

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION II

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IN THE MATTER OF THE :
 :
DIAMOND ALKALI SUPERFUND SITE : U.S. E.P.A. Index No.
(Newark Bay Study Area) : CERCLA-02-2004-2010
 :
Occidental Chemical Corporation, :
 :
Respondent :
 :
 :
Proceeding Under Sections 104, 106 :
And 122 of the Comprehensive :
Environmental Response, Compensation :
And Liability Act, as amended, :
42 U.S.C. § 9604, § 9606 and § 9622 :
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ADMINISTRATIVE ORDER ON CONSENT
FOR REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

Conformed Copy
As amended
2/17/04

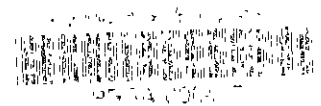


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I. JURISDICTION

1. This Administrative Order on Consent ("Order") is entered into voluntarily by the above-named Respondent and by the United States Environmental Protection Agency ("EPA") pursuant to the authority vested in the President of the United States by Sections 104, 106, 122(a), and 122(d)(3) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C. §§ 9604, 9606, 9622(a), and 9622(d)(3). This authority was delegated to the Administrator of the EPA by Executive Order 12580, dated January 23, 1987, and duly redelegated to the Regional Administrator, EPA Region II. Notice of this Order has been given to the New Jersey Department of Environmental Protection ("DEP").

II. DEFINITIONS

2. As used in this Order, unless the context clearly requires some other meaning, the following terms shall have the following meanings:

- a. ACO I shall mean the Administrative Consent Order entered into between DEP and Diamond Shamrock Chemicals Company and Marisol, Inc. on March 13, 1984.
- b. ACO II shall mean the Administrative Consent Order entered into between DEP and Diamond Shamrock Chemicals Company on December 21, 1984.
- c. Bench-Scale Treatability Studies shall mean those tests usually performed in a laboratory in which small volumes or batches of waste are tested to determine if and how the "chemistry" of the process works as individual treatment parameters varied.
- d. CERCLA shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. § 9601 et seq.
- e. Day shall mean calendar day.
- f. DEP shall mean the New Jersey Department of Environmental Protection, an agency of the State of New Jersey.
- g. Diamond Alkali Facility shall mean the properties in Newark, New Jersey, designated as Block 2348,

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Lots 57, 58, and 59, located at 80 and 120 Lister Avenue.

- h. Diamond Alkali Superfund Site shall mean the Diamond Alkali Facility, the Lower Passaic River Study Area, and the areal extent of the contamination to which hazardous substances from that facility were transported, have or may have migrated or otherwise threatened to migrate, or have come to be located.
- i. EPA shall mean the United States Environmental Protection Agency.
- j. Facility Coordinator shall mean the person designated by Respondent who shall be charged with the duty of being at all times knowledgeable of the performance of all Work performed pursuant to this Order.
- k. Feasibility Study shall mean those activities required in Paragraphs 45 through 48 below.
- l. Future EPA-Performed Response Costs shall mean all costs, including, but not limited to, direct and indirect costs, which EPA, its contractors, agents or representatives and the Agency for Toxic Substances and Disease Registry ("ATSDR") incur in conducting any portion of the work relating to this Order for which Respondent has not been given authority pursuant to this Order to perform. This shall include, but not be limited to, the performance of the Human Health and Ecological Risk Assessment, Peer Review activities, and integration of data obtained pursuant to this Order with the database and modeling for the Lower Passaic River.
- m. Future Response Costs shall mean all costs, including, but not limited to, those direct and indirect costs which EPA, or its contractors, agents or representatives incur to perform or support response actions relating to this Order, including activities relating to the development, issuance, and implementation of this Order. Future Response Costs also include, but are not limited to:

- i. negotiating, preparing, and reviewing this Order;
- ii. reviewing and providing comments on documents prepared pursuant to this Order;
- iii. organization and participation in technical meetings between EPA and Respondent conducted to implement this Order;
- iv. conducting any required community relations tasks, including briefing of state and local officials and preparation of press releases or fact sheets for the public with respect to the activities to be performed under this Order;
- v. on-site presence and periodic site inspections to oversee the implementation of this Order;
- vi. environmental monitoring, if deemed necessary by EPA, to determine Respondent's compliance with this Order;
- vii. taking of confirmatory samples, if deemed necessary by EPA;
- viii. certification that the Work under this Order has been completed;
- ix. EPA activities associated with obtaining access to off-site properties, if required for the implementation of this Order;
- x. EPA enforcement activities, as required for the implementation of this Order; and
- xi. conducting any emergency response actions pursuant to Paragraph 53.

Future Response Costs shall not include Future EPA-Performed Response Costs.

- n. Hazardous substance(s) shall mean that term as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14), and shall also mean any mixture(s) containing any such hazardous substance(s) at any concentration.

- o. Interest shall mean interest at the rate specified for interest on investments of the EPA Hazardous Substance Superfund established by 26 U.S.C. § 9507, compounded annually, in accordance with 42 U.S.C. § 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year.
- p. Lower Passaic River Study Area shall mean the 17-mile stretch of the lower Passaic River and its tributaries from Dundee Dam to Newark Bay.
- q. National Contingency Plan ("NCP") shall mean the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300, and all amendments thereto.
- r. Newark Bay Study Area shall mean Newark Bay and portions of the Hackensack River, Arthur Kill, and the Kill Van Kull.
- s. Occidental Chemical Corporation or OCC, successor to Diamond Shamrock Chemicals Company, shall mean the Occidental Chemical Corporation, the Respondent under this Order, which has its headquarters and principal place of business in Dallas, Texas.
- t. Order shall mean this Administrative Order on Consent, the Statement of Work, all appendices attached hereto and all documents incorporated by reference into this document including, without limitation, EPA-approved submissions. EPA-approved submissions (other than progress reports) are incorporated into and become a part of the Order upon approval by EPA. In the event of conflict between this Order and any appendix, this Order shall control.
- u. Paragraph shall mean a portion of this Order identified by an Arabic numeral.
- v. Parties shall mean the EPA and Respondent.
- w. Pilot-Scale Treatability Studies shall mean those tests that are intended to simulate the physical

as well as chemical parameters of a full-scale process by increasing the treatment unit sizes and the volume of waste processed over those of bench scale treatability studies.

- x. Project Manager shall mean the person designated by EPA to be responsible for monitoring of all actions and activities required pursuant to this Order, and for receipt of all items submitted to EPA under this Order. The Project Manager shall have the authority lawfully vested in a Remedial Project Manager and an On-Scene Coordinator by the NCP, 40 C.F.R. Part 300.
- y. Regional Administrator shall mean the Regional Administrator for EPA-Region II.
- z. Remedial Investigation shall mean those activities required in Paragraphs 39 through 42, below.
- aa. Remedial Investigation Work Plan or RIWP shall mean the document submitted pursuant to Paragraph 39 below that details the performance of the Remedial Investigation in conformance with the Statement of Work.
- bb. Respondent shall mean the party on the caption of this Order.
- cc. Response Costs shall mean all Future Response Costs and Future EPA-Performed Response Costs.
- dd. Section shall mean a portion of this Order identified by a Roman numeral.
- ee. Statement of Work or SOW shall mean the document attached to this Order as Appendix 1, which is incorporated into this Order by reference, and all provisions and schedules of which shall be enforceable as part of this Order.
- ff. Waste Material shall mean (1) any "hazardous substance" under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (2) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); and (3) any "solid waste" under Section 1004(27) of the Resource Conservation and Recovery Act, 42 U.S.C. § 6903(27).

99. Work shall mean all activities Respondent is required to perform under this Order.

III. PARTIES BOUND

3. This Order shall apply to and be binding upon the Respondent and Respondent's successors, receivers, trustees, and assigns who are charged with performing any activities pursuant to this Order.

4. Respondent shall provide a copy of this Order to any prospective owners or successors before a controlling interest in Respondent's assets, property rights or stock is transferred to the prospective owner or successor. Respondent shall provide a copy of this Order to each chief contractor and chief subcontractor retained to perform any Work under this Order, within seven (7) days after the effective date of this Order or on the date such services are retained, whichever date occurs later. Chief contractors or chief subcontractors shall be those contractors or subcontractors whose contracts or subcontracts for Work performed pursuant to this Order have a total value exceeding ten thousand dollars (\$10,000) per year. Respondent shall also provide a copy of this Order to each person representing Respondent with respect to the Newark Bay Study Area or the Work related thereto. With regard to the activities undertaken pursuant to this Order, each contractor and subcontractor shall be deemed to be related by contract to the Respondent within the meaning of Section 107(b)(3) of CERCLA, 42 U.S.C. § 9607(b)(3). Notwithstanding the terms of any contract, Respondent is responsible for compliance with this Order and for ensuring that its contractors, subcontractors, and agents comply with this Order, and perform any Work in accordance with this Order.

IV. FINDINGS OF FACT

5. Since the late 1800s, the lower Passaic River, has been a highly industrialized waterway, receiving direct and indirect discharges from industrial facilities.

6. The bottom sediments of the lower Passaic River contain concentrations of numerous hazardous substances, including, but not limited to, cadmium, copper, lead, mercury, nickel, zinc, polyaromatic hydrocarbons ("PAHs") bis(2-ethylhexyl) phthalate, polychlorinated biphenyls ("PCBs") dichlorodiphenyl-trichloroethate ("DDT"), diesel ("TELPH"), polychlorinated dibenzo-p-dioxins ("PCDDs"), including 2, 3, 7, 8-Tetrachloro-dibenzo-p-dioxin ("2,3,7,8-TCDD), polychlorinated dibenzofurans ("PCDFs"), 2,4-Dichlorophenoxy acetic acid ("2,4-

D"), 2,4,5-Trichlorophenoxy acetic acid ("2,4,5-T") and 2,4,5-Trichlorophenol ("2,4,5-TCP").

7. Between March 1951 and August 1969, the Diamond Alkali Company operated a facility located at 80 Lister Avenue. Among other chemicals, the company manufactured 2,4-D, 2,4,5-T, and 2,4,5-TCP, from which 2,3,7,8-TCDD is a by-product.

8. Production activities at the Diamond Alkali Facility ceased in August 1969. The entity which operated the Diamond Alkali Facility from 1951-1969 was Diamond Alkali Company, which changed its name in 1967 to Diamond Shamrock Corporation, and, in 1983, to Diamond Shamrock Chemicals Company.

9. On September 4, 1986, all the outstanding stock in Diamond Shamrock Chemicals Company was acquired by Oxy-Diamond Alkali Corporation, a wholly-owned indirect subsidiary of Occidental Petroleum Corporation. Diamond Shamrock Chemicals Company was then renamed Occidental Electrochemicals Corporation.

10. Effective November 30, 1987, Occidental Electrochemicals Corporation was merged into Occidental Chemical Corporation, a wholly-owned indirect subsidiary of Occidental Petroleum Corporation.

History of Response Actions

11. During the summer of 1983, hazardous substances were detected at various locations in Newark, New Jersey, including 80 Lister Avenue.

12. Removal activities were initiated by EPA and DEP in 1983 and were completed by Diamond Shamrock Chemicals Company in 1984 through 1986.

13. The removal activities at the 80 Lister Avenue location included the placement of a geotextile fabric on the property. Hazardous substances were vacuumed from the streets in the vicinity of 80 Lister Avenue. The soils and debris vacuumed from the streets, along with excavated soils that were also contaminated with hazardous substances, were later secured on the 120 Lister Avenue property.

14. EPA, pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, placed the Diamond Alkali Superfund Site on the National Priorities List, which is set forth at 40 C.F.R. Part 300, Appendix B, by publication in the Federal Register on September 21, 1984, 49 Fed. Reg. 37070.

15. Pursuant to ACO I and ACO II, Diamond Shamrock Chemicals Company conducted a remedial investigation and a feasibility study for the 80 and 120 Lister Avenue portion of the Diamond Alkali Superfund Site. This remedial investigation included the sampling and assessment of sediment contamination within the Passaic River. EPA issued an operable unit Record of Decision ("ROD") on September 30, 1987, which documents the selection of a remedial action plan for the cleanup of the 80 and 120 Lister Avenue portion of the Diamond Alkali Superfund Site. Pursuant to a judicial Consent Decree with EPA, Occidental Chemical Corporation and Chemical Land Holdings, Inc. agreed to implement the 1987 ROD.

16. Sampling of the Passaic River sediment during the course of the remedial investigation showed the presence of 2,3,7,8-TCDD, DDT, 2,4-D, 2,4,5-T, and 2,4,5-TCP, which were substances like those generated at the 80 and 120 Lister Avenue portion of the Diamond Alkali Superfund Site, as well as other contaminants.

17. Some of the chemicals found in the sediments during the course of the remedial investigation may have migrated from the 80 and 120 Lister Avenue portion of the Diamond Alkali Superfund Site into the Passaic River through ground-water and surface-water runoff.

18. On March 28, 1986, Diamond Shamrock Corporation submitted a report entitled "Passaic River Sediment Study," which further defined the extent of 2,3,7,8-TCDD contamination in the Passaic River sediments. Core (i.e., samples taken at depth) and surface grab samples were taken from the mouth of the Passaic River upstream to Dundee Dam. The highest levels of 2,3,7,8-TCDD were encountered in deep sediments (maximum of 1.8 parts per million) adjacent to and downstream from the 80 and 120 Lister Avenue portion of the Diamond Alkali Superfund Site.

19. Bulk surficial sediment data sampling events in the 1980s and 1990s across from and immediately downstream of the 80 and 120 Lister Avenue portion of the Diamond Alkali Superfund Site show concentrations of 2,3,7,8-TCDD ranging from approximately 400 parts per trillion (ppt) to 8400 ppt; further downstream (south of the New Jersey Turnpike overpass) concentrations range from 60-6300 ppt. These concentrations referenced above significantly exceed the levels that can produce toxic effects to biota. Recent studies have shown that 2,3,7,8-TCDD bio-accumulates in fish, to levels rendering the fish unfit for human consumption, from sediment with a much lower level of 2,3,7,8-TCDD than found in these sediments.

20. Data show that beginning in a sampling location about one mile south of the Second River, a tributary of the Passaic River, levels of 2,3,7,8-TCDD show a marked increase in both shallow and deep sediments. These higher levels of 2,3,7,8-TCDD continue from this sampling location to the mouth of the Passaic River.

21. These sampling events also showed the presence of other hazardous substances including, but not limited to, cadmium, copper, lead, mercury, nickel, zinc, PAHs, DDT, and PCBs, among other hazardous substances. The concentrations of some of these hazardous substances exceed the levels that can produce toxic effects to biota.

22. Based on the results of monitoring and research undertaken since the mid-1970s, the State of New Jersey has taken a number of steps, in the form of consumption advisories, closures, and sales bans, to limit the exposure of the fish-eating public to toxic contaminants in the lower Passaic River, Newark Bay, the Hackensack River, the Arthur Kill and the Kill Van Kull. The initial measures prohibited the sale, and advised against the consumption, of several species of fish and eel and was based on the presence of PCB contamination in the seafood. The discovery of widespread dioxin contamination in the Newark Bay Complex led the State of New Jersey to issue a number of Administrative Orders in 1983 and 1984 which prohibited the sale or consumption of all fish, shellfish, and crustaceans from the Lower Passaic River Study Area. These State fish advisories and prohibitions are still in effect.

23. Studies have shown that many of the substances referred to in the preceding Paragraphs can cause a variety of adverse, acute and/or chronic effects in exposed population groups.

a. 2,4-D and 2,4,5-T have been shown to be mutagenic or teratogenic to some organisms with demonstrated toxicity to fish and fish food organisms. 2,4,5-TCP is toxic to fish, accumulates in fatty tissue and is inert to biodegradation.

b. 2,3,7,8-TCDD is known to produce various systemic effects in animals. The systemic effects produced by 2, 3, 7, 8-TCDD include tumorigenesis, immunological dysfunction, and teratogenesis. In humans, 2,3,7,8-TCDD-contaminated materials are known to cause chloracne, metabolic disorders, and other systemic effects. Some studies are suggestive of 2,3,7,8-TCDD's abilities to cause cancer.

c. Lead has been shown to produce various systemic effects in humans, waterbirds, fish, and aquatic invertebrates. The systemic effects to humans include neurological impairment, kidney dysfunction, and decreased mental ability in infants and small children. Physiological indicators of chronic exposure in fish include a variety of deformities in larval and juvenile lifestages.

d. Mercury has been shown to be genotoxic in humans and animals. Long-term exposure to either inorganic or organic mercury can permanently damage the brain, kidney, and the developing fetus in humans. In fish and shellfish, toxic effects include a variety of reproductive, growth, and metabolic dysfunctions, as well as increased mortality in larval and juvenile stages.

e. Zinc has been shown to disrupt metabolic processes and inhibit growth and development in aquatic organisms. Prolonged exposures cause extensive edema and necrosis of liver tissue in fish. Inhibition or severe retardation of shell growth and increased larval mortality occur in shellfish. Anemia and damage to the pancreas are common symptoms of chronic sublethal exposure in humans.

f. PAHs have been shown to cause a wide range of responses in fish and other aquatic organisms, including behavioral, metabolic, reproductive, and growth dysfunction, as well as increased mortality in larval and juvenile lifestages. Several PAHs or their metabolic intermediates may be carcinogenic and mutagenic in humans and aquatic organisms.

g. PCBs may reasonably be anticipated to be carcinogenic, teratogenic, and mutagenic in humans and animals. In humans, PCBs have been shown to cause chloracne, liver damage, and other systemic effects. Typical PCB toxic responses in fish, shellfish, and waterbirds include weight loss, thymic atrophy, immunological impairment, hepatotoxicity, porphyria, and reproductive impairment.

24. Respondent OCC and EPA entered into an Administrative Order on Consent, Index No. II-CERCLA-0117, April 20, 1994 ("the AOC"), pursuant to which Respondent was ordered and agreed to undertake an RI/FS with respect to a portion of the Passaic River from an abandoned ConRail Railroad bridge at the downriver boundary located at the U.S. Army Corps of Engineers

("USACE") station designation of 40+00 (i.e., a transect running perpendicular to the USACE Federal Project Limit for dredging 4000 feet upstream from the red channel junction marker at the confluence of the Hackensack and Passaic Rivers) to a transect six miles (31680 feet) upriver located at the USACE station designation of 356+80.

25. In January of 2001 EPA by letter suggested that Respondent suspend certain work under the AOC, which it has done, in that EPA contemplated an RI/FS that would encompass a larger geographic area.

26. The sampling results from the investigation performed under the AOC and other environmental studies demonstrated that evaluation of a larger area was necessary. Pursuant to the Water Resources Development Act ("WRDA"), the United States Army Corps of Engineers ("USACE") received Congressional appropriations to conduct an ecosystem restoration study with its local sponsor, the New Jersey Department of Transportation, Office of Maritime Resources ("OMR"). Because an expanded EPA study and the USACE/OMR study have many overlapping information needs, the three agencies formed a partnership to identify and address water quality improvement, remediation, and restoration opportunities in the 17 mile stretch of the lower Passaic River from Dundee Dam to Newark Bay. This study is known as the Lower Passaic River Restoration Project and is being conducted by EPA under the authority of CERCLA and by USACE and OMR, under WRDA.

27. Although the Lower Passaic River Restoration Project study area ends at the mouth of Passaic River, because of the tidal nature of the Passaic River, there is reason to believe that the areal extent of contamination extends beyond that boundary. In order to determine with greater exactitude the boundaries of contamination from the area studied originally under the AOC, EPA believes that undertaking activities in the Newark Bay Study Area is necessary.

V. CONCLUSIONS OF LAW

28. Respondent is a "person" within the meaning of that term as defined in Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

29. The Newark Bay Study Area is a "facility" within the meaning of that term as defined in Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

30. The substances and contaminants found in the sediments of the Lower Passaic River Study Area and identified in

the FINDINGS section of this Order, including, but not limited to 2,4-D, 2,4,5-T, 2,4,5-TCP, 2,3,7,8-TCDD, cadmium, copper, lead, mercury, nickel, zinc, PAHs, DDT, and PCBs are also found at the Newark Bay Study Area and are "hazardous substances" within the meaning of that term as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14) or constitute "any pollutant or contaminant" that may present an imminent or substantial danger to public health or welfare or the environment under Sections 104(a)(1) and 106 of CERCLA, 42 U.S.C. §§ 9604(a)(1) and 9606.

31. The disposal of hazardous substances at the Newark Bay Study Area, the presence of hazardous substances in the sediment at the Newark Bay Study Area, the subsequent migration of hazardous substances within the Newark Bay Study Area, and the potential migration of all such substances outside of the boundaries of the Newark Bay Study Area as described in the FINDINGS, are actual and/or threatened "releases" within the meaning of that term as it is defined in Section 101(22) of CERCLA, 42 U.S.C. § 9601(22) and is a "release" or "substantial threat of such a release" into the environment for purposes of Section 104(a)(1).

32. Respondent is a person as defined in Section 101(21) of CERCLA, 42 U.S.C. § 9601(21) and for purposes of liability under one of more subsections of Section 107(a) of CERCLA, 42 U.S.C. § 9607(a).

33. Respondent is a responsible party under Sections 104, 107, and 122 of CERCLA, 42 U.S.C. §§ 9604, 9607, and 9622.

VI. DETERMINATIONS

34. Based upon the FINDINGS set forth above and the entire Administrative Record, and to continue an orderly process for the study of contaminants in and emanating from the lower Passaic River, EPA has determined that conditions in the Newark Bay Study Area may present an imminent and substantial endangerment to public health, welfare or the environment and that a response action of the type contemplated by the NCP in 40 C.F.R. § 300.430 is required at the Newark Bay Study Area to assess its conditions and evaluate alternatives to prevent and/or mitigate any actual and/or potential threat of harm to human health or welfare or the environment caused by the release and threatened release of hazardous substances from the Newark Bay Study Area.

35. The actions required by this Order are necessary to protect the public health or welfare or the environment, are in the public interest, 42 U.S.C. § 9622(a), are consistent with CERCLA and the NCP, 42 U.S.C. §§ 9604(a)(1), 9622(a), and will

expedite effective remedial action and minimize litigation,
42 U.S.C. § 9622(a).

36. EPA has determined that the Respondent is qualified to conduct the Remedial Investigation/Feasibility Study ("RI/FS") and that such RI/FS will be done properly and promptly and in accordance with the NCP and all other applicable regulations.

VII. ORDER

37. Based on the foregoing FINDINGS and DETERMINATIONS, it is hereby ordered and agreed that Respondent shall undertake an RI/FS with respect to the Newark Bay Study Area as defined in this Order and in accordance with all of the terms and provisions stated below.

Remedial Investigation

38. The Respondent shall finance and perform all activities required under this Order, as described in the SOW, attached hereto as Appendix 1.

39. Within one hundred and twenty (120) days of the effective date of this Order, Respondent shall submit to EPA for review and approval a detailed Remedial Investigation Work Plan ("RIWP") for the performance of a Remedial Investigation ("RI") for the Newark Bay Study Area. The RIWP shall provide for the performance of the RI in conformance with the SOW and the requirements of CERCLA and the NCP, as well as applicable guidance documents issued by EPA under CERCLA. The RIWP shall include a reasonable schedule for the performance of the tasks comprising the RI. The RIWP shall fully describe how the activities specified in the SOW will be implemented, and shall include, but not necessarily be limited to, the following.

- a. an Inventory and Overview Report of Historical Data;
- b. a Site Management Plan ("SMP");
- c. an Investigation Work Plan ("IWP");
- d. a Sampling and Analysis Plan ("SAP");
- e. a Quality Assurance Project Plan ("QAPP"); and
- f. a Health & Safety/Contingency Plan ("HASCP").

40. a. EPA will review the RIWP and comment thereon in writing. Respondent may request a conference with EPA to discuss these comments. This conference shall be held within ten (10) days of Respondent's receipt of the comments, unless otherwise agreed to by EPA. Respondent shall amend the RIWP as required by EPA's comments or as otherwise agreed upon by EPA in writing and shall submit the amended RIWP to EPA within thirty (30) days of receipt of EPA's comments on the RIWP or thirty (30) days of the date of the conference with EPA, whichever is later, or such longer time period as specified by EPA in writing.

b. At such time as EPA determines that the RIWP is acceptable, EPA will transmit to Respondent a written statement to that effect.

41. Respondent shall perform the RI in conformance with the SOW and the EPA-approved RIWP (including the implementation schedule contained therein). Respondent shall complete all activities specified in the approved RIWP and, in conformance with the schedule included in the approved RIWP, shall submit to EPA for review and approval a draft report detailing the results of the RI ("Draft RI Report").

42. a. Upon receipt of the Draft RI Report, EPA will review the report and comment thereon in writing. Respondent may request a conference with EPA to discuss these comments. This conference shall be held within ten (10) days of Respondent's receipt of the comments, unless otherwise agreed to by EPA. Respondent shall amend the Draft RI Report as required by EPA's comments or as otherwise agreed upon by EPA in writing, and shall submit the amended report to EPA within thirty (30) days of receipt of EPA's comments or thirty (30) days of the date of the conference with EPA, whichever is later or such longer time period as specified by EPA in writing.

b. EPA's comments on the Draft RI Report may require Respondent to perform such additional investigatory work as EPA finds necessary, pursuant to Paragraph 50. Such work (including any necessary work plans and reports) shall be performed by Respondent in conformance with a reasonable schedule approved by EPA.

c. If Respondent disagrees with EPA's comments with respect to the Draft RI Report, Respondent may invoke the Dispute Resolution provisions in Section XVIII. At such time as EPA determines that the Draft RI Report is acceptable, EPA will transmit to Respondent a written statement to that effect and the report will be deemed the Final RI Report.

43. EPA will conduct the Human and Ecological Risk Assessment ("HERA").

44. Respondent shall conduct a characterization of storm water and combined sewer overflows into the Newark Bay Study Area, consistent with the characterization of storm water and combined sewer overflows into the lower Passaic River being conducted for the Lower Passaic River Restoration Project.

Feasibility Study

45. Within ninety (90) days after EPA approval of the RIWP, Respondent shall submit to EPA for review and approval a detailed work plan for the performance of an FS with respect to the Newark Bay Study Area. This FS Work Plan shall provide for the performance of the FS in conformance with the SOW and the requirements of CERCLA (including, but not limited to, Section 121 of the Act) and the NCP, as well as applicable EPA guidance documents relating to the performance of feasibility studies under CERCLA. The FS Work Plan shall include a reasonable schedule for the performance of the tasks comprising the FS.

46. a. EPA will review and comment on the FS Work Plan in writing. Respondent may request a conference with EPA to discuss these comments. This conference shall be held within ten (10) days of Respondent's receipt of the comments, unless otherwise agreed by EPA. Respondent shall amend the FS Work Plan as required by EPA's comments or as otherwise agreed upon by EPA in writing and shall submit the amended FS Work Plan to EPA within thirty (30) days of receipt of EPA's comments or thirty (30) days of the date of the conference with EPA, whichever is later, or such longer time period as specified by EPA in writing.

b. At such time as EPA determines that the FS Work Plan is acceptable, EPA will transmit to Respondent a written statement to that effect.

47. a. Respondent shall perform the FS in conformance with the EPA-approved FS Work Plan and the schedule contained therein. By the date specified in the schedule contained in the EPA-approved FS Work Plan, Respondent shall submit to EPA for review a Draft FS Report, which shall include a recommended remedial alternative and a conceptual design, if EPA deems appropriate, of that alternative.

b. Respondent shall conduct all necessary laboratory and Bench Scale Treatability Studies required by EPA to evaluate the effectiveness of remedial technologies and establish engineering criteria, except where Respondent in writing demonstrates to EPA's satisfaction that they are not

needed to support the FS or to avoid duplication of the same or substantially the same studies as may be reported in literature or elsewhere.

c. If, after performance of Treatability Studies referenced in subparagraph b. above, EPA determines that a Pilot Scale Treatability Study is necessary to support the FS:

i. Respondent may perform the Pilot Scale Treatability Study under such requirements, including a schedule, as are developed under a supplemental submittal to the FS Work Plan; or

ii. In the event that Respondent declines to perform the Pilot Scale Treatability Study, Respondent shall submit to EPA in writing its reasons for not agreeing to implement the pilot scale treatability study. EPA may, in its own discretion, undertake the pilot scale treatability study.

In either case, if deemed appropriate by EPA, the results of such pilot scale treatability study shall be incorporated in the results of the Draft FS Report.

d. Preparation and/or implementation of a Pilot Scale Treatability Study shall not constitute additional work for purposes of Paragraph 50.

48. a. EPA will review and comment on the Draft FS Report in writing. Respondent may request a conference with EPA to discuss these comments. This conference shall be held within ten (10) days of Respondent's receipt of the comments, unless otherwise agreed by EPA. Respondent shall amend the Draft FS Report as required by EPA's comments or as otherwise agreed upon by EPA, and shall submit the amended report to EPA within thirty (30) days of receipt of EPA's comments or thirty (30) days of the date of the conference with EPA, whichever is later, or such longer time period as specified by EPA in writing.

b. EPA's comments on the Draft FS Report may require that Respondent conduct such additional evaluations as EPA finds necessary, pursuant to Paragraph 47. Such work (including any necessary work plans and reports) shall be performed in accordance with a reasonable schedule approved by EPA.

c. If Respondent disagrees with EPA's comments with respect to the Draft FS Report, Respondent may invoke the Dispute Resolution provisions in Section XVIII. At such time as

EPA determines that the Draft FS Report is acceptable, EPA will transmit to Respondent a written statement to that effect, and the report will be deemed the Draft FS Report.

49. Following submittal of the Draft FS Report, EPA will announce the availability of both the Final RI Report and the Draft FS Report to the public for review and comment. Following the public comment period (which may involve both written and oral comments), EPA will determine if the reports should be modified and will notify Respondent in writing of its determination. Respondent shall modify the report(s) as directed by EPA and shall submit the modified document(s) to EPA within thirty (30) days, or such other longer period as specified by EPA in writing, of receipt of EPA's determination. EPA shall remain the final arbiter in any dispute regarding the sufficiency or acceptability of both the RI and FS Reports, and EPA may modify them unilaterally.

50. EPA may determine that in addition to tasks defined in the initially approved RIWP and FS Work Plan, other additional work may be necessary to accomplish the objectives of the RI and FS. EPA may require, pursuant to this Order, that Respondent perform these response actions in addition to those required by the initially approved RIWP and FS Work Plan, including any subsequently approved modifications, if EPA determines that such actions are necessary for a complete RI and FS. Any additional work shall be of the same type or nature as required by and consistent with the objectives of the SOW. Respondent shall implement the additional tasks which EPA determines are necessary. The additional work shall be completed according to the standards, specifications and schedule set forth or approved by EPA in a written modification to the RIWP or FS Work Plan. If Respondent disagrees with EPA's determination that additional work is necessary, Respondent may invoke the Dispute Resolution provisions in Section XVIII. EPA reserves the right to conduct the work itself at any point, to seek reimbursement for the costs associated with the work from Respondent, and/or to seek any other appropriate relief.

51. EPA will make the final selection of the remedial alternatives to be evaluated and implemented with respect to the Newark Bay Study Area.

52. Community Relations Plan. EPA will prepare a community relations plan, in accordance with EPA guidance and the NCP. As requested by EPA, Respondent shall provide information supporting EPA's community relations plan and shall participate in the preparation of such information for dissemination to the public and in public meetings which may be held or sponsored by

EPA to explain activities at or concerning the Newark Bay Study Area.

53. Emergency Response and Notification of Releases.

a. In the event of any action or occurrence caused by Respondent during performance of the Work which causes or threatens a release of Waste Material from the Newark Bay Study Area that constitutes an emergency situation or may present an immediate threat to public health or welfare or the environment, Respondent shall immediately take all appropriate action. Respondent shall take these actions in accordance with all applicable provisions of this Order, including, but not limited to, the Health and Safety Plan, in order to prevent, abate or minimize such release or endangerment caused or threatened by the release. Respondent shall also immediately notify the EPA Project Manager or, in the event of his/her unavailability, the EPA Regional Emergency 24-hour telephone number of the incident. In the event that Respondent fails to take appropriate response actions as required by this Paragraph, and EPA takes such action instead, Respondent shall reimburse EPA all costs of the response action not inconsistent with the NCP pursuant to Section XVII (Payment of Response Costs).

b. In addition, in the event of any release of a hazardous substance from the Newark Bay Study Area, Respondent shall immediately notify the EPA Project Manager and the National Response center at (800) 424-8802. Respondent shall submit a written report to EPA within 7 days after each release, setting forth the events that occurred and the measures taken or to be taken to mitigate any release or endangerment caused or threatened by the release and to prevent the reoccurrence of such a release. This reporting requirement is in addition to, and not in lieu of, reporting under Section 103(c) of CERCLA, 42 U.S.C. § 9603(c), and Section 304 of the Emergency Planning and Community Right-To-Know Act of 1986, 42 U.S.C. § 11004, et seq.

VIII. EPA REVIEW OF SUBMISSIONS

54. a. After review of any deliverable, plan, report or other item which is required to be submitted for review and approval pursuant to this Order, EPA may: (a) approve the submission; (b) approve the submission with modification; (c) disapprove the submission and direct Respondent to resubmit the document after incorporating EPA's comments; or (d) disapprove the submission and assume responsibility for performing all or any part of the response action.

b. Prior to a document's approval, EPA, in its unreviewable discretion, shall determine which draft shall be made available to the public.

55. If EPA approves a submittal required by this Order, EPA will so inform Respondent in writing. Any approval by EPA that is not in writing shall not be effective or binding upon EPA.

56. a. EPA remains the final arbiter in any dispute regarding the sufficiency or acceptability of any document submitted pursuant to this Order. However, nothing in this Order shall affect any rights that Respondent may have to judicial review, if any, of EPA's actions or determinations under this Order, and, except as provided in Paragraph 117, EPA and Respondent expressly reserve all rights and defenses that they may have pursuant to applicable law.

b. If EPA disapproves or directs a modification of a submittal, Respondent may request a conference with EPA to discuss such disapproval or modification. This conference shall be held within ten (10) days of Respondent's receipt of the comments, unless otherwise agreed by EPA. Respondent shall amend the plan, report or other item as required by EPA's comments or as otherwise agreed upon by EPA and resubmit it for approval, within thirty (30) days of the receipt of EPA's comments or thirty (30) days of the date of the conference with EPA, whichever is later, or such longer time period as specified by EPA in writing. Notwithstanding the notice of disapproval, Respondent shall proceed, at the direction of EPA, to take any action required by any non-deficient portion of the submittal.

c. In the event that any comment on any submittal required pursuant to this Order is not incorporated to EPA's satisfaction in the subsequent submittal by Respondent, Respondent may, in EPA's unreviewable discretion, be deemed in violation of this Order. If EPA does not approve the subsequent submittal or portion of the submittal, EPA may unilaterally amend or modify the submittal. Respondent shall implement any such submittal as amended or developed by EPA. EPA may modify its comments and/or extend the due date for a subsequent submittal.

57. Upon written approval or approval with modifications by EPA of any submittals pursuant to this Order, Respondent shall proceed to take any action required by the submittal, as approved or modified by EPA and in accordance with applicable schedules.

58. Upon written approval by EPA, submittals pursuant to this Order or the SOW shall be deemed incorporated into this

Order as a requirement of this Order and shall be an enforceable part of this Order.

IX. EPA PROJECT MANAGER AND
RESPONDENT'S FACILITY COORDINATOR

Identification of Project Manager

59. Within fifteen (15) days of the effective date of this Order, EPA will designate a Project Manager to monitor the progress of the Work and to coordinate communication between EPA and the Respondent. EPA may also designate an alternate representative.

60. EPA's Project Manager shall have the authority set forth in 40 C.F.R. § 300.120. The Project Manager shall have the authority to require a cessation of the performance of any activity at the Newark Bay Study Area that, in the Project Manager's opinion, may present or contribute to an endangerment of public health, welfare or the environment or may cause or threaten to cause the release of hazardous substances from the Newark Bay Study Area. If the Project Manager suspends any activity at the Newark Bay Study Area, EPA may extend the compliance schedule of this Order, as appropriate. EPA shall notify the Respondent in writing of any extension of time. In addition, the Project Manager shall have the authority to take any necessary response action.

61. The Project Manager may authorize field modifications to the studies, designs, techniques or procedures undertaken or utilized in performing the Work required under this Order, provided that any such modifications are consistent with the SOW attached to this Order. All such modifications must be approved in writing and signed by the Project Manager. Field modifications within the scope of the SOW do not require the submission and approval of work plans and are not to be classified as additional submittals or response activities.

62. EPA has the unreviewable right to change its Project Manager. If EPA changes its Project Manager, EPA will inform Respondent in writing of the name, address, and telephone number of the new Project Manager.

63. The Project Manager may assign other representatives, including but not limited to, other EPA employees, contractors, and subcontractors, to serve as his or her representative for oversight of performance of daily operations during implementation of the Work.

64. The absence of EPA's Project Manager from the Newark Bay Study Area shall not delay or stop any portion of the Work.

Identification of Facility Coordinator

65. All aspects of the Work to be performed by Respondent pursuant to this Order shall be under the direction and supervision of a qualified Facility Coordinator, the selection of whom shall be subject to written approval by EPA. Within fifteen (15) days of the effective date of this Order, Respondent shall designate a Facility Coordinator and shall provide EPA in writing with the name, address, phone number, and qualifications of the Facility Coordinator and alternate Facility Coordinator, including primary support entities and staff, proposed to be used in carrying out Work under this Order. The Facility Coordinator shall be responsible for the day-to-day management of all the Work to be performed pursuant to this Order. The Facility Coordinator shall not be an attorney. The Facility Coordinator shall have adequate technical and managerial experience to manage all Work under this Order, including all activities relating to the Newark Bay Study Area. The Facility Coordinator shall be knowledgeable at all times about all matters relating to the Work being performed under this Order. The Facility Coordinator shall be the primary contact for EPA on all matters relating to the Work at the Newark Bay Study Area. A Facility Coordinator must be available to communicate with EPA during all days until this Order is terminated. At the request of the Facility Coordinator or Project Manager, legal counsel may participate in any communications with EPA.

66. Notice by EPA to the Facility Coordinator shall be deemed notice to the Respondent for all matters relating to the Work under this Order.

67. If at any time Respondent proposes to use a different Facility Coordinator, Respondent shall provide written notice of the proposed change to EPA at least fifteen (15) days prior to such proposed change and shall obtain written approval from EPA before the new Facility Coordinator assumes any responsibilities under this Order.

68. EPA will review Respondent's selection of a Facility Coordinator according to the terms of this Paragraph. If EPA disapproves the selection of the Facility Coordinator, Respondent shall submit to EPA within fifteen (15) days after receipt of EPA's disapproval of the Facility Coordinator previously selected, a list of Facility Coordinators, including primary support entities and staff, that would be acceptable to Respondent. EPA will thereafter provide written notice to

Respondent of the names of the Facility Coordinators that are acceptable to EPA. Respondent may then select any approved Facility Coordinators from that list and shall notify EPA of the name of the Facility Coordinator selected within fifteen (15) days of EPA's designation of approved Facility Coordinators.

X. NOTIFICATION AND REPORTING REQUIREMENTS

69. Respondent shall give EPA seven (7) days advance notice of the commencement of any field activities pursuant to this Order.

70. Respondent shall provide notice to local officials and other agencies as designated by EPA prior to the start of any Work at the Newark Bay Study Area pursuant to the terms of this Order.

71. In addition to other deliverables set forth in this Order, Respondent shall submit to EPA and DEP monthly written progress reports by the twentieth day of each month following the effective date of this Order. Respondent's obligation to submit progress reports continues until EPA gives Respondent written notice under this Order ending this requirement. For each calendar month, or part thereof, the monthly progress reports shall include, at least, the following:

- a. a description of actions which have been taken toward achieving compliance with this Order during the prior month;
- b. a description of actual or potential violations of this Order and other problems encountered during the prior month;
- c. a description of all corrective actions taken in response to alleged, actual or potential violations or problems which occurred during the prior month;
- d. the results of sampling, test results, and other data received or generated by Respondent during the course of implementing the Work during the prior month. Such results shall be validated in accordance with the approved Quality Assurance Project Plan (QAPP) developed in conformity with the SOW. Data submitted as part of monthly reports need not be analyzed, interpreted or otherwise summarized, except as required by the QAPP;

- e. a description of plans, actions, and data which are scheduled for next two (2) months;
- f. a quantified estimate of the percentage of the Work required by this Order which has been completed as of the date of progress report; and
- g. an identification of delays encountered or anticipated that may affect the future schedule for performance of the Work, and efforts made by Respondent to mitigate delays or anticipated delays.

72. EPA will notify the Respondent in writing, if EPA determines that a progress report is incomplete or deficient. Respondent shall make the necessary revisions and resubmit the revised progress report with the next scheduled progress report or, if the next scheduled progress report is due less than seven (7) days following Respondent's receipt of the notice of deficiency, with the subsequently scheduled progress report.

73. Respondent shall be deemed in violation of this Order if EPA determines that a revised progress report is deficient.

74. Two (2) copies of all work plans, reports, and any other documents required to be submitted to EPA under this Order shall be sent by certified mail, return receipt requested, or express delivery to the following address:

Strategic Integration Manager
Emergency & Remedial Response Division
U.S. Environmental Protection Agency, Region II
290 Broadway, 19th Floor
New York, NY 10007-1866
Attn: Diamond Alkali Project Manager - Newark Bay Study Area

with a copy to:

Diamond Alkali Project Manager- River Study Area
New Jersey Department of Environmental Protection
401 East State Street, 5th Floor
P.O. Box 028
Trenton, New Jersey 08625
Attn: Newark Bay Project Manager

A copy of all written communications shall also be sent to:

Chief, New Jersey Superfund Branch

Office of Regional Counsel
U.S. Environmental Protection Agency
290 Broadway, 17th Floor
New York, NY 10007-1866
Attn: Diamond Alkali Site Attorney - Newark Bay Study Area

75. In the event that EPA requests more than the number of copies stated above of any report or other documents required by this Order, Respondent shall provide the number of copies requested.

XI. SITE ACCESS, SAMPLING, AND AVAILABILITY OF INFORMATION

76. Respondent shall use its best efforts to obtain all access agreements which are needed to implement the terms of this Order. Best efforts include, but are not limited to, reasonable efforts to identify, locate, and contact (in writing) the owner of the property, and payment of reasonable compensation in consideration of access. If, after such efforts, Respondent cannot obtain any particular access agreement which is required for implementation of the terms of this Order, Respondent shall so notify the Project Manager in writing and shall specify the real property in question and efforts which Respondent has taken to obtain entry onto the property in question. If EPA determines that access onto the parcel in question is needed to implement any of the terms of this Order, EPA will make reasonable efforts to facilitate access by Respondent to that parcel of land. However, Respondent shall continue to implement all other terms of this Order which, in the view of EPA, can still be implemented regardless of the failure to obtain access to the parcel of land in question.

77. To the extent that Respondent has access, it shall allow unimpeded access to all areas of the Newark Bay Study Area and into all structures thereon by all EPA representatives, agents, contractors, and consultants and the State of New Jersey and the USACE. Consistent with its access rights Respondent shall permit such EPA agents and the State of New Jersey and the USACE to enter and move about the Newark Bay Study Area at will at all times and shall allow such officials or agents of EPA to undertake any observations, response actions or any other activities which EPA elects to undertake at the Newark Bay Study Area at EPA's option.

78. Quality Assurance. Respondent shall assure that Work performed, samples taken and analyses conducted conform to the requirements of the SOW, the QAPP and guidance identified therein. Respondent will assure that field personnel used by Respondent are properly trained in the use of field equipment and in chain of custody procedures. Respondent shall only use

laboratories which have a documented quality system that complies with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, March 2001) or equivalent documentation as determined by EPA.

79. Respondent shall notify EPA not less than sixty (60) days in advance of any sample collection activity or such other shorter time period as agreed to by EPA in writing. Respondent shall allow EPA or its designated representative to take duplicate and/or split samples of any samples collected in connection with Work performed in accordance with this Order. Upon request by EPA, Respondent shall direct a designated laboratory to analyze samples submitted by EPA for quality assurance purposes.

80. All results of sampling, tests, modeling or other data, including raw sampling and monitoring data, produced by Respondent in the course of implementing this Order, shall be made available to EPA, or submitted to EPA upon EPA's request. Such data or information shall be available to the public unless Respondent identifies them as confidential and EPA determines that they meet the confidentiality requirements stated in 40 CFR Part 2, Subpart B and Section 104 of CERCLA, 42 U.S.C. § 9604. In addition, EPA may release all such documents to DEP, which may make those documents available to the public unless Respondent conforms with appropriate New Jersey law and regulations regarding confidentiality. No sampling, hydrological, geological, biological, soil or sediment chemical analyses or surface water quality data or ground-water quality data collected pursuant to this Order shall be considered confidential.

81. a. EPA and its contractors and agents shall have access to all records in the custody or control of Respondent or its contractors or agents relating to implementation of the Order, including but not limited to, sampling, analysis, chain of custody records or other documents or information related to the Work.

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

requirements of this Order shall be withheld on the grounds that they are privileged.

c. Notwithstanding the exceptions identified above, no information specified in Section 104(e)(7)(F) of CERCLA, 42 U.S.C. § 9604(e)(7)(F), shall be withheld. All such records shall be made available to EPA upon request to Respondent's Facility Coordinator, and all employees of Respondent, including contractors, who engage in activity under this Order shall be available to and shall cooperate with EPA.

82. No such records shall be destroyed for a period of ten (10) years after completion of the Work required by this Order without the express written approval of EPA or a written offer by the Respondent to provide such material to EPA, followed by EPA'S written rejection of that offer.

83. Nothing in this Order shall be construed as limiting Respondent's right to collect or submit data, reports and/or other submissions that are not required by this Order.

XII. COMPLIANCE WITH APPLICABLE LAWS

84. All Work conducted pursuant to this Order shall be performed in accordance with prevailing professional standards.

85. Respondent shall comply with all applicable provisions of the NCP, 40 C.F.R. §§ 300 et seq., and all other applicable Federal and State statutes and regulations while performing all of the Work required by this Order.

86. Respondent shall require compliance with all applicable Federal and State health and safety requirements by all workers and agents of Respondent who enter the Newark Bay Study Area, including compliance with all applicable regulations of the Occupational Safety and Health Administration, as contained in 29 C.F.R. §§ 1910 et seq. and elsewhere.

87. Respondent shall be responsible for obtaining all necessary permits, licenses, and other authorizations needed to carry out the Work required by this Order.

XIII. FORCE MAJEURE

88. a. Respondent's activities under this Order shall be performed within the time limits set forth herein or otherwise established or approved by EPA, unless performance is delayed by events that constitute a force majeure. For the purposes of this Order, a force majeure is defined as any event arising from causes entirely beyond the control of Respondent or Respondent's

contractors and subcontractors despite Respondent's best efforts to fulfill the obligation. Increased costs or changed financial circumstances shall not constitute a force majeure.

b. Respondent shall orally notify EPA as soon as possible, but in no event later than forty-eight (48) hours, after Respondent becomes aware or should have become aware of any circumstances which have occurred or which are likely to occur which would constitute a force majeure. Respondent will notify the Project Manager in writing no later than five (5) days after Respondent became aware of or should have become aware of the event(s) which would or could constitute a force majeure under this Paragraph. Such notification to EPA shall not relieve Respondent of any of its obligations under this Order. Failure by Respondent to provide either the oral notice or the written notice to EPA as required by this Paragraph shall act as a waiver to assert the occurrence of a force majeure as a defense to any proceedings for stipulated penalties under this Order. Respondent shall be deemed to have notice of any circumstances of which its contractors or subcontractors were aware or should have been aware.

c. In its notice letter to EPA, Respondent shall fully describe the nature of the delay, the expected duration of the delay, the actions taken or to be taken to mitigate the delay, the timetable within such actions to mitigate any further delay will be taken, and the Respondent's rationale for attributing such delay to a force majeure event.

d. Respondent shall have the burden of proving that any requirement of this Order is excused by this force majeure provision. If EPA agrees that the delay is attributable to a force majeure event, EPA will notify Respondent in writing of the length of extension, if any, for performance of the obligations affected by the force majeure event. An extension of the time for performance of the obligations affected by the force majeure event shall not, of itself, extend the time for performance of any other obligation. If EPA does not agree that the delay or anticipated delay has been or will be caused by a force majeure event, EPA will notify Respondent in writing. EPA will be the final arbiter of any issues or disputes concerning force majeure.

XIV. MODIFICATIONS TO THIS ORDER

89. Respondent may request that EPA approve modification(s) to the EPA-approved RIWP, RI, FS Work Plan or FS Report at any time during the implementation of the Work required by this Order. All such modifications to these documents must be

approved in writing signed by the Strategic Integration Manager, Emergency and Remedial Response Division, EPA Region II.

90. This Order may be modified by mutual agreement of EPA and Respondent. All modifications to this Order shall be in writing and signed by Respondent and by EPA and shall have as the effective date that date on which such modifications are signed by EPA. EPA Project Managers do not have the authority to sign amendments to the Order. Such amendments shall be deemed to be incorporated in and enforceable parts of this Order.

91. No informal advice, guidance, suggestions or comments by EPA or DEP shall be construed to relieve Respondent of any of its obligations under this Order.

XV. ASSURANCE OF ABILITY TO COMPLETE THE WORK

92. Respondent shall demonstrate its ability to complete the Work required by this Order and to pay all claims that arise from the performance of the Work. Within fifteen (15) days after the effective date of this Order, Respondent shall fund a financial instrument or trust account sufficiently to perform the Work required under this Order beginning with the effective date of the Order through two (2) calendar year quarters. Thereafter, Respondent shall fund the financial instrument or trust account such that at the beginning of each calendar year quarter, there shall be sufficient funds available to finance the Work and other activities required under this Order projected for the succeeding calendar year quarter.

XVI. INSURANCE AND INDEMNIFICATION

93. All contractors and subcontractors that Respondent uses for Work at the Newark Bay Study Area must have at least the limits of liability coverage or indemnification set out below for any liability which may result from any activities conducted pursuant to this Order. At least seven (7) days prior to commencement of activities under this Order, Respondent shall obtain or require that its contractors and subcontractors obtain, and submit to EPA a policy or policies of insurance, for the duration of the Order, providing comprehensive general liability insurance for \$1 million per occurrence with deletion of the Watercraft Exclusion (for watercraft/maritime operations) and auto liability insurance for \$1 million per occurrence. In addition, Respondent shall satisfy or ensure that its contractors or subcontractors satisfy all applicable laws and regulations regarding the provision of workers' compensation insurance. Certificates evidencing such coverage as required herein shall be submitted to EPA on the anniversary of the effective date of this Order.

94. The United States and any and all agencies thereof shall not be liable for any injuries or damages to any person or property resulting from any acts or omissions of Respondent's officers, directors, employees, contractors or agents when carrying out any activity related to this Order. Respondent shall not represent to anyone that the United States or any agency thereof is or may be a party to any contract entered into by Respondent in carrying out any activity pursuant to this Order.

95. This Order is without prejudice to actions against the United States based on negligent actions taken directly by the United States (not including oversight or approval of Respondent's plans or activities) that are brought pursuant to any statute other than CERCLA and for which the waiver of sovereign immunity is found in a statute other than CERCLA.

XVII. PAYMENT OF RESPONSE COSTS

96. Payment of Future Response Costs. Respondent agrees to pay all Future Response Costs to EPA in accordance with the following terms and conditions:

a. Within thirty (30) days of the effective date of this Order Respondent shall make an initial payment to EPA of \$200,000. The total amount paid shall be deposited by EPA in the Diamond Alkali Superfund Site/Newark Bay Study Area Special Account within the EPA Hazardous Substance Superfund. These funds shall be retained and used by EPA to conduct or finance response actions at or in connection with the Newark Bay Study Area. Payment shall be made in accordance with Paragraph 96.b., below.

b. All payments shall be made to EPA's Account with Mellon Bank, Pittsburgh, Pennsylvania by Electronic Funds Transfer ("EFT") to Mellon Bank, Pittsburgh, Pennsylvania, as follows: Respondent shall provide the following information to its bank: 1) account title: EPA; 2) amount of payment; 3) account code for Mellon Bank account receiving the payment: 9108544; Mellon Bank ABA Routing Number: 043000261; 4) name of Party making the payment; 5) EPA Index number: CERCLA-02-2004-2010; 6) Site name: Diamond Alkali Superfund Site; and 7) Site/Spill ID number: 02-96. At the time of payment, Respondent shall send a letter which references the date of the EFT, the payment amount, the name of the site, the Index number, and Respondent's name and address to the EPA Project Manager and to the Chief, Financial Management Branch, US EPA Region II, 290 Broadway, 29th Floor, New York, New York 10007-1866.

c. Respondent shall pay to EPA all Future Response Costs not inconsistent with the NCP. On a periodic basis, EPA will send Respondent a bill requiring payment that includes a Superfund Cost Recovery Package Imaging and On-line System (SCORPIOS) Report which includes direct and indirect costs incurred by EPA and its contractors. Respondent shall make all payments within thirty (30) days of Respondent's receipt of each bill requiring payment. Respondent and EPA agree that a letter from the Strategic Integration Manager, Emergency and Remedial Response Division, EPA Region II, certifying the amount of costs incurred, and accompanied by a SCORPIOS Report shall serve as the sole basis for payment demands by EPA. Respondent shall not demand any additional documentation beyond that specified in this subparagraph as a prerequisite for making any payments demanded by EPA for Future Response Costs. Respondent shall make all payments required by this subparagraph in the manner and with notice as required by Paragraph 96.b. The total amount paid will be deposited by EPA in the Diamond Alkali Superfund Site/Newark Bay Study Area Special Account. These funds will be retained and used by EPA to conduct or finance response actions at or in connection to the Newark Bay Study Area. Any amounts remaining in the Diamond Alkali Superfund Site/Newark Bay Study Area Special Account may be utilized by EPA in accordance with Paragraph 98.f.

97. In the event that the payments for Future Response Costs are not made within thirty (30) days of Respondent's receipt of a bill, Respondent shall pay Interest on the unpaid balance. The Interest on Future Response Costs shall begin to accrue on the date of the bill and shall continue to accrue until the date of payment. Payments of Interest made under this Paragraph shall be in addition to such other remedies or sanctions available to EPA by virtue of Respondent's failure to make timely payments under this Section, including but not limited to, payment of stipulated penalties pursuant to Section XIX.

98. Future EPA-Performed Response Costs. Respondent agrees to pay all Future-EPA Performed Response Costs to EPA in accordance with the following terms and conditions:

a. Within thirty (30) days of the effective date of this Order Respondent shall make a payment to EPA of \$550,000.

b. Respondent shall pay to EPA all Future EPA-Performed Response Costs not inconsistent with the NCP. On a

periodic basis, EPA will send Respondent a bill requiring payment that includes a SCORPIOS Report which includes direct and indirect costs incurred by EPA and its contractors. Respondent shall make all payments within thirty (30) days of Respondent's receipt of each bill requiring payment. Respondent and EPA agree that a letter from the Strategic Integration Manager, Emergency and Remedial Response Division, EPA Region II, certifying the amount of costs incurred, and accompanied by a SCORPIOS Report shall serve as the sole basis for payment demands by EPA. Respondent shall not demand any additional documentation beyond that specified in this subparagraph as a prerequisite for making any payments demanded by EPA for Future Response Costs.

c. In the event that EPA's use of the Diamond Alkali Superfund Site/Newark Bay Study Area Special Account results in there being \$500,000 or less in the Diamond Alkali Superfund Site/Newark Bay Study Area Special Account at any time, and EPA determines, in its unreviewable discretion, that \$500,000 is an insufficient amount of money to fund EPA's projected Future EPA-Performed Response Costs, EPA may send a demand to Respondent for additional funds and Respondent shall pay the demanded amount within thirty (30) days of the date of the demand.

d. All payments pursuant to this Paragraph shall be paid and notice provided in accordance with Paragraph 96.b. and shall be deposited by EPA in the Diamond Alkali Superfund Site/Newark Bay Study Area Special Account to be retained and used to conduct or finance response actions at or in connection with the Newark Bay Study Area. Any amounts remaining in the Diamond Alkali Superfund Site/Newark Bay Study Area Special Account may be utilized by EPA in accordance with Paragraph 98.f.

e. After EPA has performed a final accounting of all direct and indirect costs relating to Future EPA-Performed Response Costs, EPA shall give Respondent notice of the final total amount of Future EPA-Performed Response Costs incurred accompanied by a SCORPIOS Report supporting those costs. In accordance with Section XVIII (Dispute Resolution) Respondent may then contest payment of any Future EPA-Performed Response Costs if it determines that EPA has made a mathematical error or if it alleges that a cost item that is included represents costs that are inconsistent with the NCP or outside of the definition of Future EPA-Performed Response Costs. Such dispute, if any, shall be raised and resolved in the manner described under Section XVIII (Dispute Resolution).

f. Once EPA has given Respondent notice of the total Future EPA-Performed Response Costs incurred, and any disputes concerning those costs are resolved, EPA will offset the final bill(s) for Future Response Costs or Future EPA-Performed Response Costs by any unused amount of funds in the Diamond Alkali Superfund Site/Newark Bay Study Area Special Account, and if the unused amount exceeds the amount of the bill, any excess in funds shall be returned to Respondent.

99. In the event that the payments for Future EPA-Performed Response Costs are not made within thirty (30) days of Respondent's receipt of a bill, Respondent shall pay Interest on the unpaid balance. The Interest on Future EPA-Performed Response Costs shall begin to accrue on the date of the bill and shall continue to accrue until the date of payment. Payments of Interest made under this Paragraph shall be in addition to such other remedies or sanctions available to EPA by virtue of Respondent's failure to make timely payments under this Section, including but not limited to, payment of stipulated penalties pursuant to Section XIX.

XVIII. DISPUTE RESOLUTION

100. Respondent and EPA shall make reasonable efforts to informally and in good faith resolve all disputes or differences of opinion which arise with respect to the implementation of this Order. Disputes under provisions of this Order shall be resolved according to the following procedures:

- a. If Respondent, in good faith, disagrees in whole or in part, with comments made by EPA pursuant to Paragraphs 40, 42, 46, 48, or with a payment of Future EPA-Performed Response Costs pursuant to Paragraph 98.e., Respondent shall notify EPA in writing of its objection, stating the basis for its objection, as soon as possible, but not later than fourteen (14) calendar days after receipt of such comments or notice of such determination by EPA. If Respondent so notifies EPA within the aforesaid period, the Strategic Integration Manager of the Emergency and Remedial Response Division, EPA Region II, shall provide a written response to Respondent setting forth EPA's position and the basis for that position. The written response of the Strategic Integration Manager shall constitute EPA's final decision with regard to the resolution of the dispute and shall be deemed to be incorporated in this Order.

- b. If a dispute and its resolution, as described in subparagraph a. above, cause a delay that makes it impossible for Respondent to meet a deadline set forth in or established pursuant to this Order, then that deadline shall be extended by EPA by a period of time not to exceed the delay resulting from the dispute and its resolution; PROVIDED, that Respondent shall not be entitled to any such extension if the Strategic Integration Manager, determines that Respondent's disagreement with the comments or determinations specified above is not in good faith or otherwise lacks a reasonable basis. Notwithstanding any of the foregoing, if Respondent requests an extension of a deadline set forth in or established pursuant to this Order, and if EPA declines to grant an extension in response to such a request, any delay, caused solely by the resolution of such a dispute shall not entitle Respondent to an extension of time.

- c. Notwithstanding any of the foregoing, EPA will be the final arbiter of all disputes under this Order and the final arbiter as to the sufficiency and acceptability of all Work conducted pursuant to this Order. However, nothing in this Paragraph shall affect any rights that Respondent may have to judicial review, if any, of EPA's actions or determinations under this Order, and, except as provided in Paragraph 109, EPA and Respondent expressly reserve all rights and defenses that they may have pursuant to applicable law.

XIX. ENFORCEMENT AND RESERVATIONS

101. a. If Respondent fails to submit the RIWP, the Draft RI Report, the FS Work Plan, the Draft FS or any revisions of such documents or fails to complete activities required pursuant to these documents within the applicable time periods, Respondent shall be subject to a stipulated penalty to EPA in the amount indicated below for each and every calendar day of noncompliance:

<u>Days After Required Date</u>	<u>Penalty per Violation per Day</u>
1 to 10 days	\$ 800/day
11 days to 20 days	\$1500/day
21 days to 30 days	\$3000/day
31 days or more	\$6000/day

b. If Respondent fails to comply with any other requirements or time limits set forth in or established pursuant to this Order, Respondent shall be subject to a stipulated penalty to EPA in the amount indicated below for each and every calendar day of noncompliance:

<u>Days After Required Date</u>	<u>Penalty per Violation per Day</u>
1 to 10 days	\$ 250/day
11 days to 20	\$ 500/day
21 days to 30 days	\$1000/day
31 days or more	\$2000/day

Any such penalty shall accrue as of the first calendar day after the applicable deadline has passed and shall continue to accrue until the noncompliance is corrected. Such penalties shall be due and payable ten (10) days after the date that Respondent receives a written demand from EPA for such penalties. Payment of any such penalties to EPA shall be made by EFT in the same manner as stated in Paragraph 96 and with copies to the EPA personnel as listed in Paragraph 74.

102. Any failure by Respondent to comply with any provision in this Order, including, but not limited to, any failure to comply with any terms of the SOW, EPA-approved RIWP or FS Work Plan will be considered a violation of this Order. In such an event, EPA may elect to:

- a. Demand that Respondent cease work under the Order;
- b. Use federal funds to complete the Work required by the Order; and/or
- c. Take any other action authorized under federal law or regulations.

Respondent may invoke the Dispute Resolution provisions in Section XVIII to dispute that it has failed to comply with a provision of this Order.

103. If Respondent elects not to perform the Work requested by EPA under the terms of Paragraph 41 or Paragraph 47 of this Order, EPA reserves the right to seek reimbursement for the costs associated with the Work and/or to seek any other appropriate relief from Respondent in another judicial or administrative action.

104. Nothing contained in this Order shall affect the right of EPA to pursue an action for civil penalties against any entity pursuant to Section 106(b) of CERCLA, 42 U.S.C. § 9606(b).

105. Nothing contained in this Order shall affect the right of EPA to pursue an action against Respondent or any other responsible party pursuant to Section 107 of CERCLA, 42 U.S.C. § 9607, for recovery of any costs incurred by EPA relating to this Order and/or for any other response costs which have been incurred or will be incurred by the United States relating to the Newark Bay Study Area.

106. Except as expressly provided in this Order, each party reserves all rights and defenses it may have. Nothing in this Order shall affect EPA's removal authority or EPA's response or enforcement authorities including, but not limited to, the issuance of Administrative Orders for activities not required or performed under this Order or the right to seek injunctive relief, stipulated penalties, statutory penalties, and/or punitive damages.

107. Nothing contained in this Order shall affect any right, claim, interest, defense or cause of action of EPA or Respondent with respect to any entity which is not a party to this Order.

108. Nothing in this Order constitutes a decision on pre-authorization or approval of funds under Section 111(a)(2) of CERCLA, 42 U.S.C. § 9611(a)(2).

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

110. By issuance of this Order the United States and EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondent.

111. With regard to claims for contribution against Respondent for "matters addressed" in this Order, the parties hereto agree that the Respondent is entitled to such protection from contribution actions or claims as may be provided by CERCLA Sections 113(f)(2) and 122(h)(4), 42 U.S.C. §§ 9613(f)(2) and 9622(h)(4). The "matters addressed" in this Order are the Work and Response Costs.

112. By signing this Order and taking actions under this Order, the Respondent does not necessarily agree with EPA's Findings of Fact and Conclusions of Law. Furthermore, the participation of the Respondent in this Order shall not be

considered an admission of liability and is not admissible in evidence against the Respondent in any judicial or administrative proceeding other than a proceeding by the United States, including EPA, to enforce this Order or a judgment relating to it. Respondent's consent to this Order shall not be construed as an estoppel or waiver of any defenses that Respondent wishes to raise in any other proceedings. Respondent retains its right to assert claims against other potentially responsible parties for the Newark Bay Study Area.

113. Respondent agrees not to make any claim(s) pursuant to sections 106(b)(2), 111 and/or section 112 of CERCLA, 42 U.S.C. §§ 9606(b)(2), 9611, 9612, either directly or indirectly, for reimbursement from the Hazardous Substance Superfund for any costs incurred by Respondent in complying with the terms of this Order.

XX. ADMINISTRATIVE RECORD

114. EPA shall determine the contents of the administrative record file for selection of the remedial action pursuant to the NCP. Respondent shall submit to EPA documents developed during the course of the RI/FS upon which selection of the response action may be based. Upon request of EPA, Respondent shall provide copies of plans, task memoranda for further action, quality assurance memoranda and audits, raw data, field notes, laboratory analytical reports and other reports.

XXI. TERMINATION AND SATISFACTION

115. At such time as EPA determines that the Work required by this Order has been satisfactorily completed, the Director, Emergency and Remedial Response Division, EPA Region II will notify Respondent that the requirements of this Order have been satisfied. The provisions of this Order shall be deemed satisfied when Respondent receives written notice signed by the Director, Emergency and Remedial Response Division, EPA Region II which states that all the actions required by this Order have been satisfactorily completed. Respondent may petition EPA in writing for a written termination.

XXII. EFFECTIVE DATE AND EFFECT OF CONSENT

116. This Order shall become effective on the date it is signed by the Regional Administrator as indicated below. All activities required pursuant to this Order with deadlines measured from the effective date shall be calculated from this effective date.

117. Respondent agrees not to contest any of the following in any proceeding in any federal court after the effective date of this Order:

- a. the validity of this Order; and
- b. the authority of the Regional Administrator of EPA Region II to enter into this Order.

For: U. S. ENVIRONMENTAL PROTECTION AGENCY

_____/s/
Jane M. Kenny
Regional Administrator
U.S. Environmental Protection Agency
Region II

February 13, 2004
Date

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CONSENT

The signatory identified below certifies that he or she is fully authorized to represent Respondent in this matter, to agree to the terms and conditions of this Order on behalf of Respondent and to bind Respondent to all of the terms and conditions of this Order. Respondent agrees to enter into this Order and to be bound by its terms.

OCCIDENTAL CHEMICAL CORPORATION

By: _____ /s/ _____

February 13, 2004
Date

Name: Scott A. King
Vice President and General Counsel

APPENDIX 1

STATEMENT OF WORK

Remedial Investigation/Feasibility Study

Newark Bay Study Area
Diamond Alkali Superfund Site

February 13, 2004

APPENDIX 1

Remedial Investigation/Feasibility Study
Statement of Work

PURPOSE

The purpose of this remedial investigation/feasibility study (RI/FS) is to determine the nature and extent of contamination within the Newark Bay Study Area of the Diamond Alkali Superfund Site and to develop and evaluate remedial alternatives. For the purposes of this effort, the boundaries of the Newark Bay Study Area are defined as Newark Bay and portions of the Hackensack River, the Arthur Kill, and the Kill van Kull. Since the Lower Passaic River Study Area and the Newark Bay Study Area are hydrodynamically linked waterbodies, the RI/FS for Newark Bay must be conducted consistently with the CERCLA components of the Lower Passaic River Restoration Project. The RI and FS are interconnected and are conducted concurrently so that the data collected in the RI influences the development of remedial alternatives in the FS, which in turn affects the data needs and the scope of treatability studies if necessary. -

Respondent will conduct this RI/FS (except for the human health and ecological risk assessment) and will produce draft RI and FS reports that are in accordance with this statement of work (SOW), the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (U.S. EPA, Office of Emergency and Remedial Response, October 1988), and any other guidance that EPA uses in conducting a RI/FS, as well as any additional requirements in the Administrative Order on Consent. The RI/FS Guidance describes the required report format and content. Respondent will furnish all necessary personnel, materials, and services needed, or incidental to, performing the RI/FS, except as otherwise specified in the Administrative Order on Consent.

At the completion of the RI/FS, EPA will select a remedy for the Newark Bay Study Area and will document this selection in a Record of Decision (ROD). The remedial action alternative selected by EPA will meet the cleanup standards specified in CERCLA Section 121. That is, the selected remedial action will be protective of human health and the environment, will be in compliance with, or include a waiver of, applicable or relevant and appropriate requirements of other laws, will be cost-effective, will utilize permanent solutions and alternative treatment technologies or resource recovery technologies, to the maximum extent practicable, and will address the statutory preference for treatment as a principal element. The final RI/FS report, as adopted by EPA, and EPA's human health and ecological risk assessment, with the administrative record and public comment will form the basis for the selection of the site's actions.

As specified in CERCLA section 104(a)(1), EPA will provide oversight of Respondents' activities throughout the RI/FS. Respondent will support EPA's initiation and conduct of activities related to the implementation of oversight activities.

REMEDIAL INVESTIGATION

A. Goals of the RI to be Performed

Provided below is a summary of the goals of the RI and objectives for each goal.

1. Determine the horizontal and vertical distribution and concentration of PCDDs, PCDFs, PCBs, PAHs, pesticides and metals, for the Newark Bay Study Area sediments in accordance with the provisions of this SOW;

This information is necessary to:

determine concentration gradients and, based on the gradients, identify "hot spots" for potential short term action;

identify potential exposure concentrations through the food chain for human and ecological receptors; and

evaluate prospective remedial alternatives.

2. Determine the primary human and ecological receptors (endpoints) of PCDDs, PCDFs, PCBs, PAHs, pesticides and metals contaminated sediments in the Newark Bay Study Area, in accordance with the provisions below.

This information is necessary to:

identify potential impacts to (a) humans and (b) the ecology both direct (i.e., species sustainability) and indirect (i.e., food web impacts);

identify receptors of greatest concern;

select and/or develop appropriate site-specific biological tests and contaminant uptake evaluations; and

identify human health and ecological risks and establish appropriate action levels.

3. Determine the significant direct and indirect continuing sources of PCDDs, PCDFs, PCBs, PAHs, pesticides and metals to the sediments in the Newark Bay Study Area, in accordance with EPA guidance "Principles for Managing

Contaminated Sediment Risks at Hazardous Waste Sites" (OSWER Directive 9285.6-08, February 2002).

B. Remedial Investigation Work Plan (RIWP)

The RIWP will provide a detailed description of the activities to be performed during the RI. Provided below is an outline of requirements for the RIWP.

1. The Respondent will prepare a draft RIWP that specifies the Work to be performed and the schedule for implementation of the Work.

2. The Respondent will submit the draft RIWP to EPA and NJDEP (State) consistent with the schedule in the Administrative Order on Consent. EPA will review and comment on the draft RIWP. The Respondent will revise the draft RIWP as per EPA's comments. EPA will approve the final RIWP.

3. The RIWP will consist of a report and five plans: the inventory and overview report of historical data, the Investigation Work Plan (IWP), the Sampling and Analysis Plan (SAP), the site Management Plan (SMP), the Quality Assurance Project Plan (QAPP), and the Health & Safety/Contingency Plan (HASCP).

a. Respondent will create an inventory and overview report of historical data, reports, and papers that are pertinent to the Newark Bay Study Area, including but not limited to water, sediment, and biota data. An acceptable graphic representation (GIS format consistent with formats used in the Lower Passaic River Restoration Project, as specified by EPA) of the Newark Bay Study Area that contains all relevant existing data should include but not be limited to locations of known past and present outfalls, areas of sediment deposition, location of all previous sampling locations and the data associated with those samples, and contoured, contaminant concentration gradients.

b. The IWP will describe implementation of the Work to be performed under this SOW to achieve each of the three goals and corresponding objectives described in Section A above. As described in greater detail below, the Work to be performed under this SOW will include the following elements:

i. One section of the IWP will describe the implementation of the Work for the goal concerning characterization of the spatial distribution and concentration of contaminants in sediments. That section will include the following activities:

(1) Coring locations and sampling depths will be established in accordance with the provisions contained in the Approved Investigation Work Plan. Cores will be taken to the maximum time-stratigraphic depth determined by historical radio-geochemistry or bathymetric data which corresponds to the year 1940. An additional sample will be taken from each core at the surface, in the biologically active zone, for analysis.

(2) All cores will be split, sub-sampled for sediment chemistry and radio-chemistry dating. Sediment cores remaining after sampling analyses shall be archived.

(3) All cores will be dated using the full range of radio-chemistry dating techniques, Pb^{210} , Be^7 , and CS^{137} .

ii. A second section of the IWP shall acknowledge that EPA will perform the human health and ecological risk assessment. After EPA finalizes a risk assessment plan, Respondent will perform the data collection that will provide EPA with appropriate information to implement the risk assessment plan. The RI data shall be presented in an electronic format to be specified by EPA to facilitate EPA's preparation of the human health and ecological risk assessment.

iii. A third section of the IWP shall acknowledge that EPA will perform modeling of the fate and bioaccumulation of PCDDs, PCDFs, PCBs, PAHs, pesticides and metals for the Newark Bay Study Area as part of the Lower Passaic River Restoration Project. EPA's modeling results will be incorporated into the RI Report. Respondent will perform the data collection that will provide EPA with appropriate information as described below:

(1) Under the Lower Passaic River Restoration Project, EPA is developing a model of the Lower Passaic River Study Area and the Newark Bay Study Area. As part of that effort, EPA is developing a Modeling Plan that will define the data requirements for the model, including but not limited to water quality, sediment, and biota parameters. After EPA finalizes the Modeling Plan, Respondent will perform the data collection that will provide EPA with appropriate information to implement the Modeling Plan for the Newark Bay Study Area. The data shall be presented in an electronic format to be specified by EPA to facilitate EPA's implementation of the Modeling Plan.

(2) Respondent will conduct a characterization of storm water and combined sewer overflows into the Newark Bay Study Area, consistent with the characterization of storm water and combined sewer overflows into the Lower Passaic River being conducted for the Lower Passaic River Restoration Project.

c. The SAP will describe the data to be collected during implementation of the Work for each of the three goals described above in Section A. The SAP will provide maps depicting sampling and data collection locations; a detailed description of all sampling, analysis, and testing to be performed including sampling objectives and methods, analytical and testing methods, and sampling locations and frequency; a discussion of how the sampling, analysis, and testing will produce data useful for implementation of the Work; and milestones for implementation of the Work.

d. The SMP will identify the Respondent's major contractors and their subcontractors for remedial investigation and feasibility study activities on the Newark Bay Study Area. The SMP will also identify key employees expected to participate in the work and describe their respective responsibilities.

e. The QAPP will describe the measures to be taken to provide quality assurance and maintain quality control regarding all samples collected under this SOW.

i. The QAPP will be completed taking into consideration the "EPA Requirements for QA Project Plans, QA/R-5" (EPA/240/B-01/003, March 2001) and "Region II CERCLA Quality Assurance Manual", EPA, Region II, October, 1989.

ii. The QAPP will consist of the following sections:

- Title Page
- Table of Contents
- Project Description
- Project organization and Responsibility
- Quality Assurance Objectives
- Sampling Procedures
- Sample Custody
- Calibration Procedures and Frequency
- Analytical Procedures
- Data Reduction, Validation, and Reporting
- Internal Quality Control Checks
- Performance and Systems Audits
- Preventive Maintenance
- Specific Routine Procedures Used to Assess Data Precision, Accuracy and Completeness
- Corrective Action
- Quality Assurance Reports to Management.

f. The HASCP will address the protection of health, safety and response to contingencies which could impact health, safety and the environment during the RI period.

i. The HASCP will be prepared considering the document entitled "Occupational Safety and Health Guidance Manual for Hazardous Waste site Activities" (prepared by NIOSH, OSHA, EPA and USCG, October 1985, (DHHS - NIOSH)) Publication No. 85-115).

ii. The HASCP will consist of the following items:

- Description of the known hazards and evaluation of the risks associated with the Work and the potential health impacts related to the site activities;
- List of key personnel and alternates responsible for safety, response operations and governmental notification /coordination;
- Description of levels of protection (based on specified standards) to be utilized by all personnel;
- Description of decontamination procedures for personnel and equipment, and handling/removal of disposable clothing or equipment;
- Incident emergency procedures which address emergency care for personnel injuries and exposure problems, and containment measures;
- Description of the personnel Medical Surveillance Program(s) in effect;
- Description of monitoring for personnel safety; and
- Description of routine and special personnel training programs.

C. Implementation of the RIWP

The Respondent will implement the RI in conformance with the terms of the Administrative Order on Consent and the EPA approved RIWP, including the RI schedule.

All RI data and supporting information shall be presented in an electronic format to be specified by EPA to facilitate EPA's preparation of the human health and ecological risk assessment and to ensure compatibility with the Lower Passaic River Restoration Project.

D. Community Relations

The development and implementation of community relations activities are the responsibility of EPA. A critical community relations planning step performed by EPA is the development of a community relations plan. Although implementation of the community relations plan is the responsibility of EPA, the Respondent may assist by providing information regarding the site's history, participating in public meetings, or preparing fact sheets for distribution to the general public. The extent of the Respondent's involvement in community relations activities is left to the discretion of EPA. The Respondents' community relations responsibilities, if any, are specified in the community relations plan. All Respondent-conducted community relations activities will be subject to oversight by EPA.

E. RI Report

1. In accordance with the schedule contained in the approved RIWP, Respondent will submit to the EPA and the State the draft RI Report presenting the results of the Work implemented.

2. The RI Report will consist of the following sections:

- Introduction including purpose and site background
- Description of the Newark Bay Study Area investigation
- Description of Newark Bay Study Area physical characteristics
- Presentation of the chemical characteristics of water, sediment and biota, including nature and extent of contamination, and contaminant fate and transport (including historical and RI data).
- Summary and conclusions
- Appendices including technical memoranda on field activities, analytical data and QA/QC evaluation results

3. The Respondent will submit the draft RI Report to EPA for review and comment in conformance with the terms of the Administrative Order on Consent. The Respondent will revise the draft RI Report per EPA's comments. The RI Report may require

further revision depending upon public comment. EPA will approve the final RI Report.

FEASIBILITY STUDY

A remedial action FS will be developed to evaluate remedial alternatives for the Newark Bay Study Area.

F. Feasibility Study Work Plan

1. The Respondent will prepare a draft FS Work Plan that includes a detailed description of the Work to be performed and the schedule for the implementation of the Work. The FS Work Plan will be submitted in conjunction with the RIWP.

2. The Respondent will submit the FS Work Plan to EPA and NJDEP (State) consistent with the schedule in the Administrative Order on Consent. EPA will review and comment on the draft FS Work Plan. The Respondent will revise the draft FS Work Plan as per EPA's comments. EPA will approve the final FS Work Plan.

3. Provided below is a description of each of the tasks for the FS. The FS will consist of six tasks:

- Task 1 - Description of Current Situation and Proposed Response
- Task 2 - Development of Alternatives
- Task 3 - Initial Screening of Alternatives
- Task 4 - Treatability Studies
- Task 5 - Evaluation of the Alternatives
- Task 6 - Reports

TASK 1 - DESCRIPTION OF CURRENT SITUATION AND PROPOSED RESPONSE

Information on the site background, the nature and extent of the problem, and previous response activities presented in the RI should be summarized briefly and then be incorporated by reference.

Following this summary of the current situation, a site-specific statement of purpose for the response, based on the results of the RI and EPA's human health and ecological risk assessment, should be presented. The statement of purpose should identify the actual or potential exposure pathways that should be addressed by remedial alternatives.

TASK 2 - DEVELOPMENT OF ALTERNATIVES

Based on the results of the RI and EPA's human health and ecological risk assessment, the Respondent shall develop a limited number of alternatives for source control of contaminated

Bay sediments and/or off-site remedial actions on the basis of objectives established for the response and applicable EPA policy. Implementation activities associated with Task 2 are described below.

a. Establishment of Remedial Action Objectives

Site-specific objectives for the response action will be established by EPA and incorporated by the Respondent into Task 2 of the FS. These objectives will be based on public health and environmental concerns, the description of the current situation, information gathered during the RI, section 300.430 of the National Contingency Plan (NCP), and the requirements of any other applicable Federal and/or State environmental standards, guidance and advisories as defined under Section 121 of CERCLA.

b. Alternative Remedial Actions

Combinations of identified technologies that will meet remedial response objectives will be assembled into alternative remedial actions. To the extent it is both feasible and appropriate, alternatives and other appropriate considerations should be developed into a comprehensive site specific approach. Alternatives are to be developed to include the following:

1. Treatment alternatives for source control of contaminated Newark Bay tributary sediments that would eliminate the need for long-term management (including monitoring);
2. Alternatives involving treatment as a principal element to reduce the toxicity, mobility or volume of waste;
3. An alternative that involves containment of waste with little or no treatment, but provides protection of human health and the environment primarily by preventing potential exposure or reducing the mobility of the waste; and
4. A no action alternative.

TASK 3 - INITIAL SCREENING OF ALTERNATIVES

a. Alternatives

The alternatives developed in Task 2 will be screened to eliminate alternatives that are clearly ineffective or unimplementable, or that are clearly inferior to other alternatives being considered in terms of their effectiveness, implementability, or cost prior to undertaking detailed evaluations of the remaining alternatives. The list of

alternatives will be screened based on the NCP, CERCLA, and the rules promulgated under CERCLA.

b. Alternatives Array Document

Upon completion of Task 3a, the Respondent will develop a table of applicable or relevant and appropriate requirements (ARARs) related to the remaining remedial alternatives. To facilitate this, an alternatives array document will be prepared by Respondent to summarize site description, technology identification and screening, and alternatives development and screening. The document will be submitted to EPA, who will in turn distribute it to appropriate sections and/or agencies for review and identification of ARARs. This document will be submitted by the Respondent and reviewed by EPA in conformance with section VIII of the Administrative Order on Consent. As appropriate, EPA will update the identified ARARs throughout the FS process.

TASK 4 - TREATABILITY STUDIES

a. Implementation and Evaluation of Treatability Studies

At EPA's request, Respondent shall conduct any necessary laboratory and bench scale treatability studies required to evaluate the effectiveness of remedial technologies and establish engineering criteria, except where Respondent demonstrates to EPA's satisfaction that they are not needed. The major components of the treatability studies shall include a determination of the need for and scope of studies, the design of the studies, and the completion of the studies. Where treatability studies are needed, initial treatability testing activities (such as research and study design) will be planned to occur concurrently with site characterization activities. Submittals will be made in the time frame required to maintain steady progress of the overall FS. Additional studies may also be conducted during the design phase if needed, to refine treatability results or develop detailed design criteria.

Respondent may perform pilot scale treatability studies consistent with the Administrative Order on Consent. 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 minimize potential delays of the FS.

b. Treatability Study Deliverables

If requested by EPA to undertake treatability studies, Respondent shall provide EPA with the following deliverables:

1. Treatability testing work plan

Respondent will prepare a treatability testing work plan or amendment to the original work plan for EPA review and approval describing 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 procedures, and residual waste management. The data quality objectives 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. Treatability study sampling and analysis plan

If the original SAP, QAPP, and/or HASCP is/are not adequate for defining the activities to be performed during the treatability tests, separate treatability study plans or amendments to the original plans will be prepared by Respondent for EPA review and approval.

3. Treatability study evaluation report

Following completion of treatability testing, Respondent will analyze and interpret the testing results in a technical report to EPA. Depending on the sequence of activities, this report may be a part of the RI/FS report or a separate deliverable. 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. The treatability study evaluation report will be prepared by Respondent for EPA review and approval.

TASK 5 - EVALUATION OF THE ALTERNATIVES

a. Evaluation of the Alternatives

Action-specific Federal and State ARARs and other criteria, advisories and guidance to be used in the analysis and selection of a remedy will be identified. Alternatives will be analyzed in

sufficient detail so that the remedies can be selected from a set of defined and discrete hazardous waste management approaches.

Information necessary to evaluate each alternative will be developed. The alternatives will be evaluated against the broad factors of effectiveness, implementability, and cost, using appropriate and more specific component measures such as protectiveness, compliance with ARARs, reliability, and technical feasibility. The detailed analysis of each alternative shall include both short-term and long-term considerations for effectiveness, implementability and cost.

b. Comparison of Alternatives

Compare the alternatives to each other using the full array of evaluation factors.

Component measures of effectiveness include the degree to which the alternative is protective of human health and the environment. Where health-based levels are established as ARARs, they can be used to establish the minimum level of protection needed. Where these levels do not exist, human health and ecological risk assessments performed by EPA can be used to help establish levels appropriate at the Site. The reliability of the remedy, including the potential need for a cost of replacement, is another important element of effectiveness. Specific measures may also include other health risks borne by the affected population, population sensitivities, and the impacts on environmental receptors. Another important measure of effectiveness is the degree that the mobility, toxicity, or volume of the hazardous substance, pollutant, or contaminant is reduced.

Component measures of implementability include the technical feasibility of the alternative, and the availability of any needed equipment, specialists or off-site capacity.

Component measures of cost include short-term capital and operation costs and any long-term operation or maintenance costs. Present worth analysis will be used to compare all alternatives.

Component measures should be tailored appropriately for the Newark Bay Study Area. Where the measures are likely to be important in evaluating among alternatives, more emphasis and detail may be appropriate to assist in the selection of a remedy.

TASK 6 - DRAFT FEASIBILITY STUDY REPORT

A draft FS Report presenting the results of Task 1 through 5 will be prepared.

4. The Respondent will generate the FS Report in conformance with the terms of the Administrative Order on Consent and the EPA approved FS Work Plan. In accordance with the schedule contained in the Administrative Order on Consent, Respondent will submit the draft FS Report to EPA for review and comment. The Respondent will revise the draft FS Report per EPA's comments. The FS Report may require further revision depending upon public comment. EPA will approve the final FS Report.