanently, on any task, activity or deliverable at any point during the RI/FS.

43. If EPA disapproves a resubmitted plan, report or other deliverable, or portion thereof, EPA may again direct Respondents to correct the deficiencies. EPA shall also retain the right to modify or develop the plan, report or other deliverable. Respondents shall implement any such plan, report, or deliverable as corrected, modified or developed by EPA, subject only to Respondents' right to invoke the procedures set forth in Section XV (Dispute Resolution).

44. If upon resubmission, a plan, report, or other deliverable is disapproved or modified by EPA due to a material defect, Respondents shall be deemed to have failed to submit such plan, report, or other deliverable timely and adequately unless Respondents invoke the dispute resolution procedures in accordance with Section XV (Dispute Resolution) and EPA's action is revoked or substantially modified pursuant to a Dispute Resolution decision issued by EPA or superseded by an agreement reached pursuant to that Section. The provisions of Section XV (Dispute Resolution) and Section XVI (Stipulated Penalties) shall govern the implementation of the Work and accrual and payment of any stipulated penalties during Dispute Resolution. If EPA's disapproval or modification is not otherwise revoked, substantially modified or superseded as a result of a decision or agreement reached pursuant to the Dispute Resolution process set forth in Section XV, stipulated penalties shall accrue for such violation from the date on which the initial submission was originally required, as provided in Section XVI.

45. In the event that EPA takes over some of the tasks, but not the preparation of the RI Report or the FS Report, Respondents shall incorporate and integrate information supplied by EPA into the final reports.

46. All plans, reports, and other deliverables submitted to EPA under this Settlement Agreement shall, upon approval or modification by EPA, be incorporated into and enforceable under this Settlement Agreement. In the event EPA approves or modifies a portion of a plan, report, or other deliverable submitted to EPA under this Settlement Agreement, the approved or modified portion shall be incorporated into and enforceable under this Settlement Agreement.

47. Neither failure of EPA to expressly approve or disapprove of Respondents' submissions within a specified time period, nor the absence of comments, shall be construed as approval by EPA. Whether or not EPA gives express approval for Respondents' deliverables, Respondents are responsible for preparing deliverables acceptable to EPA.

XI. QUALITY ASSURANCE, SAMPLING, AND ACCESS TO INFORMATION

48. Quality Assurance. Respondents shall assure that Work performed, samples taken and analyses conducted conform to the requirements of the SOW, the QAPP, the Field Sampling Plan and guidances identified in the SOW. Respondents will assure that field personnel used by Respondents are properly trained in the use of field equipment and in chain of custody procedures. Respondents shall use only those laboratories that have a documented quality system that complies with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, March 2001) or equivalent documentation as determined by EPA.

49. Sampling.

a. All results of sampling, tests, modeling or other data (including raw data) generated by Respondents, or on Respondents' behalf, during the period that this Settlement Agreement is effective, shall be submitted to EPA in the next semi-annual status report as described in Paragraph 38 of this Settlement Agreement. The SOW may also require submission of data at other times. EPA will make available to Respondents validated data generated by EPA unless it is exempt from disclosure by any federal or state law or regulation.

b. Respondents shall verbally notify EPA and the Commonwealth at least 14 days prior to conducting field events as described in the SOW (Section 2.II.F.2), RI/FS Work Plan or Sampling and Analysis Plan. At EPA's verbal or written request, or the request of EPA's oversight assistant, Respondents shall allow split or duplicate samples to be taken by EPA (and its authorized representatives) or the Commonwealth of any samples collected in implementing this Settlement Agreement. All split samples of Respondents shall be analyzed by the methods identified in the QAPP.

50. Access to Information.

a. Respondents shall provide to EPA and the Commonwealth, upon request, copies of documents and information (except documents or information covered by the privileges or other protections described in subparagraphs (b) or (c), below) within their possession or control or that of their contractors or agents relating to activities at the Site or to the implementation of this Settlement Agreement, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information related to the Work. Respondents shall also make available to EPA and the Commonwealth, for purposes of investigation, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

b. Respondents may assert business confidentiality claims covering part or all of the documents or information submitted to EPA and the Commonwealth under this Settlement Agreement to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). Documents or information determined to be confidential by EPA will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies documents or information when it is submitted to EPA and the Commonwealth, or if EPA has notified Respondents that the documents or information are not confidential under the standards of Section 104(e)(7) of CERCLA or 40 C.F.R. Part 2, Subpart B, the public may be given access to such documents or information without further notice to Respondents. Respondents shall segregate and clearly identify all documents or information submitted under this Settlement Agreement for which Respondents assert business confidentiality claims.

c. Respondents may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law or Massachusetts law. If the Respondents assert such a privilege in lieu of providing documents, they shall provide EPA and the Commonwealth with the following: 1) the title of the document, record, or information; 2) the date of the document, record, or information; 3) the name and title of the author of the document, record, or information; 4) the name and title of each addressee and recipient; 5) a description of the contents of the document, record, or information; and 6) the privilege asserted by Respondents. However, no documents, reports or other information created or generated pursuant to the requirements of this Settlement Agreement shall be withheld on the grounds that they are privileged.

d. No claim of confidentiality shall be made with respect to any data, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, or engineering data, or any other documents or information evidencing conditions at or around the Site.

51. In entering into this Settlement Agreement, Respondents waive any objections to any data gathered, generated, or evaluated by EPA, the Commonwealth or Respondents in the performance or oversight of the Work that has been verified according to the quality assurance/quality control ("QA/QC") procedures required by the Settlement Agreement (including the SOW) or any EPA-approved RI/FS Work Plans or Sampling and Analysis Plans. If Respondents object to any other data relating to the RI/FS, Respondents shall submit to EPA a report that specifically identifies and explains its objections, describes the acceptable uses of the data, if any, and identifies any limitations to the use of the data. The report must be submitted to EPA within 10 days of the semi-annual status report containing the data.

XII. SITE ACCESS AND INSTITUTIONAL CONTROLS

52. If any part of the Site, or any other property where access is needed to implement this Settlement Agreement, is owned or controlled by any of Respondents, such Respondents shall, commencing on the Effective Date, provide EPA and the Commonwealth, and their representatives, including contractors, with access at all reasonable times to that property for the purpose of conducting any activity related to this Settlement Agreement.

53. Where any action under this Settlement Agreement is to be performed in areas owned by or in possession of someone other than Respondents, Respondents shall use their best efforts to obtain all necessary access agreements, and shall propose a schedule for obtaining such agreements in the relevant Work Plan (subject to EPA approval under Section X of this Settlement Agreement). Respondents shall obtain such agreements under the approved schedule, or under any other schedule specified by the RPM in writing. Respondents shall immediately notify EPA if after using their best efforts they are unable to obtain such agreements. For purposes of this Paragraph, "best efforts" includes the payment of reasonable sums of money in consideration of access. Respondents shall describe in writing their efforts to obtain access. If Respondents cannot obtain access agreements, EPA may either (i) obtain access for Respondents or assist Respondents in gaining access, to the extent necessary to effectuate the response actions described herein, using such means as EPA deems appropriate; (ii) perform those tasks or activities with EPA contractors; or (iii) terminate the Settlement Agreement. Respondents shall reimburse EPA for all costs and attorney's fees incurred by the United States in obtaining such access, in accordance with the procedures in Section XVIII (Payment of Response Costs). If EPA performs those tasks or activities with EPA contractors and does not terminate the Settlement Agreement, Respondents shall perform all other tasks or activities not requiring access to that property, and shall reimburse EPA for all costs incurred in performing such tasks or activities. Respondents shall integrate the results of any such tasks or activities undertaken by EPA into its plans, reports and other deliverables.

54. Notwithstanding any provision of this Settlement Agreement, EPA and the Commonwealth retain all of their access authorities and rights, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

55. Olin shall follow the procedures of this Paragraph with respect to transfers of interests in the Olin Property:

a. At least 30 days prior to a transfer of any interest (including but not limited to fee interests, leasehold interests or mortgage interests) in the Olin Property, Olin shall (i) notify EPA in writing ("Transfer Notice"), with a copy to MassDEP, of the intended transfer, and (ii) submit an executed agreement in a form acceptable to EPA, such acceptance not to be unreasonably withheld or denied, containing the terms described in subparagraph (c)(A)-(F), below ("Transfer Agreement"). Olin shall include in the Transfer Notice the following information: the nature of the interest that is to be transferred; a description of the property that is to be transferred; if known, the intended use of the parcel that is to be transferred, including any possible activities that may affect the remedial investigation or feasibility study; and the anticipated date of the transfer. If after the Effective Date of this Settlement Agreement, Olin grants an option to acquire an interest (including but not limited to fee interests, leasehold interests or mortgage interests) in the Olin Property, a "transfer of any interest" occurs for purposes of this subparagraph upon transfer of title (or if title is not transferred, when the option holder's interest in the property is recorded, the option holder obtains a right to immediate possession, or the transaction otherwise closes, whichever occurs first), after the option holder has exercised the option.

b. If Olin has already granted an option to transfer any interest in the Olin Property, Olin shall notify EPA by telephone and in writing (with a copy to MassDEP) immediately upon learning that the holder of that option intends to exercise that option. In addition, Olin shall use its best efforts to obtain from the holder of any option that has already been granted the Transfer Agreement described in subparagraph c(A)-(F). Forty-five days after the Effective Date of this Settlement Agreement, Olin shall notify EPA and MassDEP whether any options exist, and whether or not Olin has obtained the option holder's agreement to provide an executed Transfer Agreement in a form acceptable to EPA, such acceptance not to be unreasonably withheld or denied. Any such executed Transfer Agreement obtained by Olin from the existing option holder shall be provided to EPA no more than five days after it is executed by the existing option holder. In addition, within 45 days of the Effective Date, Olin shall give any existing option holder copies of the documents described in subparagraph c(i)-(iv).

c. Prior to notifying EPA pursuant to subparagraph a, above, of any transfer (or in the case of any holders of existing options to acquire an interest in the Olin Property, within 45 days of the Effective Date), Olin shall have given the intended transferee or option holder copies of the following:

(i) this Settlement Agreement;
(ii) any instruments restricting land/groundwater use on the Olin Property, including but not limited to any instrument by which an interest in real property has been conveyed that confers a right to enforce restrictions on the use of such property;

(iii) EPA's "Interim Guidance Regarding Criteria Landowners Must Meet in Order to Qualify for Bona Fide Prospective Purchaser, Contiguous Property Owner, or Innocent Landowner Limitations on CERCLA Liability ('Common Elements')," dated March 6, 2003; "Interim Enforcement Discretion Policy Concerning 'Windfall Liens' Under Section 107(r) of CERCLA," dated July 16, 2003; and any other EPA guidances relevant to Bona Fide Prospective Purchaser criteria that are identified by EPA; and
(iv) unless the RPM agrees otherwise in writing, copies of EPA's submissions to the Surface Transportation Board dated January 26, 2006 and May 11, 2006.

In addition, prior to submitting a Transfer Notice (or in the case of an existing option holder, under the schedule and subject to the exception described in subparagraph b), Olin shall also have executed a Transfer Agreement with the intended transferee or option holder in a form acceptable to EPA, such acceptance not to be unreasonably withheld or denied, pursuant to which the intended transferee or option holder describes its planned use(s) for the Olin Property and any portion thereof and agrees:

(A) to provide full cooperation, assistance, and access to persons who are authorized to conduct response actions or operations and maintenance, provided that access shall be at reasonable times;
(B) to exercise appropriate care with respect to hazardous substances by taking reasonable steps to stop any continuing releases, prevent any threatened future release, and prevent or limit exposure to any previously released hazardous substances;
(C) to comply with any land/groundwater use restrictions established or to be established in connection with response actions or operations and maintenance;
(D) to take any action reasonably necessary to record and otherwise effectuate any additional land/groundwater use restrictions required in connection with response actions or operations and maintenance;
(E) to refrain from taking any remedial action on the Olin Property, unless such remedial action has been authorized by EPA; and
(F) that, following transfer and in connection with any intention to make any subsequent transfer, such transferee shall enter into an agreement with any subsequent intended transferee to ensure that all of the obligations set out in this Paragraph of the Settlement Agreement shall be passed to all subsequent transferees until EPA provides written notice that such further agreements are no longer required.

d. Olin shall insert into each deed, title or other instrument conveying an interest in property included in the Olin Property a notice in a form acceptable to EPA stating that the property is subject to this Settlement Agreement, including but not limited to the provisions of this Paragraph and Paragraph 52 (requiring the granting of access). Each such notice shall state that the Settlement Agreement is available from the RPM, and provide the RPM's current name, address and telephone number.

e. In the event of any transfer of any interest in the Olin Property, Olin shall continue to meet all of its obligations under this Settlement Agreement, including but not limited to its obligations to perform the Work and to provide or secure access.

XIII. COMPLIANCE WITH OTHER LAWS

56. Respondents shall comply with all applicable local, state and federal laws and regulations when performing the RI/FS. No local, state, or federal permit shall be required for any portion of any action conducted entirely on-site, including studies, if the action is selected and carried out in compliance with Section 121 of CERCLA, 42 U.S.C. § 9621. Where any portion of the Work is to be conducted off-site and requires a federal or state permit or approval, Respondents shall submit timely and complete applications and take all other actions necessary to obtain and to comply with all such permits or approvals. This Settlement Agreement is not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or regulation.

XIV. RETENTION OF RECORDS

57. During the pendency of this Settlement Agreement and for a minimum of 10 years after commencement of construction of any remedial action, each Respondent shall preserve and retain all non-identical copies of documents, records, and other information (including but not limited to documents, records, or other information in electronic form) now in its possession or control or which come into its possession or control that relate in any manner to (a) the performance of the Work, (b) any cleanups or investigations of the Site carried out under the Massachusetts Contingency Plan or other Commonwealth programs related to contaminated property, or (c) the liability of any person under CERCLA with respect to the Site, regardless of any corporate retention policy to the contrary. Until 10 years after commencement of construction of any remedial action, Respondents shall also instruct their contractors and agents to preserve all documents, records, and other information of whatever kind, nature or description relating to performance of the Work or to any cleanups or investigations of the Site carried out under the Massachusetts Contingency Plan or other Commonwealth programs related to contaminated property.

58. At the conclusion of this document retention period, Respondents shall notify EPA at least 90 days prior to the destruction of any such documents, records or other information, and, upon request by EPA, Respondents shall deliver any such documents, records, or other information to EPA. Respondents may assert that certain documents, records, and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law or by the law of Massachusetts. If Respondents assert such a privilege, they shall provide EPA with the following: 1) the title of the document, record, or other information; 2) the date of the document, record, or other information; 3) the name and title of the author of the document, record, or other information; 4) the name and title of each addressee and recipient; 5)

a description of the subject of the document, record, or other information; and 6) the privilege asserted by Respondents. However, no documents, records or other information created or generated pursuant to the requirements of this Settlement Agreement shall be withheld on the grounds that they are privileged.

59. Each Respondent hereby certifies individually that to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed or otherwise disposed of any records, documents or other information (other than identical copies) relating to its potential liability regarding the Site since notification of potential liability by EPA or the filing of suit against it regarding the Site and that it has fully complied with any and all EPA requests for information pursuant to Sections 104(e) and 122(e) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. § 6927.

XV. DISPUTE RESOLUTION

60. Unless otherwise expressly provided for in this Settlement Agreement, the dispute resolution procedures of this Section shall be the exclusive mechanism for resolving disputes arising under this Settlement Agreement. The Parties shall attempt to resolve any disagreements concerning this Settlement Agreement expeditiously and informally.

61. If Respondents object to any EPA action taken pursuant to this Settlement Agreement, including billings for Future Response Costs, they shall notify EPA in writing of their objection(s) within 14 days of such action, unless the objection(s) has/have been resolved informally. EPA and Respondents shall have 14 days from EPA's receipt of Respondents' written objection(s) to resolve the dispute (the "Negotiation Period"). The Negotiation Period may be extended at the sole discretion of EPA. Such extension may be granted verbally but must be confirmed in writing.

62. Any agreement reached by the Parties pursuant to this Section shall be in writing and shall, upon signature by the Parties, be incorporated into and become an enforceable part of this Settlement Agreement. If the Parties are unable to reach an agreement within the Negotiation Period, a Region I EPA management official at or above the level of Chief, Remediation & Restoration Branch I will issue a written decision. EPA's decision shall be incorporated into and become an enforceable part of this Settlement Agreement. Respondents' obligations under this Settlement Agreement shall not be tolled by submission of any objection for dispute resolution under this Section. Following resolution of the dispute, as provided by this Section, Respondents shall fulfill the requirement that was the subject of the dispute in accordance with the agreement reached or with EPA's decision, whichever occurs, and regardless of whether Respondents agree with the decision.

XVI. STIPULATED PENALTIES

63. Respondents shall be liable to EPA for stipulated penalties in the amounts set forth in Paragraphs 64 and 65 for failure to comply with any of the requirements of this Settlement Agreement specified below unless excused under Section XVII (Force Majeure). "Compliance" by Respondents shall include completion of the Work under this Settlement Agreement or any activities contemplated under any RI/FS Work Plan or other plan approved under this Settlement Agreement, in accordance with all applicable requirements of law, this Settlement Agreement, the SOW, and any plans or other documents approved by EPA pursuant to this Settlement Agreement and within the specified time schedules established by and approved under this Settlement Agreement. "Compliance" by Respondents shall also include complying with all the requirements of Paragraph 55 of this Settlement Agreement.

64. Stipulated Penalty Amounts - Major Violations. The following stipulated penalties shall accrue per violation per day for any noncompliance, including but not limited to, failure to submit timely or adequate deliverables, except for any noncompliance specifically identified in Paragraph 65:

Penalty Per Violation Per Day	Period of Noncompliance
$ 1,500	1st through 14th day
$ 2,000	15th through 30th day
$ 3,000	31st day and beyond

65. Stipulated Penalty Amounts - Minor Violations. The following stipulated penalties shall accrue per violation per day for failure to submit timely or adequate semi-annual status reports as required under Paragraph 38:

Penalty Per Violation Per Day	Period of Noncompliance
$ 700	1st through 14th day
$ 1,000	15th day and beyond

66. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs, and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. However, stipulated penalties shall not accrue: (1) with respect to a deficient submission under Section X (EPA Approval of Plans and Other Submissions), during the period, if any, beginning on the 31st day after EPA's receipt of

such submission until the date that EPA notifies Respondents of any deficiency; and (2) with respect to a decision by the EPA Management Official designated in Paragraph 62 of Section XV (Dispute Resolution), during the period, if any, beginning on the 21st day after the Negotiation Period begins until the date that the EPA Management Official issues a final decision regarding such dispute. Nothing herein shall prevent the simultaneous accrual of separate penalties for separate violations of this Settlement Agreement.

67. Following EPA's determination that Respondents have failed to comply with a requirement of this Settlement Agreement, EPA may give Respondents written notification of the same and describe the noncompliance. EPA may send Respondents a written demand for the payment of the penalties. However, penalties shall accrue as provided in the preceding Paragraph regardless of whether EPA has notified Respondents of a violation.

68. All penalties accruing under this Section shall be due and payable to EPA within 30 days of Respondents' receipt from EPA of a demand for payment of the penalties, unless Respondents invoke the dispute resolution procedures in accordance with Section XV (Dispute Resolution). All payments to EPA under this Section shall be paid by certified or cashier's check(s) made payable to "EPA Hazardous Substances Superfund," and shall (unless and until the RPM provides an alternate address in writing) be sent to:

(For delivery by first-class mail)
EPA Superfund – Region 1
P.O. Box 360197M
Pittsburgh, PA 15251.

(For delivery by overnight mail)
EPA Superfund – Region 1
U.S. EPA 360197
Mellon Client Service Center Room 670
500 Ross Street
Pittsburgh, PA 15262-0001

Any such payment shall indicate that the payment is for stipulated penalties, and shall refer to the EPA Region and Site/Spill ID Number 01-CH, the EPA Docket Number of this Administrative Settlement Agreement and Order on Consent, and the name and address of the party(ies) making payment. Copies of check(s) paid pursuant to this Section, and any accompanying transmittal letter(s) shall be sent to EPA's RPM at the address provided in Paragraph 31 and to the EPA Cincinnati Financial Office, 26 Martin Luther King Drive, Cincinnati, Ohio, 45268.

69. The payment of penalties shall not alter in any way Respondents' obligation to complete performance of the Work required under this Settlement Agreement.

70. Penalties shall continue to accrue as provided in Paragraph 66 during any dispute resolution period, but need not be paid until 15 days after the dispute is resolved by agreement or by receipt of EPA's decision.

71. If Respondents fail to pay stipulated penalties when due, EPA may institute proceedings to collect the penalties, as well as Interest. Respondents shall pay Interest on the unpaid balance, which shall begin to accrue on the date of demand made pursuant to Paragraph 68.

72. Nothing in this Settlement Agreement shall be construed as prohibiting, altering, or in any way limiting the ability of EPA to seek any other remedies or sanctions available by virtue of Respondents' violation of this Settlement Agreement or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Section 122(*l*) of CERCLA, 42 U.S.C. § 9622(*l*), and punitive damages pursuant to Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3). Provided, however, that EPA shall not seek civil penalties pursuant to Section 122(*l*) of CERCLA or punitive damages pursuant to Section 107(c)(3) of CERCLA for any violation for which a stipulated penalty is provided herein, except in the case of willful violation of this Settlement Agreement or in the event that EPA assumes performance of a portion or all of the Work pursuant to Section XX (Reservation of Rights by EPA), Paragraph 82. Notwithstanding any other provision of this Section, EPA may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued pursuant to this Settlement Agreement.

XVII. FORCE MAJEURE

73. Respondents agree to perform all requirements of this Settlement Agreement within the time limits established under this Settlement Agreement, unless the performance is delayed by a *force majeure*. For purposes of this Settlement Agreement, *force majeure* is defined as any event arising from causes beyond the control of Respondents or of any entity controlled by Respondents, including but not limited to their contractors and subcontractors, which delays or prevents performance of any obligation under this Settlement Agreement despite Respondents' best efforts to fulfill the obligation. *Force majeure* does not include financial inability to complete the Work or increased cost of performance.

74. If any event occurs or has occurred that may delay the performance of any obligation under this Settlement Agreement, whether or not caused by a *force majeure* event, Respondents shall notify EPA orally within 2 business days of when Respondents first knew that the event might cause a delay. Within 14 days thereafter, Respondents shall provide to EPA in writing an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Respondents' rationale for attributing such delay to a *force majeure* event if they intend to assert such a claim;

and a statement as to whether, in the opinion of Respondents, such event may cause or contribute to an endangerment to public health, welfare or the environment. Failure to comply with the above requirements shall preclude Respondents from asserting any claim of *force majeure* for that event for the period of time of such failure to comply and for any additional delay caused by such failure.

75. If EPA agrees that the delay or anticipated delay is attributable to a *force majeure* event, the time for performance of the obligations under this Settlement Agreement that are affected by the *force majeure* event will be extended by EPA for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the *force majeure* event shall not, of itself, extend the time for performance of any other obligation. If EPA does not agree that the delay or anticipated delay has been or will be caused by a *force majeure* event, EPA will notify Respondents in writing of its decision. If EPA agrees that the delay is attributable to a *force majeure* event, EPA will notify Respondents in writing of the length of the extension, if any, for performance of the obligations affected by the *force majeure* event.

XVIII. PAYMENT OF RESPONSE COSTS

76. Payments of Future Response Costs.

a. Respondents shall pay EPA all Future Response Costs not inconsistent with the NCP. On a periodic basis, EPA will send Respondents a bill requiring payment that includes an itemized cost summary. Respondents shall make all payments within 30 days of receipt of each bill requiring payment, except as otherwise provided in Paragraph 78 of this Settlement Agreement. Respondents shall make all payments required by this Paragraph by a certified or cashier's check or checks made payable to "EPA Hazardous Substance Superfund," referencing the name and address of the party(ies) making payment and EPA Site/Spill ID number 01-CH. Respondents shall (unless and until the RPM provides an alternate address in writing) send the check(s) to:

(For delivery by first-class mail)
EPA Superfund – Region 1
P.O. Box 360197M
Pittsburgh, PA 15251.

(For delivery by overnight mail)
EPA Superfund – Region 1
U.S. EPA 360197
Mellon Client Service Center Room 670
500 Ross Street
Pittsburgh, PA 15262-0001

b. At the time of payment, Respondents shall send notice that payment has been made to the RPM at the address provided in Paragraph 31 and to the EPA Cincinnati Financial Office, 26 Martin Luther King Drive, Cincinnati, Ohio, 45268.

c. The total amount to be paid by Respondents pursuant to Subparagraph 76.a. shall be deposited in the Olin Chemical Superfund Site, Wilmington, Massachusetts Special Account within the EPA Hazardous Substance Superfund to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund.

77. If Respondents do not pay Future Response Costs within 30 days of Respondents' receipt of a bill, Respondents shall pay Interest on the unpaid balance of Future Response Costs. The Interest on unpaid Future Response Costs shall begin to accrue on the date of the bill and shall continue to accrue until the date of payment. If EPA receives a partial payment, Interest shall accrue on any unpaid balance. Payments of Interest made under this Paragraph shall be in addition to such other remedies or sanctions available to the United States by virtue of Respondents' failure to make timely payments under this Section, including but not limited to payments of stipulated penalties pursuant to Section XVI. Respondents shall make all payments required by this Paragraph in the manner described in Paragraph 76.

78. Respondents may contest payment of any Future Response Costs under Paragraph 76 if they determine that EPA has made an accounting error or if they believe EPA incurred excess costs as a direct result of an EPA action that was inconsistent with the NCP. Such objection shall be made in writing within 30 days of receipt of the bill and must be sent to the EPA RPM. Any such objection shall specifically identify the contested Future Response Costs and the basis for objection. In the event of an objection, Respondents shall within the 30-day period pay all uncontested Future Response Costs to EPA in the manner described in Paragraph 76. Simultaneously, Respondents shall establish an interest-bearing escrow account in a federally-insured bank duly chartered in the Commonwealth of Massachusetts and remit to that escrow account funds equivalent to the amount of the contested Future Response Costs. Respondents shall send to the EPA RPM a copy of the transmittal letter and check paying the uncontested Future Response Costs, and a copy of the correspondence that establishes and funds the escrow account, including, but not limited to, information containing the identity of the bank and bank account under which the escrow account is established as well as a bank statement showing the initial balance of the escrow account. Simultaneously with the establishment of the escrow account, Respondents shall initiate the Dispute Resolution procedures in Section XV (Dispute Resolution). If EPA prevails in the dispute, within 5 days of the resolution of the dispute, Respondents shall pay the sums due (with accrued interest) to EPA in the manner described in Paragraph 76. If Respondents prevail concerning any aspect of the contested costs, Respondents shall pay that portion of the costs (plus associated accrued interest) for which they did not prevail to EPA in the manner described in Paragraph 76. Respondents shall be disbursed any balance of the escrow account. The dispute resolution procedures set forth in this Paragraph in conjunction

with the procedures set forth in Section XV (Dispute Resolution) shall be the exclusive mechanisms for resolving disputes regarding Respondents' obligation to reimburse EPA for its Future Response Costs.

XIX. COVENANT NOT TO SUE BY EPA

79. In consideration of the actions that will be performed and the payments that will be made by Respondents under the terms of this Settlement Agreement, and except as otherwise specifically provided in this Settlement Agreement, EPA covenants not to sue or to take administrative action against Respondents pursuant to Sections 106 and 107(a) of CERCLA, 42 U.S.C. §§ 9606 and 9607(a), for the Work and Future Response Costs. This covenant not to sue shall take effect upon the Effective Date and is conditioned upon the complete and satisfactory performance by Respondents of all obligations under this Settlement Agreement, including, but not limited to, payment of Future Response Costs pursuant to Section XVIII. This covenant not to sue extends only to Respondents and does not extend to any other person.

XX. RESERVATIONS OF RIGHTS BY EPA

80. Except as specifically provided in this Settlement Agreement, nothing herein shall limit the power and authority of EPA or the United States to take, direct, or order all actions necessary to protect public health, welfare, or the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances, pollutants or contaminants, or hazardous or solid waste on, at, or from the Site. Further, nothing herein shall prevent EPA from seeking legal or equitable relief to enforce the terms of this Settlement Agreement, from taking other legal or equitable action as it deems appropriate and necessary, or from requiring Respondents in the future to perform additional activities pursuant to CERCLA or any other applicable law.

81. The covenant not to sue set forth in Section XIX above does not pertain to any matters other than those expressly identified therein. EPA reserves, and this Settlement Agreement is without prejudice to, all rights against Respondents with respect to all other matters, including, but not limited to:

a. claims based on a failure by Respondents to meet a requirement of this Settlement Agreement;

b. liability for costs not included within the definition of Future Response Costs;

c. liability for performance of response action other than the Work;

d. criminal liability;

e. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments;

f. liability arising from the past, present, or future disposal, release or threat of release of Waste Materials outside of the Site; and

g. *liability for costs incurred or to be incurred by the Agency for Toxic* Substances and Disease Registry related to the Site.

82. Work Takeover. In the event EPA determines that Respondents have ceased implementation of any portion of the Work, are seriously or repeatedly deficient or late in their performance of the Work, or are implementing the Work in a manner which may cause an endangerment to human health or the environment, EPA may assume the performance of all or any portion of the Work as EPA determines necessary. Respondents may invoke the procedures set forth in Section XV (Dispute Resolution) to dispute EPA's determination that takeover of the Work is warranted under this Paragraph. Costs incurred by EPA in performing the Work pursuant to this Paragraph shall be considered Future Response Costs that Respondents shall pay pursuant to Section XVIII (Payment of Response Costs). Notwithstanding any other provision of this Settlement Agreement, EPA retains all authority and reserves all rights to take any and all response actions authorized by law.

XXI. COVENANT NOT TO SUE BY RESPONDENTS

83. Respondents covenant not to sue and agree not to assert any claims or causes of action against the United States, or its contractors or employees, with respect to the Work, Future Response Costs, or this Settlement Agreement, including, but not limited to:

a. any direct or indirect claim for reimbursement from the Hazardous Substance Superfund established by 26 U.S.C. § 9507, based on Sections 106(b)(2), 107, 111, 112, or 113 of CERCLA, 42 U.S.C. §§ 9606(b)(2), 9607, 9611, 9612, or 9613, or any other provision of law;

b. any claim arising out of the Work or arising out of the response actions for which Future Response Costs have been or will be incurred, including any claim under the United States Constitution, the Massachusetts Constitution, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, as amended, or at common law; or

c. any claim against the United States pursuant to Sections 107 and 113 of CERCLA, 42 U.S.C. §§ 9607 and 9613, relating to the Work or payment of Future Response Costs.

84. These covenants not to sue shall not apply in the event the United States brings a cause of action or issues an order pursuant to the reservations set forth in Paragraph 81(b), (c),

and (e) - (g), but only to the extent that Respondents' claims arise from the same response action, response costs, or damages that the United States is seeking pursuant to the applicable reservation.

85. Nothing in this Settlement Agreement shall be deemed to constitute approval or preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 C.F.R. § 300.700(d).

XXII. OTHER CLAIMS

86. By issuance of this Settlement Agreement and Order on Consent, the United States and EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondents.

87. Nothing in this Settlement Agreement constitutes a satisfaction of or release from any claim or cause of action against Respondents or any person not a party to this Settlement Agreement, for any liability such person may have under CERCLA, other statutes, or common law, including but not limited to any claims of the United States for costs, damages and interest under Sections 106 and 107 of CERCLA, 42 U.S.C. §§ 9606 and 9607.

88. No action or decision by EPA pursuant to this Settlement Agreement shall give rise to any right to judicial review except as set forth in Section 113(h) of CERCLA, 42 U.S.C. § 9613(h).

XXIII. CONTRIBUTION

89. a. The Parties agree that this Settlement Agreement constitutes an administrative settlement for purposes of Sections 113(f)(2) of CERCLA, 42 U.S.C. § 9613(f)(2), and that Respondents are entitled, as of the Effective Date, to protection from contribution actions or claims as provided by Section 113(f)(2) and 122(h)(4) of CERCLA, 42 U.S.C. §§ 9613(f)(2) and 9622(h)(4), for "matters addressed" in this Settlement Agreement. The "matters addressed" in this Settlement Agreement are the Work and Future Response Costs. The Respondents agree that the protection from contribution actions or claims described in this section does not apply to available contribution actions or claims brought by any Respondent against any other Respondent for "matters addressed" in this Settlement Agreement.

b. The Parties agree that this Settlement Agreement constitutes an administrative settlement for purposes of Section 113(f)(3)(B) of CERCLA, 42 U.S.C. § 9613(f)(3)(B), pursuant to which Respondents have, as of the Effective Date, resolved their liability to the United States for the Work and Future Response Costs.

c. Except as expressly provided in Section XXI (Covenant Not to Sue by

Respondents), nothing in this Settlement Agreement precludes the United States or Respondents from asserting any claims, causes of action, or demands for indemnification, contribution, or cost recovery against any persons not parties to this Settlement Agreement. Nothing herein diminishes the right of the United States, pursuant to Sections 113(f)(2) and (3) of CERCLA, 42 U.S.C. § 9613(f)(2) and (3), to pursue any such persons to obtain additional response costs or response action and to enter into settlements that give rise to contribution protection pursuant to Section 113(f)(2).

XXIV. INDEMNIFICATION

90. Respondents shall indemnify, save and hold harmless the United States, its officials, agents, contractors, subcontractors, employees and representatives from any and all claims or causes of action arising from, or on account of negligent or other wrongful acts or omissions of Respondents, their officers, directors, employees, agents, contractors, or subcontractors, in carrying out actions pursuant to this Settlement Agreement. In addition, Respondents agree to pay the United States all costs incurred by the United States, including but not limited to attorneys fees and other expenses of litigation and settlement, arising from or on account of claims made against the United States based on negligent or other wrongful acts or omissions of Respondents, their officers, directors, employees, agents, contractors, subcontractors and any persons acting on their behalf or under their control, in carrying out activities pursuant to this Settlement Agreement. The United States shall not be held out as a party to any contract entered into by or on behalf of Respondents in carrying out activities pursuant to this Settlement Agreement. Neither Respondents nor any such contractor shall be considered an agent of the United States.

91. The United States shall give Respondents notice of any claim for which the United States plans to seek indemnification pursuant to this Section and shall consult with Respondents prior to settling such claim.

92. Respondents waive all claims against the United States for damages or reimbursement or for set-off of any payments made or to be made to the United States, arising from or on account of any contract, agreement, or arrangement between any one or more of Respondents and any person for performance of Work on or relating to the Site. In addition, Respondents shall indemnify and hold harmless the United States with respect to any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between any one or more of Respondents and any person for performance of Work on or relating to the Site.

XXV. INSURANCE

93. Within 90 days of the Effective Date, Respondents shall secure, and shall maintain for the duration of this Settlement Agreement, comprehensive general liability insurance and

automobile insurance with limits of $5,000,000, combined single limit, naming the EPA as an additional insured. Within the same period, Respondents shall provide EPA with certificates of such insurance and a copy of each insurance policy. Respondents shall submit such certificates and copies of policies each year on the anniversary of the Effective Date. In addition, for the duration of the Settlement Agreement, Respondents shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the Work on behalf of Respondents in furtherance of this Settlement Agreement. If Respondents demonstrate by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering some or all of the same risks but in an equal or lesser amount, then Respondents need provide only that portion of the insurance described above which is not maintained by such contractor or subcontractor.

XXVI. FINANCIAL ASSURANCE

94. Respondents shall include in the RI/FS Work Plan submitted pursuant to the Statement of Work a proposed estimate of the total cost of carrying out the remainder of the RI/FS. Within 30 days of EPA's approval of the RI/FS Work Plan, Respondents shall establish and maintain financial security for the benefit of EPA in the amount set out in the RI/FS Work Plan in one or more of the following forms, in order to secure the full and final completion of Work by Respondents:

a. a surety bond unconditionally guaranteeing payment and/or performance of the Work;

b. one or more irrevocable letters of credit, payable to or at the direction of EPA, issued by financial institution(s) acceptable in all respects to EPA equaling the total estimated cost of the Work;

c. a trust fund administered by a trustee acceptable in all respects to EPA;

d. a policy of insurance issued by an insurance carrier acceptable in all respects to EPA, which ensures the payment and/or performance of the Work;

e. a corporate guarantee to perform the Work provided by one or more parent corporations or subsidiaries of Respondents, or by one or more unrelated corporations that have a substantial business relationship with at least one of Respondents, including a demonstration that any such company satisfies the financial test requirements of 40 C.F.R. Part 264.143(f); and/or

f. a corporate guarantee to perform the Work by one or more of Respondents, including a demonstration that any such Respondent satisfies the requirements of 40 C.F.R. Part 264.143(f).

95. Any and all financial assurance instruments provided pursuant to this Section shall be in form and substance satisfactory to EPA, determined in EPA's sole discretion. In the event that EPA determines at any time that the financial assurances provided pursuant to this Section (including, without limitation, the instrument(s) evidencing such assurances) are inadequate, Respondents shall, within 30 days of receipt of notice of EPA's determination, obtain and present to EPA for approval one of the other forms of financial assurance listed in Paragraph 94, above. In addition, if at any time EPA notifies Respondents that the anticipated cost of completing the Work has increased, then, within 30 days of such notification, Respondents shall obtain and present to EPA for approval a revised form of financial assurance (otherwise acceptable under this Section) that reflects such cost increase. Respondents' inability to demonstrate financial ability to complete the Work shall in no way excuse performance of any activities required under this Settlement Agreement.

96. If Respondents seek to ensure completion of the Work through a guarantee pursuant to Subparagraph 94.e. or 94.f. of this Settlement Agreement, Respondents shall (i) demonstrate to EPA's satisfaction that the guarantor satisfies the requirements of 40 C.F.R. Part 264.143(f) with respect to the amount guaranteed at this Site; and (ii) resubmit sworn statements conveying the information required by 40 C.F.R. Part 264.143(f) with respect to the amount guaranteed at this Site annually, on the anniversary of the Effective Date, to EPA. For the purposes of this Settlement Agreement, wherever 40 C.F.R. Part 264.143(f) refers to "sum of current closure and post-closure costs estimates and the current plugging and abandonment costs estimates," the current cost estimate for the Work at the Site shall be used in relevant financial test calculations.

97. If, after the Effective Date, Respondents can show that the estimated cost to complete the remaining Work has diminished below the amount approved by EPA in the RI/FS Work Plan, Respondents may, on any anniversary date of the Effective Date, or at any other time agreed to by the Parties, reduce the amount of the financial security provided under this Section to the estimated cost of the remaining Work to be performed. Respondents shall submit a proposal for such reduction to EPA, in accordance with the requirements of this Section, and may reduce the amount of the security after receiving written approval from EPA. In the event of a dispute, Respondents may seek dispute resolution pursuant to Section XV (Dispute Resolution). Respondents may reduce the amount of security in accordance with EPA's written decision resolving the dispute.

98. Respondents may change the form of financial assurance provided under this Section at any time, upon notice to and prior written approval by EPA, provided that EPA determines that the new form of assurance meets the requirements of this Section. In the event of a dispute, Respondents may change the form of the financial assurance only in accordance with the written decision resolving the dispute.

XXVII. INTEGRATION/APPENDICES

99. This Settlement Agreement and its appendices and any deliverables, technical memoranda, specifications, schedules, documents, plans, reports (other than semi-annual status reports), etc. that will be developed pursuant to this Settlement Agreement and become incorporated into and enforceable under this Settlement Agreement constitute the final, complete and exclusive agreement and understanding among the Parties with respect to the settlement embodied in this Settlement Agreement. The parties acknowledge that there are no representations, agreements or understandings relating to the settlement other than those expressly contained in this Settlement Agreement. The following appendices are attached to and incorporated into this Settlement Agreement:

"Appendix A" is the SOW (the SOW also has its own appendices).

XXVIII. ADMINISTRATIVE RECORD

100. EPA will determine the contents of the administrative record file for selection of the remedial action. Respondents shall submit to EPA documents developed during the course of the RI/FS upon which selection of the response action may be based. Upon request of EPA, Respondents shall provide copies of plans, task memoranda for further action, quality assurance memoranda and audits, raw data, field notes, laboratory analytical reports and other reports. Upon request of EPA, Respondents shall additionally submit any previous studies conducted under state, local or other federal authorities relating to selection of the response action, and all communications between Respondents and state, local or other federal authorities concerning selection of the response action. At EPA's discretion, Respondents shall establish a community information repository at or near the Site, to house one copy of the administrative record.

XXIX. EFFECTIVE DATE AND SUBSEQUENT MODIFICATION

101. This Settlement Agreement shall be effective five days after the Settlement Agreement is signed by the Regional Administrator's delegatee.

102. This Settlement Agreement may be amended by mutual agreement of EPA and Respondents. Amendments shall be in writing and shall be effective when signed by EPA. EPA RPMs do not have the authority to sign amendments to the Settlement Agreement.

103. No informal advice, guidance, suggestion, or comment by the EPA RPM or other EPA representatives regarding reports, plans, specifications, schedules, or any other writing submitted by Respondents shall relieve Respondents of their obligation to obtain any formal approval required by this Settlement Agreement, or to comply with all requirements of this Settlement Agreement, unless it is formally modified.

XXX. NOTICE OF COMPLETION OF WORK

104. When EPA determines that all Work has been fully performed in accordance with this Settlement Agreement, with the exception of any continuing obligations required by this Settlement Agreement, including but not limited to obligations under Paragraph 55, EPA will provide written notice to Respondents. If EPA determines that any such Work has not been completed in accordance with this Settlement Agreement, EPA will notify Respondents, provide a list of the deficiencies, and require that Respondents modify the RI/FS Work Plan if appropriate in order to correct such deficiencies, in accordance with Paragraph 35 (Modification of the Work Plan). Failure by Respondents to implement the approved modified RI/FS Work Plan shall be a violation of this Settlement Agreement.

It is so ORDERED AND AGREED BY:

James T. Owens, III
Director
Office of Site Remediation & Restoration
U.S. Environmental Protection Agency Region I

Date: 6/28/07

EFFECTIVE DATE: ~~6/28/07~~
7/3/07

Olin Chemical Superfund Site
Administrative Settlement Agreement and Order on Consent for RI/FS
U.S. EPA Region I, CERCLA Docket No. 01-2007-0102

Agreed this 22 day of June, 2007.
For Respondent American Biltrite Inc.

By: _____

Title: President & C.O.O.

Olin Chemical Superfund Site
Administrative Settlement Agreement and Order on Consent for RI/FS
U.S. EPA Region I, CERCLA Docket No. 01-2007-0102

Agreed this 25th day of June, 2007.
For Respondent Olin Corporation

By: Curtis M Richards

Title: Corporate Vice President E, H & S

Olin Chemical Superfund Site
Administrative Settlement Agreement and Order on Consent for RI/FS
U.S. EPA Region I, CERCLA Docket No. 01-2007-0102

Agreed this 27th day of June, 2007.
For Respondent Stepan Company

By: H. Edward Flynn

Title: Vice President, General Counsel and Secretary

STATEMENT OF WORK
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
OLIN CHEMICAL SUPERFUND SITE

June 2007

Final

Prepared by
The United States Environmental Protection Agency
Region 1 – New England
Boston, MA. 02114

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STATEMENT OF WORK

REMEDIAL INVESTIGATION AND FEASIBILITY STUDY OLIN CHEMICAL SUPERFUND SITE (THE "SITE")

SECTION 1: OBJECTIVES, REPORTING REQUIREMENTS, AND SCHEDULE

This section describes the overall objectives, reports and schedule of the remedial investigation and feasibility study process. Subsequent sections will describe the separate phases of the process in more detail.

I. OBJECTIVES

The primary objective of the remedial investigation and feasibility study ("RI" and "FS" or "RI/FS") shall be to assess site conditions and evaluate alternatives to select a remedy, to the extent necessary, for the Olin Chemical Superfund Site ("Site") as defined in the Administrative Settlement Agreement and Order on Consent ("Settlement Agreement"), CERCLA Docket No. 01-2007-0102, that shall be consistent with the National Oil and Hazardous Contingency Plan ("NCP") (40 CFR Part 300) and relevant guidance. The RI and FS shall be conducted as integrated, phased studies leading to the selection of a remedy, consistent with EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (EPA/540/G-89/004, OSWER Directive 9355.3-01 October 1988) and the National Contingency Plan ("NCP"), among other authorities.

As a Tier I site under the Massachusetts Contingency Plan ("MCP"), the Olin Chemical Superfund Site has been studied by the Olin Corporation under the auspices of the Massachusetts Department of Environmental Protection ("MassDEP"). Several response activities have also been conducted on the facility Property by the Olin Corporation. These activities have resulted in a significant amount of data, particularly on the former facility portion of the Site. This data is presented and evaluated in various investigation, remediation and risk assessment reports compiled over many years. This information will be evaluated through the RI/FS process, and incorporated, as EPA deems appropriate.

If, at any time during the RI/FS process, EPA determines that an engineering evaluation/cost analysis ("EE/CA") should be performed at the Site in preparation for a non-time critical removal ("NTCRA"), the Respondents shall conduct an EE/CA concurrent with the RI/FS.

A. Remedial Investigation

The objectives of the RI are, consistent with the NCP and taking into consideration existing information regarding the Site, to:

1. define the source(s), nature, extent, and distribution of contaminants at the Site;

2. provide sufficient information for EPA to assess the current and future potential risks to human health and to the environment; and

3. provide sufficient information to evaluate remedial alternatives, do a conceptual design of remedial actions, select a remedy, and issue a record of decision.

If EPA, after reasonable opportunity for review and comment by MassDEP, determines that any of these objectives are not fully met, additional work plans, studies or other appropriate activities shall be designed and performed by EPA or the Respondents until EPA decides that no further investigation is necessary to meet the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), as amended.

The RI shall include, but is not limited to, data gathering (monitoring and testing), and, to the extent necessary, developing methodologies, procedures, and assessments for characterizing the physical and chemical attributes of the Site.

The procedures used to address the objectives listed above may include, but are not limited to, evaluating existing Site information, including data generated and analyses prepared by the Respondents or EPA, and either of their respective contractors; identifying data gaps; performing field sampling and laboratory analyses; performing non-intrusive investigation activities such as surface geophysics; conducting bench scale and/or field pilot scale treatability studies, if necessary; and identifying all available federal, state and local human health and environmental regulations and/or laws that are applicable or relevant and appropriate (i.e., Applicable or Relevant and Appropriate Requirements ("ARARs")).

Additional detail on the RI can be found in section 300.430(d) of the NCP and the Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (EPA 540/G-89/004 OSWER-Dir. 9355.3-01 October 1988).

B. Feasibility Study

The objectives of the FS portions are to:

1. establish remedial action objectives and preliminary remediation goals, as described in NCP § 300.430(e)(2)(i).

2. review the applicability of various remedial technologies, including innovative technologies that are developed fully but lack sufficient cost or performance data for routine use at Superfund sites, to determine whether they are appropriate remedies for the Site;

3. develop remedial alternatives by screening and combining appropriate technologies based upon the three (3) screening criteria listed in the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (EPA 540/G-89/004 OSWER-Dir.

9355.3-01 October 1988, and any criteria identified in the NCP or CERCLA, as amended;

4. evaluate each alternative or combination of alternatives that meets the above screening criteria through a detailed and comparative analysis based upon the nine (9) criteria listed in the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (EPA 540/G-89/004 OSWER-Dir. 9355.3-01 October 1988), and any criteria identified in the NCP (40 CFR Part 300) or CERCLA as amended;

5. compare each alternative retained for detailed analysis to a no-action alternative, which serves as a baseline reference point for comparison; and,

6. provide direction to the RI to ensure that sufficient data of the appropriate type are gathered to develop remedial alternatives (to the extent necessary).

The FS includes, but is not limited to, conceptualizations, engineering analyses, cost analyses, and an analysis of time frames for the achievement of clean-up goals. Additional detail on the FS can be found in NCP § 300.430(e) and the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (EPA 540/G-89/004 OSWER-Dir. 9355.3-01 October 1988).

C. Operable Units

EPA, at its sole discretion, will often divide a site that is considered technically complex into discrete Operable Units ("OUs"), which are defined by media, geographic location, and/or nature of the remedy (i.e., source control verses management of migration). Establishing OUs allows RI/FS activities to proceed in a scheduled approach such that EPA can often address continuing threats (e.g., source control issues) sooner than would otherwise be possible. OUs also help EPA track remedial progress and funding requirements at complex sites.

EPA considers the Site to be technically complex due to extensive cross-media contamination over a relatively large area, presence of a large multi-phased groundwater plume and possible multiple source areas. Therefore, the RI/FS activities shall proceed under the following OUs, unless otherwise directed by EPA:

1. **Operable Unit 1 ("OU1"):** Defined as the approximately 50-acre Olin Property (hereafter, the "Olin Property" or "Property"), including the former facility area, the established conservation area, the on-Property ditch system, the calcium sulfate landfill, and the slurry wall/containment area. *The OU1 RI/FS will evaluate soil, sediment, surface water (including the on-Property ditch system), and potential vapor issues (if applicable).*

2. **Operable Unit 2 ("OU2"):** Defined as off-Property surface water and sediment areas including, at a minimum, the off-Property East Ditch, South Ditch and West Ditch. *The OU2 RI/FS will evaluate surface water and sediment issues.*

3. **Operable Unit 3 ("OU3"):** Defined as all on- and off-Property groundwater areas including the Maple Meadow Brook aquifer, groundwater beneath the Olin Property and groundwater located south and east of the Olin Property. *The OU3 RI/FS will evaluate groundwater and potential vapor issues (if applicable).*

The RI/FS will proceed as a Site-wide process encompassing all three OUs (i.e., RI/FS work is expected to proceed concurrently and independently on all OUs, although the schedule for certain OU-specific RI/FS tasks and/or deliverables may vary for each OU, depending on the complexity of the OU and amount of prior work completed). At any time, EPA may decide to change, further subdivide, or combine Operable Units for the Site.

D. Engineering Evaluation/Cost Analysis

If an EE/CA is deemed to be appropriate, the objectives of the EE/CA(s) will be to:

1. identify the objectives of the specific removal action; and

2. analyze the effectiveness, implementability and cost of various alternatives that may satisfy these objectives.

II. REPORTING REQUIREMENTS

Data, methods, and interpretations shall, at a minimum, be:

A. of sufficient quality with regard to data collection techniques, data quality objectives, analytical methodologies, and validation procedures consistent with EPA Region I guidance and policy;

B. sufficiently rigorous with regard to spatial coverage and background considerations;

C. scientifically and technically sound with relevant assumptions, biases, potential deficiencies, safety factors, and design criteria explicitly stated;

D. discussed with observations and interpretation clearly identified and distinguished;

E. discussed with relevant supporting reference material clearly identified;

F. presented in graphs, charts, maps, plans and/or cross–sections, where possible, so that the text provides a clear discussion of such illustrations;

G. discussed in relationship to the objective(s) for which they were completed and to which they are applicable; and

H. sufficient to satisfy the general objectives of the RI and FS listed above.

III. SCHEDULE: STEPS AND DELIVERABLES

A. Interim Response Steps Work Plan

The Respondents are performing, or have performed, certain activities at the Site consistent with plans previously approved under the MCP. The Respondents shall submit an Interim Response Steps Work Plan further defining the continuance and scheduling of the following activities:

- operation and maintenance activities of the interim remedial measures previously put in place at the Site, including monitoring of the slurry wall containment system and maintenance of the associated temporary cap;

- continue the design, installation and operation efforts for the off-Property West Ditch pilot extraction well; and

- continue operation and maintenance of the Plant B groundwater depression and treatment system that was installed for LNAPL containment and recovery.

These steps are described in more detail in Section 2.II.B, below.

B. RI/FS Steps

The Respondents shall perform the RI/FS as discussed in this section and as shown in Table 1. The illustrated process is based on the current understanding of the Site. The integrated RI/FS process described herein for the Site has several major steps, each associated with at least one deliverable, as shown in Table 1 and discussed in Sections 2 through 6 (see also Figure 1.1 in the Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, OSWER Directive 9355.3-01, EPA 540/6-89/004, October, 1988). The integrated RI/FS process is intended to ensure an orderly selection of a remedy. Site data needed to perform the FS shall be identified as early as possible in the RI. However, the results of investigations during the RI/FS may require changes in the process, such as conducting a non-time critical removal action (NTCRA).

C. Focused RI Report

A significant amount of Site data and other information have already been collected during prior environmental sampling and response activities performed by the Respondents. In order to avoid the duplication of previously completed efforts, and to maximize the efficiency of RI data collection activities, the Respondents shall compile available pre-existing data into an electronic database, and then submit a written report, to be referred to as a Focused Remedial Investigation Report ("Focused RI"), for EPA review and approval. The Focused RI shall merge previously compiled environmental reports, results of testing, and other relevant information into Operable Unit-specific summaries of existing Site conditions and provide an evaluation of the existing data relative to EPA data quality and usability objectives, as explained further below. In

addition, the Focused RI Report shall identify existing data gaps to support the Operable Unit specific data needs contained in the RI/FS Work Plan. Additional detail on the content of the Focused RI is provided in Section 2.II.D, below.

D. RI/FS Deliverables

Deliverables for each step of the RI/FS are shown on Table 1. The actual number of deliverables may vary depending on:

1. the types of deliverables proposed by the Respondents and approved by EPA;

2. whether separate RI and FS Reports are submitted for the different operable units;

3. tasks within RI/FS steps, particularly the tasks planned for the scoping of the RI/FS (step 1) and the Remedial Investigation (step 2);

4. the need for revisions;

5. requests for additional field studies, analyses, and documentation by EPA or the Respondents;

6. the quality and completeness of the Respondents' work;

7. the discovery of additional contaminants and/or conditions not identified in prior investigations; and

8. the possible need to conduct a non-time critical removal action (NTCRA).

EPA will consult with MassDEP and seek review of each deliverable by MassDEP and other interested stakeholders; however, pursuant to the procedures described in the Settlement Agreement, EPA retains the authority to approve, disapprove, or modify all deliverables. In any event, EPA shall provide one set of comments to Respondents. There shall be an approval, disapproval, or modification by EPA of each deliverable in accordance with the terms of the Settlement Agreement.

The Respondents shall provide EPA with 5 print copies, and MassDEP with 1 print copy, of each deliverable, unless otherwise directed by EPA. In addition, the Respondents shall provide EPA with electronic copies of all deliverables (draft and final) and correspondence in Adobe™ Acrobat. Upon request, Respondents shall also provide EPA with text and tables in MS Word, and provide data and drawings in workable and widely accepted electronic formats, or alternatively, provide EPA and EPA's consultant with access to electronic text, tables, data and drawings though a Virtual Private Network (VPN), File Transfer Protocol (FTP) or other acceptable electronic data-sharing link.

E. RI/FS Schedule

Initiation of the schedule for the Respondents to submit the Work Plan for the RI/FS shall begin on the Effective Date of the Settlement Agreement. Initiation of the other phases of the RI/FS shall be triggered by notice from EPA, as stated in Table 1. EPA may give notice to start a component of the study even if prior steps have not been completed or fully reviewed; in that case, however, the schedule regarding that component and any other affected component may be *revised as approved by EPA (either on its own initiative or in response to a proposal by* Respondents).

The Respondents shall propose a schedule in the Work Plan for the RI/FS that is consistent with framework provided in Table 1. Revised proposed schedules shall also accompany each of the major predetermined deliverables and the Semi-Annual Status Reports.

TABLE 1
GENERAL STEPS, DELIVERABLES AND SCHEDULE FOR RI/FS PROCESS

STEP	DELIVERABLES	DUE DATE
1. Scoping the RI/FS	Interim Response Steps Work Plan Focused RI Report RI/FS Work Plan	IRSWP due 4 weeks after the Effective Date of the Settlement Agreement. Focused RI Report due 3 months after the Effective Date of the Settlement Agreement. RI/FS Work Plan due 6 months after the Effective Date of the Settlement Agreement.
2. Remedial Investigation[1]	OU-Specific Remedial Investigation Fieldwork Remedial Investigation Report Human Health Risk Assessment Report Ecological Risk Assessment Report Additional Field Studies Work Plan (if necessary)	Field work for the RI shall begin within 4 weeks of approval of the Work Plan for the RI/FS.[2]

1 Separate remedial investigations, and RI reports, are anticipated for each operable unit, unless EPA determines, either on its own initiative or in response to a proposal by Respondents, that two or more OUs should be

3. Feasibility Study[3]	Development and Initial Screening of Alternatives Report Feasibility Study Report	Development and Initial Screening of Alternatives Report due 10 weeks after EPA notice to proceed with Step 3.[4]
4. Ongoing activities	Semi-Annual Status Reports	6 months after the Effective Date of the Settlement Agreement, and every 6 months thereafter.
5. Source Control EE/CA (if necessary)	Engineering Evaluation and Cost Analysis Work Plan Engineering Evaluation and Cost Analysis Report	Engineering Evaluation and Cost Analysis Work Plan due 12 weeks after EPA notice to proceed with EE/CA.
5. Additional RI/FS Drafts, Reviews, and Revisions	Second draft RI/FS and final RI/FS accepted by EPA for public review and comment, a responsiveness summary is completed and a Record of Decision is signed	to be determined by EPA

All deliverables in Table 1 are subject to approval under Section X of the Settlement Agreement, and the field work, analyses and other work set out in these deliverables shall be performed by the Respondents as required by Section X of the Settlement Agreement, with penalties governed by Section XVI of the Settlement Agreement in the event any deliverable is not delivered timely and adequately to EPA.

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combined into a single study and/or RI report. If separate remedial investigations are deemed appropriate, all-RI related activities shall proceed concurrently and independently on schedules commensurate with the proposed activities, in accordance with approved work plans and associated schedules for each of the three OUs. A single RI/FS Work Plan shall be submitted to address all operable units.

2 Respondents shall propose a due date for each OU RI Report that is commensurate with the proposed activities in the Work Plan for the RI/FS. EPA may accept this proposed due date, propose a revised due date or promulgate its own.

3 Separate feasibility studies, and FS reports, are anticipated for each operable unit, unless EPA determines, either on its own initiative or in response to a proposal by Respondents, that two or more OUs should be combined into a single study and/or FS report. If separate feasibility studies are deemed appropriate, all-FS related activities shall proceed concurrently and independently on schedules commensurate with the proposed activities.

4 Respondents shall propose a due date for each OU FS Report that is commensurate with the proposed activities in the Work Plan for the RI/FS. Respondents shall propose an updated due date for each OU FS Report in each Development and Initial Screening of Alternatives Report. EPA may accept these proposed due dates, propose revised due dates or promulgate its own due dates.

SECTION 2: SCOPING OF THE RI/FS

This Section describes the general requirements of the RI/FS Work Plan, the Interim Response Steps Work Plan and the Focused RI Report. Additional details on the contents of the RI/FS Work Plan, particularly requirements linked to certain field work and data to be presented in the RI Report, are in Section 3.

I. OBJECTIVES

The scoping of the RI/FS shall ensure that the Respondents:

A. understand the objectives of the RI/FS;

B. develop procedures to meet the RI/FS objectives, including those for field activities;

C. initiate the identification of federal, state, and local Applicable or Relevant and Appropriate Requirements ("ARARs"), which shall provide criteria for remedy selection at the Site;

D. assemble and evaluate existing data, identify data gaps, resolve inconsistencies, and fill data gaps where necessary to accomplish RI objectives;

E. develop a conceptual understanding of the Site based on the evaluation of existing data and all newly acquired data;

F. identify likely response scenarios and potentially applicable technologies and alternatives that may address Site problems;

G. undertake limited data collection efforts or studies where this information will assist in scoping the RI/FS or accelerate response actions, and begin to identify the need for treatability studies, as appropriate;

H. identify the type, quality and quantity of the data needed to assess potential remedial technologies, to evaluate technologies that may be combined to form remedial alternatives, and to support decisions regarding remedial response activities;

I. prepare site-specific health and safety plans that shall specify, at a minimum, employee training and protective equipment, medical surveillance requirements, standard operation procedures, and a contingency plan that conforms with 29 CFR 1910.120;

J. develop a Quality Assurance Project Plan and a Field Sampling Plan that shall provide a process for obtaining data of sufficient quality and quantity to satisfy data needs; and

K. draft a proposed schedule which shows the flow of studies and the submission of deliverables described in this Scope of Work.

The Respondents shall review the above scoping requirements and prepare an RI/FS Work Plan that addresses the remaining objectives to be evaluated. The requirements listed in the Project Operations Plans (POP) will apply to every Work Plan that involves field activities. The Sampling and Analysis Plan (SAP) section of the POP shall be updated for any additional or supplemental Work Plans that are required to complete field activities for the RI/FS. Updates may be in the form of numbered, OU-specific, Field Sampling Plan (FSP) addendums (e.g., OU2 FSP Addendum Number 1) and Quality Assurance Project Plan (QAPP) addendums, if required. The RI Report shall include a detailed discussion of the studies completed and how the data requirements of the Remedial Investigation have been satisfied.

II. DELIVERABLES

A. Overview

In scoping the RI/FS, the Respondents shall deliver to EPA and the MassDEP the following in writing:

1. Interim Response Steps Work Plan;
2. Focused RI Report; and
3. Work Plan for the RI/FS, including:
    a. Project Operations Plan;
    b. Preliminary Identification of Probable Applicable or Relevant and Appropriate Requirements (ARARs);
    c. Data Requirements of Potential Remedial Alternatives and Technologies; and
    d. Expanded Schedule (Critical Path Method (CPM)) for the RI/FS.

The Focused RI Report shall be submitted prior to the RI/FS Work Plan and will identify data gaps for each OU. The Work Plan for the RI/FS shall describe the necessary studies to be done to complete the RI/FS. Although the RI/FS will be performed under three separate OUs, a single RI/FS Work Plan shall be submitted for the Site. The Work Plan for the RI/FS shall be revised as EPA deems necessary, and revisions submitted prior to each subsequent phase of work as described in Table 1. The Work Plan for the RI/FS is described generally in Section 2 of this SOW; other, more specific components are described in Section 3. To reduce the submittal of repetitive information contained within each of the elements of the Work Plan, the Respondents may include appropriate cross-references at key places within each document.

B. Interim Response Steps Work Plan

The Respondents shall (a) beginning on the Effective Date of the Settlement Agreement, perform certain activities, as listed below, previously approved by MassDEP under the MCP, and (b) within 4 weeks of the Effective Date, submit an Interim Response Steps Work Plan, separate from the RI/FS Work Plan, to govern further performance of interim response steps, as follows:

1. **Slurry Wall/Cap:** The Respondents have installed a slurry wall containment system and temporary cap over a known area of Dense Aqueous Phase Liquids ("DAPL") on the Olin Property. The Respondents have been monitoring the performance of the slurry wall and temporary cap. The Respondents shall submit a plan for continued monitoring of the slurry wall containment system and maintenance of the temporary cap as part of the Interim Response Steps Work Plan. The information collected through this task will be used to assess if the slurry wall is performing as intended and document that the temporary cap is properly maintained. The Respondents shall continue monitoring and reporting activities, as provided in the most recent relevant MCP monitoring program status report, *Semi-Annual Post-Construction Monitoring Plan Status Report, June 2005 – December 2005,* Release tracking number 3-0471, 51 Eames Street Site, Wilmington, Massachusetts (MACTEC) February 10, 2006, until such time as EPA, after reasonable opportunity for review and comment by MassDEP, approves the slurry wall containment system and temporary cap monitoring activities specified in the Interim Response Steps Work Plan. The Interim Response Steps Work Plan shall provide for the presentation of all inspection and maintenance activities in the Semi-Annual Status Reports to be submitted beginning six months after the Effective Date of the Settlement Agreement, and every six months thereafter.

2. **Plant B:** A groundwater recovery/treatment system is currently being operated by the Respondents to remove and control migration of a light non-aqueous phase liquid ("LNAPL"). The system includes the extraction and treatment of groundwater, and removal of residual LNAPL, through Plant B. Extracted groundwater is discharged to the on-Property West Ditch through an EPA Remediation General Permit (RGP). LNAPL is separated from the groundwater and containerized for off-site disposal. The Plant B system has been in operation for several decades and has been modified, or enhanced by in-situ processes (air sparging, soil vapor extraction, and biostimulation). The Respondents shall continue to operate Plant B in accordance with the requirements contained in the RGP until the Interim Response Steps Work Plan is approved. The Respondents shall include in the Interim Response Work Plan an approach for continued operation, an evaluation of additional enhancement or remedial optimization options, if any, and an identification of clear objectives to be obtained in order to cease operation of the Plant B remediation system. The Interim Response Steps Work Plan shall provide for the presentation of all Plant B operation and maintenance activities, and test data, in the Semi-Annual Status Reports, to be submitted beginning six months after the Effective Date of the Settlement Agreement, and every six months thereafter.

3. **DAPL Extraction Pilot Test:** The Respondents have initiated plans to conduct a field-scale pilot test for the extraction of DAPL from the aquifer in the Off-Property West Ditch Area. The Respondents shall continue design efforts for carrying out this pilot test and include in the Interim Response Steps Work Plan a proposed schedule for submission to EPA of a DAPL Extraction Pilot Test Design Report. This Design Report shall include (a) a proposed design of the pilot test, (b) a schedule for the anticipated start and completion dates of field work for the pilot test and for submission of a post-test report, and (c) identification of the relevant data and technical and performance objectives

necessary to adequately evaluate the viability of DAPL extraction. The Respondents shall implement the DAPL extraction pilot test and submit the post-test report under the schedule and terms approved by EPA in the Design Report. The Interim Response Steps Work Plan shall also provide for the presentation of design progress, and construction and operation and maintenance activities, in the Semi-Annual Status Reports.

To the extent that any data collection is necessary to perform these activities, the Respondents shall collect such data consistent with the relevant Project Operation Plans (POPs), or equivalent plans previously approved by MassDEP under the MCP, until such time as EPA approves the POP contained in the RI/FS Work Plan.

C. Semi-Annual Status Reports

The Respondents shall submit Semi-Annual Status Reports that provide an ongoing summary of data and evaluations. A single status report shall be submitted for all operable units that generally includes the following information, as appropriate:

1. text summary of field activities for a period inclusive of the prior 6 months;
2. data summaries;
3. laboratory sheets;
4. supporting figures;
5. waste manifests; and
6. other relevant information.

The first Semi-Annual Status Report shall be submitted 6 months after the Effective Date of the Settlement Agreement.

D. Focused RI Report

The Respondents shall submit a Focused RI Report for the entire Site that generally follows the format for an RI Report as described below, and more specifically: provides an overview of investigation and clean-up activities completed by the Respondents to date, summarizes data previously collected, evaluates the spatial coverage, quality and usability of that data under EPA standards identified in the Sampling and Analysis Plan (see below); presents the results of previously completed investigations (identifying any part of these investigations that is dependent on data that may not meet EPA standards); presents previously completed risk assessment calculations and conclusions (including an assessment of whether these calculations and conclusions are consistent with the risk assessment methodology and standards described below); clearly identifies and explains the rationale for exclusion of data sets and/or previous evaluations or risk assessments; and summarizes existing conditions at the Site. The Focused RI Report shall present this information in an OU-specific manner. This report may also include a description of any redevelopment activities currently proposed in OU1 and describe in detail any potential impacts on or changes to Site conditions. The information in the Focused RI Report will directly support any proposed site characterization activities contained in the RI/FS Work

Plan and any proposed monitoring, inspection, and operation and maintenance activities proposed in the Interim Response Steps Work Plan.

E. Preliminary Identification of Applicable or Relevant and Appropriate Requirements ("ARARs")

The Respondents shall include in the Focused RI Report a preliminary identification (in the format described below) of all probable Federal Applicable or Relevant and Appropriate Requirements ("ARARs"), State ARARs and any local requirements. Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances at a CERCLA site (only those State standards that are more stringent than federal requirements may be applicable). Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal or State environmental or facility siting laws that, while not applicable to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA Site that their use is well suited to the particular site (only those State standards that are more stringent than federal requirements may be relevant and appropriate).

In addition to ARARs, the Respondents shall also make preliminary determinations on the extent to which other publicly available criteria, advisories, and guidances are pertinent to the hazardous substances, location of the Site, and remedial actions. ARARs and other criteria, advisories, and guidances shall be:

1. considered in terms of their chemical-specific, location-specific, and action-specific attributes;

2. evaluated for each medium (surface water, ground water, sediment, soil, air, biota, and facilities), particularly for chemical-specific ARARs, but including other ARARs as appropriate;

3. distinguished for each technology considered, particularly for action-specific ARARs, but including other ARARs as appropriate; and

4. considered at each major step of the RI/FS, and for each OU, where they are indicated.

In general, identification of chemical- and location-specific ARARs is more important in the beginning steps of the RI/FS, whereas the identification of action-specific ARARs gain importance later, during the more FS-oriented steps. If a requirement is determined to be not applicable, the Respondents shall subsequently consider whether it is relevant and appropriate. When any new site-specific information becomes available, ARARs should be re-examined.

- Chemical-specific ARARs are usually health or risk-based numerical limits on the amount of, or concentration of, a chemical that may be found in, or discharged to the ambient environment.

- Location-specific ARARs are general restrictions placed upon the concentration of hazardous substances or the conduct of activities solely because they are in special locations. Some examples of special locations include, but are not limited to, floodplains, wetlands, historic places, places with objects of archaeological significance, and sensitive ecosystems or habitats.

- Action-specific ARARs are usually technology-based or activity-based directions or limitations which control actions taken at CERCLA sites. Action-specific ARARs, as the name implies, govern the remedial actions.

The Respondents shall provide a list in the form of a chart of preliminary and probable ARARs, and publicly available EPA and MassDEP criteria, advisories, and guidances, and limitations which should initially be exhaustive of all such requirements. The list shall briefly describe the requirements and shall include: if it is a numerical requirement; what it is based upon (i.e., health, technical practicality); and what media it is designed for (i.e., surface water, ambient air, etc.). The list shall indicate whether each requirement is: potentially applicable or relevant and appropriate; chemical-specific, location-specific, or action-specific; pertinent to surface water, ground water, soil, air, biota, or facilities; and affixed with specific levels or goals to be attained. If specific levels or goals are affixed, they must be enumerated in the chart. The following shall be consulted during the ARAR identification process:

- CERCLA Compliance with Other Laws Manual: Draft Guidance (August 1988, EPA/540/G-89/006),

- CERCLA Compliance with Other Laws Manual: Part II, Clean Air Act and Other Environmental Statutes and State Requirements (August 1989, EPA/540/G-89/009), and

- Section 4 of Guidance of Feasibility Studies Under CERCLA (EPA, 1985c - EPA/540/G-85/003) and Appendix E of the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (EPA/540/G-89/004, OSWER Directive 9355.3-01, EPA October 1988), which presents a partial list of potential ARARs.

F. Project Operations Plan

Before field activities for the RI commence, several site-specific plans shall be written to establish procedures to be followed by the Respondents in performing field work, laboratory work, and community and agency liaison activities. These site-specific plans include the:

1) Site Management Plan ("SMP");

2) Sampling and Analysis Plan ("SAP");
3) Health and Safety Plan ("HSP"); and
4) Community Relations Support Plan ("CRSP").

The Respondents shall combine these four plans into the Project Operations Plan ("POP"). The POP is part of the Work Plan for the RI/FS, and will also address activities contained in the Interim Response Steps Work Plan. The POP is subject to EPA and MassDEP review and subsequent requests by EPA for revision before commencement of RI field work at the Site; Respondents shall submit for EPA approval an updated plan for each new phase of field work. The four components of the POP are discussed in the following sub-sections.

The Respondents shall modify the format and scope of each plan as needed to describe the sampling, analyses and other activities that are determined to be needed as the RI/FS progresses. These activities may include on-site pilot studies and/or laboratory bench scale studies of remedial treatments, and subsequent rounds of field sampling. EPA may modify the scopes of these activities at any time during the RI/FS at the discretion of EPA in response to the evaluation of RI/FS results or other developments or circumstances.

1. Site Management Plan ("SMP")

The overall objective of the Site Management Plan is to provide EPA with a written understanding and commitment of how various project aspects such as access, security, contingency procedures, management responsibilities, investigation-derived waste disposal, and data handling are to be managed by the Respondents. As part of the SMP, the Respondents shall include, at a minimum:

a. a map and list of properties where property access may be required (including properties located above the existing plumes);

b. a clear indication of the exclusion zone, contamination reduction zone, and clean area for on-site and off-site activities, as appropriate;

c. provisions reflecting that access to Site properties, required to permit Respondents to perform sampling and other work under this SOW, has either been obtained by Respondents for themselves and for EPA, or the Respondents have a process in place for securing access. The Respondents shall provide EPA timely notification of any access-related problems and issues, as required under Section XII of the Settlement Agreement. The Respondents shall provide EPA with copies of all executed access agreements;

d. a provision for the security of government and private property on the Olin Property;

e. measures to prevent unauthorized entry to the Olin Property, which might result in exposure of persons to potentially hazardous conditions;

f. the location of an office for on-site activities;

g. contingency and notification plans (for federal, state, and local authorities) for potentially dangerous activities associated with the RI/FS;

h. provisions for air monitoring, to the extent necessitated by Site activities;

i. communication to EPA on the organization and management of the RI/FS, including key personnel and their roles and responsibilities;

j. a list of contractors and subcontractors to be hired by the Respondents in the conduct of the RI/FS, and a description of their activities and roles;

k. provisions to provide financial reports of Respondents' expenditures on RI/FS activities, upon request by EPA;

l. provisions for the proper disposal of materials used and wastes derived during the RI/FS (e.g., drill cuttings, extracted ground water or other liquids, protective clothing, disposable equipment). These provisions shall be consistent with the off-site disposal aspects of CERCLA, RCRA, and applicable state laws. The Respondents shall be identified as the generator of wastes for the purpose of regulatory or policy compliance; and

m. plans and procedures for organizing, analyzing, and presenting the data generated and for verifying its quality before and during the RI/FS. The discussion of the data management plan shall include the description of the Access computer database management system that currently houses the Olin Wilmington Site data base. The description shall include the name of Respondents' software, a list of data input fields, examples of data base management output from the coding of pre-RI/FS sample data, a description of Respondents' quality assurance/quality control to ensure data accuracy and security, and capabilities of data manipulation. The description shall also include procedures whereby, upon request, Respondents shall provide EPA with a workable copy of the data base or alternatively, provide EPA and EPA's consultant, with access to the data base though a VPN, FTP or other data-sharing link.

2. Sampling and Analysis Plan ("SAP")

The purpose of the Sampling and Analysis Plan is to provide a mechanism for planning and approving field activities.

The overall objectives of the sampling and analysis plan are as follows:

a. to document specific data quality objectives, procedures, and rationales for field work and sample analytical work;

b. to provide a mechanism for planning and approving Site and laboratory activities;

c. to ensure that sampling and analysis activities are necessary and sufficient; and

d. to provide a common point of reference for all parties to ensure the comparability and compatibility of sampling and analysis activities to meet the stated project objectives.

The SAP shall be the framework for all anticipated field activities (e.g., sampling objectives, evaluation of existing data, standard operating procedures) and contain specific information on all planned field work (e.g., sampling locations and rationale, sample numbers and rationale, analyses of samples). During the RI/FS, the SAP shall be revised or appended as necessary to cover each round of field or laboratory activities.

The SAP consists of two parts: (1) a Quality Assurance Project Plan ("QAPP"), and (2) the Field Sampling Plan ("FSP"), both of which are described below in subsections 2A and 2B. The QAPP shall follow the requirements in QA/R-5 and the "Region I, EPA-New England Compendium of Quality Assurance Project Plan Requirements and Guidance." The FSP will contain all of the standard operating procedures ("SOPs") and other documentation to support specific sections of the QAPP. In some cases where there are unique FSP components for special applications, they will be added to the QAPP in the appropriate sections. In addition, the FSP and QAPP should be submitted as a single document (although they may be bound separately to facilitate use of the FSP in the field).

The SAP shall specify in the QAPP/FSP provisions for notifying EPA and MassDEP two (2) weeks before initiation of each field sampling or monitoring activities. The plan shall also allow split, replicate, or duplicate samples to be taken by EPA and MassDEP (or their contractor personnel or other government agencies working with EPA), with a minimum of forty-eight (48) hours advanced notice to Respondents. At the request of EPA (on its own behalf and/or on behalf of MassDEP), the Respondents shall provide these samples, with a minimum of forty-eight (48) hours advanced notice to Respondents, in appropriate containers to the government representatives. Identical procedures shall be used to collect the Respondents' samples and any split samples. The Respondents shall outline these provisions in Sections 8 and 9 of the QAPP.

Guidance on the topics covered in the QAPP and FSP, and their integration into each of these plans and the integration of the QAPP and the FSP into the SAP can be found in the following references, which shall be used to develop the SAP:

- EPA New England Quality Assurance Project Plan Program Guidance, April 2005;

- EPA Guidance for Quality Assurance Project Plans, EPA QA/G-5 (EPA/240/R-02/009), December 2002;

- EPA Requirements for Quality Assurance Plans, EPA QA/R-5 (EPA/240/B-01/003, March 2001);

- Region I, EPA-New England Compendium of Quality Assurance Project Plan Requirements and Guidance (U.S. EPA-New England Region I Quality Assurance Unit Staff, Office of Environmental Measurement and Evaluation; October 1999 Final);

- Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (OSWER Directive 9355.3-01, EPA/540/G-89/004, October 1988);

- Guidance for the Data Quality Objectives Process, EPA QA/G-4 (EPA/600/r-96/055, September 1994);

- Draft Data Quality Objectives Decision Errors Feasibility Trials (DEFT) Software, (EPA/600/R-96/056, September 1994);

- Guidance for the Data Quality Objectives Process for Hazardous Waste, EPA QA/G-4HW (EPA/600/R-96/007. Aug 2000);

- Guidance for Preparing Standard Operating Procedures (SOPs) EPA QA/G-6 (EPA/240/B-01/004 March 2001);

- Region I, EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses (Revised December 1996);

- Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA Pub. SW-846, Revision 6, November 2004 or subsequent revisions); and

- Guidance for Data Quality Assessment: Practical Methods for Data Analysis, EPA QA/G-9 (EPA/600/R-96-084, QA 97 Version, January 1998).

2A. Quality Assurance Project Plan ("QAPP")

The Quality Assurance Project Plan (QAPP) shall document in writing the site-specific objectives, policies, organizations, functional activities, sampling and analysis activities and specific quality assurance/quality control activities designed to achieve the data quality objectives (DQOs) of the RI/FS. The QAPP developed for this project shall document quality control and quality assurance policies, procedures, routines, and specifications.

Project activities throughout the RI/FS shall comply with the QAPP. QAPP sampling and analysis objectives and procedures shall be consistent with the above-referenced guidance documents, and particularly with the EPA Requirements for QAPPs for Environmental Data Operations (EPA QA/R-5) and appropriate EPA handbooks, manuals, and guidelines including Region I, EPA-New England Compendium of Quality Assurance Project Plan Requirements and

Guidance (October 1999 Final) (the "Compendium"). All the QAPP elements identified in EPA QA/R-5 and the "Compendium" must be addressed.

As indicated in EPA QA/R-5 and the "Compendium," a list of essential elements must be considered in the QAPP for the RI/FS. If a particular element is not relevant to a project and therefore excluded from the QAPP, specific and detailed reasons for the exclusion must be provided.

Information in a plan other than the QAPP may be cross-referenced clearly in the QAPP, provided that all objectives, procedures, and rationales in the documents are consistent, and the reference material fulfills requirements of EPA/QA/R-5. Examples of how this cross reference might be accomplished can be found in the Guidance for the Data Quality Objectives Process (EPA/600/R-96/055) and the Data Quality Objectives Decision Errors Feasibility Trials (DEFT) Software (EPA/600/R-96/056). EPA-approved references, or equivalent, or alternative methods approved by EPA shall be used, and their corresponding EPA-approved guidelines should be applied when they are available and applicable.

Laboratory QA/QC Procedures

The QA/QC procedures and SOPs for any laboratory (both fixed and mobile) used during the RI/FS shall be included in the Respondents' QAPP. Prior to the use of any laboratory, the Respondents will demonstrate, to EPA's satisfaction, that each laboratory it may use is qualified to conduct the proposed laboratory work. The proposed laboratory's use of methods and analytical protocols for the chemicals of concern in the media of interest within detection and quantification limits shall be consistent with both QA/QC procedures and DQOs approved in the QAPP for the Site by EPA. The proposed laboratory must have and follow an approved QA program. If a laboratory that does not participate in the Contract Laboratory Program ("CLP") is proposed, methods consistent with CLP methods that would be used at this Site for the purposes proposed, and QA/QC procedures approved by EPA, will be used. The Respondents shall only use laboratories which have a documented Quality Assurance Program that complies with ANSI/ASQC E4, Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs (American National Standard, January 5, 1995), and EPA Requirements for Quality Management Plans, EPA QA/R-2 (EPA/240/B-01/002, March 2001), or equivalent documentation, as determined by EPA. EPA may require that the Respondents submit detailed information to demonstrate that the laboratory is qualified to conduct the proposed work, including information on personnel qualifications, equipment and material specifications.

Data Validation Procedures

The Respondents are required to certify that a representative portion of the data has been validated by a person independent of the laboratory according to the Region I, EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses (revised December 1996) (to be amended as necessary to account for the differences between the

approved analytical methods for the project and the current Contract Laboratory Program Statements of Work ("CLP SOW")). A data validation reporting package, as described in the guidelines cited above, must be delivered at the request of the EPA remedial project manager. Approved validation methods shall be contained in the QAPP.

The independent validator shall not be the laboratory conducting the analysis and should be a person with a working knowledge of, or prior experience with EPA data validation procedures. The independent validator shall certify that the data has been validated, discrepancies have been resolved if possible, and the appropriate qualifiers have been provided.

Data Package requirements

The Respondents must keep the complete data package and make it available to EPA on request in order for EPA to conduct an independent validation of the data. The complete data package shall consist of all results, the raw data, and all relevant QA/QC information. The forms contained in the data validation functional guidelines, or project-specific forms that contain equivalent information, must be used to report the data when applicable. Raw data includes the associated chromatograms and the instrument printouts with area and height peak results. The peaks in all standards and samples must be identified. The concentration of all standards analyzed with the amount injected must be included. All laboratory tracking information must also be included in the data package.

Analytical samples will be tested using published USEPA methods, including SW-846 methods, CLP SOWs, Standard Methods (American Public Health Association), USEPA Methods for Chemical Analysis of Water or Waste Water, USEPA Clean Water Act Methods, USEPA Drinking Water Methods, and/or other USEPA published methods. To the extent EPA determines that published methods are not sufficient or available to address specific Site conditions (i.e., complex chemical matrix or need for lower detection limits), the Respondents shall propose modifications to existing methods, or alternative methods, for approval by EPA. It is anticipated that the CLP program will not be used to analyze samples, however all deliverables equivalent to those specified in the current CLP SOW must be delivered, unless specified by Respondents and approved by EPA as an exception. An example CLP-like set of data package deliverables is listed below:

1) a summary of positive results and detection limits of non-detects with all raw data;
2) tabulated surrogate recoveries and QC limits from applicable methods and all validation and sample raw data;
3) tabulated matrix spike/matrix spike duplicate recoveries, relative percent differences, spike concentrations, and QC limits from all validation and sample raw data;
4) associated blanks (trip, equipment, and method with accompanying raw data for tests);
5) tabulated initial and continuing calibration results (concentrations, calibration factors or relative response factors and mean relative response factors, % differences and % relative standard deviations) with accompanying raw data;
6) tabulated retention time windows for each column, when applicable;

7) a record of the daily analytical scheme (run logbook, instrument logbook), which includes samples and standards order of analysis;
8) the chain of custody for the sample shipment groups, DAS packing slip, DAS analytical specifications;
9) a narrative summary of method and any problems encountered during extraction or analysis;
10) tabulated sample weights, volumes, and % solids used in each sample calculation;
11) example calculation for positive values and detection limits; and
12) validation data for all tests.

The forms contained in Chapter 1 of SW-846 (Revision 6, November 2004, and any subsequent revisions), or the current CLP SOW forms, must be utilized to report the data when applicable. Customized data reporting forms for sample results and QC results may be provided in deliverable packages provided they contain the information listed above. A reduced deliverable package may be designated for some samples when no data validation is scheduled and data quality objectives of the sample collection task do not include contamination and risk evaluation. This may include waste samples tested for disposal decisions (TCLP), or other testing not directly impacting RI/FS decisions. Respondents shall provide full data deliverable packages upon request by the EPA RPM.

2B. Field Sampling Plan ("FSP")

The objective of the Field Sampling Plan is to provide EPA, MassDEP and all parties involved with the collection and use of field data, with a common written understanding of all fieldwork and the standard procedures that will be used to collect samples, and to supplement the sampling rationale information found in the QAPP. The FSP shall address the RI/FS objectives and conform to the procedures in Section 2 of this document and the National Contingency Plan ("NCP").

The FSP shall define, in detail, the sampling and data gathering methods used on a project. The FSP should be written so that a field sampling team unfamiliar with the Site would be able to gather the samples and field information required. Guidance for the selection of field methods, sampling procedures, and custody can be acquired from the Compendium of Superfund Field Operations Methods (OSWER Directive 9355.0-12, EPA/540/P-87/001), which is a compilation of demonstrated field techniques that have been used during remedial response activities at hazardous waste sites.

The FSP shall supplement the site-specific sample collection information in the QAPP and shall include the following information, only to the extent that the QAPP does not contain this information:

Site Background. The analysis of the existing Site details must be included in the FSP. This analysis shall include a conceptual Site model. A conceptual Site model includes a description of the Site and surrounding areas, and a discussion of known and suspected contaminant sources,

probable transport pathways, and other information about the Site. The FSP shall also include descriptions of specific data gaps and ways in which sampling is designed to fill those gaps.

Sampling Objectives. Specific objectives of a sampling effort that describe the intended uses of data must be clearly and succinctly stated.

Sample Location, Analytes, and Frequency. This section of the sampling plan identifies each sample matrix to be collected and the constituents to be analyzed. Tables shall be used to clearly identify the number of samples to be collected along with the appropriate number of replicates and blanks. Figures shall be included to show the locations of existing or proposed sample points.

Sample Designation. A sample numbering system shall be established. The sample designation should include the sample or well number, the sample round, the sample matrix (e.g. surface soil, groundwater, soil boring), the name of the Site, and the type of sample (e.g., field sample, QA/QC, duplicate, etc.).

Sampling Equipment and Procedures. Sampling procedures must be clearly written. Step-by-step instructions for each type of sampling are necessary to enable the field team to gather data that shall meet the Data Quality Objectives (DQOs). A list should include the equipment to be used and the material composition (e.g., Teflon, stainless steel) of equipment along with decontamination procedures.

Sample Handling and Analysis. A table shall be included that identifies sample preservation methods, types and numbers of sample containers, and holding times. Examples of paperwork such as traffic reports, chain of custody forms, packing slips or Analysis Request forms, and sample labels filled out for each sample as well as instructions for filling out the paperwork must be included. Field documentation methods including field notebooks and photographs shall be described.

Each Field Sampling Plan submitted as a part of the Work Plan for the RI/FS shall be sufficiently detailed to carry out the study, and shall provide data needed to address the objective of the study and to complete the study. Each study shall be designed to achieve a high performance on the first attempt. Each field sampling plan shall be related (by cross-references) to the other requirements in the Project Operations Plan.

In the Field Sampling Plan for the RI/FS, the Respondents shall include plans that describe how data for each of the following studies shall be collected during the Remedial Investigation. (See Section 3 of this SOW for more information on these data requirements.):[5]

1) site survey;

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5 The Respondents may omit plans to sample areas or media to the extent the Respondents believe (and have not been directed otherwise by EPA) that sufficient data has already been obtained and presented in the Focused RI; such omissions shall be plainly indicated, with a cross-reference to the Focused RI.

2) soils and sources of contaminants;

3) subsurface and hydrogeological factors for overburden and bedrock;

4) air quality;

5) surface water and sediment sampling;

6) ecological assessment;

7) Pre-ROD monitoring and sampling; and

8) treatability and pilot studies (if required).

The complete results of these studies shall be described in the Remedial Investigation Report.

3. Health and Safety Plan

The objective of the site-specific Health and Safety Plan ("HSP") is to establish the procedures, personnel responsibilities, and training necessary to protect the health and safety of all on-site personnel during the RI/FS. The plan shall provide for routine but hazardous field activities and for unexpected Site emergencies.

The site-specific health or safety requirements and procedures in the HSP shall be based on an ongoing assessment of Site conditions, including the most current information on each medium. For each field task during the RI/FS, the HSP shall identify:

a. possible problems and hazards and their solutions;

b. environmental surveillance measures;

c. specifications for protective clothing;

d. the appropriate level of respiratory protection;

e. the rationale for selecting that level; and

f. criteria, procedures, and mechanisms for upgrading the level of protection and for suspending activity, if necessary.

The HSP shall also include a discussion of exclusion zone requirements. The HSP shall indicate the on-site person (Health and Safety Officer) responsible for implementing the HSP as a representative of the Respondents; personal protective equipment; personnel decontamination procedures; and a medical surveillance program. The following documents should be consulted:

- Interim Standard Operations Safety Guides (Hazardous Response Support Division, Office of Emergency and Remedial Response EPA, Wash. D.C. 1982);

- Hazardous Waste Operations and Emergency Response, (Department of Labor, Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910);

- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities: Appendix B (NIOSH/OSHA/USCG/EPA 1985);

- Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (OSWER Directive 9355.3-01, EPA/540/G-89/004); and

- OSHA regulations at 40 CFR 1910 and Chapter 9 of the Interim Standard Operating Safety Guide, which describes the routine emergency provisions of a site-specific health and safety plan, and shall be the primary reference used by the Respondents in developing and implementing the Health and Safety Plan.

The measures in the HSP shall be developed and implemented to comply with all applicable State and Federal occupational health and safety regulations. The HSP shall be consistent with the objectives and contents of all other plans submitted by the Respondents. The HSP shall be updated during the course of the RI/FS, as necessary.

4. Community Relations Support Plan ("CRSP")

EPA, in coordination with MassDEP, shall develop a Community Relations Plan ("CRP") to describe public relations activities anticipated during the RI/FS. The Respondents shall develop a Community Relations Support Plan, whose objective is to provide support from the Respondents for the community relations efforts of EPA. This support shall include, at a minimum:

a. presentations at, and participation in, meetings at the request of EPA during the initiation, conduct, and completion of the RI/FS;

b. assistance in publishing and copying fact sheets or updates;

c. assistance in developing and maintaining mailing lists; and,

d. assistance in preparing responsiveness summaries after the RI/FS public comment periods, as requested by the EPA RPM.

G. Update of Applicable or Relevant and Appropriate Requirements ("ARARs")

The Respondents shall include in the RI/FS Work Plan an update to the preliminary list of probable Federal Applicable or Relevant and Appropriate Requirements ("ARARs"), State ARARs and any local requirements identified in the Focused RI Report. Data requirements in terms of physical and chemical characteristics needed to evaluate ARARs shall be considered as part of the RI/FS scoping. Such requirements may include but are not limited to chemical residuals, background levels, or various modeling parameters. Such data requirements shall be satisfied during the RI to the extent possible, rather than during the later phases of the RI/FS.

Once work on the FS begins, the preliminary list of probable ARARs included in the Focused RI Report, and updated in the RI/FS Work Plan, shall be refined, and additional ARARs must be sought by the Respondents during a thorough search of applicable Federal and State Environmental statutes and regulations.

All chemical- and location-specific ARARs, as well as action-specific ARARs, shall be identified after the development and Initial Screening of the Remedial Alternatives. EPA shall have final authority in deciding which ARARs are retained or added for consideration, and the extent to which they must be considered in remedy selection.

H. Data Requirements for Potential Remedial Alternatives and Technologies

Preliminary Remedial Action Objectives ("RAOs") shall be identified for each contaminated medium, and a preliminary range of remedial action alternatives and associated technologies shall be identified. The Respondents shall identify, consistent with the NCP and applicable guidance, a range of potential remedial alternatives that may be useful in achieving media-specific ARARs and preliminary risk-based RAOs, including physical treatment, natural attenuation or no action, as appropriate. In discussing potential remedial alternatives, EPA describes an alternative as a single or group of technologies (including innovative ones that are developed fully but lack sufficient cost or performance data for routine use at Superfund sites and that have the potential to offer significant advantages, as described further in section 4.3.2.4 of EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (Interim Final)*), that will achieve certain remedial action goals (see Section 4). In the Work Plan for the RI/FS, the Respondents shall identify the various technologies, and the critical data needed to evaluate applicability of the technologies, and the potential performance of technologies grouped into an alternative. These data requirements for technology evaluation shall be further incorporated in subsequent field investigation Work Plans, as appropriate.

The identification of potential technologies shall help ensure that data needed to evaluate the technologies are collected during the field investigations. Certain parameters may be common to several possible technologies and alternatives. For example, the following parameters for soils are common: chemical compounds, soil density, soil moisture, soil types, soil gradation, BTU values, total halogens, and total organic carbon. Where capping may be required, waste and soil properties such as moisture content, unit weight, strength parameters, and chemical and physical data may need to be obtained during the RI through field and laboratory testing to evaluate slope

stability and rate of settlement. Continued settlement monitoring using surficial settlement platforms and settlement anchors may be appropriate within the waste areas to collect data to estimate post-construction subsidence. Similar common data requirements exist for alternative remedies for other media.

In addition to the common data requirements, any other data necessary to evaluate a particular technology or alternative leading to remedy selection shall be noted in the RI/FS Work Plan and the appropriate data collected. EPA's Guidance on Conducting Remedial Investigations and Feasibility Studies Under CERCLA (EPA/540/G-89/004, OSWER Directive 9355.3-01, EPA October 1988) and the Technology Screening Guide for Treatment of CERCLA Soils and Sludges (EPA/540/2-88/004, September 1988) shall be sources of additional information on identifying alternative technologies.

A preliminary list of broadly defined alternatives shall be developed by the Respondents in the Work Plan. Consistent with Sections 4 and 5 of this document, this list shall include a range of alternatives in which treatment that significantly reduces the toxicity, mobility, or volume of waste is a principal element; one or more alternatives that involve containment with little or no treatment; and a no-action alternative. The Respondents shall present a chart, or a series of charts, showing the requirements and technologies to be considered for remedial alternatives. In the charts, data requirements shall be linked to the Work Plans for each field investigation.

I. Expanded Schedule for Remedial Investigation/Feasibility Study

The major predetermined deliverables are identified in Table 1. The established schedule along with a more detailed, expanded schedule for subtasks shall be included as a component of the Work Plan for the RI/FS. Modifications to the schedule must be approved by EPA, after providing reasonable opportunity for review and comment with MassDEP, prior to their implementation.

The schedule shall be presented as a chart, which shall include target dates and time periods for each deliverable, to the extent possible. The chart shall be updated when the schedule changes by showing the original (planned) due date and revisions of the due date.

A copy of the schedule shall be contained in each major workplan of the RI/FS and in each semi-annual status report required by the RI/FS agreement.

SECTION 3: REMEDIAL INVESTIGATIONS

This section describes the general objectives, requirements, components, schedule and deliverables for performing field investigations under a remedial investigation. Because the RI for the Site will be performed as three separate Operable Units, the Respondents shall perform field investigations for each OU on a separate but concurrent schedule. The Respondents shall use Section 3 as a guide in developing the necessary details of the RI/FS Work Plan.

Field Investigations

A significant amount of scoping and investigatory work has been completed by the Respondents at the Site through MassDEP cleanup program activities and other interim measures. In developing the Focused RI Report and the Work Plan for the RI/FS, the Respondents should review the scoping requirements contained within Section 2 (Scoping of the RI/FS) and this Section (which describes in greater detail the field work that must go into the RI reports, with additional details on what the Work Plan must include to prepare for this field work), to evaluate which data requirements may have already been met.

I. OBJECTIVES

At its onset, the goal of the Remedial Investigation shall be to supplement the usable existing field data and studies summarized in the Focused RI Report, and collect all new field data which can reasonably be assumed to be necessary to complete a Remedial Investigation (RI), Feasibility Study (FS) and Baseline Risk Assessment for each OU, and which will be sufficient to select a remedy for each OU. At a minimum, by carrying out the three OU remedial investigations and writing a Remedial Investigation Report for each OU, the Respondents shall characterize and/or describe the following:

1. nature and extent of hazardous substance source areas;

2. lateral and vertical extent, concentration, environmental fate, transport (e.g., bioaccumulation, persistence, mobility), phase (e.g., solid, liquid), and other physical and chemical characteristics of hazardous substances identified at the Site;

3. the media of occurrence, interface zones between media, and important parameters for treatment (e.g., soil chemistry, soil types, estimated porosity);

4. hydrogeologic factors for overburden and bedrock (e.g., depth to water table and water table fluctuations, hydraulic gradients, hydraulic conductivity, estimated porosity, and estimated recharge);

5. the delineation of any contaminant plume present and monitoring information that allows assessment of the spatial stability of constituent concentrations over time;

6. identification of chemical, physical, and biological processes that may work to limit the continued transport, diminish the concentration, or otherwise attenuate contamination. Identification of the degree to which these processes can be expected to provide adequate natural attenuation and how these processes may be enhanced;

7. climate and water table fluctuation (e.g., precipitation, run-off, stream flow, water budget);

8. extent to which the hazardous substances have migrated or are expected to migrate from their original location, and identify probable receptor areas;

9. extent to which buildings, foundations, or other underground structures may contain or may overlie hazardous substances or contaminant plumes and the potential for vapor intrusion from the contaminant plume (this evaluation shall include existing and proposed structures);

10. contaminant(s)' concentration in soil, sediment, surface water and groundwater, and potential impacts to aquatic, semi-aquatic and terrestrial receptors, and potential for higher trophic level organisms in the food web to be exposed;

11. flood plain and wetland delineation, if necessary, surface water classifications and their existing use designations;

12. groundwater characteristics and current and potential groundwater uses (e.g., characteristics related to the groundwater classes described in the Ground Water Protection Strategy, (EPA, 1984) and under Massachusetts law);

13. waste characteristics that affect the type of treatment possible (e.g., BTU values, pH, BOD);

14. potential extent and risk of future releases of substances or residuals remaining on-site and off-site;

15. physical characteristics of the Site, including important surface features, soils, geology, hydrogeology, meteorology, and ecology;

16. characteristics or classifications of air, surface water, and groundwater;

17. location of public and private water wells ;

18. extent to which contamination levels exceed appropriate health-based levels;

19. extent to which substances at the Site may be reused or recycled;

20. potential future risk posed by substances remaining onsite;

21. general characteristics of the waste, including quantities, type, phase, concentration, toxicity, propensity to bioaccumulate, persistence, and mobility;

22. extent to which the source areas can be adequately identified and characterized;

23. actual and potential exposure pathways through environmental media;

24. actual and potential exposure routes (for example, inhalation and ingestion);

25. other factors, such as sensitive populations, that pertain to the characterization of the Site or support the analysis of potential remedial action alternatives; and

26. identification of potential additional source areas at both on- and off-Property locations.

Using this information, the Respondents may be required to further define the boundaries of the RI/FS or OU study area. The Site characterization shall provide information sufficient to refine the preliminary identification of potentially feasible remedial technologies, probable ARARs, and data needed to perform the Baseline Risk Assessments.

II. REMEDIAL INVESTIGATION AND FEASIBILITY STUDY WORK PLAN REQUIREMENTS

The remedial investigation for each OU shall specifically consist of the activities and deliverables described in this section (Section 3). The Work Plan for the RI/FS shall address the requirements for all three OUs.

The Respondents shall establish, at a minimum, and include in the Work Plan for the RI/FS, the following (in addition to the Work Plan requirements imposed by Section 2 of this SOW):[6]

1. an EPA-approved approach for the surface and subsurface soil sampling program, and identification of proposed sampling locations and depths for all other media on the developed Site base map;

2. a description of the locations of suspected contaminated area(s) and, taking into consideration that portions of the study area are located within a commercially zoned area, a description of the area(s) considered to represent background levels;

3. the anticipated number and schedule of samples;

4. quality assurance/quality control procedures, including blanks, duplicates, alternative analysis conditions, and standards;

5. a method for determining how the field program shall be adjusted according to the initial sampling and chemical testing results;

6. the analytical methodology to be used for each medium including instrumentation and detection limits; and

6 The Respondents may omit plans to sample areas or media to the extent the Respondents believe (and have not been directed otherwise by EPA) that sufficient data has already been obtained and presented in the Focused RI; such omissions shall be plainly indicated, with a cross-reference to the Focused RI.

7. an evaluation of how completely each objective of the Remedial Investigation (See Part "I. Objectives" of this section) has been addressed by any previous investigations. Detail on any further efforts that are necessary to fill the remaining data gaps shall also be provided.

III. SCHEDULE/DELIVERABLES

The Respondents shall begin the field work for each OU remedial investigation study upon receipt of EPA's notification to proceed, and no later than 4 weeks from receipt of EPA's approval of the Work Plan for the RI/FS, except that EPA may, in its sole discretion, approve an alternative start date for field work based on seasonal or adverse weather conditions. During the planning and implementation of the work for the remedial investigations, the Respondents shall provide, for EPA's review and approval, all proposed deviations from the procedures in the Work Plan before making such changes in the field.

A Remedial Investigation Report, which meets the reporting requirements stated in this section, shall be submitted for each of the three OUs, consistent with the schedule (Table 1 of this document). These reports will include all useable data as presented in the Focused RI Report and collected during the field investigations (to the extent approved by EPA). These reports shall also include data in the form of summary tables organized by media and a detailed description (with figures) of all sampling locations and depths.

IV. COMPONENTS OF THE REMEDIAL INVESTIGATION

The following is a description of general remedial investigation components. Some components may not be applicable to all three Operable Units. Also, the Respondents may have already completed, or substantially completed, the field work required by some of these components, as described in the Focused RI Report.

A. Site Survey

The Respondents shall provide a Site map for each OU, which shall have elevation contours and shall display survey data collected at the Site. The map shall contain all standard topographic, physiographic, cultural, and facility features, the surveyed locations of all wells, and surface sampling locations such as soil, sediment, surface water samples collected for assessment or remedial confirmation, or where media-specific samples were previously collected.

The Respondents shall determine the elevations and locations of all wells and piezometers. It may be necessary to continually modify the Site base maps based on the ongoing results of the remedial investigations. It will be necessary to modify base maps if significant changes or proposed changes to the current Site contours occur. All Site base maps shall encompass areas large enough to show all patterns of surface water run-off from the Site. The base maps shall be of sufficient detail to delineate areas into which contaminants may migrate. If necessary, multiple Site base maps for each OU, and at various scales, may need to be developed. The Survey shall be GIS-based.

B. Soil and Sources of Contaminants

Significant investigations have been completed related to surface soils and source area identification and removal on the Olin Property (OU1). Further, cleanup activities at the Site have included the removal of waste lagoons, the removal of drum disposal areas, the capping of an on-site landfill, the creation of a drainage swale, the re-routing of a drainage ditch to a culvert, the installation and operation of an LNAPL recovery system, and the installation of a slurry wall and temporary cap. The remedial investigation for OU1 shall investigate soil, on-Property ditch sediment, surface water and air to adequately determine the nature and extent of contamination remaining on the Olin Property. The remedial investigation for OU2 shall evaluate off-Property surface water, sediment and flood plain soil media to adequately determine if additional source areas are present. The remedial investigation for OU3 shall evaluate groundwater. The nature of surface water and groundwater interaction between OU2 and OU3 will be assessed. The remedial investigations, in conjunction with the baseline risk assessments, will also evaluate if additional source control actions are warranted on and off the Olin Property.

1. Objectives

To assess the soils and sources of contamination in the unconsolidated sediments and soils, the Respondents shall characterize and/or describe the following, at a minimum:

a. the nature and concentration of contaminants in the surface soils (0-6 inches), and subsurface soils (6-inches to 10 feet below ground surface or to four feet below waste or contaminated soils, whichever one is greater) over the entire Site, and focused on areas expected to have been impacted by Site contamination;

b. the phase in which the contaminants exist, whether as free products (NAPL), dense liquids (DAPL or diffuse layer) or chemical complexes (e.g., dissolved in groundwater, adsorbed by grains);

c. the physical parameters for each soil type and layer that is contaminated (e.g., soil moisture, soil profile, soil type, density, porosity (estimated), grain size, distribution, total organic carbon, mineralogy). This information may be reported on charts, maps, and cross sections;

d. the waste characteristics and mixtures that affect the type of treatment possible (pertinent physical and chemical characteristics of each compound may be reported in a chart);

e. the extent to which the contaminants may be reused and/or recycled;

f. the background concentrations for all naturally occurring contaminants, to be obtained from soils at the relevant OU unless EPA determines (on its own initiative or in response to a proposal by Respondents) that it is necessary to derive background concentrations from other soils;

g. the physical limitations and other materials handling aspects of the soil and other sources that are contaminated;

h. the estimated volumes of soils and other sources of contamination; and

i. the ecological setting of the sampled location including types of vegetation present, depth to water table, local water flow regimes and any anthropogenic alterations.

2. Work Plan Requirements

The detailed Field Sampling Plan contained in the RI/FS Work Plan ("FSP") for the investigation of soils and contaminant sources shall describe and justify the approximate numbers and locations of each boring, test pit, and sample to be performed. The Work Plan shall provide for the sampling and analysis needed to fulfill the objectives listed previously.[7]

3. Reporting Requirements

The on-site soils sampling work (including any prior samples deemed acceptable by EPA) shall be sufficient to support, at a minimum, the following analyses, which shall be performed by the Respondent and included in the relevant RI Report(s):

a. a characterization of the vertical and horizontal extent of contamination in the unsaturated zone at the Site by soil sampling (i.e., coring, geo-probe, head-space measurements, etc.) and analysis. Areas with elevated concentrations of contaminants shall be sampled and analyzed in accordance with the approved work plan. The extent of contamination shall be bounded by sampling points showing non-detect or (in the case of naturally occurring contaminants) background concentrations for compounds identified in the contaminated area. Analysis may be supported by isocontour maps, area calculations, and volume calculations;

b. an identification/verification of contaminated soil areas on the Site;

c. a review of the data to determine if further soil and unconsolidated material sampling and analysis are needed to accomplish the goals of the Remedial Investigation and Feasibility Study;

d. a determination of the background levels of naturally occurring contaminants for each soil type based on sampling at a sufficient number of locations, to be obtained from soils at the relevant OU unless EPA determines (on its own initiative or in response to a

7 The Respondents may omit plans to sample areas or media to the extent the Respondents believe (and have not been directed otherwise by EPA) that sufficient data has already been obtained and presented in the Focused RI; such omissions shall be plainly indicated, with a cross-reference to the Focused RI.

proposal by Respondents) that it is necessary to derive background concentrations from other soils;

e. fate and transport assessment to estimate unconsolidated material concentration action limits based on the contamination levels that are preventive of groundwater contamination by leaching of contaminants to the saturated zone (including assumptions and values used in the assessment);

f. sufficient data on soil characteristics to understand the requirements of onsite materials handling and pretreatment so that the cost estimates are accurate to a +50-30% cost range and can be developed for the evaluation of remedial alternatives;

g. an estimation of the volumes of contaminated unsaturated soils and levels of confidence for the various soil action limits (from e. above) and a plot of these estimates on a graph of volume vs. soil action limits; and

h. an estimate of present and future contamination levels for soil at points of current and future potential exposure.

Results of these studies may be presented on maps, cross sections, charts, tables, and computer data bases. Based on the definition of initial soil sampling, the possible need for additional sampling and analysis shall be specified. The analysis of data shall be sufficient to map the sources, to show contaminant concentrations in three dimensions, and to estimate the volumes of soil should a soil excavation and/or in-situ treatment program be required later.

C. Subsurface and Hydrogeological Investigations

1. Objectives

Significant characterization of the groundwater aquifer has been performed through prior investigations. The Respondents have installed over 200 monitoring wells, and well clusters, throughout the plume area and have been actively monitoring that network. The existing data (to the extent deemed useable by EPA) and information gained through the planned extraction pilot study provided for elsewhere in this SOW shall be used by the Respondents, and supplemented with additional data and field activities as necessary.

The Respondents shall plan and conduct hydrogeological investigations sufficient to characterize and/or describe, at a minimum, the following:

a. the nature and extent of contamination (lateral and vertical, in each hydrologic unit) sufficiently to define the boundaries of contaminant plumes located on the Site and to characterize the aquifers in three dimensions, including bedrock;

b. populations and environments at risk and potential risks associated with future releases, if applicable;

c. an estimate of the number of years necessary to achieve clean-up goals for groundwater alternatives, including extraction and treatment remedial alternatives;

d. the subsurface stratigraphy, structure and properties for each hydrologic unit. The following may be included in this analysis: thickness, lithology, grain size distribution (glacial deposits), soil index properties (e.g. plasticity index), porosity, hydraulic conductivity, fraction of organic carbon, storativity, sorting, fracturing (orientation, frequency), and moisture content. Depending on initial screening results, other properties may be evaluated as warranted by data requirements of potential remedies or fate and transport evaluation;

e. the concentration, transport mechanisms, potential receptor locations, and other significant characteristics of each contaminant;

f. the waste mixtures and partitioning of contaminants between groundwater and soil or rock, and whether NAPL is present;

g. the waste mixtures and partitioning of contaminants between the shallow groundwater, diffuse layer and dense aqueous-phase layer (DAPL);

h. the extent of, and character and controls of the migration of, any NAPL or DAPL;

i. a quantification of the hydrogeological factors (e.g., in-situ hydraulic conductivity, storativity, conductivity, and storage capacity of each hydrologic unit; aquifer thickness; hydraulic and pressure gradients; and degree of interconnection between the different hydrogeologic units (e.g., bedrock and specific overburden strata);

j. the routes of groundwater migration, transport rates, and potential receptors. Also determine or qualitatively describe the locations, flow rates, contaminant concentrations, variability for discharge to bodies of surface water and wetlands, and head distributions within the geohydrologic units;

k. depth to and seasonal fluctuations in the water table, flow gradients, and contaminant concentrations, simultaneously with other factors such as precipitation, run-off, and stream flow;

l. the condition of any existing monitoring wells and the need to replace or abandon them (utilizing data from any previous investigations);

m. the construction location, and proximity, of residential, municipal, and previously installed monitoring wells, if available;

n. an assessment of plume stability and the migration potential of hazardous substances (analytical and/or numerical models and a process for modeling should be identified. The parameters, assumptions, accuracy, contingencies of the studies must be explicitly stated, and a plan established to verify the modeling if a significant risk is indicated for a specific population or environment);

o. a review and illustration of groundwater classifications (the need for institutional controls on ground-water use, considering such controls as adjuncts to remedial action, must be assessed);

p. physical and chemical characteristics that may affect the possible type of treatment (this information must be reported in a chart);

q. the background concentrations of naturally occurring contaminants in groundwater at a sufficient number of horizontal and vertical locations at the relevant OU (including at least one for the saturated unconsolidated overburden and bedrock), unless EPA determines (either on its own initiative or in response to a proposal by Respondents) that it is necessary to derive background concentrations from other areas; and

r. engineering properties of soils and wastes for settlement and slope stability analyses if capping is considered.

2. Work Plan Requirements

The Respondents shall design investigations that are sufficient to fully address the objectives listed above and others that may arise during the RI/FS. The FSP for the subsurface and hydrogeological investigations shall describe the locations, methods, field forms, procedures, and types of analyses to be used in performing the subsurface and hydrogeological investigations.[8] This description shall include specific drilling methods and protocol to be used. The Ground Water Technical Enforcement Guidance Document (OSWER Directive 9950, Sept. 1986) and the Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites (OSWER Dir. 9283.1-2 Final Review Draft, EPA, August 1988) shall provide the framework of these investigations. The Work Plan shall clearly show the relationship between the objectives and the studies to be performed (see subsection 1 above and subsection 3 below). The Work Plan shall provide a mechanism for EPA to review and approve of deviations from the approved Work Plan (that may be necessary due to unforeseen field conditions). The Work Plan shall allow for the potential for additional work contingent on the results of the studies described in the Work Plan for the RI/FS.

3. Reporting Requirements

8 The Respondents may omit plans to sample areas or media to the extent the Respondents believe (and have not been directed otherwise by EPA) that sufficient data has already been obtained and presented in the Focused RI; such omissions shall be plainly indicated, with a cross-reference to the Focused RI.

For the subsurface and hydrogeological investigations, the Respondents shall present the results and describe the actual procedures (especially when the actual procedures differ from those in the Work Plan) in a section of the appropriate OU-specific Remedial Investigation Report(s). This section of the Report(s) may contain all data, analyses, maps, cross sections, and charts necessary to meet the objectives for which the investigations were performed. Illustrations shall clearly identify the data points, values, and the degree of interpolation or extrapolation necessary to draw conclusions.

D. Air Quality Assessment

Air collection stations will be established upgradient, on-site, and downgradient of the Site to assess possible releases from soils. Air data will be collected in sufficient quantity to perform baseline risk assessment analyses.[9]

1. Objectives

The Respondents shall characterize and/or describe, the impact of the Site on the surrounding air quality (if any), which may require the following activities:

a. identification of any likely or detected point and area emissions of particulate, volatiles, and semi-volatiles for the existing Site, including volatilization from soil, leachate, contaminated water, landfills, waste piles, and other contaminant areas;

b. identification of any existing or planned structures, or areas where potential structures could be built, located above the plume area where intrusion of vapor may result in a potential unacceptable inhalation risk. The Respondents shall use the Johnson and Ettinger Model for Subsurface Vapor Intrusion into Buildings as required by EPA's Draft Guidance for Evaluating Vapor Intrusion from Groundwater and Soil (Nov. 2002), or any revisions to such, to support this assessment;

c. provision for monitoring concentrations (before or after any intrusive field work performed during non-summer months) at a sufficient number of locations;

d. characterization of emissions as indicated above (i.e., particulate, vapors, precipitates, and gases);

e. estimation of the emission rates and worst case impacts on and off-site for the existing Site (detailed techniques for the characterizing of air emissions and impacts shall be used if screening data indicate a potentially significant concentration);

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9 The Respondents may omit plans to sample areas or media to the extent the Respondents believe (and have not been directed otherwise by EPA) that sufficient data has already been obtained and presented in the Focused RI; such omissions shall be plainly indicated, with a cross-reference to the Focused RI.

f. supplementation of ambient air monitoring with the collection of on-site meteorological data including ambient temperature, wind speed, wind direction, and barometric pressure, if necessary;

g. provision for monitoring of ambient air quality as described in the Work Plan that shall include a description of (a) the sampling methodology (including instrumentation, sampling times, locations, detection limits, QA/QC procedures) and (b) the analytical methodology including instrumentation, detection limits and QA/QC procedures;

h. provision for modeling for potential emission sources (if necessary), including documentation of (a) source characteristics (e.g., emission rates, release height, velocity, temperature, source configuration, etc.), (b) meteorological conditions, (c) receptor locations, and (d) background concentrations at the relevant OU, unless EPA determines (on its own initiative or in response to a proposal by Respondents) that it is necessary to derive background concentrations from other areas; and

i. evaluation of the factors that are critical in characterizing the nature and extent of airborne contaminants from the Site, if any, such as background air quality.

2. Work Plan Requirements

The Respondents shall prepare an FSP for the air quality assessment during the scoping of the RI/FS. The FSP shall be implemented during the remedial investigations. As early as possible in the RI/FS, the Respondents shall gather data on the factors critical to assessing impacts on air quality. The FSP shall allow EPA to review differences between the specifications for the field work and the actual field work. The Work Plan shall also provide for additional monitoring and studies, if EPA determines they are necessary.

3. Reporting Requirements

The results of the air quality assessment shall be submitted to EPA and MassDEP for review, as part of the OU-specific Remedial Investigation Reports. Some of the air monitoring work may continue throughout the RI/FS. The Respondents shall discuss the potential for the control of gaseous emissions, including fugitive emissions, and mitigation of indoor vapors, in the FS, as appropriate.

E. Surface Water and Sediments

1. Objectives

The Respondents shall determine the nature and extent of contamination to surface water bodies, sediment and associated wetlands, including floodplain soils. Releases of concern may occur through overland flow and groundwater discharge to surface water.

The Respondents shall use existing field data (to the extent approved by EPA) and collect additional field data, as appropriate, to determine the nature and extent of contaminants in the surface water, sediments, and flood plain soils of surface drainage areas and associated wetlands, both perennial and intermittent, potentially affected by contaminants from the Site, including North Pond. Samples of surface water and sediment shall be collected (and analyzed) from several locations and in each surface water flow path that may be affected by contaminants at the Site. The collection and analysis of upgradient or reference location samples shall be sufficient to determine background concentrations of analytical parameters or to discriminate contaminants from the Site from those originating at other sources. In the event that EPA requires monitoring of seasonal changes, the plan will include sampling events to monitor those potential changes including low flow periods, and shall conform to the procedures and requirements of the Project Operations Plan (Section 2). The Respondents shall characterize and/or describe, the impact of the Site on the surface water and sediments, which may require the following activities:

a. the nature and extent of surface waters and sediments sufficient to define impacted locations and quantity of contaminants;

b. populations and environments at risk and potential risks associated with continued exposure;

c. an estimate of the amount of flow, including seasonal variations, and the destination of those surface waters;

d. the concentration, transport mechanisms, potential receptor locations, and other significant characteristics of each contaminant in surface water and sediment;

e. a review and illustration of surface water classifications (the need for institutional controls on exposure, considering such controls as adjuncts to remedial action, must be assessed); and

f. physical and chemical characteristics that may affect the possible type of treatment (this information must be reported in a chart).

2. Work Plan Requirements

The Respondents shall prepare an FSP for surface water and sediment sampling during the scoping of the RI/FS.[10] The FSP shall contain provisions for sampling events and more general assessments of wetlands, streams, and ponds if this additional work is needed. In the event that EPA requires the monitoring of seasonal changes, the FSP will include sampling events to monitor those potential changes. The FSP shall allow for EPA's and MassDEP's review of proposed differences between the actual field work and the specifications for the field work.

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10 The Respondents may omit plans to sample areas or media to the extent the Respondents believe (and have not been directed otherwise by EPA) that sufficient data has already been obtained and presented in the Focused RI; such omissions shall be plainly indicated, with a cross-reference to the Focused RI.

3. Reporting Requirements

The on-Property and off-Property surface water, sediment, and flood plain soil sampling data shall be compiled and presented in the OU1 and OU2 Remedial Investigation Reports, and may include tables, graphs, charts, and other visual aids. These illustrations shall indicate the static water levels at the time of sampling and seasonal fluctuations of water levels and the impacts of those changes on contaminant concentration and migration.

F. Ecological Assessment

1. Objectives

The Respondents shall conduct an ecological assessment to determine the nature and extent of contamination to the ecological resources on, nearby, or otherwise influenced by the Site. A reference site, or sites, may be required by EPA to be designated and sampled to produce data for EPA's use in evaluating the impact of the Site on the ecological receptors. The extent of the area to be studied shall be determined by the results of the relevant field investigation data, and upon the collection and review of available information concerning the biota expected to occur on or near the Site as either resident or transient species.

At a minimum, a qualitative study shall be conducted to determine the basic environmental characteristics at the Site, and to identify and characterize ecological communities, habitat types, and species which are present on or surrounding the Site. If necessary, further qualitative or quantitative assessments, bioassays, or tissue sampling may be required to better determine the actual impact of the Site on the environment and to support the ecological risk assessment to be prepared by the Respondents. A discussion of the impacts of proposed remedial alternatives on ecological receptors shall be included in the Feasibility Study.

Specific attention shall be placed on the Section 404(b)(1) Guidelines of the Clean Water Act regarding wetlands. Specifically, Executive Order 11990 "Protection of Wetlands," May 24, 1977, concerns all impacts to wetlands and Executive Order 11988 "Floodplain Management" is involved where actions are to be evaluated in regard to projects which may impact a floodplain.

2. Work Plan Requirements.

The Respondents shall submit an FSP for an ecological assessment.[11] This FSP shall contain an evaluation of the applicability of the following elements, and a plan to implement those elements determined to be applicable:

11 The Respondents may omit plans to collect certain data to the extent the Respondents believe (and have not been directed otherwise by EPA) that sufficient data has already been obtained and presented in the Focused RI; such omissions shall be plainly indicated, with a cross-reference to the Focused RI.

a. an accurate delineation of the wetland boundary using the U.S. ACE, 1987, Wetlands Delineation Manual with N.E. Division Field Data Collection Sheets, and classification of the wetland types using the Classification of Wetlands and Deepwater Habitats of the United States (FWS/OBS-79/31, US Fish and Wildlife Service, 1979) and determination of the functions and values of the wetlands and an accurate description and delineation of the ten (10) year and hundred (100) year floodplain;

b. a description of habitat types including a map of major habitats present at the Site and a list of plant and animal species, both resident and transient;

c. a determination of the status of those species identified in terms of sport or commercial usage, protected status, endangered, threatened, or of special concern;

d. sampling of environmental receptors for analysis of community composition, abundance, or body burden of contaminants;

e. sampling of chemical and physical parameters for surface water and sediments (e.g., grain size, total organic carbon, dissolved oxygen, etc.);

f. toxicity testing of indicator species, if required, to determine effects of contaminated Site media on the environment;

g. an evaluation of how the contamination from the Site has affected the receptors, including a discussion of fate and transport of the contaminants to the various habitat types or organisms;

h. an evaluation of whether contamination has affected the health of the wetland and other major habitats present at the Site (e.g., reduced plant growth or vigor or contributed contaminants to the food web); and

i. a discussion of how each remedial alternative under consideration affects the wetland, biota, and their functions and values.

3. Reporting

The information gathered during the Ecological Assessment will be used to develop the ecological risk assessments, which are to be included in the Baseline Risk Assessments for each OU. Tables that summarize data and other pertinent information, such as species and potential exposure pathways, will be developed before EPA provides notice to proceed with a full ecological risk assessment.

G. Treatability and Pilot Studies

1. Objectives

The objective of the treatability and pilot studies, if determined necessary by EPA, is to obtain the information to evaluate the effectiveness of potential remedial treatment technologies. The Respondents may need to conduct laboratory-scale simulations of treatment processes to evaluate the treatability of contaminated ground water, surface water, soils, and other environmental media. In any treatability and/or pilot studies, the Respondents may evaluate treatment options e.g., biological treatments, physical separation, chemical conditioning, and in-situ treatments.

The data from additional sampling programs and previously published data on the Site may be sufficient to develop a well-designed pilot program, if such a program is necessary. Before dynamic modeling, bench-scale tests may be performed to establish the "preliminary" treatability of contaminated media. Through the bench-scale tests, the Respondents may initially evaluate the applicability of treatments. Treatability studies to determine the most effective technologies to remediate any contaminant plume shall be initiated as early as possible. These studies may be conducted anytime during the RI upon approval of EPA, after providing reasonable opportunity for review and comment by the MassDEP.

2. Work Plan Requirements

The Respondents may prepare a Work Plan for the treatability and pilot studies and may include this in the Work Plan for the RI/FS. A Treatability Study Work Plan shall be submitted to EPA for approval prior to the performance of treatability and pilot studies or upon the request of EPA. A copy of this plan shall be submitted to MassDEP for review and comment. The Treatability Study Work Plan must clearly define the purpose of the study and include a detailed test plan including drawings and a step-by-step procedure, if applicable.

Respondents shall include a Work Plan for the pilot test for the extraction of DAPL in the Off Property West Ditch as part of the Interim Response Steps Work Plan.

3. Reporting

Results of treatability and pilot studies shall be submitted to EPA and MassDEP in the form of a report describing methods, analyses, and results. In the case of treatability studies of extended duration, including the planned DAPL extraction pilot, updates shall be included in the Semi-Annual Status Reports.

V. REMEDIAL INVESTIGATION DELIVERABLES

A. Remedial Investigation Report

The Respondents shall submit a Remedial Investigation Report for each Operable Unit. Each Remedial Investigation Report shall include the methods, data gathered, and analyses of results of all RI activities, as well as detail from all studies and findings that have been completed at the

Site. The Respondents shall evaluate how well the studies satisfy the objectives of the RI/FS (Section 1), the RI (Section 3), and the objectives stated in study descriptions (Section 3). The reports shall also explain differences between the actual field work and the work specified by EPA approved Work Plans for the RI/FS. Deficiencies in satisfying the objectives shall be clearly stated. Compilations of data shall be presented in formats that can accommodate the results of additional studies. In addition to the requested paper copies, Respondents shall submit draft and final RI Reports in Adobe™ Acrobat. Upon request, Respondents shall also provide EPA with text and tables in MS Word, and provide data and drawings in workable and widely accepted electronic formats or alternatively, provide EPA and EPA's consultant with access to electronic text, tables, data and drawings though a Virtual Private Network (VPN), File Transfer Protocol (FTP) or other acceptable electronic data-sharing link.

B. Additional Field Studies Work Plan (if required)

During the field investigations, the need for limited additional information may become apparent (e.g., data gaps or treatability studies). If EPA, after consultation with the MassDEP, determines that additional data are necessary to meet the objectives of the RI/FS, the Respondents shall prepare an Additional Field Studies Work Plan that describes the data to be obtained. The Respondents shall submit the Additional Field Studies Work Plan to EPA and MassDEP for review, and shall perform the necessary studies after receiving a notice to proceed with the additional field studies by EPA. The Additional Field Studies Work Plan shall be scoped to meet the field data collection objectives of the RI/FS (Section 1), be consistent with the procedures in the Project Operations Plan (Section 2), and fulfill the requirements of the Site Characterization (Section 3).

SECTION 4: FEASIBILITY STUDY

I. OBJECTIVES

If remediation is determined to be necessary, the Respondents shall develop a range of alternatives through performance of a feasibility study, as described below, for the appropriate Operable Unit.

II. THE DEVELOPMENT AND INITIAL SCREENING OF ALTERNATIVES

A. Development of Alternatives

The Respondents shall develop an appropriate range of waste management options in a manner consistent with the National Contingency Plan (NCP) (40 CFR Part 300), the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (OSWER Directive 9355.3-01), and any format or guidance provided by Region I EPA. Alternatives for remediation shall be developed by assembling combinations of technologies (including innovative ones that are developed fully but lack sufficient cost or performance data for routine use at Superfund

sites), and the media to which they would be applied, into alternatives that address contamination for the specified operable unit.

1. Objectives

Alternatives shall be developed that:

a. protect human health and the environment by recycling waste or by, eliminating, reducing, and/or controlling risks to human health and the environment posed through each pathway at the Site;

b. consider the long-term uncertainties associated with land disposal;

c. consider the goals, objectives, and requirements of the Solid Waste Disposal Act;

d. consider the persistence, toxicity, mobility, and propensity to bioaccumulate of hazardous substances and their constituents;

e. consider the short- and long-term potential for human exposure;

f. consider the potential threat to human health and the environment if the remedial alternative proposed was to fail; and

g. consider the threat to human health and the environment associated with the excavation, transportation, and re-disposal or containment of contaminated substances and/or media.

2. Development

In addition, the Respondents shall perform the following activities:

a. development of remedial action objectives ("RAOs"), specifying the contaminants and media of concern, potential exposure pathways, and preliminary remedial goals that are based on chemical-specific ARARs, EPA risk assessment data, and operable unit-specific characterization data;

b. development of response actions for each medium of interest defining engineering controls, treatment, excavation, pumping, or other actions, separately and in combinations;

c. identification of volumes or areas of media to which response actions shall apply;

d. identification and screening of technologies, including innovative ones that are developed fully but lack sufficient cost or performance data for routine use at Superfund sites, that would be applicable to each response action;

e. assembly of the selected technologies into alternatives representing a range of treatment and containment options; and

f. identification and evaluation of appropriate handling, treatment, and final disposal of all treatment residuals (e.g., ash, decontaminated soil, sludge, decontamination fluids).

B. Initial Screening of Alternatives

1. Criteria

In screening the alternatives, the Respondents shall consider, but not be limited to, the short- and long-term aspects of the following three criteria:

Effectiveness. This criterion focuses on the degree to which an alternative reduces toxicity, mobility, or volume through treatment; minimizes residual risks and affords long-term protection; complies with ARARs, and minimizes short-term impacts. It also focuses on how quickly the alternative achieves protection with a minimum of short-term impact in comparison to how quickly the protection shall be achieved.

Implementability. This criterion focuses on the technical feasibility and availability of the technologies that each alternative would employ and the administrative feasibility of implementing the alternative.

Cost. The costs of construction and any long-term costs to operate and maintain the alternatives shall be considered.

2. Range of Alternatives

The Respondents shall develop a series of alternatives for the specific operable unit, to the extent remediation is required in that OU. These alternatives shall include the following:

a. An alternative that, throughout the entire soil, source, and/or groundwater plume, reduces the contaminant concentrations to meet or exceed all MCLs, ARARs, and a 10^{-4} to 10^{-6} excess lifetime cancer risk. It shall achieve this objective as rapidly as possible and shall require no or minimal long-term maintenance.

b. A no-action alternative that would rely solely upon natural attenuation to meet clean-up standards. This may be "no further action," if some removal or remedial action has already occurred or is undertaken during the RI/FS at the Site.

c. For source control actions, as appropriate:

i. A range of alternatives in which treatment that reduces the toxicity, mobility, or volume of the hazardous substances, pollutants, or contaminants is a principal element. As appropriate, this range shall include an alternative that removes or destroys hazardous substances, pollutants, or contaminants to the maximum extent feasible, eliminating or minimizing, to the degree possible, the need for long-term management. The Respondents shall also develop, as appropriate, other alternatives which, at a minimum, treat the principal threats posed by the specific operable unit but vary in the degree of treatment employed and the quantities and characteristics of the treatment residuals and untreated waste that must be managed, and

ii. One or more alternatives that involve little or no treatment, but provide protection of human health and the environment primarily by preventing or controlling exposure to hazardous substances, pollutants, or contaminants through engineering controls, for example, containment and, as necessary, institutional controls to protect human health and the environment and to assure continued effectiveness of the response action.

d. For groundwater, the Respondents shall develop a limited number of remedial alternatives that attain site-specific remediation levels within different restoration time periods.

e. The Respondents shall give consideration to innovative technologies that are developed fully but lack sufficient cost or performance data for routine use at Superfund sites. If any innovative technologies pertinent to the specific operable unit can be identified, then one or more such technologies shall be evaluated beyond the initial screening.

III. FEASIBILITY STUDY DELIVERABLES

A. Development and Initial Screening of Alternatives Report

A Development and Initial Screening of Alternatives Report shall be submitted to EPA and MassDEP for review for each OU, as appropriate. If an alternative is to be eliminated, it must be screened out for clearly stated reasons contained in the NCP (40 CFR Part 300) and other EPA guidances. The report shall contain a chart of all alternatives and the analysis of the basic factors described in Section 4.II. The report shall justify deleting, refining, or adding alternatives. It shall also identify the data needed to select a remedy and the work plans for studies designed to obtain the data. The report shall contain charts, graphs, and other graphics to display the anticipated effectiveness of the alternatives including, for example:

1. maps showing the three-dimensional extent of contamination across the operable unit;

2. maps showing equal concentration lines for various potential soil clean-up levels and correlated to the 10^{-4} through 10^{-6} cancer risks;

3. graphs of soil volume to be treated or removed plotted against concentration (if necessary); and

4. graphs showing the predicted concentration reduction over time for potential groundwater remedial alternatives.

This report shall also describe the methods by which the Respondents shall evaluate potential remedial alternatives to be submitted to EPA and MassDEP for review.

B. Feasibility Study Report

1. Analysis

The detailed analysis of alternatives consists of an assessment of individual alternatives against each of the nine (9) evaluation criteria and a comparative analysis that focuses upon the relative performance of each alternative against those criteria. The analysis shall be consistent with the National Contingency Plan (NCP) (40 CFR Part 300) and shall consider the Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (OSWER Directive 9355.3-01).

The nine criteria are as follows:

1. Overall protection of human health and the environment;
2. Compliance with ARARs;
3. Long-term effectiveness and permanence;
4. Reduction of toxicity, mobility, or volume through treatment;
5. Short-term effectiveness;
6. Implementability;
7. Cost;
8. State Acceptance; and
9. Community Acceptance

Criteria one (1) and two (2) from the above list are considered threshold criteria. This means that an alternative must meet these two (2) criteria or (with respect to the second criterion) must contain a statutory basis for waiving compliance with specific ARARs in order for it to be eligible for selection. Criteria three (3) through seven (7) on the above list are considered primary balancing criteria. These five (5) criteria are used to further evaluate alternatives that satisfy the threshold criteria. The final two (2) criteria, state acceptance and community acceptance, are modifying criteria that shall be considered by EPA in remedy selection.

2. Reporting

The Detailed Analysis of Alternatives shall be presented in a Feasibility Study Report for each operable unit, and shall contain the following:

a. further definition of each alternative with respect to the volumes or areas of contaminated media to be addressed, the technologies to be used, and any performance requirements associated with those technologies;

b. a process scheme for each alternative which describes how each process stream, waste stream, emission residual, or treatment product shall be handled, treated and/or disposed;

c. an assessment and a summary profile of each alternative against seven (7) of the nine (9) evaluation criteria (EPA will assess State and community acceptance); and

d. a comparative analysis among the alternatives to assess the relative performance of each alternative with respect to each evaluation.

The Feasibility Study Report shall also include a chart that briefly describes the degree to which each alternative meets the seven criteria identified above. Other graphics shall be included that allow for comparisons of multiple alternatives at various risk, cost, and clean-up levels of soil, sediment, or water. These graphs may include the cost of potential remediation alternatives plotted against a range of soil clean-up levels; graphs of soil/sediment/waste volumes plotted against a range of soil clean-up volumes; and projected groundwater and surface water concentrations plotted against time for groundwater and surface water alternatives. The text of the FS Report should be submitted in hard copy and as an MS Word file.

IV. ADDITIONAL FIELD STUDIES WORK PLAN

If EPA, after providing reasonable opportunity for review and comment by MassDEP, or the Respondents deem that additional studies are needed, the Respondents shall submit an Additional Field Studies Work Plan for approval by EPA, and perform the studies consistent with the EPA-approved work plan.

SECTION 5: ADDITIONAL REMEDIAL INVESTIGATION AND FEASIBILITY STUDIES DRAFTS, REVIEWS, AND REVISIONS

Following EPA review and comment on each of the initial Draft Remedial Investigation and Feasibility Study Reports (for each OU), the Respondents shall prepare revised draft reports, as necessary, incorporating and addressing, to EPA's satisfaction, all conditions and comments from EPA. Depending on Site conditions, the acceptability of the revised Draft RI and FS Reports, or other conditions, EPA may either request additional draft revisions until RI and FS Reports are produced which EPA determines are satisfactory for public comment, or EPA may

choose to complete the documents. The approval process shall be done pursuant to "EPA Approval of Plans and Other Submissions" in Section X of the Settlement Agreement.

When EPA determines that no additional studies or RI or FS Draft Reports are needed, the most recent Respondents' Draft RI and FS Reports shall be considered the Final Remedial Investigation and Feasibility Study Reports for the appropriate operable unit. Each Final Remedial Investigation and Feasibility Study Report shall be summarized by EPA in a Proposed Plan to be submitted for public comment.

After the public comment period for each OU, the Respondents shall assist EPA in preparing a responsiveness summary. This assistance shall include, but not be limited to, providing EPA with draft responses to any public comments provided by EPA to the Respondents within three weeks of the date EPA provides the comments to the Respondents. If EPA seeks assistance from the Respondents to numerous technical or extensive comments and an extension is requested, EPA shall extend the three week deadline by an appropriate time period.

SECTION 6: NON-TIME CRITICAL REMOVAL ACTION REQUIREMENTS

If, at any time during the RI/FS process, EPA determines that an EE/CA should be performed at the Site in preparation for a NTCRA, the Respondents shall conduct an EE/CA concurrently with the RI/FS. The Respondents shall conduct one or more EE/CAs at the Site, as determined to be appropriate by EPA. The main objectives of the EE/CA are to:

1. identify the objectives of the NTCRA; and

2. analyze the effectiveness, implementability and cost of various alternatives that may satisfy these objectives.

The EE/CA may also include field investigations, if the available information is not sufficient to perform the analysis of the alternatives required to ensure that the NTCRA is consistent with the NCP.

After conducting all necessary field investigations and analyses, the Respondents shall submit the results in an initial Draft EE/CA Report. Following EPA comments on the initial Draft EE/CA Report, the Respondents shall prepare a revised Draft EE/CA Report incorporating all EPA comments and requested changes. Depending on Site conditions, the acceptability of the revised Draft EE/CA Report, or other conditions, EPA may either request additional Draft EE/CA reports, until a Final EE/CA report is produced which EPA determines is satisfactory for public comment, or EPA may choose to complete the document. The approval process shall be pursuant to Section X ("EPA Approval of Plans and Other Submissions") in the Settlement Agreement.

After EPA conducts a public comment period on the Final EE/CA Report, the Respondents shall also assist EPA in preparing a responsiveness summary consistent with the requirements in Section 5 above. After the public comment period, EPA will issue its decision on the final selection of the appropriate NTCRA in an Action Memorandum.

The Respondents may elect to perform all activities described in the Action Memorandum as a non-time critical removal action, consistent with the-following guidance documents:

1. Guidance on Implementation of the Superfund Accelerated Cleanup Model (SACM) under CERCLA and the NCP (EPA OSWER Directive No. 9203.1-03, July 7, 1992);

2. Early Action and Long-Term Action Under SACM - Interim Guidance (EPA OSWER Directive No. 9203.1-051, December 1992); and

3. Guidance on Conducting Non-Time Critical Removal Actions Under CERCLA (EPA/540-R-93-057, OSWER Directive No.9360.0-32, August 1993).

If Respondents agree to perform the NTCRA, they shall notify EPA in writing of their decision within 30 days of the date EPA issues the Action Memorandum, and shall submit a Non-Time Critical Removal Action Work Plan to EPA for approval within 60 days of the date EPA issues the Action Memorandum, unless EPA determines that Respondents need more time to complete the Work Plan. A copy of this plan shall be submitted to MassDEP for review and comment. The approval process for the Work Plan shall be pursuant to Section X ("EPA Approval of Plans and Other Submissions") in the Settlement Agreement. Upon approval, the Respondents shall perform the NTCRA pursuant to the Work Plan and under the terms of the Settlement Agreement.

Nothing in this Settlement Agreement or Scope of Work shall be construed to limit EPA's authority to require Respondents to perform the NTCRA.

SECTION 7: RISK ASSESSMENT

The Respondents shall prepare a Baseline Risk Assessment for each of the three operable units. However, to the extent that potential human health or ecological pathways of exposure exist across multiple pathways, data from multiple operable units may need to be considered in each Baseline Risk Assessment (i.e., a future worker at the Site Property may potentially be exposed to soil, sediment, surface water and groundwater requiring data from Operable Units 1, 2 and 3 to be considered).

Risk Assessment Objectives

The Respondents shall complete a Baseline Risk Assessment, to be included in the Remedial Investigation Report for each operable unit. After evaluation of the field investigation

information and establishment of the data base for the OU, the Respondents will conduct a Baseline Risk Assessment and prepare the necessary risk assessment documents. The objective of this assessment is to characterize, and quantify where appropriate, the current and potential human health and environmental risks that would prevail if no further remedial action is taken.

Risk Assessment Guidance

The risk assessment shall be completed in accordance with current guidance, procedures, assumptions, methods, and formats, including those listed below.

For Both Human Health and Ecological Risk Assessments:

- US EPA Region I Waste Management Division Risk Updates: December, 1992.

For Baseline Human Health Risk Assessments:

- Risk Assessment Guidance for Superfund (RAGS). Volume I: Human Health Evaluation Manual (Part A) interim final, EPA 540/1/-89, December 1989.

- Development of Risk-Based Preliminary Remediation Goals (Part B) publication 9285.7-01B, December 1991, PB92-963333.

- Risk Evaluation of Remedial Alternatives (Part C), publication 9285.7-01C, December 1991, PB92-963334.

- Standardized Planning, Reporting and Review of Superfund Risk Assessments (Part D), publication 9285.7-47, December 2001, PB97-963311.

- Supplemental Guidance for Dermal Risk Assessment (Part E), publication 9285.7-02EP, July 2004, PB99-963312.

- Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors" OSWER Directive 9285.6-03 (EPA, March 25, 1991).

- Supplemental Guidance to RAGS: Calculating the Concentration Term, (Publication 9285.7-08I, June 22, 1992)

- EPA Region I Supplemental Risk Assessment Guidance for the Superfund Program Part 1: Public Health Risk Assessment (EPA 901/5/89-001, June 1989).

- Guidance Data Usability in Risk Assessment (Part A) (publication 9285.7-09A, April 1992, PB92-963356).

- Guidance for Data Usability in Risk Assessment (Part B) (publication 9285.7-09B, May 1992, PB92-963362).

- Dermal Exposure Assessment: Principles and Applications (EPA 600/8-91/011B, January, 1992).

- Air/Superfund National Technical Guidance Study Series, Volumes I, II, III, and IV (EPA 450/1-89-001,002,003,004, July 1989).

- EPA Superfund's "Process for Conducting Probabilistic Risk Assessment," RAGS (Part A), Volume III, (EPA 540-R-02-002, December 2001.)

- Guidance for Comparing Background and Chemical Concentration in Soil for CERCLA Sites, September 2002.

- Role of Background in the CERCLA Cleanup Program, April 26, 2002.

- Role of the Baseline Risk Assessment in Superfund Remedy Selection, April 22, 1991.

- Soil Screening Guidance, December 2002.

- Land Use in the CERCLA Remedy Selection Process, OSWER Directive No. 9355.7-04.

- Revised Policy on Performance of Risk Assessments During RI/FSs Conducted by PRPs.

- Vapor Intrusion Guidance (Draft), November 29, 2002.

- Policy on Evaluating Health Risks to Children.

- Guidance Manual for Health Risk Assessments of Hazardous Substance Sites.

For Baseline Ecological Risk Assessments:

- Risk Assessment Guidance for Superfund, Volume II: Environmental Evaluation (EPA 540/1-89/001, March 1989).

- Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference Document (EPA 600/3-89/013), March 1989).

- Ecological Risk Assessment Guidance for Superfund: Process for Designing & Conducting Ecological Risk Assessments (U.S. EPA OSWER Directive, No. 9285.7-25, February 1997).

- The Role of Screening-Level Risk Assessments and Refining contaminants of Concern in Baseline Ecological Risk Assessments, ECO Update, (EPA 540/F-01/014, June 2001).

Additional guidelines that may be used to prepare and perform the risk assessment are:

a. Carcinogen Risk Assessment (51 FR 33992, September 24, 1986);
b. Mutagenicity Risk Assessment (51 FR 34006, September 24, 1986);
c. The Health Risk Assessment of Chemical Mixtures (51 FR 34014, September 24, 1986);
d. The Health Assessment of Suspect Developmental Toxicants (56 FR 63798, December 5, 1991); and
e. Exposure Assessment Guidelines (57 FR 22887, 1992).

Risk Assessment Methodologies

Components of the Risk Assessments

Each of the Baseline Risk Assessments shall be separated into two components: 1) the human health risk assessment; and 2) the ecological risk assessment.

The human health risk assessments shall address the following five categories at a minimum:

1. hazard identification;
2. dose-response assessment;
3. exposure assessment;
4. risk characterization; and
5. limitations/uncertainties.

The ecological risk assessments shall address the following seven categories:

1. definition of objectives;
2. characterization of site and potential receptors;
3. selection of chemicals, species and endpoints for risk evaluation;
4. exposure assessment;
5. toxicity assessment;
6. risk characterization; and
7. limitations/uncertainties.

Data Acquisition

The Baseline Risk Assessments shall be based upon information gathered prior to and during the RI/FS investigation for each operable unit, as well as on data available through peer-reviewed literature. The Respondents shall, at the direction of EPA, collect additional field data under an Additional Field Studies Work Plan to support a Baseline Risk Assessment. The decision regarding the need for supplemental data collection will be made by EPA (after providing

reasonable opportunity for review and comment by MassDEP) based on review of the RI data. Primary importance will be placed upon data collected in the field, with data collected from the literature used to support or explain field results.

Deliverables

The final products shall be the Draft Baseline Risk Assessment Reports for each operable unit, comprised of the human health and ecological risk assessments. Prior to submission of the final reports, portions of the Baseline Risk Assessments, in the form of interim deliverables (examples of which are described below), shall be submitted. The final schedule for the interim deliverables shall be finalized in the approval of the RI/FS Work Plan. Each interim deliverable shall be reviewed and accepted by EPA before proceeding with the next interim deliverable.

Once all of the interim deliverables are accepted for a given OU, an initial Draft Baseline Risk Assessment Report shall be submitted as part of each operable unit RI Report, unless a different schedule is approved by EPA (e.g. in the RI/FS Work Plan). Following review and feedback from EPA and MassDEP on an initial Draft Baseline Risk Assessment Report, a Revised Draft Baseline Risk Assessment Report may be required incorporating EPA's comments and any additional validated data or information that may have bearing on the risk assessment, acquired after the completion of the initial draft report.

Interim Deliverables - The exact format of the interim deliverables will be determined in the RI/FS Work Plan. Technical meetings may substitute for some of the interim deliverables. The interim deliverables are generally described as follows:

I. FIRST INTERIM DELIVERABLE

A. Human Health Risk Assessment

1. Hazard Identification I

The objective of this component is to present an orderly compilation of the available sampling data on the hazardous substances present at each operable unit, to identify data sets suitable for use in a quantitative risk evaluation, and if necessary, to identify contaminants of concern upon which the quantitative assessment of risk will be based.

This deliverable shall contain information identifying the extent of contamination in each medium. Summaries of the sampling data shall also be generated for each constituent detected in each medium indicating: the mean and maximum concentrations (including location of the latter), the frequency of detection, identification of the regulatory criteria (e.g., MCL/MCLGs), and the number of times the regulatory criteria is exceeded, where appropriate. In addition, pictorial/graphic displays of the data are strongly encouraged. The format of these displays will be dependent upon site-specific factors and will be determined with the approval of EPA.

Data collected, reviewed and submitted by the Respondents as part of the Focused RI Report, and subsequently determined to be usable by EPA, shall be incorporated into this Hazard Identification process.

If the number of contaminants detected is so large that quantification of health risks for each contaminant would be infeasible, then contaminants of concern may be selected. Contaminants of concern for each medium shall be identified in accordance with the EPA Region I Supplemental Risk Assessment Guidance for the Superfund Program Part 1: Public Health Risk Assessment. A narrative shall be supplied describing the selection process of contaminants of concern. Important factors in choosing contaminants of concern include contaminant concentration and frequency of detection, potential contaminant releases, potential routes and magnitude of exposure, environmental fate and transport, and toxicity.

2. Exposure Assessment I

The purpose of this deliverable is to identify all plausible present and potential future exposure pathways and exposure parameters in accordance with the Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors" OSWER Directive 9285.6-03 (EPA, March 25, 1991). Identification of complete exposure pathways include: a source, transport medium, and exposure route. The exposure parameters specified below should be used; where none are provided, values found in OSWER Directive 9285.6-03, "Standard Default Exposure Factors" or in the Region I Supplemental Risk Assessment Guidance for Superfund should be used.

Tables or flow charts are useful methods of presenting the possible exposure pathways and are recommended.

Narrative descriptions and summary tables of exposure scenarios shall be provided in this submittal. The exposure scenarios for current and potential future land use shall include, but not be limited to exposure parameters characteristic of a reasonable exposure for the following: frequency and duration of exposure, body weight and the magnitude of exposure to the contaminated medium.

B. Ecological Risk Assessment

1. Hazard Identification I

This section shall correspond to Section 3.0 of the Ecological Risk Assessment (see below).

II. SECOND INTERIM DELIVERABLE

A. Human Health Risk Assessment

1. Revised Hazard Identification

The Respondents shall incorporate and satisfy all conditions and comments received from EPA on the first deliverable regarding the extent of contamination and the selection of contaminants of concern. In addition, any newly acquired validated data shall be incorporated into this deliverable.

2. Revised Exposure Pathways and Parameters

The Respondents shall incorporate and satisfy all conditions and comments received from EPA on the exposure pathways and exposure parameters made on the first deliverable.

3. Dose-Response Evaluation

The objective of this component is to identify the nature and probability of adverse health effects which could be expected to result from exposure to the contaminants of concern. Carcinogenic and noncarcinogenic effects are characterized independently. The dose-response evaluation for possible carcinogenic effects is described by the cancer slope factor, while for noncarcinogenic effects the reference dose ("RfD") or other suitable health based criteria should be used. Agency verified dose-response criteria obtained from IRIS should preferentially be utilized.

The Respondents shall provide a dose-response evaluation consistent with the EPA Region I Supplemental Risk Assessment Guidance for the Superfund Program Part 1: Public Health-Risk Assessment Chapter 3.

B. Ecological Risk Assessment

1. Revised Hazard Identification

The Respondents shall incorporate and satisfy all conditions and comments received from EPA on the first interim deliverable regarding the selection of contaminants of concern, indicator species and endpoints. In addition, any newly acquired validated data shall be incorporated into this deliverable.

2. Exposure Assessment I

This section shall correspond to Section 4.0 of the Ecological Risk Assessment (see below).

III. THIRD INTERIM DELIVERABLE

A. Human Health Risk Assessment

1. Exposure Assessment II

The purpose of the exposure assessment is to estimate a range of possible exposures which may result from actual or threatened releases of hazardous substances from the Site. The average and reasonable maximum exposure levels which are to be characterized are defined by the manner in

which the contaminant concentration (average or maximum) is coupled with conservative exposure parameters developed for each exposure scenario per the first deliverable.

The resulting exposure levels (to be referred to as the average and reasonable maximum exposure levels) shall be revised in the draft and/or final risk assessment report, if additional validated data is received. The format of the exposure point concentrations and exposure dose levels shall be presented in narrative form and tables.

2. Risk Characterization

Risk characterization integrates the information developed during the toxicity assessment (hazard identification and dose response evaluation) and the exposure assessment to quantify the risks from the site for each exposure pathway.

Presentation of the risk characterization shall be in the form of tables which separately summarize the noncarcinogenic and carcinogenic health risk.

3. Uncertainties and Limitations

This section shall address the uncertainties and limitations of the analysis. It shall clearly address the major limitations, sources of uncertainty, and if possible, provide an indication as to whether they have resulted in an over or under-estimation of the risk.

B. Ecological Risk Assessment

The Respondents shall incorporate and satisfy all conditions and comments received from EPA on the second interim deliverable. In addition, any newly acquired validated data shall be incorporated into this deliverable.

IV. DRAFT BASELINE HUMAN HEALTH RISK ASSESSMENT REPORTS

A draft Baseline Human Health Risk Assessment Report shall be submitted for each OU after the completion and acceptance of the interim deliverables in accordance with the schedule described above and/or approved in the RI/FS Work Plan. The format of these reports shall generally conform to the chapters and sections described in Attachment B.

Once an initial draft Human Health Risk Assessment Report has been reviewed, a revised draft Human Health Risk Assessment Report may be warranted. The revised draft report shall follow the same format as the initial draft report and shall incorporate and satisfy all conditions and comments provided by EPA, after providing reasonable opportunity for review and comment by MassDEP.

V. DRAFT BASELINE ECOLOGICAL RISK ASSESSMENT REPORTS

A draft Baseline Ecological Risk Assessment Report shall be submitted for each OU after the completion and acceptance of the interim deliverables in accordance with the schedule described above and/or approved in the RI/FS Work Plan. The format of this report shall generally conform to the chapters and sections described in Attachment C.

Once an initial draft Ecological Risk Assessment Report has been reviewed, a revised draft Ecological Risk Assessment Report may be warranted. The revised draft report shall follow the same format as the initial draft report and shall incorporate and satisfy all conditions and comments provided by EPA, after providing reasonable opportunity for review and comment by MassDEP.

ATTACHMENT A

Suggested Format
Remedial Investigation Report

Draft Remedial Investigation Report

1.0 Introduction
- 1.1 Purpose of Report
- 1.2 Site Background
- 1.3 Site Description
- 1.4 Site History
- 1.5 Previous Investigations
- 1.6 Report Organization

2.0 Study Area Investigation
- 2.1 Includes field activities associated with site characterization. These may include physical and chemical monitoring of some, but not necessarily all, of the following:
  - 2.1.1 Surface Features (topographic mapping, etc.) (natural and man made features)
  - 2.1.2 Contaminant Source Investigations
  - 2.1.3 Meteorological Investigations
  - 2.1.4 Surface Water and Sediment Investigations
  - 2.1.5 Geological Investigations
  - 2.1.6 Soil and Vadose Zone Investigations
  - 2.1.7 Groundwater Investigations
  - 2.1.8 Human Population Surveys
  - 2.1.9 Ecological Investigations
- 2.2 If technical memoranda documenting field investigations were prepared, they may be included in an appendix and summarized in this report chapter.

3.0 Physical Characteristics of the Study Area
- 3.1 Includes results of field activities to determine physical characteristics. These may include some, but not necessarily all, of the following:
  - 3.1.1 Surface Features
  - 3.1.2 Meteorology
  - 3.1.3 Surface Water Hydrology
  - 3.1.4 Geology
  - 3.1.5 Soils
  - 3.1.6 Hydrogeology
  - 3.1.7 Demography and Land Use
  - 3.1.8 Ecology

4.0 Nature and Extent of Contamination
- 4.1 Presents the results of site characterization, both natural and chemical components and contaminants in some, but not necessarily all, of the following media:
  - 4.1.1 Sources (lagoons, sludges, tanks, etc.)
  - 4.1.2 Soils and Vadose Zone
  - 4.1.3 Groundwater

4.1.4 Surface Water and Sediments
4.1.5 Air

5.0 Contaminant Fate and Transport
5.1 Potential Routes of Migration (i.e., air, groundwater, etc.)
5.2 Contaminant Persistence
5.2.1 If they are applicable (i.e., for organic contaminants), describe estimated persistence in the study area environment and physical, chemical, and/or biological factors of importance for the medial of interest.
5.3 Contaminant Migration
5.3.1 Discuss factors affecting contaminant migration for the media of importance (e.g., sorption onto soils, solubility in water, movement of groundwater, etc.)
5.3.2 Discuss modeling methods and results, if applicable.

6.0 Baseline Risk Assessment
6.1 Human Health Evaluation (see below for more detail)
6.1.1 Exposure Assessment
6.1.2 Toxicity Assessment
6.1.3 Risk Assessment
6.2 Ecological Evaluation (see below for more detail)

7.0 Summary and Conclusions
7.1 Summary
7.1.1 Nature and Extent of Contamination
7.1.2 Fate and Transport
7.1.3 Risk Assessment
7.2 Conclusions
7.2.1 Data Limitations and Recommendations for Future Work
7.2.2 Recommended Remedial Action Objectives

Appendices
A. Technical Memorandum on Field Activities (if available)
B. Analytical Data and QA/QC Evaluation Results
C. Risk Assessment Methods

ATTACHMENT B

Suggested Format
Baseline Human Health Risk Assessment Report

Draft Baseline Human Health Risk Assessment Report

1.0 Introduction/Hazard Identification
- 1.1 Site description and history
  - 1.1.1 Present and future land use
  - 1.1.2 Human receptors (including type, location and numbers)
- 1.2 Nature and extent of contamination found at the site
- 1.3 Selection of contaminants of concern
  - 1.3.1 Health based ARARs (e.g. MCL/MCLG/MEG)
- 1.4 Fate and transport

2.0 Exposure Assessment
- 2.1 Exposure pathways
- 2.2 Exposure scenarios
  - 2.2.1 Exposure point concentrations (ug/l, mg/kg, ug/m3)
  - 2.2.2 Exposure dose levels (mg/kg/day)

3.0 Dose Response Evaluation
- 3.1 Dose response criteria for carcinogenic effects
- 3.2 Dose response criteria for noncarcinogenic effects

4.0 Risk Characterization
- 4.1. Narrative and tables summarizing the carcinogenic and noncarcinogenic risks by exposure pathway for the present and potential future exposure scenarios

5.0 Uncertainty/Limitations

6.0 References

7.0 Appendices
- 7.1. Documentation/data
- 7.2. Toxicity profiles for contaminants of concern

ATTACHMENT C

Suggested Format
Baseline Ecological Risk Assessment Report

Draft Baseline Ecological Risk Assessment Report

1.0 Introduction

2.0 Objectives

3.0 Hazard Identification

3.1 Site Characterization

This section shall:

3.1.1 identify the nature, extent, and sources of contamination through the various exposure pathways of concern.

3.1.2 describe the topography, hydrology, and other physical, spatial, or other features of ecological interest at and adjoining the site.

3.1.3 discuss the habitat types and associated species found or expected at or adjacent to the site, or that would otherwise be expected to be affected by contamination from the site.

3.1.4 highlight any species that are federally endangered or threatened, of special concern to the State, that are Trustee resources, or other species of interest (i.e., of particular economic or social importance).

3.2 Selection of Contaminants of Concern, Indicator Species and Endpoints

This section shall:

3.2.1 list the contaminants that have been selected. Summarize the criteria for selection of contaminants of concern, and briefly discuss the relationship between each selected compound and the factors considered during selection. Factors to be addressed include, but are not limited to, persistence, bioaccumulation, biomagnification, toxicity, frequency of detection, and concentrations detected and the relationship of these concentrations to a control or "background".

3.2.2 describe the indicator species and endpoints which have been selected. Discuss the criteria for selection, and how those species and endpoints relate to the criteria. These criteria include but are not limited to the importance and position of the species within the ecosystem, sensitivity, seasonality, relevance to the specific ecosystem found at the site and to human beneficial uses, Trustee or regulatory concerns, and availability of practical methods for prediction and measurement.

4.0 Exposure Assessment

4.1 Source Characterization and Selection of Exposure Pathways

This section shall summarize the source areas of concern and discuss for each area (and, if necessary, by type of contaminants) by indicator species, what exposure pathways will be of concern and considered for further analysis.

4.2 Fate and Transport Analysis

This section shall include operable unit-specific data, applicable models, and information available through the literature.

4.3 Exposure Scenarios and Integrated Exposure Analysis

This section shall determine the exposure scenarios applicable given the selected exposure pathways, chemicals of concern, indicator species, and endpoints. Take into account spatial and temporal variations in exposure, mechanisms of migration, points of exposure, behavioral adaptations, and population characteristics. If a food web or other complex model is to be constructed, discuss the relationships established between the various species and trophic levels represented in the food web (for example, k of dietary uptake, BCFS, BMFS, duration of exposure).

4.4 Uncertainty Analysis

5.0 Toxicity Assessment

5.1 Hazard Identification

This section shall identify the potential toxic endpoints of the chemicals of concern upon the indicator species.

5.2 Quantitative Dose-Response Assessment This section shall:

5.3 evaluate both literature/laboratory data, as well as site-specific data where available.

5.4 present any applicable benchmark values available for comparison with site conditions. These benchmarks shall include ARARs (where available), sediment quality criteria, equilibrium partitioning values, or other published or peer reviewed values.

5.5 Uncertainty Analysis

6.0 Risk Characteristics

6.1 Selection of Risk Assessment Characterization Methodology

6.2 Presentation of Risk Assessment Characterization

This section shall:

6.2.1 Provide narrative and tabular summaries of the risk predictions by exposure pathway and by indicator species; and evaluate both single and multiple chemical effects where applicable. Note specific spatial or temporal distributions if risk is estimated.

6.2.2 Discuss and quantify (where possible) risks at the community and ecosystem level.

6.3 Uncertainty Analysis

6.4 Conclusions

7.0 References

8.0 Appendices

8.1 Data

8.2 Documentation

8.3 Toxicity Profiles for Chemicals of Concern

ATTACHMENT D

Suggested Format
Feasibility Study Report

Draft Feasibility Study Report

Executive Summary

1. Introduction
   - 1.1 Purpose and Report Organization
   - 1.2 Background Information (Summarized from RI Report)
   - 1.3 Site Description
   - 1.4 Site History
   - 1.5 Nature and Extent of Contamination
   - 1.6 Contaminant Fate and Transport
   - 1.7 Baseline Risk Assessment
2. Identification and Screening of Technologies
   - 2.1 Introduction
   - 2.2 Remedial Action Objectives -
     Presents the development of remedial action objectives for each medium of interest. For each medium, the following should be discussed:
     - Contaminants of interest
     - Allowable exposure based on risk assessment (or ARARs)
     - Development of remediation goals
   - 2.3 General Response Actions –
     For each medium of interest, describes the estimation of areas or volumes to which treatment, containment, or exposure technologies may be applied.
   - 2.4 Identification and Screening of Technology Types and Process Options – For each medium of interest, describes:
     - 2.4.1 Identification and screening of technologies
     - 2.4.2 Evaluation of technologies and selection of representative technologies
3. Development and Screening of Alternatives
   - 3.1 Development of Alternatives –
     Describes rationale for combination of technologies/media into alternatives. Note: this discussion may be by medium, operable unit or the site as a whole.
   - 3.2 Screening of Alternatives (if conducted)
     - 3.2.1 Introduction
     - 3.2.2 Alternative 1
       - 3.2.2.1 Description
       - 3.2.2.2 Evaluation
     - 3.2.3 Alternative 2
       - 3.2.3.1 Description
       - 3.2.3.2 Evaluation
     - 3.2.4 Alternative 3
4. Detailed Analysis of Alternatives
   - 4.1 Introduction
   - 4.2 Individual Analysis of Alternatives
     - 4.2.1 Alternative 1
       - 4.2.1.1 Description

4.2.1.2 Assessment
4.2.2 Alternative 2
4.2.2.1 Description
4.2.2.2 Assessment
4.2.3 Comparative Analysis
Bibliography
Appendices

ATTACHMENT E

Suggested Format
Engineering Evaluation and Cost Analysis Report

Draft Engineering Evaluation and Cost Analysis Report

- Executive Summary
- Site Characterization
    - Site description and background
    - Previous removal actions
    - Source, nature and extent of contamination
    - Analytical data
    - Streamlined risk evaluation
- Identification of removal action objectives
    - Statutory limits on removal actions
    - Determination of removal scope
    - Determination of removal schedule
    - Planned removal activities
- Identification and analysis of removal action alternatives
    - Effectiveness
    - Implementability
    - Cost
- Comparative Analysis of removal action alternatives
- Recommended removal action alternative