UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6

IN THE MATTER OF:	)	ADMINISTRATIVE ORDER ON CONSENT
CAMP STANLEY STORAGE ACTIVITY BOERNE, TEXAS EPA I.D. NO.: TX2210020739	)	U.S. EPA DOCKET NO. RCRA-VI 002(h)99-H FY99
	)	Proceeding Under § 3008(h) of the Resource Conservation and Recovery Act, as Amended, 42 U.S.C. § 6928(h)
RESPONDENT	)	

I. JURISDICTION

1. This Administrative Order on Consent (Order) is issued pursuant to the authority vested in the Administrator of the United States Environmental Protection Agency (EPA) by Section 3008(h) of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, (RCRA), and further amended by the Hazardous and Solid Waste Amendments of 1984, 42 U.S.C. § 6928(h). The authority to issue this Administrative Order has been delegated to the Regional Administrator by EPA Delegation Nos. 8-31 and 8-32, dated April 16, 1985, and further delegated to the Director of the Compliance Assurance & Enforcement Division, Region 6 ("Director") by EPA Delegation Nos. R6-8-31and R6-8-32, dated July 27, 1995.

2. This Order is issued to the Camp Stanley Storage Activity (CSSA) ("Respondent"), the owner and/or operator of Camp Stanley Storage Activity ("CSSA"), Boerne, Texas ("Facility"), and is consistent with Section 6001 of RCRA, 42 U.S.C. § 6961. Respondent admits that EPA has jurisdiction to issue this Order and to enforce its terms. Further, Respondent consents to and agrees not to contest EPA's jurisdiction to: compel compliance with this Order in any subsequent enforcement proceedings, either administrative or judicial; require Respondent's full or interim compliance with the terms of this Order; or impose sanctions for noncompliance with this Order. Finally, Respondent agrees not to contest the validity of this Order, and waives any defense concerning the validity of this Order, or any particular provision contained herein.

3. Congress has specifically waived any defense of sovereign immunity that might otherwise be available to the Respondent regarding this Order. Pursuant to Section 6001 of RCRA, 42 U.S.C. § 6961, Respondent is subject to, and shall comply with all Federal, State, interstate, and local requirements, both substantive and procedural, respecting the control and abatement of solid waste or hazardous waste disposal and management in the same manner and to the same extent, as any person is subject to such requirements. Such Federal, State, interstate, and local substantive and procedural requirements include, but are not limited to, all administrative orders and all civil and administrative penalties and fines.

II. PARTIES BOUND

1. This Order is issued to the CSSA, the owner and/or operator of the Camp Stanley Storage Activity, Boerne, Texas.

2. No change in ownership or status relating to the Facility will in any way alter the status or responsibility of the Respondent under this Order. Any conveyance of title, easement, or other interest in the Respondent's Facility or a portion at the Respondent's Facility shall not affect Respondent's obligations under this Order. Respondent shall be responsible for and liable for any failure to carry out all activities required of the Respondent by the express terms and conditions of this Order, irrespective of its use of employees, agents, or consultants to perform any such tasks.

3. This Order shall apply to and bind Respondent, its officers, employees, agents, receivers, successors, assigns, and all other persons, including, but not limited to, contractors, and consultants acting under or on behalf of Respondent in connection with the implementation of this Order.

4. Each undersigned representative of the parties to this Order certifies that he/she is fully authorized to enter into the terms and conditions of the Order, and to legally bind the party he/she represents to the Order.

5. Until this Order is terminated, Respondent shall provide, or cause to be provided, a copy of this Order to all contractors, subcontractors, laboratories, and consultants retained to conduct or monitor any portion of the work performed pursuant to this Order within 30 (thirty) calendar days of the effective date of this Order or date of such retention, and shall condition all such contracts on compliance with the terms of this Order.

6. Any documents transferring ownership and/or operations of the Facility from Respondent to a successor-in-interest shall include written notice of this Order. Respondent shall, no less than thirty (30) days prior to transfer of ownership or operation of the Facility, provide to EPA written notice of said transfer of ownership and/or operation.

7. Respondent agrees to undertake all actions required by the terms and conditions of this Order including the Corrective Action Plan, which consists of the Interim/Stabilization Measures (IM), RCRA Facility Investigation (RFI), Corrective Measures Study (CMS), Corrective Measures Implementation (CMI), and is incorporated by reference in this Order. Respondent explicitly waives its rights to request a hearing on this matter and consents to the issuance of this Order without a hearing pursuant to § 3008(b) of RCRA, 42 U.S.C. § 6928(b), and 40 C.F.R. Part 24, and as an Order on Consent issued pursuant to § 3008(h) of RCRA, 42 U.S.C. § 6928(h).

III. STATEMENT OF PURPOSE

1. In entering into this Order, the mutual objectives of EPA and Respondent are to identify, investigate, and prevent the further spread of releases of hazardous wastes and/or hazardous constituents to the environment at and/or from the facility, and to ensure that corrective action activities pursuant to EPA regulations and relevant guidance documents are designed and implemented to protect human health and the environment.

2. This Order requires the Respondent to: (1) perform Interim/Stabilization Measures (IM) at the Facility to prevent or minimize the further migration of contaminants due to releases of hazardous constituents to the environment, or to mitigate current or potential threats to human health or the environment; (2) perform a RCRA Facility Investigation (RFI) to determine the nature and extent of any release(s) of hazardous waste or hazardous constituents at or from the Facility; (3) perform a Corrective Measure Study (CMS) to identify and evaluate alternatives for corrective action(s) to

prevent or mitigate any migration of release(s) of hazardous wastes or hazardous constituents at or from the Facility, and to collect any other information necessary to support the selection of corrective measures at the Facility; and (4) implement the corrective measure or measures (Corrective Measure Implementation (CMI)) selected by EPA for the Facility.

IV. FINDINGS OF FACT

1. Respondent is a Federal agency as defined in § 1004(4) of RCRA, 42 U.S.C.§ 6903(4).

2. The Respondent is the owner and/or operator of CSSA. CSSA is in Bexar County in south central Texas. It is located northwest of San Antonio, Texas, and is adjacent to the western border of Camp Bullis Army Base. CSSA has been in existence since 1906 and currently occupies approximately 4,000 acres.

3. Respondent is a generator of hazardous waste and is engaged in the treatment, storage, or disposal of hazardous waste at the Facility and was subject to the interim status requirements of 40 C.F.R. Part 265. Respondent is currently operating as a Small Quantity Generator.

4. Respondent owned and/or operated the Facility as a hazardous waste management facility on or after November 19, 1980, the applicable date which renders facilities subject to the interim status requirements, or the requirement to have a permit under Sections 3004 and 3005 of RCRA, 42 U.S.C. §§ 6924 and 6925

5. Pursuant to Section 3010(a) of RCRA, 42 U.S.C. § 6930(a), Respondent notified EPA of its hazardous waste activity. In the Notification of Hazardous Waste Activities dated September 18, 1980, Respondent identified itself as a generator, storer, and transporter of the following hazardous waste at the Facility:

   Corrosivity (D002) - 40 C.F.R. § 261.22

6. Pursuant to Section 3005(e) of RCRA, 42 U.S.C. § 6925(e), on November 19, 1980, Respondent submitted Part A of its permit application and identified that it treats, stores, or disposes of hazardous wastes by operation of a surface impoundment and tank storage for the following hazardous waste:

   a. Hazardous wastes exhibiting the characteristics of reactivity defined at 40 CFR §§ 261.22, (D002); and

   b. Hazardous wastes from non-specific sources defined at 40 CFR § 261.31, (F001).

7. There are twelve wells at CSSA used for potable drinking water sources, monitoring wells, agricultural water supplies, or a combination of aforementioned uses. Three wells are located in the north pasture (G, H, & I). Five wells are located along the northern boundary of the inner CSSA cantonment area (2, 3, 4, 16, & D). Three wells are located in the southwestern area of CSSA (9, 10, & 11). One well is located southeast of CSSA on Camp Bullis (1). The majority of the CSSA wells are open-hole completion wells.

8. During a routine pesticide screening site visit on August 9, 1991, the Texas Department of Health (TDH) sampled water supply well 16, which is located along the north inner cantonment boundary. Analytical results revealed the sample contained 127 micrograms per liter (µg/L) cis-and trans-1,2-dichlorcethane (DCE), 151 µg/L trichloroethylene (TCE), and 137 µg/L tetrachloroethylene (PCE). Subsequent sampling on August 23, 1991 confirmed the earlier results. TDH required that CSSA take the well out of service and notify previous well users on a quarterly basis.

9. The Texas Water Commission, now named the Texas Natural Resources Conservation Commission (TNRCC), collected samples on December 4, 1991, from Well 16 and from two inactive wells (wells D and 4). According to the TNRCC, well 16 was determined once again to be contaminated with TCE and PCE and well D also was contaminated with DCE.

10. In November 1992, CSSA sampled ten wells located within the CSSA perimeter. Wells 2, 3, and 4 were found to be non-detect for DCE and TCE. Well D and well 16 were found to contain concentrations up to 53 μg/L of volatile organics, which were above drinking water standards. Other inactive wells were not found to contain halogenated compounds.

11. According to Sampling and Analysis Plan for Evaluation of Ground Water contamination at CSSA, dated May 1993, which was prepared for CSSA by Engineering Science, Inc., now named Parsons Engineering Science, Inc., the following potential sources of the hazardous waste constituents found in the contaminated wells are as follows:

    a) **Oxidation Pond:** The oxidation pond was built in approximately 1975. It had a vinyl plastic liner and was used for evaporation of waste liquids from the ordnance related maintenance process. This pond was filled in with dirt in 1985 after solid and liquid residues were reportedly removed

    b) **Burn Areas 1, 2, 3, 4, and 28:** Open burning areas for ammunition, incendiary materials, trash, and garbage. Based on current information, it appears that only Burn Area 3 is contributing to the ground water contamination.

12. The aquifer underlying CSSA is the upper Glen Rose of the upper Trinity Aquifer. The Trinity Group aquifer is the primary source of drinking water in northern Bexar County. A recharge zone to the Edwards Aquifer is located at least 0.5 miles northeast of the facility.

13 The hazardous wastes and hazardous waste constituents identified below include known and suspected carcinogens and mutagens. Carcinogens and mutagens can affect the central nervous system and damage internal organs at low levels. These chemicals, under certain conditions of dose, duration, or extent of exposure, constitute a threat to human health by inhalation, ingestion and/or absorption. The following information was compiled from the *Chemical, Physical, and Biological Properties of Compounds Present at Hazardous Waste Sites* (September 27, 1985), EPA's Integrated Risk Information System (IRIS), and 40 C.F.R. Part 141:

    a) Trichloroethene (TCE)- Trichloroethene has induced hepatocellular carcinomas in mice and was mutagenic when tested using several microbial assay systems. The MCL for Trichloroethene in drinking water is 0.005 mg/l.

    b) 1,2-Dichloroethane (1, 2 DCE) - Carcinogenicity classification B2 - probable human carcinogen. 1,2-Dichloroethane is a mutagenic in bacterial test systems. The MCL in drinking water is 0.005 mg/l.

    c) Tetrachloroethene/Perchloroethylene (PCE)- Tetrachloroethene produces liver cancer in mice when administered orally by gavage. Renal toxicities have been reported following inhalation exposure of rats to fairly high concentrations. The MCL in drinking water is 0.005 mg/l.

V. CONCLUSIONS OF LAW AND DETERMINATIONS

Based on the Findings of Fact set out above, and the administrative record, the Director has determined that:

1. Pursuant to Section 6001 of RCRA, 42 U.S.C. § 6961, each department, agency, and instrumentality of the executive, legislative, and judicial branches of the Federal Government having jurisdiction over any solid waste management facility or disposal site, or engaged in any activity resulting, or which may result, in the disposal or management of solid waste or hazardous waste shall be subject to, and comply with, all Federal, State, interstate, and local requirements, both substantive and procedural (including any requirements for permits or reporting or any provision for injunctive relief and such sanctions as may be imposed by a court to enforce such relief), respecting control and abatement of solid waste or hazardous waste disposal in the same manner, and to the same extent, as any person is subject to such requirements.

2. Pursuant to Section 6001 of RCRA, 42 U.S.C. § 6961, Respondent is a federal agency subject to all requirements of RCRA in the same manner and extent as any person is subject to such requirements.

3. Respondent is a "person" within the meaning of Section 1004(15) of RCRA, 42 U.S.C. § 6903(15), and 40 C.F.R. § 260.10.

4. Respondent is the owner and/or operator of an "existing hazardous waste management facility" as defined at 40 C.F.R. § 260.10, located in Bexar County, Texas.

5. Respondent was authorized to operate under interim status pursuant to Section 3005(e) of RCRA, 42 U.S.C. § 6925(e).

6. Certain wastes and constituents found at the Facility are hazardous wastes or hazardous constituents as defined by Sections 1004(5) and 3001 of RCRA, 42 U.S.C. §§ 6903(5) and 6921, 40 C.F.R. Part 261.

7. Respondent released hazardous wastes or hazardous waste constituents, as defined by Section 3001 of RCRA, 42 U.S.C. § 6921, and 40 C.F.R. Part 261, into the environment from the Facility.

8. Respondent is subject to the provisions of Section 3008(h) of RCRA, 42 U.S.C. § 6928(h).

9. Based on the release of hazardous waste or hazardous constituents into the environment from the Facility, the Director has determined that the actions required by this Order are consistent with RCRA, and the actions ordered below are necessary to protect human health and/or the environment.

Based on the foregoing, it is hereby **Ordered** that Respondent shall perform the following actions in the manner and by the dates specified below:

VI. WORK TO BE PERFORMED

Respondent shall undertake, continue to take, and complete each of the following actions to the satisfaction of EPA, in accordance with the terms, procedures and schedules set forth in the Corrective Action Plan ("CAP"), Attachment I. The CAP is hereby incorporated in this Order by reference as if reproduced in full herein.

1. INTERIM/STABILIZATION MEASURES (IM)

   a) Within one hundred twenty (120) days of the effective date of this Order, Respondent shall submit to EPA an Interim Measures Workplan (IM Workplan) for the stabilization of the oxidation pond. EPA will approve, or modify and approve, the IM workplan. The purpose of this IM is to minimize the further release of hazardous waste or hazardous waste constituents to the ground water, and mitigate the current or potential threat to human health and/or the environment. The IM Workplan shall be prepared in accordance with the requirements

contained in the CAP and shall identify and evaluate interim measures, which shall be consistent with and integrated into any long term remedy at the Facility. Other specific interim measures that are required by this Order are presented in the CAP

Upon approval or modification of the IM Workplan by EPA, Respondent shall undertake, or continue to take, the IM in accordance with the IM Workplan, concurrently with other corrective action activities.

b) In the event Respondent identifies a current or potential threat to human health and/or the environment, the Respondent shall immediately notify EPA orally, and in writing within five (5) days, summarizing the immediacy and magnitude of the potential threat to human health and/or the environment.

If additional information becomes available to EPA after the effective date of this Order, and that information indicates the existence of a current or potential threat to human health and/or the environment, EPA will provide notification to Respondent so that Respondent may initiate interim measures. Within one hundred twenty (120) days of any notification described above, Respondent shall submit an amended Interim Measures Workplan for EPA approval, or modification and approval. The amended IM Workplan will identify Interim Measures that mitigate threats to the environment and are consistent with, and integrated into, any long term remedy at the Facility. The amended IM Workplan shall be prepared in accordance with the requirements contained in the CAP.

Upon approval or modification of the amended IM Workplan by EPA, Respondent shall undertake the Interim Measures in accordance with the amended IM Workplan, and concurrently with other corrective action activities

c) The IM Workplan(s) shall ensure that the Interim Measures are designed to control or abate threats to human health and/or the environment and/or to prevent or minimize the further spread of contamination while long-term remedies are pursued at the Facility.

d) Within sixty (60) days after data validation for completion of the construction of the IM (except for long term operation, maintenance, and monitoring), the Respondent shall submit a Interim Measures Implementation Report in accordance with the requirements specified in the CAP. EPA will approve, or modify and approve, the IM Implementation Report.

2. RCRA FACILITY INVESTIGATION (RFI)

a) Within ninety (90) days of the effective date of this Order, Respondent shall submit a Description of Current Conditions Report to EPA. EPA will approve, or modify and approve, the Description of Current Conditions Report. The Description of Current Conditions Report shall be prepared in accordance with the requirements set forth in the CAP.

b) Within one hundred twenty (120) days of the effective date of this Order, Respondent shall submit to EPA a RCRA Facility Investigation (RFI) Workplan. The RFI Workplan shall be prepared in accordance with the requirements set forth in the CAP.

c) The RFI Workplan shall be developed in accordance with RCRA, its implementing regulations, and relevant EPA guidance documents referenced in Attachment II, and any other documents determined and identified by EPA to be relevant during the course of this action.

d) The RFI Workplan shall describe in detail the methodology for determining the presence,

magnitude, horizontal and vertical extent, direction, and rate of movement of any hazardous wastes or hazardous waste constituents within and beyond the Facility boundary.

e) The RFI Workplan shall conform to the requirements of the CAP and shall document the procedures the Respondent shall use to conduct those investigations necessary to: (1) characterize the potential pathways of contaminant migration; (2) characterize the source(s) of contamination; (3) define the degree and horizontal and vertical extent of contamination; (4) identify actual or potential receptors; and (5) support the development of alternatives from which a corrective measure(s) will be recommended by CSSA and selected by EPA. A specific schedule for implementation of all activities shall be included in the RFI Workplan.

f) In accordance with the provisions of the CAP, the RFI Workplan shall include: (1) a Project Management Plan (*Work Plan*); (2) a Data Collection Quality Assurance Plan *(Field Sampling Plan)*; (3) a Data Management Plan *(Quality Assurance Project Plan)*; (4) a Health and Safety Plan; and (5) a Community Relations Plan.

g) EPA will approve, or modify and approve, the RFI Workplan. Respondent shall implement the RFI Workplan according to the schedule set forth in the RFI Workplan.

h) Within seven hundred thirty (730) days of the approval of the RFI Workplan and subject to Section XIV of this Order, Respondent shall submit to EPA a RFI Report for review and approval. The RFI Report shall be prepared in accordance with the requirements contained in the CAP.

i) EPA will approve, or modify and approve, the RFI Report.

j) Within sixty (60) days after the submission of the RFI Report, Respondent shall submit a Risk Assessment and Investigative Analysis to EPA.

k) EPA will approve, or modify and approve, the Risk Assessment and Investigative Analysis.

l) During the RCRA Facility Investigation, it may be necessary to revise the Final RFI Workplan to increase or decrease the detail of information collected to accommodate the Facility specific situation. If such revisions are made, the schedule for deliverables affected by these revisions may be adjusted by EPA.

3. CORRECTIVE MEASURES STUDY (CMS)

a) Within one hundred twenty (120) days after the RFI Report is approved by EPA, Respondent shall submit a CMS Report to EPA. The CMS Report shall be consistent with the requirements in the CAP.

b) EPA will approve, or modify and approve, the CMS Report.

c) During the Corrective Measures Study, it may be necessary to revise the CMS to increase or decrease the detail of information collected to accommodate the Facility specific situation. If such revisions are made, the schedule for deliverables affected by these revisions may be adjusted by EPA.

d) The Corrective Measures Study shall be developed in accordance with RCRA, its implementing regulations, and relevant EPA guidance documents referenced in Attachment II, and any other documents determined and identified by EPA to be relevant during the course of this action.

4. CORRECTIVE MEASURES IMPLEMENTATION (CMI)

a) Unless otherwise specified in this Order, within one hundred twenty (120) days of Respondent's receipt of notification of EPA's approval of the Respondent's selection of the corrective measure, or upon written direction from EPA, Respondent shall submit to EPA a Corrective Measures Implementation Program Plan ("CMI Program Plan").

b) Respondent shall develop and submit to EPA draft deliverables as described in a manner consistent with the CMI Scope of Work contained in the CAP. These deliverables are subject to review, comment, and approval by EPA. The required deliverables shall include, but not be limited to: (1) a Program Management Plan; (2) a Community Relations Plan; (3) Design Plans and Specifications; (4) an Operation and Maintenance Plan; (5) a Cost Estimate; (6) a Project Schedule; (7) Construction Quality Assurance Objectives, (8) a Health and Safety Plan; (9) Prefinal Design and Final Design, (10) a Construction Quality Assurance Plan, (11) a Prefinal Inspection Report, (12) a Corrective Measure Implementation Plan, and (13) a Corrective Measure Implementation Report. The Respondent shall submit the above deliverables according to the schedule set forth in the CAP.

c) The Corrective Measures Implementation Workplan shall be developed in accordance with RCRA, its implementing regulations, and relevant EPA guidance documents referenced in Attachment II, and any other documents determined and identified by EPA to be relevant during the course of this action.

d) Unless otherwise specified in this Order, EPA will approve, or modify and approve, the deliverables associated with the CMI.

e) Upon EPA approval or modification and approval of all deliverables described in the CMI Scope of Work contained in the CAP, Respondent shall implement the activities of these deliverables.

f) During the Corrective Measures Implementation, it may be necessary to revise the Final CMS to increase or decrease the detail of information collected to accommodate the Facility specific situation. If such revisions are made, the schedule for deliverables affected by these revisions may be adjusted by EPA.

5. SUBMISSIONS / AGENCY APPROVAL / ADDITIONAL WORK

a) Within five (5) days of approval or modification by EPA of any Workplan(s), Respondent shall commence work and implement the tasks required by the Workplan(s), in accordance with the standards, specifications and schedule stated in the Workplan(s) as approved or modified by EPA.

b) Beginning with the third month following the effective date of this Order, Respondent shall provide EPA with the appropriate IM, RFI, and CMS progress reports every quarter, due on the tenth (10th) day of the following month The CMI monthly and semi-annual progress reports are also due the tenth day of the following month. The progress reports shall conform to requirements in relevant Scopes of Work contained in the CAP.

c) The Respondent shall provide EPA with the results of all sampling and testing performed under this Order in every quarterly progress report as specified in Section VI.5.(b).

d) EPA will review all major reports and workplans (i.e., IM Workplan, Current Conditions Report, IM Report, RFI Workplan, RFI Report, CMS Report, CMI Program Plan, Corrective

Measures Design Plan, Final Design Plan, Final Construction Plan, and Corrective Measures Construction Report) or other submittals required under this Order, and notify Respondent in writing of EPA's approval or modification of the deliverables or any part thereof. Upon EPA approval or modification, the submittal shall be deemed incorporated into and part of this Order.

e) Notwithstanding the foregoing, EPA reserves the right to disapprove of, or provide comments on, any deliverable or any part thereof. Within thirty (30) days of receipt of EPA's disapproval or comments on any deliverable, Respondent shall address the deficiencies to EPA's satisfaction and submit a revised submittal. EPA shall approve or modify the revised submittal. Upon EPA approval or modification, the submittal shall be deemed incorporated into and part of this Order.

f) Any noncompliance with such EPA approved plans, reports, specifications, schedules, and attachments shall be construed as a violation of the terms of this Order, and subject to the penalty provisions of Section XIX. Oral advice or approvals given by EPA representatives will not relieve Respondent of their obligation to obtain any formal, written approvals required by this Order

g) Four (4) copies of all deliverables shall be hand delivered, or sent by certified mail, return receipt requested, to the EPA Project Manager. An additional one (1) copy shall be sent to TNRCC. Respondent shall also submit to EPA a copy of all report submittals on 3.5 inch computer disk. The text shall be in a format compatible with WordPerfect version 5.1 or later, and data shall be in a format compatible with Lotus 123 version 2.2 or later

h) The Respondent shall provide EPA with a statement reflecting the percentage of work accomplished thus far within the fiscal year and the percentage of funds expended to date in every third quarterly progress report, as specified in Sections VI.5(b) and (g).

i) In all instances wherein this Order requires written submissions to EPA, each submission must be accompanied by the following certification signed by a "responsible official":

> I certify that the information contained in or accompanying this submission is true, accurate and complete to the best of my knowledge and information. As to those portions of this submission for which I cannot personally verify the truth and accuracy, I certify as the Facility Official having supervisory responsibility for the person(s) who, acting upon my direct instructions, made the verification, that this information is true, accurate, and complete.

For the purpose of this certification, a "responsible official" means person in charge of a principal Facility function, or any other person who performs similar decision-making functions for the Facility.

j) EPA may determine, or Respondent may propose that certain tasks, including investigatory work, engineering evaluation, or procedure/methodology modifications, are necessary in addition to or in lieu of the tasks included in any EPA-approved workplan, when such additional work is necessary to meet the purposes set forth in Section III: Statement of Purpose. If EPA determines that Respondent shall perform additional work, EPA will notify the Respondent in writing and specify the basis for its determination that the additional work is necessary. Within thirty (30) days after the receipt of such determination, Respondent shall have the opportunity to meet or confer with EPA to discuss the additional work. If required by EPA, Respondent shall submit for EPA approval, a workplan for the additional work. EPA will specify the contents of such workplan. Such workplan shall be submitted

within (30) days of receipt of EPA's determination that additional work is necessary, within (30) days after meeting and/or conferring with EPA, or according to an alternative schedule established by EPA. Upon approval of a workplan by EPA, Respondent shall implement it in accordance with the schedule and provisions contained therein.

6. HEALTH AND SAFETY REQUIREMENTS

Respondent, its contractors, and subcontractors shall comply with the applicable health and safety requirements found in 29 C.F.R. Part 1910

VII. PROJECT MANAGER

1. Within ten (10) days of the effective date of this Order, EPA and Respondent shall each designate a Project Manager and notify each other in writing of the Project Manager it has selected. Each Project Manager shall be responsible for overseeing the implementation of this Order. The EPA Project Manager or his designate will be EPA's designated representative for the Facility. All communications between Respondent and EPA, including all documents, reports, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed through the Project Managers.

2. The Parties shall provide written notice within five (5) days after changing Project Managers.

3. If EPA determines that activities in compliance or noncompliance with this Order have caused or may cause a release of hazardous waste, hazardous constituents, or is a threat to human health or environment, or that Respondent is not capable of undertaking any studies or corrective measure ordered, EPA may order Respondent to discontinue work being conducted pursuant to this Order for such period of time as EPA determines may be needed to abate any such releases or threats, and/or to undertake any action which EPA determines is necessary to abate such releases or threats. Failure to comply with EPA's stop work order may result in a penalty of not to exceed $25,000 per day of continued non-compliance with EPA's stop work order, pursuant to Section 3008(h)(2) of RCRA, 42 U.S.C. § 6928(h)(2)

4. In the event EPA suspends the Work or any other activity at the Facility, EPA may extend affected schedules under this Order for a period of time equal to that of the suspension of the Work or other activities, plus reasonable additional time for resumption of activities. If the delay pursuant to this section is caused by Respondent or its contractor's non-compliance with this Order, then any extension of the compliance deadlines shall be at EPA's sole discretion. Any extensions in the schedules set out in this Order or its attachments must be made by EPA in writing, and incorporated by reference into this Order.

5. The absence of the EPA Project Manager from the Facility shall not be cause for the stoppage or delay of work.

VIII. SAMPLING AND DATA/DOCUMENT AVAILABILITY

1. The Respondent shall submit to the EPA the results of all sampling and tests or other data generated by its employees and/or consultants with respect to the implementation of this Order. Data that has not yet undergone QA/QC, shall be submitted with the quarterly progress reports stamped "Subject to Revision".

2. Respondent shall submit these results in quarterly progress reports as described in Attachment I, and Section VI.5(b) of this Order.

3. Respondent shall specify the name and address of the laboratory to be used for sample analysis. EPA reserves the right to conduct a performance and QA/QC audit of the above specified laboratory. If the audit reveals deficiencies in lab performance or QA/QC, resampling and analysis may be required.

4. At the request of EPA, the Respondent shall allow split or duplicate samples to be collected by EPA, and/or its authorized representatives, of any samples collected by the Respondent pursuant to the implementation of this Order. The Respondent shall notify EPA not less than fourteen (14) days in advance of any well installation or sample collection activity.

IX. QUALITY ASSURANCE

Throughout all sample collections and analysis activities, Respondent shall use EPA-approved quality assurance, quality control, and chain-of-custody procedures, which shall be part of proposed and approved plans. Respondent shall:

1. Follow all applicable EPA guidance documents for sampling and analysis;

2. Notify EPA and TNRCC not less than fourteen (14) days in advance of any field sampling or investigation activity;

3. Inform the EPA Project Manager not less than fourteen (14) days in advance which laboratories will be used by Respondent;

4. Ensure that laboratories used by Respondent for analyses perform such analyses according to EPA methods (SW-846, 3rd Edition, or as superseded) or other methods deemed satisfactory to EPA. If methods other than EPA methods are to be used, Respondent shall submit all protocols to be used for analyses to EPA for approval within thirty (30) days prior to the commencement of analyses; and

5. Ensure that laboratories used by Respondent for analyses participate in a quality assurance/quality control program equivalent to that which is followed by EPA. As part of such a program, and upon request by EPA, such laboratories shall perform analysis on known samples provided by EPA to demonstrate the quality of the analytical data.

X. CORRECTIVE ACTION MANAGEMENT UNIT

As part of the remedial activities, Respondent may apply to the EPA for the designation of a corrective action management unit (CAMU) in accordance with 40 CFR Subpart S. If EPA approves Respondent's application for a CAMU designation, EPA's written CAMU designation shall be incorporated herein by reference as if reproduced in full.

(a) For the purpose of implementing remedies under RCRA Section 3008(h), EPA may designate an area at the facility as a corrective action management unit, as defined in § 260.10, in accordance with the requirements of 40 CFR 264.552. One or more CAMUs may be designated at a facility.

(1) Placement of remediation wastes into or within a CAMU does not constitute land disposal of hazardous wastes.

(2) Consolidation or placement of remediation wastes into or within a CAMU does not constitute creation of a unit subject to minimum technology requirements.

(b) (1) EPA may designate a regulated unit (as defined in 40 CFR § 264.90(a)(2)) as a

CAMU, or may incorporate a regulated unit into a CAMU, if:

(i) The regulated unit is closed or closing, meaning it has begun the closure process under 40 CFR § 264.113 or § 265.113; and

(ii) Inclusion of the regulated unit will enhance implementation of effective, protective and reliable remedial actions for the facility.

(2) The subpart F, G, and H requirements and the unit-specific requirements of 40 CFR Part 264 or 265 that applied to that regulated unit will continue to apply to that portion of the CAMU after incorporation into the CAMU.

(c) EPA shall designate a CAMU in accordance with the following:

(1) The CAMU shall facilitate the implementation of reliable, effective, protective, and cost-effective remedies;

(2) Waste management activities associated with the CAMU shall not create unacceptable risks to humans or to the environment resulting from exposure to hazardous wastes or hazardous constituents;

(3) The CAMU shall include uncontaminated areas of the facility, only if including such areas for the purpose of managing remediation waste is more protective than management of such wastes at contaminated areas of the facility;

(4) Areas within the CAMU, where wastes remain in place after closure of the CAMU, shall be managed and contained so as to minimize future releases, to the extent practicable;

(5) The CAMU shall expedite the timing of remedial activity implementation, when appropriate and practicable;

(6) The CAMU shall enable the use, when appropriate, of treatment technologies (including innovative technologies) to enhance the long-term effectiveness of remedial actions by reducing the toxicity, mobility, or volume of wastes that will remain in place after closure of the CAMU; and

(7) The CAMU shall, to the extent practicable, minimize the land area of the facility upon which wastes will remain in place after closure of the CAMU

(d) Respondent shall provide sufficient information to enable EPA to designate a CAMU in accordance with the criteria in 40 CFR § 264.552.

(e) EPA shall specify the requirements for CAMUs in the order to include the following:

(1) The areal configuration of the CAMU.

(2) Requirements for remediation waste management to include the specification of applicable design, operation and closure requirements.

(3) Requirements for ground water monitoring that are sufficient to:

(i) Continue to detect and to characterize the nature, extent, concentration,

direction, and movement of existing releases of hazardous constituents in ground water from sources located within the CAMU; and

(ii) Detect and subsequently characterize releases of hazardous constituents to ground water that may occur from areas of the CAMU in which wastes will remain in place after closure of the CAMU.

(4) Closure and post-closure requirements

(i) Closure of corrective action management units shall:
(a) Minimize the need for further maintenance; and
(b) Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, for areas where wastes remain in place, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, to surface waters, or to the atmosphere.

(ii) Requirements for closure of CAMUs shall include the following, as appropriate and as deemed necessary by EPA for a given CAMU:
(a) Requirements for excavation, removal, treatment or containment of wastes;
(b) For areas in which wastes will remain after closure of the CAMU, requirements for capping of such areas; and
(c) Requirements for removal and decontamination of equipment, devices, and structures used in remediation waste management activities within the CAMU.

(iii) In establishing specific closure requirements for CAMUs under 40 CFR § 264.552(e), EPA shall consider the following factors:
(a) CAMU characteristics;
(b) Volume of wastes which remain in place after closure;
(c) Potential for releases from the CAMU;
(d) Physical and chemical characteristics of the waste;
(e) Hydrological and other relevant environmental conditions at the facility which may influence the migration of any potential or actual releases; and
(f) Potential for exposure of humans and environmental receptors if releases were to occur from the CAMU.

(iv) Post-closure requirements as necessary to protect human health and the environment, to include, for areas where wastes will remain in place, monitoring and maintenance activities, and the frequency with which such activities shall be performed to ensure the integrity of any cap, final cover, or other containment system.

(f) EPA shall document the rationale for designating CAMUs and shall make such documentation available to the public.

(g) The designation of a CAMU does not change EPA's existing authority to address clean-up levels, media-specific points of compliance to be applied to remediation at a facility, or other remedy selection decisions.

XI. REPORTING AND PUBLIC ACCESS TO DOCUMENTS AND SAMPLING DATA

The Respondent may assert a confidentiality claim covering all or part of any information submitted to EPA pursuant to this Order. Analytical data generated pursuant to this Order shall not be claimed as confidential. Confidentiality claims processed by EPA in accordance with the procedures outlined in 40 C.F.R. Part 2, or other applicable legal authority, shall include a written statement explaining how the information claimed to be confidential meets the substantive criteria for use in confidentiality determinations found in 40 C.F.R. § 2.208. If EPA approves the claim, EPA will afford the information confidential status, as specified in 40 C.F.R. Part 2, Subpart B. Information determined not to be confidential may be made available to the public without further notice to the Respondent. If the Respondent makes no claim of confidentiality for information submitted pursuant to this Order, EPA will make the information available without further notice to the Respondent.

XII. PUBLIC COMMENT AND PARTICIPATION IN CORRECTIVE MEASURE(S) SELECTION

1. EPA will provide the public with an opportunity to review and comment on the final draft, and any subsequent drafts, of the Corrective Measures Study Report and a description of Respondent's proposed corrective measure(s), including Respondent's justification for proposing such corrective measure(s) (the "Statement of Basis").

2. Following the public comment period, Respondent will respond to comments from the public, as appropriate. EPA may approve the Corrective Measures Study Report and approve Respondent's selection of one of the proposed final corrective measure(s) or require Respondent to revise the Report and/or perform additional corrective measures studies.

3. EPA will approve Respondent's selected corrective measure in the Final Decision and Response to Comments (RTC). The notification will include EPA's reasons for approving the corrective measure.

XIII. FACILITY ACCESS AND RECORD RETENTION

1. EPA, and/or any EPA authorized-representative(s) are authorized, allowed, and permitted, pursuant to Section 3007(a) of RCRA, 42 U.S.C. § 6927(a), to enter onto and to be escorted around all property at the Facility at all reasonable times for the purposes of enforcing the requirements of RCRA. EPA shall provide advance notice of any request for entry onto the Facility.

2. Respondent shall allow EPA to inspect and copy all documents and other writings, including all sampling and monitoring data, pertaining to work undertaken pursuant to this Order.

3 To the extent areas adjacent to the Facility are owned by parties other than those bound by this Order, Respondent shall use its best efforts to obtain site access agreements from the present owners to perform work pursuant to this Order no later than thirty (30) days after EPA approval of the specific workplan. Best efforts shall include, but not be limited to, payment by Respondent of reasonable rental costs and compensation for losses sustained by the owner or occupant of the realty. Access agreements shall provide access to Respondent, its Contractor(s), the United States, EPA, the State of Texas, TNRCC, and their representatives, including contractors. Any such access agreements shall be incorporated by reference into this Order. In the event that site access agreements are not obtained within thirty (30) days of the specific workplan approval, Respondent shall notify EPA by telephone within 24 hours after expiration of the above thirty (30) day period, and shall within seven (7) days of the oral notification, notify EPA in writing of the failure to gain such site access agreements regarding both the lack of, and efforts to obtain, such agreements. If EPA is able to obtain access, Respondent shall thereafter perform work described in this Order.

4. Nothing in this subsection is intended to limit, affect or otherwise constrain EPA's rights of access to property pursuant to applicable law.

5. All data, information, and records created or maintained in connection with the implementation of work under this Order, including the Respondent's contractors, shall be made available to EPA upon request. Respondent shall retain all such data, information or records for six (6) years after termination of the Order, and provide notification to EPA and TNRCC sixty (60) days prior to the destruction of any such documents. All employees of Respondent and all persons, including contractors who engage in activity under this Order, shall be available to and shall cooperate with the EPA.

XIV. FUNDING

1. Respondent agrees to obtain sufficient funding through its budgetary process to fulfill its obligations under this Order

2. Notwithstanding the provision of Paragraph 1 of this section, any requirement for the payment or obligation of funds by Respondent established by the terms of this Order shall be subject to the availability of appropriated funds, and no provision herein shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, 31 U.S.C. § 1341. In cases where payment or obligation of funds would constitute a violation of the Anti-Deficiency Act, the compliance schedules contained herein, which would require the payment or obligation of such funds, shall be adjusted. Failure to obtain adequate funds or appropriations from Congress does not release the Respondent from its ultimate obligation to comply with this Order as expeditiously as possible.

3. If funds are not externally approved or appropriated as requested, the Respondent shall report the lack of funds to EPA within ten (10) calendar days in accordance with Section VI.5.(f). The Respondent's notification shall include: (1) an explanation of the shortage of funds; (2) an evaluation of the priorities within the remaining work to be performed; (3) a discussion of the options; and (4) a recommendation for modifications to the appropriate work plans. EPA shall approve or modify the Respondent's recommendation and notify the Respondent thereof. The EPA-approved recommendation shall be deemed an amendment to this Order unless the Respondent invokes dispute resolution within (ten) 10 days after receipt thereof.

XV. DISPUTE RESOLUTION

1. The Parties to this Order shall make reasonable efforts to resolve disputes at the Project Manager or immediate supervisor level. If resolution cannot be achieved, the procedures of this section shall be implemented to resolve a dispute.

2. If Respondent disagrees, in whole or in part, with any EPA disapproval or modification or other decision or directive made by EPA pursuant to this Order, the CSSA Commander shall notify EPA in writing of its objections and the basis therefore, within fourteen (14) calendar days of receipt of EPA's disapproval, decision, or directive. Said notice shall set forth the specific points of the dispute, how the position Respondent is maintaining is consistent with the requirements of this Order, the basis for Respondent's position, and any matters which it considers necessary for EPA's determination. Within fourteen (14) calendar days of EPA's receipt of such written notice, the Director of the Compliance Assurance & Enforcement Division shall provide to Respondent its decision on the pending dispute.

3. EPA's decision pursuant to paragraph two (2) of this Section shall be binding upon both parties to this Order, unless a General Officer or Senior Executive Service-level person within Respondent's chain of command for environmental issues, within ten (10) calendar days, notifies EPA in writing of its

continued objection(s) and requests the Region 6 Regional Administrator to convene a conference for the purpose of discussing Respondent's objections and the reasons for EPA's determination. The Regional Administrator shall issue a written decision within fourteen (14) calendar days from the date of the informal conference, which shall be binding and incorporated into this Order. The failure to invoke these Dispute Resolution procedures shall constitute a waiver of the right to contest a specific requirement of this Order.

4. The pendency of any dispute under this Section shall not affect Respondent's responsibility for timely performance of the work required by this Order, except that the time period for completion of work affected by such dispute shall be extended for a period not to exceed the actual time taken to resolve any good faith dispute in accordance with the procedures specified herein.

5. During the pendency of the dispute resolution process, stipulated penalties with respect to the disputed matter shall be tolled.

XVI. EPA APPROVALS/DISAPPROVALS

All decisions, determinations, and approvals required to be made by EPA under this Order must be in writing. If EPA does not approve any plan, report, or other item required to be submitted to EPA for its approval pursuant to this Order, Respondent shall address any deficiencies as directed by the EPA, and resubmit the plan, report, or other item for the EPA's approval within the time frame specified in this Order.

XVII. RESERVATION OF RIGHTS

1. EPA expressly reserves all statutory and regulatory powers, authorities, rights, remedies, both legal and equitable, which may pertain to Respondent's failure to comply with any of the requirements of this Order, including without limitation, the assessment of penalties under Section 3008(h)(2) of RCRA, 42 U.S.C. § 6928(h)(2). This Order shall not be construed as a waiver or limitation of any rights, remedies, powers and/or authorities which EPA has under RCRA, CERCLA, or any other statutory, regulatory, or common law enforcement authority of the United States.

2. This Order shall not be construed to affect or limit the rights or responsibilities of any Federal, State, or local agency or authority pursuant to any other statutory provision, nor shall the entry of this Order limit or otherwise preclude the EPA from taking additional enforcement action pursuant to Section 3008(h) of RCRA, 42 U.S.C. § 6928(h), Section 106 of CERCLA, 42 U.S.C. § 9606, or any other available legal authority, should the EPA determine that such actions are warranted. Nor shall this Order be construed to affect or limit in any way the obligation of the Respondent to comply with all Federal, State, and local laws and regulations governing the activities required by this Order. This Order shall not be construed as a ruling or determination of any issue related to any Federal, State, or local permit whether required in order to implement this Order or required in order to continue or alter operations of the Facility (including but not limited to construction, operation or closure permits required under RCRA), and the Respondent shall remain subject to all such permitting requirements. Nothing in this Order is intended to release or waive any claim, cause of action, demand or defense in law or equity that any party to this Agreement may have against any person(s) or entity not a party to this Agreement.

3. EPA expressly reserves all rights and defenses that it may have, including the right both to disapprove of work performed by Respondent pursuant to this Order, and to request that Respondent perform tasks in addition to those stated in Attachment I of this Order.

4. Notwithstanding any other provision of this Order, the Respondent shall remain responsible for obtaining any applicable Federal, State, or local permit for any activity at the Facility including those necessary for the performance of the work and for the operation or closure of the Facility.

XVIII. SUBSEQUENT MODIFICATION OF ORDER

After consultation with the Respondent, this Order may be modified by EPA to ensure protection of human health and the environment. Such amendments shall be in writing, and shall be effective and incorporated into the Order on the date that such amendments are signed by EPA. Any reports, plans, specifications, schedules, and attachments required by this Order are, upon written approval by EPA, incorporated into this Order. Upon the request of the Respondent, EPA may extend the deadlines set forth in this Order

XIX. STIPULATED PENALTIES

1. Unless there has been a written modification of a schedule by EPA, or compliance with any provision of this order would result in Respondent exceeding available funding levels, or the Force Majeure provisions of this Order are invoked, Respondent's failure to comply with any scheduled requirement, condition or term, set forth in this Order in the time or adequacy specified herein, shall result in Respondent paying a Stipulated Penalty as follows.

Period of Failure to Comply	Penalty Per Violation Per Day
1st day through 30th day	$ 500.00
31st day through 60th day	$1,000.00
61st day and beyond	$ 5,000.00

2. Stipulated penalties under this Section shall be paid no later than thirty (30) days after Respondent's receipt of written notification of noncompliance from EPA. Such stipulated penalties shall be paid by money order, certified check, or cashier's check made payable to the "Treasurer of the United States" and mailed to:

Regional Hearing Clerk (6C)
U.S. EPA, Region 6
P.O. Box 360582M
Pittsburgh, PA, 15251

3. Document No. VI002(h)99-H FY99 should be clearly typed on the check to ensure proper credit. Respondent shall send simultaneous notices of such payments, including copies of the money order, cashier's check or certified check to the following

Section Chief
Technical Section, (6EN-HX)
Hazardous Waste Enforcement Branch
Compliance Assurance and Enforcement Division
U.S. EPA, Region 6
1445 Ross Avenue
Dallas, TX 75202-2733

Chief, Legal Branch (6EN-L)
Compliance Assurance and Enforcement Division
U.S. EPA, Region 6
1445 Ross Avenue
Dallas, TX 75202-2733

4. Respondent may dispute EPA's right to the stated amount of penalties, including the applicable time frame or start date for which stipulated penalties apply, by invoking the dispute resolution procedures under Section XV of this Order. During the dispute resolution process, stipulated penalties shall be tolled until a final decision is reached. If Respondent does not prevail upon resolution of the dispute, stipulated penalties shall begin to accrue on the date the final decision is reached, and EPA shall collect all penalties which accrued prior to the tolling of the stipulated penalties. If Respondent prevails upon resolution of the dispute, no penalties on the disputed issue shall be payable.

5. The stipulated penalties set forth in this Section do not preclude EPA from pursuing any other remedies or sanctions that may be available to EPA by reason of Respondent's failure to comply with any of the requirements of this Order. If EPA elects to pursue any other remedies or sanctions that may be available to EPA by reasons of Respondent's failure to comply with any of the requirements of this order, any assessed stipulated penalties will be credited towards the other remedies or sanctions.

XX. OTHER CLAIMS

Nothing in this Order shall constitute or be construed as a release from any claim, cause of action, demand, or defense in law or equity, against any person, firm, partnership, or corporation for any liability it may have arising out of or relating in any way to the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous constituents, hazardous substances, hazardous wastes, pollutants, or contaminants found at, taken to, or taken or migrating from the Facility.

XXI. PARTICIPATION IN COMMUNITY RELATIONS ACTIVITIES

Respondent shall plan, provide support, and attend public meetings, as appropriate, to explain corrective action activities at or concerning the Facility, including the findings of the RFI and CMS.

XXII. TERMINATION AND SATISFACTION

1. Respondent may seek termination of this Order by submitting to EPA a written document which indicates Respondent's compliance with all requirements of this Order and the associated dates of approval correspondence from EPA. The provisions of this Order shall be deemed satisfied upon Respondent's and EPA's execution of an "Acknowledgment of Termination and Agreement to Record Preservation and Reservation of Rights" ("Acknowledgment"). The Acknowledgment will specify that Respondent has demonstrated to the satisfaction of EPA that the terms of this Order, including any additional tasks determined by EPA, under Sections XVII and XVIII, to be required pursuant to this Order, have been satisfactorily completed. Respondent's execution of the Acknowledgment will affirm Respondent's continuing obligation (1) to preserve all records as required in Section XIII "Facility Access and Record Retention"; and (2) to recognize EPA's reservation of rights as required in Section XVII "Reservation of Rights", after all other requirements of the Order are satisfied.

2. This Order may also be terminated upon Respondent's receipt of written notice from EPA that Respondent has demonstrated, that the terms of the Order, including any additional tasks determined by EPA to be required pursuant to this Order, have been satisfactorily completed. This notice shall also affirm Respondent's continuing obligation (1) to preserve all records as required in Section XIII "Facility Access and Record Retention"; and (2) to recognize EPA's reservation of rights as required

in Section XVII "Reservation of Rights", after all other requirements of the Order are satisfied.

XXIII. LIMITATION OF EPA LIABILITY

EPA shall not be liable for any injuries or damages to persons or property resulting from acts or omissions of the Respondent, its officers, directors, employees, agents, receivers, trustees, successors, assigns, or contractors in carrying out activities pursuant to this Order, nor shall the EPA be held out as a party to any contract entered into by the Respondent in carrying out activities pursuant to this Order.

XXIV. OTHER ENFORCEMENT AUTHORITY

Failure or refusal to carry out the terms of this Order in a manner deemed satisfactory to EPA may subject Respondent to a civil penalty enforcement action in an amount not to exceed $25,000 for each day of non-compliance with this Order, in accordance with Section 3008(h) of RCRA, 42 U.S.C. § 6928(h).

XXV. STATEMENT OF SEVERABILITY

If any provision or authority of this Order, or the application of this Order to any party or circumstances, is held by any judicial or administrative authority to be invalid, the application of such provisions to other parties or circumstances and the remainder of the Order shall not be effected thereby.

XXVI. FORCE MAJEURE

1. Respondent shall perform all the requirements of this Order according to the time frames set unless this performance is prevented or delayed by events which constitute a Force Majeure.

2. For the purposes of this Order, a Force Majeure is defined as any event arising from causes beyond the control of Respondent, which could not have been prevented or mitigated through the exercise of due diligence, that delays or prevents the performance of any obligation under this Order. Such events do not include increased costs of performance, economic hardship, changed economic circumstances, normal precipitation events, or failure to submit timely and complete applications for Federal, State, or local permits. A Force Majeure shall include insufficient availability of funds in the environmental management program only if the Respondent shall have made timely requests for such funds as part of the budgetary process set forth in Section XIV of this Order.

3. Respondent has the burden of proving by clear and convincing evidence that any delay is or will be caused by events beyond its control. EPA shall make the final determination as to whether certain events constitute a Force Majeure.

4. In the event of a Force Majeure, Respondent shall immediately notify EPA by telephone within 24 hours after Respondent becomes aware of the event and shall within seven (7) days of the oral notification, notify EPA in writing of the cause and anticipated length of the delay. The notification shall also state the measures taken and/or to be taken to prevent or minimize the delay, and the time table by which Respondent intends to implement the delayed activity. Failure of Respondent to comply with the Force Majeure notice requirements will be deemed a forfeiture of its right to Force Majeure.

5. In the event of a Force Majeure, the time for performance of the activity delayed by the Force Majeure may be extended for the period of the delay attributable to the Force Majeure plus reasonable additional time for resumption of activities. The time for performance of any activity dependent on the

delayed activity shall be similarly extended, except to the extent that the dependent activity can be implemented in a shorter time. EPA shall determine whether subsequent requirements are to be delayed and the time period granted for any delay. Respondent shall adopt all reasonable measures to avoid or minimize any delay caused by a Force Majeure.

XXVII. SURVIVABILITY/PERMIT INTEGRATION

1. Subsequent to the issuance of this Order, a RCRA permit or Post-Closure Order may be issued to the Facility incorporating the requirements of this Order by reference.

2. Any requirements of this Order shall not terminate upon the issuance of a RCRA permit or Post-Closure Order unless all Order requirements of the Corrective Action Plan (Attachment I) are expressly replaced by the requirements in the permit or all provisions of this Order have been fully complied with to EPA's satisfaction as per Section XXII of this Order.

XXVIII. EFFECTIVE DATE

The Effective Date of this Order shall be the date on which it is signed by the EPA. Because this Order was entered with the consent of both parties, Respondent explicitly waives its right to request a hearing on this matter and consents to the issuance of this Order without a hearing pursuant to § 3008(b) of RCRA as an Order issued pursuant to § 3008(h) of RCRA, 42 U.S.C. 6928(b).

IT IS SO AGREED AND ORDERED:

Dated: _____ By: _____
Ernest N. Roberson, Jr.
Lieutenant Colonel, U.S. Army
Commanding
CSSA

Dated: _____ By: _____
Samuel Coleman, P.E., Director
Compliance Assurance &
Enforcement Division
U.S. Environmental Protection Agency, Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

CERTIFICATE OF SERVICE

I hereby certify that on the 5th day of May, 1999, the original of the foregoing Administrative Order on Consent was hand delivered to the Regional Hearing Clerk, U.S. Environmental Protection Agency, Region 6, First Interstate Bank Tower, 1445 Ross Avenue, Dallas, Texas 75202-2733, and that a true and correct copy of the Administrative Order on Consent was hand delivered to Brian Murphy, the Project Manager for the Respondent on the 5th day of May, 1999.

_____

Signature

SCOPE OF WORK
IMPLEMENTATION OF INTERIM/STABILIZATION MEASURES
CAMP STANLEY STORAGE ACTIVITY

A. PURPOSE

Interim/Stabilization Measures are implemented so as to mitigate a current or potential threat to human health and/or the environment. Interim/Stabilization Measures must be consistent with and integrated into any long term remedy at the Facility. Where applicable, Respondent may provide information on existing interim measures and their effectiveness.

B. SCOPE

The Interim/Stabilization Measures to be implemented at the Facility consist of the following tasks:

1. Development of the Interim/Stabilization Measures Work Plan

2. Interim/Stabilization Measures Implementation

3. Preparation of Reports

C. IMPLEMENTATION OF INTERIM/STABILIZATION MEASURES

The Respondent shall submit an Interim/Stabilization Measures (IM) Workplan, and implement the interim/stabilization measures contained in the IM Workplan, as described below and in accordance with Section VI.1 of the Order. The information may be provided in the CSSA Environmental Encyclopedia.

1. Interim/Stabilization Measures Workplan

The IM Workplan shall include, but not be limited to, the following:

(a) A description of on-going and planned interim measures;
(b) A statement of the objectives of each interim/stabilization measure, including how the measure mitigates a potential threat to human health and the environment and is consistent with and integrated into any long term remedy for the Facility; and
(c) Proposed location, design plans and specifications, construction, operation, and maintenance requirements of the interim measures, including a sampling and analysis plan.

2. Interim/Stabilization Measures Implementation

Interim/Stabilization Measures shall include, but not be limited to, the following:

(a) The off-site monitoring wells that were sampled in 1996 shall be resampled to determine if the wells have become impacted by the ground water plume. All facility potable water wells and ground water monitoring wells shall be sampled in order to provide a current baseline for ground water contamination delineation.

(b) Respondent shall locate and map all off-site water wells, located within one-quarter mile of the facility boundary, which have the potential to be impacted by activities from the Facility.

(c) Respondent shall evaluate the interim measures (IMs) necessary to control the further spread of contamination from the oxidation pond (SWMU O-1). At a minimum, the following interim measures shall be evaluated and implemented, as appropriate:

(1) In-situ treatment or excavation and removal of the contaminated soil and/or sludge; and/or

(2) Mitigate the migration of contamination from the oxidation pond.

(d) Respondent shall expedite the closure of the oxidation pond under State closure requirements. In order to expedite closure of the oxidation pond, previous investigation data and results shall be used.

(e) CSSA shall determine the proper disposition, and then implement the action, for the soil piles at the previously sifted SMWUs (B-8, 20, 24, 28, and Demo Dud Area).

3. Reports

The Respondent shall prepare plans, specifications, and reports according to the requirements as set forth above to document the design, construction, operation, maintenance, and monitoring of the interim measures. In addition the documentation shall include, but not be limited to the following:

(a) Progress Reports

The Respondent shall provide the State and EPA with signed, quarterly IM progress reports containing, but not limited to, the following information.

(1) A description and estimate of the percentage of the IM completed;
(2) Summaries of all findings determined during the course of IM actions;
(3) Summaries of all changes made in the IM during the reporting period;
(4) Summaries of all contacts with representatives of the local community, public interest groups or State government during the reporting period;
(5) Summaries of all problems or potential problems encountered during the reporting period;
(6) Actions being taken to rectify problems;
(7) Projected work for the next reporting period; and
(8) Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

(b) Interim/Stabilization Measure Report

No later than sixty (60) days after data validation for the completion of the construction of the IM (except for long term operation, maintenance and monitoring), the Respondent shall submit a Final IM Report to EPA for approval, or modification and approval, by EPA. The Report shall document whether the project is consistent with the design specifications, and whether the interim/stabilization measures are performing adequately. The report shall include, but not be limited to, the following elements:

(1) Synopsis of the interim/stabilization measures and certification of the design and construction;
(2) Explanation of any modifications to the plans and why these were necessary for the project;
(3) Listing of the criteria, established before the interim measures were initiated, for

judging the functioning of the interim measures, and also an explanation of any modification to these criteria;

(4) Results of monitoring activities at the Facility, and an evaluation of the extent to which the interim/stabilization measures will meet or exceed the performance criteria; and

(5) Description of the operation and maintenance (including monitoring) to be undertaken at the Facility.

The IM Report shall include, but not be limited to, copies of the inspection summary reports, inspection data sheets, problem identification and corrective measure reports, block evaluation reports, photographic reporting data sheets, design engineers' acceptance reports, deviations from design and material specifications (with justifying documentation) and as-built drawings.

D. FACILITY SUBMISSION SUMMARY

A summary of the information reporting requirements contained in the Interim Measures Scope of Work is present below:

Facility Submission	Due Date*
Submit IM Workplan	120 days
Submit IM Report	60 days after data validation for completion of construction of the IM
Progress Reports	Quarterly

*All dates are calculated from the Effective Date of this Order unless otherwise specified.

SCOPE OF WORK
RCRA FACILITY INVESTIGATION (RFI)
CAMP STANLEY STORAGE ACTIVITY

A. PURPOSE

The purpose of this RCRA Facility Investigation (RFI) is to determine the nature and extent of releases of hazardous waste or constituents from regulated units, solid waste management units (SWMUs), and areas of concern (AOCs) at the Facility, and to gather all necessary data to support the Corrective Measures Study. The Respondent shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RFI at the Facility. EPA/TNRCC/CSSA shall develop a process to determine the level of investigation required for each site. In order to expedite the remediation of the most contaminated sites first, a phased RFI approach will be utilized. A site that is determined to be an AOC will be investigated. If any AOC is identified as having chemicals of concern that have been released into the environment, it shall be added to the RFI process.

B. SCOPE

The RFI consists of seven tasks:

1. Task I: Preliminary Report: Description of Current Conditions

    A. Facility Background
    B. Nature and Extent of Contamination
    C. Pre-Investigation Evaluation of Corrective Measure Technologies

2. Task II. RFI Workplan

    A. Project Management Plan
    B. Data Collection Quality Assurance Plan
    C. Data Management Plan
    D. Health and Safety Plan
    E. Community Relations Plan

3. Task III: Facility Investigation

    A. Environmental Setting
    B. Source Characterization
    C. Contamination Characterization
    D. Potential Receptor Identification

4. Task IV. Human Health and Ecological Risk Assessment

5. Task V: Investigation Analysis

6. Task VI: Treatability Studies

7. Task VII: Progress Reports

B.1. TASK I: PRELIMINARY REPORT: DESCRIPTION OF CURRENT CONDITIONS

The Respondent shall submit a Preliminary Report: Description of Current Conditions (DCC) to EPA for approval or modification and approval, in accordance with Section VI.2 of the Order. The DCC Report shall provide the information as set forth below. The data gathered during any previous investigations or inspections and other relevant data shall be included. In providing the information requested below, Respondent shall provide either a written response or a reference to existing documentation which addresses the requested information. Respondent may submit the CSSA Environmental Encyclopedia as the DCC, as long as the information set forth below is included in the CSSA Environmental Encyclopedia

A. Facility Background

The Respondent's DCC Report shall include a summary of the regional location, pertinent boundary features, general Facility physiography, hydrogeology, and historical use of the Facility for the treatment, storage or disposal of solid and hazardous waste. The Respondent's report shall include, but not be limited to, the following:

1. Map(s) depicting the following:

   (a) General geographic location;
   (b) Property lines, with the owners of all adjacent property clearly indicated, and all land previously owned and/or used by the Facility around what has been designated as the Facility,
   (c) Topography (with a contour interval of five (5) or ten (10) feet and an approximate scale of 3/4 inch = 100 feet), showing waterways, all wetlands, floodplains, surface water features, drainage patterns;
   (d) All tanks, past or present, buildings, utilities, paved areas, easements, rights-of-way, and other features;
   (e) All solid or hazardous waste treatment, storage or disposal areas active after November 19, 1980;
   (f) All known past solid or hazardous waste treatment, storage or disposal areas regardless of whether they were active on November 19, 1980;
   (g) All known past and present underground product and waste tanks or piping;
   (h) Surrounding land uses (residential, commercial, agricultural, recreational);
   (i) The location of all production and ground water monitoring wells. These wells shall be clearly labeled with ground and top of casing elevations included; and
   (j) The location of all wastewater and storm water outfalls used by the Facility.

All maps shall be of sufficient detail and accuracy to locate and report all past, current and future work performed at the Facility;

2. A history and description of ownership and operation, solid and hazardous waste generation, treatment, storage and disposal activities at the Facility;

3. Approximate dates or periods of all known past product and waste spills, identification of the materials spilled, the amount spilled, the location where spilled, and a description of the response actions conducted (local, State, or Federal response units or private parties), including copies of all inspection

reports and technical reports generated as a result of the response; and

4. A summary of past permits requested and/or received, any State or Federal environmental enforcement actions taken against the Facility, the resolution thereof, and a list of environmental studies performed for the Facility

B. **Nature and Extent of Contamination**

The Respondent shall include in the Preliminary Report the existing information on the nature and extent of contamination.

1. The Respondent's DCC Report shall include a summary of all possible source areas of contamination. This, at a minimum, should include all regulated units, solid waste management units, spill areas, and other suspected source areas of contamination. For each area, the Respondent shall identify the following:

   (a) Location of unit/area (which shall be depicted on a Facility map);
   (b) Quantities of solid and hazardous wastes in the area;
   (c) Hazardous waste or constituents, to the extent known, in the area; and
   (d) Identification of areas where additional information is necessary.

2. The Respondent shall include in the DCC Report an assessment and description of the existing degree and extent of contamination. This should include, but not be limited to, the following:

   (a) Available monitoring data and qualitative information on locations and levels of contamination at the Facility;
   (b) All potential migration pathways, including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and
   (c) The potential impact(s) on human health and the environment, including demography, ground water and surface water use, and land use.

C. **Pre-Investigation Evaluation of Corrective Measure Technologies**

Respondent shall include in the DCC Report an identification of site criteria that may influence the selection of corrective measure technologies that may be used on-site or off-site for the containment, treatment, remediation, and/or disposal of contamination at or nearby the Facility. Respondent shall also identify any field, laboratory, bench or pilot scale data that need to be collected in the facility investigation to facilitate the evaluation and selection of the final corrective measure or measures (e.g., compatibility of waste and construction materials, information to evaluate effectiveness, treatability of wastes, etc.).

B.2. TASK II: RFI WORKPLAN REQUIREMENTS

The Respondent shall prepare a Final RFI Workplan in accordance with Section VI.2. of the Order. The RFI Workplan shall include the development of several distinct plans, which shall be prepared concurrently. The RFI Workplan as approved or modified by EPA shall become the Final RFI Workplan. During the RFI, it may be necessary to revise the Final RFI Workplan to accommodate a Facility specific situation. The RFI Workplan shall include the following:

A. Project Management Plan (*Work Plan*)

The Respondent shall prepare a Project Management Plan, which will include a discussion of the technical approach, schedules, budget, and necessary personnel. The technical approach shall include the rationale for investigation of each media (soil, ground water, surface water, soil gas, and air) and a description of each area of concern which may have contamination from Facility activities. The technical approach shall address all the requirements set forth in Task III of this Corrective Action Plan. The Project Management Plan shall also document the overall management approach to the RFI.

B. Data Collection Quality Assurance Plan (*Field Sampling Plan*)

The Respondent shall prepare a Data Collection Quality Assurance Plan to document all monitoring procedures, including: sampling, field measurements, and sample analysis performed during the investigation to characterize the environmental setting, source, and contamination, so as to ensure that all information, data and resulting decisions are technically sound, statistically valid, and properly documented.

1. Data Collection Strategy

The Data Collection Strategy shall include, but not be limited to, the following:

(a) Description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;

(b) Description of methods and procedures to be used to assess the precision, accuracy and completeness of the measurement data;

(c) Description of the methodology used to assure that the data accurately and precisely represent the characteristics of a population, parameter variations at a sampling point, and process conditions or environmental conditions.
Examples of factors which shall be considered and discussed include:

(1) Environmental conditions at the time of sampling,
(2) Number of sampling points;
(3) Representativeness of selected media; and
(4) Representativeness of selected analytical parameters.

(d) Description of the measures to be taken to assure that the following data sets can be compared to each other:

(1) RFI data generated by the Respondent;
(2) RFI data generated by parties other than the Respondent;
(3) Data previously generated by Respondent or Respondent's agents.
(4) Data previously generated by parties other than the

Respondent.

(e) Details relating to the schedule and information to be provided in quality assurance reports. The reports shall include but not be limited to:

(1) Periodic assessment of measurement data accuracy, precision, and completeness;
(2) Results of performance audits, including whatever corrective actions are necessary as a result os audits and re-audits;
(3) Results of system audits; and
(2) Significant quality assurance problems and recommended solutions;

2 Sampling

The Sampling Strategy shall discuss:

(a) Selecting appropriate sampling locations, depths, etc.;
(b) Determining a statistically sufficient number of sampling sites;
(c) Measuring all necessary ancillary data;
(d) Determining conditions under which sampling will be conducted;
(e) Determining which media are to be sampled (e.g., ground water, air, soil, sediment, etc.);
(f) Determining which parameters are to be measured and where;
(g) Selecting the frequency of sampling and length of sampling period;
(h) Selecting the types of sample (e.g., composites vs. grabs) and number of samples to be collected;
(i) Documenting field sampling operations and procedures, including,

(1) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters, and adsorbing reagents);
(2) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;
(3) Documentation of specific sample preservation method;
(4) Calibration of field devices;
(5) Collection of replicate samples;
(6) Potential interferences present at the Facility;
(7) Construction materials and techniques, associated with monitoring wells and piezometers;
(8) Field equipment listing and sample containers;
(9) Sampling order; and
(10) Decontamination procedures.

(j) Selecting appropriate sample containers,
(k) Sample preservation; and
(l) Chain-of-custody, including:

(1) Standardized field tracking reporting forms to establish sample custody in the field prior to shipment; and
(2) Pre-prepared sample labels containing all information necessary for effective sample tracking

3. Field Measurements

The Field Measurements Strategy shall discuss.

(a) Selecting appropriate field measurement locations, depths, etc.;
(b) Providing a statistically sufficient number of field measurements;
(c) Measuring all necessary ancillary data;
(d) Determining conditions under which field measurement should be conducted;
(e) Determining which media are to be addressed by appropriate field measurements (e.g., ground water, air, soil, sediment, etc.);
(f) Determining which parameters are to be measured and where;
(g) Selecting the frequency of field measurement and length of field measurements period, and
(h) Documenting field measurement operations and procedures, including:

(1) Procedures and forms for recording raw data and the exact location, time, and Facility-specific considerations associated with the data acquisition;
(2) Calibration of field devices;
(3) Collection of replicate measurements;
(4) Potential interferences present at the Facility;
(5) Construction materials and techniques associated with monitoring wells and piezometers used to collect field data;
(6) Field equipment listing,
(7) Order in which field measurements were made; and
(8) Decontamination procedures.

4. Contaminated Material Disposal

All waste material and material contaminated with hazardous constituents generated by activities required in the RFI shall be disposed of in accordance with all State and Federal regulations.

5. Sample Analysis

The Sample Analysis Strategy shall specify the following:

(a) Chain-of-custody procedures, including:

(1) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;
(2) Provision for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and
(3) Specification of laboratory sample custody procedures for sample handling, storage, and disbursement for analysis.

(b) Sample storage procedures and holding times;
(c) Sample preparation methods;
(d) Analytical procedures, including:

(1) Scope and application of the procedure;
(2) Sample matrix;
(3) Potential interferences;
(4) Precision and accuracy of the methodology;
(5) Method detection limits;
(6) Calibration procedures and frequency;
(7) Data reduction, validation and reporting;
(8) Internal quality control checks, laboratory performance and systems audits and frequency, to be conducted annually during the life of an analytical services subcontract by Parsons or other contractor working for Respondent, including:

i) Method blank(s);
ii) Laboratory control sample(s);
iii) Calibration check sample(s);
iv) Replicate sample(s);
v) Matrix-spiked sample(s);
vi) "Blind" quality control sample(s);

(9) Preventive maintenance procedures and schedules;
(10) Corrective action (for laboratory problems); and
(11) Turnaround time.

C. Data Management Plan (*Quality Assurance Project Plan*)

The Respondent shall develop and implement a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the RFI.

1. Data Record

The data record shall include, but not be limited to, the following:

(a) Unique sample or field measurement code;
(b) Sampling or field measurement location and sample or measurement type;
(c) Sampling or field measurement raw data;
(d) Laboratory analysis ID number;
(e) Property or component measured; and
(f) Result of analysis (e.g., concentration).

2. Tabular Displays

The following data shall be presented in tabular displays:

(a) Unsorted (raw) data;
(b) Results for each medium, or for each constituent monitored;
(c) Data reduction for statistical analysis;
(d) Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and

(e) Summary data.

3. Graphical Displays

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

(a) Display sampling locations and sampling grids;
(b) Boundaries of sampling areas, and areas where more sampling is required;
(c) Levels of contamination at each sampling location;
(d) Geographical extent of contamination;
(e) Display contamination levels, averages, and maxima;
(f) Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters; and
(g) Indicate features affecting intramedia transport and show potential receptors; and
(h) Illustrate the structural geology in the area of the Facility, including detailed structural geology of the Facility.

D. Health and Safety Plan

The Respondent shall prepare and implement a Health and Safety Plan for RFI activities at the Facility.

1. Major elements of the Health and Safety Plan shall include, but not be limited to, the following:

(a) Facility description, including availability of resources such as roads, water supply, electricity and telephone service;
(b) Describe the known hazards and evaluate the risks associated with each activity conducted, including, but not limited to on and off-site exposure to contaminants during the implementation of interim measures at the Facility;
(c) List key personnel and alternates responsible for site safety, response operations, and for protection of public health,
(d) Delineate work areas;
(e) Describe levels of protection to be worn by personnel in work area;
(f) Establish procedures to control site access;
(g) Describe decontamination procedures for personnel and equipment;
(h) Establish site emergency procedures;
(i) Address emergency medical procedures for injuries and toxicological problems;
(j) Describe requirements for an environmental surveillance program;
(k) Specify any routine and special training required for responders; and
(l) Establish procedures for protecting workers from weather-related problems.

2. The Health and Safety Plan shall be consistent with:

(a) NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);

(b) EPA Order 1440.1 - Respiratory Protection;
(c) EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;
(d) Facility Contingency Plan;
(e) EPA Standard Operating Safety Guide (1984);
(f) OSHA regulations particularly in 29 CFR 1910 and 1926;
(g) State and local regulations; and
(h) Other EPA guidance as provided.

E. Community Relations Plan

Respondent shall prepare a Community Relations Plan which includes a description of the site background, history of community involvement at the site, community relations strategies, a schedule of community relations activities, a list of contacts, local officials, and interested parties. Respondent shall coordinate public relations activities with the EPA Project Manager. Respondent shall never appear to represent or speak for EPA before the public, other governmental officials, or the media.

B.3. TASK III: FACILITY INVESTIGATION

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

The investigations should result in data of adequate technical quality to support the development and evaluation of the alternatives during the Corrective Measures Study.

The Facility investigation activities shall be conducted in accordance with the RFI Workplan. All sampling and analyses shall be conducted in accordance with the Data Collection Quality Assurance Plan.

At the conclusion of the Facility investigations, the Respondent shall prepare and submit to EPA for review and approval an RFI Report, which shall contain an analysis and a summary of all Facility investigations implemented pursuant to the requirements of this Task III. EPA will approve or modify and approve the RFI Report.

A. Environmental Setting

The Respondent shall collect information to supplement and verify existing information on the environmental setting at the Facility. The Respondent shall characterize the following:

1. Hydrogeology

The Respondent shall prepare a report evaluating hydrogeologic conditions at the Facility. This report shall be included in the RFI Report and shall provide the following information:

(a) A description of the regional and Facility specific geologic and hydrogeologic characteristics affecting ground water flow beneath the Facility, including:

(1) Regional and Facility specific stratigraphy;
(2) Regional structural geology;
(3) Depositional history;
(4) Identification and characterization of areas and amounts of recharge and discharge;
(5) Regional and Facility specific ground water flow patterns;
(6) Seasonal variation in ground water flow patterns.

(b) An analysis of any topographic features that might influence the ground water flow system;

(c) Based on field data, tests, (gamma and neutron logging of existing and new wells, piezometers and borings) and cores, a representative and accurate classification and description of the hydrogeologic units which may be part of the migration pathways at the Facility (i.e., the aquifers and any intervening saturated and unsaturated units), including

(1) Hydraulic conductivity and porosity (total and effective);
(2) Lithology, grain size, sorting, degree of cementation;
(3) An interpretation of hydraulic interconnections between

saturated zones; and

(4) The attenuation capacity and mechanisms of the natural earth materials(e.g., ion exchange capacity, organic carbon content, mineral content etc.).

(d) Based on field studies and cores, structural geology and hydrogeologic cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of the migration pathways identifying:

(1) Sand and gravel deposits in unconsolidated deposits;
(2) Zones of fracturing or channeling in consolidated or unconsolidated deposits; and
(3) Zones of higher permeability or lower permeability that might direct and restrict the flow of contaminants;

(e) Based on data obtained from ground water monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring including:

(1) Water-level contour and/or potentiometric maps;
(2) Hydrologic cross sections showing vertical gradients;
(3) The flow system, including the vertical and horizontal components of flow;
(4) Any temporal changes in hydraulic gradients, due to seasonal influences; and
(5) Create flow net maps using well cluster data.

(f) A description of manmade influences that may affect the hydrogeology of the Facility, identifying:

(1) Active and inactive local water-supply and production wells with an approximate schedule of pumping; and
(2) Manmade hydraulic structures (pipelines, french drains, ditches, etc.).

2. Soils

The Respondent shall conduct a program to characterize the geologic units above the water table in the vicinity of the contaminant release(s). Such characterization may include, as appropriate, but not be limited to, the following information.

(a) USCS soil classification;
(b) Soil profile, including ASTM classification of soils;
(c) Directional relative permeability;
(d) Bulk density;
(e) Soil pH;
(f) Particle size distribution;
(g) Moisture content;
(h) Infiltration (field test);
(i) Storage capacity;

(j) Mineral content; and
(k) Soil conductivity.

3. Surface Water and Sediment

The Respondent shall conduct a program to characterize any marshes, creeks, wetland areas, or ditches surrounding and crossing the Facility, as appropriate. Such characterization shall include, but not be limited to, the following activities and information:

(a) Description of the temporal and permanent surface water bodies including:

(1) For all local wetland areas, temporal surface water bodies, and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies (i.e., 100 year event);
(2) Drainage patterns; and
(3) Evapotranspiration rates.

(b) Description of the chemistry of surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biochemical oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients, chemical oxygen demand, total organic carbon, and specific contaminant concentrations, as proposed by the Respondent and approved by EPA;
(c) Description of sediment characteristics including:

(1) Deposition area;
(2) Thickness profile; and
(3) Physical parameters (e.g., grain size, density, ion exchange capacity, etc.).

B. **Source Characterization**

Respondent shall document and quantify in the RFI Report the following specific characteristics to the extent known or ascertainable at all known source areas of hazardous wastes and/or hazardous constituents subsequent to November 1980 and to the extent known or ascertainable for periods prior thereto:

1. Source Areas

2. Unit/Disposal Area Characteristics:

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

3. Waste Characteristics:

(a) Type of waste placed in each unit;

(1) Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing or reducing agent);
(2) Quantity; and
(3) Chemical composition

(b) Physical and chemical characteristics of the wastes;

(1) Physical form (solid, liquid, gas);
(2) Physical description (e.g., powder, oily sludge);
(3) Temperature;
(4) pH;
(5) General chemical class (e.g., acid, base, solvent);
(6) Molecular weight;
(7) Density;
(8) Boiling point;
(9) Viscosity;
(10) Solubility in water;
(11) Cohesiveness of the waste; and
(12) Vapor pressure.

(c) Migration and dispersal characteristics of the waste;

(1) Sorption;
(2) Biodegradability, bioconcentration, biotransformation;
(3) Photodegradation rates;
(4) Hydrolysis rates; and
(5) Chemical transformations.

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

C. **Contamination Characterization**

The Respondent shall collect analytical data on ground water, soils, surface water and sediment contamination in the vicinity of the Facility and include said data in the RFI Report. These data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include time and location of sampling, media sampled, concentrations found, and conditions during sampling, and the identity of the individuals performing the sampling and analysis. The Respondent shall prepare for the RFI Report maps that indicate the extent of contamination within all media. The Respondent shall address the following types of contamination at the Facility:

1. Ground Water Contamination

Respondent shall characterize the vertical and horizontal extent of the ground water contamination plume. This characterization must include monitoring wells completed at various depths dependent upon hydrogeological conditions and contaminant characteristics. Characterization of the plume beyond Facility boundaries shall be conducted with a program utilizing present monitoring wells, additional wells

and soil gas testing. This investigation shall at a minimum provide the following information:

(a) A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Facility;
(b) The horizontal and vertical direction of contamination movement;
(c) The velocity of ground water;
(d) The horizontal and vertical concentration profiles of all constituents of potential concern (COPCs) in the ground water that are measured by EPA approved procedures;
(e) A minimum of two complete COPCs analyses are required in all wells;
(f) An evaluation of factors influencing the plume movement; and
(g) An extrapolation of future contaminant movement.

The Respondent shall document the procedures used in making the above determinations (e g., well design, well construction, geophysics, modeling, etc.)

2. Soil Contamination

The Respondent shall conduct an investigation to characterize the nature and extent of any contamination of the soil and rock units above the water table. The investigation shall provide the following information:

(a) A description of the vertical and horizontal extent of contamination both onsite and off-site;
(b) A description of contaminant and soil chemical properties within the contaminant source area and plume. This includes contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation and other factors that might affect contaminant migration and transformation;
(c) Specific soil properties and contaminant concentrations as proposed by Respondent and approved by EPA to include at a minimum;

    (1) USCS soil classification;
    (2) Soil profile, including ASTM classification of soils;
    (3) bulk density of soil;
    (4) soil pH;
    (5) particle size distribution;
    (6) moisture content;
    (7) storage capacity;
    (8) mineral content;
    (9) soil conductivity; and
    (10) concentration of constituents of potential concern at the site.

(d) The direction of contaminant movement;
(e) An extrapolation of future contaminant movement;
(f) The Respondent shall implement a soil boring investigation to determine the extent of soil contamination at the Facility. Soil gas monitoring will be performed during drilling of all borings Laboratory analysis of borings for contaminants listed in C.2.c.10 of the above section will be performed on soils at depths where either visual contamination is evident, or soil gas concentrations indicate contamination. All boreholes shall be properly abandoned. Disposal

of all drilled soils will conform to all applicable State and Federal regulations;

(g) Off-site soil contaminant plumes shall be defined using soil borings, soil gas monitoring, laboratory analyses, and closure of boreholes as described immediately above;

(h) A characterization of the physical and chemical nature of soils and contaminants in the following areas:

(1) Ditches and run-off accumulation areas at or near the SWMUs, AOCs, and/or Facility property boundaries;
(2) All contaminated soil storage areas and waste piles;
(3) Railcar unloading areas;
(4) Truck unloading areas; and
(5) Any other areas of concern.

(i) Maps of all areas included in the soil investigation which are at an appropriate scale to represent the site.

3. Surface Water and Sediment Contamination

The Respondent shall conduct a surface water and sediment investigation to characterize contamination resulting from releases at the Facility.

The investigation shall include, but not be limited to, the following information:

(a) A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Facility, and the extent of contamination in underlying sediments;
(b) The horizontal and vertical direction of contaminant movement;
(c) The contaminant velocity;
(d) An evaluation of the physical, biological and chemical factors influencing contaminant movement;
(e) An extrapolation of future contaminant movement;
(f) The surface water and sediment investigation must include the following to ensure adequate assessment of contaminants at or near the Facility:

(1) Samples of any ponded water bodies inside the Facility at or near a SWMU or AOC and immediately outside the Facility boundary near any SWMU or AOC;
(2) Samples from drainage ditches, culverts, etc., which accept water from areas nearby any SWMUs or AOCs and drain to wetland areas;
(3) Samples from wetland area at or near the Facility property boundaries and near a SWMU or AOC;
(4) Samples from wetland areas, if it is determined that contaminated constituents may have reached these areas;
(5) Analysis of samples for general water quality parameters, and should at minimum, include temperature, pH, dissolved oxygen (DO), conductivity, biochemical oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS), total dissolved solids (TDS), total organic carbon (TOC), and nutrients; and

(6) Analysis of samples for constituents related to past and present Facility activities.

(g) Maps for all areas included in the surface water and sediment investigation which are on a scale of appropriate to the size of the area.

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

4. Monitoring Wastewater Discharge

Respondent shall monitor the treated wastewater discharged from the Facility as required by Respondent's NPDES permit. Respondent shall use accepted protocols for sampling and laboratory analyses, a description of which shall be submitted to the State and EPA for review with the RFI Workplan.

5. Wetlands Monitoring

Respondent shall investigate wetland areas when identified as potentially impacted by the Facility. Respondent shall determine if contamination has reached such wetland areas with a sampling and analysis plan designed to characterize the physical and chemical nature of surface water, sediments, soils, and contaminants.

D. Potential Receptors

The Respondent shall collect the information necessary to describe the human populations and environmental systems that are susceptible to contaminant exposure from the Facility. The following characteristics shall be identified:

1. Local uses and possible future uses of ground water:

   (a) Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial) for each aquifer beneath the Facility.

2. Local uses and possible future uses of surface waters draining from the Facility:

   (a) Domestic and municipal (e.g. potable and lawn/gardening watering);
   (b) Recreational (e.g. swimming, fishing);
   (c) Agricultural,
   (d) Industrial; and
   (e) Environmental (e.g. fish and wildlife propagation)

3. Human use of or access to the Facility and adjacent lands, including but not limited to:

   (a) Facility operations;
   (b) Recreation;
   (c) Hunting;
   (d) Residential;

(e) Commercial;
(f) Zoning; and
(g) Relationship between population locations and prevailing wind direction.

4. A description of the biota in surface water bodies on, adjacent to, or affected by the Facility.

5. A description of the ecology overlying and adjacent to the Facility.

6. A description of any endangered or threatened species near the Facility.

B.4. TASK IV: HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

Sixty (60) days after the RFI Report is approved, the Respondent shall submit to EPA for review and approval a screening risk assessment or, if necessary, a baseline risk assessment for the potential human health and environmental risks posed by the site in the absence of any remedial action. For human health risks this effort will involve the following components: 1) contaminant identification; 2) exposure assessment; 3) toxicity assessment; and 4) risk characterization. For ecological risks the effort will include the following components: 1) problem formulation; 2) exposure assessment; 3) ecological effects assessment; and 4) risk characterization.

A. Human Health Risk Assessment

1. Contaminant Identification

The Respondent shall review available information on the hazardous substances present at the site and identify the major contaminants of concern. Contaminants of concern should be selected based on their intrinsic toxicological properties, because they are present above background, or risk-based screening levels, and/or because they are currently in, or potentially may migrate into, critical exposure pathways.

2. Exposure Assessment

The Respondent shall identify actual or potential exposure pathways, characterize potentially exposed receptors and evaluate the actual or potential extent of exposure.

3. Toxicity Assessment

The Respondent shall provide a toxicity assessment of those chemicals found to be of concern during site investigation activities. This will involve an assessment of the types of adverse health effects associated with chemical exposures, the relationships between magnitude of exposures, the relationships between magnitude of exposures and adverse effects, and the related uncertainties for contaminant toxicity.

4. Risk Characterization

The Respondent shall integrate information developed during the exposure and toxicity assessments to characterize the current or potential risk to human health posed by the site. This characterization should identify the potential for adverse health effects for the chemicals of concern and identify any uncertainties associated with contaminant(s), toxicity(ies), and/or exposure assumptions

B. Ecological Risk Assessment

1. Problem Formulation

The Respondent shall perform problem formulation to characterize relevant ecological information about the site, identify contaminants and receptors likely to be present and identify potential effects that may occur. The outcome of the problem formulation component will be a site specific conceptual model describing pathways for contaminants, receptors of concern, expected linkages between site-related

contaminants and ecological receptors that will be evaluated and effects that may be expected. Assessment endpoints and measurement endpoints will be identified as well as the hypotheses and objectives that will be evaluated.

2. Exposure Assessment

The Respondent shall perform an exposure assessment to document the release(s), migration and fate of contaminants and identify contaminants of concern. Representative biological receptors and their important habitats will be identified. The magnitude and the extent of exposure of contaminants of concern to receptors of concern will be documented.

3. Ecological Effects Assessment

The Respondent shall perform an ecological effects assessment including compilation of information on past studies of the toxicity of contaminants of concern to organisms of concern for the site and will conduct site specific studies to document effects (e.g., toxicity testing, community or population measurements, tissue residue analyses, and/or other biological effects measurements).

4. Ecological Risk Characterization

The Respondent shall perform ecological risk characterization by comparing exposure and effects information to assess the potential or actual effects at or near the site. Uncertainties in the ecological risk assessment process will be identified in this stage. This ecological risk characterization step will also be used to develop recommendations for ecologically protective clean-up levels, to evaluate any proposed remedial actions for their ability to reduce risk, and to identify further monitoring to document remedy effectiveness.

B.5. TASK V: INVESTIGATION ANALYSIS

In conjunction with the submittal of the Risk Assessment Report, the Respondent shall submit an Investigation Analysis to support the selection of Protection Standards for the Facility. The Analysis shall describe the extent of contamination (qualitative/quantitative) in relation to background levels indicative for the area around the Facility, and shall include the following information:

A. Protection Standards

1. Ground Water Protection Standards

For regulated units, the Respondent shall provide information including, but not limited to, the items listed below, which are necessary to support the EPA's selection/development of Ground Water Protection Standards for all of the Appendix IX constituents found in the ground water during the Facility Investigation (Task III). The Ground Water Protection Standards shall consist of:

(a) For any constituents for which an MCL has been promulgated under the Safe Drinking Water Act, the MCL value; or
(b) The background level of that constituent in the ground water; or
(c) Those level of constituents which are demonstrated as being protective of human health and the environment.

2. Other Relevant Protection Standards

The Respondent shall identify, in the Investigation Analysis, all relevant and applicable standards for the protection of human health and the environment (e.g. National Ambient Air Quality Standards, Federally approved state water quality standards, etc.).

B.6. TASK VI: TREATABILITY STUDIES

The Respondent shall complete a Treatability Studies (TS) Program if so directed by EPA. Treatability studies are performed to determine the applicability of corrective measure technologies to conditions and problems at or resulting from the Facility. In addition, if applicable, testing results and operating conditions will be used in the detailed design of the selected remedial technology. Where it is determined by EPA that treatability testing is required, the Respondent shall complete the activities described in this Task.

A. Determine Candidate Technologies

The Respondent will identify candidate technologies for a treatability studies program in the Preliminary Report: Description of Current Conditions (Task I). Additional treatability studies may also be identified during the RFI/CMS process. Treatability Studies will include the following evaluations: (1) installation and operation of a system designed to recover and control migration of hazardous waste and constituents in ground water; (2) installation and operation of a system designed to recover and control migration of hazardous waste and constituents in soil; (3) installation and operation of a system designed to recover and control migration of hazardous waste and constituents in surface water; (4) installation and operation of a system designed to control migration of hazardous waste and constituents in air; and (5) any additional candidate technologies for a treatability studies program. The listing of candidate technologies will cover the range of technologies required for alternatives analysis. The specific data requirements for the testing program will be determined and refined during the RFI and CMS. The treatability study(ies) shall include the following

1. Literature Survey

The Respondent will conduct a literature survey to gather information on performance, relative costs, applicability, removal efficiencies, operation and maintenance (O&M) requirements, and implementability of candidate technologies. If practical candidate technologies have not been sufficiently demonstrated, or cannot be adequately evaluated for this site on the basis of available information, treatability testing will be conducted

2. Evaluate Treatability Studies

Once a decision has been made to perform treatability studies, the Respondent and EPA will decide on the type of treatability testing to use (e.g., bench versus pilot). Because of the time required to design, fabricate, and install pilot scale equipment as well as perform testing for various operating conditions, the decision to perform pilot testing should be made as early in the process as possible to ensure that results are integrated into the evaluation of corrective measure alternatives within the CMS.

B. Implementation of Treatability Studies

Where a TS Program is conducted, the deliverables that are required include a work plan, a sampling and analysis plan, and a final treatability evaluation report.

1. Treatability Testing Workplan

(a) No later than thirty (30) days after receipt of written direction from EPA, Respondent shall submit to EPA a TS Workplan, for EPA review, modification, and approval.

(b) The TS Workplan shall describe the site background, remedial technology(ies) to be tested, test objectives, experimental procedures, treatability conditions to be tested, measurements of performance, analytical methods, data management and analysis, health and safety, residual waste management and schedule (e.g., testing, deliverables, etc.). The data quality objectives (DQO) for treatability testing should be documented as well. If pilot scale treatability testing is to be performed, the pilot-scale work plan will describe pilot plant installation and start-up, pilot plant operation and maintenance procedures, operating conditions to be tested, a sampling plan to determine pilot plant performance, and a detailed health and safety plan. If testing is to be performed off-site, permitting requirements will be addressed.

2. Sampling and Analysis Plan (SAP)

(a) If the original RFI Workplan is not adequate for defining the activities to be performed during the TS program, the TS Workplan shall include a treatability study SAP, or amendment to the original RFI Workplan.

(b) Respondent shall submit the SAP as an element of the Draft TS Workplan.

3. Treatability Study

(a) The Respondent shall complete TS activities according to the schedule described in the Workplan, and submit to EPA a Draft TS Report for review and approval by EPA.

(b) No later than thirty (30) days after receipt of EPA's comments on the Draft TS Report, Respondent shall submit a Final TS Report which addresses all of EPA's comments to the satisfaction of EPA.

(c) The report will evaluate each technology's effectiveness, implementability, cost and actual results as compared with predicted results. The report will also evaluate full scale application of the technology, including a sensitivity analysis identifying the key parameters affecting full-scale operation.

B.7. TASK VII: PROGRESS REPORTS

The Respondent shall at a minimum provide the State and EPA with signed, quarterly RFI progress reports containing:

A. A description and estimate of the percentage of the RFI completed;

B. Summaries of all findings;

C. Summaries of all changes made in the RFI during the reporting period;

D. Summaries of all contacts with representatives of the local community, public interest groups or the State government during the reporting period;

E. Summaries of all problems or potential problems encountered during the reporting period;

F. Actions being taken to rectify problems;

G. Changes in contact personnel during the reporting period;

H. Projected work for the next reporting period; and

I. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

C. FACILITY SUBMISSION SUMMARY

A summary of the activities and reporting requirements contained in the RFI Scope of Work is presented below:

Facility Submission	Due Date
Preliminary Report: Description of Current Conditions (Task I)	90 days
RFI Workplan (Task II)	120 days
RFI Report (Task III)	730 days after receipt of EPA approval of the RFI Workplan
Risk Assessment (Task IV)	60 days after EPA approval of RFI Report
Investigation Analysis (Task V)	Concurrently with the Risk Assessment Report
Treatability Studies (Task VI)	As directed by EPA, according to the schedule contained in the Treatability Study Workplan
Progress Reports on Tasks I through VI	Quarterly

*All due dates are calculated from the effective date of this Order unless otherwise specified.

SCOPE OF WORK
CORRECTIVE MEASURE IMPLEMENTATION
CAMP STANLEY STORAGE ACTIVITY

A. PURPOSE

The purpose of this Corrective Measure Implementation (CMI) program is to design, construct, operate, maintain, and monitor the performance of the corrective measure or measures selected to protect human health and the environment. Respondents will furnish all personnel, materials and services necessary for the implementation of the corrective measure or measures.

B. SCOPE

The Corrective Measure Implementation program consists of four tasks:

1. Task XI: Corrective Measure Implementation Program Plan

    A. Program Management Plan
    B. Community Relations Plan

2. Task XII: Corrective Measure Design

    A. Design Plans and Specifications
    B. Operation and Maintenance Plan
    C. Cost Estimate
    D Project Schedule
    E. Construction Quality Assurance Objectives
    F. Health and Safety Plan
    G. Design Phases

3. Task XIII. Corrective Measure Construction

    A. Responsibility and Authority
    B. Inspection Activities
    C. Monitoring or Testing Requirements
    D. Documentation

4. Task XIV: Reports

    A. Progress Reports
    B. Draft Reports
    C. Final Reports

B.1. TASK XI: CORRECTIVE MEASURE IMPLEMENTATION PROGRAM PLAN

The Respondent shall submit a Final Corrective Measures Implementation Program Plan as described below and in accordance with Section VI.4 of the Order. The CMI Program Plan shall include, but not be limited to, the following elements:

A. Program Management Plan

The Respondent shall prepare a Program Management Plan which will document the overall management strategy for performing the design, construction, operation, maintenance and monitoring of corrective measure(s). The Plan shall document the responsibility and authority of all organizations and key personnel involved with the implementation. The Plan will also include a description of qualifications of key personnel directing the Corrective Measure Implementation Program, including contractor personnel. The Plan shall include a schedule(s) for completion of Task XII.

B. Community Relations Plan

The Respondent shall revise the Community Relations Plan as necessary to address the information needs of the community during design and construction activities.

1 Specific activities which must be conducted during the design stage are the following.

(a) Revise the Facility Community Relations Plan to reflect knowledge of citizen concerns and involvement at this stage of the process; and

(b) Prepare and distribute a public notice and an updated fact sheet at the completion of engineering design.

2 Depending on citizen interest at a Facility at this point in the corrective action process, community relations activities could range from group meetings to fact sheets on the technical status.

B.2. TASK XII: CORRECTIVE MEASURE DESIGN

The Respondent shall prepare a Final Corrective Measure Design (CMD) Report that addresses the requirements necessary to implement the selected corrective measure(s) at the Facility, as defined in the Corrective Measure Study. The CMD Report shall include, but not be limited to, the following elements:

A. Design Plans and Specifications

The Respondent shall develop clear and comprehensive design plans and specifications, which include but are not limited to the following:

1. Discussion of the design strategy and the design basis, including:

   (a) Compliance with all applicable or relevant environmental and public health standards; and
   (b) Minimization of environmental and public impacts.

2. Discussion of the technical factors of importance including:

   (a) Use of currently accepted environmental control measures and technology;
   (b) The constructability of the design; and
   (c) Use of currently acceptable construction practices and techniques.

3. Description of assumptions made and detailed justification of these assumptions.

4. Discussion of the possible sources of error and references to possible operation and maintenance problems.

5. Detailed drawings of the proposed design including:

   (a) Qualitative flow sheets; and
   (b) Quantitative flow sheets.

6. Tables listing equipment and specifications.

7. Tables giving material and energy balances.

8. Appendices including:

   (a) Sample calculations (one example presented and explained clearly for significant or unique design calculations);
   (b) Derivation of equations essential to understanding the CMD Report; and
   (c) Results of laboratory and/or field tests.

B. Operation and Maintenance Plan

The Respondent shall prepare an Operation and Maintenance Plan to cover both implementation and long term maintenance of the corrective measure(s). The Plan shall be composed of, but not be limited to, the following elements:

1. Description of normal operation and maintenance (O&M) requirements:

   (a) Description of tasks for operation;
   (b) Description of tasks for maintenance;
   (c) Description of prescribed treatment or operation conditions; and
   (d) Schedule showing frequency of each O&M task.

2. Description of potential operating problems:
   (a) Description and analysis of potential operation problems,
   (b) Sources of information regarding problems; and
   (c) Common and/or anticipated remedies.

3. Description of routine monitoring and laboratory testing:

   (a) Description of monitoring tasks;
   (b) Description of required laboratory tests and basic interpretation of data;
   (c) Required QA/QC; and
   (d) Schedule of monitoring frequency and data, if appropriate, when monitoring may cease.

4. Description of alternate O&M:

   (a) Should systems fail, alternate procedures to prevent undue hazard; and
   (b) Analysis of vulnerability and additional resource requirements should a failure occur.

5. Safety plan:

   (a) Description of precautions, of necessary equipment, etc., for site personnel; and
   (b) Safety tasks required in event of system failure.

6. Description of equipment:

   (a) Equipment identification;
   (b) Installation of monitoring components;
   (c) Maintenance of site equipment; and
   (d) Replacement schedule for equipment and installed components.

7. Records and reporting mechanisms required:

   (a) Daily operating logs, as appropriate;
   (b) Laboratory records;
   (c) Records for operating costs;
   (d) Mechanism for reporting emergencies;
   (e) Personnel and maintenance records; and
   (f) Quarterly reports to State agencies.

An initial Operation and Maintenance Plan shall be submitted with the Draft CMD Report and the Final Operation and Maintenance Plan with the Final as-built Design Documents.

C. Cost Estimate

The Respondent shall develop cost estimates for the purpose of assuring that the Facility has the financial resources necessary to construct and implement the corrective measure(s). The cost estimate developed in the Corrective Measure Study shall be refined to reflect the more detailed and/or accurate design plans and specifications being developed. The cost estimate shall include both capital and operation and maintenance costs. An initial Cost Estimate shall be submitted simultaneously with the Draft CMD Report and the Final Cost Estimate with the Final Design Documents.

D. Project Schedule

The Respondent shall develop a detailed Project Schedule for construction and implementation of the corrective measure(s) (i.e. Task XIII), which identifies timing for initiation and completion of all critical path tasks. The Respondent shall specifically identify dates for completion of the project and major interim milestones which shall be enforceable terms of this Order. An initial Project Schedule shall be submitted simultaneously with the Draft CMD Report and the Final Project schedule with the Final Design Document.

E. Construction Quality Assurance Objectives

The Respondent shall identify and document the objectives and framework for the development of a construction quality assurance program including, but not limited to the following: responsibility and authority; personnel qualifications; inspection activities; sampling requirements; and documentation.

F. Health and Safety Plan

The Respondent shall modify the Health and Safety Plan developed for the RCRA Facility Investigation to address the activities to be performed at the Facility to implement the corrective measure(s).

G. Design Phases

The design of the corrective measure(s) should include, but not be limited to, the phases outlined below.

1. Correlating plans and specifications

General correlation between drawings and technical specifications, is a basic requirement of any set of working construction plans and specifications. Before submitting the project specifications, Respondent shall:

(a) Coordinate and cross-check the specifications and drawings; and
(b) Complete the proofing of the edited specifications and required cross-checking of all drawings and specifications.

These activities shall be completed prior to the 95% Pre-Final Design submittal to the Agency.

2. Equipment start-up and operator training

The Respondent shall prepare, and include in the technical specifications governing treatment systems, contractor requirements for providing the following elements: (1) appropriate service visits by experienced personnel to supervise the installation, adjustment, startup and initial operation of the treatment systems; and (2) training covering appropriate operational procedures once the startup has been successfully accomplished.

3. Additional Studies

Corrective Measure Implementation may require Additional Studies to supplement the available technical data. At the direction of the Agency for any such studies required, the Respondent shall furnish all services, including field work as required, materials, supplies, plant, labor, equipment, investigations, studies and superintendence. Sufficient sampling, testing and analysis shall be performed to optimize the required treatment and/or disposal operations and systems. There shall be an initial meeting of all principal personnel involved in the development of the program. The purpose will be to discuss objectives, resources, communication channels, role of personnel involved and orientation of the site, etc. The Interim Additional Studies report shall present the results of the testing with the recommended treatment or disposal system (including options). A review conference shall be scheduled after the interim report has been reviewed by all interested parties. The Final Additional Studies Report include all data taken during the testing and a summary of the results of the studies.

4. Pre-Final and Final Design

The Respondent shall submit the Pre-Final and Final Design documents in two parts. The first submission shall be at 95% completion of design (i.e., Pre-Final). After approval of the Pre-Final submission, the Respondent shall execute the required revisions and submit the Final Design documents 100% complete with reproducible drawings and specifications.

The Pre-Final Design submittal shall consists of the Design Plans and Specifications, Operation and Maintenance Plan, Capital and Operating and Maintenance Cost Estimate, Quality Assurance Plan and Specifications for the Health and Safety Plan and Project Schedule.

The Final Design submittal shall consist of the Final Design Plans and Specifications (100% complete), Respondent's Final Construction Cost Estimate, the Final Draft Operation and Maintenance Plan, Final Quality Assurance Plan and Health and Safety specifications. The quality of the design documents should be such that Respondents would be able to include them in a bid package and invite contractors to submit bids for the construction project.

B.3. TASK XIII: CORRECTIVE MEASURE CONSTRUCTION

The Respondent shall develop and implement a Construction Quality Assurance (CQA) Plan to ensure, with a reasonable degree of certainty, that a completed corrective measure(s) meets or exceeds all design criteria, plans and specifications. The CQA Plan shall be submitted to EPA for review and approval concurrently with the Pre-Final Design. The CQA Plan is a Facility specific document which must be submitted to EPA for review and approval prior to the start of construction. At a minimum, the CQA Plan should include the elements which are summarized below. Upon EPA approval or modification of the CQA Plan and Final Design, Respondents shall construct and implement the corrective measure(s) in accordance with the approved design, schedule and the CQA Plan.

A. Responsibility and Authority

The responsibility and authority of all organizations (i.e., technical consultants, construction firms, etc.) and key personnel involved in the construction of the corrective measure(s) shall be described fully in the CQA Plan. Respondents must identify a CQA officer and the necessary supporting inspection staff.

B. Inspection Activities

The observations and tests that will be used to monitor the construction and/or installation of the components of the corrective measure(s) shall be summarized in the CQA Plan. The Plan shall include the scope and frequency of each type of inspection. Inspections shall verify compliance with all environmental requirements and include, but not limited to air quality and emissions monitoring records, waste disposal records (e.g., RCRA transportation manifests), etc. The inspection should also ensure compliance with all health and safety procedures. In addition to oversight inspections, the Respondent shall conduct the following activities:

1. Pre-Construction Inspection and Meeting

Respondents shall conduct a Pre-Construction Inspection and Meeting with EPA to:

(a) Review methods for documenting and reporting inspection data;
(b) Review methods for distributing and storing documents and reports;
(c) Review work area security and safety protocol;
(d) Discuss any appropriate modifications of the construction quality assurance plan to ensure that site-specific considerations are addressed; and
(e) Conduct a site walk-around to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations.

The Pre-Construction Inspection and Meeting shall be documented by a designated person and minutes should be transmitted to all parties.

2. Pre-Final Inspection

Upon preliminary project completion, the Respondent shall notify EPA for the purposes of conducting a Pre-Final Inspection. The Pre-Final Inspection will consist of a walk-through inspection of the entire project site, as appropriate. The inspection is to determine whether the project is complete and consistent with the contract documents

and the EPA approved corrective measure. Any outstanding construction items discovered during the inspection will be identified and noted. Additionally, treatment equipment will be operationally tested by Respondent. The Respondent will certify that the equipment has performed to meet the purpose and intent of the specifications. Retesting will be completed where deficiencies are revealed. The Pre-Final Inspection Report should outline the outstanding construction items, actions required to resolve items, completion date for these items, and date for Final Inspection.

3. Final Inspection

Upon completion of any outstanding construction items, Respondents shall notify EPA for the purposes of conducting a Final Inspection. The Final Inspection will consist of a walk-through inspection of the project site, as appropriate. The Pre-Final Inspection Report will be used as a checklist with the Final Inspection focusing on the outstanding construction items identified in the Pre-Final Inspection. Confirmation shall be made that outstanding items have been resolved.

C. **Sampling Requirements**

The sampling activities, sample size, sample locations, frequency of testing, acceptance and rejection criteria, and plans for correcting problems as addressed in the project specifications should be presented in the CQA Plan.

D. **Documentation**

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

B.4. TASK XIV: REPORTS

The Respondent shall prepare plans, specifications, and reports as set forth in Task XI through Task XIV to document the design, construction, operation, maintenance and monitoring of the corrective measure. The documentation shall include, but not limited to the following:

A. Progress Reports

The Respondent shall at a minimum provide EPA with signed, quarterly progress reports containing:

1. A description and estimate of the percentage of the CMI completed;
2. Summaries of all findings and data;
3. Summaries of all changes made in the CMI during the reporting period;
4. Summaries of all contacts with representative of the local community, public interest groups or State government during the reporting period;
5. Summaries of all problems or potential problems encountered during the reporting period;
6. Actions being taken to rectify problems,
7. Projected work for the next reporting period; and
8. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

B. Reports

1. Respondent shall submit a Corrective Measure Implementation Program Plan as outlined in Task XI;
2. Respondent shall submit a Corrective Measure Design Report as outlined in Task XII, and in accordance with the EPA approved schedule included in the CMI Program Plan;
3. Respondent shall submit a Construction Quality Assurance Program Plan as outlined in Task XIII and in accordance with the EPA approved schedule included in the CMD Report; and
4. At the "completion" of the construction of the project, Respondent shall submit a Final Corrective Measure Implementation Report to EPA for review and approval. The CMI Report shall document that the project is consistent with the design specifications, and that the corrective measure is performing adequately. The CMI Report shall include, but not be limited to the following elements:

    (a) Synopsis of the corrective measure(s) and certification of the design and construction;
    (b) Explanation of any modifications to the plans and why these were necessary for the project;
    (c) Listing of the criteria, established before the corrective measure was initiated, for judging the functioning of the corrective measure and also explaining any modification to these criteria;
    (d) Results of Facility monitoring, indicating that the corrective measure(s) will meet or exceed the performance criteria; and
    (e) Explanation of the operation and maintenance (including monitoring) to be undertaken at the Facility.

The CMI Report should include, but not be limited to, all of the daily inspection summary reports, inspection summary reports, inspection data sheets, problem identification and corrective measure reports, block evaluation reports, photographic

reporting data sheets, design engineers' acceptance reports, deviations from designated material specifications (with justifying documentation) and as-built drawings.

C. Final Reports

No later than thirty (30) days after receipt of EPA's comments on the plans and reports included in this Scope of Work, Respondent shall finalize said plans and reports, including: (1) Final CMI Program Plan; (2) Final CMD Report; (3) Final CQA Plan; and (4) Final CMI Report. The final plans and reports shall address all of EPA's comments to the satisfaction of EPA.

C. FACILITY SUBMISSION SUMMARY

A summary of the activities and information reporting requirements contained in the Corrective Measure Implementation Scope of Work is present below:

FACILITY SUBMISSION	DATE DUE
CMI Program Plan (Task XI)	120 days after EPA approval of the remedy selection
Corrective Measure Design Plan (Task XII)	In accordance with the schedule in the EPA approved Final CMI Program Plan
Pre-Final Design (Task XII)	In accordance with the schedule in the EPA approved Final CMI Program Plan
Final Design (Task XII)	In accordance with the schedule in the EPA approved Final CMI Program Plan
Draft Construction Quality Assurance Plan (Task XIII)	Concurrent with the Pre-Final Design document
Final Construction Quality Assurance Plan (Task XIII)	Concurrent with the Final Design document
Construction of Corrective Measures (Task XIII)	60 days after receipt of EPA approval of the Final Corrective Measure Design Plan and Final Construction Quality Assurance Plan
Corrective Measure Construction Report (Task XIV)	In accordance with the EPA approved Final Corrective Measure Design Plan
Progress Reports on Tasks XI through XIV	Quarterly
Progress Reports during Operation and Maintenance	Quarterly

SCOPE OF WORK
CORRECTIVE MEASURE STUDY
CAMP STANLEY STORAGE ACTIVITY

A. PURPOSE

Based on the results of the RFI, the identified Corrective Measure Technologies (Task I.C.), and the results of any treatability studies, the Respondent shall identify, screen and develop the alternatives for removal, containment, treatment and/or other remediation of the contamination that has been identified at the Facility.

B. SCOPE

The Corrective Measure Study (CMS) program consists of three tasks:

1. Task VIII: Identification and Development of Corrective Action Alternatives

    A. Description of Current Condition
    B. Establish Corrective Action Objectives
    C. Identify, Screen, and Develop Corrective Measure Alternatives

2. Task IX. Evaluation of the Corrective Measure Alternatives

    A. Protective of Human Health and the Environment
    B. Attain Media Cleanup Standards
    C Control the Sources of Releases
    D. Comply with Any Applicable Standards for Management of Wastes
    E. Long Term Reliability and Effectiveness
    F. Reduction in the Toxicity, Mobility or Volume of Wastes
    G. Short Term Effectiveness
    H. Implementability
    I. Cost Estimate
    J. Public Involvement

3. Task X: Reports

    A. Progress Reports
    B. Draft Report
    C. Final Report

B.1. TASK VIII: IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE ACTION ALTERNATIVES

A. Description of Current Conditions

The Respondent shall submit, as an element of the CMS Report, an update to the information describing the current situation at the Facility and the known nature and extent of the contamination as documented by the RFI Report. The Respondent shall include an update to information presented in Task I of the RFI to EPA and the State regarding previous response activities and any interim measures which have or are being implemented at the Facility. The Respondent shall also include a Facility specific statement of the purpose for the response, based on the results of the RFI. The statement of purpose should identify the actual or potential exposure pathways that should be addressed by corrective measures.

B. Establishment of Corrective Action Objectives

The Respondent shall propose Facility specific objectives for corrective action, subject to EPA review and approval, as an element of the CMS Report. These objectives shall be based on media cleanup standards, human health and environmental criteria, resource protection, source control, information gathered during the RFI and interim measures, EPA guidance, and the requirements of any applicable State and Federal statutes and regulations.

C. Identification, Screening, and Development of Corrective Measure Alternatives

1. Identification

The Respondent shall review the results of the RFI, assess the technologies specified in Task I.C., and identify additional technologies which are applicable at the Facility. The Respondent shall list and describe potentially applicable technologies for each affected media that may be used to achieve the corrective action objectives. The Respondent shall include a table that summarizes the available technologies. Depending on the site-specific conditions, EPA may require the Respondent to include additional technologies.

The Respondent shall include innovative corrective action technologies when appropriate, especially in situations where there are a limited number of applicable existing corrective measure technologies.

The Respondent shall rely on standard engineering practice to determine which of the previously identified technologies appear most suitable for the Facility. Technologies can be combined to form the overall corrective action alternatives. The alternatives developed should represent a workable number of option(s) that each appear to adequately address all site problems and corrective action objectives. Each alternative may consist of an individual technology or a combination of technologies.

2. Screening

The Respondent shall screen the preliminary corrective measure technologies identified in Task I.C. of the RFI and any supplemental technologies to eliminate those that may prove infeasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that do not achieve the corrective measure objectives within a reasonable time period. This screening process focuses on eliminating those technologies which have severe limitations for a given set of waste and site-specific conditions. The screening step may also eliminate technologies based on inherent

technology limitations.

The Respondent shall evaluate and document the technology limitations of the corrective measure alternatives identified above which may prove infeasible to implement given the existing set of waste and site specific conditions.

Site, waste, and technology characteristics which are used to screen the corrective measure technology alternatives are described in more detail below:

a. Site Characteristics

Site data should be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics should be eliminated from further consideration.

b. Waste Characteristics

Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by these waste characteristics should be eliminated from consideration. Waste characteristics particularly affect the feasibility of in-situ methods, direct treatment methods, and land disposal (on/off-site).

c. Technology Limitations

During the screening process, the level of technology development, performance record, and inherent construction, operation, and maintenance problems should be identified and supported by performance data for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process. For example, certain treatment methods have been developed to a point where they can be implemented in the field without extensive technology transfer or development.

3. Development

Utilizing the technologies which are not eliminated in the screening process outlined in Task VIII C.2 , the Respondent shall identify corrective measure alternatives to achieve the corrective action objectives established in Task VIII.B.

B.2. TASK IX: EVALUATION OF THE CORRECTIVE MEASURE ALTERNATIVES

The Respondent shall describe and evaluate each corrective measure alternative that passes through the Initial Screening in Task VIII. For each alternative which warrants a more detailed evaluation, including those situations when only one alternative is being proposed, the Respondent shall provide detailed documentation of how the potential remedy will comply with each of the standards (i.e. Task IX.A. through Task IX.D) listed below. These standards reflect the major corrective action objectives and components of remedies including cleanup of releases, source control and management of wastes that are generated by remedial activities. The Respondent shall also provide detailed documentation for each of the additional evaluation criteria (i.e. Task IX.E through Task IX.J) which supports the use of viable remedial alternatives.

A. Protective of Human Health and the Environment

The standard for protection of human health and the environment is a general mandate derived from the RCRA statute. This standard requires that remedies include those measures that are needed to be protective, but are not directly related to media cleanup, source control, or management of wastes. An example would be a requirement to provide alternative drinking water supplies in order to prevent exposures to releases from an aquifer used for drinking water purposes. Another example would be a requirement for the construction of barriers or for other controls to prevent harm arising from direct contract with waste management units. Therefore, the Respondent shall include in the CMS Report a discussion on what types of short term remedies are appropriate for the particular Facility in order to meet this standard. This information shall be provided in addition to a discussion of how the other corrective measure alternatives meet this standard.

B. Attain Media Cleanup Standards

Corrective measures shall be required to attain media cleanup standards set by State or Federal regulations (e.g. ground water standards). The media cleanup standards for a corrective measure will often play a large role in determining the approach of implementing the remedy.

As part of the necessary information for satisfying this requirement, the Respondent shall address whether the potential corrective measure will achieve the corrective action objective identified under Task VIII.B, as approved by EPA, as well as other, alternative remediation objectives that may be proposed by the Respondent. The Respondent shall also include an estimate of the time frame necessary for each alternative to meet these standards.

C. Control the Sources of Releases

A critical objective of any corrective measure must be to stop further environmental degradation by controlling or eliminating further releases that may pose a threat to human health and/or the environment. Unless source control measures are taken, efforts to clean up releases may be ineffective or, at best, will essentially involve a perpetual cleanup. Therefore, an effective source control program is essential to ensure the long-term effectiveness and protectiveness of the corrective action program.

The proposed source control standard is not intended to mandate a specific remedy or class of remedies. Instead, the Respondent is encouraged to examine a wide range of options. This standard should not be interpreted to preclude the equal consideration of using other protective remedies to control the source, such as partial waste removal, capping, slurry walls, in-situ treatment/stabilization and consolidation. Source controls may need to be combined with

other measures, such as plume management or exposure controls, to ensure an effective and protective remedy.

D. Comply with Any Applicable Standards for Management of Wastes

The Respondent shall include a discussion of how the specific waste management activities will be conducted in compliance with all applicable State or Federal regulations (e.g., CAMU closure requirements, land disposal restrictions).

E. Long-term Reliability and Effectiveness

In evaluating the long-term reliability and effectiveness of a corrective measure, EPA will place an emphasis on its ability to provide adequate protection of human health and the environment over the long term. Thus, source control technologies that involve treatment of wastes, or that otherwise do not rely on containment structures or systems to ensure against future releases, will be strongly preferred to those that offer more temporary, or less reliable, controls.

Demonstrated and expected reliability is a way of assessing the risk and effect of failure. The Respondent shall consider whether the technology, or combination of technologies, has been used effectively together under analogous site conditions, whether failure of any one technology in the alternative will have an immediate impact on receptors, and whether the alternative will have the flexibility to deal with uncontrollable changes at the site (e.g., heavy rain storms, earthquakes, etc.).

Most corrective measure technologies, with the exception of destruction, deteriorate with time. Often deterioration can be slowed through proper system operation and maintenance, but the technology eventually may require replacement. Each corrective measure alternative shall be evaluated in terms of the projected useful life of the overall alternative and of its component technologies. Useful life is defined as the length of time the corrective action objective identified under Task VIII B can be maintained.

F. Reduction in the Toxicity, Mobility or Volume of Wastes

As a general goal, remedies will be preferred that employ techniques, such as treatment technologies, that are capable of eliminating or substantially reducing the inherent potential for the wastes in SWMUs (and/or contaminated media at the Facility) to cause future environmental releases or other risks to human health and the environment. Estimates of how much the corrective alternatives will reduce the waste toxicity, volume, and/or mobility may be helpful in applying this factor. This may be done through a comparison of initial site conditions to post-corrective measure conditions.

G. Short-term Effectiveness

Short-term effectiveness may be particularly relevant when remedial activities will be conducted in densely populated areas, or where waste characteristics are such that risks to workers or the environment are high and special protective measures are needed. Possible factors to consider include fire, explosion, exposure to hazardous substances and potential threats associated with treatment, excavation, transportation, and redisposal or containment of waste material.

H. **Implementability**

Implementability will often be a determining variable in shaping remedies. Some technologies will require State or local approvals prior to construction, which may increase the time necessary to implement the remedy. In some cases, State or local restrictions or concerns may necessitate eliminating or deferring certain technologies or remedial approaches from consideration in remedy selection. Information to consider may include, but not be limited to:

1. Additional time of administrative activities (e.g., permits, rights of way, off-site approvals, etc.) required prior to implementing the corrective measure alternative;

2. The availability of adequate off-site treatment, storage capacity, disposal services, needed technical services and materials;

3. The availability of prospective technologies for each corrective measure alternative;

4 Constructability is determined by conditions both internal and external to the Facility conditions and include such items as location of underground utilities, depth to water table, heterogeneity of subsurface materials, and location of the Facility (i.e., remote location vs. a congested urban area). The Respondent shall evaluate what measures can be taken to facilitate construction under these conditions. External factors which affect implementation include the need for special permits or agreements, equipment availability, and the location of suitable off-site treatment or disposal facilities; and

5. Time has two components that shall be addressed: the time it takes to implement a corrective measure and the time it takes to actually see beneficial results.

I. **Cost Estimate**

The Respondent shall develop an estimate of the cost of each corrective measure alternative (and for each phase or segment of the alternative). The cost estimate shall include both capital and operation and maintenance costs.

1. Capital costs consist of direct (construction) and indirect (nonconstruction and overhead) costs.

   (a) Direct capital costs include, but are not limited to:

      i) Construction costs: Costs of materials, labor (including fringe benefits and worker's compensation), and equipment required to install the corrective measure;
      ii) Equipment costs: Costs of treatment, containment, disposal and/or service equipment necessary to implement the action; these materials remain until the corrective action is complete;
      iii) Land and site-development costs: Expenses associated with purchase of land and development of existing property; and
      iv) Buildings and services costs. Costs of process and nonprocess buildings, utility connections, purchased services, and disposal costs.

(b) Indirect capital costs include, but are not limited to:

i) Engineering expenses: Costs of administration, design, construction supervision, drafting, and testing of corrective measure alternatives;

ii) Legal fees and license or permit costs: Administrative and technical costs necessary to obtain licenses and permits for installation and operation;

iii) Startup and initial evaluation and adjustment costs: Costs incurred during corrective measure startup; and

iv) Contingency allowances: Funds to cover costs resulting from unforeseen circumstances, such as adverse weather conditions, strikes, and inadequate Facility characterization.

2. Operation and maintenance costs are post-construction costs necessary to ensure continued effectiveness of a corrective measure. The Respondent shall consider the following operation and maintenance cost components:

(a) Operating labor costs: Wages, salaries, training, overhead, and fringe benefits associated with the labor needed for post-construction operations;

(b) Maintenance materials and labor costs: Costs for labor, parts, and other resources required for routine maintenance of facilities and equipment;

(c) Auxiliary materials and energy: Costs of such items as chemicals and electricity for treatment plant operations, water and sewer service, and fuel;

(d) Purchased services: Sampling costs, laboratory fees, and professional fees for which the need can be predicted;

(e) Disposal and treatment costs: Costs of transporting, treating, and disposing of waste materials, such as treatment plant residues, generated during operations;

(f) Administrative costs: Costs associated with administration of corrective measure operation and maintenance not included under other categories;

(g) Insurance, taxes, and licensing costs: Costs of such items as liability and sudden accidental insurance; real estate taxes on purchased land or rights-of-way; licensing fees for certain technologies; and permit renewal and reporting costs;

(h) Maintenance reserve and contingency funds: Annual payments into escrow funds to cover (1) costs of anticipated replacement or rebuilding of equipment and (2) any large unanticipated operation and maintenance costs; and

(i) Other costs: Items that do not fit any of the above categories.

The relative cost of a corrective measure may be an appropriate consideration, especially in those situations where several different technical alternatives to remediation will offer equivalent protection of human health and the environment, but may vary widely in cost. Cost estimates could include costs for: engineering, site preparation, construction, materials, labor, sampling/analysis, waste management/disposal, permitting, health and safety measures, a training, operation and maintenance, etc.

J. Public Involvement

After a CMS has been performed by the Respondent, and EPA has selected a preferred alternative for proposal in the Statement of Basis, it is the EPA's policy to request public comment on the Administrative Record and the proposed corrective measure(s). Changes to the proposed corrective measure(s) may be made by EPA after consideration of public comment. The EPA may also require that the Respondent perform additional corrective measures studies. In the event that significant interest is expressed during the public comment period, a public meeting may be held to facilitate community participation. After consideration of the public's comment on the proposed corrective measure(s), EPA will develop the Final Decision and Response to Comments (RTC) to document the selected corrective measure(s), the EPA's justification for such selection, and response to the public's comment. Additional public involvement activities may be necessary, based on Facility specific circumstances.

B.3 TASK X: REPORTS

The Respondent shall submit a Corrective Measure Study (CMS) Report presenting the results of Tasks VIII through X and recommending a corrective measure alternative.

A. **Progress Reports**

The Respondent shall at a minimum provide the State and EPA with signed, quarterly CMS progress reports containing:

1. A description and estimate of the percentage of the CMS completed;

2. Summaries of all findings;

3. Summaries of all contacts with representatives of the local community, public interest groups or State government during the reporting period;

4. Summaries of all problems or potential problems encountered during the reporting period;

5. Actions being taken to rectify problems;

6. Changes in the personnel involved with the CMS during reporting period; and

7. Projected work for the next reporting period.

B. **Corrective Measures Study Report**

The CMS Report shall at a minimum include:

1. A description of the Facility;

2. Site topographic map;

3. Updated description of the current conditions at the Facility;

   (a) Summary of field studies (ground water, surface water, soil, air); and
   (b) Summary of treatability studies.

4. A description of the corrective action objectives;

5. A description of the potentially applicable technologies;

   (a) Identification of technologies;
   (b) Screening of technologies.

6. Description of potentially applicable technology limitations;

7. Description of corrective measure alternatives identified after initial screening process;

   (a) Preliminary design criteria;

(b) General operation and maintenance requirements; and
(c) Long-term monitoring requirements.

8. Description of the following corrective measure standards and evaluation criteria:

(a) Protection of human health and the environment;
(b) Media cleanup standards;
(c) Release source control;
(d) Compliance with applicable standards for management of wastes;
(e) Long-term reliability and effectiveness;
(f) Reduction in toxicity, mobility, or volume of wastes;
(g) Short-term effectiveness;
(h) Implementability;
(i) Cost estimates; and
(j) Public involvement.

C. FACILITY SUBMISSION SUMMARY

A summary of the activities and information reporting requirements contained in the Corrective Measure Study Scope of Work is presented below:

Facility Submission	Due Date
CMS Report (Tasks VIII, IX, X)	120 Days after the Final RFI Report
Progress Reports (Tasks VIII, IX, X)	Quarterly

ATTACHMENT II

REFERENCE LIST

CORRECTIVE ACTION REFERENCE LIST

The following list comprises guidance documents and other information sources which may be useful in implementing corrective action activities at RCRA facilities. Contacts for additional information are included at the end of this list.

"*RCRA Corrective Action Plan - Final*," EPA 520-R-94-004, May 1994.

"*Interim Final RCRA Facility Investigation (RFI) Guidance*," Volumes I-IV, EPA/530/SW-89-031, May 1989.

"*Preparation of Soil Sampling Protocols: Sampling Techniques and Strategies*", EPA/600/R-92/128, July 1992.

"*Identification and Compilation of Unsaturated/Vadose Zone Models*", EPA/600/R-94/028, March 1994.

"*Handbook: Stabilization Technologies for RCRA Corrective Actions*," EPA/625/6-91/026, August 1991.

"*Innovative Treatment Technologies: Annual Status Report (Sixth Edition)*," EPA 542-R-94-005, Number 6, September 1994.

"*Terms of Environment - Glossary, Abbreviations, and Acronyms*," EPA 175-B-94-015, Revised April 1994.

"*Evaluation of Technologies for In-Situ Clean-up of DNAPL Contaminated Sites*," EPA 600/R-94/120.

"*Subsurface Characterization and Monitoring Techniques*," A Desk Reference Guide, Volume I, Solids and Ground Water, Appendices A and B, EPA/625/R-93/003a, May 1993.

"*Subsurface Characterization and Monitoring Techniques*," A Desk Reference Guide, Volume II, The Vadose Zone, Field Screening and Analytical Methods, Appendices C and D, EPA/625/R-93/003b, May 1993.

"*Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA*," Interim Final EPA/540/G-89/004, OSWER Directive 9355.3-01, October 1988.

"*RCRA Ground-water Monitoring Technical Enforcement Guidance Document (TEGD)*," OSWER Directive 9950.1, September 1986.

"*Handbook: Ground Water*," Volumes I and II, EPA/625/6-90/016 (a & b), September 1990 and July 1991.

"*Ground-Water Modeling: An Overview and Status Report*," EPA/600/2-89/028, December 1988.

"*Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities*," Interim Final, EPA/530/SW-89/026, April 1989.

"*Data Quality Objectives for Remedial Response Activities*," EPA/540/G-87/003 & 004, OSWER Directive 9335.0-7B, March 1987.

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

"*Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A)*," OSWER Directive 9285.7-01A; Interim Final, EPA/540/1-89/002, December 1989

"*Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part B, Development of Preliminary Remediation Goals)*," OSWER Directive 9285.7-01B
"*Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part C, Risk Evaluation of Remedial Alternatives)*," OSWER Directive 9285.7-01C.

"*Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual. Supplemental Guidance: "Standard Default Exposure Factors"*. OSWER Directive 9285.6-03.

"*Risk Assessment Guidance for Superfund, Volume II: Environmental Evaluation Manual*," Interim Final, EPA/540/1-89/001, March 1989.

"*Final Guidance for Data Useability in Risk Assessment,*" (Parts A & B), OSWER Directive 9285.7-09A, April 1992.

"*Supplemental Guidance to RAGS: Calculating the Concentration Term,*" OSWER Directive 9285.7-08I.

"*Exposure Factors Handbook,*" Office of Health and Environmental Assessment. EPA/600/8-89/043

"*Integrated Risk Information System - (IRIS),*" On-line Computer Service.

"*Health Effects Assessment Summary Tables,*" Office of Emergency and Remedial Response. Publication 9200.6-303.

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

"*Framework for Ecological Risk Assessment,*" EPA/630/R-92-001 (January 1992).

"*A Review of Ecological Assessment Case Studies from a Risk Assessment Perspective,*" EPA/630/R-92/005 May 1993.

"*A Review of Ecological Assessment Case Studies from a Risk Assessment Perspective, Volume II,*" EPA/630/R-94/003, July 1994.

"*ECO Update, Ecological Assessment of Superfund Sites: An Overview,*" Publication 9345.0-05I, Vol 1, No. 2 (December, 1991).

"*ECO Update, Developing A Work Scope for Ecological Assessment,*" Publication 9345.0-05I, Vol. 1, No. 4 (May 1992)

"*Checklist for Ecological Assessment/Sampling,*" Draft, Office of Solid Waste and Emergency Response (January 1993).

"*A Compendium of Superfund Field Operations Methods,*" Two Volumes, EPA/540/P-87/001a&b, OSWER Directive 9355.0-14, August 1987.

"*Technical Guidance Document: Construction Quality Assurance for Hazardous Waste Land Disposal Facilities,*" EPA 530/SW-86/031, OSWER Directive 9472.003, October 1986.

"*Corrective Measures for Releases to Ground Water from SWMUs,*" Draft Final, EPA/530-SW-86-020, March 1985.

"*Basics of Pump-and-Treat Groundwater Remediation Technology,*" EPA/600/8-90/003, March 1990.

"*Technical Guidance for Corrective Measures--Determining Appropriate Technology and Response for Air Releases,*" Draft Final, EPA/530-SW-86-021, March 1985.
"*Air/Superfund National Technical Guidance Study Series,*" Volumes I-IV, EPA 450/1-89-001,002,003,004 (1989 and 1990).

"*Corrective Measures for Releases to Soil from SWMUs,*" Draft F EPA/530-SW-86-022, March 1985.

"*Technical Guidance for Corrective Measures -- Subsurface Gas,*" EPA/530-SW-86-023, March 1985.

"*Guide for Conducting Treatability Studies under CERCLA,*" Interim Final, EPA/540/2-89/058.

"*Guide for Conducting Treatability Studies under CERCLA: Aerobic Biodegradation Remedy Screening*", EPA/540/2-91/013B, July 1991.

"*Guide for Conducting Treatability Studies under CERCLA: Chemical Dehalogenation,*" EPA/540/R-92/013B.

"*Guide for Conducting Treatability Studies under CERCLA: Soil Vapor Extraction,*" EPA/540/2-91/019B, September 1991.

"*Guide for Conducting Treatability Studies under CERCLA: Soil Washing*," EPA/540/2-91/020B, September 1991.

"*Selected Alternative and Innovative Treatment Technologies for Corrective Action and Site Remediation*," EPA/540/8-91/092, 1991.

"*Synopses of Federal Demonstrations of Innovative Site Remediation Technologies*," EPA/540/8-91/009, May 1991.

"*Bibliography of Federal Reports and Publications Describing Alternative and Innovative Treatment Technologies for Corrective Action and Site Remediation*," EPA/540/8-91/007, May 1991.

"*Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments*," EPA/530/SW-89/047, July 1989

"*Handbook on In-Situ Treatment of Hazardous Waste-Contaminated Soils*," EPA/540/2-90/002, January 1990.

"*Stabilization/Solidification for CERCLA and RCRA Wastes*," EPA/625/6-89/022, May 1989.

"*Technology Screening Guide for Treatment of CERCLA Soils and Sludges*," EPA/540/2-88/004, September 1988.

"*Health and Safety Requirements of Employees Employed in Field Activities*," EPA Order 1440.2, July 12, 1981.

"*Handbook of RCRA Ground-Water Monitoring Constituents: Chemical and Chemical Properties*," EPA/530/R-92/022, September 1992.

"*RCRA Ground-Water Monitoring: Draft Technical Guidance*," EPA/530/R-93/001, November 1992.

"*Statistical Training Course for Ground-Water Monitoring Data Analysis*," EPA/530/R-93/003, 1992.

"*Literature Survey of Innovative Technologies for Hazardous Waste Site Remediation: 1987 - 1991*," EPA/542/B-92/004, July 1992.

"*Characterizing Heterogeneous Wastes: Methods and Recommendations*," EPA/600/R-92/033, February 1992.

"*Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells*," EPA/600/4-89/034, April 1989.

"*RCRA Public Involvement Manual*," OSWER, EPA/530/R-93/006, September 1993.

"*Soil Vapor Extraction Technology, Reference Handbook*," ORD, EPA/540/2-91/003, February 1991.

"*Guidance on RCRA Corrective Action Decision Document: The Statement of Basis and Response to Public Comments*," OSWER Directive 9902.6, February 1991.

"*Contaminants and Remedial Options at Wood Preserving Sites*," EPA/600/R-92/182, 1992.

"*Test Methods For Evaluating Solid Waste, Physical/Chemical Methods (3rd Edition)*, SW-846, 1988.

"*Common Cleanup Methods at Superfund Sites*," EPA 540/R-94/043, August 1994.

"*Common Chemicals Found at Superfund Sites*," EPA 540/R-94/044, August 1994.

"*Guidance for Design, Installation and Operation of GroundWater Extraction and Product Recovery Systems*," PUBL-SW183-93, August 1993.

"*Guidance for Design, Installation and Operation of Soil Venting Systems*," PUBL-SW185-93, July 1993.

"*Guidance for Design, Installation and Operation of In-Situ Air Sparging Systems*," PUBL-SW186-93, September 1993.

QUALITY ASSURANCE

"*Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans*," QAMS-005/80, December 29, 1980.

AIR GUIDANCE

"*Air/Superfund NTGS Series: Volume I, Overview of Air Pathway Assessments for Superfund Sites*" (Revised), EPA-450/1-89-001a, November 1992.

"*Air/Superfund NTGS Series: Volume II, Estimation of Baseline Air Emissions at Superfund Sites*", EPA-450/1-89-002a, August 1990.

"*Air/Superfund NTGS Series: Volume III, Estimation of Air Emissions from Clean-up Activities at Superfund Sites*", EPA-450/1-89-003, January 1990.

"*Air/Superfund NTGS Series: Volume IV, Procedures for Dispersion Modeling and Air Monitoring for Superfund Air Pathway Analysis*", EPA-450/1-89-002a, July 1989.

"*Air/Superfund NTGS Series: Volume IV - Guidance for Ambient Air Monitoring at Superfund Sites*", (Revised) (Partially Replaces EPA-450/1-89-004), EPA-451/R-93-007, May 1993.

"*Air Stripper Design Manual*", EPA-450/1-90-003, May 1990.

"*Comparisons of Air Stripper Simulations and Field Performance Data*", EPA-450/1-90-002, March 1990.
"*Development of Example Procedures for Evaluating the Air Impacts of Soil Excavation Associated with Superfund Remedial Actions*", EPA-450/4-90-014, July 1990.

"*Guidance on Applying the Data Quality Objectives Process for Ambient Air Monitoring Around Superfund Sites*", (Stages I & II), EPA-450/4-89-015, August 1989.

"*Guidance on Applying the Data Quality Objectives Process for Ambient Air Monitoring Around Superfund Sites*", (Stage III), EPA-450/4-90-005, March 1990.

"*Review and Evaluation of Area Source Dispersion Algorithms for Emission Sources at Superfund Sites*", EPA-450/4-89-020, November 1989.

"*Soil Vapor Extraction VOC Control Technology Assessment*", EPA-450/1-89-017, Sept. 1989.

"*Superfund Air Pathway Analysis Review Criteria Checklists*", EPA-450/1-90-001, January 1990.

"*User's Guide for the Fugitive Dust Model*", EPA-910/9-88-202R, May 1990.

"*TSCREEN: A Model for Screening Toxic Air Pollutant Concentrations*", EPA-450/4-90-013, January 1991.

"*Estimation of Air Impacts for Air Stripping of Contaminated Water*", EPA-450/1-91-002, May 1991.

"*Database of Emission Rate Measurement Projects*", EPA-450/1-91-003, June 1991.

"*Emission Factors for Superfund Remediation Technologies*", EPA-450/1-91-001, March 1991.

"*Guidance on the Application of Refined Dispersion Models for Air Toxics Releases*", (Revises EPA-450/4-91-007), EPA-454/R-93-002, May 1993.

"*Contingency Plans at Superfund Sites Using Air Monitoring*", EPA-450/1-90-005, January 1990.

"*Estimation of Air Impacts for Soil Vapor Extraction (SVE) Systems*", EPA-450/1-92-001, January 1992.

"*Guideline for Predictive Baseline Emissions Estimation Procedures for Superfund Sites*", EPA-450/1-92-002, January 1992.

"*Screening Procedures for Estimating the Air Impacts of Incineration at Superfund Sites*", EPA-450/1-92-003,

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"*Estimation of Air Impacts for the Excavation of Contaminated Soil*", EPA-450/1-92-004, March 1992.

"*Models for Estimating Air Emission Rates from Superfund Remedial Actions*", EPA-451/R-93-001, March 1993.

"*Contingency Analysis Modeling for Superfund Sites and Other Sources*", EPA-454/R-93-001, January 1993.

"*Control of Air Emissions from Superfund Sites*", EPA-625/R-92/012, November 1992.

"*A Workbook of Screening Techniques for Assessing Impacts of Toxic Air Pollutants*", EPA-450/4-88-009, September 1988.

"*Applicability of Open Path Monitors for Superfund Site Cleanup*", EPA-451/R-92-001, May 1992.

"*Assessing Potential Indoor Air Impacts for Superfund Sites*", EPA-451/R-92-002, September 1992.

"*Evaluation of Short-term Air Action Levels for Superfund Sites*", EPA-451/R-93-009, May 1993.

"*Air Emissions from Area Sources: Estimating Soil and Soil-gas Sample Number Requirements*", EPA-451/R-93-002, April 1993.

"*Estimation of Air Impacts from Area Sources of Particulate Matter emissions at Superfund Sites*", EPA-451/R-93-004, April 1993.

"*Estimation of Air Impacts for Bioventing Systems Used at Superfund Sites*", EPA-451/R-93-003, April 1993.

"*Estimation of Air Impacts for Solidification and Stabilization Processes Used at Superfund Sites*", EPA-451/R-93-006, April 1993.

"*Estimation of Air Impacts for Thermal Desorption Units Used at Superfund Sites*", EPA-451/R-93-005, April 1993.

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"*Air/Superfund Guide to Pollutant Toxicity*", EPA-451/R-94-002, July 1994.

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"*Technical Support Services for Superfund Site Remediation and RCRA Corrective Action*," (third edition), EPA/540/8-91/091, March 1992.

"*Accessing Federal Data Bases for Contaminated Site Clean-Up Technologies*," EPA/540/8-91/008, May 1991.

"*Memorandum on the Use of Supplemental Environmental Projects, Amendment to GM 22*," James M. Strock, February 12, 1991.

"*Catalog of Office of Waste Programs Enforcement Publications*," EPA/540/8-90/016, November 1990.

"*A Catalogue of Hazardous and Solid Waste Publications*," EPA 530-SW-91-013, May 1991.

USEFUL TELEPHONE NUMBERS:

RCRA/CERCLA/UST Hotline: (800) 424-9346

EPA's Office of Research and Development publishes occasional ground water and engineering issue papers. For information contact ORD Publications Office, Center for Environmental Research

- Information (CERI): (513) 569-7562
- National Technical Information Services (NTIS): (703) 487-4650.