UNITED STATES DISTRICT COURT
DISTRICT OF NEW JERSEY

UNITED STATES OF AMERICA,

Plaintiff,

v.

Civil Action No. 3:24-cv-11009

ARNET REALTY COMPANY, L.L.C., OLD BRIDGE MINERALS, INC., AND HB WAREHOUSING, LLC,

Defendants.

CONSENT DECREE

TABLE OF CONTENTS

I. BACKGROUND

1. The United States of America ("United States"), on behalf of the Administrator of the United States Environmental Protection Agency ("EPA"), filed a complaint in this matter under sections 106 and 107 of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA").

2. The United States in its complaint seeks, *inter alia*: (1) reimbursement of costs incurred by EPA and the Department of Justice ("DOJ") for response actions at the CPS/Madison Superfund Site in Old Bridge Township, New Jersey ("Site"), together with accrued interest; and (2) performance by the defendants of a response action at the Site consistent with the National Contingency Plan, 40 C.F.R. part 300 ("NCP").

3. In accordance with the NCP and section 121(f)(1)(F) of CERCLA, EPA notified the State of New Jersey ("State") on September 29, 2023, of negotiations with potentially responsible parties ("PRPs") regarding the implementation of the remedial design and remedial action ("RD/RA") for the Site, and EPA has provided the State with an opportunity to participate in such negotiations and to be a party to this Consent Decree ("Decree").

4. In accordance with section 122(j)(1) of CERCLA, EPA notified the United States Department of Commerce, National Oceanic and Atmospheric Administration, United States Department of the Interior, Fish and Wildlife Service, and New Jersey Department of Environmental Protection's Office of Natural Resource Restoration on September 29, 2023, of negotiations with PRPs regarding the release of hazardous substances that may have resulted in injury to the natural resources under federal trusteeship and encouraged the trustees to participate in the negotiation of this Decree.

5. The defendants that have entered into this Decree ("Settling Defendants") do not admit any liability to Plaintiff arising out of the transactions or occurrences alleged in the complaints, nor do they acknowledge that the release or threatened release of hazardous substances at or from the Site constitutes an imminent and substantial endangerment to the public health or welfare or the environment.

6. In accordance with section 105 of CERCLA, EPA listed the Site on the National Priorities List ("NPL"), set forth at 40 C.F.R. part 300, Appendix B, by publication in the Federal Register on September 8, 1983, 48 Fed. Reg. 40658.

7. In response to a release or a substantial threat of a release of hazardous substances at or from the Site, BASF Corporation ("BASF") completed a Remedial Investigation for Operable Units 1 and 2 of the Site on July 10, 2015, and a Feasibility Study for the Site on November 1, 2018, in accordance with 40 C.F.R. § 300.430.

8. In response to a release or a substantial threat of a release of hazardous substances at or from the Site, Settling Defendants completed a Remedial Investigation and Feasibility Study for Operable Unit 3 of the Site on May 12, 2023, in accordance with 40 C.F.R. § 300.430.

9. In accordance with section 117 of CERCLA and 40 C.F.R § 300.430(f), EPA published notice of the completion of the Feasibility Study and of the proposed plan for remedial action for Operable Unit ("OU")1 and OU2 on April 24, 2019, in a major local newspaper of general circulation. EPA provided an opportunity for written and oral comments from the public on the proposed plan for remedial action. A copy of the transcript of the public meeting and comments received are available to the public as part of the administrative record upon which the Director of the Superfund and Emergency Management Division ("SEMD"), EPA Region 2, based the selection of the response action.

10. EPA selected the remedial action to be implemented at Operable Units 1 and 2 of the Site, which is embodied in a final Record of Decision ("OU1/OU2 Record of Decision"), executed on September 30, 2019, on which the State has given its concurrence. The OU1/OU2 Record of Decision includes a summary of responses to the public comments. Notice of the final plan was published in accordance with section 117(b) of CERCLA.

11. In accordance with section 117 of CERCLA and 40 C.F.R § 300.430(f), EPA published notice of the completion of the Feasibility Study and of the proposed plan for remedial action for OU3 on June 6, 2023, in a major local newspaper of general circulation. EPA provided an opportunity for written and oral comments from the public on the proposed plan for remedial action. A copy of the transcript of the public meeting and comments received are available to the public as part of the administrative record upon which the Director of SEMD, EPA Region 2, based the selection of the response action.

12. EPA selected a remedial action to be implemented at the Site, which is embodied in a final Record of Decision ("OU3 Record of Decision"), executed on September 26, 2023, on which the State has given its concurrence. The OU3 Record of Decision includes a summary of responses to the public comments. Notice of the final plan was published in accordance with section 117(b) of CERCLA.

13. Beginning in 1991, under the direction of the New Jersey Department of Environmental Protection ("NJDEP"), Settling Defendants installed three groundwater recovery wells downgradient of their property, to intercept groundwater contamination entering the Runyon Watershed. When the groundwater surrounding these recovery wells achieved the clean-up goals in place at that time, the recovery wells were shut down and replaced by the pump and treatment system wells on Settling Defendants' property which, together with the three wells operated by BASF, are known as the Interim Remedial Measure ("IRM") wells. Under NJDEP oversight, Madison Industries, Inc., corporate predecessor to Settling Defendant Old Bridge Minerals, Inc., initiated a Performance Monitoring Program ("PMP") to evaluate the effectiveness of the Madison Industries, Inc. IRM pump and treatment system. Pursuant to the PMP, Settling Defendants continue to operate and maintain the IRM wells on their property under NJDEP oversight.

14. The remedy selected for OU1 in the OU1/OU2 Record of Decision addressed organic compounds and metals contamination; for the metals contamination, the selected remedy consists of continued operation of the Madison Industries, Inc. IRM pump and treatment system, the IRM wells for which Settling Defendants are responsible, groundwater monitoring, and continuation of institutional controls. Settling Defendants are performing the operation and

maintenance of their IRM wells under the oversight of NJDEP and are obligated to continue to perform the operation and maintenance under 1988 and 1992 court orders entered by the Superior Court of New Jersey, Middlesex County between, *inter alia*, NJDEP and Madison Industries, Inc., corporate predecessor to Settling Defendant Old Bridge Minerals, Inc., and CPS Chemical Corporation in *City of Perth Amboy, A Municipal Corporation of the State of New Jersey v. Madison Industries, Inc., et al.*, and *State of New Jersey Department of Environmental Protection & Energy v. Chemical & Pollution Sciences, Inc., et al.*, Docket Nos. C-4474-76 and L-28115-76 (consolidated). EPA has determined that financial assurance is not necessary for OU1 (metals contamination) because it is in operation and maintenance under NJDEP oversight. BASF is performing the remedial design for the component of the OU1 groundwater remedy that addresses organic compounds under an EPA administrative settlement agreement and order on consent.

15. In 2023, Old Bridge Chemicals, Inc. changed its name to Old Bridge Minerals, Inc. and Madison Industries, Inc. was reorganized and consolidated into Old Bridge Minerals, Inc. The reorganization of companies does not reflect any change in ownership or any divestiture of any previous company assets.

16. Based on the information currently available, EPA has determined that the Work will be properly and promptly conducted by Settling Defendants if conducted in accordance with this Decree.

17. The Parties recognize, and the Court by entering this Decree finds, that this Decree has been negotiated by the Parties in good faith, that implementation of this Decree will expedite the cleanup of the Site and will avoid prolonged and complicated litigation between the Parties, and that this Decree is fair, reasonable, in the public interest, and consistent with CERCLA.

NOW, THEREFORE, it is hereby **ORDERED** and **DECREED** as follows:

II. JURISDICTION AND VENUE

18. This Court has jurisdiction over the subject matter of this action under 28 U.S.C. §§ 1331, 1367, and 1345, and section 113(b) of CERCLA, and personal jurisdiction over the Parties. Venue lies in this District under section 113(b) of CERCLA and 28 U.S.C. §§ 1391(b), and 1395(a), because the Site is located in this judicial district. This Court retains jurisdiction over the subject matter of this action and over the Parties for the purpose of resolving disputes arising under this Decree, entering orders modifying this Decree, or effectuating or enforcing compliance with this Decree. Settling Defendants may not challenge the terms of this Decree or this Court's jurisdiction to enter and enforce this Decree.

III. PARTIES BOUND

19. This Decree is binding upon the United States and upon Settling Defendants and their successors. Unless the United States otherwise consents, (a) any change in ownership or corporate or other legal status of any Settling Defendant, including any transfer of assets, or (b) any Transfer of the Site or any portion thereof, does not alter any of Settling Defendants' obligations under this Decree. Settling Defendants' responsibilities under this Decree cannot be assigned except under a modification executed in accordance with ¶82.

20. In any action to enforce this Decree, Settling Defendants may not raise as a defense the failure of any of their officers, directors, employees, agents, contractors, subcontractors, or any person representing Settling Defendants to take any action necessary to comply with this Decree. Settling Defendants shall provide notice of this Decree to each person representing Settling Defendants with respect to the Site or the Work. Settling Defendants shall provide notice of this Decree to each contractor performing any Work and shall ensure that notice of the Decree is provided to each subcontractor performing any Work.

IV. DEFINITIONS

21. Subject to the next sentence, terms used in this Decree that are defined in CERCLA or the regulations promulgated under CERCLA have the meanings assigned to them in CERCLA and the regulations promulgated under CERCLA. Whenever the terms set forth below are used in this Decree, the following definitions apply:

"CERCLA" means the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601-9675.

"Consent Decree" or "Decree" means this consent decree, all appendixes attached hereto (listed in Section XIX), and all deliverables incorporated into the Decree under Section 7 of the SOW. If there is a conflict between a provision in Sections I through XXIV and a provision in any appendix or deliverable, the provision in Sections I through XXIV controls.

"Day" or "day" means a calendar day. In computing any period under this Decree, the day of the event that triggers the period is not counted and, where the last day is not a working day, the period runs until the close of business of the next working day. "Working day" means any day other than a Saturday, Sunday, or federal or State holiday.

"DOJ" means the United States Department of Justice.

"Effective Date" means the date upon which the Court's approval of this Decree is recorded on its docket.

"EPA" means the United States Environmental Protection Agency.

"Fund" means the Hazardous Substance Superfund established under section 9507 of the Internal Revenue Code, 26 I.R.C. § 9507.

"Future Response Costs" means all costs (including direct, indirect, payroll, contractor, travel, and laboratory costs) that the United States (a) pays between January 1, 2023 and the Effective Date relating to this Decree or incurs prior to the Effective Date but pays after the Effective Date relating to this Decree; (b) pays after the Effective Date in implementing, overseeing, or enforcing this Decree, including: (i) in developing, reviewing and approving deliverables generated under this Decree; (ii) in overseeing Settling Defendants' performance of the Work; (iii) in assisting or taking action to obtain access or use restrictions under ¶ 29.e; (iv) in securing, implementing, monitoring, maintaining, or enforcing Institutional Controls, including any compensation paid; (v) in taking action under ¶ 39 (Access to Financial Assurance); (vi) in taking response action described in ¶ 66 because of Settling Defendants' failure to take emergency action under ¶ **5.4** of the SOW; (vii) in implementing a Work Takeover under ¶ 26; (viii) in implementing community involvement activities including the cost of any technical assistance grant provided under section 117(e) of CERCLA; (ix) in enforcing this Decree, including all costs paid under Section XII (Dispute Resolution) and all litigation costs; and (x) in conducting periodic reviews in accordance with section 121(c) of CERCLA. Future Response Costs also includes all Interest accrued after January 1, 2023 on EPA's unreimbursed costs under section 107(a) of CERCLA. Future Response Costs do not include any costs that Settling Defendants have paid or are obligated to pay to EPA pursuant to Administrative Settlement Agreement and Order on Consent for Remedial Investigation and Feasibility Study, Index No. II-CERCLA-02-2015-2027.

"Including" or "including" means "including but not limited to."

"Institutional Controls" means Proprietary Controls (*i.e.*, easements or covenants running with the land that (i) limit land, water, or other resource use, provide access rights, or both and (ii) are created under common law or statutory law by an instrument that is recorded, or for which notice is recorded, in the appropriate land records office) and state or local laws, regulations, ordinances, zoning restrictions, or other governmental controls or notices that: (a) limit land, water, or other resource use to minimize the potential for human exposure to Waste Material at or in connection with the Site; (b) limit land, water, or other resource use to implement, ensure noninterference with, or ensure the protectiveness of the Remedial Action; (c) provide information intended to modify or guide human behavior at or in connection with the Site; or (d) any combination thereof.

"Interest" means interest at the rate specified for interest on investments of the Fund, as provided under section 107(a) of CERCLA, compounded annually on October 1 of each year. The applicable rate of interest will 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. As of the date of lodging of this Decree, rates are available online at https://www.epa.gov/superfund/superfund-interest-rates.

"National Contingency Plan" or "NCP" means the National Oil and Hazardous Substances Pollution Contingency Plan promulgated under section 105 of CERCLA, codified at 40 C.F.R. part 300, and any amendments thereto.

"OU1/OU2 Record of Decision" means the EPA decision document that memorializes the selection of the remedial action relating to Operable Units 1 and 2 at the Site signed on September 30, 2019, by the Director of SEMD, EPA Region 2, and all attachments thereto. The OU1/OU2 Record of Decision is attached as Appendix A.

"OU3 Record of Decision" means the EPA decision document that memorializes the selection of the remedial action relating to Operable Unit 3 at the Site signed on September 26, 2023, by the Director of SEMD, EPA Region 2, and all attachments thereto. The OU3 Record of Decision is attached as Appendix B.

"OU1/OU2 Remedial Action" means the remedial action selected in the OU1/OU2 Record of Decision.

"OU3 Remedial Action" means the remedial action selected in the OU3 Record of Decision.

"Owner Settling Defendants" means the following Settling Defendants who own or control all or a portion of the Site: Arnet Realty Company L.L.C. and HB Warehousing, LLC.

"Paragraph" or "¶" means a portion of this Decree identified by an Arabic numeral or an upper- or lower-case letter.

"Parties" means the United States and Settling Defendants.

"Performance Standards" means the remediation goals, as set forth in the Records of Decision for OU1/OU2 Record of Decision (metals contamination) and OU3 Record of Decision.

"Plaintiff" means the United States.

"RCRA" means the Solid Waste Disposal Act, 42 U.S.C. §§ 6901-6992k, (also known as the Resource Conservation and Recovery Act).

"Remedial Action" means the remedial actions selected in the OU1/OU2 Record of Decision for metals contamination and the OU3 Record of Decision.

"Remedial Design" means those activities to be undertaken by Settling Defendants to develop plans and specifications for implementing the Remedial Action as set forth in the SOW.

"Scope of the Remedy" means the scope of the remedy set forth in ¶ **1.3** of the SOW.

"Section" means a portion of this Decree identified by a Roman numeral.

"Settling Defendants" means Arnet Realty Company L.L.C.., Old Bridge Minerals, Inc. which is the successor to both Old Bridge Chemicals, Inc. and Madison Industries, Inc, and HB Warehousing, LLC, which is an affiliate of Old Bridge Minerals, Inc. As used in this Decree, this definition means all settling defendants, collectively, and each settling defendant, individually.

"Site" means the CPS/Madison Superfund Site, comprising approximately 35 acres, located at 554 Waterworks Road in Old Bridge Township, Middlesex County, New Jersey, and depicted generally on the map attached as Appendix D.

"Special Account" means the special account, within the Fund, established for the Site by EPA under section 122(b)(3) of CERCLA.

"State" means the State of New Jersey.

"Statement of Work" or "SOW" means the document attached as Appendix C, which describes the activities Settling Defendants must perform to implement and maintain the effectiveness of the Remedial Action.

"Transfer" means to sell, assign, convey, lease, mortgage, or grant a security interest in, or where used as a noun, a sale, assignment, conveyance, or other disposition of any interest by operation of law or otherwise.

"United States" means the United States of America and each department, agency, and instrumentality of the United States, including EPA.

"Waste Material" means (a) any "hazardous substance" under Section 101(14) of CERCLA; (b) any pollutant or contaminant under section 101(33) of CERCLA; (c) any "solid waste" under section 1004(27) of RCRA; and (d) any "hazardous waste" under N.J.A.C. § 7:26G-5.

"Work" means all obligations of Settling Defendants under Sections VI (Performance of the Work) through IX (Indemnification and Insurance).

"Work Takeover" means EPA's assumption of the performance of any of the Work in accordance with ¶ 28.

V. OBJECTIVES

22. The objectives of the Parties in entering into this Decree are to protect public health, welfare, and the environment through the design, implementation, and maintenance of a response action at OU1 (metals contamination) and OU3 of the Site by Settling Defendants, to pay response costs of Plaintiff, and to resolve and settle the claims of Plaintiff against Settling Defendants as provided in this Decree.

VI. PERFORMANCE OF THE WORK

23. Settling Defendants shall finance, develop, implement, operate, maintain, and monitor the effectiveness of the Remedial Action all in accordance with the SOW, any modified SOW and all EPA-approved, conditionally approved, or modified deliverables as required by the SOW or modified SOW.

24. Nothing in this Decree and no EPA approval of any deliverable required under this Decree constitutes a warranty or representation by EPA that completion of the Work will achieve the Performance Standards.

25. Settling Defendants' obligations to finance and perform the Work and to pay amounts due under this Decree are joint and several. In the event of the insolvency of any Settling Defendant or the failure by any Settling Defendant to participate in the implementation of the Decree, the remaining Settling Defendants shall complete the Work and make the payments.

26. **Modifications to the Remedial Action and Further Response Actions**

a. Nothing in this Decree limits EPA's authority to modify the Remedial Action or to select further response actions for the Site in accordance with the requirements of CERCLA and the NCP. Nothing in this Decree limits Settling Defendants' rights, under sections 113(k)(2) or 117 of CERCLA, to comment on any modified or further response actions proposed by EPA.

b. If EPA modifies the Remedial Action in order to achieve or maintain the Performance Standards, or both, or to carry out and maintain the effectiveness of the Remedial Action, and such modification is consistent with the Scope of the Remedy, then Settling Defendants shall implement the modification as provided in ¶ 26.c.

c. Upon receipt of notice from EPA that it has modified the Remedial Action as provided in ¶ 26.b and requesting that Settling Defendants implement the modified Remedial Action, Settling Defendants shall implement the modification, subject to their right to initiate dispute resolution under Section XII within 30 days after receipt of EPA's notice. Settling Defendants shall modify the SOW, or related work plans, or both in accordance with the Remedial Action modification or, if Settling Defendants invoke dispute resolution, in accordance with the final resolution of the dispute. The Remedial Action modification, the approved modified SOW, and any related work plans will be deemed to be incorporated into and enforceable under this Decree.

27. **Compliance with Applicable Law**. Nothing in this Decree affects Settling Defendants' obligations to comply with all applicable federal and state laws and regulations. Settling Defendants must also comply with all applicable or relevant and appropriate requirements of all federal and state environmental laws as set forth in the Record of Decision and the SOW. The activities conducted in accordance with this Decree, if approved by EPA, will be deemed to be consistent with the NCP as provided under section 300.700(c)(3)(ii).

28. **Work Takeover**

a. If EPA determines that Settling Defendants (i) have ceased to perform any of the Work required under this Section; (ii) are seriously or repeatedly deficient or late in performing the Work required under this Section; or (iii) are performing the Work required under this Section in a manner that may cause an endangerment to public health or welfare or the environment, EPA may issue a notice of Work Takeover to Settling Defendants, including a description of the grounds for the notice and a period of time ("Remedy Period") within which Settling Defendants must remedy the circumstances giving rise to the notice. The Remedy Period will be 20 days, unless EPA determines in its unreviewable discretion that there may be an endangerment, in which case the Remedy Period will be 10 days.

b. If, by the end of the Remedy Period, Settling Defendants do not remedy to EPA's satisfaction the circumstances giving rise to the notice of Work Takeover, EPA may notify Settling Defendants and, as it deems necessary, commence a Work Takeover.

c. EPA may conduct the Work Takeover during the pendency of any dispute under Section XII but shall terminate the Work Takeover if and when: (i) Settling Defendants remedy, to EPA's satisfaction, the circumstances giving rise to the notice of Work Takeover; or (ii) upon the issuance of a final determination under Section XII (Dispute Resolution) that EPA is required to terminate the Work Takeover.

VII. PROPERTY REQUIREMENTS

29. **Agreements Regarding Access and Noninterference**

a. As used in this Section, "Affected Property" means any real property, including the Site, where EPA determines, at any time, that access; land, water, or other resource use restrictions; Institutional Controls; or any combination thereof, are needed to implement the Remedial Action.

b. Settling Defendants shall use best efforts to secure from the owner(s), other than an Owner Settling Defendant, of all Affected Property, an agreement, enforceable by Settling Defendants and by Plaintiff, requiring such owner to provide Plaintiff and Settling Defendants, and their respective representatives, contractors, and subcontractors with access at all reasonable times to such owner's property to conduct any activity regarding the Decree, including the following:

(1) implementing the Work and overseeing compliance with the Decree;

(2) conducting investigations of contamination at or near the Site;

(3) assessing the need for, planning, or implementing additional response actions at or near the Site;

(4) determining whether the Site is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted under the Decree; and

(5) implementing, monitoring, maintaining, reporting on, and enforcing any land, water, or other resource use restrictions and Institutional Controls.

c. Further, each agreement required under ¶ 29.b must commit the owner to refrain from using its property in any manner that EPA determines will pose an unacceptable risk to public health or welfare or to the environment as a result of exposure to Waste Material, or will interfere with or adversely affect the implementation, integrity, or protectiveness of the Remedial Action, including the following:

(1) engaging in activities that could interfere with the Remedial Action;

(2) using contaminated groundwater;

(3) engaging in activities that could result in human exposure to contaminants in soils and groundwater; and

(4) constructing new structures that may interfere with the Remedial Action.

d. As used in this Section, "best efforts" means the efforts that a reasonable person in the position of Settling Defendants would use to achieve the goal in a timely manner, including the cost of employing professional assistance and the payment of reasonable sums of money to secure access and/or use restriction agreements.

e. Settling Defendants shall provide to EPA a copy of each agreement required under ¶ 29.b. If Settling Defendants cannot accomplish what is required through best efforts in a timely manner, they shall notify EPA, and include a description of the steps taken to achieve the requirements. If the United States deems it appropriate, it may assist Settling Defendants, or take independent action, to obtain such access or use restrictions.

30. **Access and Noninterference by Owner Settling Defendants**. The Owner Settling Defendants shall: (a) provide Plaintiff and the Settling Defendants, and their representatives, contractors, and subcontractors with access at all reasonable times to the Site to conduct any activity regarding the Decree, including those listed in ¶ 29.b; and (b) refrain from using the Site in any manner that EPA determines will pose an unacceptable risk to public health or welfare or to the environment because of exposure to Waste Material, or will interfere with or adversely affect the implementation, integrity, or protectiveness of the Remedial Action, including the restrictions listed in ¶ 29.c.

31. If EPA determines in a decision document prepared in accordance with the NCP that Institutional Controls in the form of state or local laws, regulations, ordinances, zoning restrictions, or other governmental controls or notices are appropriate, Settling Defendants shall cooperate with EPA's and the State's efforts to secure and ensure compliance with such Institutional Controls.

32. **Notice to Successors-in-Title**

a. Owner Settling Defendants shall, within 15 days after the Effective Date, submit for EPA approval a notice to be recorded regarding their property at the Site in the appropriate land records. The notice must: (1) include a proper legal description of the property; (2) provide notice to all successors-in-title: (i) that the property is part of, or affected by, the Site; (ii) that EPA has selected a remedy for the Site; and (iii) that potentially responsible parties have entered into a Decree requiring implementation of such remedy; and (3) identify the U.S. District Court in which the Decree was filed, the name and civil action number of this case, and the Effective Date of the Decree. Owner Settling Defendants shall record the notice within 10 days after EPA's approval of the notice and submit to EPA, within 10 days thereafter, a certified copy of the recorded notice.

b. Owner Settling Defendants shall, prior to entering into a contract to Transfer any of their property that is part of the Site, or 60 days prior to a Transfer of such property, whichever is earlier:

(1) notify the proposed transferee that EPA has selected a remedy regarding the Site, that potentially responsible parties have entered into a Consent Decree requiring implementation of such remedy, and that the United States District Court has entered the Decree (identifying the name and civil action number of this case and the date the Court entered the Decree); and

(2) notify EPA of the name and address of the proposed transferee and provide EPA with a copy of the notice that it provided to the proposed transferee.

33. Notwithstanding any provision of the Decree, EPA retains all of its access authorities and rights, as well as all of its rights to require land, water, or other resource use restrictions and Institutional Controls, including related enforcement authorities, under CERCLA, RCRA, and any other applicable statute or regulations.

VIII. FINANCIAL ASSURANCE

34. To ensure completion of the Work required under Section VI, Settling Defendants shall secure financial assurance, initially in the amount of $1,650,000 ("Estimated Cost of the OU3 Work"), for the benefit of EPA. The financial assurance must: (i) be one or more of the mechanisms listed below, in a form substantially identical to the relevant sample documents available from EPA; and (ii) be satisfactory to EPA. As of the date of lodging of this Decree, the sample documents can be found under the "Financial Assurance - Settlements" category on the Cleanup Enforcement Model Language and Sample Documents Database at https://cfpub.epa.gov/compliance/models/. Settling Defendants may use multiple mechanisms if they are limited to surety bonds guaranteeing payment, letters of credit, trust funds, insurance policies, or some combination thereof. The following are acceptable mechanisms:

a. a surety bond guaranteeing payment, performance of the Work, or both, that is issued by a surety company among those listed as acceptable sureties on federal bonds as set forth in Circular 570 of the U.S. Department of the Treasury;

b. an irrevocable letter of credit, payable to EPA or at the direction of EPA, that is issued by an entity that has the authority to issue letters of credit and whose letter-of-credit operations are regulated and examined by a federal or state agency;

c. a trust fund established for the benefit of EPA that is administered by a trustee that has the authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency;

d. a policy of insurance that provides EPA with acceptable rights as a beneficiary thereof and that is issued by an insurance carrier that has the authority to issue insurance policies in the applicable jurisdiction(s) and whose insurance operations are regulated and examined by a federal or state agency;

e. a demonstration by one or more Settling Defendants that they meet the relevant test criteria of ¶ 35; or

f. a guarantee to fund or perform the Work executed in favor of EPA by a company: (1) that is a direct or indirect parent company of a Settling Defendant or has a "substantial business relationship" (as defined in 40 C.F.R. § 264.141(h)) with a Settling Defendant; and (2) demonstrates to EPA's satisfaction that it meets the financial test criteria of ¶ 35.

35. Settling Defendants seeking to provide financial assurance by means of a demonstration or guarantee under ¶ 34.e or 34.f must, within 30 days after the Effective Date:

a. demonstrate that:

(1) the affected Settling Defendant or guarantor has:

i. two of the following three ratios: a ratio of total liabilities to net worth less than 2.0; a ratio of the sum of net income plus depreciation, depletion, and amortization to total liabilities greater than 0.1; and a ratio of current assets to current liabilities greater than 1.5; and

ii. net working capital and tangible net worth each at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; and

iii. tangible net worth of at least $10 million; and

iv. assets located in the United States amounting to at least 90 percent of total assets or at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; or

(2) the affected Settling Defendant or guarantor has:

i. a current rating for its senior unsecured debt of AAA, AA, A, or BBB as issued by Standard and Poor's or Aaa, Aa, A or Baa as issued by Moody's; and

ii. tangible net worth at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; and

iii. tangible net worth of at least $10 million; and

iv. assets located in the United States amounting to at least 90 percent of total assets or at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; and

b. submit to EPA for the affected Settling Defendant or guarantor: (1) a copy of an independent certified public accountant's report of the entity's financial statements for the latest completed fiscal year, which must not express an adverse opinion or disclaimer of opinion; and (2) a letter from its chief financial officer and a report from an independent certified public accountant substantially identical to the sample letter and reports available from EPA. As of the date of lodging of this Decree, a sample letter and report is available under the "Financial Assurance - Settlements" subject list category on the Cleanup Enforcement Model Language and Sample Documents Database at https://cfpub.epa.gov/compliance/models/.

36. Settling Defendants providing financial assurance by means of a demonstration or guarantee under ¶ 34.e or 34.f must also:

a. annually resubmit the documents described in ¶ 35.b within 90 days after the close of the affected Settling Defendant's or guarantor's fiscal year;

b. notify EPA within 30 days after the affected Settling Defendant or guarantor determines that it no longer satisfies the relevant financial test criteria and requirements set forth in this Section; and

c. provide to EPA, within 30 days of EPA's request, reports of the financial condition of the affected Settling Defendant or guarantor in addition to those specified in ¶ 35.b; EPA may make such a request at any time based on a belief that the affected Settling Defendant or guarantor may no longer meet the financial test requirements of this Section.

37. Settling Defendants shall, within 14 days after the Effective Date, seek EPA's approval of the form of Settling Defendants' financial assurance. Within 30 days after the Effective Date, Settling Defendants shall secure all executed or otherwise finalized mechanisms or other documents consistent with the EPA-approved form of financial assurance and shall submit such mechanisms and documents to the Regional Financial Management Officer, to DOJ, and to EPA.

38. Settling Defendants shall diligently monitor the adequacy of the financial assurance. If any Settling Defendant becomes aware of any information indicating that the financial assurance provided under this Section is inadequate or otherwise no longer satisfies the requirements of this Section, such Settling Defendant shall notify EPA of such information within seven days. If EPA determines that the financial assurance provided under this Section is inadequate or otherwise no longer satisfies the requirements of this Section, EPA will notify the affected Settling Defendant of such determination. Settling Defendants shall, within 30 days after notifying EPA or receiving notice from EPA under this Paragraph, secure and submit to EPA for approval a proposal for a revised or alternative financial assurance mechanism that satisfies the requirements of this Section. EPA may extend this deadline for such time as is reasonably necessary for the affected Settling Defendant, in the exercise of due diligence, to secure and submit to EPA a proposal for a revised or alternative financial assurance mechanism, not to exceed 60 days. Settling Defendants shall follow the procedures of ¶ 40 in seeking approval of, and submitting documentation for, the revised or alternative financial assurance mechanism. Settling Defendants' inability to secure financial assurance in accordance with this Section does not excuse performance of any other requirement of this Decree.

39. **Access to Financial Assurance**

a. If EPA issues a notice of a Work Takeover under ¶ 28.b, then, in accordance with any applicable financial assurance mechanism, EPA may require that any funds guaranteed be paid in accordance with ¶ 39.d.

b. If EPA is notified that the issuer of a financial assurance mechanism intends to cancel the mechanism, and the affected Settling Defendant fails to provide an alternative financial assurance mechanism in accordance with this Section at least 30 days prior to the cancellation date, the funds guaranteed under such mechanism must be paid prior to cancellation in accordance with ¶ 39.d.

c. If, upon issuance of a notice of a Work Takeover under ¶ 28.b, either: (1) EPA is unable for any reason to promptly secure the resources guaranteed under any applicable financial assurance mechanism, whether in cash or in kind, to continue and complete the Work; or (2) the financial assurance is a demonstration or guarantee under ¶ 34.e or 34.f, then EPA is entitled to demand an amount, as determined by EPA, sufficient to cover the cost of the remaining Work to be performed. Settling Defendants shall, within 14 days after such demand, pay the amount demanded as directed by EPA.

d. Any amounts required to be paid under this ¶ 39 must be, as directed by EPA: (i) paid to EPA in order to facilitate the completion of the Work by EPA or by another person; or (ii) deposited into an interest-bearing account, established at a duly chartered bank or trust company that is insured by the FDIC, in order to facilitate the completion of the Work by another person. If payment is made to EPA, EPA may deposit the payment into the Fund or into the Special Account to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by EPA to the Fund.

40. **Modification of Amount, Form, or Terms of Financial Assurance**. Beginning after the first anniversary of the Effective Date, and no more than once per calendar year, Settling Defendants may submit a request to change the form, terms, or amount of the financial assurance mechanism. Any such request must be submitted to EPA in accordance with ¶ 37, and must include an estimate of the cost of the remaining Work, an explanation of the bases for the cost calculation, and a description of the proposed changes, if any, to the form or terms of the financial assurance. EPA will notify Settling Defendants of its decision regarding the request. Settling Defendants may initiate dispute resolution under Section XII regarding EPA's decision within 30 days after receipt of the decision. Settling Defendants may modify the form, terms, or amount of the financial assurance mechanism only: (a) in accordance with EPA's approval; or (b) in accordance with any resolution of a dispute under Section XII. Settling Defendants shall submit to EPA, within 30 days after receipt of EPA's approval or consistent with the terms of the resolution of the dispute, documentation of the change to the form, terms, or amount of the financial assurance instrument.

41. **Release, Cancellation, or Discontinuation of Financial Assurance**. Settling Defendants may release, cancel, or discontinue any financial assurance provided under this Section only: (a) if EPA issues a Certification of Work Completion under **¶ 5.9** of the SOW; (b) in accordance with EPA's approval of such release, cancellation, or discontinuation; or (c) if there is

a dispute regarding the release, cancellation or discontinuance of any financial assurance, in accordance with the agreement, final administrative decision, or final judicial decision resolving such dispute under Section XII.

IX. INDEMNIFICATION AND INSURANCE

42. **Indemnification**

a. Plaintiff does not assume any liability by entering into this Decree or by virtue of any designation of Settling Defendants as EPA's authorized representative under section 104(e)(1) of CERCLA. Settling Defendants shall indemnify and save and hold harmless Plaintiff and its officials, agents, employees, contractors, subcontractors, and representatives for or from any claims or causes of action arising from, or on account of, negligent or other wrongful acts or omissions of Settling Defendants, their officers, directors, employees, agents, contractors, subcontractors, and any persons acting on Settling Defendants' behalf or under their control, in carrying out activities under this Decree, including any claims arising from any designation of Settling Defendants as EPA's authorized representative under section 104(e)(1) of CERCLA. Further, Settling Defendants agree to pay Plaintiff all costs it incurs including attorneys' fees and other expenses of litigation and settlement arising from, or on account of, claims made against Plaintiff based on negligent or other wrongful acts or omissions of Settling Defendants, their officers, directors, employees, agents, contractors, subcontractors, and any persons acting on their behalf or under their control in carrying out activities under with this Decree. Plaintiff may not be held out as a party to any contract entered into by or on behalf of Settling Defendants in carrying out activities under this Decree. The Settling Defendants and any such contractor may not be considered an agent of Plaintiff.

b. Plaintiff shall give Settling Defendants notice of any claim for which Plaintiff plans to seek indemnification in accordance with this ¶ 42, and shall consult with Settling Defendants prior to settling such claim.

43. Settling Defendants covenant not to sue and shall not assert any claim or cause of action against Plaintiff for damages or reimbursement or for set-off of any payments made or to be made to Plaintiff, arising from or on account of any contract, agreement, or arrangement between any one or more of Settling Defendants and any person for performance of Work or other activities on or relating to the Site, including claims on account of construction delays. In addition, Settling Defendants shall indemnify and save and hold Plaintiff harmless with respect to any claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between any one or more of Settling Defendants and any person for performance of work at or relating to the Site, including claims on account of construction delays.

44. **Insurance**. Settling Defendants shall secure, by no later than 15 days before commencing any on-site Work, the following insurance: (a) commercial general liability insurance with limits of liability of $1 million per occurrence; (b) automobile liability insurance with limits of liability of $1 million per accident; and (c) umbrella liability insurance with limits of liability of $5 million in excess of the required commercial general liability and automobile liability limits. The insurance policy must name Plaintiff as an additional insured with respect to all liability arising out of the activities performed by or on behalf of Settling Defendants under

this Decree. Settling Defendants shall maintain this insurance until the first anniversary after issuance of EPA's Certification of Remedial Action Completion under ¶ **5.7** of the SOW. In addition, for the duration of this Decree, Settling Defendants shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the Work on behalf of Settling Defendants in furtherance of this Decree. Prior to commencement of the Work, Settling Defendants shall provide to EPA certificates of such insurance and a copy of each insurance policy. Settling Defendants shall resubmit such certificates and copies of policies each year on the anniversary of the Effective Date. If Settling Defendants demonstrate by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering the same risks but in a lesser amount, then, with respect to that contractor or subcontractor, Settling Defendants need provide only that portion of the insurance described above that is not maintained by the contractor or subcontractor. Settling Defendants shall ensure that all submittals to EPA under this Paragraph identify the CPS/Madison Superfund Site, Old Bridge, NJ**,** and the civil action number of this case.

X. PAYMENTS FOR RESPONSE COSTS

45. **Payments by Settling Defendants for Future Response Costs**

a. **Periodic Bills**. On a periodic basis, EPA will send Settling Defendants a bill for Future Response Costs, including a **e-Recovery Report** listing direct costs paid by EPA and DOJ and related indirect costs. Settling Defendants may initiate a dispute under Section XII regarding a Future Response Cost billing, but only if the dispute relates to one or more of the following issues: (1) whether EPA has made an arithmetical error; (2) whether EPA has included a cost item that is not within the definition of Future Response Costs; or (3) whether EPA has paid excess costs as a direct result of an EPA action that was inconsistent with a specific provision or provisions of the NCP. Settling Defendants must specify in the Notice of Dispute the contested costs and the basis for the objection.

b. **Payment of Bill**. Settling Defendants shall pay the bill, or if they initiate dispute resolution, the uncontested portion of the bill, if any, within 30 days after receipt of the bill. Settling Defendants shall pay the contested portion of the bill determined to be owed, if any, within 30 days after the determination regarding the dispute. Each payment for: (1) the uncontested bill or portion of bill, if late, and; (2) the contested portion of the bill determined to be owed, if any, must include an additional amount for Interest accrued from the date of receipt of the bill through the date of payment. Settling Defendants shall make payment at https://www.pay.gov using the "EPA Miscellaneous Payments Cincinnati Finance Center" link, and including references to the Site/Spill ID and DJ numbers listed in ¶ 81 and the purpose of the payment. Settling Defendants shall send notices of this payment to DOJ and EPA.

46. **Deposit of Payments**. EPA may, in its unreviewable discretion, deposit the amounts paid under ¶¶ 45.b in the Fund, in the Special Account, or both. EPA may, in its unreviewable discretion, retain and use any amounts deposited in the Special Account to conduct or finance response actions at or in connection with the Site, or transfer those amounts to the Fund.

XI. FORCE MAJEURE

47. “Force majeure,” for purposes of this Decree, means any event arising from causes beyond the control of Settling Defendants, of any entity controlled by Settling Defendants, or of Settling Defendants’ contractors that delays or prevents the performance of any Work despite Settling Defendants’ best efforts. Given the need to protect public health and welfare and the environment, the requirement that Settling Defendants exercise “best efforts” to perform the Work includes using best efforts to anticipate any potential force majeure and best efforts to address the effects of any potential force majeure (a) as it is occurring and (b) following the potential force majeure such that any adverse effects are minimized to the greatest extent possible. “Force majeure” does not include financial inability to complete the Work or a failure to achieve the Performance Standards.

48. If any event occurs for which Settling Defendants will or may claim a force majeure, Settling Defendants shall notify EPA’s Project Coordinator by email. The deadline for the notice is 3 days after Settling Defendants first knew or should have known that the event would likely delay or prevent performance. Settling Defendants are deemed to know of any circumstance of which any contractor of, subcontractor of, or entity controlled by Settling Defendants knew or should have known. Within 7 days after the notice under ¶ 48, Settling Defendants shall send a further notice to EPA that includes: (i) a description of the event and its effect on the implementation of the Work; (ii) a description of all actions taken or to be taken to minimize the adverse effects of the event; (iii) a description of and an explanation for the requested excuse or extension; (iv) a statement as to whether, in the opinion of Settling Defendants, the event may cause or contribute to an endangerment to public health or welfare, or the environment; and (v) all available proof supporting the claim of force majeure. Failure to submit timely or complete notices under ¶ 48 regarding an event precludes Settling Defendants from asserting a claim of force majeure regarding that event, provided, however, that EPA may, in its unreviewable discretion, excuse such failure if it is able to assess to its satisfaction whether the event is a force majeure and whether Settling Defendants have exercised their best efforts under ¶ 47.

49. EPA will notify Settling Defendants of its determination whether Settling Defendants are entitled to relief under ¶ 47, and, if so, the excuse of or extension of time for performance of the portion of the Work affected by the force majeure. Any such excuse or extension does not, of itself, excuse or extend the time for performance of any other Work. Settling Defendants may initiate dispute resolution under Section XII regarding EPA’s determination. In any such proceeding, Settling Defendants have the burden of proving that they are entitled to relief under ¶ 47 and that their proposed excuse or extension is warranted under the circumstances.

50. The failure by EPA to timely complete any activity under the Decree is not a violation of the Decree, provided, however, that if such failure prevents Settling Defendants from timely completing any Work, Settling Defendants may seek relief under this Section.

XII. DISPUTE RESOLUTION

51. Unless otherwise provided in this Decree, Settling Defendants must use the dispute resolution procedures of this Section to resolve any dispute arising under this Decree. Settling Defendants shall not initiate a dispute challenging the Record of Decision. The United States may enforce any requirement of the Decree that is not the subject of a pending dispute under this Section.

52. A dispute will be considered to have arisen when one or more parties sends a written notice of dispute ("Notice of Dispute"). Disputes arising under this Decree must in the first instance be the subject of informal negotiations between the parties to the dispute. The period for informal negotiations may not exceed 20 days after the dispute arises, unless the parties to the dispute otherwise agree. If the parties cannot resolve the dispute by informal negotiations, the position advanced by EPA is binding unless Settling Defendants initiate formal dispute resolution under ¶ 53. By agreement of the parties, mediation may be used during this informal negotiation period to assist the parties in reaching a voluntary resolution or narrowing of the matters in dispute.

53. **Formal Dispute Resolution**

a. **Statements of Position**. Settling Defendants may initiate formal dispute resolution by serving on the Plaintiffs, within 20 days after the conclusion of informal dispute resolution under ¶ 52, an initial Statement of Position regarding the matter in dispute. The Plaintiff's responsive Statement of Position due within 20 days after receipt of the initial Statement of Position. All Statements of Position must include supporting factual data, analysis, opinion, and other documentation. A reply, if any, is due within 10 days after receipt of the response. If appropriate, EPA may extend the deadlines for filing statements of position for up to 45 days and may allow the submission of supplemental statements of position.

b. **Formal Decision**. An EPA management official at the level of the Deputy Director of SEMD, EPA Region 2, or, at the sole discretion of EPA, someone occupying a higher position, will issue a formal decision resolving the dispute ("Formal Decision") based on the statements of position and any replies and supplemental statements of position. The Formal Decision is binding on Settling Defendants unless they timely seek judicial review under ¶53.

c. **Compilation of Administrative Record**. EPA shall compile an administrative record regarding the dispute, which must include all statements of position, replies, supplemental statements of position, and the Formal Decision.

54. **Judicial Review**

a. Settling Defendants may obtain judicial review of the Formal Decision by filing, within 20 days after receiving it, a motion with the Court and serving the motion on all Parties. The motion must describe the matter in dispute and the relief requested. The parties to the dispute shall brief the matter in accordance with local court rules.

b. **Review on the Administrative Record**. Judicial review of disputes regarding the following issues must be on the administrative record: (i) the adequacy or appropriateness of deliverables required under the Decree; (ii) the adequacy of the performance of the Remedial Action; (iii) whether a Work Takeover is warranted under ¶ 28; (iv) determinations about financial assurance under Section VIII; (v) EPA's selection of modified or further response actions; (vi) any other items requiring EPA approval under the Decree; and (vii) any other disputes that the Court determines should be reviewed on the administrative record. For all of these disputes, Settling Defendants bear the burden of demonstrating that the Formal Decision was arbitrary and capricious or otherwise not in accordance with law.

c. Judicial review of any dispute not governed by ¶ 53.b. shall be governed by applicable principles of law.

55. **Escrow Account**. For disputes regarding a Future Response Cost billing, Settling Defendants shall: (a) establish, in a duly chartered bank or trust company, an interest-bearing escrow account that is insured by the Federal Deposit Insurance Corporation ("FDIC"); (b) remit to that escrow account funds equal to the amount of the contested Future Response Costs; and (c) send to EPA copies of the correspondence and of the payment documentation (e.g., the check) that established and funded the escrow account, including the name of the bank, the bank account number, and a bank statement showing the initial balance in the account. EPA may, in its unreviewable discretion, waive the requirement to establish the escrow account. Settling Defendants shall cause the escrow agent to pay the amounts due to EPA under ¶ 45, if any, by the deadline for such payment in ¶ 45. Settling Defendants are responsible for any balance due under ¶ 45 after the payment by the escrow agent.

56. The initiation of dispute resolution procedures under this Section does not extend, postpone, or affect in any way any requirement of this Decree, except as EPA agrees, or as determined by the Court. Stipulated penalties with respect to the disputed matter will continue to accrue, but payment is stayed pending resolution of the dispute, as provided in ¶ 59.

XIII. STIPULATED PENALTIES

57. Unless the noncompliance is excused under Section XI (Force Majeure), Settling Defendants are liable to the United States for the following stipulated penalties:

a. for any failure: (i) to pay any amount due under Section X; (ii) to establish and maintain financial assurance in accordance with Section VIII; (iii) to submit timely or adequate deliverables under Section 7 of the SOW; and (iv) to (a) timely initiate, perform, and complete the Remedial Action and Operation and Maintenance in accordance with the OU1/OU2 Record of Decision (metals contamination) and OU3 Record of Decision, the SOW, or this Consent Decree, and plans and schedules approved hereunder, including any deadline imposed by the SOW or by any plan which is prepared pursuant to the SOW and approved by EPA; (b) to meet obligations imposed by the Emergency Response and Reporting Provisions of the SOW; and (c) to meet obligations imposed by Section VII (Property Requirements):

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

b. for any failure to submit timely or adequate deliverables required by this Decree other than those specified in ¶ 57.a:

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

58. **Work Takeover Penalty**. If EPA commences a Work Takeover, Settling Defendants are liable for a stipulated penalty in the amount of $1,000,000. This stipulated penalty is in addition to the remedy available to EPA under ¶ 39 (Access to Financial Assurance) to fund the performance of the Work by EPA.

59. **Accrual of Penalties**. Stipulated penalties accrue from the date performance is due, or the day a noncompliance occurs, whichever is applicable, until the date the requirement is completed or the final day of the correction of the noncompliance. Nothing in this Decree prevents the simultaneous accrual of separate penalties for separate noncompliances with this Decree. Stipulated penalties accrue regardless of whether Settling Defendants have been notified of their noncompliance, and regardless of whether Settling Defendants have initiated dispute resolution under Section XII, provided, however, that no penalties will accrue as follows:

a. with respect to a submission that EPA subsequently determines is deficient under ¶ **7.6** of the SOW, during the period, if any, beginning on the 31st day after EPA's receipt of such submission until the date that EPA notifies Settling Defendants of any deficiency;

b. with respect to a matter that is the subject of dispute resolution under Section XII, during the period, if any, beginning on the 21st day after the later of the date that EPA's Statement of Position is received or the date that Settling Defendants' reply thereto (if any) is received until the date of the Formal Decision under ¶ 53.b.; or

c. with respect to a matter that is the subject of judicial review by the Court under ¶ 54, during the period, if any, beginning on the 31st day after the Court's receipt of the final submission regarding the dispute until the date that the Court issues a final decision regarding such dispute.

60. **Demand and Payment of Stipulated Penalties**. EPA may send Settling Defendants a demand for stipulated penalties. The demand will include a description of the noncompliance and will specify the amount of the stipulated penalties owed. Settling Defendants may initiate dispute resolution under Section XII within 30 days after receipt of the demand. Settling Defendants shall pay the amount demanded or, if they initiate dispute resolution, the uncontested portion of the amount demanded, within 30 days after receipt of the demand. Settling Defendants shall pay the contested portion of the penalties determined to be owed, if any, within

30 days after the resolution of the dispute. Each payment for: (a) the uncontested penalty demand or uncontested portion, if late; and (b) the contested portion of the penalty demand determined to be owed, if any, must include an additional amount for Interest accrued from the date of receipt of the demand through the date of payment. Settling Defendants shall make payment at https://www.pay.gov using the link for "EPA Miscellaneous Payments Cincinnati Finance Center," including references to the Site/Spill ID and DJ numbers listed in ¶ 81, and the purpose of the payment. Settling Defendants shall send a notice of this payment to DOJ and EPA. The payment of stipulated penalties and Interest, if any, does not alter any obligation by Settling Defendants under the Decree.

61. Nothing in this Decree limits the authority of the United States: (a) to seek any remedy otherwise provided by law for Settling Defendants' failure to pay stipulated penalties or interest; or (b) to seek any other remedies or sanctions available by virtue of Settling Defendants' noncompliances with this Decree or of the statutes and regulations upon which it is based, including penalties under section 122(*l*) of CERCLA, provided, however, that the United States may not seek civil penalties under section 122(*l*) of CERCLA for any noncompliance for which a stipulated penalty is provided for in this Decree, except in the case of a willful noncompliance with this Decree.

62. Notwithstanding any other provision of this Section, the United States may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued under this Decree.

XIV. COVENANTS BY PLAINTIFFS

63. **Covenants for Settling Defendant**s. Subject to ¶¶ 64 and 65, the United States covenants not to sue or to take administrative action against Settling Defendants under sections 106 and 107(a) of CERCLA regarding the Work and Future Response Costs.

64. The covenants under ¶ 63: (a) take effect upon the Effective Date; (b) are conditioned on the satisfactory performance by Settling Defendants of the requirements of this Decree; (c) extend to the successors of each Settling Defendant but only to the extent that the alleged liability of the successor of the Settling Defendant is based solely on its status as a successor of the Settling Defendant; and (d) do not extend to any other person.

65. **General Reservations**. Notwithstanding any other provision of this Decree, the United States reserves, and this Decree is without prejudice to, all rights against Settling Defendants regarding the following:

a. liability for failure by Settling Defendants to meet a requirement of this Decree;

b. liability arising from the past, present, or future disposal, release, or threat of release of Waste Material outside of the Site;

c. liability based on Settling Defendants' ownership of the Site when such ownership commences after Settling Defendants' signature of this Decree;

d. liability based on Settling Defendants' operation of the Site when such operation commences after Settling Defendants' signature of this Decree and does not arise solely from Settling Defendants' performance of the Work;

e. liability based on Settling Defendants' transportation, treatment, storage, or disposal, or arrangement for transportation, treatment, storage, or disposal of Waste Material at or in connection with the Site, after signature of this Decree by Settling Defendants, other than as provided in the Record of Decision, under this Decree, or ordered by EPA;

f. liability for additional operable units at the Site or the final response action;

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

h. liability, prior to achievement of Performance Standards, for additional response actions that EPA determines are necessary to achieve and maintain Performance Standards or to carry out and maintain the effectiveness of the Remedial Action, but that are not covered by ¶ 26.b; and

i. criminal liability.

66. Subject to ¶ 63, nothing in this Decree limits any authority of Plaintiffs to take, direct, or order all appropriate action to protect public health and welfare and the environment or to prevent, abate, respond to, or minimize an actual or threatened release of Waste Material on, at, or from the Site, or to request a Court to order such action.

XV. COVENANTS BY SETTLING DEFENDANTS

67. **Covenants by Settling Defendant**s

a. Subject to ¶ 68, Settling Defendants covenant not to sue and shall not assert any claim or cause of action against the United States or the State under CERCLA, section 7002(a) of RCRA, the United States Constitution, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, the State Constitution, State law, or at common law regarding the Work, past response actions relating to the Site and Future Response Costs.

b. Subject to ¶ 68, Settling Defendants covenant not to seek reimbursement from the Fund through CERCLA or any other law for costs of the Work and past response actions regarding the Site and Future Response Costs.

68. **Settling Defendants' Reservation**. The covenants in ¶ 67 do not apply to any claim or cause of action brought, or order issued, after the Effective Date by the United States to the extent such claim, cause of action, or order is within the scope of a reservation under ¶¶ 65.a through 65.h.

69. ***De Minimis*/Ability to Pay Waiver**. Settling Defendants shall not assert any claims and waive all claims or causes of action (including claims or causes of action under

sections 107(a) and 113 of CERCLA) that they may have against any third party who enters or has entered into a *de minimis* or "ability-to-pay" settlement with EPA to the extent Settling Defendants' claims and causes of action are within the scope of the matters addressed in the third party's settlement with EPA, provided, however, that this waiver does not apply if the third party asserts a claim or cause of action regarding the Site against the Settling Defendants. Nothing in the Decree limits Settling Defendants' rights under section 122(d)(2) of CERCLA to comment on any *de minimis* or ability-to-pay settlement proposed by EPA.

XVI. EFFECT OF SETTLEMENT; CONTRIBUTION

70. The Parties agree and the Court finds that: (a) the complaint filed by the United States in this action is a civil action within the meaning of section 113(f)(1) of CERCLA; (b) this Decree constitutes a judicially approved settlement under which each Settling Defendant has, as of the Effective Date, resolved its liability to the United States within the meaning of sections 113(f)(2) and 113(f)(3)(B) of CERCLA; and (c) each Settling Defendant is entitled, as of the Effective Date, to protection from contribution actions or claims as provided by section 113(f)(2) of CERCLA, or as may be otherwise provided by law, for the "Matters Addressed" in this Decree. The contribution protection under the preceding sentence extends to the successors of each Settling Defendant but only to the extent that the alleged liability of the successor of the Settling Defendant is based solely on its status as a successor of the Settling Defendant. The "Matters Addressed" in this Decree are the Work and Future Response Costs, provided, however, that if the United States exercises rights under the reservations in ¶¶ 65.a, 65.f, or 65.h, the "Matters Addressed" in this Decree will no longer include those response costs or response actions that are within the scope of the exercised reservation.

71. Each Settling Defendant shall, with respect to any suit or claim brought by it for matters related to this Decree, notify DOJ and EPA no later than 60 days prior to the initiation of such suit or claim. Each Settling Defendant shall, with respect to any suit or claim brought against it for matters related to this Decree, notify DOJ and EPA within 10 days after service of the complaint on such Settling Defendant. In addition, each Settling Defendant shall notify DOJ and EPA within 10 days after service or receipt of any Motion for Summary Judgment and within 10 days after receipt of any order from a court setting a case for trial.

72. **Res Judicata and Other Defenses**. In any subsequent administrative or judicial proceeding initiated against any Settling Defendant by either Plaintiff for injunctive relief, recovery of response costs, or other appropriate relief relating to the Site, Settling Defendants shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, claim preclusion (res judicata), issue preclusion (collateral estoppel), claim-splitting, or other defenses based upon any contention that the claims raised by the United States in the subsequent proceeding were or should have been brought in the instant case.

73. Nothing in this Decree diminishes the right of the United States under section 113(f)(2) and (3) of CERCLA to pursue any person not a party to this Decree to obtain additional response costs or response action and to enter into settlements that give rise to contribution protection pursuant to section 113(f)(2).

XVII. RECORDS

74. **Settling Defendant Certification**. Each Settling Defendant certifies individually that: (a) to the best of its knowledge and belief, after thorough inquiry it has not altered, mutilated, discarded, destroyed or otherwise disposed of any documents and electronically stored information relating to the Site, including information relating to its potential liability under CERCLA regarding the Site, since the earlier of notification of potential liability by the United States or the filing of suit against it regarding the Site; and (b) it has fully complied with any and all EPA requests for information under sections 104(e) and 122(e) of CERCLA, and section 3007 of RCRA, and State law.

75. **Retention of Records and Information**

a. Settling Defendants shall retain, and instruct their contractors and agents to retain, the following documents and electronically stored data ("Records") until 10 years after the Certification Completion of the Work under SOW ¶ **5.9** (the "Record Retention Period"):

(1) All records regarding Settling Defendants' liability under CERCLA regarding the Site;

(2) All reports, plans, permits, and documents submitted to EPA in accordance with this Decree, including all underlying research and data; and

(3) All data developed by, or on behalf of, Settling Defendants in the course of performing the Remedial Action.

b. Settling Defendants shall retain all Records regarding the liability of any person under CERCLA regarding the Site during the Record Retention Period.

c. At the end of the Record Retention Period, Settling Defendants shall notify EPA that it has 90 days to request the Settling Defendants' Records subject to this Section. Settling Defendants shall retain and preserve their Records subject to this Section until 90 days after EPA's receipt of the notice. These record retention requirements apply regardless of any corporate record retention policy.

76. Settling Defendants shall provide to EPA, upon request, copies of all Records and information required to be retained under this Section. Settling Defendants shall also make available to EPA, for purposes of investigation, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

77. **Privileged and Protected Claims**

a. Settling Defendants may assert that all or part of a record requested by Plaintiffs is privileged or protected as provided under federal law, in lieu of providing the record, provided that Settling Defendants comply with ¶ 77.b, and except as provided in ¶ 77.c.

b. If Settling Defendants assert a claim of privilege or protection, they shall provide Plaintiff with the following information regarding such record: its title; its date; the name, title, affiliation (e.g., company or firm), and address of the author, of each addressee, and of each recipient; a description of the record's contents; and the privilege or protection asserted. If a claim of privilege or protection applies only to a portion of a record, Settling Defendants shall provide the record to Plaintiff in redacted form to mask the privileged or protected portion only. Settling Defendants shall retain all records that they claim to be privileged or protected until Plaintiff has had a reasonable opportunity to dispute the privilege or protection claim and any such dispute has been resolved in Settling Defendants' favor.

c. Settling Defendants shall not make any claim of privilege or protection regarding: (1) any data regarding the Site, including all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, radiological or engineering data, or the portion of any other record that evidences conditions at or around the Site; or (2) the portion of any record that Settling Defendants are required to create or generate in accordance with this Decree.

78. **Confidential Business Information (CBI) Claims**. Settling Defendants may claim that all or part of a record provided to Plaintiff under this Section is CBI to the extent permitted by and in accordance with section 104(e)(7) of CERCLA and 40 C.F.R. § 2.203(b). Settling Defendants shall segregate and shall clearly identify all records or parts thereof submitted under this Decree for which they claim is CBI by labeling each page or each electronic file "claimed as confidential business information" or "claimed as CBI." Records that Settling Defendants claim to be CBI will be afforded the protection specified in 40 C.F.R. part 2, subpart B. If no CBI claim accompanies records when they are submitted to EPA, or if EPA notifies Settling Defendants that the records are not entitled to confidential treatment under the standards of section 104(e)(7) of CERCLA or 40 C.F.R. part 2, subpart B, the public may be given access to such records without further notice to Settling Defendants.

79. In any proceeding under this Decree, validated sampling or monitoring data generated in accordance with the SOW and reviewed and approved by EPA, if relevant to the proceeding, is admissible as evidence, without objection.

80. Notwithstanding any provision of this Decree, Plaintiff retains all of its information gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

XVIII. NOTICES AND SUBMISSIONS

81. All agreements, approvals, consents, deliverables, modifications, notices, notifications, objections, proposals, reports, waivers, and requests specified in this Decree must be in an electronic writing. Whenever a notice is required to be given or a report or other document is required to be sent by one Party to another under this Decree, it must be sent via email as specified below. All notices under this Section are effective upon receipt. There is a rebuttable presumption that such notices are received on the same day that they are sent. Any Party may change the person or address applicable to it by providing notice of such change to all Parties.

As to DOJ:	*via email to*: eescdcopy.enrd@usdoj.gov Re: DJ # 90-11-3-1525/3
As to EPA:	Brennan Woodall Woodall.Brennan@epa.gov Re: Site/Spill ID # 0283
As to the Regional Financial Management Officer:	*via email to*: cinwd acctsreceivable@epa.gov Re: Site/Spill ID # 0283
As to the State:	Dylan Zaliwski Dylan.Zaliwski@dep.nj.gov
As to Settling Defendants:	*via email to*: Jeffrey Smith, P.G. Langan Engineering & Environmental Services, LLC jsmith@Langan.com

XIX. APPENDIXES

82. The following appendixes are attached to and incorporated into this Decree:

"Appendix A" is the OU1/OU2 Record of Decision.

"Appendix B" is the OU3 Record of Decision.

"Appendix C" is the SOW.

"Appendix D" is the description and map of the Site.

"Appendix E" is the complete list of Settling Defendants.

XX. MODIFICATIONS TO DECREE

83. Except as provided in ¶ 26 of the Decree and ¶ **7.6** of the SOW (Approval of Deliverables), nonmaterial modifications to Sections I through XXIV and the Appendixes must be in writing and are effective when signed (including electronically signed) by the Parties. Material modifications to Sections I through XXIV and the Appendixes must be in writing, signed (which may include electronically signed) by the Parties, and are effective upon approval by the Court. As to changes to the remedy, a modification to the Decree, including the SOW, to implement an amendment to the Record of Decision that "fundamentally alters the basic features" of the Remedial Action within the meaning of 40 C.F.R. § 300.435(c)(2)(ii) will be considered a material modification.

XXI. SIGNATORIES

84. The undersigned representative of the United States and each undersigned representative of a Settling Defendant certifies that he or she is fully authorized to enter into the terms and conditions of this Decree and to execute and legally bind such Party to this document.

XXII. PRE-ENTRY PROVISIONS

85. If for any reason the Court should decline to approve this Decree in the form presented, this agreement, except for ¶ 86 and ¶ 87, is voidable at the sole discretion of any Party and its terms may not be used as evidence in any litigation between the Parties.

86. This Decree will be lodged with the Court for at least 30 days for public notice and comment in accordance with section 122(d)(2) of CERCLA and 28 C.F.R. § 50.7. The United States may withdraw or withhold its consent if the comments regarding the Decree disclose facts or considerations that indicate that the Decree is inappropriate, improper, or inadequate.

87. Settling Defendants agree not oppose or appeal the entry of this Decree.

XXIII. INTEGRATION

88. This Decree constitutes the entire agreement among the Parties regarding the subject matter of the Decree and supersedes all prior representations, agreements, and understandings, whether oral or written, regarding the subject matter of the Decree.

XXIV. FINAL JUDGMENT

89. Upon entry of this Decree by the Court, this Decree constitutes a final judgment under Fed. R. Civ. P. 54 and 58 among the Parties.

SO **ORDERED** this ___ day of ___________, 20__.

____

United States District Judge

Signature Page for Consent Decree in *U.S. v. Arnet Realty Company L.L.C., Old Bridge Minerals, Inc., and HB Warehousing, LLC*

FOR THE UNITED STATES:

TODD KIM
Assistant Attorney General
U.S. Department of Justice
Environment and Natural Resources Division

Dated: 12/9/24

Alexandra B. Sherertz

Alexandra B. Sherertz
Trial Attorney
U.S. Department of Justice
Environment and Natural Resources Division
Environmental Enforcement Section
P.O. Box 7611
Washington, DC 20044-7611
Phone: (202) 598-5263
E-mail: Alexandra.Sherertz@usdoj.gov

Signature Page for Consent Decree in *U.S. v. Arnet Realty Company L.L.C., Old Bridge Minerals, Inc., and HB Warehousing, LLC*

FOR THE U.S. ENVIRONMENTAL PROTECTION AGENCY:

Evangelista, Pat Digitally signed by Evangelista, Pat
Date: 2024.09.30 18:25:19 -04'00'

Pat Evangelista
Division Director
Superfund & Emergency Management Division
U.S. Environmental Protection Agency
Region 2

CLAY MONROE Digitally signed by CLAY MONROE
Date: 2024.09.30 18:05:00 -04'00'

Clay Monroe
Assistant Regional Counsel
U.S. Environmental Protection Agency
Region 2
290 Broadway
NY, NY 10007

Signature Page for Consent Decree in *U.S. v. Arnet Realty Company L.L.C., Old Bridge Minerals, Inc., and HB Warehousing, LLC*

FOR ARNET REALTY COMPANY, L.L.C.:

9/30/24
Dated

Name: Bruce Bzura
Title: Owner
Address: 554 Water Works Road, Old Bridge, NJ 08857

If the Decree is not approved by the Court within 60 days after the date of lodging, and the United States requests, Settling Defendants agree to execute a waiver of service of a summons under Rule 4 of the Federal Rules of Civil Procedure and any applicable local rules of this Court. **This Settling Defendants hereby designates the agent below to execute the Rule 4 waiver of service.** This Settling Defendant understands that it does not need to file an answer to the complaint until it has executed the waiver of service or otherwise has been served with the complaint.

Name: Bruce Bzura
Title: Owner
Company: Arnet Realty, LLC
Address: 554 Water Works Road
Old Bridge, NJ 08857
Phone: 732-727-2225 ext 310
email: BBzura@oldbridgechem.com

Signature Page for Consent Decree in *U.S. v. Arnet Realty Company L.L.C., Old Bridge Minerals, Inc., and HB Warehousing, LLC*

FOR HB WAREHOUSING, LLC:

9/30/24
Dated

Name: Bruce Bzura
Title: Owner
Address: 554 Water Works Road, Old Bridge, NJ 08857

If the Decree is not approved by the Court within 60 days after the date of lodging, and the United States requests, Settling Defendants agree to execute a waiver of service of a summons under Rule 4 of the Federal Rules of Civil Procedure and any applicable local rules of this Court. **This Settling Defendants hereby designates the agent below to execute the Rule 4 waiver of service.** This Settling Defendant understands that it does not need to file an answer to the complaint until it has executed the waiver of service or otherwise has been served with the complaint.

Name: Bruce Bzura
Title: Owner
Company: HB Warehousingm LLC.
Address: 554 Water Works Road, Old Bridge, NJ 08857

Phone: 732-727-2225 ext 310
email: BBzura@oldbridgechem.com

Signature Page for Consent Decree in *U.S. v. Arnet Realty Company L.L.C., Old Bridge Minerals, Inc., and HB Warehousing, LLC*

FOR OLD BRIDGE MINERALS, INC.:

9/30/24
Dated

Name: Adam Bzura
Title: Chief Executive Officer
Address: 554 Water Works Road, Old Bridge, NJ 08857

If the Decree is not approved by the Court within 60 days after the date of lodging, and the United States requests, Settling Defendants agree to execute a waiver of service of a summons under Rule 4 of the Federal Rules of Civil Procedure and any applicable local rules of this Court. **This Settling Defendants hereby designates the agent below to execute the Rule 4 waiver of service.** This Settling Defendant understands that it does not need to file an answer to the complaint until it has executed the waiver of service or otherwise has been served with the complaint.

Name: Adam Bzura
Title: Chief Executive Office
Company: Old Bridge Minerals, Inc.
Address: 554 Water Works Road, Old Bridge, NJ 08857

Phone: 732-727-2225 ext. 309
email: ABzura@oldbridgechem.com

APPENDIX A

RECORD OF DECISION

CPS Madison Superfund Site
Operable Units One and Two
Old Bridge Township, Middlesex County, New Jersey

United States Environmental Protection Agency
Region 2
New York, New York
September 2019

541232

Table of Contents

FIGURES

TABLES

APPENDICES

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

CPS Madison Superfund Site

Old Bridge Township, Middlesex County, New Jersey

Superfund Site Identification Number: NJD002141190

Operable Unit(s): 01 and 02

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the U.S. Environmental Protection Agency's (EPA's) selection of a remedy for Operable Units One and Two (OU1 and OU2) of the CPS Madison Superfund Site (Site) located in Old Bridge Township, Middlesex County, New Jersey. OU1 consists of contaminated groundwater and OU2 addresses contaminated soil on the property formerly operated by CPS Chemical Company, Inc. (the CPS property). The remedy has been chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C. § 9601-9675, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. This decision document explains the factual and legal basis for selecting the OU1 and OU2 remedy. The attached index (see Appendix I) identifies the items that comprise the administrative record upon which the selected remedy is based.

The New Jersey Department of Environmental Protection (NJDEP) was consulted, in accordance with Section 121(f) of CERCLA, 42 U.S.C. § 9621(f), and concurs with the selected remedy (see Appendix II).

ASSESSMENT OF SITE

Actual or threatened releases of hazardous substances from the Site, if not addressed by the implementation of the response action selected in this ROD, may present an imminent and substantial endangerment to public health and welfare and to the environment.

DESCRIPTION OF SELECTED REMEDY

<u>OU1 - Groundwater</u>

The selected remedy for organic contaminants in groundwater includes the following remedial activities:

- Treatability study and pilot testing to ensure remediation goals for the organic Site contaminants will be achieved.
- Installation and operation of an In-Situ Chemical Oxidation (ISCO) Permeable Reactive Barrier (PRB) well system.
- Installation and operation of groundwater and vadose zone monitoring systems.

- Continued operation of the existing CPS Interim Remedial Measure (IRM) pump and treatment system until the PRB system has been shown to be effective.
- Long-Term Monitoring (LTM) to monitor the low-level organic plume between the PRB and the Perth Amboy wells.
- Continuation of institutional controls - Classification Exception Area (CEA) and Well Restriction Area (WRA).
- Placement of institutional controls in the form of a deed notice to address potential vapor intrusion issues in the event that buildings are constructed in the future above the organic plume.

Because the selected remedy for organic contamination in groundwater will need to be proven under Site conditions, an upgraded version of the CPS IRM Pump and Treat System is selected as the contingency remedy should the contaminant concentrations in effluent of the ISCO Barrier increase (exceeding the variability of the existing IRM results) over four consecutive monitoring periods.

The selected remedy for metal contaminants in groundwater includes the following remedial activities:

- Continued operation of the Madison IRM pump and treatment system.
- Groundwater monitoring.
- Continuation of institutional controls - CEA and WRA.

<u>OU2 – Soils on CPS Property</u>

The selected remedy for soil on the CPS property is ISCO with limited excavation. The major components of the selected soil alternative include:

- Excavation of soils contaminated with 1,4-dioxane from the Repackaging Area and placement in the Tank Farm Area for treatment.
- In-situ chemical oxidation.
- In-situ soil mixing of the oxidant in accessible areas (~20,000 cubic yards).
- In-situ injection of the oxidant in inaccessible areas (~ 1,500 cubic yards).
- Post-Remediation Monitoring.
- Institutional controls.

This remedy will use ISCO to break down organic chemicals in soils to carbon dioxide and water. By this method, organic chemicals in the soil that contribute to groundwater contamination will be permanently removed.

The total present worth cost for the groundwater and soil selected remedy is $22,308,000.

STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in Section 121 of CERCLA, 42 U.S.C. § 9621, because it 1) is protective of human health and the environment; 2) meets a level or standard of control of the hazardous substances, pollutants, and contaminants that at least attains the legally applicable or relevant and appropriate requirements under federal and state laws unless a statutory waiver is justified; 3) is cost-effective; and 4) utilizes permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable. In addition, the selected remedy satisfies the Section 121 of CERCLA, 42 U.S.C. § 9621 preference for the use of treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous substances as a principal element.

Because the selected remedy will result in contaminants remaining above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years.

ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the administrative record file for this action.

- A discussion of the current nature and extent of contamination is included in the "Summary of Site Characteristics" section.
- The Site Chemicals of Concern (COCs) are presented in the "Summary of Site Characteristics" section.
- A discussion of the potential adverse effects associated with exposure to Site COCs is included in the "Summary of Site Risks" section.
- The remediation goals for the Site COCs are presented in the "Remedial Action Objectives" section and in Tables 7 and 8.
- A discussion of principle threat waste is included in the "Principal Threat Wastes" section.
- A discussion of the current and reasonably anticipated future land use assumptions is included in the "Current and Potential Future Land and Resources Uses" section.
- The estimated capital, operation and maintenance, and total present-worth costs are presented in the "Description of Remedial Alternatives" section.
- A discussion of the key factors that led to the selection of the remedy is included in the "Comparative Analysis of Alternatives" and "Statutory Determinations" sections.

AUTHORIZING SIGNATURE

Pat Evangelista, Acting Director
Superfund and Emergency Management Division

9/30/19
Date

DECISION SUMMARY

CPS Madison Superfund Site
Operable Units One and Two
Old Bridge Township, Middlesex County, New Jersey

SITE NAME, LOCATION, AND DESCRIPTION

SITE DESCRIPTION

The two facilities which make up the Site are adjacent properties located along Water Works Road in Old Bridge Township, Middlesex County, New Jersey (Figure 1). The Site acts as a source area for groundwater contamination that flows southwest, into the Runyon Watershed (Figure 2).

CPS Chemical Corporation, Inc. (CPS) Property: The CPS property is approximately 30 acres, located at 570 Water Works Road. The former CPS facility is located within the western portion of the property and is approximately 6.7 acres. From 1967, until operations ended in 2001, the facility processed organic chemicals used in the production of water treatment agents, lubricants, oil field chemicals, and anti-corrosive agents, and engaged in solvent recovery. While the main office and a storage building remain on the property, the process equipment and storage tanks that were located at the south end of the property were demolished and removed from the Site in 2005. This portion of the Site is now inactive.

Madison Industries, Inc. (Madison) Property: The Madison property is 15 acres, located at 554 Water Works Road. The Madison property is bordered to the east by the CPS property and to the west by the Perth Amboy wellfield. Madison has operated the facility (formerly known as "Food Additives") in the northern half of this property since 1967, producing inorganic chemicals used in fertilizer, pharmaceuticals and food additives. On the southern portion of the property, Madison's sister company, Old Bridge Chemical, operates a plant that produces mostly zinc salts and copper sulfate. Both companies continue to operate on the property today.

Runyon Watershed: The Runyon Watershed is mostly undeveloped land which borders the Madison property to the southwest. The watershed contains the Perth Amboy wellfield which lies approximately 3,000 feet southwest (downgradient) of the CPS and Madison facilities. The wellfield supplies over 5,000 gallons per minute (gpm) to the City of Perth Amboy. The extracted water is treated to remove solids and metals using an on-site clarification and filtration system. Site-related contaminants have entered the watershed via groundwater, and to a lesser extent, via surface water.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

In the early 1970s, releases of organic compounds and metals from the CPS and Madison properties resulted in the closing of 32 wells in the Perth Amboy wellfield. In 1979, a state court ordered the companies to perform a remedial investigation under the supervision of NJDEP. The investigation led to a 1981 court order for the companies to implement a remediation program to address groundwater contamination emanating from each of the properties. On September 1, 1983, the Site was placed on the National Priorities List (NPL) with New Jersey as the lead agency. In 1991 and 1992, an off-property groundwater collection system consisting of six recovery wells (three wells operated by CPS, and three by Madison) was installed to protect the Perth Amboy wellfield from contamination emanating from the CPS and Madison properties. Between 1993 and 2000 the groundwater surrounding these recovery wells achieved the cleanup goals in place at that time; the recovery wells were shut down and replaced by the pump and treatment system wells on each of the company's properties, which are collectively known as the Interim Remedial Measure (IRM) wells.

In 1998, NJDEP established a Classification Exception Area (CEA) and a Well Restriction Area (WRA) encompassing the area of the volatile organic plume emanating from the CPS property, covering approximately 32 acres, to a depth of 80 feet. A CEA/WRA is an institutional control established under New Jersey law documenting an area where water quality standards cannot be met and which limits installation of groundwater extraction wells. In 1999, NJDEP established CEAs and WRAs encompassing the areas of two metals plumes emanating from the Madison facility, which are approximately 20.7 acres, and 3.3 acres, to a depth of 80 feet.

In 1998, Ciba Specialty Chemicals (Ciba) acquired responsibility for the CPS Chemical Company facility as part of its acquisition of Allied Colloids, Inc. Ciba continued production of water treatment chemicals until 2001, when Ciba ended operations at the facility. In 2003, Madison Industries, Inc. entered bankruptcy, and NJDEP requested that EPA take the lead role in overseeing the Superfund cleanup. In 2005, EPA entered an administrative order on consent (AOC) with Ciba. The AOC required Ciba to perform a remedial investigation and feasibility study (RI/FS) to determine the extent of contamination in groundwater and soil, determine if an action was needed to address the contamination, and identify potential alternatives to address the contamination. In 2008, BASF Corporation (BASF) acquired Ciba and assumed responsibility for completing the requirements of the AOC as Ciba's corporate successor. The RI/FS was completed in August 2018. Madison entered into an AOC with EPA in 2015 and is currently working on an RI/FS to address soil contamination on its property and sediment contaminated with metals in the watershed. This will be the subject of a future remedy selection process.

COMMUNITY PARTICIPATION

On April 24, 2019, EPA released the Proposed Plan for OU1 and OU2 to the public for comment. Supporting documentation comprising the administrative record file was made available to the public at the information repositories maintained at the Old Bridge Public Library, 1 Old Bridge Plaza, Old Bridge, New Jersey 08857, the EPA Region 2 Superfund Records Center, 290 Broadway, 18th Floor, New York, New York 10007, and EPA's website for the Site at https://www.epa.gov/superfund/cps-madison.

EPA published notice of the start of the public comment period, which ran from April 24, to May 24, 2019, and the availability of the above-referenced documents in the *Home News Tribune* on April 24, 2019. A news release announcing the Proposed Plan, which included the public meeting date, time, and location, was issued to various media outlets and posted on EPA's Region 2 website on April 24, 2019.

A public meeting was held on May 8, 2019, at the Old Bridge Municipal Court, 1 Old Bridge Plaza, Old Bridge, New Jersey, to discuss the alternatives presented in the RI/FS, and to present EPA's proposed alternatives for OU1 and OU2 to the community. Approximately 25 people attended the public meeting, including residents, media, local business people and local government officials. Public comments were related to remedy details, the performance of the work at the Site, and public health concerns.

A copy of the public notice published in the *Home News Tribune,* along with responses to the questions and comments received at the public meeting and in writing during the public comment period can be found in the attached Responsiveness Summary (See Appendix III).

At the request of the Perth Amboy City Administrator, on May 22, 2019, EPA attended a city council meeting with members of the public in attendance. EPA gave a presentation of the Proposed Plan to 39 attendees and answered questions. These questions and EPA's responses are summarized in the attached Responsiveness Summary.

SCOPE AND ROLE OF OPERABLE UNITS

The NCP, at 40 CFR Section 300.5, defines an operable unit as a discrete action that comprises an incremental step toward comprehensively addressing site problems. A discrete portion of a remedial response eliminates or mitigates a release, threat of a release, or pathway of exposure.

Due to the complexity of working with two facilities and varying land uses, EPA is addressing the cleanup of the Site in three operable units. Operable Unit 1 (OU1) addresses groundwater contamination emanating from both properties that impacts the Perth Amboy wellfield. Operable Unit 2 (OU2) addresses contaminated soil on the CPS property that is a direct contact hazard and acts as a contaminant source to groundwater. Operable Unit 3 (OU3) will address sediment and contaminated soil on the Madison property that is a direct contact hazard and acts as a contaminant source to groundwater.

This ROD addresses OU1 and OU2. OU3 contamination will be evaluated separately and will be addressed in a future remedy selection process.

SUMMARY OF SITE CHARACTERISTICS

The Site is relatively flat, ranging from 20 to 25 feet above mean sea level (AMSL). Most of the Site lies within a 100-year flood hazard area, except for a small area in the northeast corner of the CPS Property that is 28 feet AMSL. The facilities are mostly surfaced with asphalt or concrete, except for the three-acre area of the Former Tank Farm that was demolished by Ciba in 2005. The Magothy Formation, which underlies the Site, is used as a drinking water aquifer. Two of the geologic units of the Magothy lie directly under the Site, the Old Bridge sand, and the Perth Amboy fire clay. The Old Bridge sand is between 60 and 70 feet thick beneath the Site and readily conducts water. The fire clay is discontinuous under the Site but acts as a confining unit in some areas. Below the Magothy is the Raritan Formation, which is also a drinking water aquifer. Groundwater under the Site generally flows southwest towards the Perth Amboy supply wells which are approximately half a mile downgradient.

Prickett's Brook, an intermittent stream on the Site, flows west along the southern border of the CPS property (Figure 2). The brook turns north along the border between the CPS and Madison properties until it turns west again and bisects the Madison property. From the Madison property, it enters the Runyon Watershed and travels southwest through Prickett's Pond, and eventually reaches Tennent Pond. The ponds both act as recharge basins for the Perth Amboy wellfield. Prickett's Brook and the downgradient ponds are not currently used for recreational purposes.

SUMMARY OF SITE INVESTIGATIONS

Performance Monitoring Program

Beginning in 1991, under the direction of NJDEP, CPS and Madison installed the IRM wells downgradient of the Madison property, to intercept Site groundwater contamination entering the Runyon Watershed. A Performance Monitoring Program (PMP) was initiated to evaluate the effectiveness of the IRM pump and treatment systems. Pursuant to the PMP, BASF and Madison continue to monitor the IRM wells, which have been reconfigured several times to adjust to reduced contaminant levels in the plumes. The IRM system for the CPS property has been operating since 1996, and was upgraded by BASF in 2015. Madison's IRM system has been operating since 1997, with occasional configuration adjustments.

The Remedial Investigation

In October 1992, NJDEP executed separate Administrative Consent Orders (ACOs) with CPS and Madison to each perform an RI/FS to address the contamination associated with their property. CPS conducted its RI/FS in three phases, documented in three reports submitted in 1993, 1994, and 1996.

In 2003, NJDEP requested that EPA take the lead for the Site. As noted above, EPA entered an AOC with Ciba in 2005 to perform an RI/FS. Ciba submitted an RI/FS Summary Report related to investigations at the CPS property in 2005, pursuant to an AOC with EPA.

Ciba initiated a Supplemental Remedial Investigation (SRI) in 2008, to address data gaps in the previous RI and provide more current data on the status of Site contamination. Also in 2008, BASF acquired Ciba. In 2009, BASF assumed responsibility for compliance with the AOC as corporate successor to Ciba.

The main focus of the SRI was site-wide groundwater and soil on the CPS property. The SRI also investigated surface water contamination, which will be addressed as part of OU3 in a future remedy selection process. BASF submitted the final SRI Report in 2015.

As described above, Madison entered into an AOC with EPA in 2015, and is currently working on an RI/FS to address soil contamination on its property and sediment contaminated with metals in the watershed. This will be the subject of a future remedy selection process.

Groundwater

Groundwater contamination at the Site originates from source areas on both the CPS and Madison properties.

Volatile organic compounds (VOCs) predominantly originate from soils in the former process area on the southern half of the CPS property. These compounds include: 1,2,4-trichlorobenzene; chlorobenzene; benzene; methylene chloride; 1,1,2,2-tetrachloroethane; 1,4-dichlorobenzene; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene; cis-

1,2-dichloroethene; and vinyl chloride. A full list of organic COCs in groundwater can be found in Table 7.

A second source area on the CPS property is soils at the former truck and rail car loading area, which was used to repackage 1,4-dioxane for redistribution. That area is located near the south-west corner of the storage building along the border between the CPS and Madison properties, and appears to be the primary source of 1,4-dioxane in groundwater.

The organic groundwater plume extends from the water table to approximately 40 feet below ground surface (bgs) beneath the CPS and Madison properties (Figure 3). The plume dips downward as it travels southwest toward the Perth Amboy wells where it can be found between 60 and 80 feet bgs, which is the depth at which the supply wells are screened.

The IRM system that was initiated in 1991, under a State order, has greatly reduced the size and concentration of the organic plume that reaches the Perth Amboy wellfield. Most of the organic contaminants that are found southwest of the CPS and Madison properties are near or below both the New Jersey Groundwater Quality Standards (NJGWQS) and Federal and State Maximum Contaminant Levels (MCLs), and attenuate prior to reaching the Perth Amboy wells. Currently the only organic contaminant reaching any of the Perth Amboy wells above the NJGWQS is 1,4-dioxane. Prior to November 2015, the 1,4-dioxane standard was 10 parts per billion (ppb) and there were no exceedances of this level at the Perth Amboy wells. In November 2015, the NJGWQS for 1,4-dioxane was changed to 0.4 ppb, resulting in an exceedance of the new standard at three Perth Amboy wells. However, due to well-head treatment and mixing with non-impacted wells, the finished water supplied to Perth Amboy continues to meet all drinking water standards including the standard for 1,4-dioxane.

In April 2016, NJDEP designated the 1,4-dioxane contamination in the Runyon Watershed an Immediate Environmental Concern (IEC). An IEC condition is identified when a New Jersey Drinking Water/Ground Water Remediation Standard or a Rapid Action Indoor Air Screening Level is exceeded, or a Direct Contact threat exists and a completed pathway between a hazardous substance release and a receptor exists. Designation as an IEC required BASF to evaluate and mitigate this condition in accordance with the New Jersey Site Remediation Reform Act N.J.S.A. 58:10C-1 et seq. (SRRA), the Technical Requirements for Site Remediation N.J.A.C. 7:26E (Technical Rules), and Administrative Requirement for the Remediation of Contaminated Sites N.J.A.C. 7:26C (ARRCS). BASF has evaluated the extent of the 1,4-dioxane contamination and intends to place a reactive barrier near the impacted supply wells that will destroy the 1,4 dioxane prior to reaching the Perth Amboy wells. While this action is being performed under NJDEP authority and oversight separately from the remedy being chosen in this decision document, it is an integral part of the overall protectiveness of the Site's remedial program. NJDEP and EPA will monitor the progress of this action to ensure that this contamination is mitigated. If BASF's reactive barrier proves ineffective at meeting NJGWQS and MCLs, EPA may consider other response actions under CERCLA. The CEA/WRA was expanded in 2017 to include the 1,4-dioxane contamination area, and now encompasses 103 acres.

Inorganic contamination (metals) predominantly originates from the Madison property, with the larger contribution from the northern half of the property. A metals plume, consisting of zinc, cadmium, copper, and lead above the NJGWQS extends approximately 600 feet into the Runyon Watershed. A less concentrated plume containing zinc, cadmium and lead originates from the area of the sludge treatment piles associated with the Perth Amboy water treatment plant. The zinc distribution is the most widespread. Both zinc plumes are approximately 1,400 feet long, and 800 feet apart. The metals concentrations in the Madison plume are currently stable or decreasing. The plume stability is due in part to the ongoing pumping of the recovery wells that make up the Madison IRM. A list of metals COCs in groundwater can be found in Table 7.

CPS On-Site Soils

The CPS property contains contaminated soils that act as a contaminant source to groundwater and pose potential contact hazards. The SRI Report divided the CPS property into three areas based on general use (Figure 2). Area 1, the Former Tank Farm, contained chemical tanks (where the main chemical processing took place), as well as fuel oil storage tanks, and hazardous waste storage. Area 1 also includes the former truck and railroad car loading areas. Area 2, the Former Plant Operations Area, is associated with support activities, including office and laboratory buildings, storage facilities, and parking lots. Area 3, the Side Lot Area, makes up the eastern two thirds of the property, and is largely undeveloped. RI sampling confirmed that Area 3 was not significantly impacted by facility operations and therefore this area was not further evaluated in the RI/FS. Contaminant releases occurred in Area 1 and in the adjacent southwest corner of Area 2. A list of COCs in soil can be found in Table 8.

<u>Volatile Organic Compounds (VOCs)</u> The SRI Report identified multiple VOCs in soils that exceeded the Non-Residential Direct Contact Soil Remediation Standards (NRDCSRS) at several locations within Areas 1 and 2. The VOCs identified in the RI include: 1,1,2,2-tetrachloroethane; 1,2,4-trichlorobenzene; 1,2-dichloroethane; 1,2-dichloropropane; 1,4-dichlorobenzene; 1,2-dichlorobenzene; benzene; methylene chloride; tetrachloroethene; trichloroethene and vinyl chloride. Table 8 includes the NRDCSRS for these VOCs. VOCs with concentrations exceeding NRDCSRS were found in Areas 1 and 2 at depths up to 26 feet. Elevated VOC concentrations have also been detected at some locations within the silts and clays at the Site, however, these low-permeability units have limited the vertical migration of the contaminant mass. Residual non-aqueous phase liquid (NAPL) has also been observed in a few shallow soil borings (< 25 feet) installed within the source areas. While a vapor intrusion sampling event completed in 2009 determined that vapor intrusion did not affect existing buildings on the CPS and Madison properties at that time, VOCs found in the groundwater on these properties exceed EPA vapor intrusion screening levels in groundwater.

<u>Semi-Volatile Organic Compounds (SVOCs)</u> SVOCs were detected in surface soil (0-2 ft.) samples at concentrations exceeding the NRDCSRS at two locations within Area 2. The SVOCs are polycyclic aromatic hydrocarbon (PAH) compounds, and include: benzo(a)anthracene; indeno(1,2,3-CD)pyrene; benzo(a)pyrene; benzo(g)fluoranthene; and dibenzo(a,h)anthracene. The samples were collected from low-lying portions of the CPS property that receive storm water runoff from the asphalt parking lot/covered areas. PAH detections are likely attributable to parking lot runoff related to either motor vehicles or components of asphalt, as there are no

known or suspected operation-related sources of PAHs in this area.

Inorganic Contamination (metals) Surface soil sampling did not identify any areas on the CPS property with metal concentrations exceeding the NRDCSRS. Arsenic was detected in subsurface soils above the NRDCSRS at one location and exceeded the NRDCSRS by a factor of less than two. Arsenic at the CPS property can be attributed to the natural background conditions, as there are no known or suspected sources of arsenic associated with past operations at the CPS property. Glauconitic sediment, associated with elevated metals concentrations reflecting natural background, is also present in the areas where arsenic exceeded the NRDCSRS. The SRI Report also indicates that several metals were detected at concentrations slightly above default NJ Impact to Groundwater Screening Levels (IGWSLs) at four surface soil sample locations. The metals with concentrations exceeding the IGWSLs include cadmium, lead, and zinc, as well as beryllium, manganese, mercury, nickel, and silver. Of these metals, only beryllium and manganese, which are not site-related, have been detected in groundwater at the Site at concentrations above NJGWQS or MCLs. The IGWSLs are generic screening levels that are used to determine whether site-specific SRS for unsaturated soils need to be developed to protect groundwater. The IGWSLs are not soil remediation goals by default.

1,4-Dioxane Supplemental source characterization sampling was conducted in April 2017. Sampling was conducted to investigate whether the presence of residual 1,4-dioxane in shallow unsaturated soils is posing a risk to groundwater. Figure 4 shows an area of contamination straddling the north-west border of Area 1. The unsaturated soil in this area contained the highest concentrations of 1,4-dioxane found on the Site, and generally corresponds with the area of highest 1,4-dioxane concentrations (> 100 µg/L to 650 µg/L) in shallow groundwater (< 10 feet).

CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

Land Use

The two properties that comprise the Site together include 45 acres of developed and undeveloped land, currently zoned for commercial/industrial use. The Site is bordered to the southwest by the Runyon Watershed. EPA does not anticipate that the land use will change in the foreseeable future.

Groundwater Use

The Magothy and Raritan Formations constitute the regional aquifer system supplying water resources to the surrounding area. The Perth Amboy municipal water supply wells are located approximately 3,000 feet downgradient from the CPS and Madison facilities.

SUMMARY OF SITE RISKS

As part of the RI/FS, a baseline risk assessment was performed to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site in the absence of any actions or controls to mitigate such releases, under current and future land uses. The baseline risk assessment includes a human health risk assessment and an ecological risk assessment. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. The risks and hazards for the Site are presented in the baseline risk assessment and will be summarized in this section.

Human Health Risk Assessment

A four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario: Hazard Identification – uses the analytical data collected to identify the contaminants of potential concern at the site for each medium, with consideration of a number of factors explained below; Exposure Assessment - estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated surface soil) by which humans are potentially exposed; Toxicity Assessment - determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and Risk Characterization - summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks. The risk characterization also identifies contamination with concentrations which exceed acceptable levels, defined by the National Contingency Plan (NCP) as an excess lifetime cancer risk greater than $1 \times 10^{-6} – 1 \times 10^{-4}$, an excess of lifetime cancer risk greater than 1×10^{-6} (i.e., point of departure) combined with site-specific circumstances, or a Hazard Index greater than 1.0; contaminants at these concentrations are considered chemicals of concern (COCs) and are typically those that will require remediation at the Site. Also included in this section is a discussion of the uncertainties associated with these risks.

Hazard Identification

In this step, the chemicals of potential concern (COPCs) in each medium were identified based on such factors as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations, mobility, persistence, and bioaccumulation. The risk assessment focused on surface soil, subsurface soil, groundwater and indoor air associated with the Site which may pose significant risk to human health. Analytical information that was collected to determine the nature and extent of contamination found site-related contaminants in surface soil (Area 1, Area 2 and Area 3), subsurface soil, groundwater and indoor air at concentrations of potential concern.

A comprehensive list of all COPCs that were investigated can be found in the BHHRA, entitled "Final Baseline Human Health Risk Assessment CPS/Madison Superfund Site Old Bridge Township, Middlesex County, New Jersey" – April 2015. This document is available in the Administrative Record file. The list of COCs identified in surface soil, subsurface soil, surface water, groundwater and indoor air and calculated exposure point concentrations for each media are presented in Table 1.

Exposure Assessment

As noted previously, consistent with Superfund policy and guidance, the BHHRA assumes no actions have been taken or institutional controls established to mitigate or remove hazardous substance releases. Cancer risks and noncancer hazard indices were calculated based on an estimate of the reasonable maximum exposure (RME) expected to occur under current and future conditions at the Site. The RME is defined as the highest exposure that is reasonably expected to occur at a site. For those contaminants for which the risk or hazard exceeded the acceptable levels, the central tendency estimate (CTE), or the average exposure, was also evaluated.

The BHHRA for the Site quantified risks and hazards to human health associated with exposure to media present in OU1 and OU2. OU1 addresses contaminated groundwater beneath the Site, while OU2 addresses soils at the CPS property. For purposes of evaluating risks and hazards from exposure to soils in the BHHRA, OU2 was further subdivided into 3 subareas representing geographically different portions of the CPS property. The subareas, referred to as Areas 1 through 3, encompass soils at: the former tank farm area (Area 1); the former plant area (Area 2); and the side lot (Area 3). Because the Madison soils remedial investigation has not been completed, it was not considered in the BHHRA for the CPS property.

Current use of the CPS property consists of operation and maintenance of the IRM groundwater pump and treatment system. There are currently no full-time employees on the property. The CPS property, as well as most of the surrounding area, is zoned SD3, Specialized Development for industrial land use as part of the Township's long-term development plan. Based on the current zoning and past industrial use of the Site, it is expected that future use would remain unchanged. However, for overall completeness and because BASF has expressed interest in redevelopment or reuse of the CPS property, a hypothetical future resident (child and adult) was evaluated in the BHHRA. In addition, the potential for vapor intrusion from subsurface sources into indoor air was also evaluated even though there are currently no occupied buildings on the CPS property.

Exposure pathways were identified for each potentially exposed population and each potential exposure scenario for exposure to surface soil, subsurface soil, groundwater and indoor air. Exposure pathways that were qualitatively or quantitatively assessed in the BHHRA are presented in Table 2. Additional pathways that were investigated, but not evaluated further can be found in the BHHRA. The current and future land use scenarios included the following exposure pathways and populations:

- Trespassers (adolescent and adult) current/future ingestion and dermal contact with surface soil in Areas 1, 2 and 3.
- Indoor Worker (adult): future ingestion and dermal contact with surface soil in Areas 1, 2 and 3 and ingestion of groundwater.
- Outdoor Worker (adult): future ingestion, dermal contact and inhalation of soil particles associated with surface soil in Areas 1, 2 and 3 and ingestion of groundwater.
- Construction and Utility Worker (adult): future ingestion, dermal contact and inhalation of soil particles and vapors for surface and subsurface and inhalation of vapors from trenches.
- On-site Residents (child and adult): future ingestion and dermal contact with surface soil

and ingestion, dermal contact and inhalation from groundwater exposure.

In this assessment, exposure point concentrations were estimated using either the maximum detected concentration of a contaminant or the 95% upper-confidence limit (UCL) of the average concentration. Chronic daily intakes were calculated based on the RME. The RME is intended to estimate a conservative exposure scenario that is still within the range of possible exposures.

Toxicity Assessment

Under current EPA guidelines, the likelihood of carcinogenic risks and noncancer hazards due to exposure to site chemicals are considered separately. Consistent with current EPA policy, it was assumed that the toxic effects of the site-related chemicals would be additive. Thus, cancer and noncancer risks associated with exposures to individual COPCs were summed to indicate the potential risks and hazards associated with mixtures of potential carcinogens and noncarcinogens, respectively.

Toxicity data for the human health risk assessment were obtained from the Integrated Risk Information System (IRIS) database, the Provisional Peer Reviewed Toxicity Database (PPRTV), or another source that is identified as an appropriate reference for toxicity values consistent with EPA's directive on toxicity values. The toxicity values for the contaminants identified as COCs are presented in Table 3 (noncancer) and Table 4 (cancer). The toxicity information for all COPCs is presented in the BHHRA.

Risk Characterization

Noncarcinogenic risks were assessed using a hazard index (HI) approach, based on a comparison of expected contaminant intakes and benchmark comparison levels of intake (reference doses, reference concentrations). Reference doses (RfDs) and reference concentrations (RfCs) are estimates of daily exposure levels for humans (including sensitive individuals) which are thought to be safe over a lifetime of exposure. The estimated intake of chemicals identified in environmental media (e.g., the amount of a chemical ingested from contaminated drinking water) is compared to the RfD or the RfC to derive the hazard quotient (HQ) for the contaminant in the particular medium. The HI is obtained by adding the hazard quotients for all compounds within a particular medium that impacts a particular receptor population.

The HQ for oral and dermal exposures is calculated as below. The HQ for inhalation exposures is calculated using a similar model that incorporates the RfC, rather than the RfD.

HQ = Intake/RfD
Where: HQ = hazard quotient
Intake = estimated intake for a chemical (mg/kg-day)
RfD = reference dose (mg/kg-day)

The intake and the RfD will represent the same exposure period (i.e., chronic, subchronic, or acute).

As previously stated, the HI is calculated by summing the HQs for all chemicals for likely exposure scenarios for a specific population. An HI greater than 1.0 indicates that the potential exists for noncarcinogenic health effects to occur as a result of site-related exposures, with the potential for health effects increasing as the HI increases. When the HI calculated for all chemicals for a specific population exceeds 1.0, separate HI values are then calculated for those chemicals which are known to act on the same target organ. These discrete HI values are then compared to the acceptable limit of 1.0 to evaluate the potential for noncancer health effects on a specific target organ. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media.

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a carcinogen, using the cancer slope factor (SF) for oral and dermal exposures and the inhalation unit risk (IUR) for inhalation exposures. Excess lifetime cancer risk for oral and dermal exposures is calculated from the following equation, while the equation for inhalation exposures uses the IUR, rather than the SF:

$$\text{Risk} = \text{LADD} \times \text{SF}$$

Where: Risk = a unitless probability (1×10^{-6}) of an individual developing cancer
LADD = lifetime average daily dose averaged over 70 years (mg/kg-day)
SF = cancer slope factor, expressed as [1/(mg/kg-day)]

These risks are probabilities that are usually expressed in scientific notation (such as 1×10^{-4}). An excess lifetime cancer risk of 1×10^{-4} indicates that one additional incidence of cancer may occur in a population of 10,000 people who are exposed under the conditions identified in the assessment. Again, as stated in the NCP, the point of departure is 1×10^{-6} and the target risk range for site-related exposure is 1×10^{-6} to 1×10^{-4}.

The HI that exceed EPA's acceptable value of 1 for noncancer effects are presented in Table 5 and the cancer risks that exceed EPA's risk range of 1×10^{-6} to 1×10^{-4} are presented in Table 6.

Summary of the comprehensive cancer risk and noncancer hazard estimates for each receptor population evaluated in the BHHRA are provided in Tables 5 and 6, below. These numeric estimates are reflective of the sum of all risk stemming from exposure to Site-related groundwater contamination and the soils at the CPS property. In summary, exposure to site-related groundwater contamination through dermal, ingestion and the inhalation pathways posed unacceptable risk to human health. Exposure to soils through ingestion, present in Exposure Area 1 exceeded EPA's noncancer benchmark value of 1 based on a future child's exposure to TCE and 1,2,3-trichlorobenzene contaminated soils. The contaminated soil also acts as a contaminant source to the groundwater. Based on concentrations of VOCs in groundwater, there is potential for vapor intrusion issues in future site buildings.

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. More specific information concerning uncertainty in the health risks is presented in the BHHRA report. In general, the main sources of uncertainty include:

- Uncertainties in the nature and extent of the release of COPC.
- Uncertainties associated with the identification of future land uses and potential receptors.
- Uncertainties in estimating the frequency, duration and magnitude of possible exposures.
- Uncertainties associated with assigning exposure parameters to a heterogeneous population that includes both men and women and the young and old.
- Uncertainties in estimating cancer slope factors and unit risks and/or non-carcinogenic measures of toxicity.
- Uncertainties in the assumption of additivity of risk across multiple COPCs and exposure pathways.

Ecological Risk Assessment

In 2015, BASF completed a Screening Level Ecological Risk Assessment (SLERA), to determine if Site contaminants had the potential to affect ecological receptors in the OU1 and OU2 areas. The SLERA concluded the following:

- There were no completed exposure pathways in Areas 1 and 2 on the CPS property due to absence of habitat.
- Risk due to ecological receptor exposure to soils in Area 3 is negligible based on the screening level exposure estimate.
- Risk due to ecological receptor exposure to CPS-related contaminants in groundwater are negligible based on concentrations found in groundwater discharge locations.

Overall the SLERA did not identify any unacceptable risks to ecological receptors exposed to Site contaminants in environmental media in the OU1 and OU2 areas.

Basis for Taking Action

Based on the results of the RI/FS, including the risk assessments, EPA has determined that the response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), requirements to-be-considered

(TBCs) ,[1] and Site-specific, risk-based levels.

The RAOs identified for OU1, groundwater contamination, are:

- Prevent exposure to groundwater contaminated by site-related contaminants.
- Prevent the potential for further migration of site-related contaminants.
- Restore groundwater impacted by Site contaminants to applicable State and Federal standards within a reasonable time frame.
- Prevent/minimize contaminated groundwater from serving as a source of current and future vapor intrusion.

The RAOs identified for OU2, soil contamination at the CPS property, are:

- Mitigate the on-going sources of CPS property-related contaminants to groundwater.
- Prevent exposure to soils contaminated by CPS property-related contaminants.
- Prevent/minimize contaminated soil from serving as a source of current and future vapor intrusion.

EPA and NJDEP have promulgated MCLs, and NJDEP has promulgated groundwater quality standards (NJGWQS) which are enforceable, health-based, protective standards for drinking water contaminants. In the Proposed Plan, EPA selected the more stringent of the MCLs and GWQS as the preliminary remediation goals (PRGs) for the COCs in the Site groundwater. EPA used the more stringent of the NJDEP NRDCSRSs and the NJDEP impact to groundwater soil screening levels as the PRGs for the unsaturated soils. The NJDEP NRDCSRSs were used as the PRGs for the saturated soils and, when no NRDCSRS was available, the EPA Regional Screening Level (RSL) for industrial soil was used. The default NJ Impact to Groundwater Screening levels in the Proposed Plan were replaced with site-specific values based on NJ impact to groundwater guidance and approved by NJDEP. PRGs become final remediation goals when EPA selects a remedy after taking into consideration all public comments. EPA's final remediation goals for the Site can be found in Tables 7 and 8.

DESCRIPTION OF REMEDIAL ALTERNATIVES

CERCLA Section 121(b)(1), 42 U.S.C. § 9621(b)(1), mandates that remedial actions be protective of human health and the environment, cost-effective, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives, to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA Section 121(d), 42 U.S.C. § 9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4), 42 U.S.C. § 9621(d)(4). Detailed descriptions of the remedial

[1] TBCs are advisories, criteria, or guidance that were developed by EPA, other federal agencies, or states that may be useful in developing CERCLA remedies.

alternatives for addressing the contamination associated with OU1 and OU2 at the Site and associated ARARs can be found in the Feasibility Study (FS) report, dated November 2018.

The OU1/OU2 remedial alternatives are summarized below. The construction time for each alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate the performance of the remedy with any potentially responsible parties, or procure contracts for design and construction. The "no-action" alternative was evaluated for soil and groundwater because the NCP requires that the "no-action" alternative be considered as a baseline for comparison against other alternatives.

Groundwater Alternatives

Each active groundwater alternative contains the following elements:

- Groundwater performance monitoring.
- Long-Term Monitoring (LTM) of the downgradient plume, between the CPS and Madison properties and the Perth Amboy wells.
- Institutional controls (i.e., CEA/WRA).

The groundwater alternatives assume NJDEP's IEC program will address 1,4-dioxane near the Perth Amboy wells as an integral part of the overall protectiveness of the Site's remedial program. EPA and NJDEP will monitor the progress of this action to ensure that this contamination is mitigated.

In order to reduce the number of alternatives and simplify the process of selecting them, EPA has grouped the groundwater alternatives into alternatives that address organic contaminants (1A, 2A, and 3A), and alternatives that address metal contaminants (1B, 2B, and 3B). One alternative will be selected from each group.

Organic Alternative 1A - No Action

Capital Cost:	$0
Annual Operation and Maintenance (O&M) Cost:	$0
Present Worth Cost:	$0
Construction Timeframe: 0 years	

The NCP requires that a "No Action" alternative be evaluated to establish a baseline for comparison with other remedial alternatives. Under this alternative, no action would be taken to remediate the organic contamination in groundwater at the CPS/Madison Site. Additionally, the existing CPS IRM pump and treatment system would be shut down.

Organic Alternative 2A – Upgraded CPS Site IRM Pump and Treat System

Capital Cost:	$8,008,000
Annual O&M Cost:	$401,000
Present Worth Cost:	$10,573,000
Construction Time Frame:	19-22 months

Alternative 2A involves upgrading the existing CPS IRM pump and treatment system with additional recovery well(s) to fully capture the migration of organic contaminants from the source areas and additional treatment to address 1,4-dioxane. It includes the following elements:

- A Groundwater Treatment Plant (GWTP) treatability study would be performed to evaluate and design the treatment process train.
- The CPS IRM recovery well system would be expanded to fully cover the 1,4-dioxane source area (one additional well is assumed for cost estimating purposes).
- The existing three IRM wells would be relocated further downgradient of the source area to accommodate implementation of the OU2 source soil remedial alternative.
- A new GWTP will be constructed to meet the new project requirements which would include treatment of 1,4-dioxane, as well as the other organic site contaminants. To ensure that the effluent from the pump and treatment system consistently achieves discharge limits, the new treatment system would address the organic contaminants using chemical oxidation or adsorptive media. The existing GWTP would remain in service until the new GWTP is fully operational and tested.
- The treated effluent would continue to be discharged to the current on-site surface water location.
- A LTM program to monitor concentrations in the downgradient plume of groundwater contamination, between the CPS and Madison properties and the Perth Amboy wellfield, would ensure that the pump and treatment system continues to reduce concentrations in the downgradient plume until remediation goals are achieved.
- Placement of institutional controls in the form of a deed notice to address potential vapor intrusion issues in the event that buildings are constructed in the future above the organic plume.

The existing CEA/WRA would be maintained as an institutional control under this alternative.

Organic Alternative 3A – In-Situ Chemical Oxidation Permeable Reactive Barrier

Capital Cost:	$3,828,000
Annual O&M Cost:	$283,000
Present Worth Cost:	$5,589,000
Construction Time Frame:	7-8 months

Alternative 3A involves placement of a series of closely spaced wells forming a permeable reactive barrier perpendicular to the groundwater flow and downgradient of the organic contaminant source areas located on the CPS property. These wells would inject an oxidant (ozone or peroxide) into the subsurface, which would destroy dissolved-phase organic contaminants that pass through the oxidant. It includes the following elements:

- Treatability study and pilot testing of the ISCO Permeable Reactive Barrier (PRB) to ensure remediation can be achieved.
- Installation and operation of an ISCO PRB well system.
- Installation of groundwater and vadose zone monitoring systems.
- Continued operation of the existing CPS IRM pump and treatment system until the PRB system proves it can achieve remediation goals.
- A LTM program to monitor concentrations in the downgradient plume of groundwater contamination, between the CPS and Madison properties and the Perth Amboy wellfield, would ensure that the PRB continues to reduce concentrations in the downgradient plume until remediation goals are achieved.
- Placement of institutional controls in the form of a deed notice to address potential vapor intrusion issues in the event that buildings are constructed in the future above the organic plume.

The existing CEA/WRA would be maintained as an institutional control under this alternative.

Metals Alternative 1B – No Action

Capital Cost: $0
Annual O&M Cost: $0
Present Worth Cost: $0
Construction Timeframe: 0 months

The NCP requires that a "No Action" alternative be evaluated to establish a baseline for comparison with other remedial alternatives. Under this alternative, no action would be taken to remediate the metals contamination in groundwater at the Site. Under this alternative the Madison IRM would be discontinued.

Metals Alternative 2B – Continued Operation of the Madison IRM

Capital Cost: $0
Annual O&M: $1,344,000
Present Worth Cost: $12,183,000
Construction Timeframe: 0 months

Alternative 2B involves continued operation of the Madison IRM pump and treatment wells. The Madison IRM pump and treatment system has been in operation since 1991 and has effectively reduced and controlled the metal contaminant plume containing elevated levels of lead, cadmium, copper and zinc, over time. When Madison completes the OU3 RI/FS, a separate remedy selection process that addresses the source areas on the Madison property will also evaluate the need for the continuing operation of the Madison IRM.

Metals Alternative 3B – Permeable Reactive Barrier

Capital Cost:	$2,661,000
Annual O&M:	$153,000
Present Worth Cost:	$3,355,000
Construction Timeframe:	4-5 months

Alternative 3B involves placing a PRB downgradient of the Madison source areas to precipitate out metal contaminants (lead, cadmium, copper and zinc) in groundwater as they pass through the barrier. The barrier would need to be placed at a depth of approximately 30 feet. Zero valent iron and apatite are two possible reactants that would require treatability testing to determine their viability.

Soil Alternatives

Each active soil alternative contains the following elements:

- Institutional controls in the form of a deed notice restricting the future use of the CPS property to prohibit residential use.
- Groundwater and soil sampling to verify that performance goals are achieved.
- All soil alternatives would meet substantive requirements for flood zones and wetlands.

Alternative 1 – No Action

Capital Cost:	$0
Annual O&M Cost:	$0
Present Worth Cost:	$0
Timeframe:	0 years

The NCP requires that a "No Action" alternative be evaluated to establish a baseline for comparison with other remedial alternatives. Under this alternative, no action would be taken to remediate the contaminated soil on the CPS property.

Alternative 2 – Capping

Capital Cost:	$1,565,000
Annual O&M Cost:	$73,000
Present Worth Cost:	$1,846,000
Construction Timeframe:	6-8 months

Alternative 2 consists of construction of a low-permeability cap of approximately 56,000 square feet to protect against direct contact hazards to human health and to reduce, to the extent possible, storm water infiltration through the unsaturated source soils that would impact the groundwater. The cap would not treat or destroy the contaminants, it would eliminate the pathways to human exposure. Long-term monitoring and maintenance are essential to maintain the integrity of this engineering control.

Alternative 3 – Excavation, Ex-situ Soil Vapor Extraction, and In-situ Chemical Oxidation

Capital Cost:	$11,338,000
Annual O&M Cost:	$2,100
Present Worth Cost:	$10,684,000
Construction Timeframe:	40-41 months

Alternative 3 employs excavation and on-site ex-situ soil vapor extraction (SVE) of contaminated soils accessible to excavation, and in-situ chemical oxidation for contaminated source soils inaccessible to excavation (i.e., adjacent/beneath the sewer line). Excavated areas would be backfilled with treated soils. Due to excavation below the water table, this alternative would employ steel sheeting (for sidewall support and groundwater infiltration control) and includes a dewatering and treatment system. This alternative would provide immediate removal of contaminated soil in the source area that presents contact hazards and would reduce contaminant concentrations that impact groundwater. An active groundwater remedy for organics (2A or 3A) must be in place before this alternative could be implemented since it is likely to mobilize contaminants and the current IRM does not have complete capture.

Alternative 4 – Excavation, Off-site Disposal, and In-situ Chemical Oxidation

Capital Cost:	$13,975,000
Annual O&M Cost:	$2,100
Present Worth Cost:	$14,004,000
Construction Timeframe:	12-15 months

Alternative 4 employs excavation and off-site disposal of contaminated soils accessible to excavation, backfill of excavated areas with certified clean fill, and in-situ chemical oxidation for contaminated source soils not accessible to excavation. Due to excavation below the water table, this alternative would employ steel sheeting (for sidewall support and groundwater infiltration control) and includes a dewatering and water treatment system. This alternative would provide immediate removal of contaminated soil in the source area that presents a contact hazard and would reduce contaminants that impact groundwater. An active groundwater remedy (2A or 3A) must be in place before this alternative could be implemented since it is likely to mobilize contaminants and the current IRM does not have complete capture.

Alternative 5 – In-Situ Chemical Oxidation (ISCO) with limited excavation

Capital Cost:	$4,507,000
Annual O&M:	$2,100
Present Worth Cost:	$4,536,000
Construction Timeframe:	14-16 months

Alternative 5 uses chemical oxidants (such as peroxide, Fenton’s Reagent, and/or persulfate) to destroy contaminants by converting them into simple molecules such as carbon dioxide and water. The critical aspect of ISCO is to achieve contact between the oxidant and the contaminant. This alternative would address the adsorbed contaminant mass in the soils found in the Former Tank Farm Area, particularly in the discontinuous low permeability layers, by in-situ mixing of the soil while injecting oxidant to achieve contact with the contaminants. The soil contaminated with 1,4-dioxane from the Repackaging Area would be excavated and placed in the Former Tank Farm Area to undergo treatment with the soils in that area. A third area, near the on-site sewer main, will be evaluated during design to determine if the contaminated soils are accessible for in-situ mixing or would require injection without mixing. An active groundwater remedy (2A or 3A) must be in place before this alternative could be implemented since it is likely to mobilize contaminants and the current IRM does not have complete capture.

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy for a site, EPA considers the factors set forth in Section 121 of CERCLA 42 U.S.C. § 9621, and conducts a detailed analysis of the viable remedial alternatives pursuant to Section 300.430(e)(9) of the NCP, 40 C.F.R § 300.430(e)(9), EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies, OSWER Directive 9355.3-01, and EPA's A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents, OSWER 9200.1-23.P. The detailed analysis consists of an assessment of the individual alternatives against each of the nine evaluation criteria at 40 C.F.R. § 300.430(e)(9)(iii) and a comparative analysis focusing upon the relative performance of each alternative against those criteria. The evaluation criteria are described below.

Threshold Criteria – The first two criteria are known as "threshold criteria" because they are the minimum requirements that each response measure must meet to be eligible for selection as a remedy.

- <u>Overall protection of human health and the environment</u> addresses whether a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

- <u>Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)</u> addresses whether a remedy will meet all the applicable or relevant and appropriate requirements of other federal and state environmental statutes and requirements or provide grounds for invoking a waiver.

Primary Balancing Criteria – The next five criteria are known as "primary balancing criteria." These criteria are factors by which tradeoffs between response measures are assessed so that the best options will be chosen, given site-specific data and conditions.

- <u>Long-term effectiveness and permanence</u> refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

- Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies, with respect to these parameters, which a remedy may employ.
- Short-term effectiveness addresses the period needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.
- Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
- Cost includes estimated capital, O&M, and present-worth costs.

Modifying Criteria – The final two evaluation criteria are called “modifying criteria” because new information or comments from the State or the community on the Proposed Plan may modify the selected response measure or cause another response measure to be considered.

- State acceptance indicates if, based on its review of the FS report and Proposed Plan, the State concurs with the selected remedy.
- Community acceptance refers to the public's general response to the alternatives described in the FS report and Proposed Plan.

EVALUATION OF GROUNDWATER ALTERNATIVES FOR ORGANIC CONTAMINANTS

1. **Overall Protection of Human Health and the Environment**

Alternative 1A, No Action, would not be protective of human health or the environment since it does not include measures to prevent exposure to contaminated groundwater. Because the “no action” alternative is not protective of human health and the environment it was eliminated from consideration under the remaining criteria.

Alternatives 2A and 3A would protect human health by preventing off-site migration of organic contaminants and restoring groundwater to meet remediation goals, which are the lower of NJGWQS and MCLs. Institutional controls (CEA and WRA), that are already in place, would maintain protectiveness in the interim. In addition, institutional controls will be required in the form of a deed notice to address potential vapor intrusion issues in the event that buildings are constructed in the future above the organic plume.

2. **Compliance with Applicable or Relevant and Appropriate Requirements**

Actions taken at any Superfund site must meet all applicable or relevant and appropriate requirements under federal and state laws or provide grounds for invoking a waiver of those requirements.

Alternatives 2A and 3A are both expected to meet NJGWQS and MCLs (which are chemical-specific ARARs) for organic contaminants in groundwater migrating from the source areas. The downgradient plume (outside the area captured and addressed by the action) would be monitored to ensure it meets NJGWQS and MCLs through attenuation over time. Any concentrations above NJGWQS and MCLs are expected to be addressed by the IEC actions that are being overseen by NJDEP under state statutory authorities. Both alternatives would meet action- and location-specific ARARs.

3. **Long-Term Effectiveness and Permanence**

Alternatives 2A and 3A would provide long-term effectiveness and permanent protection to human receptors, provided they are properly constructed, operated and maintained until remediation goals are met. Alternative 3A would require a treatability study to determine which reactants are most effective and if all the chemical-specific objectives can be achieved. Alternative 2A would require upgrades to the existing groundwater pump and treatment plant, and then regular oversight to maintain pumping wells and the treatment plant.

While Alternative 3A would also require regular oversight, it would require less equipment maintenance than 2A because it does not require extraction, treatment and discharge to groundwater. Both remedial alternatives would achieve groundwater standards in the same timeframe.

4. **Reduction of Toxicity, Mobility, or Volume through Treatment**

Alternative 2A reduces the toxicity and volume of groundwater contaminants by treatment and removal. Treated water would be reintroduced to the surface water if it meets discharge standards. Alternative 3A would reduce the groundwater contaminant toxicity and volume by in-situ treatment as contaminants pass through the reactive barrier.

5. **Short-Term Effectiveness**

Although the estimated time to construct Alternative 2A is expected to be longer than 3A, both alternatives would be protective in the short-term. The CPS IRM wells, which have reduced and controlled the majority of the contaminant plume, would remain in operation until the selected remedy is ready to be turned on. Both alternatives would present risks to on-site workers due to handling caustic chemicals, but the risks can be controlled with sound engineering practices. For both alternatives, risks to the community and environment would be negligible because the IRM wells would be operating until a new remedy is constructed.

6**. Implementability**

While Alternative 2A is an augmented version of what is already in place, it would require more infrastructure and O&M than 3A because it involves modifying the extraction, reinjection, as well as treatment element of the pump and treatment system. For this reason, Alternative 2A would also require more time to construct than 3A. Both alternatives are technically and administratively feasible. Alternative 3A has fewer reporting requirements. Both Alternative 2A and 3A would be implementable and would require materials and equipment that are readily available.

7. **Cost**

The total estimated present worth costs calculated using a discount rate of 7 percent are:

- Alternative 1A - $0.
- Alternative 2A - $10,573,000.
- Alternative 3A - $5,589,000.

EVALUATION OF GROUNDWATER ALTERNATIVES FOR METAL CONTAMINANTS

1. **Overall Protection of Human Health and the Environment**

Alternative 1B, No Action, would not be protective of human health since it does not include measures to prevent exposure to contaminated groundwater. Because the "no action" alternative is not protective of human health and the environment it was eliminated from further consideration.

Alternatives 2B and 3B would both protect human health by preventing off-site migration of metal contaminants and restoring groundwater to meet remediation goals, which are the lower of NJGWQS and MCLs. Institutional controls (CEA and WRA), that are already in place, would maintain protectiveness in the interim.

2. **Compliance with Applicable or Relevant and Appropriate Requirements**

Actions taken at any Superfund site must meet all applicable or relevant and appropriate requirements under federal and state laws or provide grounds for invoking a waiver of those requirements.

Alternative 2B has demonstrated that it controls the migration of metals contamination in groundwater from the source areas, and therefore would continue to meet chemical specific ARARs such as NJGWQS and MCLs. Alternative 3B is expected to capture metals contamination migrating from the source areas but would require treatability testing to ensure complete capture of all the chemicals of concern. With both alternatives, remedial action objectives would be met in groundwater downgradient of the treatment system through attenuation. Both alternatives would meet both action- and location-specific ARARs.

3. **Long-Term Effectiveness and Permanence**

Alternative 2B is already in place and would provide long-term effectiveness and permanent protection to human and ecological receptors. Alternative 3B would require a treatability study to determine which reactants are most effective, if the reactants are compatible with the upgradient organic alternative, and if all the chemical specific objectives can be achieved. Alternative 2B would require operation and maintenance of the pumping wells and the treatment plant. Alternative 3B may require change out of reactive media over time to remain effective.

Alternative 3B may be slightly less permanent because the contaminants remain trapped in the media of the barrier wall and could potentially desorb under changing conditions. This concern could be mitigated by removal of the media when remediation goals have been achieved. Both alternatives require technically feasible maintenance tasks. Both alternatives would achieve groundwater standards in the same timeframe.

4. **Reduction of Toxicity, Mobility, or Volume through Treatment**

Alternative 2B would reduce the volume of groundwater contaminants by treatment and removal in a treatment plant. Alternative 3B would reduce the groundwater contaminant mobility by treatment and capture of the contaminants as the groundwater passes through the barrier.

5. **Short-Term Effectiveness**

Both Alternatives would be protective in the short-term. Alternative 2B is already in place and functioning, and therefore presents no short-term risks to on-site workers, the community, or the environment. Alternative 3B would require 4 - 5 months to construct. During that time, the Madison IRM wells, which have reduced and controlled the contaminant plume, would remain in operation until Alternative 3B is functional. Risk to on-site workers would be posed by construction tools and equipment, but these risks are easily controlled by sound engineering practices.

6. **Implementability**

Both alternatives are implementable. Alternative 2B has been constructed and requires only continued operation and maintenance. Alternative 3B would require construction materials and equipment that are readily available. If combined with Organic Alternative 3A, the choice of reactants for Alternative 3B would be limited by compatibility with the upgradient alternative. This would require sequencing of the treatability testing and add to the implementation time and complexity for Alternative 3B.

7. **Cost**

The total estimated present worth costs calculated using a discount rate of 7 percent are:

• Alternative 1B - $0.
• Alternative 2B - $12,183,000.
• Alternative 3B - $3,355,000.

EVALUATION OF SOIL ALTERNATIVES

1. **Overall Protection of Human Health and the Environment**

Alternative 1 is not protective of human health or the environment because no action would be taken to address soil contamination. Because the "no action' alternative is not protective of human health and the environment it was eliminated from further consideration under the remaining eight criteria.

Alternative 2 would use capping and institutional controls to protect human health by eliminating contact with the contaminated soil. However, this alternative would not effectively mitigate the sources of organic contamination to the groundwater below the water table.

Alternatives 3, 4, and 5 would protect human health and the environment by treating the soil contaminants that pose a contact risk and act as a source of groundwater contamination.

2. **Compliance with Applicable or Relevant and Appropriate Requirements**

Alternative 2 would quickly address direct contact chemical-specific ARARs for soil by the physical barrier of a cap. However, because Alternative 2 would leave soil contamination below the water table that acts as a groundwater source, it would take a longer period of time for groundwater ARARs to be achieved, and the groundwater remedies to be completed.

Alternatives 3, 4, and 5 would all meet chemical-specific ARARs/soil remediation goals by removing or treating the organic contaminants. Because some contamination would remain in place above NJRDCSRS, institutional controls in the form of a deed notice would be required to prohibit future residential use of the CPS property.

All the alternatives would comply with action-specific ARARs, and all will be able to meet substantive requirements of location-specific ARARs for flood hazard areas and wetlands.

3. **Long-Term Effectiveness and Permanence**

Alternatives 3, 4, and 5 all achieve a similar high degree of long-term effectiveness and permanence by either removal or destruction of the on-site soil contamination. Alternatives 4 and 5 will achieve soil remediation goals in 12–16 months, while Alternative 3 requires 40-41 months. Each of these alternatives would include bench testing of the ISCO component. Alternative 2 has a lesser degree of long-term effectiveness and permanence than Alternatives 3, 4, and 5 because the organic contaminants would remain on-site and the cap would require maintenance for the foreseeable future, but the cap would achieve protection in 6-8 months.

4. **Reduction of Toxicity, Mobility, or Volume through Treatment**

Alternative 2 would reduce mobility of the contaminants above the water table by capping, not treatment, and would not reduce toxicity or volume. Contaminants below the water table would still act a source of groundwater contamination, prolonging the time needed for the groundwater remedies to reach remediation goals.

Alternatives 3 and 5 use treatment exclusively to reduce contaminant toxicity, mobility and volume.

Alternative 4 relies on removal and off-site disposal for most of the soil contamination and does not reduce toxicity or volume for most of the contaminant mass. However, ISCO treatment would be used to reduce contaminant toxicity and volume in areas not accessible to excavation.

5. **Short-Term Effectiveness**

Alternative 2 presents very minimal short-term risks to the community and site workers or the

environment because none of the contaminated soil would be disturbed during placement of the cap.

Alternatives 3 and 4 involve excavation and thus have potential for short-term adverse effects. Potential risks posed to site workers, the community and the environment during implementation of each of the soil alternatives could be due to wind-blown or surface water transport of contaminated soil. Any potential impacts associated with dust and runoff would be minimized through proper installation and implementation of dust and erosion control measures. The areas would be monitored throughout the construction of the ISCO system. Alternatives 3, 4, and 5 would all involve use of ISCO chemicals which can be caustic. These hazards can be controlled with proper handling and protective clothing.

Alternative 5 employs in-situ mixing during ISCO injections and would involve a minor amount of open excavation, which would minimize dust.

6. **Implementability**

Alternative 2, capping, has the least technical challenges and would be easily implemented.

Alternatives 3 and 4 require excavation, sheet piling, dewatering, water treatment, and discharge of the effluent, which are technically more complex, but still employ readily available equipment and expertise.

Alternative 5 is more easily implemented compared to Alternatives 3 and 4 because it involves less excavation than Alternatives 3 and 4. ISCO injection and mixing of soil also employs less infrastructure and would pose fewer technical complexities compared to Alternatives 3 and 4. Materials for all the alternatives are readily available.

7. **Cost**

The total estimated present worth costs calculated using a discount rate of 7 percent are:

- Alternative 1 - $0.
- Alternative 2 - $1,846,000.
- Alternative 3 - $10,684,000.
- Alternative 4 - $14,004,000.
- Alternative 5 - $4,536,000.

State Acceptance

NJDEP concurs with the selected remedy for groundwater and soil. A letter of concurrence is attached in Appendix II.

Community Acceptance

Comments received during the public comment period indicate that the public generally supports the selected remedy for groundwater and soil. These comments are summarized and addressed in the Responsiveness Summary, which is attached as Appendix III to this document.

PRINCIPAL THREAT WASTES

The NCP establishes an expectation that the EPA will use treatment to address the principal threats posed by a Site whenever practicable (NCP Section 300.430(a)(1)(iii)(A)). Identifying principal threat wastes combines concepts of both hazard and risk. In general, principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment in the event exposure should occur. Non-principal threat wastes are those source materials that generally can be reliably contained and that would present only a low risk in the event of exposure. The decision to treat principal threat wastes is made on a site-specific basis through a detailed analysis of alternatives, using the remedy selection criteria which are described above. The manner in which principal threat wastes are addressed provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

The high concentrations of VOCs in the CPS property soils are an on-going source of contamination to the groundwater and are therefore considered to be principal threat wastes. By utilizing treatment as a significant component of the remedy for soil, the statutory preference for remedies that employ treatment as a principal element is satisfied.

SELECTED REMEDY

Summary of the Rationale for the Selected Remedy

Based upon consideration of the requirements of CERCLA, the detailed analysis of the alternatives, and public comments, EPA has determined that Alternative 3A – ISCO Permeable Reactive Barrier, Alternative 2B – Continued Operation of the Madison IRM, and Alternative 5 – In-Situ Chemical Oxidation with limited excavation, best satisfy the requirements of CERCLA Section 121, 42 U.S.C. §9621, to respectively address the soil, and groundwater at the Site, and provide the best balance of tradeoffs among the remedial alternatives with respect to the NCP's nine evaluation criteria, 40 CFR § 300.430(e)(9).

For organics in groundwater, Alternative 3A which was selected over other alternatives because it is expected to achieve substantial and long-term risk reduction by substantially reducing contaminant levels in the groundwater as they begin to migrate off the CPS property and before reaching the Perth Amboy wellfield. The selected alternative for organics in groundwater reduces risk by destroying organic contaminants migrating from the CPS property, at a lower cost, compared to the other active alternative (2A), and will be reliable over the long-term.

Because Alternative 3A still needs to be proven under existing Site conditions, Alternative 2A, Upgraded CPS Site IRM Pump and Treat System, is selected as the contingency remedy should the contaminant concentrations in effluent of the ISCO Barrier increase (exceeding the variability of the existing IRM results) over four consecutive monitoring periods. Although the cost of Alternative 2A is higher, and requires discharge of treated effluent to surface water, it is a proven technology and would be protective.

Because of the potential for vapor intrusion, institutional controls will be required in the form of a deed notice to address potential vapor intrusion issues in the event that buildings are constructed in the future above the organic plume.

For metals in groundwater, Alternative 2B, was selected over other alternatives because it is in place and has been proven effective. It is expected to control the metals contamination coming from the Site until the sources on the Madison property are addressed by a remedy as part of a future remedy selection process. While Alternative 3B is potentially viable, it was not chosen due to limitations imposed by potential incompatibility of the reactants with the alternative selected for organic contaminants in groundwater, which could require sequencing that would lead to delays in implementation.

For contaminated soil on the CPS property, Alternative 5 was selected. This alternative uses ISCO to break down organic chemicals to carbon dioxide and water. By this method, organic chemicals in the soil that contribute to groundwater contamination will be permanently removed.

Alternative 5 was selected over other soil alternatives because it is expected to achieve substantial and long-term risk reduction through chemical treatment and is expected to allow the CPS property to be used for its reasonably anticipated future land use, which is commercial. It is also easier to implement than the other alternatives, while still reducing soil concentrations to a level that will not impact groundwater. The selected soil alternative will reduce the risk within 16 months, at a cost comparable to other alternatives and should be reliable over the long-term.

Though the selected remedy for soil will be protective, it will not achieve levels that would allow for unrestricted use. Therefore, institutional controls, such as deed notices restricting the future use of the CPS property, will be required. Five-year reviews would be conducted since contamination would remain above levels that allow for unlimited use and unrestricted exposure.

Based on information currently available, the selected alternatives meet the threshold criteria and provide the best balance of tradeoffs among the alternatives with respect to the balancing and modifying criteria. EPA expects the selected alternatives to satisfy the following statutory requirements of Section 121(b) of CERCLA: (1) be protective of human health and the environment; (2) be cost-effective; (3) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and (4) satisfy the preference for treatment as a principle element, or explain why the preference for treatment will not be met. Section 121(d) of CERCLA further specifies that an action must comply with ARARs unless a waiver can be justified.

Description of the Selected Remedy

Based upon an evaluation of the alternatives, EPA, in consultation with NJDEP, has selected Alternative 3A, Alternative 2B and Alternative 5 to address the contaminated groundwater at the

Site and soil at the CPS property. Figures 5 and 6 depict the groundwater remedies for organic and metals contamination respectively. Figure 7 depicts the conceptual layout of the selected remedy for soil on the CPS property. Well head protection of the Perth Amboy public water supply wells, to address 1,4-dioxane, will be implemented concurrently under NJDEP direction. While well head protection is not part of the EPA selected remedy, it is an important part of the overall remediation strategy for the Site.

The selected alternative for organic contaminants in groundwater (OU1), Alternative 3A, includes the following remedial activities:

- Treatability study and/or pilot testing to ensure remediation goals for the organic site contaminants will be achieved.
- Installation and operation of an ISCO PRB well system.
- Installation and operation of groundwater and vadose zone monitoring systems.
- Continued operation of the existing CPS IRM pump and treatment system until the PRB system has been shown to be effective.
- LTM to monitor the low-level organic plume between the PRB and the Perth Amboy wells.
- Continuation of institutional controls - CEA and WRA.
- Placement of institutional controls in the form of a deed notice to address potential vapor intrusion issues in the event that buildings are constructed above the organic plume.

After treatability and/or pilot testing, and prior to the source removal on the CPS property, a series of injection wells will be installed to deliver the ISCO reactants into the area intended to act as a barrier to organic contamination. While the reactants are being injected, groundwater in and around the barrier will be monitored to ensure adequate distribution of ISCO reactants, and reduction of the organic contaminants. The soil gas above the groundwater table will also be monitored to determine the need for vapor mitigation systems in the buildings on the CPS Chemical or Madison properties. The existing CPS IRM groundwater pump and treat system will remain in operation during ISCO injections. The groundwater pump and treat system will only begin to be phased out as data from the monitoring system confirms that groundwater remediation goals are being achieved by the ISCO barrier. The ISCO barrier will remain in operation until the upgradient source removal is complete and remediation goals are achieved upgradient of the barrier.

Because the selected remedy for organic contamination in groundwater will need to be proven under Site conditions, an upgraded version of the CPS IRM Pump and Treat System is selected as the contingency remedy should the contaminant concentrations in effluent of the ISCO Barrier increase (exceeding the variability of the existing IRM results) over four consecutive monitoring periods.

The selected alternative for metal contaminants in groundwater, Alternative 2B, includes the following remedial activities:

- Continued operation of the Madison IRM pump and treatment system.
- Groundwater monitoring.
- Continuation of Institutional controls - CEA/WRA.

The selected alternative for OU2 soil is Alternative 5, in-situ chemical oxidation with limited excavation. The major components of the selected soil alternative include:

- Excavation of soils contaminated with 1,4-dioxane from the Repackaging Area and placement in the Tank Farm Area for treatment.
- In-situ chemical oxidation.
- In-situ soil mixing of the oxidant in accessible areas (~20,000 cubic yards).
- In-situ injection of the oxidant in inaccessible areas (~ 1,500 cubic yards).
- Post-Remediation Monitoring.
- Institutional Controls.

The CPS property soil remedy (Alternative 5) will begin upon completion of the installation and testing of the down-gradient organic groundwater remedy described above. The soil remedy will involve excavation of approximately 900 cubic yards of soil from the Repackaging Area to be placed in the Former Tank Farm Area for treatment. The contaminated soil in the Former Tank Farm Area will be injected with ISCO reactant and mixed by auger, excavator or other method, to ensure the reactant makes contact with the soil contaminants. The soil will be sampled after treatment to ensure that the remediation goals are met.

There is a small area surrounding the sewer line, containing approximately 1,500 cubic yards of contaminated soil, that may not be accessible to the mixing or excavation equipment. This may require injection of the ISCO reactant without mixing. During the remedy design, EPA intends to eliminate or minimize the volume of material that is not subjected to mixing.

Summary of the Estimated Selected Remedy Costs

The estimated total present-worth costs for the three components of the selected remedy is $22,308,000. The cost estimates are based on available information and are order-of-magnitude engineering cost estimates that are expected to be between +50 to -30 percent of the actual project cost. Changes to the cost estimate can occur as a result of new information and data collected during the design of the remedy.

Cost estimates for the components of the selected remedy are presented in Tables 9, 10 and 11. Individual cost estimates for each remedial alternative evaluated are provided in Tables 9 through 16 of the FS Report.

Expected Outcomes of the Selected Remedy

The three components of the selected remedy actively address organic and metals contamination in groundwater and soil at the Site. The results of the risk assessment indicate excess cancer risk from ingestion of groundwater containing Site contaminants. The response actions selected in this ROD will address groundwater leaving the Site, as well as contaminated Site soils that are considered principal threat waste and act as a source to groundwater and, thereby, will eliminate the risks associated with these exposure pathways while allowing the commercial/industrial use of the CPS property, and reduce contamination in groundwater to levels that meet state and federal standards within a reasonable time frame.

Remediation goals for the OU1/OU2 COCs are presented in Tables 7 and 8.

STATUTORY DETERMINATIONS

EPA has determined that the selected remedy complies with the CERCLA and NCP provisions for remedy selection, meets the threshold criteria, and provides the best balance of tradeoffs among the alternatives with respect to the balancing and modifying criteria. These provisions require the selection of remedies that are protective of human health and the environment, comply with ARARs (or justify a waiver from such requirements), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the toxicity, mobility and volume of hazardous substances as a principal element (or justifies not satisfying the preference). The following sections discuss how the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The selected remedy will protect human health and the environment because it will prevent human exposure to contaminated groundwater and soil. Over the long term, the selected remedy will restore groundwater to levels that meet state and federal standards within a reasonable time frame. In addition, institutional controls will protect human health over both the short and long term by preventing groundwater use within the area of the contaminant plume, and exposure to vapor intrusion. This action will result in the reduction of exposure risk to levels within EPA's risk range of 1×10^{-4} to 1×10^{-6} for carcinogens and below a HI of 1.0 for noncarcinogens. Implementation of the selected remedy will not pose unacceptable short-term risks.

Compliance with ARARs

The selected remedy is expected to achieve the remediation goals for COCs in the soils. These remediation goals are based on NJDEP's NRDCSRSs (chemical-specific ARARs) for the COCs in the soils, and federal MCLs or more stringent NJGWQS (chemical-specific ARARs) for the COCs in the groundwater. NJDEP RDCSRS will be addressed by institutional controls in the form of a deed notice that prohibits future residential use of the CPS property. The remedy will comply with location and action-specific ARARs.

A full list of the ARARs, TBCs, and other guidance related to implementation of the selected remedy is presented in Tables 12, 13 and 14.

Cost Effectiveness

A cost-effective remedy is one whose costs are proportional to its overall effectiveness (40 C.F.R. § 300.430(f)(1)(ii)(D)). Overall effectiveness is based on the evaluations of long-term effectiveness and permanence, reduction in toxicity, mobility, and volume through treatment, and short-term effectiveness. Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to cost to determine cost-effectiveness.

Each of the alternatives underwent a detailed cost analysis. In that analysis, capital and annual O&M costs were estimated and used to develop present-worth costs. In the present-worth cost analysis, annual O&M costs were calculated for the estimated life of each alternative. The total estimated present worth cost for implementing the selected remedy is $22,308,000.

Based on the comparison of overall effectiveness to cost, the selected remedy meets the statutory requirement that Superfund remedies be cost effective (40 C.F.R. § 300.430(f)(1)(ii)(D)) and is the lowest-cost action which will achieve remediation goals in the Site soils and restore groundwater to levels that meet state and federal standards within a reasonable time frame.

Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to Maximum Extent Practicable

The selected remedy complies with the statutory mandate to utilize permanent solutions, alternative treatment technologies, and resource recovery alternatives to the maximum extent practicable because it represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner to remediate the OU1 and OU2 areas. The selected remedy satisfies the criteria for long-term effectiveness and permanence by permanently reducing the mass of contaminants in the Site soils and groundwater, thereby reducing the toxicity, mobility and volume of contamination.

Preference for Treatment as a Principal Element

The selected remedy satisfies the statutory preference for remedies that employ treatment as a principal element by using ISCO for soils and groundwater.

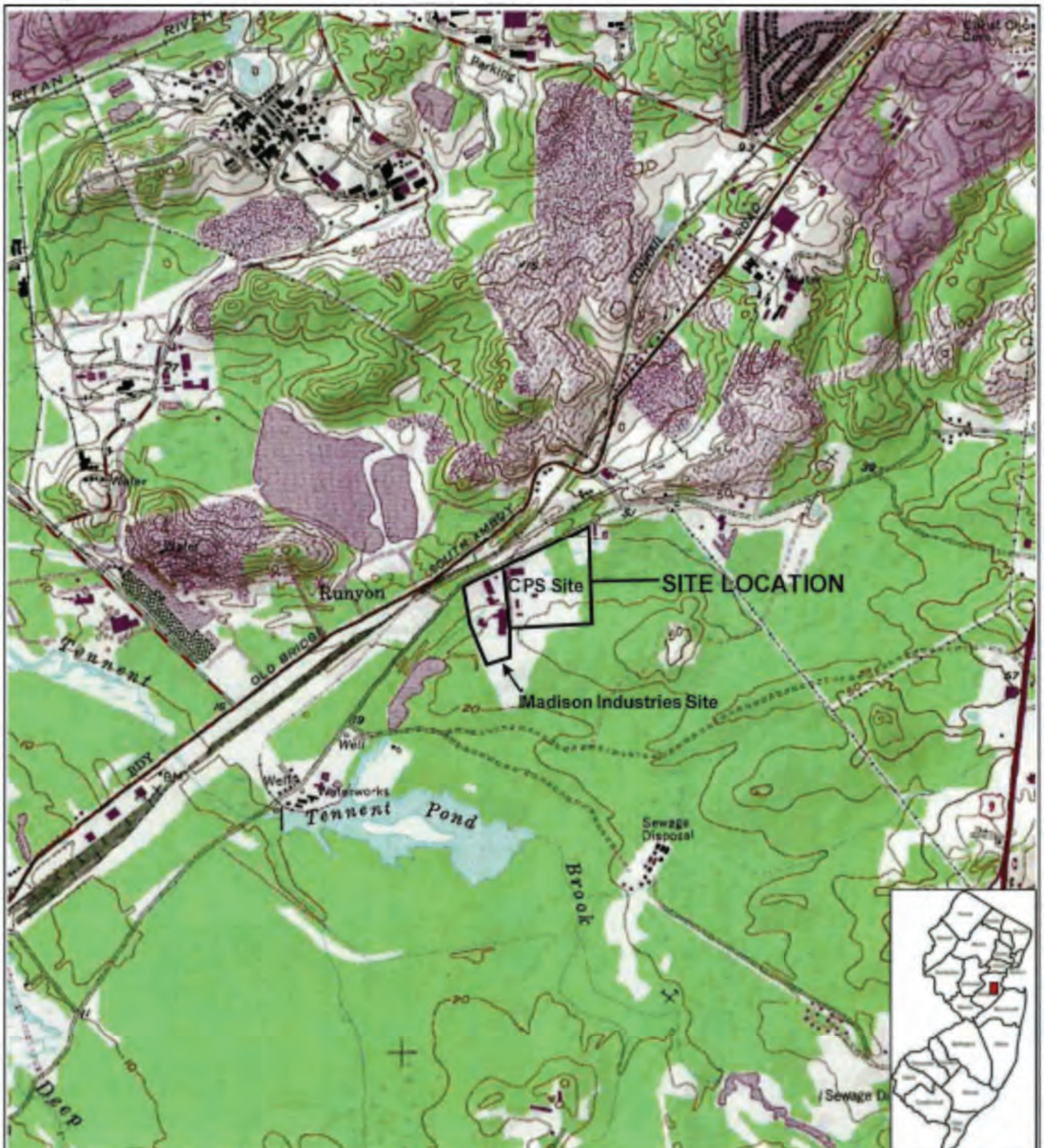
Five-Year Review Requirements

Because the selected remedy results in contaminants remaining above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for OU1 and OU2 was released to the public on April 24, 2019. The Proposed Plan identified Alternative 3A, Alternative 2B, and Alternative 5 as the preferred alternatives for remediating the groundwater contaminated with organic compounds, groundwater contaminated with metals, and soil contamination at the CPS property, respectively, which comprise OU1 and OU2 of the Site. Based upon review of the written and verbal comments submitted during the public comment period, EPA determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate.

Figure 1 - Site Location



Site Geographic Coordinates: 40º 26' 05"N; 74º19' 36" W
Source: USGS Topographic Map, 7.5 Minute Series
South Amboy NJ Quadrangle, photo-revised 1981
Scale: 1:24,000
1 in = 2000 ft

Figure 2
Site Map with Soil Exposure Areas

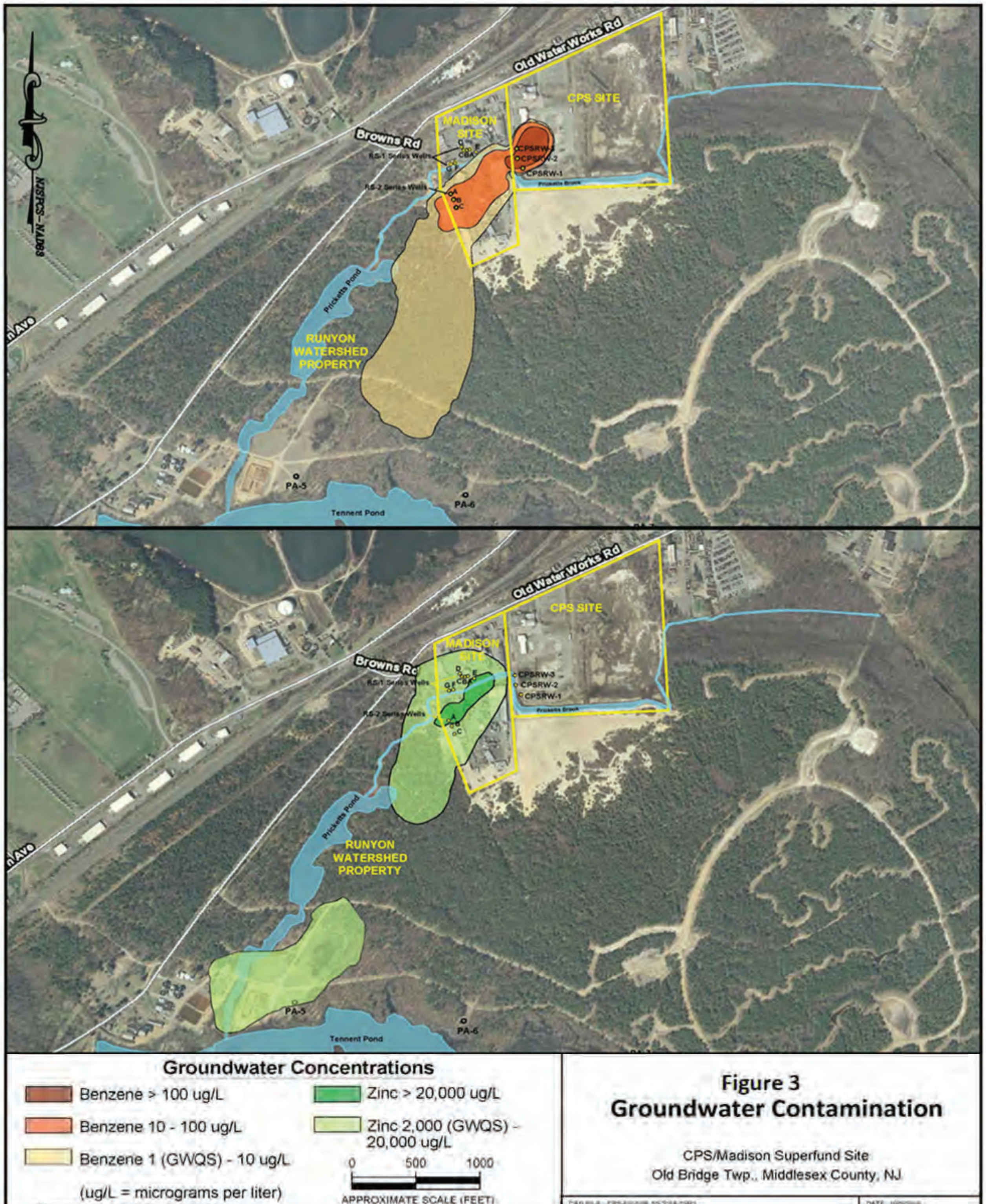


Figure 3
Groundwater Contamination

CPS/Madison Superfund Site
Old Bridge Twp., Middlesex County, NJ


Water Works Rd
Water Works Rd
AREA 2
Former
Plant Area
AREA 3
Undeveloped
Side Lot
4 ft
15 ft
25 ft
10 ft
AREA 1
Former Production
Area (Tank Farm Area)
LEGEND
15 ft
Soil Remediation Area and Depth in Feet (ft)
Soil Exposure Areas
CPS Site Property Boundary
0
90
180
APPROXIMATE SCALE (FEET)
Figure 4
Soil Contamination
CPS/Madison Superfund Site
Old Bridge Twp , Middlesex County, NJ

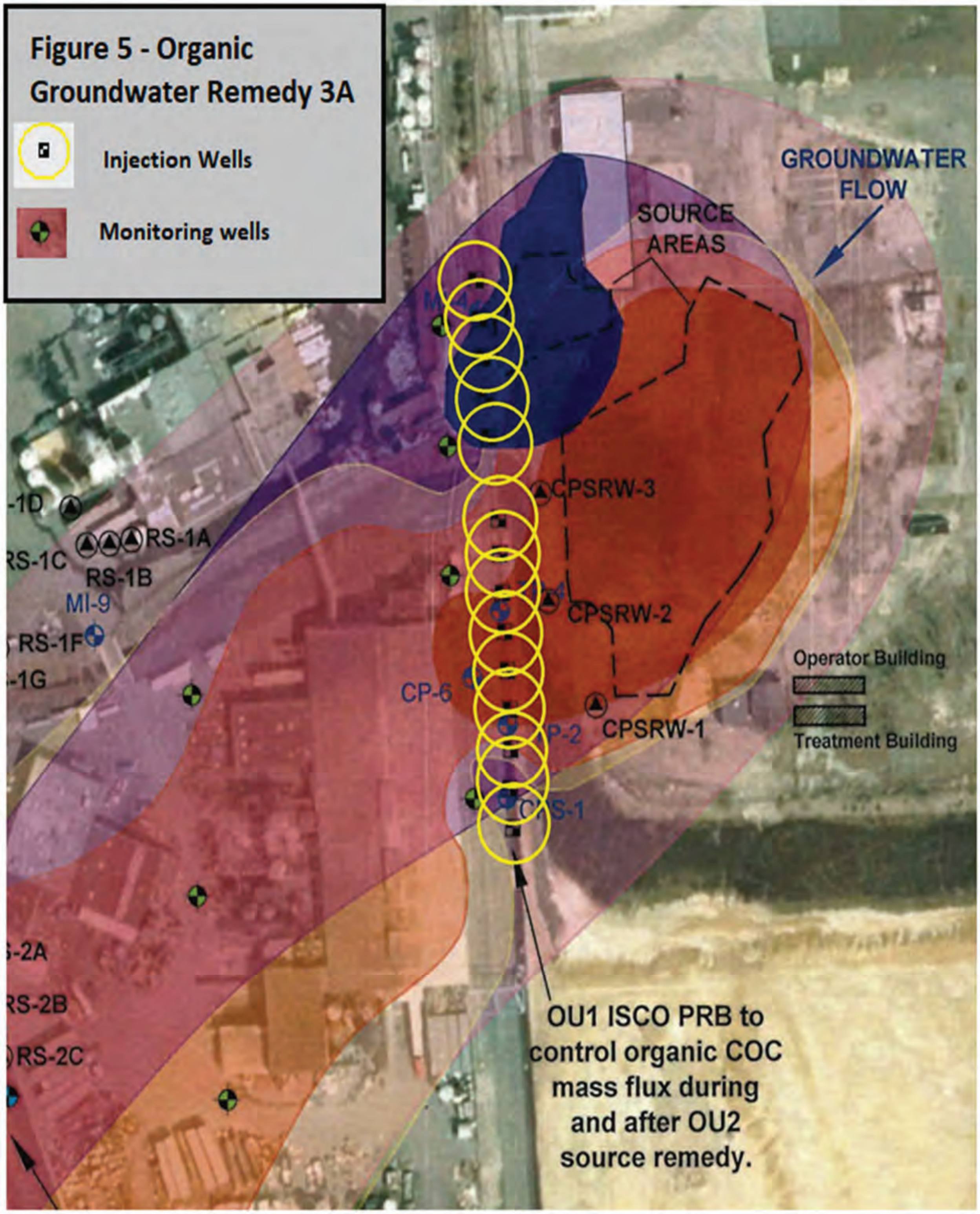


Figure 5 - Organic
Groundwater Remedy 3A
Injection Wells
Monitoring wells
GROUNDWATER
FLOW
SOURCE
AREAS
CPSRW-3
CPSRW-2
CPSRW-1
CP-6
MI-9
RS-1A
RS-1B
RS-1C
RS-1F
-1D
-1G
-2A
RS-2B
RS-2C
Operator Building
Treatment Building
OU1 ISCO PRB to
control organic COC
mass flux during
and after OU2
source remedy.


Figure 6 - Inorganic Groundwater Remedy 2B
Pumping Well
PA-A
Monitoring Well
MI-4
CPS-10
RS-1D
RS-1A
RS-1C
CPSRW-3
MI-9
TP-4
CPSRW-2
RS-1F
RS-1G
CP-6
TP-2
CPS-1
PA-A
RS-2A
RS-2B
WCC-11M
RS-2C
WCC-11VS
PA-B
CPS-9


Figure 7 - Soil Remedy 5
Excavation
ISCO with Mixing
ISCO without Mixing
4 ft
15 ft
15 ft
25 ft
10 ft
Equipment/ Material Staging
Storage
Storage
Office Trailer
Office Trailer
Office Trailer
Support Facilities
Construction Area Access Route
Overhang
Concrete Pad

TABLE 1
Summary of Chemicals of Concern and
Medium-Specific Exposure Point Concentrations

Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
		Min	Max					
Surface soil – Area 1	1,2,3-Trichlorobenzene	0.08	450	mg/kg	20/44	145.8	mg/kg	95% Appx Gamma UCL
	Thallium	0.461	1.32	mg/kg	6/41	0.662	mg/kg	95% KM(t) UCL

Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Min	Max	Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
Sitewide Groundwater	1,1,2-Trichloroethane	0.0001	0.0075	mg/l	11/66	0.0005934	mg/l	95% KM (BCA) UCL NP
	1,2,3-Trichlorobenzene	0.00056	0.40593	mg/l	13/20	0.314	mg/l	99% KM Cheb UCL NP
	1,2,4-Trichlorobenzene	0.0001	1.9796	mg/l	39/58	0.509	mg/l	99% KM Cheb UCL NP
	1,2,4-Trimethylbenzene	0.00028	0.07274	mg/l	19/21	0.0303	mg/l	95% GROS Adj Gamma UCL
	1,2-Dichlorobenzene	0.0001	1.254	mg/l	46/63	0.502	mg/l	99% KM Cheb UCL NP
	1,2-cis-dichloroethene	0.0001	1.1163	mg/l	49/63	0.221	mg/l	99% KM Cheb UCL NP
	1,2-Dichloroethane	0.0001	0.1946	mg/l	50/68	0.0231	mg/l	95% Appx Gamma UCL
	1,2-Dichloropropane	0.02048	0.02048	mg/l	1/66	0.02048	mg/l	Maximum
	1,2-trans-dichloroethane	0.0002	0.2703	mg/l	28/66	0.0265	mg/l	95% KM (Cheb) UCL NP
	1,3-Dichlorobenzene	0.0001	0.2369	mg/l	39/63	0.0325	mg/l	95% Appx Gamma UCL
	1,4-Dichlorobenzene	0.0001	0.8657	mg/l	47/63	0.264	mg/l	99% KM Cheb UCL NP
	Benzene	0.0001	2.0598	mg/l	52/69	0.364	mg/l	97.5% KM Cheb UCL NP
	Chlorobenzene	0.0001	8.1	mg/l	52/69	8.1	mg/l	97.5% KM Cheb UCL NP
	Methylene chloride	0.0004	0.0004	mg/l	1/66	0.341	mg/l	97.5% KM Cheb UCL NP
	Napthalene	0.0001	0.036	mg/l	26/52	0.0102	mg/l	95% GROS Adj Gamma UCL
	O-Xylene	0.0005	1.2796	mg/l	23/51	0.32	mg/l	99% KM Cheb UCL NP
	Toluene	0.0001	13.8097	mg/l	28/66	3.656	mg/l	99% KM Cheb UCL NP j
	Trichlorethylene	0.0002	0.018	mg/l	45/68	0.00641	mg/l	95% GROS Appx Gamma UCL
	Vinyl chloride	0.0001	0.3397	mg/l	36/66	0.0466	mg/l	97.5% KM Cheb UCL NP
	Xylene	0.0001	3.2943	mg/l	29/65	0.354	mg/l	95% Appx Gamma UCL

TABLE 1
Summary of Chemicals of Concern and
Medium-Specific Exposure Point Concentrations

	Mercury	0.00066	0.01	mg/l	4/39	0.0008698	mg/l	95% KM (t) UCL
	Aniline	0.00378	0.4701	mg/l	3/3	0.4701	mg/l	Maximum
	Aluminum	0.25	189	mg/l	39/39	55.28	mg/l	95% Cheb (Mean, SD) UCL
	Antimony	0.0059	0.018	mg/l	5/35	0.00832	mg/l	95% KM (% bootstrap) UCL
	Arsenic	0.0065	0.138	mg/l	14/39	0.0251	mg/l	95% KM (% bootstrap) UCL
	Cadmium	0.00055	0.613	mg/l	22/49	0.0808	mg/l	95% KM (Cheb) UCL NP
	Cobalt	0.0051	0.0745	mg/l	30/39	0.0745	mg/l	Maximum
	Copper	0.0034	123	mg/l	31/42	52.99	mg/l	99% KM Cheb UCL NP
	Iron	0.05262	770	mg/l	38/40	342.6	mg/l	99% KM Cheb UCL NP
	Thallium	0.0104	0.0206	mg/l	4/39	0.00788	mg/l	95% KM (t) UCL
	Vanadium	0.0026	2.03	mg/l	21/39	0.397	mg/l	95% Adj Gamma UCL
	Zinc	0.148	914	mg/l	46/47	223.1	mg/l	99% KM Cheb UCL

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

This table presents the chemicals of concern (COCs) and exposure point concentrations (EPCs) for each of the COCs in surface soil, subsurface soil and groundwater for the CPS/Madison site, including Area1, Area 2 and Area 3. The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the EPC and how it was derived. Note that soil concentrations of several compounds are above the concentrations that are associated with an adverse impact to groundwater; thus, there is a need to address the soil through a remedial action.

TABLE 2
SELECTION OF EXPOSURE PATHWAYS
CPS/Madison Superfund Site

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis
Current/Future	Soil	Surface Soil	Areas 1, 2 and 3	Trespasser	Adult	Ingestion	Quant
						Dermal	Quant
					Adolescent	Ingestion	Quant
						Dermal	Quant
Future	Soil	Surface Soil	Areas 1, 2 and 3	Outdoor Worker	Adult	Ingestion	Quant
						Dermal	Quant
						Inhalation	Quant
				Indoor Worker	Adult	Ingestion	Quant
						Dermal	Quant
				Resident	Adult	Ingestion	Quant
						Dermal	Quant
					Child	Ingestion	Quant
						Dermal	Quant
		Combined Soil (0-10 feet)	Areas 1, 2 and 3	Trespasser	Adult	Ingestion	Quant
						Dermal	Quant
					Adolescent	Ingestion	Quant
						Dermal	Quant
				Outdoor Worker	Adult	Ingestion	Quant
						Dermal	Quant
				Indoor Worker	Adult	Ingestion	Quant
						Dermal	Quant
				Construction Worker	Adult	Ingestion	Quant
						Dermal	Quant
						Inhalation	Quant
				Resident	Adult	Ingestion	Quant
						Dermal	Quant
					Child	Ingestion	Quant
						Dermal	Quant
	Groundwater	Groundwater	Areas 1, 2 and 3	Outdoor Worker	Adult	Ingestion	Quant
				Indoor Worker	Adult	Ingestion	Quant
				Construction Worker	Adult	Ingestion	Quant
						Dermal	Quant
				Resident	Adult	Ingestion	Quant
						Dermal	Quant
						Inhalation	Quant
					Child	Ingestion	Quant
						Dermal	Quant
						Inhalation	Quant
	Indoor Air	Indoor Air	On-site Area 2	Indoor Worker	Adult	Inhalation	Quant

Quant: will be quantitatively evaluated
Qual: will be qualitatively evaluated
Child = 0-6 years

TABLE 3

Non-Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	% Absor. Effic. (Dermal)	Adjusted RfD (Dermal)	Adj. Dermal RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates of RfD:
1,1,2-Trichloroethane	Chronic	4.0E-03	mg/kg-day	100	4.0E-03	mg/kg-day	Hematological	1000/1	IRIS	2013
1,2,3-Trichlorobenzene	Chronic	8.0E-04	mg/kg-day	100	8.0E-04	mg/kg-day	NOAEL	10,000	PPRTV SL	2013
1,2,4-Trichlorobenzene	Chronic	1.0E-02	mg/kg-day	100	1.0E-02	mg/kg-day	Endocrine	1000/1	IRIS	2013
1,2-Dichloroethane	Chronic	6.0E-03	mg/kg-day	100	6.0E-03	mg/kg-day	Renal	300	PPRTV	2013
1,2-cis-dichloroethene	Chronic	2.0E-03	mg/kg-day	100	2.0E-03	mg/kg-day	Kidney	3,000	IRIS	2013
1,2-trans-dichloroethene	Chronic	2.0E-02	mg/kg-day	100	2.0E-02	mg/kg-day	Liver	1000/1	IRIS	2013
1,2-dichloropropane	Chronic	9.0E-02	mg/kg-day	100	9.0E-02	mg/kg-day	Liver	1000	MRL	2014
1,3-Dichlorbenzen	Chronic	3.0E-03	mg/kg-day	100	3.0E-03	mg/kg-day	Liver	-----	NCEA	2013
1,4-Dichlorobenzene	Chronic	7.0E-02	mg/kg-day	100	7.0E-02	mg/kg-day	Hepatic	100	MRL	2013
Benzene	Chronic	4.0E-03	mg/kg-day	100	4.0E-03	mg/kg-day	Immune	300	IRIS	2013
Chlorobenzene	Chronic	2.0E-02	mg/kg-day	100	2.0E-02	mg/kg-day	Liver	1000/1	IRIS	2013
Methylene chloride	Chronic	6.0E-03	mg/kg-day	100	6.0E-03	mg/kg-day	Liver	100/1	IRIS	2013
Toluene	Chronic	8.0E-02	mg/kg-day	100	8.0E-02	mg/kg-day	Kidney	3000/1	IRIS	2013
Trichloroethene	Chronic	5.0E-04	mg/kg-day	100	5.0E-04	mg/kg-day	Heart malformation	1000/100/10	IRIS	2013
Vinyl chloride	Chronic	3.0E-03	mg/kg-day	100	3.0E-03	mg/kg-day	Liver	30/1	IRIS	2013
O-Xylene	Chronic	2.0E-01	mg/kg-day	100	2.0E-01	mg/kg-day	General toxicity	1000/1	Surrogate	2013
Xylene	Chronic	2.0E-01	mg/kg-day	100	2.0E-01	mg/kg-day	General toxicity	1000/1	IRIS	2013
Analine	Chronic	7.0E-03	mg/kg-day	1000	7.0E-03	mg/kg-day	Blood	1000	PPRTV	2013
Napthalene	Chronic	2.0E-02	mg/kg-day	100	2.0E-02	mg/kg-day	Body weight	3000/1	IRIS	2013
Aluminum	Chronic	1.0E+00	mg/kg-day	100	1.0E+00	mg/kg-day	Nervous system	100	PPRTV	2013
Antimony	Chronic	4.0-04	mg/kg-day	100	4.0E-04	mg/kg-day	Hematological	1000/1	IRIS	2013
Arsenic	Chronic	3.0E-04	mg/kg-day	100	3.0E-04	mg/kg-day	Skin	3/1	IRIS	2013
Cadmium	Chronic	5.0E-04	mg/kg-day	100	5.0E-04	mg/kg-day	Kidney	10/1	IRIS	2013
Cobalt	Chronic	3.0E-04	mg/kg-day	100	3.0E-04	mg/kg-day	Thyroid	3000	PPRTV	2013
Copper	Chronic	4.0E-02	mg/kg-day	100	4.0E-02	mg/kg-day	-----	-----	HEAST	2013
Iron	Chronic	7.0E-01	mg/kg-day	100	7.0E-01	mg/kg-day	GI	3	MRL	2013
Mercury	Chronic	3.0E-04	mg/kg-day	100	3.0E-04	mg/kg-day	Immune	1000/1	IRIS	2013

TABLE 3

Non-Cancer Toxicity Data Summary

Thallium	Chronic	1.0E-05	mg/kg-day	100	1.0E-05	mg/kg-day	NOAEL	3000	PPRTV SL	2013
Vanadium	Chronic	5.0E-03	mg/kg-day	100	5.0E-03	mg/kg-day	Kidney	3000	RSL	2013
Zinc	Chronic	3.0E-01	mg/kg-day	100	3.0E-01	mg/kg-day	Liver	3	IRIS	2013

Pathway: Inhalation

Chemical of Concern	Chronic/ Subchronic	Inhalation RfC		Primary Target Organ or System	Combined Uncertainty /Modifying Factors	Sources of RfC Target Organ	Date of RfC
		Value	Units				
1,1,2-Trichloroethane	Chronic	**2.0E-04**	mg/m^3	NOAEL	1000	PPRTV	2013
1,2,4-Trichlorobenzene	Chronic	**2.0E-03**	mg/m^3	Urinary	3000	PPRTV	2013
1,2-Dichloroethane	Chronic	**7.0E-03**	mg/m^3	Nervous system	3000	PPRTV	2013
1,2-cis-dichloroethene	-----	**-----**	-----	-----	-----	-----	-----
1,2-trans-dichloroethene	Chronic	**6.0E-02**	mg/m^3	Lung/liver	3000	PPRTV	2013
1,2-Dichloropropane	Chronic	**4.0E-03**	mg/m^3	Respiratory	300/1	IRIS	2014
1,3-Dichlorobenzene	-----	**-----**	-----	-----	-----	-----	-----
1,4-Dichlorobenzene	Chronic	**8.0E-01**	mg/m^3	Developmental	100/1	IRIS	2013
Benzene	Chronic	**3.0E-02**	mg/m^3	Immune system	300/1	IRIS	2013
Chlorobenzene	Chronic	**5.0E-02**	mg/m^3	Liver	1000	PPRTV	2013
Methylene chloride	Chronic	**6.0E-01**	mg/m^3	Hepatic	30	IRIS	2013
Toluene	Chronic	**5.0E+00**	mg/m^3	Nervous system	10/1	IRIS	2013
Trichloroethene	Chronic	**2.0E-03**	mg/m^3	Heart malformations	100/10	IRIS	2013
Vinyl chloride	Chronic	**1.0E-01**	mg/m^3	Liver	30/1	IRIS	2013
O-Xylene	Chronic	**1.0E-01**	mg/m^3	Nervous system	300/1	Surrogate	2013
Xylene	Chronic	**1.0E-01**	mg/m^3	Nervous system	300/1	IRIS	2013
Analine	Chronic	**1.0E-03**	mg/m^3	Spleen	3000/1	IRIS	2013
Napthalene	Chronic	**3.0E-03**	mg/m^3	Lung	3000/1	IRIS	2013
Aluminum	Chronic	**5.0E-03**	mg/m^3	LOAEL	300	PPRTV	2013
Antimony	-----	**-----**	-----	-----	-----	-----	-----
Arsenic	Chronic	**1.5E-05**	mg/m^3	Developmental	-----	CalEPA	2013
Cadmium	Chronic	**1.0E-05**	mg/m^3	Renal	9	MRL	2013
Cobalt	Chronic	**6.0E-06**	mg/m^3	Respiratory	300	PPRTV	2013
Copper	-----	**-----**	-----	-----	-----	-----	-----
Iron	-----	**-----**	-----	-----	-----	-----	-----
Mercury	Chronic	**3.0E-04**	mg/m^3	Respiratory	30/1	IRIS	2013

TABLE 3

Non-Cancer Toxicity Data Summary

Thallium	-----	-----	-----	-----	-----	-----	-----
Zinc	-----	-----	-----	-----	-----	-----	----

Key

GI – Gastrointestinal System
IRIS: Integrated Risk Information System, USEPA
PPRTV SL: Provisional Peer Review Toxicity Value Screening Level, USEPA
HEAST: Health Effect Assessment Summary Table, USEPA
MRL: Minimum Risk Level, Agency for Toxic Substances and Disease Registry (ATSDR)
CalEPA: California Environmental Protection Agency

NOAEL: No observable adverse effect level
LOAEL: Lowest observable adverse effect level

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information which is relevant to the contaminants of concern in surface soil, subsurface soil, groundwater and indoor air. When available, the chronic toxicity data have been used to develop oral reference doses (RfDs) and inhalation reference doses (RfDi).

TABLE 4

Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
1,2-Dichloroethane	9.1E-02	$(mg/kg/day)^{-1}$	9.1E-02	$(mg/kg/day)^{-1}$	B2	IRIS	2013
1,4-Dichlorobenzene	5.4E-03	$(mg/kg/day)^{-1}$	5.4E-03	$(mg/kg/day)^{-1}$	Possible carcinogen	CalEPA	2013
Benzene	5.5E-02	$(mg/kg/day)^{-1}$	5.5E-02	$(mg/kg/day)^{-1}$	Known carcinogen	IRIS	2013
Vinyl chloride (adult)	7.2E-01	$(mg/kg/day)^{-1}$	7.2E-01	$(mg/kg/day)^{-1}$	Known carcinogen	IRIS	2013
Vinyl chloride (adult/child)	1.4E+00	$(mg/kg/day)^{-1}$	1.4E+00	$(mg/kg/day)^{-1}$	Known carcinogen	IRIS	2013
Arsenic	1.5E+00	$(mg/kg/day)^{-1}$	1.5E+00	$(mg/kg/day)^{-1}$	Known carcinogen	IRIS	2013

Pathway: Inhalation

Chemical of Concern	Unit Risk	Units	Inhalation Slope Factor	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
1,2-Dichloroethane	2.6E-05	$1(ug/m^3)$	-----	-----	B2	IRIS	2013
1,4-Dichlorobenzene	1.0E-05	$1(ug/m^3)$	-----	-----	Possible carcinogen	CalEPA	2013
Benzene	7.8E-06	$1(ug/m^3)$	-----	-----	Known carcinogen	IRIS	2013
Vinyl chloride (adult)	4.4E-06	$1(ug/m^3)$	-----	-----	Known carcinogen	IRIS	2013
Vinyl chloride (adult/child)	8.8E-06	$1(ug/m^3)$	-----	-----	Known carcinogen	IRIS	2013
Arsenic	4.3E-03	$1(ug/m^3)$	-----	-----	Known carcinogen	IRIS	2013

Key:

IRIS: Integrated Risk Information System. U.S. EPA
B2: Probable Human Carcinogen
CalEPA: California Environmental Protection Agency

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to the contaminants of concern in surface soil, subsurface soil, groundwater and indoor air. Toxicity data are provided for both the oral and inhalation routes of exposure.

TABLE 5
Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child (0-6 year)

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Surface soil	Surface soil	Surface soil within Area 1	1,2,3-Trichlorobenzene	Kidney	**1.7**	-----	-----	**1.7**
			Thallium	-----	**1.5**	-----	-----	**1.5**
Hazard Index Total= (Note that thallium was determined to be related to background and was not identified as a COC, therefore the hazard index total is 2, not 4)								**4**

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child (0-6 years)

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Subsurface soil	Subsurface soil	Subsurface soil within Area 2	Thallium	-----	**1.6**	-----	-----	**1.6**
Hazard Index Total= (Note that thallium was determined to be related to background and was not identified as a COC, therefore the hazard index total is less than 1, not 2)								**2**

Scenario Timeframe: Future
Receptor Population: Outdoor Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Sitewide Groundwater	1,2,3-Trichlorobenzene	Kidney	**3.8**	-----	-----	**3.8**
			1,2-cis-dichloroethylene	-----	**1.1**	-----	-----	**1.1**
			Cobalt	Endocrine	**2.4**	-----	-----	**2.4**
			Copper	-----	**13**	-----	-----	**13**
			Iron	-----	**4.8**	-----	-----	**4.8**
			Thallium	-----	**7.7**	-----	-----	**7.7**
			Zinc	Liver	**7.3**	-----	-----	**7.3**
Hazard Index Total = 48								

TABLE 5
Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Indoor Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Sitewide Groundwater	1,2,3-Trichlorobenzene	Kidney	**3.8**	-----	-----	**3.8**
			1,2-cis-dichloroethylene	-----	**1.1**	-----	-----	**1.1**
			Cobalt	Endocrine	**2.4**	-----	-----	**2.4**
			Copper	-----	**13**	-----	-----	**13**
			Iron	-----	**4.8**	-----	-----	**4.8**
			Thallium	-----	**7.7**	-----	-----	**7.7**
			Zinc	Liver	**7.3**	-----	-----	**7.3**
							Hazard Index Total=	**48**

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child (0-6 years)

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Sitewide Groundwater	1,2,3-Trichlorobenzene	Kidney	**25**	-----	-----	**25**
			1,2,4-Trichlorobenzene	Endocrine	**3.3**	**4.1**	**520**	**527.3**
			1,2-cis-dichloroethylene	-----	**7.1**	-----	-----	**7.1**
			1,3-Dichlorobenzene	Liver	0.69	0.62	-----	**1.3**
			Benzene	Immune	**5.8**	0.89	**29**	**35.7**
			Chlorobenzene	Liver	**4.8**	1.7	**67**	**73.5**
			Toluene	Liver	**2.9**	1.0	**1.6**	**5.5**
			Vinyl Chloride	Liver	0.99	0.052	**1.2**	**2.2**
			Aniline	-----	**4.3**	-----	-----	**4.3**
			Aluminum	Nervous system	**3.5**	-----	-----	**3.5**
			Arsenic	Skin	**5.3**	0.035	-----	**5.4**
			Antimony	General toxicity	**1.3**	0.059	-----	**1.4**
			Cadmium	Kidney	**5.2**	**1.4**	-----	**6.5**
			Cobalt	Endocrine	**16**		-----	**16**
			Copper	-----	**85**	0.56	-----	**85**

TABLE 5
Risk Characterization Summary - Noncarcinogens

			Iron	-----	**31**		-----	**31**
			Thallium	-----	**50**		-----	**50**
			Vanadium	Kidney	**5.1**	**1.3**	-----	**6.4**
			Zinc	Liver	**48**	0.19	-----	**48**
			1,1,2-Trichloroethane	-----	0.0093	0.0086	**6.7**	**6.7**
			1,2,4-Trimethylbenzene	-----	**-----**	**-----**	**8.6**	**8.6**
			1,2-Trichlorobenzene	General toxicity	**-----**	**-----**	**5.4**	**5.4**
			1.2-Dichloroethane	Nervous system	0.25	0.012	**8.1**	**8.3**
			1,2-Dichloroproane	Respiratory	0.015	0.0014	**12**	**12**
			1,2-Trans-dichloroethylene	-----	0.085	-----	**1.1**	**1.1**
			Methylene Chloride	Liver	**3.6**	0.14	**1.5**	**5.3**
			Napthalene	Respiratory	0.033	0.021	**6.7**	**6.7**
			O-Xylene	Nervous system	0.1	-----	**6.7**	**6.8**
			Trichloroethylene	Nervous system	-----	-----	**7.6**	**7.6**
			Xylene	Nervous system	0.11	-----	**8.2**	**8.3**
			Mercury	-----	0.19	0.017	**5**	**5.2**
							Hazard Index Total=	**1023**

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Sitewide Groundwater	1,2,3-Trichlorobenzene	Kidney	**11**	**-----**	-----	**11**
			1,2,4-Trichlorobenzene	Endocrine	**1.4**	**1.8**	**120**	**123.2**
			1,2-cis-dichloroethylene	-----	**3.0**	**-----**	**-----**	**3.0**
			Benzene	Immune system	**2.5**	0.38	**6.6**	**9.5**
			Chlorobenzene	Liver	**2.1**	0.74	**16**	**18.8**
			Methylene Chloride	Liver	**1.6**	0.059	0.35	**2.0**
			Toluene	Kidney	**1.3**	0.44	0.37	**2.1**
			Analine	-----	**1.8**	-----	-----	**1.8**
			Aluminium	Nervous system	**1.5**	-----	-----	**1.5**

TABLE 5
Risk Characterization Summary - Noncarcinogens

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Ingestion	Dermal	Inhalation	Exposure Routes Total
			Arsenic	Skin	**2.3**	0.012	-----	**2.3**
			Cadmium	Kidney	**2.2**	0.46	-----	**2.6**
			Cobalt	Endocrine	**6.8**	----	-----	**6.8**
			Copper	-----	**36**	0.19	-----	**36.2**
			Iron	-----	**13**	-----	-----	**13**
			Thallium	-----	**22**	0.11	-----	**22.1**
			Vanadium	Kidney	**2.2**	0.44	-----	**2.6**
			Zinc	Liver	**20**	0.064	-----	**20.1**
			1,1,2-Trichloroethane	-----	0.0041	0.00038	**1.6**	**1.6**
			1,2,4-Trimethylbenzene	-----	-----	-----	**2.0**	**2.0**
			1,2-Dichlorobenzene	General toxicity	0.15	0.1	**1.2**	**1.5**
			1,2-Dichloroethane	Nervous system	0.11	0.0052	**1.9**	**2.0**
			1,2-Dichloropropane	Respiratory	0.0062	0.00062	**2.7**	**2.7**
			Napthalene	Respiratory	0.014	0.0092	**1.5**	**1.5**
			O-Xylene	Nervous system	0.044	-----	**1.5**	**1.5**
			Trichloroethylene	Nervous system	0.35	0.059	**1.8**	**2.2**
			Xylene	Nervous system	0.048	-----	**1.9**	**1.9**
			Mercury	-----	0.079	0.0059	**1.1**	**1.1**
							Hazard Index Total=	**301**

Scenario Timeframe: Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Groundwater – Area 1	1,2,4-Trichlorobenzene	Endocrine	0.00002	0.0076	**11**	**11**
			1,4-Dichlorobenzene	Endocrine	0.000015	0.00035	**1.5**	**1.5**
			Benzene	Immune system	0.0011	0.085	**140**	**140**
			Chlorobenzene	Liver	0.00068	0.1	**45**	**45.1**
			Napthalene	Respiratory	0.0000004	0.00009	**4.2**	**4.2**

TABLE 5

Risk Characterization Summary - Noncarcinogens

			Toluene	Nervous system	0.000029	0.0048	**5.1**	**5.1**
			Vinyl Chloride	Liver	0.000029	-----	**7.1**	**7.1**
			Xylene	Nervous system	0.000018	-----	**16**	**16**
							Hazard Index Total=	**230**

Summary of Risk Characterization - Non-Carcinogens

The table presents hazard quotients (HQs) for each route of exposure and the hazard index (sum of hazard quotients) for exposure to surface soil, subsurface soil, and groundwater for all routes of exposure. The Risk Assessment Guidance for Superfund states that, generally, a hazard index (HI) greater than 1 indicates the potential for adverse non-cancer effects. A qualitative assessment of the vapor intrusion pathway indicated that exposure to site-related volatiles (e.g., benzene chloroform, ethylbenzene and tetrachloroethylene) in on-site buildings at the former CPS facility is a potentially complete exposure pathway for the future timeframe.

TABLE 6

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Outdoor Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Sitewide Groundwater	Vinyl Chloride	**1.2E-04**	-----	-----	**1.2E-04**
			Arsenic	**1.3E-04**	-----	-----	**1.3E-04**
						Total Risk =	**4E-04**

Scenario Timeframe: Future
Receptor Population: Indoor Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Sitewide Groundwater	Vinyl Chloride	**1.2E-04**	-----	-----	**1.2E-04**
			Arsenic	**1.3E-04**	-----	-----	**1.3E-04**
						Total Risk =	**4-E04**

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Sitewide Groundwater	Benzene	**1E-04**	1.7E-05	**5.8E-04**	**7.1E-04**
			Vinyl Chloride	**3.6E-04**	1.9E-05	9.0E-05	**3.8E-04**
			Arsenic	**2.1E-04**	1.4E-06	-----	**2.1E-04**
			1,2-Dichloroethane	1.2E-05	5.6E-07	**1.3E-04**	**1.4E-04**
			1,4-Dichlorobenzene	7.8E-06	5.0E-06	**5.8E-04**	**6.0E-04**
						Total Child Risk =	**2E-03**

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Sitewide Groundwater	Benzene	**1.9E-04**	2.9E-05	**5.3E-04**	**7.5E-04**
			Vinyl Chloride	**3.2E-04**	-----	4.3E-05	**3.6E-04**
			Arsenic	**3.5E-04**	1.8E-06	-----	**3.5E-04**
			1,2-Dichloroethane	2.0E-05	9.7E-07	**1.2E-04**	**1.4E-04**
			1,4-Dichlorobenzene	1.3E-05	9.0E-06	**4.8E-04**	**5.0E-04**
						Total Adult Risk =	**2E-03**
						Total Adult/Child Risk =	**4E-03**

Scenario Timeframe: Future
Receptor Population: Construction/Utility
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Groundwater – Area 1	Benzene	8.3E-09	6.7E-07	**1.2E-03**	**1.2E-03**
						Total Adult Risk =	**1E-03**

Summary of Risk Characterization - Carcinogens

The table presents cancer risks for sitewide groundwater and groundwater in Area 1 for all routes of exposure. A qualitative assessment of the vapor intrusion pathway indicated that exposure to site-related volatiles (e.g., benzene chloroform, ethylbenzene and tetrachloroethylene) in on-site buildings at the former CPS facility is a potentially complete exposure pathway for the future timeframe. As stated in the National Contingency Plan, the point of departure is 10^{-6} and the acceptable risk range for site-related exposure is 10^{-6} to 10^{-4}.

Table 7 - Remediation Goals for Groundwater Contaminants				
	State GW Quality Criteria (ppb)	State MCLs (ppb)	Federal MCLS (ppb)	**Groundwater Remediation Goals (ppb)***
Organic Contaminants				
aniline	6			**6**
benzene	1	1	5	**1**
chlorobenzene	50	50	100	**50**
1,2-dichlorobenzene	600	600	600	**600**
1,3-dichlorobenzene	600	600		**600**
1,4-dichlorobenzene	75		75	**75**
cis-1,2-dichloroethene	70		70	**70**
trans-1,2-DCE	100		100	**100**
1,2-dichloroethane	2	2	5	**2**
1,1-dichloroethene	1	2	7	**1**
1,2-dichloropropane	1		5	**1**
1,4-Dioxane	0.4			**0.4**
ethylbenzene	700		700	**700**
methylene chloride	3	3		**3**
naphthalene	300	300		**300**
1,1,2,2-tetrachloroethane	1	1		**1**
tetrachloroethene(PCE)	1	1	5	**1**
toluene	600		1,000	**600**
1,2,3-trichlorobenzene	Not found			**TBD**
1,2,4-trichlorobenzene	9	9	70	**9**
1,1,2-trichloroethane	3	3	5	**3**
trichloroethene (TCE)	1	1	5	**1**
vinyl chloride	1		2	**1**
xylenes, total	1,000	1,000	10,000	**1,000**
Metal Contaminants				
aluminum	200		200 Secondary	**200**
antimony	6		6	**6**
arsenic	3	5	10	**3**
cadmium	4		5	**4**
copper	1,300		1,300	**1,300**
iron	300		300 Secondary	**300**
lead	5		15+	**5**
mercury	2		2	**2**
thallium	2		2	**2**
zinc	2,000		5,000 Secondary	**2,000**

* Preliminary Remediation Goals are the lesser of the preceding groundwater standards.
+ Federal Action Level

Table 8: Remediation Goals for Soil		
Contaminants of Concern	**NJ Non-Res Direct Contact Soil Remediation Standard (mg/kg)**	**Site Specific Impact to GW Screening Levels* (mg/kg) (Above the Water Table)**
benzene	5	0.005
chlorobenzene	7,400	3
1,2-dichlorobenzene	59,000	89
1,3-dichlorobenzene	59,000	100
1,4-dichlorobenzene	13	11
cis-1,2-dichloroethene (DCE)	560	0.9
trans-1,2-DCE	720	2
1,2-dichloroethane	3	0.005
1,1-dichloroethene	150	0.02
1,2-dichloropropane	5	0.007
1,4-Dioxane		0.02
ethylbenzene	110,000	63
methylene chloride	230	0.02
1,1,2,2-tetrachloroethane	3	0.03
Tetrachloroethene (PCE)	1,500	0.02
toluene	91,000	28
1,2,4-trichlorobenzene	820	4
1,1,2-trichloroethane	6	0.05
trichloroethene (TCE)	10	0.04
vinyl chloride	2	0.005
xylenes, total	170,000	95

* The default NJ Impact to Groundwater Screening levels in the Proposed Plan were replaced with site-specific values based on NJ impact to groundwater guidance and approved by NJDEP.

Table 9
OU1 Alternative 3A Present Value Cost Estimate
CPS/Madison Superfund Site, Old Bridge New Jersey

OU1 Remedial Alternative

Organic CoCs

Alternative 3A: ISCO Permeable Reactive Barrier

Includes:
a. Pre-Design Investigation
b. Remedial Action Work Plan
c. Permitting
d. PRB (ozone/perozone) treatment
e. Groundwater Monitoring
f. Institutional Controls: CEA/WRA

Design Criteria

Aquifer Conditions
- Fine to coarse sands with silt/clay lenses/discontinuous layers.
- Depth of impact at IRM location: ~10 to 40 ft
- Seepage velocity 1 ft/day

Plume Characteristics
- VOC plume:
  - length = ~2,600 ft
  - width = 400 to 700 ft
  - depth = 35 feet at CPS Site; 60 ft on the Runyon Watershed Prop.
- 1,4-Dioxane plume:
  - length = ~3,500 ft
  - width = 600 to 3,000 ft
  - depth = 35 feet at CPS Site; 90 ft at the Runyon Well Field

ISCO PRB
- 400-ft ISCO PRB using ozone/peroxide injected into 14 wells spaced at 30-ft intervals.
- Use of MNA to address remainder of the OCoC plume

ISCO PRB Operation
- Operation of existing IRM for 2 years while ISCO PRB is designed and constructed.
- Operation of the PRB for 4 years for OU2 Alternatives 3, 4 and 5, and for 28 years for OU2 Alternative 2 (net of 30-year evaluation period).

Groundwater Monitoring
- Install 7 new wells
- Quarterly performance monitoring of 8 monitoring wells for 5 years.
- Semi-annual MNA sampling of 20 wells for 30 years.

Notes:

1. The cost estimates shown have been prepared for guidance in project evaluation and implementation from information available at the time of the estimate. The actual costs will depend on actual labor, equipment and material costs, competitive market conditions, final project scope, implementation schedule, and other variable factors.

2.* Costs rounded to the nearest thousands.

A. Remedial Engineering Design and Permitting

Description	Unit	Rate	Quantity	Subtotal	Cost*	Notes
1. Site Surveying	LS	$ 9,000	1	$ 9,000	$ 9,000	Locate 48 locations/supervision/CAD
2. Remedial Design Investigation					$ 160,000	Assumes 18 borings to 40 feet with 5 discrete groundwater samples per boring collected between 10 and 40 ft. Five days to complete the sampling. Costs include subsurface utility clearance (GPR/EM) and surveying of sample locations.
a. Remedial Design Work Plan	LS	$ 41,500	1	$ 41,500		
b. Field Personnel/Equipment/Materials	LS	$ 28,500	1	$ 28,500		
c. Subcontractors (Driller, Surveyor, Utility Clearing)	LS	$ 36,700	1	$ 36,700		
d. Analytical (VOCs, 1,4-Dioxane, QA Samples)	LS	$ 10,500	1	$ 10,500		
e. Data Validation/Evacuation/Report	LS	$ 35,500	1	$ 35,500		
f. Management (5%)	LS	$ 7,600	1	$ 7,600		
3. Pilot test					$ 385,000	4 month pilot test for both ozone and perozone, 2 injection points
a. 4 month test (setup, operation, sampling, report)	LS	$ 384,612				
4. Design and Remedial Action Work Plan					$ 249,000	Includes treatability study to for oxidant type/dosage, ISCO design, remedial action work plans (ISCO injection, waste management, air monitoring plans etc.)
a. Treatability Study	LS	37,000	1	$ 37,000		
b. Engineering Design Package	LS	$ 130,000	1	$ 130,000		
c. Remedial Work Plans (RAWP/QAPP/H&S Plan)	LS	$ 82,100	1	$ 82,100		
5. Construction Specifications	LS	$ 15,000	1	$ 15,000	$ 15,000	
6. Permitting					$ 43,000	Permit equivalents based on remedial action components and presence of freshwater wetlands within the locations of the injection areas.
a. Well Construction Permits	LS	$ 250	14	$ 3,500		
b. NJ Freshwater Wetlands Permit Equivalent	LS	$ 18,000	1	$ 18,000		
c. NJ Flood Hazard Area Individual Permit Equivalent	LS	$ 9,000	1	$ 9,000		
d. NJ Permit-by-Rule Discharge Authorization (ISCO)	LS	$ 6,000	2	$ 12,000		
				Subtotal	$ 861,000	
				Contingency (15%)	$ 129,000	
				Total Engineering, Design and Permitting	$ 990,000	

B. Construction/Capital Costs

Description	Unit	Rate	Quantity	Subtotal	Cost*	Notes
1. Preparation					$ 129,000	Includes Contractor cost to setup work and support areas, temporary utilities, trailer, SESC controls, and subsurface utility investigation
a. Site Preparation and Utilities	LS	$ 70,745	1	$ 70,745		
b. Construction Support Areas	LS	$ 58,660	1	$ 58,660		
2. PRB Monitoring System Installation					$ 109,000	Installation of 9 wells including supervision/surveying, IDW disposal
a. Groundwater Performance Wells	well	$ 4,200	7	$ 29,400		
b. Infrastructure Wells	well	$ 5,100	8	$ 40,800		
c. Soil Gas Wells	well	$ 4,900	8	$ 39,200		
3. PRB System					$ 1,585,000	
a. Oxidant Supply Facility and Startup of System	LS	$ 1,201,300	1	$ 1,201,300		14 dual injection wells
b. Oxidant Conveyance System	LS	$ 180,800	1	$ 180,800		12 ft x 60 ft oxidant supply facility
c. PRB Wells	LS	$ 14,500	14	$ 203,000		12 ft x 40 ft operator facility
4. Site Restoration/Demobilization					$ 27,000	Includes restoration of area disturbed per SESC plan and DEP permits
a. Site Restoration/Demobilization	LS	$ 27,300	1	$ 27,300		
5. Management and QA/QC					$ 618,000	Contractor QC, H&S (including perimeter air monitoring), and Construction Oversight for project duration. Includes final surveying, and remedial action report.
a. Construction Oversight/QA/As-Builts	LS	$ 318,760	1	$ 318,760		
b. Contractor QC, Admin, and Meetings	LS	$ 220,000	1	$ 220,000		
c. Contractor H&S	LS	$ 79,000	1	$ 79,000		
				Subtotal	$ 2,468,000	
				Contingency (15%)	$ 370,000	
				Total Construction and Capital Cost	$ 2,838,000	

C. Operations and Maintenance (Annual Costs)

Description	Unit	Rate	Quantity	Subtotal	Cost*	Notes
1. Existing IRM P&T System Operation					$ 246,000	2-year operation until new GWTP is designed, constructed, and tested. Amount based on current annual O&M.
a. O&M/Sampling/Permit Reporting	Year	$ 205,000	1	$ 205,000		
b. Contingency (15%) + Management (5%)	year	$ 41,000	1	$ 41,000		
2. Existing IRM Performance Monitoring Program					$ 41,000	Annual amount based on current semi-annual sampling and reporting for the PMP Program.
a. Fieldwork/Sampling Equipment	year	$ 18,000	1	$ 18,000		
b. Analytical (VOCs, Blanks, QC Samples)	year	$ 9,000	1	$ 9,000		
c. Data Evaluation, Validation and Reporting (Annual)	year	$ 7,000	1	$ 7,000		
d. Contingency (15%) + Management (5%)	year	$ 7,000	1	$ 7,000		
3. PRB Operation						
4-year of PRB Operations					$ 202,400	
a. O&M/Sampling/Permit Reporting	Year	$ 176,000	1	$ 176,000		
b. Contingency (10%) + Management (5%)		$ 26,400	1	$ 26,400		
30-Year PRB Operation					$ 202,400	
a. O&M/Sampling/Permit Reporting	Year	$ 176,000	1	$ 176,000		
b. Contingency (10%) + Management (5%)		$ 26,400	1	$ 26,400		
4. Quarterly Groundwater Monitoring (per event)					$ 50,000	Includes the quarterly sampling of monitoring wells for VOCs and 1,4-dioxane and preparation of semi-annual reports.
b. Fieldwork/Equipment Per Sampling Event	event	$ 3,900	4	$ 15,600		
b. Analytical (VOCs, Blanks, QC Samples)	event	$ 3,160	4	$ 12,640		
c. Data Validation/evaluation/Report (semi-annual)	report	$ 7,000	2	$ 14,000		
d. Contingency (15%) + Management (5%)	-	$ 8,000	1	$ 8,000		
5. Semi-Annual MNA Groundwater Monitoring (per event)					$ 50,000	Includes the semi-annual sampling of monitoring wells for VOCs, 1,4-dioxane, and natural attenuation parameters and preparation of semi-annual reports.
a. Fieldwork/Equipment Per Sampling Event	event	$ 6,700	2	$ 13,400		
b. Analytical (VOCs, Blanks, QC Samples)	event	$ 5,800	2	$ 11,600		
c. Reporting (semi-annual)	report	$ 8,300	2	$ 16,600		
d. Contingency (15%) + Management (5%)		$ 8,000	1	$ 8,000		
6. Institutional Controls / Certification						2-year annual prorated cost
a. Biennial Certification	Year	$ 4,000	1	$ 4,000	$ 4,000	

D. Present Value Analysis

Cost Type	Year	Cost per Year	Total Cost	Discount Factor (7%)	Present Value*	Notes
A. Remedial Engineering Design and Permitting	0	$ 990,000	$ 990,000	1.000	$ 990,000	
B. Construction/Capital Costs	0	$ 2,838,000	$ 2,838,000	1.000	$ 2,838,000	
C. Operations and Maintenance						
2-Year Existing IRM Operation						
• Pump and Treatment O&M (2 Years)	1-2	$ 246,000	$ 738,000	1.808	$ 445,000	2 years
• Performance Monitoring Program	1-2	$ 41,000	$ 82,000	1.808	$ 74,000	2 years
4-Year PRB Operations (OU2 Alts. 3, 4, and 5)						
• PRB O&M (4 Years)	3-6	$ 202,400	$ 809,600	2.957	$ 598,000	4 years
• Quarterly Groundwater Sampling	3-7	$ 50,000	$ 250,000	3.579	$ 179,000	5 years
• Semi-Annual Runyon GW Sampling (5 years)	3-7	$ 25,000	$ 125,000	3.579	$ 89,000	5 years
• Semi-Annual MNA and Groundwater Sampling	8-30	$ 50,000	$ 1,150,000	7.019	$ 351,000	23 years
• Biennial Certification	1-30	$ 2,000	$ 60,000	12.409	$ 25,000	30 years
Total Present Value of Alternative 3A (2 Years Operation of Existing IRM and 4 Years of PRB O&M):					**$ 5,589,000**	
2-Year Existing IRM Operation						
• Pump and Treatment O&M (2 Years)	1-2	$ 246,000	$ 492,000	1.808	$ 445,000	2 years
• Performance Monitoring Program	1-2	$ 41,000	$ 82,000	1.808	$ 74,000	2 years
28-year PRB Operation (OU2 Alt. 2)						
• PRB O&M (28 Years)	3-30	$ 202,400	$ 6,072,000	10.596	$ 2,145,000	28 years
• Quarterly Groundwater Sampling	3-4	$ 50,000	$ 100,000	1.578	$ 79,000	2 years
• Semi-Annual Runyon GW Sampling (2 years)	3-4	$ 25,000	$ 50,000	1.578	$ 39,000	2 years
• Semi-Annual MNA and Groundwater Sampling	3-30	$ 50,000	$ 1,400,000	10.596	$ 530,000	28 years
• Biennial Certification	1-30	$ 2,000	$ 60,000	12.409	$ 25,000	30 years
Total Present Value of Alternative 3A (2 Years Operation of Existing IRM and 28 Years of PRB O&M):					**$ 7,165,000**	

Table 10
OU1 Alternative 2B Present Value Cost Estimate
CPS/Madison Superfund Site, Old Bridge New Jersey

OU1 Remedial Alternative Metal CoCs	Design Criteria
<u>Alternative 2B - Limited Action - Continued IRM Operation</u> Includes: a. Operation of the Madison Site IRM Pump and Treatment System b. Continuation of the Madison Site Performance Monitoring Program c. Continued maintenance of the Madison Site CEA <u>Notes:</u> 1. The cost estimates shown have been prepared for guidance in project evaluation and implementation from information available at the time of the estimate. The actual costs will depend on actual labor, equipment and material costs, competitive market conditions, final project scope, implementation schedule, and other variable factors. 2. * Costs rounded to the nearest thousands.	<u>Madison On-site Existing P&T System</u> • Operation of 8 existing recovery wells: RS-1A, RS-1B, RS-1D, RS-1F, RS-1G, RS-2A, RS-2B, and RS-2C. • Total average recovery rate = 75 gpm • Operation of the existing treatment system: pH adjustment and metals treatment, discharge to sanitary sewer. • Maintenance of equipment • 15 and 30 years of operation depending on the extent of the OU3 source metals remedy. <u>Performance Monitoring Program</u> • Quarterly sampling of 9 monitoring wells, 8 recovery wells, and 4 surface water samples for Metals analysis (above sampling required by the MCUA). • Quarterly reporting. <u>Institutional Control</u> • Update of the horizontal and vertical extent of the Madison CEA limits based on current groundwater quality data. • Maintenance of the CEA/WRA for 30 years.

A. Operations and Maintenance (Annual Costs)

Description	Unit	Rate	Quantity	Subtotal	Cost	Notes
<u>1. Pump and Treatment System Operation</u>					$ 1,255,000	Estimated amount based on current O&M costs plus contingency /management on O&M. Discharge cost includes both conveyance and treatment by the POTW.
a. O&M/Sampling/Permit Reporting	Year	$ 405,000	1	$ 405,000		
b. Discharge Cost to Sanitary Sewer System	Year	$ 768,700	1	$ 768,700		
c. Contingency (15%) + Management (5%) on O&M	-	$ 81,000	1	$ 81,000		
<u>2. Performance Monitoring Program</u>	year				$ 78,000	Annual amount based on current sampling and reporting for the PMP Program.
a. Fieldwork/Sampling Equipment	quarter	$ 6,220	4	$ 24,880		
b. Analytical (VOCs, Blanks, QC Samples)	quarter	$ 2,400	4	$ 9,600		
c. Data Evaluation, Validation and Reporting (Annual)	quarter	$ 7,680	4	$ 30,720		
d. Contingency (15%) + Management (5%)	-	$ 13,000	1	$ 13,000		
<u>3. Institutional Controls (Groundwater) / Certification</u>						
a. CEA Revision	LS	$ 6,500	1	$ 6,500	$ 6,500	Initial one time cost.
b. Biennial Certification (per year)	Year	$ 4,000	1	$ 4,000	$ 4,000	2-year annual prorated cost.

D. Present Value Analysis

Cost Type	Year	Cost per Year	Total Cost	Discount Factor (7%)	Present Value*	Notes
A. Operations and Maintenance						
• Pump and Treatment O&M (15 Years)	1-15	$ 1,255,000	$ 18,825,000	9.108	$ 11,430,000	15 years
• Performance Monitoring Program	1-15	$ 78,000	$ 1,170,000	9.108	$ 710,000	15 years
• CEA Revision	1	$ 6,500	$ 6,500	1.000	$ 7,000	1 year
• Biennial Certification	1-15	$ 4,000	$ 60,000	9.108	$ 36,000	15 years
Total Present Value of Alternative 2B for 15 Years:					$ 12,183,000	
A. Operations and Maintenance						
• Pump and Treatment O&M (30 Years)	1-30	$ 1,255,000	$ 37,650,000	12.409	$ 15,573,000	30 years
• Performance Monitoring Program	1-30	$ 78,000	$ 2,340,000	12.409	$ 968,000	30 years
• CEA Revision	1	$ 6,500	$ 6,500	1.000	$ 7,000	1 year
• Biennial Certification	1-30	$ 4,000	$ 120,000	12.409	$ 50,000	30 years
Total Present Value of Alternative 2B for 30 Years:					$ 16,598,000	

Table 11
OU2 Alternative 5 Present Value Cost Estimate
CPS/Madison Superfund Site, Old Bridge New Jersey

OU2 Remedial Alternative

Alternative 5: In-Situ Chemical Oxidation

Includes:
a. Pre-Design Investigation
b. Remedial Action Work Plan
c. Permitting
d. ISCO Treatment
e. Institutional Controls: Non-Residential Use /
f. Groundwater Monitoring

Design Criteria

Site Conditions
- Water table: 1 to 3 feet
- Fine to medium sands with silt/clay lenses.

ISCO
- Excavation/backfill of 1,4-Dioxane area (900 cy)
- Persulfate, peroxide, and Zvi treatment
- In-situ soil mixing - 20,000 cy
- Direct push injection - 1,500 cy
- Supplemental direct push injection - 5,000 cy
- Post-remediation soil sampling at one sample per 70 cy

Post-Remediation Groundwater Monitoring
- covered under OU1 Alternatives

Notes:

1. The cost estimates shown have been prepared for guidance in project evaluation and implementation from information available at the time of the estimate. The actual costs will depend on actual labor, equipment and material costs, competitive market conditions, final project scope, implementation schedule, and other variable factors.

2. * Costs rounded to the nearest thousands.

A. Remedial Engineering Design and Permitting

Description	Unit	Rate	Quantity	Subtotal	Cost*	Notes
1. Site Surveying	LS	$ 21,000	1	$ 21,000	$ 21,000	
2. Remedial Design Work Plan		$ 58,000	1	$ 58,000	$ 58,000	
3. ISCO Bench Testing		$ 35,000	1	$ 35,000	$ 35,000	Includes sample collection
3. Remedial Design Investigation	LS				$ 72,000	Investigations related to the delineation of impacted soil limits and facility foundation design
a. Field Personnel/Equipment/Materials)	LS	$ 23,000	1	$ 23,000		
b. Subcontractors (Driller, Surveyor, Utility Clearing)	LS	$ 33,000	1	$ 33,000		
c. Analytical	LS	$ 9,000	1	$ 9,000		
d. Data Validation/Evaluation/Report	LS	$ 7,000	1	$ 7,000		
4. Design and Remedial Action Work Plan					$ 130,000	Includes RD report, the preparation of the Remedial Action Work Plan, CQAPP, and Construction H&S plans
a. Engineering Design Package	LS	$ 71,000	1	$ 71,000		
b. Remedial Work Plans (RD report/RAWP)	LS	$ 59,000	1	$ 59,000		
5. Construction Specifications	LS	$ 21,000	1	$ 21,000	$ 21,000	
6. Permitting					$ 45,000	Permit equivalents based on remedial action components and presence of freshwater wetlands and flood hazard area within the construction area.
a. NJ Flood Hazard Area Permit Equivalent	LS	$ 19,000	1	$ 19,000		
b. NJ Freshwater Wetlands Permit Equivalent	LS	$ 13,000	1	$ 13,000		
c. Soil Erosion & Sediment Control Plan	LS	$ 8,000	1	$ 8,000		
d. NJ Permit-by-Rule Discharge Authorization (ISCO)	LS	$ 5,000	1	$ 5,000		
				Subtotal	$ 382,000	
				Contingency (15%)	$ 57,000	
				Total Engineering Design and Permitting	$ 439,000	

B. Construction/Capital Costs

Description	Unit	Rate	Quantity	Subtotal	Cost*	Notes
1. Preparation					$ 493,000	
a. Site Preparation/Trailers Setup, removal U/G lines	LS	$ 306,000	1	$ 306,000		
b. Monitoring Well Abandonment, Move IRM Wells	LS	$ 11,000	1	$ 11,000		Abandon 11 wells in the construction area.
c. Repackaging Area (asphalt removal and soil exc.)	LS	$ 176,000	1	$ 176,000		Excavation of 900 cy and backfill
2. ISCO Treatment					$ 1,861,000	Includes estimated oxidant material amounts, soil mixing (majority of area up to 15 ft), and supplemental ISCO of 5,000 cy yards using injection.
a. Mobilize/Demobilize Equipment	LS	$ 18,000	1	$ 18,000		
b. ISCO Chemicals						
• ZVI	lb.	$ 4.00	20,000	$ 80,000		
• Persulfate	lb.	$ 2.50	408,000	$1,020,000		
• Hydrogen Peroxide (32%)	gal	$ 20.00	8,000	$ 160,000		
c. Soil Mixing	cy	$ 20	19,500	$ 390,000		
d. Injection	Day	$ 28,000	3	$ 84,000		
e. Lime	LS	$ 1	9000	$ 9,000		
f. Supplemental Injection	Day	$ 10,000	10	$ 100,000		
3. Post Remediation Soil Sampling					$ 116,000	Assumes 50 borings in the treatment areas during initial treatment plus 15 additional borings after the supplemental treatment.
a. Drilling/Sample Collection	LS	$ 97,000	1	$ 97,000		
b. Data Evaluation/Report	LS	$ 19,000	1	$ 19,000		
4. Site Restoration/Demobilization					$ 265,000	Includes the installation of 8 monitoring wells: 4 shallow (15 ft) and 4 deep (30 ft) for post-remediation performance monitoring, includes supervision and surveying.
a. Monitoring Well Installation	LS	$ 4,500	8	$ 36,000		
b. Site Restoration	LS	$ 192,000	1	$ 192,000		
c. Demobilization	LS	$ 37,000	1	$ 37,000		
5. Management and QA/QC					$ 802,000	Contractor QC, H&S (including perimeter air monitoring), and Construction Oversight for project duration. Includes final surveying and remedial action report.
a. Construction Oversight/QA/As-Builts	LS	$ 395,000	1	$ 395,000		
b. Contractor QC, Admin, and Meetings	LS	$ 225,000	1	$ 225,000		
c. Contractor H&S	LS	$ 182,000	1	$ 182,000		
				Subtotal	$ 3,537,000	
				Contingency (15%)	$ 531,000	
				Total Construction and Capital Cost	$ 4,068,000	

C. Operations and Maintenance (Annual Costs)

Description	Unit	Rate	Quantity	Subtotal	Cost*	Notes
1. Institutional Controls (Land) / Certification						
a. Deed Notice (Yr. 1)	LS	$ 4,000	1	$ 4,000	$ 4,000	
b. Biennial Certification (30 Yrs.)	Year	$ 2,000	1	$ 2,000	$ 2,000	

D. Present Value Analysis

Cost Type	Year	Cost per Year	Total Cost	Discount Factor (7%)	Present Value*	Notes
A. Remedial Engineering Design, and Permitting	0	$ 439,000	$ 439,000	1.000	$ 439,000	
B. Construction/Capital Costs	0	$ 4,068,000	$ 4,068,000	1.000	$ 4,068,000	
C. Operations and Maintenance						
• Deed Notice	1	$ 4,000	$ 4,000	0.935	$ 4,000	
• Biennial Certification	1-30	$ 2,000	$ 60,000	12.409	$ 25,000	30 years
				Total Present Value of Alternative 5:	**$ 4,536,000**	

Table 12 Chemical-Specific ARARs for OU1 and OU2
CPS/Madison Superfund Site

Regulatory Level	ARAR	Description	Status	Comment
State	Ground Water Quality Standards (N.J.A.C. 7:9C)	Establishes designated uses of the State's groundwater and specifies groundwater quality standards (GWQS) for protection of groundwater and for groundwater remediation.	Applicable	GWQS are identified as remedial goals for Site related COCs.
State	NJ Soil Remediation Standards (N.J.A.C. 7:26D)	Establishes the minimum standards for the remediation of contaminated soil.	Applicable	Per USEPA May 12, 2010 letter to NJDEP the ingestion/dermal exposure pathway SRS are ARARs, but SRS for the inhalation pathway are not an ARAR.[1]
State	NJ - Safe Drinking Water Act Rules (N.J.A.C 7:10)	Establishes allowable contaminant levels in public drinking water including Primary Maximum Contaminant Levels (MCLs) and Secondary MCLs for contaminants that impact aesthetic qualities of drinking water.	Applicable	Contains MCLs that are generally equal to or more stringent than the Federal Safe Drinking Water Act MCLs. Applicable to determine whether groundwater if used from the Site for drinking would require treatment to meet the MCLs.
Federal	Safe Drinking Water Act (40 CFR 141.50-52)	Establishes federal MCLs - maximum permissible levels of contaminants in water that is delivered to any user of a public water system	Applicable	Applicable to determine whether groundwater if used from the Site for drinking would require treatment to meet the MCLs.

1 - Letter dated May 12, 2010, USEPA Region 2 to NJDEP Site Remediation Program regarding Application of New Jersey's Soil Remediation Standards at Federal-Lead Superfund Sites.

Table 13 Action-Specific ARARs for OU1 and OU2
CPS/Madison Superfund Site

Regulatory Level	ARAR	Description	Status	Comment
State	NJ - Technical Requirements for Site Remediation and Administrative (N.J.A.C. 7:26E) Requirements for the Remediation of Contaminated Sites (N.J.A.C. 7:26B)	Specifies requirements for remedial activities under New Jersey cleanup programs, including requirements for institutional and engineering controls for contaminated soils left in place and for contaminated groundwater in excess of standards.	Applicable	Substantive requirements applicable if contaminated soils remain at levels above NJ soil remediation standards and applicable to a groundwater Classification Exception Area/Well Restriction Area (established for the CPS property) and monitored natural attenuation if implemented.
State	NJ - Pollutant Discharge Elimination System Rules (N.J.A.C. 7:14A)	Establishes standards for groundwater and surface water discharge for site remediation projects.	Applicable	The CPS IRM pump and treatment system discharges to surface water under a NJ Discharge to Surface Water Permit. Under CERCLA, permits are not required for on-site work.
State	NJ – Water Pollution Control Act Rules (N.J.A.C. 7:14)	Established rules governing the construction of wastewater treatment facilities.	Applicable	Applicable to the CPS and Madison IRM pump and treatment systems.
State	NJ – Air Pollution Rules (N.J.A.C. 7:27)	Establishes air quality standards for discharge of pollutants to air for protection of public health and preservation of ambient air quality.	Applicable	Substantive requirements applicable to remedial activities that result in air emissions.
State	NJ – Well Construction and Maintenance Rules (N.J.A.C. 7:9D)	Establishes requirements for installation and decommissioning of wells.	Applicable	Substantive requirements applicable to a remedial action that involves construction or abandonment of wells.
State	NJ - Soil Erosion and Sediment Control Act (N.J.S.A. 4:24-43 and N.J.A.C. 2:90-1)	Establishes soil erosion and sediment control standards for construction projects that result in soil erosion.	Potentially Applicable	Applicable to remedial construction activities that result in total land disturbance greater than or equal to 5000 sf^2..
State	NJ - Hazardous Waste Regulations (N.J.A.C. 7:26G)	Describes methods for identifying hazardous wastes and lists known hazardous wastes.	Applicable	Applicable to determine if hazardous waste is identified and managed during site remediation.
State	NJ – Noise Control Rules (N.J.A.C. 7:29)	Sets forth regulations relating to the control and abatement of noise from industrial, commercial, public service or community service facilities.	Relevant and Appropriate	Applicable to establishing limits on the noise that can be generated during remedial activities.
State	NJ – Storm Water Management (N.J.A.C. 7:8)	Establishes requirements for managing and controlling storm water from construction.	Potentially Applicable	Applicable if remedial activities include total land disturbance exceeding regulatory threshold.
Federal	Federal - Clean Air Act (42 USC 7401)	Establishes limits on emissions to atmosphere from industrial and commercial activities to reduce pollution and preserve air quality	Potentially Applicable	Applicable to remedial activities that emit pollutants to the air.
Federal	Federal - National Ambient Air Quality Standards (40 CFR 50)	Establishes emissions limits for primary and secondary National Ambient Air Quality Standards	Potentially Applicable	Applicable to remedial activities that may emit pollutants to the air.
Federal	Federal - National Emission Standards for Hazardous Air Pollutants (40 CFR Part 61, 63)	Establishes limits on hazardous emissions to the atmosphere such as benzene and PCE. Sets requirements for public exposure to hazardous airborne emissions.	Applicable	Applicable to remedial activities that may emit pollutants to the air.

Table 13 Action-Specific ARARs (Continued)
CPS/Madison Superfund Site Feasibility for OU1 and OU2

Regulatory Level	ARAR	Description	Status	Comment
Federal	Federal - Resource Conservation and Recovery Act (40 CFR 260-270)	Establishes responsibilities and standards for the management of hazardous and non-hazardous waste	Applicable	Applicable for management of hazardous and non-hazardous waste generated by remedial activities.
Federal	Identification and Listing of Hazardous Waste (40 CFR Part 261)	Defines remediation wastes that may be subject to regulation as hazardous wastes and lists specific chemical and industry-source wastes.	Potentially Applicable	Applicable if any hazardous waste will be generated as part of the remedy.
Federal	Resource Conservation and Recovery Act (40 CFR 264)	Establishes procedures for hazardous waste treatment, storage, and disposal facilities and includes regulations for land disposal units.	Potentially Applicable	Applicable for management of hazardous waste during remediation.
Federal	Federal – Hazardous Materials Transportation (49 CFR 107, 171-180)	Established standards for the transportation of hazardous wastes and/or materials.	Potentially Applicable	Applicable to remedial activities that involve the off-site transportation of hazardous waste.
Federal	Federal - Ambient Water Quality Criteria (40 CFR 131, 401)	Provides criteria developed for the protection of freshwater and marine aquatic life and for the protection of human health from the ingestion of water and/or organisms.	Applicable	Applicable if remedy results in surface water discharge.
Federal	Federal – General Pretreatment Regulations for Existing and New Sources of Pollution (40 CFR 403)	Prohibits discharge of pollutants to a Publicly Operated Treatment Works (POTW) that cause or may cause pass through or interference with operation of a publicly owned treatment works.	Applicable	Applicable if remedy results in discharge of water to the publicly owned treatment works.

Table 14 Location-Specific ARARs for OU1 and OU2
CPS/Madison Superfund Site

Regulatory Level	ARAR	Description	Status	Comment
State	NJ – Freshwater Wetlands Protection Act Rules (N.J.A.C. 7:7A)	Establishes requirements for the protection of freshwater wetlands and regulates activities disturbing freshwater wetlands.	Applicable	Freshwater wetlands have been identified on or adjacent to the Site and substantive requirements are applicable to remedial actions that affect the wetlands. Best management practices will be used during implementation to avoid or minimize impacts on aquatic habitat.
State	NJ Flood Hazard Area Control Act Rules (N.J.A.C. 7:13)	Sets forth requirements governing human disturbance to the land and vegetation in a flood hazard area and riparian zone.	Applicable	A flood hazard area has been identified on or adjacent to the Site. Substantive requirements are applicable to remedial actions that are within the flood hazard area or riparian zone.
State	NJ – Endangered and Non- Games Species Conservation Act (N.J.S.A. 23:2A-1)	Standards for the protection of NJ and Federal threatened and endangered species.	Potentially Applicable.	Although one endangered species (Indiana bat) is potentially occurring in the vicinity of the Site, it has not been identified on site.
State	NJ – Endangered Plant Species Program Rules (N.J.A.C. 7:5C)/Endangered Plant Species List Act (N.J.S.A. 13:1B)	Identifies endangered plant species native to the State and establishes the requirement to protect threatened and endangered plant species.	Potentially Applicable	Although one threatened plant species (Swamp Pink) is potentially occurring in the vicinity of the Site, the plant has not been identified on site.
Federal	Federal - National Environmental Policy Act (40 CFR 6, Appendix A)	Requires federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions.	To be considered	Freshwater wetlands/floodplain have been identified on or adjacent to the Site. .
Federal	Federal – Fish and Wildlife Conservation Act (16 USC 2901 et seq.)	Establishes guidance and policy to promote conservation of non-game fish and wildlife and habit.	Potentially Applicable	Applicable if remedy impacts non-game fish and wildlife and habitat.

APPENDIX I

ADMINISTRATIVE RECORD INDEX

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL
09/12/2019

REGION ID: 02

Site Name: CPS/MADISON INDUSTRIES
CERCLIS ID: NJD002141190
OUID: 01/02
SSID: 0283
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
564980	09/12/2019	ADMINISTRATIVE RECORD INDEX FOR OU1 AND OU2 FOR THE CPS/MADISON INDUSTRIES SITE	2	Administrative Record Index		(US ENVIRONMENTAL PROTECTION AGENCY)
471841	04/13/2015	FINAL BASELINE HUMAN HEALTH RISK ASSESSMENT FOR THE CPS/MADISON INDUSTRIES SITE	2646	Report	(BASF CORPORATION)	(AMEC ENVIRONMENT & INFRASTRUCTURE INCORPORATED)
471842	04/13/2015	TRANSMITTAL OF THE FINAL BASELINE HUMAN HEALTH RISK ASSESSMENT FOR THE CPS/MADISON INDUSTRIES SITE	1	Letter	OSOLIN,JOHN (US ENVIRONMENTAL PROTECTION AGENCY)	(AMEC ENVIRONMENT & INFRASTRUCTURE INCORPORATED)
395860	07/10/2015	REMEDIAL INVESTIGATION REPORT - TEXT, FIGURES, AND TABLES FOR THE CPS/MADISON INDUSTRIES SITE	518	Report	(BASF CORPORATION)|(NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION)|(US ENVIRONMENTAL PROTECTION AGENCY)	(PRINCETON GEOSCIENCE INCORPORATED)
395861	07/10/2015	REMEDIAL INVESTIGATION REPORT - APPENDIX A, B, AND C FOR THE CPS/MADISON INDUSTRIES SITE	249	Report	(BASF CORPORATION)|(NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION)|(US ENVIRONMENTAL PROTECTION AGENCY)	(PRINCETON GEOSCIENCE INCORPORATED)
395862	07/10/2015	REMEDIAL INVESTIGATION REPORT - APPENDIX D FOR THE CPS/MADISON INDUSTRIES SITE	101	Report	(BASF CORPORATION)|(NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION)|(US ENVIRONMENTAL PROTECTION AGENCY)	(PRINCETON GEOSCIENCE INCORPORATED)
395863	07/10/2015	REMEDIAL INVESTIGATION REPORT - APPENDIX E FOR THE CPS/MADISON INDUSTRIES SITE	1173	Report	(BASF CORPORATION)|(NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION)|(US ENVIRONMENTAL PROTECTION AGENCY)	(PRINCETON GEOSCIENCE INCORPORATED)

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL

04/23/2019

REGION ID: 02

Site Name: CPS/MADISON INDUSTRIES
CERCLIS ID: NJD002141190
OUID: 01/02
SSID: 0283
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
395864	07/10/2015	REMEDIAL INVESTIGATION REPORT - APPENDIX F THROUGH K FOR THE CPS/MADISON INDUSTRIES SITE	760	Report	(BASF CORPORATION)|(NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION)|(US ENVIRONMENTAL PROTECTION AGENCY)	(PRINCETON GEOSCIENCE INCORPORATED)
395865	07/10/2015	REMEDIAL INVESTIGATION REPORT - APPENDIX L THROUGH P FOR THE CPS/MADISON INDUSTRIES SITE	1292	Report	(BASF CORPORATION)|(NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION)|(US ENVIRONMENTAL PROTECTION AGENCY)	(PRINCETON GEOSCIENCE INCORPORATED)
565212	08/27/2015	FINAL SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT FOR OU1 AND OU2 FOR THE CPS/MADISON INDUSTRIES SITE	171	Report		
376340	11/02/2015	ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT FOR REMEDIAL INVESTIGATION / FEASIBILITY STUDY FOR THE CPS/MADISON INDUSTRIES SITE	49	Agreement		BZURA,BRUCE (MADISON INDUSTRIES)|MUGDAN,WALTER (US ENVIRONMENTAL PROTECTION AGENCY)
560546	11/01/2018	FINAL FEASIBILITY STUDY FOR OU1 AND OU2 FOR THE CPS/MADISON INDUSTRIES SITE	7510	Report	(BASF CORPORATION)	(FREY ENGINEERING, LLC)
565211	03/26/2019	NJDEP'S APPROVAL OF THE PROPOSED PLAN FOR OU1 AND OU2 FOR THE CPS/MADISON INDUSTRIES SITE	2	Letter	CARPENTER,ANGELA (US ENVIRONMENTAL PROTECTION AGENCY)	PEDERSEN,MARK,J (NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION)
562817	04/18/2019	PROPOSED PLAN FOR OU1/OU2 FOR THE CPS/MADISON INDUSTRIES SITE	24	Publication		(US ENVIRONMENTAL PROTECTION AGENCY)

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL

04/23/2019

REGION ID: 02

Site Name: CPS/MADISON INDUSTRIES
CERCLIS ID: NJD002141190
OUID: 01/02
SSID: 0283
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
411100	09/30/2005	US EPA REGION II ADMINISTRATIVE ORDER ON CONSENT FOR REMEDIAL INVESTIGATION AND FEASIBILITY STUDY - INDEX NO. II-CERCLA-02-2004-2027 FOR THE CPS/MADISON INDUSTRIES SITE	86	Legal Instrument		PAVLOU,GEORGE (US ENVIRONMENTAL PROTECTION AGENCY)
565591	05/01/2017	IEC SOURCE CONTROL REPORT FOR THE CPS/MADISON INDUSTRIES SITE	37	Report	(US ENVIRONMENTAL PROTECTION AGENCY)	(PRINCETON GEOSCIENCE INCORPORATED)

APPENDIX II

STATE LETTER OF CONCURRENCE

State of New Jersey

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Site Remediation and Waste Management Program
Mail Code 401-06
P.O. Box 420
Trenton, New Jersey 08625-0420
Telephone: 609-292-1250

CATHERINE R. McCABE
Commissioner

September 11, 2019

Pat Evangelista, Acting Director
Superfund and Emergency Management Division
U.S. Environmental Protection Agency Region II
290 Broadway
New York, NY 10007-1866

RE: CPS/Madison Superfund Site
Old Bridge Township, Middlesex County, New Jersey
Program Interest Number 008178
Activity Number RPC000001

Dear Mr. Envangelista:

The New Jersey Department of Environmental Protection (Department) has reviewed the Record of Decision, dated September 2019 for the CPS/Madison Superfund Site, Operable Unit (OU) 1 and 2, prepared by the U.S. Environmental Protection Agency (EPA) Region II, which addresses groundwater contamination emanating from both facilities and soil contamination on the CPS property.

The Selected Remedy for Groundwater (OU1) includes:

- Organics, Alternative 3A, In-Situ Chemical Oxidation (ISCO) Permeable Reactive Barrier (PRB) with long-term monitoring, and
- Metals, Alternative 2B, Continued operation of the Madison Interim Remedial Measure (IRM) groundwater extraction and treatment system

The Selected Remedy for Soil for the CPS property (OU2) includes:

- Alternative 5 – In-Situ Chemical Oxidation with limited excavation

The Department concurs with the selected remedy for groundwater for both facilities and the selected remedy for soil for the CPS property. The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, is cost effective, and uses permanent solutions and treatment technologies to the maximum extent practicable. In-situ chemical oxidation of the volatile organic compound contamination satisfies the statutory preference for treatment as a principal element of the remedy. The Department acknowledges that contaminated soils at the Madison property will be addressed in the future under OU3.

DEP appreciates the opportunity to participate in the decision making process to select an appropriate remedy. If you have any questions, please call me at 609-292-1250.

Sincerely,

Mark J. Pedersen, Assistant Commissioner
Site Remediation and Waste Management Program

CC: Lynn Vogel, NJDEP, BCM

APPENDIX III

RESPONSIVENESS SUMMARY

APPENDIX III

RESPONSIVENESS SUMMARY

Operable Units 1 and 2 of the CPS/Madison Site

Old Bridge, New Jersey

INTRODUCTION

This Responsiveness Summary provides a summary of the public's comments and concerns regarding the Proposed Plan for Operable Units 1 and 2 of the CPS/Madison Site ("Site") and EPA's responses to those comments.

All comments summarized in this document have been considered in EPA's final decision for the selection of the cleanup response for the Site. This Responsiveness Summary is divided into the following sections:

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

This section provides the history of the community involvement and interests regarding the Site.

II. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS AND RESPONSES

This section contains summaries of oral and written comments received by EPA at the public meeting and during the public comment period, and EPA's responses to these comments.

The last section of this Responsiveness Summary includes attachments, which document public participation in the remedy selection process for this Site. They are as follows:

Attachment A contains the Proposed Plan that was distributed to the public for review and comments.

Attachment B contains the public notices that appeared in the Home News Tribune.

Attachment C contains the transcripts of the public meeting.

Attachment D contains the public comments received during the public comment period. Note: personal information, such as email addresses, home addresses, and phone numbers contained in the letters and emails were redacted to protect the privacy of the commenters.

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

The subject of this Record of Decision and Responsiveness Summary is the First and Second Operable Units (OU1 and OU2) of the CPS/Madison Site in Old Bridge, New Jersey

On April 24, 2019, EPA released the Proposed Plan for OU1 and OU2 to the public for comment. Supporting documentation comprising the administrative record was made available to the public at the information repositories maintained at the Old Bridge Public Library, 1 Old Bridge Plaza, Old Bridge, New Jersey 08857, the EPA Region 2 Superfund Records Center, 290 Broadway, 18th Floor, New York, New York 10007, and EPA's website for the Site at https://www.epa.gov/superfund/cps-madison.

EPA published notice of the start of the public comment period, which ran from April 24, to May 24, 2019, and the availability of the above-referenced documents in the Home News Tribune on April 24, 2019. A news release announcing the Proposed Plan, which included the public meeting date, time, and location, was issued to media outlets and posted on EPA's Region 2 website on April 24, 2019.

A public meeting was held on May 8, 2019, at the Old Bridge Municipal Court, 1 Old Bridge Plaza, Old Bridge, New Jersey. The purpose of this meeting was to inform local officials and interested citizens about the Superfund process, to present the Proposed Plan for the Site and to respond to questions. At the meeting, EPA reviewed the history of the Site, the results of the investigation of contamination at the Site, and details about the Proposed Plan, before taking questions from meeting attendees. The transcript of this public meeting is included in this Responsiveness Summary as Attachment C.

At the request of the Perth Amboy City Administrator, EPA attended a city council meeting on May 22, 2019, with members of the public in attendance. EPA gave a presentation of the Proposed Plan and answered questions.

II. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS AND RESPONSES

A. SUMMARY OF QUESTIONS AND EPA'S RESPONSES FROM THE PUBLIC MEETING CONCERNING THE CPS/MADISON SITE – A public meeting was held on May 8, 2019, at the Old Bridge Municipal Court, 1 Old Bridge Plaza, Old Bridge, New Jersey. Following a brief presentation of the investigation findings, EPA presented the Proposed Plan and preferred alternatives for the CPS/Madison Site, received comments from interested citizens, and responded to questions regarding the remedial alternatives under consideration. Comments and questions raised by the public following EPA's presentation are categorized by relevant topics and presented as follows:

Comment #1: One commenter asked, how many chemical oxide wells EPA is planning to install.

EPA Response: The distribution and number of wells will depend on the area of influence of each injection well. The intent is to create a barrier of wells with overlapping areas of influence. For cost estimation purposes BASF estimated that 14 wells may be needed.

Comment #2: One commenter asked, what restrictions will be placed on the Site.

EPA Response: There are two types of restrictions that will be placed on the Site. The first type of restriction would be a "well restriction", which would prevent the placement of drinking water wells in the area of groundwater contamination without treatment. This restriction would be removed when the groundwater achieves New Jersey Groundwater standards.

The second type of restriction would be a "use restriction", in this case the property would be restricted to non-residential use because the soil will be remediated to non-residential standards. Furthermore, any new buildings would require testing for vapor intrusion potential due to the organic chemicals in the groundwater.

Comment #3: One commenter asked if EPA will install a barrier to protect the Perth Amboy wells and, if so, how long will it take.

EPA Response: BASF, under NJDEP's direction, has already installed, and is currently testing a treatment barrier upgradient of Perth Amboy Supply Well 6. The system will be expanded to the other affected wells. The initial results indicate that the barrier is effective in reducing 1,4-dioxane to acceptable levels.

Comment #4: One commenter was concerned that ozone could be released and create breathing difficulties for those with breathing issues. The commenter asked if there would be a filter or air monitoring in place to ensure that ozone is not released to the air.

EPA Response: The ozone should react with the contaminants and be completely consumed within the groundwater during the treatment process. Soil vapor above the groundwater will be monitored during the operation of the chemical oxidation barrier. This monitoring will ensure that the reaction is contained within the groundwater and ozone is not released to the air.

Comment #5: Several commenters asked if EPA considered carbon filtration.

EPA Response: Filtration with carbon or a similar material was evaluated as part of Groundwater Organic Alternative 2A, a pump and treat alternative. That alternative is being retained as a contingency remedy in the event that the In-Situ Chemical Oxidation (ISCO) reactive barrier should prove ineffective. A major advantage of the ISCO barrier over the pump and treatment alternative is that the oxidant will react with contaminants adsorbed onto the soils that would otherwise act as a continuing contaminant source to groundwater under the pump and treatment alternative.

Comment #6: One commenter asked how EPA intends to oxidize the soil?

EPA Response: Oxidant will be injected directly into the soils to a depth of 10 to 25 feet while mixing it in place with augers or other mechanical mixing device. Mixing allows the oxidant to make contact with contaminants that might otherwise be isolated in less permeable zones of soil. Testing of the treated soil and groundwater will determine if a second application is required to meet the remediation goals.

Comment #7: A commenter asked what type of oxidants would be used to address the contamination.

EPA Response: The ISCO reactive barrier that addresses groundwater will employ ozone or a combination of ozone and peroxide. The soil remedy will employ a combination of sodium persulfate, hydrogen peroxide and zero valent iron. These oxidants will be adjusted and possibly supplemented with other known oxidants to maximize the effectiveness under site conditions.

Comment #8: One commenter asked if ISCO has been used successfully at other sites with similar contaminants. If so, can we see the sites that were studied.

EPA Response: EPA has drawn on a broad range of experience with ISCO technology on many sites. Appendix F of the CPS/Madison Site Feasibility Study contains five case studies where ISCO technology was successfully applied at sites with similar contaminants. These five sites are not the complete list of sites reviewed, but they represent the range of similar sites.

Comment #9: One commenter asked if ISCO was already being used for the supply well protection.

EPA Response: The well head protection discussed in Comment #3 is an ISCO Reactive Barrier similar to the one proposed in this record of decision, but on a smaller scale.

Comment #10: One commenter asked if there is currently contamination in the water.

EPA Response: Groundwater in the Runyon Watershed contains contaminants above the groundwater standards. Only one contaminant(1,4-dioxane) reaches the supply wells at levels marginally above the standard. However, after mixing and treatment, water supplied to the community achieves acceptable standards.

Comment #11: One commenter stated that people in the area have been thinking the water may have given them cancer or some other disease, and asked if EPA is sure the water is safe.

EPA Response: The water that reaches the tap achieves water quality standards.

Comment #12: One commenter stated that the companies responsible for contamination have stressed the community's ability to supply water, and asked if EPA has considered removing the companies to restore the land to the watershed.

EPA Response: The Superfund program's objective is to address contamination that presents an unacceptable risk to human health and the environment. The remedial alternatives evaluated in the Proposed Plan are premised on the assumption that the use of the properties that make up the Site will remain commercial or industrial.

Comment #13: One commenter asked if EPA considered removing the soil instead of using ISCO.

EPA Response: Excavation was considered as one of the alternatives in the Feasibility Study and Proposed Plan. EPA is selecting ISCO for the following reasons:

- ISCO satisfies the statutory preference for treatment of contaminants, whereas excavation and off-site disposal of soil would require landfilling of waste.
- Excavation and off-site disposal have the potential for greater short-term risks to workers, the community and the environment than ISCO.
- ISCO is more easily implementable than excavation and off-site disposal, which would require sheet-piling, dewatering, and discharge of treated effluent.
- ISCO is less costly than the off-site disposal alternative but should be just as effective. Therefore, ISCO is more cost-effective.

The Evaluation of Soil Alternatives in the ROD contains a more detailed comparison of these factors and others, consistent with the NCP criteria.

Comment #14: Several commenters asked if EPA could require the companies to drill a new supply well if the remedy should fail.

EPA Response: The selected remedy does not contemplate installation of a new public water supply well if the remedy fails. The ROD provides a contingency remedy that will be implemented if the groundwater remedy for organic contamination is not effective. The contingency remedy would consist of an upgraded version of the CPS IRM pump and treatment system, which is currently in place and has been proven to be effective in addressing organic groundwater contamination.

B. WRITTEN COMMENTS AND EPA'S RESPONSES RECEIVED DURING THE PUBLIC COMMENT PERIOD FROM THE COMMUNITY - The public comment period is the time during which EPA accepts comments from the public on proposed actions and decisions. The public comment period ran from April 24, 2019, to May 24, 2019. EPA's responses to the written comments are provided below.

Comment #15: One commenter was concerned with byproduct formation particularly bromate when using ISCO chemicals. The commenter asked what filter systems will be used to capture byproducts and what other methods will be used to limit byproduct formation.

EPA Response: EPA will evaluate the possibility of byproduct formation (e.g. the formation of bromate and hexavalent chromium ions from naturally occurring bromide and chromium in contact with remedial oxidants) during the Remedial Design Investigation (RDI) phase of the project. A RDI pilot scale testing of ISCO chemicals will be conducted before the design phase. The ISCO pilot test will include a comprehensive groundwater monitoring program using wells that are hydraulically downgradient of the ISCO treatment test zones. The groundwater monitoring program will indicate the type and magnitude of possible byproduct formation and the attenuation/reduction of any byproduct formation downgradient of the groundwater reactive zones. This information will be used in the design of a full-scale treatment program that will include minimizing the production of any potential byproducts, as needed, and the creation of a groundwater monitoring program that will ensure that drinking water quality standards are met at the nearby municipal water supply well field throughout the remedial program. Because oxidant dosing, oxidant contact time, and pH changes are the primary drivers for chemical reactions, measures to control byproduct formation will be evaluated. Evaluation will include optimizing the amount of oxidant added to sufficiently destroy organic contaminants of concern while limiting byproduct formation, and suppressing byproduct formation using other applicable oxidants such as hydrogen peroxide in tandem with ozone, which commonly suppresses the formation of bromate and hexavalent chromium.

Comment #16: One commenter asked what Site chemicals will be removed by the oxidation method.

EPA Response: Oxidation breaks down organic chemicals (such as 1,4-dioxane, benzene, and chlorobenzene) into simpler molecules. Driven to completion, the end product will be carbon dioxide, water, sulfate and chloride ions. A complete list of Site-related organic chemicals can be found in Tables 7 and 8.

Comment #17: One commenter asked what residuals will be produced using ozone and or peroxide.

EPA Response: See response to comment 16.

Comment #18: One commenter asked what Fenton's Reagent is, and what residuals will be produced using Fenton's Reagent and/or persulfate.

EPA Response: Fenton's Reagent is a solution of hydrogen peroxide (H_2O_2) with iron (ferrous iron – Fe($^{2+}$)) as a catalyst that produces a strong oxidant radical that oxidizes and destroys organic contaminants found at the Site. Common byproducts of Fenton's Reagent and persulfate treatment include oxygen, carbon dioxide, and sulfate and chloride ions. Certain organic compounds that are known as ketones, such as acetone and 1,2-butanone, also are commonly formed during the ISCO treatment process, but these reaction byproducts are generally less toxic and more biodegradable (degraded by natural bacteria in the aquifer) than the organic contaminants that are being targeted for treatment. Less common are toxic disinfection byproducts such as trihalomethanes (via oxidation of organic compounds), bromate (via oxidation of naturally occurring bromide ions), and hexavalent chromium (via oxidation of naturally occurring chromium). Typically, the byproducts generated in the treatment zone will naturally attenuate (i.e., reduce to innocuous compounds through pH, mineralization and biological interactions) and thus quickly reduce in concentration as groundwater flows away from the treatment zone. Laboratory and pilot scale testing will be employed to evaluate the field application's effectiveness of a candidate oxidant and byproduct formation. The information obtained from the pilot scale testing will be used to design full scale treatment to optimize the amount of oxidant added to effectively treat the organic contaminants, control byproduct formation, and monitor groundwater flowing from the treatment zone to ensure that there will be no impacts to potential receptors.

Comment #19: One commenter asked which alternatives will use Fenton's Reagent.

EPA Response: Fenton's Reagent is one of the potential oxidants evaluated for Soil Alternative 5.

Comment #20: One commenter was concerned that Groundwater Alternative 3A would require nanotechnology which some researchers consider risky due to the unknown effects of nanoparticles on human health and the environment.

EPA Response: None of the technologies considered in the alternatives employ nanoparticles. Groundwater Alternative 3A does discuss the use of microbubbles of ozone. These bubbles are not nanoparticles. The bubbles will readily dissolve in the water leaving no residual particles.

Comment #21: One commenter asked what other types of advanced treatment were considered, such as UV/Oxidation.

EPA Response: The advanced water treatment technology UV/Oxidation was considered to support the pump and treat alternative.

Comment #22: Several Commenters expressed a preference for Soil Alternative 4, Excavation and Off-site Disposal. Others were concerned about using ISCO in inaccessible areas.

EPA Response: See response to comment #13. Soil Alternatives 3, 4, and 5 would use ISCO, without mixing, only for contaminated soils that were inaccessible, and that would otherwise be left untreated.

Comment #23: One commenter also asked for details regarding Soil Alternative 4 (above) such as volumes of ozone and hydrogen peroxide, frequency of injection, reaction time, working hours, and injection technology.

EPA Response: These specific details will be addressed in the remedial design phase.

Comment #24: A commenter asked about measures that will be put in place to address vapor releases at the Site and protection of on-site workers.

EPA Response: Vapor emissions will be monitored in real-time using dedicated air monitoring equipment (e.g., photoionization detectors) at the work areas and at the Site perimeter to ensure protection of human health and the environment. Air monitoring will be performed in accordance with a Site Health and Safety Plan (HASP) and a Perimeter Air Monitoring Plan. If emissions exceed a safety threshold, then work will stop and emission control measures will be applied (e.g., the application of environmentally safe chemical foam). In addition, on-site workers will wear appropriate personal protective equipment (PPE) in accordance with the Site HASP to protect the on-site workers and minimize exposure to hazards during remediation activities.

Comment #25: One commenter asked the following questions regarding Groundwater – Organic Alternative 2A:

- How long would the treatability study take?
- What would be included in the treatment process train?
- Will it include a filtration system to capture product formation?
- If a filtration system is used will it be bio-filtration?

EPA Response: Organic Alternative 2A is the contingency remedy, identified by EPA in the event that Organic Alternative 3A does not prove effective under Site conditions. Should it be necessary to move to the contingency remedy, the treatability study would take approximately two months. Pump and treat is a common remedy, and treatment components are often prescribed based on the chemical make-up of the groundwater. The exact treatment train would be determined in design. Since a pump and treatment system is already in place as part of the CPS IRM, the design phase would be based on many of the components that are currently being used at the Site. It is likely that filtration would be a component since it is currently the most common pump and treatment component used to address 1,4-dioxane.

Comment #26: One commenter expressed concern that residents were kept in the dark regarding issues concerning their drinking water. The commenter considered the mixing of water to meet the standards as “unconscionable, careless, and callous” and requested that EPA choose low-risk alternatives with proven track records.

EPA Response: The City of Perth Amboy Water Department informs residents about issues regarding their drinking water. EPA understands that the Water Department has provided notice of the exceedance of standards to residents, including the recent notice regarding the trihalomenthane exceedance. The notice reported that the exceedance was detected through routine monitoring, and the exceedance is not an emergency. Trihalomenthane is a byproduct of chlorination of drinking water to remove bacteria. Without chlorination, drinking water could pose serious health threats.

NJDEP took action to address the 1,4-dioxane issue once data indicated that the groundwater quality standards were of concern. NJDEP has promulgated a new, lower groundwater quality standard for 1,4-dioxane and has evaluated New Jersey’s drinking water supply to address the issue. In the drinking water supplied by the Perth Amboy water purveyor, the concentrations at the tap are meeting groundwater quality standards, and steps have been taken to ensure standards continue to be met.

Comment #27: One commenter noted that Tables 1 and 2 in the Proposed Plan summarize health hazards and risks associated with the identified contaminants for present and future trespassers, on-site construction workers and future residents by exposure to the groundwater. The commenter stated that the plan does not address exposure and risk to people exposed to groundwater offsite, including by consuming the groundwater extracted from the Perth Amboy wellfield and asked if it could be assumed that the health risks from the contaminated public water supply wells – both now and in the future - would be similar to the serious risk shown in the tables.

Response: The risks shown in the tables are associated with exposure to the highest contaminant levels on the Site, assuming no treatment has occurred. However, there are some protections currently in place, in the form of the IRM pump and treatment systems. Exposures to the contaminant levels identified in the tables would not occur unless the protections in place were removed.

Comment #28: One commenter stated that any comprehensive remediation plan for these sites is incomplete without consideration of surface water and sediment. The commenter stated that Prickett's Brook runs through both sites, and then empties into Prickett's Pond in the Perth Amboy Runyon Watershed, where it recharges the groundwater. Since it runs through the worst contamination source areas, it is likely the recipient of runoff from the contaminated soil on the CPS and Madison properties. The commenter stated that there is a need to fully assess the results of historical flow of contaminants in surface water and noted that the brook provides a path for surface water to bypass the groundwater and soil monitoring sampling that is ongoing and proposed.

EPA Response: Testing has indicated that the surface water and sediment in Pricket's Brook does not contain organic contamination. EPA expects to address all the contamination issues associated with the Site and, as with other complex Superfund sites, a phased approach is warranted to address threats posed by the Site.

EPA will be investigating metal contamination of sediment as a potential concern as part of a future investigation and remedy selection process. Metal contamination in the public water supply, if any, would be addressed by Utility Service Affiliates (Perth Amboy), Inc., the company that Perth Amboy contracts with to operate Perth Amboy's water treatment and distribution system. While some of the metals that require treatment occur naturally, future remedy selection will address contamination contributed by the Site.

Comment #29: One commenter stated that the groundwater remedial alternative of an ISCO Permeable Reactive Barrier appears reasonable and effective, as long as strict monitoring is kept in place and, because Organic Alternative 3A still needs to be proven in the on-site conditions (as noted in the Proposed Plan), there needs to be an upgraded CPS IRM pump and treatment system ready to go as back up.

EPA Response: Under Groundwater Alternative 3A, the existing CPS IRM pump and treatment system will remain in place until the ISCO is running and EPA is satisfied that it has proven to be effective. The contingency remedy (Organic Alternative 2A, the upgraded IRM pump and treatment system) will only be put in place in the unlikely event that ISCO is ineffective. If that occurred, the pump and treat system would be modified as needed, and the hydrology of the aquifer is already well defined. Should it become necessary, EPA expects that the time it would take to upgrade the pump and treatment system should be relatively short.

Comment #30: One commenter stated, the alternative for the on-site soil remediation at the CPS property, In-Situ Chemical Oxidation thru soil mixing (Alternative 5), is unacceptable when the Perth Amboy wellfield is at risk. The commenter is concerned that complete mixing would be difficult, and failure to mix thoroughly would be difficult to detect in a timely manner. The commenter prefers Alternative 4 because it would remove the soil from the Site.

EPA Response: The groundwater remedy will prevent the contaminants from impacting the Perth Amboy wells. The purpose of the soil remedy is to eliminate direct contact hazards on-site, and to remove the source to groundwater contamination, so the groundwater remedy can attain the remediation goals and, ultimately, no longer be required. Monitoring groundwater that enters the groundwater treatment area would be an effective way of testing to determine if the soil remedy is functioning as designed. Extensive testing will be conducted to ensure the soil source is no longer present at levels that may contaminate the groundwater or pose an unacceptable risk through direct contact before the groundwater remedy is completed. In the event the source is not completely removed, the groundwater remedy technology will continue to operate until the soil remedy is effectively completed.

It is difficult to determine the extent of the source, especially when much of the source material is within the groundwater table. ISCO has the potential to address undetected or difficult to reach areas of contamination. While excavation sounds more effective and permanent, for the CPS property EPA has concluded that ISCO is equally effective and protective.

Comment #31: A commenter stated that EPA's concern with trucking contaminated soil through the community could be addressed by using the rail sidings present on both properties. The commenter added that there would also be cost savings associated with rail transport.

EPA Response: While EPA agrees that rail transport would reduce some of the short-term exposure risk and could cost less than trucking, these differences are not significant. There would still be off-site handling exposures using rail transportation, and while some transportation cost savings could be achieved, the majority of the cost is associated with on-site handling and off-site disposal costs.

EPA is sensitive to the needs of the community and has provided an opportunity for the public to comment on the Proposed Plan. Input from the community was given consideration in the evaluation of the nine criteria for remedy selection and additional community outreach and engagement will continue through the remedial design and remedial action phases of the CPS/Madison Site.

ATTACHMENT A

PROPOSED PLAN

Superfund Proposed Plan

U.S. Environmental Protection Agency, Region II

CPS/Madison Superfund Site
Old Bridge, New Jersey

April 2019

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan identifies the Preferred Alternative to address contaminated groundwater and soil at the CPS/Madison Superfund Site (Site). The Site is located in Old Bridge Township, New Jersey (Figure 1). The contamination is associated with the former CPS Chemical (CPS) facility, and adjacent Madison Industries (Madison) facility which is still in operation.

BASF Corporation (current owner of the CPS property) has completed a remedial investigation/feasibility study (RI/FS) for soils and groundwater at the Site (not including soils on the Madison property) under EPA oversight. Madison is conducting an RI for soils on its property. Groundwater and surface water were sampled on the CPS facility, the downgradient Madison facility, and in the Perth Amboy wellfield. The RI identifies areas of groundwater and soil contamination where remedial action is required.

The Preferred Alternative for groundwater at the Site is: 1) a permeable reactive barrier using chemical oxidation to treat organic constituents; and 2) continuation of an existing Interim Remedial Measure (IRM) for metals, which includes groundwater extraction and treatment. The Preferred Alternative for contaminated soil on the CPS property is in-situ chemical oxidation (ISCO) with soil mixing. In areas where soil mixing is impractical, in-situ chemical oxidation alone will be used to destroy organic contaminants in place. Soils on the Madison property will be addressed in a subsequent proposed plan.

This Proposed Plan contains descriptions and evaluations of the cleanup alternatives considered for the Site and EPA's preferred alternative. This Proposed

MARK YOUR CALENDARS

PUBLIC COMMENT PERIOD
April 24, 2019 to May 24, 2019
EPA will accept written comments on the Proposed Plan during the public comment period.

PUBLIC MEETING
May 8, 2019 at 7:00 pm
EPA will hold a public meeting to explain the Proposed Plan and alternatives presented in the Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at the Old Bridge Municipal Court, 1 Old Bridge Plaza, Old Bridge, New Jersey 08857

For more information, see the Administrative Record at the following locations:

EPA Records Center, Region 2
290 Broadway, 18th Floor
New York, New York 10007-1866
(212) 637-4308
Hours: Monday-Friday – 9 A.M. to 5 P.M. by appointment

Old Bridge Public Library
1 Old Bridge Plaza
Old Bridge, New Jersey 08857
oldbridgelibrary.org

Send comments on the Proposed Plan to:

John Osolin, Remedial Project Manger
U.S. EPA, Region 2
290 Broadway, 19th Floor
New York, NY 10007-1866
Telephone: 212-637- 4412
Email: Osolin.john@epa.gov

EPA's website for the CPS/Madison Site is:
https://www.epa.gov/superfund/cps-madison

Plan was developed by EPA, the lead agency, in consultation with the New Jersey Department of Environmental Protection (NJDEP), the support agency. EPA, in consultation with NJDEP, will select a final remedy for contaminated groundwater and soil after reviewing and considering all information submitted during the 30-day public comment period.

EPA, in consultation with NJDEP, may modify the Preferred Alternative or select another response action presented in this Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on the alternatives presented in this Proposed Plan.

EPA is issuing this Proposed Plan as part of its community relations program under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or Superfund), 42 U.S.C. 9617(a), and Section 300.435(c)(2) (ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This Proposed Plan summarizes information that can be found in greater detail in the Site RI and FS reports as well as other related documents contained in the Administrative Record. The location of the Administrative Record is provided on the previous page. EPA and NJDEP encourage the public to review these documents to gain a more comprehensive understanding of the site-related Superfund activities performed by the responsible parties, under EPA and NJDEP oversight.

SITE DESCRIPTION

The two facilities which make up the Site are adjacent properties located along Water Works Road in Old Bridge Township, Middlesex County, New Jersey. The Site acts as a source area for groundwater contamination that flows southwest, into the Runyon Watershed. (See Figure 1)

CPS Chemical Facility: The CPS property is approximately 30 acres, located at 570 Water Works Road. The CPS facility is located within the western portion of the property and is approximately 6.7 acres. From 1967 until it ceased operations in 2001, the CPS facility processed organic chemicals used in the production of water treatment agents, lubricants, oil field chemicals, anti-corrosive agents and engaged in solvent recovery. While the main office and a storage building remain on site, the process equipment and storage tanks that were located at the south end of the facility were demolished and removed from the Site in 2005. This portion of the Site is now inactive.

Madison Industries Facility: The Madison property is 15 acres located at 554 Water Works Road. The Madison property is bordered to the east by the CPS property and to the west by the Perth Amboy wellfield. The Madison facility (formerly known as "Food Additives") has operated in the northern half of this property since 1967, producing inorganic chemicals used in fertilizer, pharmaceuticals and food additives. On the southern portion of the property, Madison's sister company, Old Bridge Chemical, operates a plant that produces mostly zinc salts and copper sulfate.

Runyon Watershed: The Runyon Watershed is mostly undeveloped land which borders the Madison property to the southwest. The watershed contains the Perth Amboy wellfield which lies approximately 3,000 feet southwest (downgradient) of the CPS and Madison facilities. The wellfield supplies over 5,000 gallons per minute (gpm) to the City of Perth Amboy. The extracted water is treated to remove solids and metals using an on-site clarification and filtration system. Contaminants have entered the watershed via groundwater and to a lesser extent by surface water.

SITE HISTORY

In the early 1970s, releases of organic compounds and metals from the CPS and Madison properties resulted in the closing of 32 wells in the Perth Amboy wellfield. In 1979, a state court ordered the companies to perform a remedial investigation under the supervision of NJDEP. The investigation led to a 1981 court order for the companies to implement a remediation program to address groundwater contamination emanating from each of the properties. On September 1, 1983, the Site was placed on the National Priorities List (NPL) with New Jersey as the lead agency. In 1991 and 1992 an off-site groundwater collection system consisting of six recovery wells (three wells operated by each company) was installed to protect the Perth Amboy wellfield. Between 1993 and 2000 the groundwater surrounding these recovery wells achieved the clean-up goals in place at that time; the recovery wells were shut down and replaced by wells on each of the company's properties which are collectively known as the Interim Remedial Measure (IRM) wells.

In 1998, NJDEP established a Classification Exception Area (CEA) and a Well Restriction Area (WRA) encompassing the area of the volatile organic plume, covering approximately 32 acres, to a depth of 80 feet. In 1999, NJDEP established CEAs and WRAs encompassing the areas of two metals plumes, which are approximately 20.7 acres, and 3.3 acres, to a depth of 80 feet (Figure 2).

In 2001, the CPS Chemical plant closed. In 2003, Madison Industries went into bankruptcy, and NJDEP requested that EPA take the lead role in overseeing the Superfund cleanup. In 2005, EPA entered into an administrative order with Ciba Specialty Chemicals (Ciba), which had recently purchased the CPS property. The order required Ciba to perform a remedial investigation and feasibility study (RI/FS) to determine the extent of contamination in groundwater and soil, determine if an action was needed to address the contamination, and identify potential alternatives to address the contamination. The RI/FS was completed in August of 2018 and is the basis for this proposed plan. Madison entered into an Order with EPA in 2015 and is currently working on an RI/FS to address soil contamination on its property and sediment contaminated with metals in the watershed.

SITE CHARACTERISTICS

The Site is relatively flat ranging from 20 to 25 feet above mean sea level (AMSL). Most of the Site lies within a 100-year flood hazard area, except for a small area in the northeast corner of the CPS Property that is 28 feet AMSL. The facilities are mostly surfaced with asphalt or concrete, except for the three-acre area of the former tank farm that was demolished by Ciba in 2005. The Magothy Formation, which underlies the Site, is used as a drinking water aquifer. Two of the geologic units of the Magothy lie directly under the Site, the Old Bridge sand, and the Perth Amboy fire clay. The Old Bridge sand is between 60 and 70 feet thick beneath the Site and readily conducts water. The fire clay is discontinuous under the Site but acts as a confining unit in some areas. Below the Magothy is the Raritan Formation which is also a drinking water aquifer. Groundwater under the Site generally flows southwest towards the Perth Amboy supply wells which are approximately half a mile downgradient.

Prickett's Brook, an intermittent stream on the Site, flows west along the southern border of the CPS property (See Figure 1). The brook turns north along the border between the CPS and Madison properties until it turns west again and bisects the Madison property. From Madison it enters the Runyon Watershed and travels southwest through Prickett's Pond and eventually reaches Tennent Pond. The ponds both act as recharge basins for the Perth Amboy wellfield. Prickett's Brook and the downgradient ponds are not currently used for recreational purposes.

SUMMARY OF SITE INVESTIGATIONS

Performance Monitoring Program

Beginning in 1991, under the direction of NJDEP, CPS and Madison installed the IRM wells downgradient of the CPS property, to intercept Site groundwater contamination entering the Runyon Watershed. A Performance Monitoring Program (PMP) was initiated to evaluate the effectiveness of the IRM pump and treatment systems. The PMP continues to monitor the IRM wells which have been reconfigured several times to adjust to reduced contaminant levels in the plumes. The IRM system for CPS has been operating on the CPS property since 1996, and was upgraded in 2015.

The Remedial Investigation

In October 1992, NJDEP executed separate Administrative Consent Orders (ACOs) with CPS and Madison to perform an RI/FS to address each company's contribution to Site contamination. CPS conducted its RI/FS in three phases, documented in three reports submitted in 1993, 1994, and 1996.

In 2003, NJDEP requested that EPA take the lead for the Site. Ciba submitted an RI/FS Summary Report in 2005 pursuant to an Administrative Order on Consent (AOC) with EPA. Madison was unable to sign an AOC with EPA at that time.

Ciba initiated a Supplemental Remedial Investigation (SRI) in 2008, to address data gaps in the previous RI and provide more current data on the status of Site contamination. When BASF acquired the CPS Property from Ciba in 2009, it took over responsibility for the SRI.

The main focus of the SRI was site-wide groundwater and soil on the CPS property. The SRI also investigated surface-water contamination, which will be addressed by Madison in a future proposed plan. The final SRI Report was submitted in 2015.

Groundwater

Groundwater contamination at the Site originates from source areas on both the CPS and Madison properties.

Volatile organic compounds (VOCs) predominantly originate from soils in the former process area on the southern half of the CPS property. These compounds include: 1,2,4-trichlorobenzene; chlorobenzene; benzene; methylene chloride; 1,1,2,2-tetrachloroethane; 1,4-dichlorobenzene; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene; cis-1,2-dichloroethene; and vinyl chloride. A full list of organic compounds in groundwater can be found in Table 3.

A second source area on the CPS property is soils at the former truck and rail car loading area, which was used to repackage 1,4-dioxane for redistribution. That area is located near the south-west corner of the storage building along the border between the CPS and Madison properties and appears to be the primary source of 1,4-dioxane in groundwater.

The VOC groundwater plume extends from the water table to approximately 40 feet below ground surface (bgs) beneath the CPS and Madison facilities (Figure 2). The plume dips downward as it travels south west toward the Perth Amboy wells where it can be found between 60 and 80 feet bgs, which is the depth at which the supply wells are screened.

The IRM system that was initiated in 1991 under a State order has greatly reduced the size and concentration of the organic plume that reaches the Perth Amboy wellfield. Most of the organic contaminants that are found southwest of CPS/Madison properties are near or below both the New Jersey Groundwater Quality Standards (NJGWQS), and Federal and State Maximum Contaminant Levels (MCLs), and attenuate prior to reaching the Perth Amboy wells. Currently the only VOC reaching any of the Perth Amboy wells above the NJGWQS is 1,4-dioxane. Prior to November 2015, the 1,4-dioxane standard was 10 parts per billion (ppb) and there were no exceedances of this level at the Perth Amboy wells. In November 2015, the NJGWQS for 1,4-dioxane was changed to 0.4 ppb, resulting in an exceedance of the new standard at three Perth Amboy wells. However, due to well-head treatment and mixing with non-impacted wells, the finished water supplied to Perth Amboy continues to meet all drinking water standards including the standard for 1,4-dioxane. In April 2016, NJDEP designated the 1,4-dioxane contamination in the Runyon Watershed an Immediate Environmental Concern (IEC). Designation as an IEC requires BASF to evaluate and mitigate this condition. BASF has evaluated the extent of the 1,4-dioxane contamination and intends to place a reactive barrier near the impacted supply wells that will destroy the 1,4 dioxane prior to reaching the Perth Amboy wells. While this action is being performed under NJDEP direction separately from the remedies being chosen in this document, it is an integral part of the overall protectiveness of the Site’s remedial program. NJDEP and EPA will monitor the progress of this action to ensure that this contamination is mitigated. If BASF’s reactive barrier proves ineffective at meeting NJGWQS and MCLs, EPA may consider other response actions under CERCLA. The CEA/WRA was expanded in 2017 to include the 1,4-dioxane contamination area, and now encompasses 103 acres.

Inorganic Contamination (metals) predominantly originates from the Madison facility with the larger contribution from the northern half of the property. A metals plume, consisting of zinc, cadmium, copper, and lead above the NJGWQS extends approximately 600 feet into the Runyon Watershed. A less concentrated plume containing zinc, cadmium and lead originates from the area of the sludge treatment piles associated with the Perth Amboy water treatment plant. The zinc distribution is the most widespread. Both zinc plumes are approximately 1,400 feet long, and +800 feet apart. The metals concentrations in the Madison plume are currently stable or decreasing. The plume stability is due in part to the ongoing pumping of the recovery wells that make up the Madison IRM. A list of inorganic compounds in groundwater can be found in Table 3.

CPS On-site Soils

The CPS Facility contains contaminated soils that act as a contaminant source to groundwater and pose potential contact hazards. The SRI Report divided the CPS property into three areas based on general use (Figure 3). Area 1, The Former Tank Farm, contained chemical tanks (where the main chemical processing took place), as well as fuel oil storage tanks, and hazardous waste storage. Area 1 also includes the former truck and railroad car loading areas. Area 2, The Former Plant

Operations Area, is associated with support activities, including office and laboratory buildings, storage facilities, and parking lots. Area 3, the Side Lot Area, makes up the eastern two thirds of the property, and is largely undeveloped. RI sampling confirmed that Area 3 was not significantly impacted by the CPS facility operations, and therefore this area will not be included in further Site discussions. Contaminant releases did occur in Area 1 and in the adjacent southwest corner of Area 2. A list of contaminants found in soil can be found in Table 4.

Volatile organic compounds (VOCs) The SRI Report identified multiple VOCs in soils that exceeded the NJDEP Residential and Non-Residential Direct Contact Soil Remediation Standards (RDCSRS and NRDCSRS), at several locations within Areas 1 and 2. The VOCs identified in the RI include: 1,1,2,2-tetrachloroethane; 1,2,4-trichlorobenzene; 1,2-dichloroethane; 1,2-dichloropropane; 1,4-dichlorobenzene; 1,2-dichlorobenzene; benzene; methylene chloride; tetrachloroethene; trichloroethene and vinyl chloride. Table 4 includes the NJ Soil Remediation Standards (SRS) for these VOCs. VOCs with concentrations exceeding the SRS were found in Areas 1 and 2 at depths up to 26 feet. Elevated VOC concentrations have also been detected at some locations within the silts and clays at the Site, however, these low-permeability units have limited the vertical migration of the contaminant mass. Residual non-aqueous phase liquid (NAPL) has also been observed in a few shallow soil borings (< 25 feet) installed within the source areas.

Semi-Volatile Organic Compounds (SVOCs) Semi-Volatile Organic Compounds were detected in surface soil (0-2 ft.) samples at concentrations exceeding RDCSRS and NRDCSRS, at two locations within Area 2. The SVOCs are polynuclear aromatic hydrocarbon (PAH) compounds, and include: benzo(a)anthracene; indeno(1,2,3-CD)pyrene; benzo(a)pyrene; benzo(g)fluoranthene; and dibenzo(a,h)anthracene. The samples were collected from low-lying portions of the CPS facility that receive storm water runoff from the asphalt parking lot/covered areas. PAH detections are likely attributable to parking lot runoff related to either motor vehicles or components of asphalt, as there are no known or suspected operation-related sources of PAHs in this area.

Inorganic Contamination (metals) Surface soil sampling did not identify any areas on the CPS facility with metal concentrations exceeding the direct contact SRS. Arsenic was detected in subsurface soils above the NRDCSRS at one location and exceeded the NRDCSRS by a factor of less than two. Arsenic at the Site can be attributed to the natural background conditions, as there are no known or suspected sources of arsenic associated with past operations at the CPS facility. Glauconitic sediment, associated with elevated metals concentrations reflecting natural background, is also present in the areas where the arsenic exceeded the direct-contact SRS. The SRI Report also indicates that several metals were detected at concentrations slightly above default NJ Impact to Groundwater Screening Levels (IGWSLs) at four surface soil sample locations. The metals with concentrations exceeding the IGWSLs include cadmium, lead, and zinc (Madison Site contaminants), as well as beryllium, manganese, mercury, nickel, and silver. Of these metals, only beryllium and manganese, which are not site-related, have been detected in groundwater at the Site at concentrations above NJGWQS or MCLS. The IGWSLs are generic screening levels that are used to determine whether site-specific SRS for unsaturated soils need to be developed to protect groundwater. The IGWSLs are not soil remediation goals.

Supplemental source characterization sampling was conducted in April 2017. Sampling was conducted to investigate the presence of residual 1,4-dioxane in shallow unsaturated soils, posing a risk to groundwater. Figure 3 shows an area of contamination straddling the north-west border of Area 1. The unsaturated soil in this area contained the highest concentrations of 1,4-dioxane found on the Site, and generally corresponds with the area of highest 1,4-dioxane concentrations (> 100 µg/L to 650 µg/L) in shallow groundwater (< 10 feet).

SCOPE AND ROLE OF OPERABLE UNIT

Due to the complexity of working with two facilities and varying land uses, EPA is addressing the cleanup of the Site in several phases called operable units. Operable Unit 1 (OU1) addresses groundwater contamination emanating from both facilities and impacting the Perth Amboy wellfield. Operable Unit 2 (OU2) addresses contaminated soil on the CPS property that is a direct contact hazard and acts as a contaminant source to groundwater. Operable Unit 3 (OU3) addresses surface water and contaminated soil on the Madison property that is a direct contact hazard and acts as a contaminant source to groundwater.

This Proposed Plan addresses OU1 and OU2. OU3 contamination will be evaluated separately and will be addressed in a future Proposed Plan.

PRINCIPAL THREAT WASTE

Principal threat waste is defined in the box above. The soil contamination that acts as a source to groundwater is considered a Principle Threat Waste due to its high mobility and potential impact to the Perth Amboy supply wells.

> **WHAT IS A "PRINCIPAL THREAT"?**
>
> The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to ground water, surface water or air, or acts as a source for direct exposure. Contaminated ground water generally is not considered to be a source material; however, Non-Aqueous Phase Liquids (NAPLs) in ground water may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

SUMMARY OF SITE RISKS

As part of the RI/FS, baseline risk assessments are conducted to estimate current and future risks posed to human and ecological receptors from exposure to hazardous substances at a site in the absence of any actions (engineering or institutional) to control or mitigate exposures to these hazardous substances. A four-step human health risk assessment process was used for assessing site-related cancer risks and noncancer health hazards. The four-steps are: Hazard Identification of Chemicals of Potential Concern (COPCs); Exposure Assessment; Toxicity Assessment; and Risk Characterization (see box on page 7 entitled "What is Risk and How is it Calculated" for more details on the Superfund risk assessment process).

Consistent with the NCP, the results of the baseline risk assessment are used to determine whether remedial action is necessary at a site in addition to helping identify the exposure pathways that drive the need for a remedial action.

Human Health Risk Assessment

The baseline human health risk assessment (HHRA) for the Site quantified risks and hazards to human health associated with exposure to media present in OU1 and OU2. As mentioned earlier, OU1 addresses contaminated groundwater beneath the Site, while OU2 addresses soils at the CPS Facility. For purposes of evaluating risks/hazards from exposure to soils in the baseline HHRA, OU2 was further subdivided into 3 subareas representing geographically different portions of the CPS facility. The subareas, referred to as Areas 1 through 3, encompass soils at: 1- the former tank farm area (Area 1); 2- the former plant area (Area 2); and 3- the side lot (Area 3). Because the Madison portion of the Site (OU3) remedial investigation has not been completed, it was not considered in the baseline HHRA for the CPS Facility.

Current use of the CPS property consists of operation and maintenance of the groundwater extraction and treatment system. There are currently no full-time employees on the property. The CPS property, as well as most of the surrounding area, is zoned SD3, Specialized Development for industrial land use as part of the Township's long-term development plan. Based on the current zoning and past industrial use of the Site, it is expected that future use would remain unchanged. However, for overall completeness and because the property owner expressed interest in redevelopment or reuse of the Site, a hypothetical future resident (child and adult) was evaluated in the HHRA. In addition, the potential for vapor intrusion from subsurface sources into indoor air was also evaluated.

Excess lifetime cancer risk and noncancer health hazard were estimated based on current and future reasonable maximum exposure scenarios. These numeric risk estimates were developed by considering various health-protective estimates about the concentrations, frequency and duration of an individual's exposure to chemicals selected as contaminants of potential concern (COPCs), as well as the toxicity of these contaminants. COPCs were selected by comparing the maximum detected concentration of each analyte to appropriate medium-specific risk-based screening values. This screening process was conducted separately for soil at each exposure area.

WHAT IS RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the contaminants of concern (COCs) at the site in various media (*i.e.*, soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a “reasonable maximum exposure” scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other noncancer health hazards, such as changes in the normal functions of organs within the body (*e.g.*, changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and noncancer health hazards.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for noncancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a “one in ten thousand excess cancer risk;” or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6}, corresponding to a one in ten thousand to a one in a million excess cancer risk.

For noncancer health effects, a “hazard index” (HI) is calculated. The key concept for a noncancer HI is that a “threshold” (measured as an HI of less than or equal to 1) exists below which noncancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a noncancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the site.

The exposure media quantitatively evaluated in the baseline HHRA included surface soils, subsurface soils, groundwater within the VOC plume, on-site shallow groundwater, and indoor air (the vapor intrusion pathway). The risk assessment considered the following potential human receptors for the current timeframe: adolescent (12-18 year-old) and adult trespassers. For the future timeframe, potential human receptors included: the trespasser (adolescent and adult), indoor and outdoor workers, construction and utility workers, and on-site residents (child and adult).

Sediment and surface water associated with the nearby Pricket’s Brook and Pond watershed was not evaluated in the 2015 Baseline Human Health Risk Assessment Report, however this media will be considered in the future risk assessment addressing the Madison-related contamination.

The HHRA quantified two types of health effects: excess lifetime cancer risk and noncancer hazard. Cumulative cancer risk estimates for each receptor were compared to EPA’s target risk range of 10^{-6} (one-in-one million) to 10^{-4} (one-in-ten thousand). The noncancer hazard index (HI) was compared to EPA’s target threshold value of 1. Quantitative results and conclusions of the HHRA are discussed below.

Summary of Conclusions- Human Health Risk Assessment

Summary of the total cancer risk and noncancer hazard estimates for each receptor population evaluated in the HHRA are provided in Table 1, below. These numeric estimates are reflective of the sum of all risk stemming from exposure to site-wide groundwater and the soils at the CPS Site. Subsequent subsections of this document further discuss the risks by media (e.g., surface soil, subsurface soil, groundwater, etc.) and identify the media-specific chemicals of concern (COCs), or those chemicals identified in the HHRA as driving the need for the remedial action.

Risk Summary- Surface Soils (depth of 0-2ft bgs)

Cancer risks and noncancer hazards from exposure to surface soil in Areas 1, 2 and 3 were estimated for the following receptor populations: current/future adolescent and adult trespasser, future adult site workers (indoor and outdoor), along with future child and adult residents.

Results of the HHRA indicated cancer risk estimates for all receptor populations did not exceed EPA’s target risk range of 10^{-6} (one-in-one million) to 10^{-4} (one-in-ten thousand).

Table 1:
Summary of Total Hazard and Risk Estimates-
All Receptor Populations Evaluated/Considered in the HHRA

Receptor Population- Timeframe	Excess Lifetime Risk Estimates: Total Hazard Index (HI)	Excess Lifetime Risk Estimates: Excess Lifetime Cancer Risk (ELCR)
	Exposure Area 1	
Adolescent Trespasser- Current/Future	0.2	4.E-07
Adult Trespasser- Current/Future	0.06	2.E-07
Outdoor Worker- Future	**50**	**4.E-04**
Indoor Worker- Future	**4**	1.E-05
Construction Worker- Future	0.4	4.E-07
Utility Worker- Future	**230**	**1.E-03**
Child Resident*- Future	**1027**	**4.E-03**
Adult Resident*- Future	**302**	
	Exposure Area 2	
Adolescent Trespasser- Current/Future	0.08	8.E-07
Adult Trespasser- Current/Future	0.03	3.E-07
Outdoor Worker- Future	**48**	**4.E-04**
Indoor Worker- Future	**48**	**4.E-04**
Construction/Utility Worker- Future	0.5	1.E-06
Child Resident*- Future	**1025**	**4.E-03**
Adult Resident*- Future	**301**	
	Exposure Area 3	
Adolescent Trespasser- Current/Future	0.0008	3.E-07
Adult Trespasser- Current/Future	0.003	1.E-07
Outdoor Worker- Future	**48**	2.E-06
Indoor Worker- Future	0.008	**4.E-04**
Construction/Utility Worker- Future	0.00007	4.E-07
Child Resident*- Future	**1023**	**4.E-03**
Adult Resident*- Future	**301**	

Footnotes:
(*): Total cancer **r**isk estimates for the child/adult resident reflects RME lifetime exposure assumptions (26 years); values derived by summing cancer risk from childhood exposure (0-6 year-old) to those of adult exposure (20 years).
Bolded & underlined values: reflect risk/hazard estimates that exceed EPA's threshold criteria (i.e., ELCR >10^{-4} or HI>1).

Noncancer hazard estimates for the future child resident in Area 1 (HI=4) and Area 2 (HI=2), exceeded EPA's hazard threshold value of 1. The noncancer hazard of 4 for the child resident in Area 1 was primarily due to the presence of 1,2,3-trichlorobenzene and thallium in surface soil. As presented in the Final Human Health Risk Assessment Report, dated 2015, thallium concentrations in Area 1 surface soils are similar to background concentrations, hence thallium was excluded as a site-related contaminant of concern (COC). Although the total noncancer HI for a future residential child in Area 2 was equal to 2, it did not exceed 1 when the hazards were separated by the critical target organ effect. To sum up, 1,2,3-trichlorobenzene was identified as the only COC in surface soil posing an unacceptable risk under a residential scenario.

Risk Estimates- Surface and Subsurface Soil (0-10 ft bgs)

Total lifetime cancer risks and noncancer hazards were evaluated for future construction/utility workers who may encounter contaminants in the first 10 feet of soil present in Areas 1, 2 and 3. Results of the HHRA indicated the cancer and hazard risk estimates of 4×10^{-7} and 0.4, respectively, did not exceed EPA's threshold criteria. Although the risks and hazards associated with soil exposure under a commercial use are within or below EPA's acceptable values, the soil concentrations of several compounds are above the concentrations that are associated with an adverse impact to groundwater; thus, there is a need to address the soil through a remedial action.

Risk Estimates- Groundwater (including potential shallow groundwater exposures)

Total lifetime cancer risks and noncancer hazards based on exposure to groundwater beneath the Site were calculated for the future timeframe only since all potential receptor populations are currently connected to the local public water supply. Populations of interest included the on-site adult/child resident, adult indoor and adult outdoor worker exposed to site-wide groundwater through potable uses (e.g., drinking, hand-washing, bathing, etc.). Exposure to shallow groundwater by an adult construction/utility worker conducting maintenance or upgrades to utility/sewer lines in the three exposure areas at the Site was also considered. The numeric risk results, as documented in the 2015 HHRA for the Site, are presented in Table 2.

Cancer risk and noncancer hazard estimates associated with future potable use of groundwater from within the Site contaminant plume exceeded EPA's benchmark values. Inhalation of volatiles during showering represented more than 50% of the total risks,

Table 2:
Groundwater Exposures-
Total Lifetime Noncancer Hazard and Cancer Risk Estimates

Receptor Population- Timeframe	**Total Lifetime Risk Estimates**	
	Total Hazard Index (HI)	Excess Lifetime Cancer Risk (ELCR)
	Sitewide Groundwater	
Outdoor Worker- Future	**48**	**4E-04**
Indoor Worker- Future	**48**	**4E-04**
Child Resident*- Future	**1023**	**4.E-03**
Adult Resident*- Future	**301**	
	Exposure Area 1	
Construction/Utility Worker- Future	**230**	**1E-03**
	Exposure Area 2	
Construction/Utility Worker- Future	1	6E-07
	Exposure Area 3	
Construction/Utility Worker- Future	0.00007	6E-10

Footnotes:
(*****): Total cancer risk estimates for the child/adult resident reflects RME lifetime exposure assumptions (26 years); values derived by summing cancer risk from childhood exposure (0-6 year-old) with those from adult exposure (20 years).
Bolded & underlined values: reflect risk/hazard estimates that exceed EPA's threshold criteria (i.e., ELCR $>10^{-4}$ or HI>1).

with ingestion and dermal risks contributing the remainder of the risks. The COCs contributing the largest portion of the estimated cancer risk for residents were: benzene (1.4×10^{-3}), 1,4-dichlorobenzene (1×10^{-3}), vinyl chloride (7.5×10^{-4}), arsenic (5.6×10^{-4}), 1,2 dichloroethane (2.8×10^{-4}), and 1,1,2,2-tetrachloroethane (6×10^{-5}). The COCs based on the noncancer HI were: 1,2,4-trichlorobenzene (527), copper (85), chlorobenzene (74), thallium (51), zinc (48), benzene (36), iron (31), 1,2,3-trichlorobenzene (25), 1,2-dichloropropane (12), 1,2-dichloroethane (8.3), xylenes, total (8.3), cis 1,2-DCE (7), cadmium (7), o-xylene (6.8), naphthalene (6.8), 1,1,2-trichloroethane (6.7), 1,2- dichlorobenzene (6), toluene (5.5), vanadium (6.4), arsenic (5.4), methylene chloride (5.3), mercury (5.2), aniline (4), aluminum (3.5), vinyl chloride (2), antimony (1.4), ethylbenzene (1.3), and 1,3-dichlorobenzene (1.3), trans-1,2-DCE (1.2), 1,4-dichlorobenzene (1.1).

Additionally, cancer and noncancer hazard estimates for the future utility worker in Area 1 exceeded EPA's benchmark values based on inhalation of vapors released from shallow groundwater during excavation activities. Benzene was identified as the predominant contributor to cancer risk (1×10^{-3}), while the largest contributors to the noncancer HI were benzene (140), chlorobenzene (45), xylenes (16), 1,2,4-trichlorobenzene (11), vinyl chloride (7.1), toluene (5.1), and 1,4-dichlorobenzene (1.5).

Risk Estimates- Potential for Vapor Intrusion

The potential for vapor intrusion (VI) from subsurface sources into indoor air was evaluated in the HHRA since groundwater and soils at the Site are known to contain volatile organic compounds (VOCs). Currently a vacant building is present on the former CPS Facility property and occupied manufacturing buildings are present on the Madison property.

The vapor intrusion pathway was quantitatively and qualitatively evaluated using EPA developed vapor intrusion screening values for various media (groundwater, soil vapor, and indoor air) sampled at the Site. Results of the assessment found that potential exposure to site-related volatiles (e.g., benzene, chloroform, ethylbenzene, and tetrachloroethylene) in on-site buildings at the former CPS facility is a potentially complete exposure pathway for the future timeframe. Based on these findings, if the buildings were to be occupied in the future, or new buildings were to be constructed on Site, they would be subject to a VI investigation.

Screening Level Ecological Risk Assessment

In 2015, the responsible parties completed a Screening Level Ecological Risk Assessment (SLERA), to determine if Site contaminants had the potential to affect ecological receptors in the OU1 and OU2 areas. The SLERA concluded the following:

- There were no completed exposure pathways in Areas 1 and 2 on the CPS property due to absence of habitat;

- Risk due to ecological receptor exposure to soils in Area 3 is negligible based on the screening level exposure estimate; and
- Risk due to ecological receptor exposure to CPS related contaminants in groundwater are negligible based on concentrations found in groundwater discharge locations.

Overall the SLERA did not identify any unacceptable risks to ecological receptors exposed to Site contaminants in environmental media in the OU1 and OU2 areas.

It is the EPA's current judgment that the Preferred Alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of pollutants or contaminants from the Site which may present an imminent and substantial endangerment to the public health or welfare.

REMEDIAL ACTION OBJECTIVES

The following remedial action objectives (RAOs) for contaminated media address the human health and ecological risks at the Site:

OU1 – Groundwater

The RAOs identified for the remedial alternatives for OU1 groundwater contamination are:

- Prevent exposure to groundwater contaminated by site-related contaminants.

- Prevent the potential for further migration of site-related contaminants.

- Restore groundwater impacted by Site contaminants to applicable State and Federal standards within a reasonable time frame.

- Prevent/Minimize contaminated groundwater from serving as a source of current and future vapor intrusion.

OU2 – CPS Source Soils

The RAOs identified for the remedial alternatives for OU2 are:

- Mitigate the on-going sources of CPS site-related contaminants to groundwater.

- Prevent exposure to soils contaminated by CPS site-related contaminants.

- Prevent/Minimize contaminated soil from serving as a source of current and future vapor intrusion.

Achieving the RAOs relies on the remedial alternatives' ability to meet final remediation goals/cleanup levels derived from Preliminary Remediation Goals (PRGs), which are based on such factors as Applicable or Relevant and Appropriate Requirements (ARARs), risk, and background. EPA and NJDEP have promulgated maximum contaminant levels (MCLs) and NJDEP has promulgated groundwater quality standards (GWQSs) which are enforceable, health-based, protective standards for various drinking water contaminants. In this Proposed Plan, EPA selected the more stringent of the MCLs and GWQSs as the preliminary remediation goals (PRGs) for COCs in Site groundwater. EPA used the more stringent of the NJDEP nonresidential direct contact soil remediation standards and the NJDEP impact to groundwater soil screening levels as the PRGs for the unsaturated soils.

The Lists of PRGS for groundwater and soil may be found in Tables 3 and 4 respectively. PRGs may be further modified through the evaluation of alternatives and are used to select the clean-up goals in the Record of Decision.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA requires that each selected remedy be protective of human health and the environment, be cost effective, comply with ARARs unless a waiver can be justified, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

Potential technologies applicable to groundwater and soil remediation were identified and screened by effectiveness, implementability, and cost criteria, with emphasis on effectiveness. Those technologies that passed the initial screening were then assembled into remedial alternatives.

For the soil alternatives, the proposed depths of remediation are based on the soil boring data taken during the RI. These depths were used to estimate the quantity of soil to be addressed and the associated costs. The actual depths and quantity of soil to be addressed will be finalized during design and implementation of the selected remedy. Full descriptions of each alternative can be found in the FS which is part of the Administrative Record.

The time frames below are for construction and do not include the time to negotiate with the responsible parties, design a remedy or the time to procure necessary contracts. Five-year reviews will be conducted as a component of the alternatives that would leave contamination in place above levels that allow for unlimited use and unrestricted exposure.

For all groundwater and soil alternatives, the present worth cost includes the periodic present worth cost of five-year reviews.

Groundwater Alternatives:

Common Elements for Groundwater

Each groundwater alternative contains the following elements:

- Groundwater performance monitoring.
- Long Term Monitoring (LTM) of the low level organic plume between the groundwater control remedy selected and the Perth Amboy wells.
- Institutional controls (i.e., CEA/WRA).

The groundwater alternatives assume NJDEP's IEC program will address 1,4-dioxane near the Perth Amboy wells as an integral part of the overall protectiveness of the Site's remedial program. EPA and NJDEP will monitor the progress of this action to ensure that this contamination is mitigated.

In order to reduce the number of alternatives and simplify the process of selecting them, EPA has grouped the groundwater alternatives into alternatives that address organic contaminants (1A, 2A, and 3A), and alternatives that address metal contaminants (1B, 2B, and 3B). One alternative will be selected from each group.

Organic Alternative 1A - No Action

Capital Cost:	*$0*
Annual O&M Cost:	*$0*
Present Worth Cost:	*$0*
Construction Timeframe:	*0 years*

The NCP requires that a "No Action" alternative be evaluated to establish a baseline for comparison with other remedial alternatives. Under this alternative, no action would be taken to remediate the organic contamination in groundwater at the CPS/Madison Site. Additionally, the existing CPS IRM pump and treatment system would be shut down.

Organic Alternative 2A – Upgraded CPS Site IRM Pump and Treat System with LTM

Capital Cost:	*$8,008,000*
Annual O&M Cost:	*$401,000*
Present Worth Cost:	*$10,573,000*
Construction Time Frame:	*19-22 months*

Alternative 2A involves upgrading the existing CPS IRM pump and treatment system with additional recovery well(s) to fully capture the migration of organic contaminants from the source areas, and additional treatment to address 1,4-dioxane.

Alternative 2A consists of the following elements:

- A Groundwater Treatment Plant (GWTP) treatability study would be performed to evaluate and design the treatment process train.
- The CPS IRM recovery well system would be expanded to fully cover the 1,4-dioxane source area (one additional well is assumed for cost estimating purposes).
- The existing three IRM wells would be relocated further downgradient of the source area to accommodate implementation of the OU2 source soil remedial alternative.
- A new GWTP will be constructed to meet the new project requirements which would include treatment of 1,4-dioxane. The new treatment system would address 1,4-dioxane using chemical oxidation or adsorptive media and to

ensure that the discharge limit is achieved consistently. The existing GWTP would remain in service until the new GWTP is fully operational and tested.

- The treated effluent would continue to be discharged to the current on-site surface water location.
- A LTM program would ensure that the IRM will continue to reduce concentrations in the downgradient plume until remediation goals are achieved.

The CPS Site CEA/WRA would be maintained as an institutional control under this alternative.

Organic Alternative 3A – In-Situ Chemical Oxidation Permeable Reactive Barrier with LTM

Capital Cost:	*$3,828,000*
Annual O&M Cost:	*$283,000*
Present Worth Cost:	*$5,589,000*
Construction Time Frame:	*7-8 months*

Alternative 3A involves placement of a series of closely spaced wells forming a permeable reactive barrier perpendicular to the groundwater flow, and downgradient of the organic contaminant source areas located on the CPS property. These wells would continuously inject an oxidant (ozone or peroxide) into the subsurface, which will destroy dissolved-phase organic contaminants that pass through the oxidant.

Alternative 3A consists of the following remedial activities:

- Treatability study and pilot testing of the ISCO Permeable Reactive Barrier (PRB) to ensure remediation can be achieved.
- Installation and operation of an ISCO PRB well system.
- Installation of groundwater and vadose zone monitoring systems.
- Continued operation of the existing CPS IRM until the PRB system proves it can achieve remediation goals.
- A LTM program will ensure that the PRB continues to reduce concentrations in the downgradient plume until remediation goals are achieved.

Metals Alternative 1B – No Action

Capital Cost:	*$0*
Annual O&M Cost:	*$0*
Present Worth Cost:	*$0*
Construction Timeframe:	*0 months*

The NCP requires that a “No Action” alternative be evaluated to establish a baseline for comparison with other remedial alternatives. Under this alternative, no action would be taken to remediate the organic contamination in groundwater at the Site. Under this alternative the Madison IRM would be shut down.

Metals Alternative 2B –Continued Operation of the Madison IRM

Capital Cost:	*$0*
Annual O&M:	*$1,344,000*
Present Worth Cost:	*$12,183,000*
Construction Timeframe:	*0 months*

Alternative 2B involves continued operation of the Madison IRM wells. The Madison IRM wells have been in operation since 1991 and have effectively reduced and controlled the metal contaminant plume over time. It is anticipated that once Madison completes the OU3 RI/FS and addresses the source areas on its property, the IRM may no longer be required.

Metals Alternative 3B – Permeable Reactive Barrier

Capital Cost:	*$2,661,000*
Annual O&M:	*$153,000*
Present Worth Cost:	*$3,355,000*
Construction Timeframe:	*4-5 months*

Alternative 3B involves placing a PRB downgradient of the Madison source areas to precipitate out metal contaminants (lead, cadmium, copper and zinc) in groundwater as they pass through the barrier. The barrier would need to be placed at a depth of approximately 30 feet. Zero valent iron and apatite are two possible reactants that will require treatability testing to determine their viability.

Soil Alternatives:

Common Elements for Soil Alternatives

Each soil alternative contains the following elements:

- Institutional controls in the form of a deed notice restricting the future use of the CPS property to prohibit residential use.

- Groundwater and soil sampling to verify that performance goals are achieved.
- All soil alternatives would meet substantive requirements for flood zones and wetlands.

Alternative 1 – No Action

Capital Cost:	*$0*
Annual O&M Cost:	*$0*
Present Worth Cost:	*$0*
Timeframe:	*0 years*

The NCP requires that a "No Action" alternative be evaluated to establish a baseline for comparison with other remedial alternatives. Under this alternative, no action would be taken to remediate the contaminated soil on the CPS property.

Alternative 2 – Capping

Capital Cost:	*$1,565,000*
Annual O&M Cost:	*$73,000*
Present Worth Cost:	*$1,846,000*
Construction Timeframe:	*6-8 months*

Alternative 2 consists of construction of a low-permeability cap of approximately 56,000 square feet to protect against direct contact hazards to human health and to reduce, to the extent possible, storm water infiltration through the unsaturated source soils that would impact the groundwater. The cap does not treat or destroy the contaminants, it eliminates the pathways to human exposure. Long-term monitoring and maintenance is essential to maintain the integrity of this engineering control.

Alternative 3 – Excavation, Ex-situ Soil Vapor Extraction, and In-situ Chemical Oxidation

Capital Cost:	*$11,338,000*
Annual O&M Cost:	*$2,100*
Present Worth Cost:	*$10,684,000*
Construction Timeframe:	*40-41 months*

Alternative 3 employs excavation and on-site ex-situ soil vapor extraction (SVE) of contaminated soils accessible to excavation, and in-situ chemical oxidation for contaminated source soils inaccessible to excavation (i.e., adjacent/beneath the sewer line). Excavated areas would be backfilled with treated soils. Due to excavation below the water table, this alternative would employ steel sheeting (for sidewall support and groundwater infiltration control) and includes a dewatering and treatment system. This alternative would provide immediate removal of contaminated soil in the source area that presents contact hazards and would reduce contaminant concentrations that impact groundwater. An active groundwater remedy for organics (2A or 3A) must be in place before this alternative can be implemented.

Alternative 4 – Excavation, Off-site Disposal, and In-situ Chemical Oxidation

Capital Cost:	*$13,975,000*
Annual O&M Cost:	*$2,100*
Present Worth Cost:	*$14,004,000*
Construction Timeframe:	*12-15 months*

Alternative 4 employs excavation and off-site disposal of contaminated soils accessible to excavation, backfill of excavated areas with certified clean fill, and in-situ chemical oxidation for contaminated source soils not accessible to excavation. Due to excavation below the water table, this alternative would employ steel sheeting (for sidewall support and groundwater infiltration control) and includes a dewatering and water treatment system. This alternative would provide immediate removal of contaminated soil in the source area that presents a contact hazard and would reduce contaminants that impact groundwater. An active groundwater remedy (2A or 3A) must be in place before this alternative can be implemented.

Alternative 5 – In-Situ Chemical Oxidation with limited excavation

Capital Cost:	$4,507,000
Annual O&M:	$2,100
Present Worth Cost:	$4,536,000
Construction Timeframe:	14-16 months

Alternative 5 uses chemical oxidants (such as peroxide, Fenton's Reagent, persulfate) to destroy contaminants by converting them into simple molecules such as carbon dioxide and water. The critical aspect of ISCO is to achieve contact between the oxidant and the contaminant. This alternative would address the adsorbed mass in the source soils, particularly in the discontinuous low permeability layer within the OU2 boundaries by in-situ mixing of the soil while injecting oxidant to achieve contact with the contaminants. The soil contaminated with 1,4-dioxane from the Repackaging Area would be excavated and placed in the Tank Farm Area to undergo treatment with those soils. An active groundwater remedy (2A or 3A) must be in place before this alternative can be implemented.

EVALUATION OF ALTERNATIVES

The NCP lists nine criteria for evaluation and comparison of remedial alternatives. This section of the Proposed Plan profiles the relative performance of each alternative against the nine criteria, and how each of the alternatives compares to the other options under consideration. Seven of the nine evaluation criteria are discussed below. The final two criteria, "State Acceptance" and "Community Acceptance" are discussed at the end of the document. A more detailed analysis of each of the alternatives is presented in the FS report.

Evaluation of Groundwater Alternatives for Organic Contaminants

1. Overall Protection of Human Health and the Environment

Alternative 1A, No Action, would not be protective of human health or the environment since it does not include measures to prevent exposure to contaminated groundwater. Because the "no action" alternative is not protective of human health and the environment it was eliminated from consideration under the remaining criteria.

Alternatives 2A and 3A would protect human health by preventing off-site migration of organic contaminants and maintaining the institutional controls (CEA and WRA) that are already in place.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Actions taken at any Superfund site must meet all applicable or relevant and appropriate requirements under federal and state laws or provide grounds for invoking a waiver of those requirements.

Alternatives 2A and 3A are both expected to meet NJGWQS and MCLs (which are chemical specific ARARs) for organic contaminants in groundwater migrating from the source areas. The downgradient plume will be monitored to ensure it meets NJGWQS and MCLs through attenuation over time. Any concentrations above NJGWQS and MCLs will be addressed by the IEC actions overseen by NJDEP. Both alternatives will meet action and location specific ARARs.

3. Long-Term Effectiveness and Permanence

Alternatives 2A and 3A would provide long-term effectiveness and permanent protection to human receptors, provided the remedies are maintained. Alternative 3A will require a treatability study to determine which reactants are most effective and if all the chemical specific objectives can be achieved. Alternative 2A would require regular oversight to maintain pumping wells and the treatment plant. While Alternative 3A would also require regular oversight, it would require less equipment maintenance than 2A because it does not require extraction, treatment and discharge to groundwater.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 2A reduces the toxicity and volume of groundwater contaminants by treatment and removal. Treated water may be reintroduced to the ground if it meets discharge standards. Alternative 3A would reduce the groundwater contaminant toxicity and volume by in-situ treatment as contaminants pass through the reactive barrier.

5. Short-Term Effectiveness

Although the estimated time to construct Alternative 2A is expected to be longer than 3A, both alternatives would be protective in the short-term. The CPS IRM wells, which have reduced and controlled the majority of the contaminant plume, would remain in operation until the selected remedy is ready to be turned on. Both alternatives would present risks to on-site workers due to handling caustic chemicals, but the risks can be easily controlled with sound engineering practices. For both alternatives, risks to the community and environment are negligible because the IRM wells would be operating until a new remedy is constructed.

6. Implementability

While Alternative 2A is an augmented version of what is already in place, it would require more infrastructure and O&M than 3A because it involves extraction and reinjection, as well as treatment. For this reason

Alternative 2A would also require more time to construct than 3A. Both remedies are technically and administratively feasible. Alternative 3A has fewer reporting requirements. Both are implementable and require materials and equipment that are readily available.

7. Cost

The total estimated present worth costs are:

- Alternative 1A - $0.
- Alternative 2A - $10,573,000.
- Alternative 3A - $5,589,000.

Evaluation of Groundwater Alternatives for Metal Contaminants

1. Overall Protection of Human Health and the Environment

Alternative 1B, No Action, would not be protective of human health since it does not include measures to prevent exposure to contaminated groundwater. Because the "no action' alternative is not protective of human health and the environment it was eliminated from further consideration.

Alternatives 2B and 3B would both protect human health by preventing off-site migration of inorganic contaminants and maintaining the institutional controls (CEA and WRA) that are already in place.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Actions taken at any Superfund site must meet all applicable or relevant and appropriate requirements under federal and state laws or provide grounds for invoking a waiver of those requirements.

Alternative 2B has already demonstrated that it controls the migration of metals contamination in groundwater from the source areas, and therefore will meet chemical specific ARARs such as NJGWQS and MCLs. Alternative 3B is expected to capture metals contamination migrating from the source areas, but would require treatability testing to ensure complete capture of all the chemicals of concern. With both alternatives, remedial action objectives would be met in groundwater downgradient of the treatment system through attenuation. Both remedies would meet both action and location specific ARARs.

3. Long-Term Effectiveness and Permanence

Alternative 2B is already in place and would provide long-term effectiveness and permanent protection to human and ecological receptors. Alternative 3B would require a treatability study to determine which reactants are most effective and if all the chemical specific objectives can be achieved. Alternative 2B would require regular oversight to maintain pumping wells and the treatment plant. Alternative 3B may require change out of reactive media over time to remain effective. Alternative 3B may be slightly less permanent because the contaminants remain trapped in the media of the barrier wall and could potentially desorb under changing conditions. This concern could be mitigated by removal of the media when NJGWQS and MCLs are achieved. Both alternatives require technically feasible maintenance tasks.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 2B reduces the volume of groundwater contaminants by treatment and removal in a treatment plant. Alternative 3B would reduce the groundwater contaminant mobility by capture of the contaminants as the groundwater passes through the barrier.

5. Short-Term Effectiveness

Both Alternatives would be protective in the short-term. Alternative 2B is already in place and functioning, and therefore presents no short-term risks to on-site workers, the community, or the environment. Alternative 3B would require 4 - 5 months to construct. During that time the Madison IRM wells, which have reduced and controlled the contaminant plume, would remain in operation until Alternative 3B is functional. Risk to on-site workers would be posed by construction tools and equipment, but these risks are easily controlled by sound engineering practices.

6. Implementability

Both alternatives are implementable. Alternative 2B has been constructed and requires only maintenance. Alternative 3B would require construction materials and equipment that are readily available. If combined with organic Alternative 3A, the choice of reactants for Alternative 3B would be limited by compatibility with the upgradient alternative. This would require sequencing of the treatability testing and add to the implementation time for Alternative 3B.

7. Cost

The total estimated present worth costs calculated using a discount rate of 7 percent are:

- Alternative 1B - $0.
- Alternative 2B - $12,183,000.
- Alternative 3B - $3,355,000.

Evaluation of Soil Alternatives

1. Overall Protection of Human Health and the Environment

Alternative 1 is not protective of human health or the environment because no action would be taken to address soil contamination. Because the “no action’ alternative is not protective of human health and the environment it was eliminated from further consideration under the remaining eight criteria.

Alternative 2 would use capping and institutional controls to protect human health by eliminating contact with the contaminated soil. However, this alternative would not effectively mitigate the sources of organic contamination to the groundwater below the water table.

Alternatives 3, 4, and 5 would protect human health and the environment by treating the soil contaminants that pose a contact risk, and act as a source of groundwater contamination.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Alternative 2 would quickly mitigate soil contact pathways. However, soil contamination below the water table that acts as a groundwater source would require a long period of time before groundwater ARARs could be achieved, and the groundwater remedies shut down.

Alternatives 3, 4, and 5 will all meet soil remediation goals by removing or treating the organic contaminants. All the alternatives will comply with action specific ARARs, and all except Alternative 1 will need to meet substantive requirements of location-specific ARARs for flood hazard areas and wetlands.

3. Long-Term Effectiveness and Permanence

Alternatives 3, 4, and 5, all achieve a similar high degree of long-term effectiveness and permanence by either removal or destruction of the on-site soil contamination. Each of these alternatives would require bench testing for the ISCO portion of the alternatives.

Alternative 2 has a lesser degree of long-term effectiveness and permanence than Alternatives 3,4, and 5 because the organic contaminants would remain on-site and the cap would require maintenance for the foreseeable future.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 2 reduces mobility of the contaminants above the water table by capping but does not reduce toxicity or volume. Contaminants below the water table will still act a source of groundwater, prolonging the time the groundwater remedies would be required to function.

Alternatives 3 and 5 use treatment exclusively to reduce contaminant toxicity and volume.

Alternative 4 relies on removal and off-site disposal and does not reduce toxicity or volume for most of the contaminant mass. However, ISCO treatment would be used to reduce contaminant toxicity and volume in any area not accessible to excavation.

5. Short-Term Effectiveness

Alternative 2 presents very minimal short-term risks to the community and site workers or the environment because none of the contaminated soil is disturbed during placement of the cap.

Alternatives 3 and 4 involve excavation and thus have potential for short-term adverse effects. Potential risks posed to site workers, the community and the environment during implementation of each of the soil alternatives could be due to wind-blown or surface water transport of contaminated soil. Any potential impacts associated with dust and runoff would be minimized through proper installation and implementation of dust and erosion control measures. The areas would be monitored throughout the construction of the ISCO system.

Alternative 5 employs in-situ mixing during ISCO injections and only involves a minor amount of open excavation, which should minimize dust.

Alternatives 3, 4, and 5 all involve use of ISCO chemicals which can be caustic. These hazards can be controlled with proper handling and protective clothing.

6. Implementability

Alternative 2, capping, has the least technical challenges and would be easily implemented.

Alternatives 3 and 4 require excavation, sheet piling, dewatering, water treatment, and discharge of the effluent, which are technically more complex, but still employ readily available equipment and expertise.

Alternative 5 is more implementable compared to Alternatives 3 and 4 because it involves less excavation than Alternatives 3 and 4. In-situ ISCO injection and mixing of soil also employs less infrastructure and would pose fewer technical complexities compared to Alternatives 3 and 4.

Materials for all the alternatives are readily available.

7. Cost

The total estimated present worth costs calculated using a discount rate of 7 percent are:

- Alternative 1 - $0.
- Alternative 2 - $1,846,000.
- Alternative 3 - $10,684,000.
- Alternative 4 - $14,004,000.
- Alternative 5 - $4,536,000.

PREFERRED ALTERNATIVE

The preferred groundwater alternatives for the cleanup of the Site are 3A – ISCO Permeable Reactive Barrier, and 2B – Continued Operation of the Madison IRM. For the on-site soil at the CPS property, the preferred alternative is Alternative 5 – In-Situ Chemical Oxidation with limited excavation. Together, these three elements comprise EPA's preferred alternative.

Groundwater:

The preferred alternative for organic contaminants in groundwater (OU1), Alternative 3A, includes the following remedial activities:

- Treatability study and pilot testing to ensure remediation goals for the organic site contaminants will be achieved.
- Installation and operation of an ISCO PRB well system.
- Installation and operation of groundwater and vadose zone monitoring systems.
- Continued operation of the existing CPS IRM until the PRB system is proven.
- LTM to monitor the low level organic plume between the PRB and the Perth Amboy wells.
- Institutional controls (i.e., CEA/WRA).

The preferred alternative for organics in groundwater was selected over other alternatives because it is expected to achieve substantial and long-term risk reduction by substantially reducing contaminant levels in the groundwater as they begin to migrate off the CPS property and before reaching the Perth Amboy wellfield. The preferred alternative for organics in groundwater reduces risk by destroying organic contaminants leaving the CPS property, at a lower cost compared to the other active alternative (2A), and should be reliable over the long-term.

Because Alternative 3A still needs to be proven under Site conditions, Alternative 2A, Upgraded CPS Site IRM Pump and Treat System, will be selected as the contingency remedy should the groundwater monitoring show that the effluent of the ISCO Barrier is not achieving NJGWQS and MCLs. Although the cost of Alternative 2A is higher, and requires groundwater discharge, it is a proven technology and would be protective.

The preferred alternative for metal contaminants in groundwater, Alternative 2B, includes the following remedial activities:

- Continued operation of the Madison IRM wells.
- Groundwater monitoring.
- Institutional controls (i.e., CEA/WRA).

The preferred alternative for metals in groundwater was selected over other alternatives because it is in place and has been proven effective. It is expected to control the metals contamination coming from the Site, until the sources on the Madison site are removed by a remedy to be selected for OU3. While Alternative 3B is potentially viable, it was not chosen due to potential compatibility issues with the upgradient alternatives for organic contaminants.

Soil:
The preferred alternative for OU2 soil is Alternative 5, in-situ chemical oxidation with limited excavation. The major components of the preferred soil alternative include:

- Excavation of soils contaminated with 1,4-dioxane from the Repackaging Area and placement in the Tank Farm Area for treatment.
- In-situ chemical oxidation.
- In-situ soil mixing in accessible areas (~20,000 cubic yards).
- In-situ injection in inaccessible areas (~ 1,500 cubic yards).
- Post-Remediation Monitoring.
- Institutional Controls.

This alternative would use in-situ chemical oxidation to break down organic chemicals to carbon dioxide and water. By this method, organic chemicals in the soil that contribute to groundwater contamination will be permanently removed.

The preferred alternative for soil was selected over other alternatives because it is expected to achieve substantial and long-term risk reduction through chemical treatment, and is expected to allow the Site to be used for its reasonably anticipated future land use, which is commercial. The preferred soil alternative reduces the risk within 16 months, at a cost comparable to other alternatives and should be reliable over the long-term.

Though the preferred remedy for soil would be protective, it would not achieve levels that would allow for unrestricted use. Therefore, institutional controls, such as deed notices restricting the future use of the CPS property, would be required. Five-year reviews would be conducted since contamination would remain above levels that allow for unlimited use and unrestricted exposure.

Based on information currently available, the lead agency believes the preferred alternatives meet the threshold criteria and provide the best balance of tradeoffs among the alternatives with respect to the balancing and modifying criteria. EPA expects the preferred alternatives to satisfy the following statutory requirements of section 121(b) of CERCLA: (1) be protective of human health and the environment; (2) be cost-effective; (3) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and (4) satisfy the preference for treatment as a principle element, or explain why the preference for treatment will not be met. Section 121(b) of CERCLA further specifies that an action must comply with ARARs unless a waiver can be justified.

The total present worth cost for the groundwater and soil preferred alternatives is $22,308,000.

Consistent with EPA Region 2's Clean and Green policy, EPA will evaluate the use of sustainable technologies and practices with respect to implementation of a selected remedy.

State Acceptance

The State of New Jersey concurs with the preferred alternatives for site-wide groundwater (OU1), and soil on the CPS property (OU2).

Community Acceptance

Community acceptance of the preferred alternatives will be evaluated after the public comment period ends and will be described in the Record of Decision. Based on public comment, the preferred alternatives could be modified from the version presented in this proposed plan. The Record of Decision is the document that formalizes the selection of the remedy for a site.

COMMUNITY PARTICIPATION

EPA provided information regarding the cleanup of the Site through meetings, the Administrative Record file for the Site and announcements published in the local newspaper. EPA encourages the public to gain a more comprehensive understanding of the Site and the RI activities that have been conducted there.

The dates for the public comment period, the date, location and time of the public meeting, and the locations of the Administrative Record file are provided on the front page of this Proposed Plan.

For further information on EPA's preferred alternative for the Site contact:

John Osolin
Remedial Project Manager
Osolin.John@epa.gov
(212) 637-4412

Pat Seppi
Community Involvement Coordinator
Seppi.Pat@epa.gov
(646) 369-0068

U.S. EPA
290 Broadway 19th Floor
New York, New York 10007-1866

On the Web at:
https://www.epa.gov/superfund/cps-madison

Legend:

CPS Site Soil Exposure Areas

Site Boundaries

Water Supply Well

0 250 500

APPROXIMATE SCALE (FEET)

Figure 1
Site Map with Soil Exposure Areas

CPS/Madison Superfund Site
Old Bridge Twp., Middlesex County, NJ

CAD FILE: CPS-FS-01R-10-2018.DWG | DATE: 10/5/2018

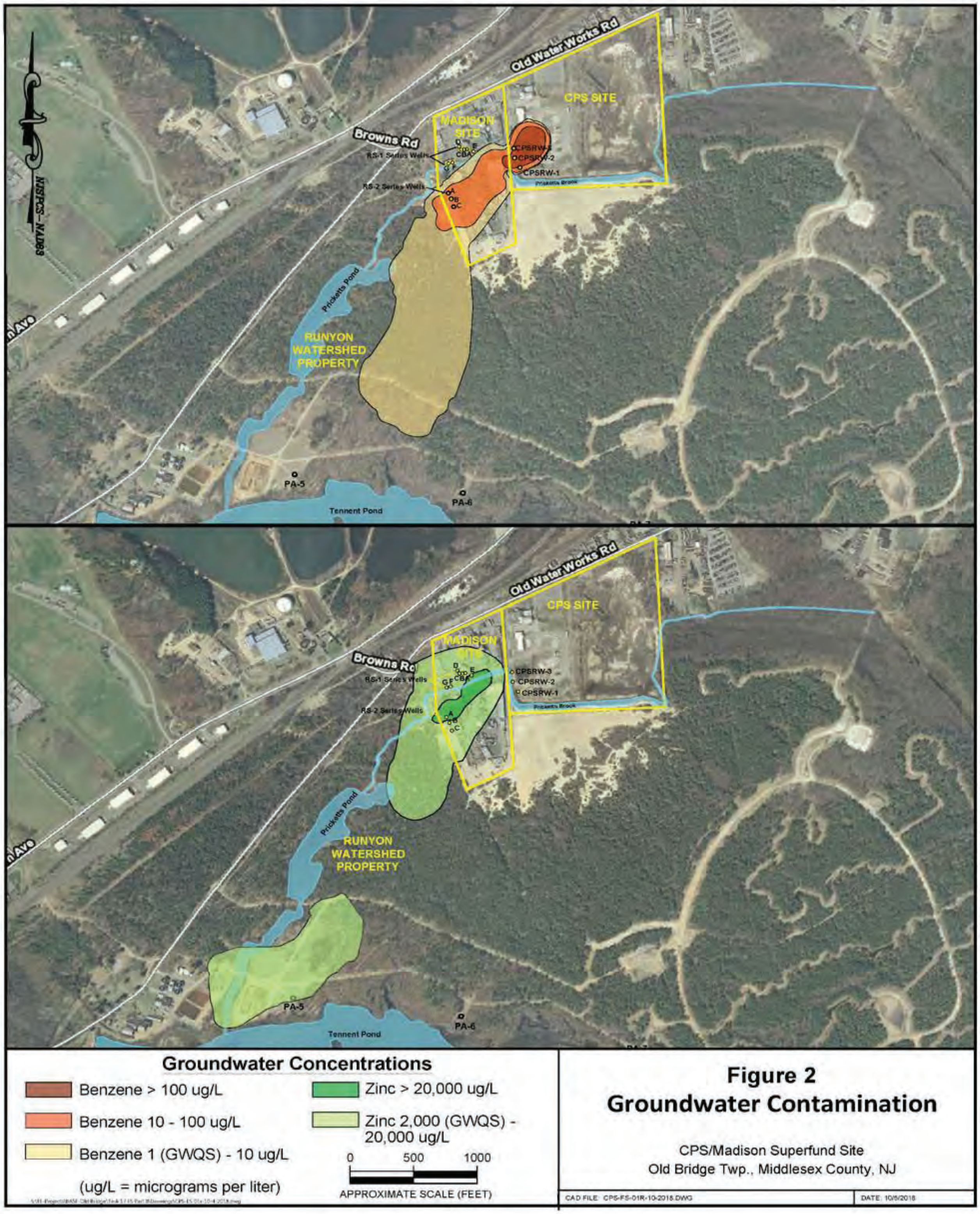


Figure 2
Groundwater Contamination

CPS/Madison Superfund Site
Old Bridge Twp., Middlesex County, NJ

LEGEND

15 ft — Soil Remediation Area and Depth in Feet (ft)

Soil Exposure Areas

CPS Site Property Boundary

0 90 180

APPROXIMATE SCALE (FEET)

Figure 3
Soil Contamination

CPS/Madison Superfund Site
Old Bridge Twp., Middlesex County, NJ

File: CPS-FS-07-10-8-2018.dwg | DATE: 10/8/2018

Table 3 - Preliminary Remediation Goals for Groundwater Contaminants

	State GW Quality Criteria (ppb)	State MCLs (ppb)	Federal MCLS (ppb)	**Preliminary GW Remediation Goals (ppb)***
Organic Contaminants				
aniline	6			**6**
benzene	1	1	5	**1**
chlorobenzene	50	50	100	**50**
1,2-dichlorobenzene	600	600	600	**600**
1,3-dichlorobenzene	600	600		**600**
1,4-dichlorobenzene	75		75	**75**
cis-1,2-dichloroethene	70		70	**70**
trans-1,2-DCE	100		100	**100**
1,2-dichloroethane	2	2	5	**2**
1,1-dichloroethene	1	2	7	**1**
1,2-dichloropropane	1		5	**1**
1,4-Dioxane	0.4			**0.4**
ethylbenzene	700		700	**700**
methylene chloride	3	3		**3**
naphthalene	300	300		**300**
1,1,2,2-tetrachloroethane	1	1		**1**
tetrachloroethene(PCE)	1	1	5	**1**
toluene	600		1,000	**600**
1,2,3-trichlorobenzene	Not found			**TBD**
1,2,4-trichlorobenzene	9	9	70	**9**
1,1,2-trichloroethane	3	3	5	**3**
trichloroethene (TCE)	1	1	5	**1**
vinyl chloride	1		2	**1**
xylenes, total	1,000	1,000	10,000	**1,000**
Metal Contaminants				
aluminum	200		200 Secondary	**200**
antimony	6		6	**6**
arsenic	3	5	10	**3**
cadmium	4		5	**4**
copper	1,300		1,300	**1,300**
iron	300		300 Secondary	**300**
lead	5		15+	**5**
mercury	2		2	**2**
thallium	2		2	**2**
zinc	2,000		5,000 Secondary	**2,000**

* Preliminary Remediation Goals are the lesser of the preceeding groundwater standards.

+ Federal Action Level

Table 4 - Preliminary Remediation Goals for Soil Contaminants *		
Contaminants	**NJ Non-Res Direct Contact Soil Remediation Standard (mg/kg)**	**Default NJ Impact to GW Screening Levels (mg/kg) (Above the Water Table)**
benzene	5	0.005
chlorobenzene	7,400	0.6
1,2-dichlorobenzene	59,000	17
1,3-dichlorobenzene	59,000	19
1,4-dichlorobenzene	13	2
cis-1,2-dichloroethene (DCE)	560	0.3
trans-1,2-DCE	720	0.6
1,2-dichloroethane	3	0.005
1,1-dichloroethene	150	0.008
1,2-dichloropropane	5	0.005
1,4-Dioxane		1.25 +
ethylbenzene	110,000	13
methylene chloride	230	0.01
1,1,2,2-tetrachloroethane	3	0.007
tetrachloroethene(PCE)	1,500	0.005
toluene	91,000	7
1,2,4-trichlorobenzene	820	0.7
1,1,2-trichloroethane	2	0.02
trichloroethene (TCE)	10	0.01
vinyl chloride	0.7	0.005
xylenes, total	170,000	19

* The Preliminary Remediation Goals in this table are based on the NJ default values. It is EPA's intent to replace these with site-specific values based on NJ impact to groundwater guidance.

+ This Impact to Groundwater Screening Level was calculated using NJDEP's default values and guidance.

ATTACHMENT B

PUBLIC NOTICE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY INVITES PUBLIC COMMENT ON THE PROPOSED PLAN FOR THE CPS/MADISON SUPERFUND SITE OLD BRIDGE, NEW JERSEY

The U.S. Environmental Protection Agency (EPA) announces the opening of a 30-day comment period on the preferred plan to address contaminated soil and groundwater at the CPS/Madison Superfund Site located in Old Bridge, New Jersey. The preferred remedy and other alternatives are identified in the Proposed Plan.

The comment period begins Wednesday, April 24, 2019. As part of the public comment period, EPA will hold a public meeting on Wednesday, May 8, 2019 at 7pm at the Old Bridge Municipal Complex/Courtroom, 1 Old Bridge Plaza, Old Bridge, NJ. The Proposed Plan is available electronically at the following address: https://www.epa.gov/superfund/cps-madison.

Written comments on the Proposed Plan, postmarked no later than close of business May 24, 2019, may be emailed to osolin.john@epa.gov or mailed to John Osolin, US EPA, 290 Broadway, 19th Floor, New York, NY 10007-1866.

The Administrative Record files are available for public review at the following information repositories:

The Old Bridge Library, 1 Old Bridge Plaza or at the USEPA – Region 2, Superfund Records Center, 290 Broadway, 19th Floor, New York, NY 10007-1866.

For more information, please contact Pat Seppi, EPA's Community Liaison, at 646.369.0068 or seppi.pat@epa.gov.

☐ PROOF O.K. BY: ______________ ☐ O.K. WITH CORRECTIONS BY: ______________

PLEASE READ CAREFULLY • SUBMIT CORRECTIONS ONLINE

ADVERTISER: UNITED STATES ENVIROMENT PROOF CREATED AT 4/23/2019 12:25 PM
SALES PERSON: Gina Wood PROOF DUE: - NEXT RUN DATE: 04/24/19
PUBLICATION: AP-EST DAILY SIZE: 3 col X 10.45 in

AP-GCI0177069-01.INDD

ATTACHMENT C

PUBLIC MEETING TRANSCRIPT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 2

- X

GROUNDWATER CONTAMINATION

SUPERFUND SITE PUBLIC MEETING

- X

Old Bridge Municipal Building
1 Old Bridge Plaza
Old Bridge, NJ

May 8, 2019
7:00 p.m.

P R E S E N T E R S

PAT SEPPI,
EPA, Community Liaison

JOHN OSOLIN,
EPA Geologist/Project Manager

RICH PUVOGEL,
EPA, NJ Central Remediation Section Chief

CHUCK NACE,
EPA, Environmental Toxicologist

LYNN VOGEL,
DEP Case Manager

MS. SEPPI: Thank you for coming to our meeting tonight. We really do appreciate it.

First I'd like to go around and have the EPA and the other folks who are here who are working on this site introduce themselves.

First of all, I'm Pat Seppi, I'm the EPA Region 2 and I'm the community liaison for this site.

John?

MR. OSOLIN: John Osolin, I'm project manager for this site for EPA and also Region 2.

MS. SEPPI: Rich? I'm sorry, Chuck?

MR. NASE: I am Chuck Nase, I'm an environmental toxicologist for EPA.

MS. SEPPI: Thank you.

MR. PUVOGEL: I'm Rich Puvogel, I'm the New Jersey Central Remediation Section Chief and John's supervisor.

MS. SEPPI: Right. Lynn?

MS. VOGEL: I'm Lynn Vogel, I'm with New Jersey DEP, case manager.

MS. SEPPI: Thank you. Joe?

MR. GUARNACCIA: I'm Joe Guarnaccia and I work for BASF and we're conducting the remediation working with the State for the EPA.

MS. SEPPI: Thank you. And, Bill, why don't you introduce yourself?

MR. SCHULTZ: Bill Schultz, Raritan Riverkeeper.

MS. SEPPI: Raritan Riverkeeper. We've worked at many other sites together.

Do you want me to turn the lights off now or when we start -- can you see all right if we leave the lights the way they are? Okay. That is fine.

So the reason that we're here tonight is to present to you EPA's plan to clean up the CPS Madison site. Hopefully some of you, if not all of you, had a chance to read the proposed plan. It is on our website and, as I said, we do have some copies that I can hand out to you at the end if you would prefer just to have a written copy.

So this is a little bit different. This is a lot different actually than our normal meetings. Normally we have a stenographer. This is a formal public meeting for EPA and this is something that we have to do whenever we're presenting a proposed plan, you know, for the public and for your input and for your comments. So what we do in a situation like this is we have a stenographer, or in this case, a videographer to -- Joe will video the whole meeting and then when you -- at the end of the presentation when you come up to ask your questions, you know, he will video you also. But we'll talk a little bit about how we're going to handle that after John finishes his presentation.

So after this meeting the next document that you receive from the EPA is called the Record of Decision. We call it a ROD and what it is is actually the legally binding document that states how EPA plans to go ahead and clean up the site. That is only after that we have a chance to look at your comments. All those comments will be taken and put into what's called a responsiveness summary which is a document that will also be available to you and all of this will be posted on our web page and that's what we normally do. Sometimes the towns run it, have it posted too, and I will certainly check with them to see if they would like a link to that Record of Decision. And I'm sure they will say because Old Bridge I have to say is really very cooperative, very nice in helping us set everything up, so I'm sure they'll want to post that on their web page.

The other thing I want to mention is the comment period. There is a 30 day comment period that started on April 24th and it will end close of business on May 24th. So if you leave this meeting tonight and you think of other questions or comments, you can either e-mail or send it to John directly through snail mail, your comments, as long as we receive them by May 24th, close of business, they'll be included in the responsiveness summary.

One other thing I did want to ask, if you wouldn't mind, if you could let us get through our presentation and wait for questions until the end, we would really appreciate that. I know sometimes it's hard, you have this question you want to ask, but a lot of times those questions are answered during the presentation. So that might be a better way to go if you don't mind.

We'll post this presentation on the web page also probably in the next couple of days once I get the final version and John sends it to me, I'll have our IT people post it.

So with that, let me turn this over to John for the presentation.

MR. OSOLIN: One thing I'd like to add to what she said, is on our website and also in the proposed plans that we will have them back at the end of the night, we have all the contact information you need, both the website, the repository, the -- my address, my e-mail address and my phone number. So any of that information you might need.

Okay. My name is John Osolin. Like I said before, I'm the project manager for this site. I'm going to take you here through a presentation tonight.

We're going to start with the history of the site. I'm going to show you how the site came to be, what has taken place over the years. And then I will take you through the investigation, show you how the site was investigated, what we -- how we made the determinations we made and then introduce you to EPA's preferred plan.

So let's get started. The CPS site is made of up of three areas. The CPS Chemical site, the Madison Industry site and the Runyon Watershed.

The CPS site is a 30 acre site. It has a plant area, a former plant, there's a 6.7 seven acre area and that is in the western portion of the site. This plant operated from 1967 to 2001. Over that time they made organic chemicals that are used in oil field -- as oil field chemicals, as water treatment chemicals, as lubricants and other organic chemicals. They also did solvent recovery on the site and that is how some of the contaminants came to be there.

The Madison Industry site is a 15 acre site. It -- they have operated from 1967 to the present. They're still in operation. They produce inorganic -- inorganic chemicals for pharmaceuticals, for food additives and fertilizers. They also have another sister company on the south end of the site which is Old Bridge Chemicals and they produce zinc salts and copper sulfates.

The Runyon Watershed is down here. It contains the Perth Amboy supply wells, Perth Amboy well field, these are three of the five wells on the Perth Amboy well field, PA-5, PA-6, PA-7. They lie about 3,000 feet southwest of the companies and the well field produces about 5,000 gallons per minute and that -- that water goes through a treatment plant and then goes to the public.

In the mid '70s there was a series of wells over here, supply wells called the Bennett suction line. These wells were -- came impacted from contaminants that came from the site and had to be shut down and the wells were moved to where they are now as a result of that.

Next. So in 1979 after the Bennett suction wells were closed down, the State Court ordered the companies, CPS and Madison to do remedial investigation to look at the extent of the contamination in the well field and on their sites.

In 1981, as a result of that investigation, the companies were asked to implement the groundwater remediation program. At about that time the site was brought to EPA's attention and EPA listed it on the National Priorities List or the Superfund List in 1983.

Getting on the Superfund List allows EPA to spend money on investigation of the site.

Next. In 1991 and 1992 the companies placed wells downgradien of their facilities in the Runyon Watershed. There were six wells, three wells from each company. These were recovery wells. The purpose of those wells was to pump and treat the water to reduce the contamination that was coming off the site, capture it as it's coming off the site and prevent it from reaching the Perth Amboy supply wells.

In 1993, between 1993 and 2000, the water around those six wells began to achieve the clean up goals that were set to them and those wells were moved up gradient and eventually onto the sites of the properties of the two companies where they are now. Those wells are collectively known as the interim remedial measure wells or the IRM wells. Then in 2001 the CPS chemical plant closed.

Next. So to give you an idea what's been going on since the site was discovered, the State has been working, as we've said, there's court orders out there, these IRM wells were put in place. I would like to show you a picture of what exactly has been undertaken in that time.

So this picture, you can see CPS up in the corner here and the Madison site right over here, and again, the wells are down in this area. You can see some monitoring wells here. The yellow area represents an exceedance of the groundwater standard for chlorobenzene. And this is the plume as we see it in 1994.

Next. In 2004, after a lot of pumping, the plume is now been shrunken and is now up closer to the sites and further away from the wells. So as you can see, this plume and any exceedance of groundwater standards is well above where the water -- the water wells are.

Next. Now, in 2014, once again, we see shrink -- the shrinkage of the plume and the plume is just barely coming off the properties, the two properties. And that is the chlorobenzene plume. I chose -- well, I chose a lot of these chemicals because they were extensive plumes. Some of the other smaller plumes and I wanted to show you the maximum extent of the contamination.

Next. Another example is benzene plume. Now, this is where the benzene plume had looked in 1991, and you can see the yellow area is the area of exceedance.

Now, the yellow area is very close to

the wells. Very shortly after discovery of this, they did find they had an exceedance in one of the wells down in the Perth Amboy wells but because of the pumping, that lasted -- that didn't last very long. We actually had placed a stripper, a carbon stripper on the Perth Amboy wellhead and that was never used because we pulled back the contamination and it was -- it wouldn't have been effective because the -- it wasn't going into the well. So it still sits there. It's unused. If ever we needed it, it would be used. But -- and in 1991 that's the way it looked.

Now, this is 2002 and you can see the orange area which represents the higher contamination is up closer to CPS and you can see that it's -- it's starting from this area on the CPS property which was a former process facility and it's being pulled back.

Next one. In 2016 you can see that it's been pulled back quite a bit and it's even further and it continues -- those wells continue to pump today and it continues to shrink this plume.

Next. So now this is the zinc plume. The Madison property produces metals chemicals, metals and their contaminants are metals-related. So the zinc plume is emanating from the Madison site here and that has reached down into the well field, in 1996 reached down this far.

In 2004 you see it has shrunk back a little, and in 2014 even further and that continues today. So this represents the exceedance of zinc in the well field that we pumped. And as you can see, we have a fairly extensive -- this well -- this and this are -- the Perth Amboy wells, but all these others are monitoring wells and that's just part of it. I forget the total number of wells that we have in there to monitor this. It's very extensive.

One of my colleagues couldn't believe how many wells we had in this well field.

So in 2003 NJDEP or New Jersey Department of Environmental Protection requested that EPA take the lead role. When the site was listed, it was listed with NJDEP lead.

So for cleaning up the Superfund site, EPA took the lead in 2003 and in 2005 EPA entered into an order with Ciba Special Chemicals who had -- bought the site from CPS. And the order required Ciba to investigate the site, investigate the source areas of these contamination and come up with a plan to -- to clean that up.

In 2009 BASF purchased the property from Ciba Special Chemicals and they became responsible for cleaning up the site. So they took the property and also took the responsibility of cleaning it up at that time.

In 2015 EPA entered into an order with Madison who was unable to enter into an order earlier and they are currently doing a real investigation feasibility study.

Next. In 2015 NJDEP changed the one four dioxane groundwater clean up -- groundwater standard from 10 to .4 parts per billion, that's a 25 fold decrease in the level that's allowable.

At the time, you know, this is in the

middle of the remediation that was going on, the plume looked like this. That was a one four dioxane plume of ten parts per billion, and as you can see, there's nothing leaving the site. At ten parts per billion, there's nothing that exceeds the standard off the site.

In 2016 DEP declared that the Runyon well field was IEC which is Immediate Environment Concern, and as such, the BASF is required to delineate that plume to .4 now to see all the area that's included in the .4 plume, as well as come up with a plan how to address that plume and they're currently doing that.

Next. This plume the -- the orange plume represents the .4 plume. And now, you know, that's -- you can see that that -- that's much more extensive and it does reach down to three of the five wells in the -- the -- the Perth Amboy well field.

Now, what we're doing here today is we're doing a remedy for the source area up here and we're cutting off the source, we're removing that source from going down further, however, the companies are required under this IEC to address the -- the groundwater in front of these wells, to prevent it from getting into these wells, so they -- currently BASF was working with the State of New Jersey and they are working on putting treatment before those wells at this time. So this is a two -- two-pronged attack, two pronged approach at addressing the groundwater here. One, to get rid of the sources, and the other to protect the wells until the source area can be removed. One more.

Next slide. So this slide I'm zooming out to give you a better picture of the Perth Amboy well field. Again, we have the CPS Chemical site right here. Madison is right here. If you remember the plume that you saw in the last slide, that's right here. And you see the Perth Amboy well 5, 6 and 7 over here. Those are the wells that we saw in the previous side.

We also have in this slide we have -- PA-8 which is not affected by the plume and we also have the Ranney well that is not affected by the plume.

Now, this is important because at this time we are taking a lot of water from the Ranney well.

As I said before, 5,000 gallons per minute are coming out of this water field, the well field area and the Ranney well supplies approximately 4,000 gallons per minute. So if you do the math and you add in the -- they have to add in some of the wells over here to that well to get their water, but by the time it is pumped out and goes to the treatment, by the time it gets into the public supply system, it meets standards.

So this issue right over here is being handled under the State with the companies. Like I said, we're looking at putting wellhead protection there and EPA with this action that we're talking about today is addressing the source areas and the plumes that are coming off those source areas.

Next. So we went through the history, we went through -- we're going to look next at the investigation that we did. We're going to look at the way we came to the conclusion of -- that our preferred remedy was the best remedy for the site.

So to start with, very early on in the site, DEP and EPA got together and decided that using a phased approach was the best approach for the site. We do this on most sites. We divide it up into the phases. We call them operable units.

Operable unit 1 is site-wide groundwater. That is being addressed under this proposed plan. Operable unit 2 is the soil contamination on the CPS property, that's the organic contamination, the source of that organic plume, but the site-wide groundwater addresses the contaminants, both organic and inorganic.

These two operable units, 1 and 2, are the subject of this proposed plan. Operable unit 3 is soil contamination, mostly metals on the Madison property, that will be addressed in a future opposed plan.

Next. So we did remedial

investigation, the purpose of our remedial investigation is to look and find out where -- what type of contaminants are on our site and where they are located.

We have a list right here of all organic contaminants that are found in groundwater and also inorganic contaminants that are in groundwater. I won't begin to list these. I don't want to take up too much of your time. They are in the proposed plan. You'll see a list of them. But this -- these are the chemicals that we found on site. In -- we have looked in groundwater, we looked in soils, we looked in surface water. We looked all over. This is what we have found.

To give you a better picture of it, I'm going to go back to the -- the slides with the -- the groundwater contamination and I'm using benzene slide to give you an idea what the plume looks like in benzene. As you can see, the source is on the CPS site and it moves down towards the well field.

This is the zinc contamination and, once again, that starts on the Madison well field, goes into the well field. There's another plume out here that is actually down towards the well field. That is actually treated. In Perth Amboy they have a -- they remove the metals and that is actually removed in the Perth Amboy well field. But our intent with this -- with our actions here are to cut off the plume, to keep it from going down there and also eliminate the sources eventually so that we can turn this off and then -- and we no longer have to address the zinc and the -- organics.

Next. So when we looked at the CPS -- the contamination on the CPS property, contamination in the soils, on the property were mostly volatiles and semi-volatiles, you see a list right here. I am not going to read through the list again. I'll show you a slide to show you where they are.

These chemicals act as a source of contamination and could also be a potential contact hazard. So we took -- we took a look at those.

Next. These are rather located in a

small area. This is the CPS chemical site. This is the edge of the Madison facility, the Perth Amboy well field would be down here somewhere.

That's Waterworks Road going through the top there. The red areas over here, there's two areas that are -- surrounded by the red checkered line, those are the areas of contamination in the soil.

The first -- the smaller one up here is the loading dock where they unloaded and loaded things onto rail cars. That is the area we believe most of the one four dioxane that comes from this site is located and then we have another area over here which is under the former process facility for the tank farm that they had there. That also contains these volatiles and most of this area was never actually used. This is the plant facility, so you will find nothing out here.

We've investigated, we've done samples all over here, groundwater and soil samples and found nothing out there and this is an office building, so there really isn't much here. It's mostly in this plant operation area that we're finding it.

Next. So once we found that we had chemicals on site, we had to look and see are these chemicals -- do they have potential to address -- to affect both ecological and human health. So we did an ecological risk assessment. The ecological risk assessment did not identify any ecological receptors that could be affected by the contaminants at the site.

Next. The human health risk assessment, however, showed that there were unacceptable risks associated with future exposures, potential exposures at the site in both groundwater and soils. By future exposures, we're talking about we look at exposure scenarios and some of them are current -- current day exposures, things that are actually happening today. We didn't find any of those, but there's potential for like say a site worker who's digging in the soil to come in contact with it. There was a potential for somebody to drink the groundwater. These exposures are what is represented here. But -- and they show that there was a potential for unacceptable risk. As such, EPA has to take an action on the site to address these risks.

Next. So EPA put together clean up goals based on Federal and State MCLs and various criteria and we picked the most stringent of them and we put together clean up goals for both groundwater, and again, I'm not going to read through that list and read the numbers to you. It's in the proposed plan. You can read that yourself.

Next. And we also put together clean up goals for soil. So the clean up that we're going to do has to address both chemicals on the site to the levels that we are -- we have here. These are our clean up goals.

Next. So I'm going back now and we're looking at the groundwater. EPA and the State and BASF determined that it -- probably the best way to address the site contaminants was to look at the contaminants in groundwater separately for two reasons. We have a source area on the CPS site that is, you know -- is over here and we have a source area on the Madison site. They're both separated, they're both spacially located in different spots. It's better to, you know, try to cut it off right near the source. So it would be -- better to place a remedy over here and for the Madison to put something over there.

The second is that there's no chemical -- there's nothing that we can do that will address both organics and metals, at the same time we have to put different processes in place. So it doesn't make sense to go out of our way to combine these things in one plant because there -- you know, you are going to have two separate systems anyway within that same plant, so we might as well put the systems where the contamination is.

So we decided to split the groundwater into two sections and I'll show you why that's important here. So when we did the feasibility study, we have to look at alternatives.

A feasibility study basically looks

at all the processes that will address the contaminants at the site. We look at, you know, for organics there's carbon, there's in situ chemical oxidation. There's all these different methods which you can use to destroy or reduce organic chemicals. We also have, you know, different things that will address metals.

So we looked at all these things and we put them together in alternatives and we evaluated those alternatives. For this site we're going to pick three alternatives because we divided the groundwater into organic alternatives and inorganic alternatives and then we have the CPS site soils as the third remedy that we have to choose.

So once we put together all of these alternatives and we're trying to evaluate them, the way we evaluate them is with EPA's nine criteria. The first two criteria of the nine criteria are threshold criteria, those -- every remedy that's going to be accepted has to pass. All the ones that come through those first two criteria are evaluated by the next five criteria, the balancing criteria, those tweak out the little differences between them and which -- which they work better with these chemicals on our site which are -- you know, have the small footprint. We look at all the different possibilities and decide which is the most appropriate for this site. And then we put it into a proposed plan and we put it out to the public and that's where the last two criteria come in, they are the modifying criteria, that's State acceptance and community acceptance and we go to the State and we go to the community, that's what you're here for, and we ask for comments, we ask you to look at what we're doing and give us comments. We'll address those comments in our proposed plan responsiveness and summary, and then based on those comments and the feedback that we get, we'll choose a proposed plan.

So these are the preferred alternatives EPA came up with. I'm not going to read them to you right now. I have slides to explain each of them. But there are three alternatives for each of the -- two for the groundwater and one for soils and they are a total -- at a total cost of $23.3 million.

Next. The first alternative, the alternative for groundwater is a permeable reactive barrier employing chemical oxidation. I'll explain that.

This again is a map of the corner of the CPS, this is even a closer look at the site. Just that you remember these -- this polygon over here and there was another one over here. This is the source area. This is the contaminated soils on the site. So the contaminated -- these represent plumes coming off of that, that source and what we have here is a series of wells that are along the boundary line between CPS and this is the Madison property, the watershed would be down here. These are a series of wells and -- the circles represent an area of influence for each of those wells. This is not totally accurate, I mean that area of influence, we may have more wells are required. We may have less wells, but the -- there will be overlapping areas of influence.

The groundwater -- the contaminated groundwater flows through this area and we pump chemical oxidants in the ground. They can be ozone or peroxide. There's several other oxidants. We're looking at ozone and peroxide right now. And they will be pumped into that area and the -- as the water flows through it, those oxidants will oxidize the organic chemicals and break them down into hopefully harmless chemicals like carbon dioxide and water. That is what we expect to happen here that -- it's been effective on other sites and we think it could work here.

However, we have a contingency remedy right here. In case we get out there, the -- the pump and treat that we have ongoing, we're not going to stop that when we put these wells in and when we start pumping this chemical in.

We're not going to stop pump and treat until it's determined that this is effective. We will have monitoring wells on both sides to monitor what goes into that wall and what comes out of that wall.

So we're going to make sure that

works and then we're going to slowly start backing off of the other wells and make sure that that can take the load of the contaminants coming through.

So we have that as a backup. If, for whatever reason it's not working, we can go back to the pump and treat that already was there and we would be adding more wells and we would be adding more treatment for one four dioxane to make sure that we've got full capture of this and that's our contingency remedy.

So that's the first, the organic remedy that we prefer. That's our preferred remedy for the organics and groundwater.

Next. For metals we chose continued operation of the Madison pump and treat system. Madison pump and treat system has been very effective in pulling it back. We have wellhead treatment at the wells, that is intercepting anything that gets down gradient. We see no reason to change this at this time.

We will be addressing the source area in the future and we hope -- our intent is to be able to turn off this pump and treat once we've removed the sources, but at this time, we are going to continue operation at the Madison pump and treat with modifications. This pump and treat has been modified over time and we can plan to continue to do that.

Next. So the EPA's preferred alternative for the soils is chemical oxidation with soil mixing.

Now, this is very similar to what we're doing with the down gradient water, except one of the problems with getting it in soils is that you need to get the oxidant to where the chemicals are if you have, you know, if you pump it in and it goes preferred pathways, you can lose it. So what we're doing is we're -- as we're pumping in, we're either augering it or we're mechanically mixing the soils with the oxidant and that will kill -- that will destroy the organic chemicals there. And that whole time we will have the other remedy in place and that will never be turned off until there's nothing coming out of this area.

So what we will be doing is this red area over here, the loading area, we plan to excavate, it's a shallow area, we plan to excavate it and to bring it into this area to be treated with oxidation and mixing and we also have an area over here that's around a sewer line, is in an area that's a little difficult to get. Now, we hope to be able to address that and get as much of that out and it put it over here, but if there is some that's left there, we may have to put the chemical oxidation -- chemicals into the ground to address it in place and we may not be able to mix it, it is not ideal, but it's better than nothing and it's -- we're going to do whatever we can to get them out into this area, but that's, you know, that's our alternative.

So that's the EPA's preferred alternative for the soils on site and now we open it to questions.

(The presentation concluded.)

MS. SEPPI: So thank you, John. Thank you very much. And thank you for your attention. We do appreciate it. I know sometimes it can get a little technical and I hope the slides helped.

Now, Joe, because we usually have a stenographer here, this is going to be a little bit different now. So, Joe, what is the best way for you to, you know, handle the questions?

VIDEOGRAPHER: If it isn't too much trouble, if one by one if you can come up, grab the microphone, and state your name for the record, and then proceed with your questions.

MR. OSOLIN: The comments that you make here will be put into the record and will be considered for -- you know, we will respond to them in our responsive summary with the record decision that we put out. So feel free to -- you know, there's no question or any concern that, you know, we don't want to hear. Come on up.

MS. SEPPI: Come on up.

MR. OSOLIN: She can stand at the side if she wants --

MS. SEPPI: You can stand right there.

MR. OSOLIN: -- if she doesn't want to face the front.

MS. SEPPI: We just want to make sure everybody can hear your question.

MS. HUBBERMAN: Can you hear me? Can you hear me? Okay. Good day. My name is Sharon Hubberman and I do appreciate you coming and doing this presentation. It's very informative. I do have some questions though.

MS. SEPPI: Sure. That's why we're here.

MS. HUBBERMAN: If I'm a little repetitive --

MS. SEPPI: No, no.

MS. HUBBERMAN: -- it's because I'm trying to gain a broader understanding --

MR. OSOLIN: Sure.

MS. HUBBERMAN: -- of what's being done. Okay. Now, you have informed us that you would be forming a reactive barrier. From my understanding, this reactive barrier would go on the two sites which is pretty much causing -- you know, that you said you wanted to put wells to form a react -- like to prevent the future contamination, kind of like hinder it, put a barrier there --

MR. OSOLIN: Yes.

MS. HUBBERMAN: How many wells are you planning, approximately?

MR. OSOLIN: It all depends on the influence of the well. I mean, we -- a normal well radius influence I'm guessing is about 15, 20 feet radius. And we overlap those wells so we put them -- you know, say if they were 20-foot radius, maybe we'd put them, I don't know, 15 to 20 feet apart so that they would overlap. And then you pump the contaminate in.

It spreads out and so their fingers are into each other so that they're overlapping. So you have a whole wall of this oxidant in the ground. And as the contaminants move through, it comes into contact with that.

MS. HUBBERMAN: Okay. Regarding the restrictions that you're looking for that you will be placing or the types of activities on this site, what are they? What are these restrictions? What are the activities that are going to be restricted during this cleanup and how is that going to ensure that in the future, there's not further contamination from these sites, whether they're still active or inactive?

Like I said, one of them is inactive but it sounds like one other site is still active. So I just want to hear from you what are the restrictions --

MS. SEPPI: On the site?

MS. HUBBERMAN: On the site.

MR. OSOLIN: The site is being handled -- the Old Bridge Chemicals is actually a RCRA site. That means it's an active facility that's being addressed by our RCRA program, EPA's RCRA program. The other -- the CPS site is closed but there is a potential that it could be used in the future once this is cleaned up.

But those sites are, as all chemical sites in New Jersey, are being overseen by NJDEP and to some extent EPA. And those have to follow very stringent laws that prevent this kind of thing from happening. Quite frankly, when a lot of this was happening, there weren't the laws in place to prevent this from happening.

And now they regularly get visits from people from NJDP from EPA to make sure that these chemical companies are operating under the guidelines and preventing them from causing contamination like that. And the laws that are put in place also are a negative thing.

I mean, any company does not want to end up on the hook for one of these cleanups. They're very expensive; 22 million dollars. It's a lot easier to handle your chemicals when you -- if you know that that cleanup is going to come and -- you know, you're not going to dump it on the ground. You're not going to do the things that have been done in the past.

MS. HUBBERMAN: Okay. Moving forward with that cleanup, now, you indicated that there are wells that are on the Runyon which is down gradient to where the plumes are impacting. There's some sort of impact there.

My question is, is there going to be some sort of like restrictive barrier or a mechanism where it's going to take a while? I mean, from my understanding, there has been problems with this site going back to the 1980s upon which the Court mandated a cleanup and then the companies went and tried to appeal it and it's been -- I mean, this is many, many years of plumes impacting the site.

So as a resident in the neighboring town, even for the residents of Old Bridge, I would imagine that those toxins or those chemicals, whether organic or inorganic, they accumulate and compound throughout the years. So being that our water well is down gradient, I mean, I'm not a hydrologist or anything but common sense would say to me that when it rains or pours, it would tend to move or seep.

So are you going to also put a barrier to help, you know, protect those wells? Because it seems when you were showing the different stages where you had the six wells, that kind of helped make the plumes smaller. So in this case, I mean, we're talking the dioxane which is cause for concern.

And recently, we received a notice that we also had a TTHM which is, you know, the chlorine into the organic material. So as a resident, I just -- I would like to know what else would you be doing to immediately address that versus waiting many, many, many years for efficacy?

MR. OSOLIN: Well, first of all, I would like to characterize -- I wouldn't characterize it as we've waited many, many years. The pumping and treating has been ongoing since 19 -- the 1990s and that has been -- they've been very active in doing that.

When the site was first determined, discovered, the wells were shut down -- the impact of the wells was shut down. Wells were moved down gradient. The companies were required to pull well head protection on those wells. And we protected the wells so that they didn't get impacted by the contaminants from the site.

And we also worked at pulling back the plume. Under the state, the companies worked with the state to pull back the plume. So we weren't getting contaminants in the wells. What we found -- one thing, dioxane is a relatively newcomer on the site and then the change in the standard also -- you know, we -- it was being cleaned up to the standards at the time.

And now the standard changed and we find that it's at levels -- at low levels. It's fairly low levels down near those wells but it is at levels above the standard. And as I had said before, the company, BASF, is working with the state and they're putting a protective barrier in front of the wells that will also use this chemical oxidation method to knock down the contaminants so that it's safe to drink. And with the mixing that is going on, the water that reaches the public is safe to drink.

MS. HUBBERMAN: On that matter of the chemical oxidation, so you had mentioned that the reactive barriers would utilize the chemical oxidation upon which would either be ozone or peroxide, word specific, specific to that.

It's my understanding that ozone does have a direct impact to individuals who have breathing difficulties or ailments. And my concern is, you know, when you conduct some sort of cleanup, it's going to release or not -- I don't know --

MR. OSOLIN: We would monitor

that. That's part of the operation. We won't allow that to happen. We're pumping it into ground water and the intent is for the oxidant to be used up before it leaves the ground more. So you won't have the opportunity to breathe that. It will be down below --

MS. HUBBERMAN: So there's going to be a filter in place and some sort of air monitor in place on that area to make sure that it's not released into the air?

MR. OSOLIN: We'll be monitoring to see that it doesn't come out of the ground but the filter will actually be the ground water, the ground --

MS. HUBBERMAN: Has there been any consideration regarding like a carbon filtration system? Which I know you had said there's both organic and inorganic. And per my understanding, you're not utilizing this same kind of treatment to address both.

So I also know that carbon filtration, which isn't pumping a chemical, it's more of a natural state, does address the organic material, perhaps not the inorganic which is the chemicals, but I would like there to be at least some consideration given to that aspect mostly because the dangers that I feel with engaging in the ozone or adding chemicals, it still incurs a risk. We don't know what that risk is.

So, you know, as a resident, I think it would be very important at least to me, and I don't know if I can speak to other individuals, that we do our best to mitigate not only the current risk and the infiltration of these chemicals but also what could possibly, you know, occur. And then the last is how do you intend to oxidize the soil? I don't understand that part.

MR. OSOLIN: Okay. So these chemicals are in the soil just like the oxidants will interact with the water and, you know, the oxidants are put into the water and they will interact with the chemicals in the water. If you put these oxidants in the soil and mix them, they're going to react with the chemicals that are in the soil.

MS. HUBBERMAN: What type of oxidants would you be --

MR. OSOLIN: Peroxide, --

MS. HUBBERMAN: So the ozone?

MR. OSOLIN: Ozone, yeah. I mean, there are other oxidants and they are very effective. They've been used across the country. This isn't the first time this is being used and they are very effective. And with the proper cautions, they can be made very safe.

MS. HUBBERMAN: Okay.

MR. OSOLIN: It certainly wouldn't -- if we found in the -- you know, this is going to be started out on a very small basis and gradually widened until we're sure that it's working correctly, we have no problems. It's not going to be just like overnight turned on and we're going to turn off the ground water pump and treat system which does use a filtration system similar to what you're talking about.

We're going to slowly turn on this system and work through the -- any hiccups there might be. And by the time we get it running at full capacity, there should be no problems with it.

MS. HUBBERMAN: You cited efficacy rate. So that efficacy rate has been done under the control of the EPA and other Superfund sites? Like did you utilize this proposed process in other sites that had similar contaminants?

And based upon that result, is that open to the public or -- 'cause what I would like to be very clear on is that this proposal of the two measures that you're looking to implement, whether this is a test or whether this is based upon science that has been reached upon through your action somewhere else. So if you could just --

MR. OSOLIN: We can answer that question. And, yes, that has been done. We have sites that have used this.

This isn't the first time this has been used. And all these processes that we use to clean up sites are evaluated by EPA in test studies and stuff like that to determine --

MS. HUBBERMAN: Is it available --

MS. SEPPI: You know what we can do? I mean, I don't think we know that right off the top of our heads what other sites, --

MR. OSOLIN: We have a few sites.

MS. SEPPI: -- but we could certainly -- we have other sites and they may not even be in Region 2. We have, you know, ten different regions across the country that we talk to all the time when we come up with these methodologies. So what we'll do -- and you left me your e-mail?

MS. HUBBERMAN: I'll give it to you.

MS. SEPPI: Okay. Or put it on the sign-in sheet and we'll check into

that and we'll get that information back.
Thank you.

MR. OSOLIN: One of the things that we do when we look at technologies that are presented to us, we look for other sites where they've been used. We look for tests that were done. We look for things that -- and we don't propose something that we don't feel could work. And, you know, obviously it's going to be addressed in the utmost of caution.

MS. SEPPI: And you had very good questions.

MR. OSOLIN: Yes.

MS. SEPPI: We appreciate that. Are you a science teacher?

MS. HUBBERMAN: No.

MS. SEPPI: It sounded like you were definitely.

MS. HUBBERMAN: I work in finance. Well, I used to work in finance. Not anymore.

MS. SEPPI: Wow. Well, very good questions. Thank you.

MR. OSOLIN: Very good questions.

MS. SEPPI: Yes?

MS. BROWN: Hello?

MS. SEPPI: That's just for Joe.

MR. OSOLIN: Yeah, it's just for the --

MS. BROWN: Oh, okay.

MR. OSOLIN: He's a court reporter.

MS. BROWN: Okay. I don't have nearly as complex questions so don't worry. I'm actually, as you know, the Councilwoman for Ward 3 where the site is actually going to be getting worked on and I want to make sure that I just ask these questions on behalf of the community that will be probably most effected.

So it looks like from what you've stated here today that there is a potential for water to be contaminated in the future but that's not currently the case? Is that what you're saying? Or is there currently contamination in the water?

MR. OSOLIN: Well, there's currently contamination in the water in the well field.

MS. BROWN: Okay.

MR. OSOLIN: But by the time it gets to the tap, it achieves standards, acceptable standards.

MS. BROWN: Okay.

MR. OSOLIN: So you're not in danger from the water that comes off of the -- out of the Perth Amboy well field.

MS. BROWN: Yeah.

MR. OSOLIN: 'Cause we have mixing that occurs. We mix with the clean water. And we also have some, you know, other things in place that we have to -- the pumping that's going on and everything. So there's very little water getting to those wells. And once it's mixed, by the time it gets to the public, it's safe.

MS. BROWN: Okay.

MS. SEPPI: Do you want to --

MR. NACE: I can -- I'm Chuck

Nace with the EPA. The future that he's potentially talking about with the exposure is we assume that if that site were redeveloped or if someone would drill a well on that site and drink the water from that well, so that would be putting the well right in where the highest contamination is and drinking that without treatment. And that's where the future risks would be if someone were to do that.

So we want to make sure we come in and clean up the site so that that won't happen in the future. So that's the future potential. It has nothing to do with the well going down, down gradient, and it's actually on the site itself.

MS. BROWN: Okay. There is a very common belief which I'm actually surprised there's not any -- I don't think there's any constituents here from this ward, but I think there is a perception that contaminants cause, you know, various diseases that are going on right in this area because of the Superfund site.

So, you know, I wanted to, you know, kind of clear that up, you know. Obviously, people are really concerned. People find that if they get any type of cancer or disease, they really do believe that it's coming from contaminants that are being leached through the soil and the water over in this site.

So I just want to relay their fears. I mean, I don't know if this will but I definitely want to just ask on that behalf. So you are 100% sure though that by the time the water reaches the tap, it's completely safe?

MR. OSOLIN: Yes.

MS. BROWN: 'Cause I know they test the water but I know there's things that always get through.

MR. OSOLIN: And, you know, is there contaminants that come through? I mean, at a very low level of course. And there's no drinking water anywhere in the world that don't -- doesn't have some level of contaminants. But these are tested. The testing is available.

The numbers that we use to evaluate this are very, very conservative and you're talking about in order for the number that we're talking about, the 0.4 plus -- and, Bill, maybe you want to talk to this, but it's based on a lifetime of drinking, 70 years of drinking that water every single day.

So it's not like you're drinking -- you know, you're grabbing a glass of water and you're going to get cancer. You would have to drink from water contaminated at that level for 70 years every day.

MS. BROWN: At the current level?

MR. OSOLIN: No, at the level that we're cleaning up to.

MS. BROWN: That you're cleaning up to. Okay.

MR. OSOLIN: Where we're going with it.

MS. BROWN: So you're saying if someone was to drill and actually drink water from that specific area of the site, then they would be affected much more harshly than if they were away from it? 'Cause --

MR. NACE: Right. Because the concentrations are so --

MS. BROWN: Right.

MR. NACE: -- much higher. So it may not take 70 years of --

MS. BROWN: Right.

MR. NACE: We base our cleanups and our drinking water standards on protecting people from long-term chronic exposure.

MS. BROWN: Okay. All right. That was it. Thank you.

MS. SEPPI: Thank you.

MR. OSOLIN: Thank you. That was a good question.

MS. SEPPI: That was a good question. And I have to say, you know, that's one of the number one questions that we always get is are my -- you know, I'm living close to the site. Does that have anything to do with the illnesses?

So please if your constituents have any questions, they can certainly call John or me and I'll -- you know, we'll get the answer to you.

MS. BROWN: I'll post the link for the proposed plan. I'll do that.

MS. SEPPI: Good. Okay, great. Thank you. Thanks for coming tonight.

Here you go, sir.

MR. MAKIEL: Thanks --

MS. SEPPI: You're welcome.

MR. MAKIEL: -- for listening to my concerns. One of my concerns is --

MS. SEPPI: I'm sorry. I don't mean to --

MR. MAKIEL: Vincent Makiel.

MS. SEPPI: Thank you.

MR. MAKIEL: One of my concerns is obviously over the years, 32 wells have been closed. I think that puts a little bit of a stress on the community finding resources. There are such things as droughts. There's such things as developments. This site actually was, not too many years ago, considered for development.

I think any thought about restrictions should say we should remove the companies in some way and use the facilities they have to get back into what's a watershed for people to drink, not for development, not for other things.

I'd also like to present to John, this is 2019. This was given to the homeowners. Triarylmethane levels were above the allowable limit. That's not my imagination. If you read this, this is actually in Spanish but Mr. Perez can give you it in English as well.

But the residents of Perth Amboy, a lot of them are Spanish, we'd like you to talk to them too. So my reason for giving that is during the course from August of last year, there was a pump installed, four million gallons from the Runyon well. That pump, from what I understand, broke. And so it amounted to them trying to get a new pump for this year.

I think they've used at least two pumps in a period of less than a year. So that entails the limited amount of wells. I'm no mathematician or scientist but the stress on trying to find clean water is definitely an element in this problem in this Superfund site. This has gone on. I'll give you a few details.

C.D. Smith Engineering service did a study for the city. 56,000 the city had to appropriate. I appreciate that amount in total. You said 22 million for that barrier. I believe it should be more.

Is there going to be anything -- any soil removal or any part of the site that's actually going to be removed and taken somewhere else and put some other material in there? Is that a consideration?

MR. OSOLIN: That was one of the options that we considered. This issue of soil mixing and chemical oxidation should address that in cleaning up soils so that these chemicals are destroyed.

MR. MAKIEL: But you state in the press release you're going to do studies over five years to see that it's actually working. And I think that that shows that there's some other elements that could arise in terms of organics or other elements on the site. Madison Industries is producing. You said other sites or other part of the sites would be development.

I think the restrictions would be to remove the industries from the site. They've been there too long and we need to have drinking water for Perth Amboy. In the press release, it simply states numerous times the city of Perth Amboy or Perth Amboy. And the way you actually put that in words seems like Perth Amboy is next to the watershed.

No, it has to go through miles and miles of pipes which involve future infrastructure cost which the city of Perth Amboy has to allocate appropriate funding in the future. I think the young woman who stated that the carbon plan -- to have a carbon infrastructure plan put into the site is a proper movement to protect the site for the future.

Not that it's going to -- that your scientific study to remove the oxidant isn't something that you're doing but I think that to protect the public is important. During June, the city appropriated and they recouped $500,000 for the CPA Madison Superfund site by ordinance supposedly. Was that money provided to the city yet of Perth Amboy?

MR. GUARNACCIA: I missed that point. What was that?

MR. MAKIEL: In June, appropriation of $500,000 for the cleanup of CPS Madison Superfund site and the city council told me that that money would be recouped from BASF. Has that money been provided yet or is this going to be five years from now when the testing's done?

MR. GUARNACCIA: I'm not aware of that particular number but we are working with the city to upgrade the treatment plan with pumps and we're making it -- we're at -- we're upgrading the system. And we are -- BASF is repaying the city for any costs associated with that.

MR. MAKIEL: Now, we're having this US EPA Superfund meeting --

MR. GUARNACCIA: We're doing that as we speak.

MR. MAKIEL: -- and that's your -- we're more or less studying this as a possible solution but we don't have a complete answer whether it's going to be a solution. For the people who have to drink the water, I'm not saying that your -- as a science or as a chemist your facts are right, but as a complete three, four decades of this site being a problem and you still stated that there could be other developments. Okay?

In May of 2018, the city entered into an agreement with BASF to address the Superfund issue. If I were to ask you what is your future in terms of the development of the site and your needs in terms of what kind of -- I understand you're into chemicals and what have you. Are you going to continue to use the site for chemical use? 'Cause I don't think that's a good idea.

If you're committing to a Superfund site, I don't think it's a good idea to keep using chemicals on the site. If I went down there right now, it's coming out of the smoke stacks. It's limited in terms of the accumulation. But over many, many years, that -- those fumes go somewhere. So is there any idea --

MR. GUARNACCIA: Well, from BASF's perspective, the immediate goal is to remediate the site so that it's protective of human health and the environment.

MR. MAKIEL: So that's under water?

MR. GUARNACCIA: Beyond that, it's -- there are -- BASF has no plans.

MR. MAKIEL: Okay. The last thing I have to say is I asked Mr. John one question.

MR. OSOLIN: Can I add one thing?

MR. MAKIEL: The 900 cubic yards that you say are going to be imputed back into the watershed area, are there other methods other than using that same material and implementing them back into the watershed?

Are there other materials that can satisfy the same thing that are cleaner -- that are proven to be clean not taken from an area that's been disturbed? You're calling this a Superfund site.

MR. OSOLIN: It is a Superfund site.

MR. MAKIEL: Right.

MR. OSOLIN: The contamination -- one thing -- can we go back to one of the slides?

MS. SEPPI: Do you know which one?

MR. OSOLIN: Let me see.

MR. MAKIEL: In your press

release, it specifically says 900 cubic yards would be put back into the watershed.

MR. OSOLIN: Okay. Let's do this slide here.

MS. SEPPI: This one? All right.

MR. MAKIEL: Just that statement is concerning to somebody. I've looked at some other Superfund sites and it doesn't look like they're putting back materials that are disturbed back into --

MR. OSOLIN: What we're talking about, the area we're talking about I believe, is the area over here where we're taking it out and treating it in an area with the other area, right? Is that the cubic yards?

MR. GUARNACCIA: Right. And it's what's in the plan.

MR. OSOLIN: What's going on here -- you're concerned with the contamination that's right over here. We've got a wall. We currently have a wall of pump and treat that is soaking up -- pulling up this contamination. A lot of what's down gradient here was down -- is contamination that was there years ago and is in the soils and slowly bleeding out. It will take time for that to come out.

We can't pull the small levels of contamination that are in that soil. We can't address that because it's -- it would be -- you'd be basically taking away the whole watershed and throwing it away for levels that aren't even impacting the wells at all.

But what we are doing is we are cutting off input to that to allow that to disseminate, to go away. We are also -- the two-prong approach that I talked about earlier, in the wells that are down here, we are going to have well head treatment.

So anything that remains in the plume over here that moves down gradient will be captured before it goes into those wells. So what the state is working on with the company and the company's agreed to work on is down here. That will protect those wells.

In the meantime, what we're doing is we're putting -- we're placing a wall here to prevent anything further from getting off the site and we are testing to make sure that wall holds up. Before we turn off the pumping wells which are pumping and treating and using carbon strips and being in carbon and all that, before we turn that off, we're going to make sure that this system is as effective if not more effective than the previous system.

And if that's not the case, we will be putting carbon and pumping treatment in this area. But we can test to make sure that nothing gets through this wall and that's the intent. So once this wall prevents any contamination from leaking our source area, then we're going to go after the source area. And this wall is not going to be taken out until the source area is completely remediated and we have nothing passing through that.

MR. MAKIEL: I see that's

part of environmental cleanup, providing a wall. I'm just stating, and I'll put it in writing, why you're taking 900 cubic yards of material and putting it back in. It seems like a cleanup should be taking that out and disposing of it in some way other than a watershed that people are drinking water from.

MR. PUVOGEL: The Superfund program has a preference for treatment when we approached this cleanup program. It's not just taking it out and putting it somewhere else in a landfill or something like that.

MR. MAKIEL: That's more expensive, right, --

MR. PUVOGEL: Then treatment is, yeah.

MR. MAKIEL: -- to put that in another area?

MR. PUVOGEL: Oh, sorry. Rich Puvogel, EPA. It depends where -- if you're taking it offsite, it depends where it's going and what type of landfill it has to go in. If it has to go into a specific landfill that's a hazardous waste landfill, it gets very expensive. And sometimes it's easier -- or not easier but less expensive to treat it onsite.

When you treat it onsite, there's less transportation of this material, long distances to the proper landfill, and you can treat it onsite and contain it better. But there's a preference for EPA's actions when we do these cleanup actions for treatment to destroy the compounds at their sources. That's it.

MR. OSOLIN: And many of the -- many of the contaminant problems we have in New Jersey are due to landfills that we took contaminates -- you know, that contaminates are in those landfills. Why would we want -- instead of destroying those contaminants, why do we want to add them to landfills?

MR. MAKIEL: Some of the major industries in Edison and other things, they actually removed and shipped them.

This is drinking water for communities. As you said, as your director or administrator said, the community -- if you're that serious about helping the community which is miles from here, then removal of the site should be a major -- removal of materials that happen to be disturbed should be a major consideration.

And that if infrastructure needs in the future for the city of Perth Amboy, if you read the budget for this year, it says people are going to be faced with fees as well as infrastructure costs in the future. That's miles from here down Bordentown Avenue.

So if they can be assured that at least their water -- materials have been removed and are clean now, that provides an emphasis for people to feel safer. So I think that that detail should be considered and more money should be spent to clean up the complete area, not use material that is already disturbed. That's my opinion and I'm a resident and I appreciate it.

MR. OSOLIN: We appreciate your comments.

MS. SEPPI: We do.

MR. OSOLIN: We appreciate your comments and we will respond to them.

MS. SEPPI: We will. And you know what? We'll have a transcript of your comments and your questions so you don't have to send everything in writing because we'll have all that. We'll have a transcript of it.

MR. MAKIEL: John has that letter.

MS. SEPPI: Right.

MR. MAKIEL: It was given to the citizens of Perth Amboy, to their homes. It's the ramification of needing multiple wells, not just relying on individuals or a couple. Thirty-two were closed.

MS. SEPPI: We'll have -- we'll see if -- we'll have that translated.

MR. OSOLIN: This doesn't have to do with the 32 wells that were closed. It has nothing to do with that.

MR. MAKIEL: No, it's trying to find cleaner water.

MR. OSOLIN: I read -- I read this thing and it basically said there was an exceedance in trihalomethanes. This was handed out by the well field and it was part of their transparency. But they also said that there was no --

MR. MAKIEL: For transparency, I communicated. It's the idea that they're looking for cleaner water in the Runyon Watershed. That's an idea that went from -- I'm not saying this because they wanted to find cleaner water. So I'm not talking about the -- the 32 wells just means you can't go there, right, in terms of --

MR. OSOLIN: Actually, the area that we -- the area where the 32 wells were, that was part of the area that was remediated with the IRM wells that I spoke to before, the wells that were placed in the Runyon Watershed to pump out that contamination and destroy that contamination.

They did a pump and treat. They pumped it out. They filtered it. They destroyed that contamination. And most of that contamination is no longer there so we did what you're asking. That's been going on for many years now with the companies and the state.

MR. MAKIEL: Basically with the current situation, I'd say organics as well. And I agree totally with what Sharon said that we need to be protective in terms of -- whether it be carbon filtration.

This was said by the representative of the company that provides a service. Carbon filtration in the future is a costly -- it's costly indefinite but it's something that is going to be protective of our health.

MR. OSOLIN: Now, wait a second. Are you saying the company that provides the water for Perth Amboy suggested that they need carbon filtration?

MR. MAKIEL: That could be

it. All I'm saying is that could be one element of helping us be secure that we're going to have cleaner water.

MR. OSOLIN: Well, I was out at the Perth Amboy water field. I went and I visited the Ranney well about two months ago. And I looked at what they had out there and we do have a carbon stack there that was put in by the companies that own CPS --

MR. GUARNACCIA: That's an air stripper.

MR. OSOLIN: Oh, I'm sorry. That's an air stripper. I'm sorry. It wasn't carbon filtration. That hasn't been used because the levels didn't warrant it. The levels that are getting there didn't warrant the use of the air stripper. The water is protected.

MS. HUBBERMAN: What is an air stripper?

MS. SEPPI: John, what is an air stripper? Sharon asked.

MR. OSOLIN: An air stripper

-- all organics -- I'm trying to think how to best explain it. All organics will volatilize. Basically, they vaporize --

MS. SEPPI: Disperse.

MR. OSOLIN: -- like water does and they go into the air. That could be a potential air contaminate. In many cases, it just, you know, it goes off and we don't have any ill effects from it. But what they do in an air stripper is they run it through these balls and various things that make turbulence in there.

And the turbulence makes the water -- the organics come out of the ground -- out of the water and we capture it in a -- I believe it's a carbon filter that they capture the stuff that comes off of the air stripper. So you create turbulence, you volatilize the organic chemicals, and then you capture it in a carbon filter. And so you're just basically taking it right out of the water. So that's how an air stripper works.

MS. SEPPI: Sir, you had a

question?

MR. MAKIEL: I'm responding to the -- when I said the carbon filtration is helping the community deal with the water is safer. There was a meeting that you discussed that as one element of the future needs for Perth Amboy. Plus, I heard --

MR. PEREZ-JIMENEZ: Let me clarify that.

MS. SEPPI: Sure.

MR. PEREZ-JIMENEZ: My name is Luis Perez-Jimenez and I'm the Director of Water Utilities in Perth Amboy. The company that he's referring to that supplies the water to Perth Amboy is USAPA. We have a contract with the city, a long-term contract and we operate and manage the utilities.

I've been working with Joe for a while now and this issue with carbonation. There was an exceedance in THMs and when I went in front of the council to talk about that letter that sent because this is considered a Tier 2 violation and under a

Tier 2 violation, we are supposed to submit or send a letter to each customer in Perth Amboy.

MS. RODRIGUEZ: I did not receive a letter.

MR. PEREZ-JIMENEZ: Excuse me?

MS. RODRIGUEZ: I did not receive a letter.

MR. PEREZ-JIMENEZ: If you give me your address, I'll make sure that you get one. We send letters to whatever addresses we have. The customers that we have, we send letters to those addresses.

MS. RODRIGUEZ: I've been a customer for many, many years since 1985.

MS. SEPPI: I don't mean to interrupt but if you could just say your name so we have it, please?

MS. RODRIGUEZ: My name is Maria Elena Rodriguez and I live in Perth Amboy.

MS. SEPPI: Okay.

MS. RODRIGUEZ: So, Mr.

Perry, you did not send every letter, the notification letter, to every homeowner because I'm here to tell you I have never received any kind of notice. I went to City Hall to ask for a copy. Until now, I'm still waiting.

MR. PEREZ-JIMENEZ: Well, you give me your address and I'll make sure that you get one.

MS. HUBBERMAN: I left a message.

MS. RODRIGUEZ: That too.

MR. PEREZ-JIMENEZ: What number did you call?

MS. HUBBERMAN: Your main number. If you call City Hall, press 1 or whatever the water department is, that's where they directed me.

MR. PEREZ-JIMENEZ: Oh, that's City Hall. I have my own numbers. I'm outside City Hall. Well, give me your address and I'll make sure that you get a letter.

MS. HUBBERMAN: We're

representatives of the entire ward, Ward 6 and 7. We asked our neighbors. They did not receive the letter so there is a big constituency of people that did not receive the letter.

And the other thing, regarding that TTH chemical, it only requires parts per trillion to actually have a negative effect on a person's health. So if we put like a little droplet of this chemical over many, many barrels of water and we drink it, we will have the side effects. So this is serious. And in Perth Amboy, we're not getting -- there's not a transparency here.

MR. PEREZ-JIMENEZ: THM is formed when natural curing organic matter reacts with chlorine and it forms the THM. That's what we were trying to explain to them. It's the same thing that you said about the 14D. It takes 70 years drinking 1.5 gallons of water for something to happen. And it's not guaranteed that it's going to happen.

That letter says that. I don't

know if all of them received the letter. I mean, I didn't send the letter myself. We had a company that sent letters to whatever addresses they got.

MS. SEPPI: But it looks like you're going to look into that?

MR. PEREZ-JIMENEZ: Yes, I'll look into that. Now, that's about that letter and the THM. When I mentioned the carbon filter at the other meeting, I meant -- we were talking about the THM. We were not talking about the 14D. Carbon filters removed the organic matter from the water and that will help reduce the THM. That's what we talked about at that time, not 14D.

The $500,000 that the gentleman mentioned is an amount of money that we put -- that the city put in. So every time that we do something like buying plumes, anything related with the 14D contamination, the city will pay and BASF will reimburse the city. We have up to $500,000. If we exceed that number, we have to consult with them and they will authorize us to put more money so that whatever money we spend, they reimburse. As we spend the money, they reimburse.

It's not that they're going to give us $500,000 and put it in the bank for the contamination. Now, as we spend the money, they reimburse the city.

MR. OSOLIN: And I think that's an important thing to mention here. BASF came onto this. They bought the property from CIBA Specialty Chemicals who bought the property from CPS who caused the contamination out there. So BASF never operated out there. They've taken on the site. They bought it, through whatever method I don't know.

But they've -- in purchasing it, they became responsible for the site and they are working with us. And they've become actually a very important partner in cleaning up this site. We have -- they're working with the water company. They're putting well head treatment on it. They've signed an agreement with EPA to help clean up the site, look at various things to address the site, and they are reimbursing the government for that.

EPA is also being paid for the work that we do out at this site to make sure that this situation is taken care of. So they've become an important partner in this and as with everybody. It's the state, EPA, the water company is involved with this, and BASF. It's a combined effort that's making this happen, that's cleaning this up.

MR. PEREZ-JIMENEZ: Now, also I'm a resident of Perth Amboy. My family is there. I have three kids. We all drink that water and I'm proud of that water. I produced that water. I know that if there's any contamination on that water, I'd be the first one to scream 'cause I don't want my family drinking that water.

Now, but going back to this treatment, and I understand their concern of it, if this is going to take a little longer than expected, will you guys consider at least drilling more wells to be away from that plume?

MR. OSOLIN: I guess I'd throw that back to you. EPA isn't the one that supplies the water. We're out there protecting the water. I think it's the -- I don't know. We wouldn't be the ones drilling the wells.

MR. PEREZ-JIMENEZ: No, no, not you. But will EPA approve for BASF?

MR. OSOLIN: I don't think we've -- that's a state function. I don't know.

MR. SCHULTZ: Would there be a restriction on the property for them to drill additional wells?

MR. OSOLIN: There is a CEA which is a well-restriction area in that area where you're not allowed to drill water wells. Okay? That area influences -- that comes off the site you're restricted from using because of the residual contamination that is in that well field. And that area will shrink as we shrink the contamination.

That area will get smaller.

But as of now, there's a well-restriction area in place that provides protection from somebody sticking a well in there and drinking the water out of it.

MR. PEREZ-JIMENEZ: That's close to five, six, and seven?

MR. OSOLIN: Yeah.

MR. PEREZ-JIMENEZ: If we want to drill a well near the Runyon not on number nine, number eight, is there any restriction there?

MR. OSOLIN: Not by EPA. Not by EPA. That's a state and a local thing. That's not an EPA -- we don't do well restrictions. With the well restrictions that are in place, they're state well restrictions.

MR. PUVOGEL: And that's not from EPA. The State Bureau of Water Allocation determines where you can put a well and how much you can pump out of that. That's what the state is saying.

MR. PEREZ-JIMENEZ: And we

have to go through the EPA to get all the permits and all that. Like for the permit just to put a pump on well number nine. But if we see that the plume is approaching more and more towards five, six, or seven and then we said, All right, we have to abandon this well, or we don't have to abandon because we're cleaning the water over there because it's taking too long, now that water's going to get into my treatment plan.

Can we say, All right, let's replace this well and put another one near the raining well? I mean, I know that I can -- I know that we need the permit from the DEP but is that something that EPA will say, and maybe it's working with Joe, is that something that EPA will tell Joe or the DEP, Joe, listen, we need to put another well over there. You're paying for that.

MR. PUVOGEL: No, it's not something that we would get into a discussion of what they should pay for or what they shouldn't pay for. That is between the city -- the water purveyor and the city. We don't have the authority to tell them to pay you for that action.

MR. OSOLIN: Yeah. If there is farm from a company's property, the city can take it up with the company and get them to put another well in for protecting that. That's not an EPA function. You know, we would not -- we're not the state or the local authority. We don't do that. We don't say they can and we don't say they can't.

MR. PEREZ-JIMENEZ: Do you guys provide funds?

MR. PUVOGEL: Our focus is to fund the remediation and cleaning up of that scenario. That's what our focus is on. We don't have the authority to make anyone else pay for anybody else's damages.

MR. PEREZ-JIMENEZ: But you don't have funds? Let's say we want to drill on a well. There's no funds?

MR. PUVOGEL: We can't authorize those funds to be for a well. Our funds go to the cleanup process.

MR. NACE: The EPA Superfund does not have funds for that. EPA does have drinking water assistance funds through other parts of the EPA that may or may not be applicable. We could put you in touch with those programs to see if something like that would be applicable if you need to do that. But through Superfund, we cannot do that.

MR. PEREZ-JIMENEZ: This is just a question. I know that Joe -- you know, we've talked about it in different meetings that we've been in and they did mention that whatever they're doing over there, it's not working.

If we need to have more treatment, it will happen. I don't know. I want to make sure I have a plan B just in case something happens. Somebody can fund whatever we need to do there.

MR. OSOLIN: Well, we're addressing --

MR. SCHULTZ: If I may --

MS. SEPPI: If you could just

state your name, please, Bill?

MR. SCHULTZ: Bill Schultz, Raritan Riverkeeper. I think I'm following Luie's thoughts. If your treatments start to fail, you'll be able to document that the plume is encroaching on our existing wells and that we may -- the city may have to take additional actions, in other words, drill additional wells in another part of the field because of the failure of your treatments? And that might open the door for the city to negotiate with BASF to kick in some funds.

MR. OSOLIN: I don't know that I can answer that question to be honest with you. I mean, we'll put that --

MR. SCHULTZ: You'll be able to document the failure of your treatment?

MR. OSOLIN: If it fails, yeah.

MR. NACE: We would be doing long-term monitoring of the down gradient plume and we would be able to tell if the --

MR. SCHULTZ: So if the plume

were to expand, --

MR. NACE: -- if it's increasing or expanding, yes.

MR. SCHULTZ: -- you'd be able to document the expansion of the plume which would be impacting the existing wells? And that would open the city's negotiations with BASF to --

MR. OSOLIN: We actually did that back in -- back when CPS was out there. In the very beginning when we first got involved in the early '90s, we came out there and we drilled wells as part of our program -- our Superfund program. We went out -- and as our removals program, we went out and drilled wells down near the EPA and actually called them EPA wells.

You can see them in the diagram down near the wells to show that there was contamination at the level of the inputs to the Perth Amboy wells down there, that the water was actually being pulled down towards the wells. We put wells there to see that. That actually helps Perth Amboy go to court and get relief from CPS at that time.

So, yes, we would be -- our investigations document when -- I don't think we're going to -- I mean, quite honestly, I don't think we're going to document the failure. I don't -- I'm looking at this remedy and I see it as fairly failure proof. First of all, we're pulling back the contamination. The plume's actually shrinking, okay, what's already there. We're improving that.

We're adding more measures to stop it from going into the Perth Amboy well field, okay, towards the Perth Amboy well field. And then we're going to take out the source. So you've got measures in that area already in place that are working that are pulling the contamination, you know, and removing the contamination.

We're putting more measures in the place and then we're taking out the source. It can only get better, you know. And the method -- this wall that, you know, we're creating here down gradient of the source, that is going to be put in before we start addressing the source. To a certain extent, it's already there in the wells -- in the pump and treat wells that we have that are in place right along the edge over here. They were already there.

Once this wall is proven effective, it will start slowly depending on taking dependents off of those wells and put that in place. That will remain there until nothing is coming out of this area. So I don't see how it could fail. We've got pump and treat contingency. If this doesn't work, we keep the pump and treat and we beef that up and then we take out the source. So it's going to get better.

The area we're working on here, you know, we're monitoring -- if there's a failure, we're going to see a failure and we'll document it. But quite frankly, I don't see how it could fail.

MR. SCHULTZ: That's what I was looking for 'cause he's got a -- I know what he's faced with. He's got to go back and he's got to have some kind of an answer 'cause somebody's going to ask him, If all this falls apart, what do we do, Lu? He's got to have an answer. So that's why I say if you can show -- you'll be able to show an increase in the plume --

MR. OSOLIN: Yes.

MR. SCHULTZ: -- and that's his key to go look for other answers.

MS. SEPPI: I think -- I'm sorry. I don't want to interrupt. Did you have something you were waiting to say?

MS. HUBBERMAN: Yes. In your slide presentation, you stated that the dioxane -- the plumes of the dioxane have actually hit PA5, PA8 or 6? I don't know.

MR. OSOLIN: 6 and 7 -- 5, 6, and 7.

MS. HUBBERMAN: And the only one that is not contaminated is P8?

MR. OSOLIN: 8 and the rainy well.

MS. HUBBERMAN: 8 and the rainy well. Okay. So what I'm understanding is this. The process or the cleanup may not be -- may not have an immediate time frame to it. It takes time to be able to diminish those plumes. As it stands right now, we're looking at these wells. They're contaminated. So I think what he's -- there's that plume in that area, correct?

So I think from his standing point, he wants to look out for the safety of our drinking water and wants to know, All right, is this in writing, which I believe it is just by your presentation that there's a presence of it, and what action, if any, our count would be able to do.

And my understanding from this conversation is the city of Perth Amboy was to take this information and somehow go and bring this either in a legal matter or directly with the company that's involved in the cleanup to help address the short-term issue until your cleanup is accomplished.

MR. OSOLIN: But as I also discussed, they're already doing that.

They're already doing that. The wells that are being impacted, the state -- once the state realized that we have wells -- once they changed the level at which we have the cleanup to do, we looked at the wells, did an intake of those wells, and the companies were forced to put protection on those wells. They're currently in the process of doing that.

One of the wells has already got protection and one of the ones that is most contaminated has already got a line of this that's going on. They're actually -- they put protection on it and they're working to put it in place for the whole thing. That's already taking place. So it's a two-prong approach. We've got EPA and the companies working together.

And with the state, we're taking out the source area and we're preventing -- we're putting up a wall to prevent anything from moving offsite. The second prong is a barrier in front of those wells and around those wells to prevent anything from going in there in the short term. And that's the effort that the state is undertaking right now with the companies.

And the companies are out there -- I was out there in the well field with Joe and with Perth Amboy and I watched and saw what they were doing, what they were pumping, how they were pumping. They've got a pump house there. They've got input wells in. They've got monitoring wells. They're monitoring what's going in.

They're monitoring to make sure that, A, the contamination is being destroyed down gradient of those pumping -- the input wells where they're imputing the ozone. And they're making sure that it's destroyed before it gets to the well 'cause you don't want the ozone. You don't want anything in there.

So they're putting it in and they're measuring it to make sure that it doesn't reach the well, and that the chemicals are destroyed right before they get to the well. So this is all going on.

MS. HUBBERMAN: So this ozone process has been already occurring to the site? Is that what you're saying?

MR. OSOLIN: Yes, that's what I'm saying.

MS. SEPPI: Okay. Do you have more questions?

MR. PEREZ-JIMENEZ: No, I'm done.

MS. SEPPI: Okay. Thank you. Good questions. I'm really impressed with this group here tonight. We're getting some really good, good questions. Yeah.

MR. OSOLIN: We appreciate you coming out. I know this is a concern. It's a concern of ours and a concern of the state, EPA. It's a concern and we're addressing it. And, you know, we have plenty of partners here and we want your questions. We want your concerns and we want to address them.

MS. SEPPI: We do.

MR. OSOLIN: We do.

MS. SEPPI: And are there any

more questions?

(No response.)

MS. SEPPI: I mean, too, let's make sure that we have the e-mail addresses if you all have e-mail rather than, you know, the snail mail addresses 'cause as soon as we get some of the answers as we promised we would tonight about, you know, other Superfunds sites that may have used this type of -- this type of methodology before, you know, I'd like to put all these names on a mailing list and just reach out to you as new information comes around.

And also, when we get this proposed plan signed with the responsive summary that will talk about your comments and address them and your questions, we can get those out to everybody too. And don't forget we have some copies of the proposed plan here tonight if you'd like to take it.

You know, let's keep in contact because I think this was a really good conversation, you know, and I'd like to continue it. I don't just want to leave here tonight and, you know, you don't hear from us ever again. So that would be good. And same thing with the city. I know we spoke -- I e-mailed back and forth with Mr. Farr, Frank Farr?

MR. SCHULTZ: Carr.

MS. SEPPI: Carr. I'm sorry. Why did I say Farr? Carr, yes. And, you know, we're going to be talking to him later in the week to talk about any additional information he might want. So, you know, all these avenues are open out there right now.

MR. OSOLIN: By the way, the studies -- the previous studies on the ozone and the oxidation and all that we were talking about, we have them already. It's not -- we don't have to look for them. We have them already.

They -- we've got -- when this first came up, I was one of the most -- you can ask my Section Chief, I was one of the most skeptical people for the use of chemical oxidation. I was a little concerned about that. I was -- I asked questions. I was concerned. Can we get this oxidant to the chemicals so that we can destroy them and is it safe?

I was given quite a few sites where it had been used and I met with an expert from EPA from I believe Oklahoma. And he confirmed that it absolutely can work and with the right observations with the right input, we can make this happen. And without that assurance, I wouldn't have done -- I wouldn't even have thought -- you know, this wouldn't be the preferred plan here because we obviously -- we don't want to fail.

We don't -- we want to get out there and we want to make it happen. We want to make it work. And so we put this in place and then we asked the companies that we want a contingency remedy that will back this up.

And, you know, I look at this and I'm not really sure how it would fail. I'm that confident of it. So we will get that information to you if you'd like it and we will answer those questions in the responsive summary. Okay?

MS. SEPPI: Does anyone else want the proposed copy? And, Maria and Sharon, do you want to give me your addresses, your e-mails, so I can get information out to you?

- - -

(This concludes the hearing.)

- - -

C E R T I F I C A T I O N

I hereby certify that the proceedings and evidence noted are contained fully and accurately in the stenographic notes taken by me upon the foregoing matter dated May 20, 2019, and that this is a correct transcript of the same.

AnnMarie Badalamenti
Court Reporter-Commissioner of Deeds

(The foregoing certification of this transcript does not apply to any reproduction of the same by any means, unless under the direct control and/or supervision of the certifying reporter.)

ATTACHMENT D

WRITTEN COMMENTS

From the Desk of Sharon D. Hubberman

May 23, 2019

VIA: ELECTRONIC MAIL AND REGULAR MAIL

US Environmental Protection Agency
Attn: John Osolin, Geologist/Project Mgr.
Emergency & Remedial Response Division
290 Broadway, 19th Floor
New York, NY 10007-1865

RE: Superfund Proposal Plan
CPS/Madison Superfund Site
Old Bridge, NJ

Dear Mr. Osolin,

Thank you for your recent presentations regarding the proposed Superfund site cleanup plan.

Please accept the below as comments and questions pertaining, and in response to your presentation.

On Byproduct formation:
As expressed to you on Wednesday, May 22, 2019, my mom and I have concerns regarding possible byproduct formation when using the caustic chemicals, Ozone and Hydrogen Peroxide. Specifically, in a Tuscon Arizona case study regarding the cleanup of 1,4 Dioxane near the Tucson International Airport area Superfund site located in the Tucson Basin in Pima County, Arizona, there were pilot testing experiments carried out with ozone-hydrogen peroxide (O3-H2O2) systems, and it showed increases in Bromate to over 50 ug/l, which was 5x the regulated limit.

What secondary or tertiary filtration system will be implemented to capture any byproduct formation or byproduct film produced by the use of OZONE and Hydrogen Peroxide?

If Bromate is a byproduct outcome, how will you capture, and or remove it? What type of filtration or technology will be used?

What specific organic and inorganic compounds will be removed by the oxidation method? Please list chemicals.

What other residuals would be produced by the use of Ozone and or Peroxide?

What is Fenton's Reagent?

What other residuals would be produced by Fenton's Reagent, or persulfate?

Is Fenton's Reagent a solvent only used with Alternative 3A technology? Will it be used in the other Alternative solutions presented, ie 2A?

Treatment by Ozone Only

In a public forum in Ann Arbor, Michigan which discussed Ozone only treatment of 1,4 Dioxane, research indicated that it was not successful. Where specifically have you seen success in Ozone only treatment? Is there a report that can be accessed online?

On Advanced Treatment for 1, 4 Dioxane / New Technology

In your plan proposal, you indicate three elements that comprise the EPA's preferred alternatives: "preferred groundwater alternatives for the cleanup of the Site are 3A ISCO Permeable Reactive Barrier, and 2B—Continued Operation of the Madison IRM ..[and] for the on-site soil at the CPS property, the preferred alternative is 5." (page 17)

In the remedial action plan under Organic Alternative 3A, it states that activities would include the installation and operation of an **"ISCO PRB well system."** This type of system utilizes nanotechnology, and has been noted to have "near future" applications for chemicals like 1, 4 Dioxane.

Nanotechnology treatment of contaminated water also carries significant human and ecological risks because such technology is new, requires more research, and is not regulated.

In an article published by University of Arizona, Water Resourced Research Center, titled "Nanotechnology Promised Water Resource Gains but Raises Concerns," it affirms that this type of technology is not regulated and the potential human and ecological risks are unknown:

"A prime concern is that the enhanced reactivity of nanoparticles increases their toxicity. Further, nanoparticles are extremely small and very difficult to contain raising the concern that they could escape into the environment and pose a threat to aquatic life. Whether handled at the treatment plant or consumed in treated water nanomaterials pose an unknown risk. Benn says, "Nanotechnology provides a strategy to improve water quality through treatment and remediation. Also, however, the use of nanotechnology has raised concerns that nanoparticles might end up in water supplies ... Our research is looking at the release of engineered nanomaterials that could potentially enter water systems. We are considering nanomaterials as an emerging contaminant."

Further it is mentioned that since the remediation of groundwater involves nano solvents, it raises concerns that such nanoform solvents are harmful:

"Meanwhile questions have been raised about whether iron in its nanoform is harmful to the environment and human health. Benn asks: "As we inject a nanomaterial into groundwater to remediate a problem are we simultaneously creating a new problem by injecting a material that may have adverse environmental effects?"

Both my mom and I have deep concerns and objections to this type of remedial activity because this type of technology does not have regulations that adequately address the development and use of nano-technology, including and not limited to the potential human and ecological risk and long term impact. Nanoparticles penetrate further into the human cell and organisms because of its subcellular component, and the impact is not yet known and we strongly DO NOT want to incur a potential unknown harm in our future, or in the lives of all residents living in Perth Amboy.

Since nano technology uses nano solvents which has new properties, is there any way in knowing that these new properties could harm people or harm the environment if exposure occurs? Does it accumulate in the body? Is it easily detectable?

If someone is using or handling these nano solvents in the work place, is there any way that they can be exposed to this? Is it dangerous? Is it harmless? Does it accumulate in the body? At what level is it dangerous?

On Oxidation Methods

What other types of Advanced treatment methodology are being considered?

Why hasn't UV/Oxidation treatment been considered? Or is it being considered?

In a technology overview report by GWRTAC titled "Ultraviolet Oxidation Treatment" (UVOT) prepared by Robert J. Trach, it states the following advantages offered by UV/Oxidation processed in the treatment of groundwater:

"• UV/O3/H2O2 treatment processes do not add to the pollutant load to the groundwater treatment system. This is in contrast to many of the existing end-of-pipe pollution abatement systems presently in use which merely transfer the waste from one medium to another leaving, for example, combustion by-products or contaminated absorbent for further disposal (1).
• UV radiation enhanced ozone treatment with hydrogen peroxide additions have been used in the successful treatment of particularly refractive substances such as ferricyanides and other chemical compounds (1, 3,)" (page 6)

According to some reports on other cleanup methods of Superfund sites, this type of UVOT cleanup method has a longer history.

<u>On IN-SITU Chemical Oxidation with limited excavation:</u>

One of the stated EPA preferred alternatives; the recommendation of IN-Situ mixing with limited excavation has raised concerns by other residents in the Perth Amboy Community who attended Wednesday's, May 22nd EPA presentation. There are persons who expressed that they would not want the treated contaminated soil treated on site and/or put back into the site once treated. Others expressed a passionate response to having the contaminated soil excavated, removed, disposed, and/or treated somewhere else. In addition, there was a strong recommendation that once the contaminated soil is excavated and removed, that he excavated area would be filled back with certified clean soil, not treated soil.

The Alternative 4-Excavation, Off-site Disposal, and In-situ Chemical Oxidation, is the alternative presented by your organization which somewhat address the above concerns, wherein certified clean fill would replace the excavated and off-site disposal of contaminated soils.

However, Alternative 4 also includes In-Situ Chemical oxidation, with caustic chemicals.

We would like to know what the calculation of how much Ozone and Hydrogen Peroxide will be used, and what is the surface area in which those chemicals would be injected to? How many meters? How often? What is the duration of how long it will take for this chemical to rid the contamination?

Is there going to be a vacuum or some sort of covering over the In Situ site where these caustic chemicals will be added to?

Will there be some sort of Gas filtration system installed to detect the ozone vapors? Or other types of possible vapors like Ammonia?

What protections will be in place for the workers on the cleanup site who would be using the caustic chemicals?

At what time would these caustic chemicals be used? During the day from 9am to 4pm, or during a "graveyard" shift? Unfortunately, there have been horrible smells late at night which is difficult to report because the EPA offices and other Human Health Agencies are closed at night.

When the ozone treatment occurs, will it be done in a climate-controlled environment? Does temperature or climate impact this caustic chemical? Will it be performed during the summer months? How will you control the volatility of the ozone chemical? What type of technology would be used to inject the ozone into the contaminated site?

On Organic Alternative 2A

How long would the Groundwater Treatment Plant treatability study take?

What will be included in the treatment process train? Would it include a filtration system that will capture any by product formation?

In a presentation made by Dr. Hadas Mamane, titled "Advanced Oxidation Processes (AOP): Technologies for Water Treatment and Reuse" she underscored the importance of having a BIO filtration system that captures byproduct formation and byproduct film.

Regarding Exposure to Toxins

While your goal, as expressed in your presentation, is to cleanup both organic and inorganic contaminates at this CPS/Madison SuperFund site, it does not undo the past human exposure to these toxins in our drinking water.

All of the residents in Perth Amboy have been kept in the dark, and there is a strong lack of transparency regarding our drinking water. To hear at your presentation that 1,4 Dioxane plumes have contaminated three of our drinking wells is very upsetting, and the fact that this was a major problem for many years is extremely disconcerting and scary. In addition, to hear that the methods used in treating our drinking water was composed of mixing contaminated water with clean water in order to reduce the levels of 1,4 Dioxane exposure in our opinion, is unconscionable, careless, and callous.

There are many residents who have been living in Perth Amboy since the time of their birth for many years. In our daily routine, we and all the residents of Perth Amboy have used or consumed the water in many ways, ie. drinked/cooked with the water, taken showers/baths in the water, washed dishes, pots, cars, washed our clothes with the water, etc., which means our exposure to chemical **TOXINS** greatly exceed the 2 Liters of exposure you mentioned in your presentation.

Please take our comments and feedback with extreme consideration because our lives depend on the efficacy and we prefer low risk, regulated methods, and a long historical track record, and proven methodology to clean the contaminated site.

Overall, after evaluating the options presented in the forms of Alternatives, please consider the below options versus your preferred alternatives.

1. (Short Term Immediate Efficacy) Immediate Barrier Implementation: More barriers are needed to stop current migration of 1-4 dioxane plumes, whether in the form of wells or steel as suggested in other alternative methods. They need to be placed in an area which combats the growth of the plumes to safeguard our wells from further contaminations. Is freezing a method that can stop the spread of 1,4 dioxane plumes?

2. (Immediate Removal) Alternative 4 which include Excavation Off-site Disposal with caveats stated above (ie. Including secondary and tertiary filtration systems, vacuum, vapor monitoring and capture)

3. (Has a defined History Record: Pump and Treat) Alternative 2A – Upgraded CPS Site Pump and Treat System with Long Term Monitoring.

4. (Carbon and UV/Oxidation): A combination of treatment systems and technology that have been used in other countries and states.

Thank you in advance for your consideration.

Sincerely,

Sharon D. Hubberman

Sharon D. Hubberman
Perth Amboy Resident

Maria E. Rodriguez

Maria E. Rodriguez
Perth Amboy Resident

From the Desk of Sharon D. Hubberman

May 24, 2019

VIA: ELECTRONIC MAIL AND REGULAR MAIL

US Environmental Protection Agency
Attn: John Osolin, Geologist/Project Mgr.
Emergency & Remedial Response Division
290 Broadway, 19th Floor
New York, NY 10007-1865

RE: Superfund Proposal Plan
CPS/Madison Superfund Site
Old Bridge, NJ Addendum to our Letter

Dear Mr. Osolin,

This is an addendum to our letter submitted to you. Regarding risk, we would like to highlight that we prefer low risk, and what we mean to say is that the risks must be contained in a strong risk controlled environment. The immediacy of the removal of the toxic chemicals weighs heavily, and if extractions of contaminated soil have been performed successfully in other contaminated sites, what is the likelihood of a ZERO toxin result? What are the calculated risks with disposal and removal of contaminated soil? What is the success rate of permanent removal of contaminated soil?

With in-situ cleanups, and redeposits of treated soil, what is the success rate of a permanent cleanup of chemical toxins? Is it a ZERO toxin result? Lastly, we would like for there to be consideration of upgrading the Site Pump and Treat System with Long Term Monitoring at the Madison site.

Thank you again for your time and consideration.

Sincerely,

Sharon D. Hubberman

Sharon D. Hubberman
Perth Amboy Resident

Maria E. Rodriguez

Maria E. Rodriguez
Perth Amboy Resident

EPA CPS/MADISON SUPERFUND SITE
Old Bridge, NJ

Proposed Remediation Plan April 2019

Greg Bender Comments and Suggestions.

I have conducted a brief review of the proposed remediation plan, and had the opportunity to ask some questions at the presentation and meeting with the Perth Amboy City Council on Wednesday, May 22nd in Perth Amboy, NJ. These comments are a result of the additional information you provided and a review of the maps provided, and supersede any verbal remarks made at the meeting.

1. Tables 1 and 2 in the plan summarize health hazard and risks associated with the identified contaminates for present and future trespassers, construction workers and residents (of the site) by exposure to the groundwater. The plan does not address exposure and risk to water exposure offsite, including the groundwater extracted from the Perth Amboy wellfield. Can we assume the health risks from the contaminated wells – both now and in the future, if any more are reached by the plume – would be similar to the serious risk shown in the tables?
2. Any comprehensive remediation plan for these sites is incomplete without the consideration for surface water – both present continued runoff, as well as sediments deposited from past flows. I understand that surfacewater is to be considered separately, but it is essential that a final plan include it before actions are taken. As noted in the plan, and shown on the figure 1 aerial map, Pricketts Brook runs thru both sites, and then runs to Pricketts Pond in the Perth Amboy Runyon Watershed, where it recharges the groundwater. Since it runs thru the worst contamination source areas, the unloading and handling areas, it is likely the recipient of both rain and washdown cleanup attempts. The Brook was a continuous path for contaminates to the watershed. We need to fully assess the results of that history. Note that the Brook provides a path for surfacewater to bypass the groundwater and soil monitoring sampling that is ongoing and proposed. We need a full assessment of the effects of the surfacewater situation and history.
3. The groundwater remedial alternative of an ISCO Permeable Reactive Barrier appears reasonable and effective, as long as strict monitoring is kept in place. Because this alternative, 3A, still needs to be proven in the on-site conditions (as noted in the plan), there needs to be an upgraded CPS site IRM pump and treatment system ready to go as back up.
4. For the on-site soil remediation at the CPS property, the suggested alternative – In-Situ Chemical Oxidation thru soil mixing (Alternative 5) is unacceptable. The risks associated with non-homogeneous mixing of the soil are real, and a failure in this process would seem to be difficult to detect in a timely manner. Since the soil is the source of the groundwater contamination, it is very important to stop the contamination at the beginning. In short, get the contaminated soil out of

there! Alternative 4 removes the soil, provides in-situ remediation for any remaining inaccessible soil, and replacement with certified clean fill. This would be the best alternative for long term risk elimination for the Perth Amboy wellfields. One further note: From discussions at the end of the presentation, EPA staff suggested that the community hazards of trucking many truckloads of contaminated dirt thru the community would be an issue. They noted that Alternative 5 would not have that concern, since all soil would remain on site. What is overlooked in this concern is that both of these sites have an active rail siding within them. The line connects with the freight line thru the area so that soil removal by rail would never enter onto any public streets, or cause traffic and community fears. Movement of hazardous materials by rail, which is quite common in New Jersey, is routine is this region. Further, this same rail network was involved with the transportation of hi-hazard, radioactive soil (from the BOMARC missile fire) from the Joint Base McGuire Dix Lakehurst, via a rail spur that exited Lakehurst onto the freight line from Lakehurst to South Amboy. There is precedent for rail movement of contamination in this area, and very successfully. It is a unique opportunity to have a clean up site(s) that have secure rail access and loading areas. Finally, if the estimate for alternative 4 was based on trucking all the soil, it may be less costly to use rail. Please reconsider alternative 4 for the soil.

Thanks for your time and consideration of these comments.

Sincerely,

Greg Bender

Osolin, John

From:	Vincent Mackiel
Sent:	Friday, May 24, 2019 11:05 AM
To:	Osolin, John
Subject:	Public Comment: CPS/Madison Industries Superfund--CERCLIS ID NJD002141190

Vincent Mackiel

John Osolin, Remedial Project Manager
USEPA, Region 2
290 Broadway, 19th Floor
New York, NY 10007-1866

Re: CPS/Madison Industries Superfund Plan--CERCLIS ID NJD002141190

Dear Mr. Osolin:

I have the following concerns during the Public Comment process including May 8th (with 22nd)regarding cleanup of pollution of the Perth Amboy water supply at Runyon Watershed in Old Bridge, New Jersey.

*The Risk Assessment Reports(Project #3651120035) of April 13,2015 show serious impacts and concerns as a resident drinking Perth Amboy water as cummulative receptor cancer risk and receptor hazard values are above USAEPA limits--not withstanding treatment efforts by Middlesex Water Company. Two public notices in 2018 and 2019 detail this concern(Dioxane and Trihalomethanes violations, PWSSIDNJ1216001.)

Please acknowledge new water-well opportunities as New Jersey Department of Environmental Protection is approached by our Water supplier--Middlesex Water Company. A representative proposed opening up a new well #8 providing better water(in quality and quantity) for the community, at the May 8th public meeting. New technology offers us hope.

*As a concerned resident and consumer, I respectfully asked that the proposed plan for the CPS/Madison Superfund Site, Old Bridge, New Jersey, implement Alternative 4--Excavation, Offsite Disposal and In-Situ Chemical Oxidation.Your press release states 900 cubic yards are involved. This plan would clean the area between the remediation area and the Perth Amboy water supply. Decades of pollution and neglect from the responsible parties have left this area as a sort of" Dead Zone." A new beginning(filling the Runyon Watershed with clean soils and plants) finally can start moving the process toward a real watershed not an Industrial zone.

Thanks for your response.
Sincerely,
Vincent Mackiel

APPENDIX B

RECORD OF DECISION

CPS/Madison Superfund Site

Operable Unit 3

Old Bridge Township, Middlesex County, New Jersey

U.S. Environmental Protection Agency
Region 2
September 2023

DECLARATION STATEMENT

RECORD OF DECISION

SITE NAME AND LOCATION

CPS/Madison Site (EPA ID#NJD002141190)
Old Bridge Township, Middlesex County, New Jersey.
Operable Unit 3 - Soil

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the U.S. Environmental Protection Agency's (EPA's) selection of a remedy for Operable Unit (OU) 3 of the CPS/Madison Superfund Site (Site) located in Old Bridge Township, Middlesex County, New Jersey. OU3 addresses contaminated soil on the portion of the Site operated by Madison Industries, Inc. and Old Bridge Chemicals, Inc. (the Madison property).

The selected remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document explains the factual and legal basis for selecting the OU3 remedy for the Site. The attached index (see Appendix III) identifies the items that comprise the Administrative Record upon which the selected remedy is based.

The State of New Jersey Department of Environmental Protection (NJDEP) concurs with the selected remedy (see Appendix IV).

ASSESSMENT OF THE SITE

The remedial action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

DESCRIPTION OF THE SELECTED REMEDY

The remedial action described in this document addresses soil contamination at the Madison property portion of the CPS/Madison Superfund Site, which is contaminated primarily with lead, cadmium, and zinc.

The major components of the OU3 remedy include the following:

- Excavation and off-site disposal of 1,320 cubic yards of contaminated soil from unpaved areas on the Madison property;

- Use of existing pavement on the Madison property as an engineering control, in the form of capping, over contaminated soils;
- Long-term monitoring of sediment and surface water; and
- Institutional controls, such as a deed notice, to prevent exposure to residual soils that exceed levels that allow for unrestricted use, and to limit disturbance of capped areas.

The total present worth cost for the selected remedy is $1,950,000.

DECLARATION OF STATUTORY DETERMINATIONS

Part 1: Statutory Requirements

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to the remedial action, is cost effective and utilizes permanent solutions and treatment technologies to the maximum extent practicable.

Part 2: Statutory Preference for Treatment

The selected remedy does not satisfy the statutory preference for treatment as a principal element of the remedy for the following reason(s): treatment is impracticable due to technical infeasibility and no source materials constituting principal threats will be addressed within the scope of this action. Remedies selected for the other operable units (OU1 and OU2) have met the statutory preference for treatment.

Part 3: Five-Year Review Requirements

Because this remedy, upon completion, will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

RECORD OF DECISION DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the Administrative Record for this Site.

- Contaminants of concern and their respective concentrations may be found in the "Site Characteristics" section.

- Baseline risk represented by the contaminants of concern may be found in the "Summary of Site Risks" section.

- Cleanup levels established for contaminants of concern and the basis for these levels can be found in the "Remedial Action Objectives" section.

- Current and reasonably anticipated future land use assumptions used in the baseline risk assessment and decision document can be found in the "Current and Potential Future Site and Resource Uses" section.

- Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedial cost estimates are projected can be found in the "Description of Alternatives" section.

- Key factors that led to selecting the remedy may be found in the "Comparative Analysis of Alternatives" and "Statutory Determinations" sections.

Pat Evangelista
Digitally signed by Pat Evangelista
Date: 2023.09.26 17:17:34 -04'00'

September 26, 2023

-- --------------------------------

Pat Evangelista, Director
Superfund and Emergency Management Division
EPA-Region 2

Date

RECORD OF DECISION

DECISION SUMMARY

CPS/Madison Superfund Site

Operable Unit 3

Old Bridge Township, Middlesex County, New Jersey

U.S. Environmental Protection Agency
Region 2
September 2023

TABLE OF CONTENTS

SITE NAME, LOCATION AND DESCRIPTION

The two facilities which comprise the Site are adjoining properties located adjacent to Water Works Road in Old Bridge Township, Middlesex County, New Jersey (Figure 1). The Site acts as a source area for groundwater contamination that flows southwest, into the Runyon Watershed.

CPS Chemical Corporation, Inc. (CPS) Property: The CPS property is approximately 30 acres, located at 570 Water Works Road. The former CPS facility is located within the western portion of the CPS property and is approximately 6 acres. From 1967, until operations ended in 2001, CPS, and then Ciba Specialty Chemicals, Inc. (Ciba), which acquired the operations in 1998, processed organic chemicals used in the production of water treatment agents, lubricants, oil field chemicals, and anti-corrosive agents, and engaged in solvent recovery. While the main office and a storage building remain on the property, the process equipment and storage tanks that were located at the south end of the property were demolished and removed from the Site in 2005. The CPS portion of the Site is now inactive.

Madison Industries, Inc. (Madison) Property: The Madison property is 15 acres, located at 554 Water Works Road. The Madison property is bordered to the east by the CPS property and to the west by the Perth Amboy wellfield. Madison has operated the facility (formerly known as “Food Additives”) in the northern half of this property since 1967, producing inorganic chemicals used in fertilizer, pharmaceuticals, and food additives. On the southern portion of the property, Madison’s sister company, Old Bridge Chemicals, Inc. (Old Bridge), operates a plant that produces mostly zinc salts and copper sulfate. Both companies continue to operate on the property.

Runyon Watershed: The Runyon Watershed is mostly undeveloped land which borders the Madison property to the southwest. The watershed contains the Perth Amboy wellfield which lies approximately 3,000 feet southwest (downgradient) of the CPS and Madison properties. The wellfield supplies over 5,000 gallons per minute (gpm) to the City of Perth Amboy. The extracted water is treated to remove solids and metals using an on-site clarification and filtration system. Site-related contaminants have entered the watershed via groundwater, and to a lesser extent, via surface water.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

In the early 1970s, releases of organic compounds and metals from the CPS and Madison properties resulted in the closing of 32 wells in the Perth Amboy wellfield. In 1979, a state court ordered the companies to perform a remedial investigation under the supervision of NJDEP. The investigation led to a 1981 court order for the companies to implement a remediation program to address groundwater contamination emanating from each of the properties, On September 1, 1983, the Site was placed on the National Priorities List (NPL) with New Jersey as the lead agency.

In 1991 and 1992, CPS and Madison installed an off-site groundwater collection system consisting of six recovery wells (three wells operated by each company) to protect the Perth Amboy wellfield. Between 1993 and 2000 the groundwater surrounding these recovery wells achieved the clean-up goals in place at that time; the recovery wells were shut down and replaced by wells on each of the company’s properties which are collectively known as the Interim Remedial Measure (IRM) wells.

In 1998, NJDEP established a Classification Exception Area (CEA) and a Well Restriction Area (WRA) encompassing the area of the volatile organic groundwater plume, covering approximately 32 acres, to a depth of 80 feet. In 1999, NJDEP established CEAs and WRAs encompassing the areas of two metals plumes, which are approximately 20.7 acres, and 2.2 acres, to a depth of 80 feet.

In 1992, Madison filed for bankruptcy protection and in 2001, Ciba closed the CPS Chemical facility. In 2003, NJDEP requested that EPA take the lead role in overseeing the Superfund cleanup.

In 2005, EPA entered into an administrative order on consent (AOC) with Ciba which required Ciba to perform a remedial investigation and feasibility study (RI/FS) to determine the extent of contamination of all contaminants of concern in groundwater (i.e., CPS and Madison impacts to groundwater), referred to as OU1, and of CPS-related impacts to soil, referred to as OU2, determine if an action was needed to address the contamination, and identify potential alternatives to address the contamination. BASF Corporation (BASF) acquired Ciba in 2010, at which time BASF assumed the obligations of Ciba as its corporate successor, including responsibility for the RI/FS required in the 2005 AOC. BASF completed that RI/FS in August of 2018. EPA issued a Proposed Plan in April 2019, identifying the preferred alternative to address contamination. EPA released the ROD in September 2019, documenting the selection of remedies to address contamination in groundwater (both organic and metals contamination), (OU1) and soil on the CPS property (OU2).

In 2015, Madison entered into an AOC with EPA, which required Madison to perform an RI/FS to address contamination in soil (at the Madison property) and sediment in Prickett's Brook and Prickett's Pond on-site and downstream of the Madison property (OU3). This RI/FS was completed in May 2023.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

On June 1, 2023, EPA released the Proposed Plan for OU3 to the public for comment. Supporting documentation comprising the administrative record file was made available to the public at the information repository maintained at the EPA Region 2 Superfund Records Center, 290 Broadway, 18th Floor, New York, New York 10007, and EPA's website for the Site at https://www.epa.gov/superfund/cps-madison.

EPA published notice of the start of the public comment period, which ran from June 1 to July 3, 2023, and the availability of the above-referenced documents in the *Home News Tribune* on June 6, 2023. A news release announcing the Proposed Plan, which included the public meeting date, time, and location, was issued to various media outlets and posted on EPA's Region 2 website on June 1, 2023.

A public meeting was held on June 15, 2023, at the Old Bridge Senior Center, 1 Old Bridge Plaza, Old Bridge, New Jersey 08857 to discuss the alternatives presented in the RI/FS, review the proposed remedial activities at the Site, and to respond to any questions from residents and other attendees.

A copy of the public notice published in the *Home News Tribune*, along with responses to the comments received at the public meeting and in writing during the public comment period can be found in the attached Responsiveness Summary (see Appendix V).

SCOPE AND ROLE OF OPERABLE UNIT

Due to the complexity of working with two facilities and varying land uses, EPA is addressing the cleanup of the Site in three operable units. OU1 addresses groundwater contamination emanating from both properties that impacts the Perth Amboy wellfield. OU2 addresses contaminated soil on the CPS property that is a direct contact hazard and acts as a contaminant source to groundwater. OU3 addresses contaminated soil on the Madison property that is a direct contact hazard and acts as a contaminant source to groundwater.

This ROD addresses OU3, the final operable unit. EPA issued a ROD selecting remedies for OU1 and OU2 in September 2019.

SITE CHARACTERISTICS

The Site is relatively flat, ranging from 20 to 25 feet above mean sea level (AMSL). Most of the Site lies within a 100-year flood hazard area, except for a small area in the northeast corner of the CPS property that is 28 feet AMSL. The facilities are mostly surfaced with asphalt or concrete, except for the three-acre area of the former tank farm that was demolished by Ciba in 2005. The Magothy Formation, which underlies the Site, is used as a drinking water aquifer. Two of the geologic units of the Magothy lie directly under the Site, the Old Bridge sand, and the Perth Amboy fire clay. The Old Bridge sand is between 60 and 70 feet thick beneath the Site and readily conducts water. The fire clay is discontinuous under the Site but acts as a confining unit in some areas. Below the Magothy is the Raritan Formation which is also a drinking water aquifer. Groundwater under the Site generally flows southwest towards the Perth Amboy supply wells which are approximately half a mile downgradient.

Prickett’s Brook, an intermittent stream on the Site, flows west along the southern border of the CPS property (Figure 1). The brook turns north along the border between the CPS and Madison properties until it turns west again and bisects the Madison property. From the Madison property, the brook enters the Runyon Watershed and travels southwest through Prickett’s Pond and eventually reaches Tennent Pond. Prickett’s Brook and the downgradient ponds are not used for recreational purposes.

EPA conducted an Environmental Justice Screen for the Site using EJScreen 2.11. The EJ index percentiles for nearly all of the environmental and socioeconomic indicators for the area immediately adjacent to the Site are either below or comparable to state and/or national averages; therefore, the results did not suggest that there would be communities with environmental justice concerns immediately adjacent to the Site.

SUMMARY OF SITE INVESTIGATIONS

Performance Monitoring Program

Beginning in 1991, under the direction of NJDEP, CPS and Madison installed the IRM wells downgradient of the CPS property to intercept Site groundwater contamination entering the Runyon Watershed. A Performance Monitoring Program (PMP) was initiated to evaluate the effectiveness of the IRM pump and treatment systems. Pursuant to the PMP, BASF and Madison continue to monitor the IRM wells, which have been reconfigured several times to adjust to reduced contaminant levels in the plumes. The IRM system for the Madison property has been operating since 1997, with occasional configuration adjustments.

The Remedial Investigation

In October 1992, NJDEP executed separate Administrative Consent Orders (ACOs) with CPS and Madison, for each to perform an RI/FS to determine the nature and extent of potential source areas of contamination, including soils and sediment contamination at their respective facilities, and to identify potential treatment technologies. CPS conducted its RI/FS in three phases, documented in three reports submitted in 1993, 1994, and 1996. Madison completed its RI/FS in July 2001. NJDEP did not issue a record of decision and asked EPA to take over in 2003.

In 2003, EPA assumed responsibility from NJDEP as lead agency overseeing the Superfund cleanup. As with many Superfund sites, the work at the Site was conducted in phases, focusing first on the CPS property. In 2015, Madison entered into an AOC with EPA to perform the RI/FS for OU3, consisting of the contaminated soil at the Madison property. In 2018, Madison submitted an RI/FS Work Plan for OU3 to address data gaps in the 2001 RI prepared for NJDEP and provide more current data on the status of Site contamination. The main focus of the RI/FS was soil at the Madison property and sediment and surface water in Prickett's Pond and Prickett's Brook. The final Remedial Investigation Report was submitted by Madison in May 2023.

Summary of the Remedial Investigation

The full results of the OU3 RI can be found in the OU3 CPS/Madison Remedial Investigation Report (May 2023) which is in the administrative record.

RI sampling of soil, sediment, and surface water by Madison, under EPA oversight, began in 2018 and continued to 2019. Additional sampling was conducted in 2021 for the Focused Baseline Ecological Risk Assessment.

The results of sample analyses were screened to determine if the levels of contamination posed a potential harm to human health and/or the environment. This was done by comparing the measured values of contaminants to standards that are protective of human health or ecological receptors.

The soil sample analytical results were compared to NJDEP's Residential Soil Remediation Standards (NJRSRS) for the Ingestion-Dermal and Inhalation Exposure Pathways, the Non-residential Soil Remediation Standards (NJNRSRS) for the Ingestion-Dermal and Inhalation Exposure Pathways, and the Migration to Groundwater Soil Remediation Standards (MGWSRS). The default MGWSRS were developed to be protective of the majority of sites when no site-specific information is available. When site-specific information is available, site-specific MGWSRS can be developed. For OU3 soils, site-specific MGWSRS were developed by analyzing the site-specific leachability of the contaminants in accordance with the NJDEP Alternative Remediation Standards Technical Guidance for Soil and Soil Leachate for the Migration to Groundwater Exposure Pathway. The site-specific MGWSRS were compared to the default MGWSRS and the soil sample analytical results were compared to the least stringent of the two, per NJDEP guidance. The sediment sample analytical results were compared to the lowest effect levels for ecological receptors and surface water results were compared to NJDEP's Surface Water Quality Standards (SWQS) for Fresh Water. In addition, a human health risk assessment and an ecological risk assessment were conducted to determine if levels of contaminants exceeded EPA's acceptable risk range. Explanations of the results of the human health and ecological risk assessments are provided in separate sections later in this document. The results of the RI showed that metals including lead, cadmium, and zinc are the major contaminants of concern (COCs) in OU3 soils.

Madison On-site Soils

Inorganic Contamination (Metals) The RI Report identified several metals in soils that exceeded at least one of the NJDEP soil remediation standards (SRS) that the soil analytical results were compared to. The metals identified in the RI include arsenic, cadmium, copper, lead, mercury, silver, and zinc. Most exceedances were detected in or around the Northern Plant Area, with fewer exceedances being detected in the Southern Plant Area. Metals with concentrations exceeding at least one of the NJDEP SRS were found at depths up to 8 feet, with most exceedances occuring between 0 to 2 feet below ground surface (bgs). Lead, zinc, and cadmium were identified at concentrations above the NJNRSRS and/or MGWSRS most frequently, while copper was only detected above the NJRSRS. Silver occurrence in soil appears to be co-located with the distribution of cadmium, copper, lead, and zinc. Arsenic was detected in one location above the NJNRSRS. This location also had NJRSRS or MGWSRS exceedances of copper, lead, and zinc. Mercury was detected in one location above the MGWSRS. Arsenic and mercury were also detected at similar concentrations in off-site and background samples. Their distribution appears to be random and not indicative of a spill or release.

As previously discussed in the 2019 ROD for OU1 and OU2, metals originating from the Madison property have migrated to groundwater.

Volatile organic compounds (VOCs) A limited variety and number of organic compounds were identified in soil above the MGWSRS. Three VOCs were identified in a small number of shallow soil (1-4.5 ft.) samples at concentrations that slightly exceeded the MGWSRS. They are benzene, methylene chloride, and trichloroethylene (TCE). Benzene exceeded the MGWSRS in two samples in the Northern Plant Area, methylene chloride exceeded the MGWSRS in two samples in the Southern Plant Area, and TCE exceeded the MGWSRS in one sample in the Northern Plant Area. No VOCs were detected above the NJRSRS or NJNRSRS.

Semi-volatile organic compounds (SVOCs) Two SVOCs were identified in a small number of shallow soil (1-2 ft.) samples at concentrations exceeding the NJRSRS or the MGWSRS. Benzo(a)pyrene exceeded the NJRSRS in one sample in the Northern Plant Area and 2-Methylnaphthalene exceeded the MGWSRS in two samples in the Northern Plant Area. No other SVOCs were detected above the NJRSRS, NJNRSRS, or the MGWSRS.

Total polychlorinated biphenyls (PCBs) were detected above the NJRSRS in one sample in the Northern Plant Area as well as in one of the background locations.

Sediment

Cadmium, copper, lead, and zinc were the most common contaminants found at the highest concentrations above the Lowest Effects Levels (LELs) for the NJDEP Ecological Screening Criteria (ESC). Other constituents found above these criteria include arsenic, chromium, cobalt, mercury, nickel, cyanide, and eight organic compounds (including some VOCs/SVOCs, pesticides, and PCBs). These other constituents were found less frequently and based on their distribution, do not appear to be related to the Madison property.

Surface Water

Cadmium, copper, lead, and zinc were again the most common contaminants found at the highest concentrations above the SWQS for fresh water. Other constituents found above these criteria include arsenic, beryllium, chromium, cobalt, nickel, silver, vanadium, and ten organic compounds (including some VOCs/SVOCs and PCBs). These other constituents were found less frequently, and their distribution patterns do not suggest the Madison property is a source. The presence and distribution of the VOCs is consistent with discharge of VOC-impacted groundwater from the CPS property.

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

Land Use

The CPS and Madison properties that together comprise the Site include 45 acres of developed and undeveloped land, currently zoned for commercial/industrial use. The Site is bordered to the southwest by the Runyon Watershed. EPA does not anticipate that the land use will change in the foreseeable future.

Groundwater Use

The Magothy and Raritan Formations constitute the regional aquifer system supplying water resources to the surrounding area. The Perth Amboy municipal water supply wells are located approximately 3,000 feet downgradient from the CPS and Madison facilities.

SUMMARY OF SITE RISKS

As part of the RI/FS, EPA conducted a baseline risk assessment to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site in the absence of any actions or controls to mitigate such releases, under current and future land uses. The baseline risk assessment includes a human health risk assessment (HHRA), Screening Level Ecological Risk Assessment (SLERA), Baseline Ecological Risk Assessment (BERA), and a focused Ecological Risk Assessment (ERA). It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the baseline risk assessment for the Site.

Human Health Risk Assessment

A four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario:

> *Hazard Identification* – uses the analytical data collected to identify the contaminants of potential concern at the site for each medium, with consideration of a number of factors explained below;
>
> *Exposure Assessment* - estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated well-water) by which humans are potentially exposed;

Toxicity Assessment - determines the types of adverse health effects associated with contaminant exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and

Risk Characterization - summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks The risk characterization also identifies contamination with concentrations which exceed acceptable levels, defined by the NCP as an excess lifetime cancer risk greater than $1 \times 10^{-6} – 1 \times 10^{-4}$ or a Hazard Index greater than 1; contaminants at these concentrations are considered COCs and are typically those that will require remediation at the Site. Also included in this section is a discussion of the uncertainties associated with these risks.

Hazard Identification

In this step, contaminants of potential concern (COPCs) in each medium at the Site were identified based on such factors as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations, mobility, persistence and bioaccumulation. The HHRA began with selecting COPCs in various media (i.e., surface soil, subsurface soil, surface water and sediment) that could potentially cause adverse effects in exposed populations. COPCs are selected by comparing the maximum detected concentrations of each chemical identified with state and federal risk-based screening values. The COPC screening was conducted separately for each medium of interest and exposure area in the HHRA. A comprehensive list of all COPCs can be found in the HHRA in the administrative record. Only site-related risk driving COCs, or those chemicals exceeding EPA's threshold criteria, are included in Table 4.

Exposure Assessment

Consistent with Superfund policy and guidance, the HHRA assumes no remediation or institutional controls to mitigate or remove hazardous substance releases. Cancer risks and noncancer hazard indices were calculated based on an estimate of the reasonable maximum exposure (RME) expected to occur under current and future conditions at the Site. The RME is defined as the highest exposure that is reasonably expected to occur at a site.

To aide in the assessment of risk, the Madison property was divided into the following exposure areas based on historical and current use of the Site, anticipated future use of the Site and current land features:

- Northern Plant (NP) Areas 1/9
- Southern Plant (SP) Areas 3/8
- Southern Plant (SP) Area 5
- Southern Plant (SP) Area 6/12
- Southern Plant (SP) Area 10
- Sitewide (combining all the exposure areas)
- Off-site Area 4
- Off-site Area 14
- Prickett's Brook (On-site and Off-site)
- Prickett's Pond
- Tennent Pond

The current and anticipated future use of the Madison property is industrial. As such, the following receptors and exposure pathways were evaluated for the on- and off- site soil areas and surface water and sediment features of Prickett's Brook, and for the off-site surface water and sediments features on Prickett's Pond and Tennent Pond:

- Current/future outdoor industrial worker: exposure to soil via incidental ingestion, dermal contact, and inhalation of particulate emissions in ambient air. Incidental ingestion and dermal contact with sediment and surface water in the on-site portion of Prickett's Brook.

- Current/future construction/utility worker: exposure to surface and subsurface soil (0-15 ft below ground surface) via incidental ingestion, dermal contact, and inhalation of particulate emissions in ambient air.

- Adult and Youth (6-18 years old) trespassers: exposure to surface soils via incidental ingestion, dermal contact, and inhalation of particulate emissions in ambient air. Incidental ingestion and dermal contact with sediment and surface water while wading in the on-site portion of Prickett's Brook.

- Adult and Youth (6-18 years old) recreational visitors: incidental ingestion and dermal contact with sediments and surface water while wading or hiking in/near the off-site portion of Prickett's Brook, and to Prickett's Pond and Tennent Pond.

A summary of all the exposure pathways considered in the HHRA can be found in Table 3. Typically, exposures are evaluated using a statistical estimate of the exposure point concentration, which is usually an upper bound estimate of the average concentration for each contaminant, but in some cases may be the maximum detected concentration. Consistent with EPA guidance, the exposure point concentration for lead was calculated as the arithmetic mean of all samples collected from the appropriate media. A summary of the exposure point concentrations for lead identified in soil can be found in Table 4, while a comprehensive list of the exposure point concentrations for all COPCs can be found in the HHRA.

Toxicity Assessment

In this step, the types of adverse health effects associated with contaminant exposures and the relationship between magnitude of exposure and severity of adverse health effects were determined. Potential health effects are contaminant-specific and may include the risk of developing cancer over a lifetime or other noncancer health effects, such as changes in the normal functions of organs within the body (*e.g.*, changes in the effectiveness of the immune system). Some contaminants are capable of causing both cancer and noncancer health effects.

Under current EPA guidelines, the likelihood of carcinogenic risks and noncarcinogenic hazards due to exposure to site chemicals are considered separately. Consistent with current EPA policy, it was assumed that the toxic effects of the site-related chemicals would be additive. Thus, cancer and noncancer risks associated with exposures to individual COPCs were summed to indicate the potential risks and hazards associated with mixtures of potential carcinogens and noncarcinogens, respectively.

Toxicity data for the human health risk assessment were provided by the Integrated Risk Information System (IRIS) database, the Provisional Peer Reviewed Toxicity Database (PPRTV), or another source that is identified as an appropriate reference for toxicity values consistent with EPA's directive on toxicity values. This information is presented in Table 5 series (non-carcinogenic toxicity data) and Table 6 series (cancer toxicity data) of the HHRA. The comprehensive HHRA is available in the administrative record for the Site.

Risk Characterization

This step summarized and combined outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks. For chemicals other than lead, exposures were evaluated based on the potential risk of developing cancer and the potential for noncancer health hazards.

Noncarcinogenic risks were assessed using a hazard index (HI) approach, based on a comparison of expected contaminant intakes and benchmark comparison levels of intake (reference doses, reference concentrations). Reference doses (RfDs) and reference concentrations (RfCs) are estimates of daily exposure levels for humans (including sensitive individuals) which are thought to be safe over a lifetime of exposure. The estimated intake of chemicals identified in environmental media (*e.g.*, the amount of a chemical ingested from contaminated drinking water) is compared to the RfD or the RfC to derive the hazard quotient (HQ) for the contaminant in the particular medium. The HI is obtained by adding the HQs for all compounds within a particular medium that impacts a particular receptor population.

The HQ for oral and dermal exposures is calculated as below. The HQ for inhalation exposures is calculated using a similar model that incorporates the RfC, rather than the RfD.

HQ = Intake/RfD

Where: HQ = hazard quotient
Intake = estimated intake for a chemical (mg/kg-day)
RfD = reference dose (mg/kg-day)

The intake and the RfD will represent the same exposure period (i.e., chronic, subchronic, or acute).

As previously stated, the HI is calculated by summing the HQs for all chemicals for likely exposure scenarios for a specific population. An HI greater than 1 indicates that the potential exists for noncarcinogenic health effects to occur as a result of site-related exposures, with the potential for health effects increasing as the HI increases. When the HI calculated for all chemicals for a specific population exceeds 1, separate HI values are then calculated for those chemicals which are known to act on the same target organ. These discrete HI values are then compared to the acceptable limit of 1 to evaluate the potential for noncarcinogenic health effects on a specific target organ. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media.

As summarized in Table 5, noncancer risk estimates for all receptors evaluated at the Madison Site fell below EPA's threshold value of 1. Receptor specific noncancer HIs ranged from 0.0035 to 0.79.

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a carcinogen, using the cancer slope factor (SF) for oral and dermal exposures and the inhalation unit risk (IUR) for inhalation exposures. Excess lifetime cancer risk for oral and dermal exposures is calculated from the following equation, while the equation for inhalation exposures uses the IUR, rather than the SF:

Risk = LADD x SF

Where: Risk = a unitless probability (1×10^{-6}) of an individual developing cancer
LADD = lifetime average daily dose averaged over 70 years (mg/kg-day)
SF = cancer slope factor, expressed as [1/(mg/kg-day)]

These risks are probabilities that are usually expressed in scientific notation (such as 1×10^{-4}). An excess lifetime cancer risk of 1×10^{-4} indicates that one additional incidence of cancer may occur in a population of 10,000 people who are exposed under the conditions identified in the assessment. Again, as stated in the NCP, the acceptable risk range for site-related exposure is 10^{-6} to 10^{-4}.

As shown in Table 5, total cancer risk estimates for all receptors evaluated in the HHRA fell within or below EPA's threshold of 10^{-6} to 10^{-4}. Receptor specific cancer risk estimates for the Site ranged from 1.9×10^{-5} to 8.4×10^{-8}.

Lead evaluation

Lead was identified as a COPC in soil based upon a comparison of the maximum detected concentration to the current commercial/industrial soil screening level of 800 mg/kg.

Because there are no published quantitative toxicity values for lead it is not possible to evaluate risks from lead exposure using the same methodology as for the other COPCs. However, since the toxicokinetics (the absorption, distribution, metabolism, an excretion of toxins in the body) of lead are well understood, lead is regulated based on blood lead concentrations. In lieu of evaluating risk using typical intake calculations and toxicity criteria, EPA developed models (the IEUBK model for the child receptor and ALM model for the adult receptors) to predict blood lead concentration and the probability of a child's or developing fetus' blood lead concentration exceeding a target blood lead level based on a given multimedia exposure scenario. For the Madison HHRA, blood lead concentrations and the resultant probabilities of a fetus' blood lead concentrations exceeding 5µg/dL were estimated using the Adult Lead Methodology (ALM) model for adolescent and adult receptors.

Consistent with EPA guidance, EPCs for lead were based on the arithmetic mean of all the samples within the exposure area from the appropriate depth interval. Results of the ALM model were compared to the regional risk reduction goal for lead which is to limit the probability of a child or developing fetus' blood lead level from exceeding 5 micrograms per deciliter (µg/dL) to 5% or less.

The ALM results revealed blood lead above the risk reduction goal for the outdoor industrial worker and construction/utility workers present on Northern Plant (NP) Areas 1/9 and for the sitewide outdoor industrial worker. Blood lead risk exceedances ranged from 16.4% for the sitewide outdoor industrial worker to 42.5% for the NP Areas 1/9 outdoor industrial worker.

In summary, the results of the HHRA indicated there were no unacceptable cancer risks or noncancer hazard from exposure to non-lead constituents. However, exposure to lead surpassed EPA's risk reduction goal (to limit the probability of a developing fetus' blood lead level from exceeding 5 µg/dL to 5% or less) for a sitewide outdoor industrial worker and an outdoor industrial worker and construction/utility worker on the Northern Plant Areas 1/9.

Uncertainties

The procedures and inputs used to assess human health risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis
- environmental parameter measurement
- fate and transport modeling
- exposure parameter estimation
- toxicological data.

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the chemicals of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the risk assessment provides upper-bound estimates of the risks to populations near the Site and is highly unlikely to underestimate actual risks related to the Site.

More specific information concerning public health risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the HHRA report.

Ecological Risk Assessment

Ecological risk was evaluated in three steps, where representative ecological receptors were identified, and measurement and assessment endpoints were developed to identify potential risk from contaminants of potential ecological concern (COPECs) to those receptors. As described above, there were three evaluations conducted to evaluate the potential ecological risk associated with the Site: a SLERA, BERA and focused ERA. These documents can be found in the administrative record.

The SLERA evaluated all detected compounds in soil, sediment, and surface water. The conclusions were that metals, specifically cadmium, copper, lead, nickel, vanadium, and zinc, in sediment and surface water have a potential for adverse effects in vertebrate invertivores. The recommendation from the SLERA was to proceed with further site-specific evaluations to assess the potential for adverse effects in invertivores.

The BERA was conducted focusing on the site-related metals (cadmium, copper, lead and zinc) in soil, sediment, and surface water. The conclusions were that elevated risks were identified in aquatic receptors for the evaluated metals in surface water and sediment; however, toxicity tests and invertebrate surveys did not show any toxicity or impact to community structure suggesting that the metals are not bioavailable.

The focused ERA was then conducted to investigate site-specific bioavailability and toxicity of metals in the sediment. The focused evaluation included measuring sediment bioaccumulation of metals in invertebrates, sediment toxicity in invertebrates, sediment chemical residue analysis and updated food web models. The result of this evaluation indicates sporadic sediment toxicity to invertebrates that is not directly correlated to sediment concentrations of Madison property-related metals. The toxicity may be related to groundwater discharge associated with OU1 and OU2 or may be associated with upstream impacts. It is expected that as remedial actions are implemented for the other operable units, if the toxicity is associated with groundwater discharge, it will decrease over time. A long-term monitoring program to measure toxicity associated with groundwater discharge, as well as to include additional baseline sediment sampling, was included as a common element in all remedial alternatives evaluated for OU3.

Basis for Taking Action

Based on the results of the HHRA and ecological risk assessments, the response action selected in this Record of Decision is necessary to protect the public health or welfare of the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards such as applicable or relevant and appropriate requirements (ARARs), to-be-considered (TBC) advisories, criteria and guidance, and site-specific risk-based levels. The primary objective of any remedial strategy is overall protectiveness.

The following RAOs were developed to address the human health and ecological risks discussed above for OU3 contaminated media:

- Prevent migration of on-going sources of Madison property-related soil contaminants to groundwater that pose a potential risk to human health and the environment.
- Prevent ingestion, dermal, and inhalation exposure to Madison property-related soil contaminants that pose unacceptable human health risk to the current and future industrial worker and construction/utility worker.
- Prevent the potential erosion and migration of soil containing Madison-property related contaminants to surface water and sediment.

Achieving the RAOs relies on the remedial alternatives' ability to meet final remediation goals/cleanup levels derived from preliminary remediation goals (PRGs), which are based on such factors as ARARs, risk, and background levels of contaminants in the environment that occur naturally or are from other industrial sources. In the Proposed Plan, EPA selected the more stringent of the NJNRSRS for the Ingestion-Dermal Exposure Pathway and the NJDEP MGWSRS as the PRGs for COCs in the OU3 unsaturated soils. Lead was identified as a COC for OU3 soils because lead drives the human health risk identified in the HHRA. Cadmium and zinc were identified as COCs for OU3 soils because both cadmium and zinc exceed the MGW PRGs in OU3 soils. PRGs become final remediation goals (RGs) when EPA selects a remedy after taking into consideration all public comments. A complete list of ARARs can be found in Appendix II-A (Table 1) and EPA's final RGs for OU3 can be found in Appendix II-A (Table 2).

DESCRIPTION OF ALTERNATIVES

Section 121(b)(1) of CERCLA, 42 U.S.C. §9621(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions that employ, as a principal element, treatment to reduce permanently and significantly the volume, toxicity, or mobility of the hazardous substances, pollutants, and contaminants at a site. Section 121(d) further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants that at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to Section 121(d)(4) of CERCLA, 42 U.S.C. §9621(d)(4). Detailed descriptions of the remedial alternatives for addressing the soil contamination associated with OU3 can be found in the FS Report, dated May 2023.

Potential technologies applicable to soil remediation were identified and screened by effectiveness, implementability, and cost criteria, with emphasis on effectiveness. Those technologies that passed the initial screening were then assembled into remedial alternatives.

The construction timeframes for each alternative reflects only the estimated time required to construct the remedy; they do not include the time to negotiate with the responsible party, design the remedy, or procure necessary contracts. Five-year reviews will be conducted as a component of the alternatives that would leave contamination in place above levels that allow for unlimited use and unrestricted exposure.

Common Elements

All the alternatives, except for the no action alternative (Alternative 1), include common components.

Alternatives 2 and 3 include using existing paved areas and structures on the Madison property as a cap to protect against direct contact hazards to human health and to address the migration to groundwater pathway in these areas. The existing paved areas will be assessed to determine if they meet NJDEP capping requirements and, if they do not, they will be upgraded to meet them. Implementation will also include ongoing inspections, maintenance, and reporting to ensure the continued effectiveness of a cap on these areas.

Alternatives 2 and 3 also include long-term sediment and surface water monitoring to assess the effectiveness of remedial actions, once implemented, for OU1, OU2, and soil within OU3. A workplan for this monitoring will be developed during the Remedial Design (RD) phase.

Alternatives 2 and 3 also include institutional controls (in the form of a deed notice) to restrict the Madison property to non-residential uses. A deed notice would also define the restricted areas on the Madison property and provide a description of engineering controls in the restricted areas and specify actions to be taken if a restricted area is to be disturbed. In addition, a deed notice would require annual inspections to determine that the engineering controls remain protective of human health and the environment and biennial certifications to document continued protectiveness of the remedial action.

Finally, because Alternatives 2 and 3 would leave contamination in place above levels that would allow for unlimited use and unrestricted exposure, a review of conditions at the Site will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

Soil Alternatives:

Alternative 1 – No Action

Capital Cost:	*$0*
Annual O&M Cost:	*$0*
Present Worth Cost:	*$0*
Construction Timeframe:	*0 years*

The NCP requires that a "No Action" alternative be evaluated to establish a baseline for comparison with other remedial alternatives. Under this alternative, there would be no remedial actions actively conducted at OU3 to control or remove soil contaminants. This alternative also does not include monitoring or institutional controls.

Alternative 2 – Excavation in Unpaved Areas and Off-Site Disposal

Capital Cost:	*$1,330,000*
Annual O&M Cost:	*$620,000*
Present Worth Cost:	*$1,950,000*
Construction Time Frame:	*18 months*
Est. Time to Reach RAOs:	*5 years*

In addition to the common elements listed above, this alternative employs excavation and off-site disposal of contaminated soils. Soils in unpaved and undeveloped areas where site COCs exceed RGs would be excavated and staged on-site prior to characterization sampling and off-site disposal at a permitted disposal facility. Excavated areas would be backfilled with certified clean fill. In areas where the Site is paved, the existing pavement would act as a cap over contaminated soils, as detailed earlier in the Common Elements section. This alternative would provide removal of contaminated soil that presents a direct contact hazard and eliminate the potential migration to groundwater pathway.

Approximately 1,320 cubic yards (cy) of soil would be excavated under this alternative. The 1,320 cy would contain approximately 16,000 square feet (sf) of soil, between 2-5 feet in depth, from 11 areas impacted by site COCs. The 11 areas are primarily located along the perimeter of the Madison property where soil is not currently covered by pavement (Figure 2).

Alternative 3 – Capping of Unpaved Areas

Capital Cost:	*$830,000*
Annual O&M Cost:	*$620,000*
Present Worth Cost:	*$1,450,000*

Construction Time Frame: *18 months*
Est. Time to Reach RAOs: *5 years*

In addition to the common elements listed above, this alternative involves placing a cap of impermeable material (such as asphalt or concrete) over impacted soils in unpaved and undeveloped areas where site COCs exceed RGs (Figure 2). In areas where the Site is paved, the existing pavement would act as a cap over contaminated soils, as detailed earlier in the Common Elements section. Capping would address human health concerns and control potential impacts to groundwater; therefore, this alternative would address both the direct contact hazard posed by the contaminated soil and the potential migration to groundwater pathway. The placement of additional impermeable material on the property may also require improved stormwater management controls due to a reduction in water storage capacity for the property.

Evaluation of Alternatives

In evaluating the remedial alternatives, each alternative is assessed against nine evaluation criteria set forth in the NCP namely, overall protection of human health and the environment; compliance with ARARs; long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; cost; and state and community acceptance.

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, EPA considered the factors set out in CERCLA Section 121, 42 U.S.C. § 9621, by conducting a detailed analysis of the viable remedial response measures pursuant to the NCP, 40 CFR § 300.430€(9) and OSWER Directive 9355.3-01. The detailed analysis consisted of an assessment of the individual response measure against each of nine evaluation criteria and a comparative analysis focusing upon the relative performance of each response measure against the criteria.

Threshold Criteria - The first two criteria are known as "threshold criteria" because they are the minimum requirements that each response measure must meet in order to be eligible for selection as a remedy.

---

1. Overall Protection of Human Health and the Environment

Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or institutional controls.

Alternative 1, No Action, would not be protective of human health or the environment because no action would be taken to address soil contamination. For this reason, Alternative 1 was eliminated from further consideration under the remaining eight criteria.

Alternative 2 would be protective of human health and the environment by removing soil in unpaved areas to meet RGs. In paved areas where impacted soils exceed RGs, the existing pavement would serve as a cap to mitigate the direct contact and migration to groundwater pathways. A deed notice would be required for areas that have soil contamination remaining above the NJRSRS for the ingestion-dermal exposure pathway, to restrict the use of the property to non-residential use, define the restricted areas, and describe engineering controls.

Alternative 3 would also be protective of human health and the environment. Alternative 3 would require capping to be placed over unpaved areas with exceedances of the RGs to address the ingestion-dermal and migration to groundwater pathways. Similar to Alternative 2, existing paved areas would serve as a cap and a deed notice would be required to restrict the property to non-residential uses, define the restricted areas, and describe engineering controls.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Section 121(d) of CERCLA and NCP § 300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate federal and state requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA section 121(d)(4).

The chemical-specific ARARs and related RGs for cadmium, lead, and zinc would be met under Alternative 2 as exceedances of the NJNRSRS for the ingestion-dermal pathway would either (1) be removed via excavation or (2) remain in place, but migration and exposure would be controlled via the existing cap(s) and structures. In the case of Alternative 3, the chemical-specific ARARs would be met by capping unpaved areas where there are exceedances of the RGs, as well as by the existing cap(s) and structures.

Location-specific ARARs would be met by Alternatives 2 and 3 during the construction phase by following substantive requirements for construction and development in flood hazard areas.

Action-specific ARARs would be met by Alternative 2 during the construction phase by proper design and implementation of the action including disposal of excavated soil at the appropriate disposal facility. Action-specific ARARs would be met by Alternative 3 during the construction phase by following NJDEP's substantive technical requirements for site remediation.

Primary Balancing Criteria - The next five criteria, criteria 3 through 7, are known as "primary balancing criteria". These criteria are factors with which tradeoffs between response measures are assessed so that the best option will be chosen, given site-specific data and conditions.

---

3. Long-Term Effectiveness and Permanence

A similar degree of long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup levels have been met. This criterion includes the consideration of residual risk that will remain on-site following remediation and the adequacy and reliability of controls.

Alternative 2 provides the greatest degree of long-term effectiveness and permanence because it removes the soils impacted by COCs in the unpaved areas and has greater climate resilience than Alternative 3.

To a lesser degree than Alternative 2, the capping of unpaved impacted areas included under Alternative 3 would reduce potential mobility and exposure concerns posed by the COCs by mitigating the potential migration to groundwater and direct contact pathways. Additionally, the addition of impermeable caps required under Alternative 3 would increase the amount of stormwater runoff and could make the Madison property more susceptible to flooding. Therefore, in considering climate resiliency, Alternative 3 may provide a lesser degree of long-term effectiveness and permanence compared to Alternative 2.

For both alternatives, the caps would require maintenance for the foreseeable future.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

Neither of the soil alternatives include treatment, so there would be no reduction of toxicity, mobility, or volume through treatment under any alternative.

5. Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community and the environment during construction and operation of the remedy until cleanup levels are achieved.

Alternative 2 would pose some short-term risks during implementation. Risks to site workers, the community and the environment include potential short-term exposure to contaminants during excavation of soil. Potential risks would be addressed via implementation of a health and safety plan, air monitoring, and the use of dust control technologies, as needed, during earth disturbances. An exclusion zone would be established during excavation activities to restrict Madison facility workers from entering the excavation area. Remediation workers and anyone entering the exclusion zone would be required to wear personal protective equipment to prevent exposure to COCs.

Alternative 3 presents fewer short-term risks during implementation. Capping is unlikely to require the disturbance of impacted soils beyond grading that may be required to prepare the subbase prior to cap installation. Any potential risks arising from the disturbance of impacted soil would be addressed using the same measures identified for Alternative 2.

The construction timeframe for both Alternative 2 and Alternative 3 would be approximately 18 months.

6. Implementability

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

Alternatives 2 and 3 have common implementability issues related to the removal of soil (Alternative 2) and installation of caps (Alternative 3). The technologies needed for both alternatives are proven and conventional. Contractors needed to perform the work for both alternatives are readily available. Coordination with other agencies including NJDEP will be required. Pursuant to the permit exemption at Section 121(e)(1) of CERCLA, 42 U.S.C. § 9621(e)(1), no permits would be required for on-site work although substantive requirements of otherwise-required permits would be met. Both Alternative 2 and Alternative 3 will also require filing a deed notice, followed by periodic inspections, and submission of biennial certifications to NJDEP.

7. Cost

Includes estimated capital and O&M costs, and net present worth value of capital and O&M costs.

The total estimated present worth costs, calculated using a 7% discount rate, are: $1,950,000 for Alternative 2; and $1,450,000 for Alternative 3.

Modifying Criteria - The final two evaluation criteria, criteria 8 and 9, are called "modifying criteria" because new information or comments from the state or the community on the Proposed Plan may modify the preferred response measure or cause another response measure to be considered.

---

8. State Acceptance

Indicates whether based on its review of the FS Report and the Proposed Plan, the state supports, opposes, and/or has identified any reservations with the selected remedial measure.

The State of New Jersey concurs with EPA's selected remedy for OU3.

9. Community Acceptance

Summarizes the public's general response to the response measures described in the Proposed Plan and the FFS report. This assessment includes determining which of the response measures the community supports, opposes, and/or has reservations about.

EPA solicited input from the community on the remedial alternatives that were proposed for OU3. Oral comments were recorded from attendees of the public meeting. EPA received written and oral comments from residents of Old Bridge and Perth Amboy. Comments received during the public comment period and EPA responses are in the attached Responsiveness Summary, Appendix V.

PRINCIPAL THREAT WASTE

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (40 C.F.R. § 300.430(a)(1)(iii)(A)). The “principal threat” concept is applied to the characterization of “source materials” at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for the migration of contamination to groundwater, surface water, or air, or act as a source for direct exposure. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. Although cadmium, lead, and zinc in soil may act as sources to groundwater or surface water, these sources are not highly mobile and are not considered principal threat wastes at this OU.

SELECTED REMEDY

Based upon consideration of the results of the site investigation, the requirements of CERCLA, and the detailed analysis of the remedial alternatives and public comments, EPA has determined that Alternative 2, Excavation in Unpaved Areas and Off-Site Disposal, is the appropriate remedy for the Site. This remedy best satisfies the requirements of CERCLA Section 121 and the NCP’s nine evaluation criteria for remedial alternatives, 40 C.F.R. § 300.430(e)(9).

Summary of the Rationale for the Selected Remedy

The preferred remedy was selected over other alternatives because it is expected to achieve the greatest degree of long-term effectiveness and permanence by removing impacted soils in the unpaved areas. The preferred alternative will be protective of human health and the environment, comply with all ARARs, and be easily implementable with minimal short-term risk. The preferred remedy reduces the risk from OU3 contaminants within approximately 18 months, at a cost comparable to other alternatives and should be reliable over the long-term.

Based on information currently available, EPA believes the selected remedy meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing criteria. The selected remedy satisfies the following statutory requirements of CERCLA Section 121: (1) be protective of human health and the environment; (2) comply with ARARs; (3) be cost-effective; and (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Long-term monitoring would be performed to assure the protectiveness of the remedy.

Description of the Selected Remedy

The major components of the OU3 remedy include the following:

- Excavation and off-site disposal of 1,320 cy of contaminated soil from unpaved areas on the Madison property;
- Use of existing pavement on the Madison property as an engineering control, in the form of capping, over contaminated soils;
- Long-term monitoring of sediment and surface water; and
- Institutional controls, such as a deed notice, to prevent exposure to residual soils that exceed levels that allow for unrestricted use, and to limit disturbance of capped areas.

Approximately 1,320 cy of soil containing concentrations of lead, cadmium, and zinc greater than the RGs will be excavated from unpaved areas within the Madison property under this remedy. The 1,320 cy will contain approximately 16,000 sf of soil, between 2-5 feet in depth, from 11 areas impacted by site COCs. The 11 areas are primarily located along the perimeter of the Madison property where soil is not currently covered by pavement (Figure 2).

In areas within the Madison property where existing pavement is already in place over contaminated soils, the pavement will be assessed to determine if it meets NJDEP capping requirements and upgraded to meet those requirements if necessary. This component of the remedy will also include ongoing inspections, maintenance, and biennial certifications to document the continued effectiveness of a cap over these areas.

Long-term monitoring of sediment and surface water will be conducted to assess the effectives of remedial actions, once implemented, for OU1, OU2, and soil within OU3. A workplan further detailing the long-term monitoring will be developed during the RD phase.

Institutional controls, in the form of a deed notice, will be established for the Madison property to restrict the property to non-residential uses. The deed notice will provide information regarding the Site, presence and location of contaminants, and compliance inspections and monitoring requirements.

The environmental benefits of the selected remedy may be enhanced by employing design technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy.

Summary of Estimated Remedy Costs

The total estimated present-worth cost for the selected remedy is $1,950,000. This is an engineering cost estimate that is expected to be within the range of plus 50 percent to minus 30 percent of the actual project cost. Further detail on the cost is presented in Appendix II C, Table 6 and Table 7.

Expected Outcomes of the Selected Remedy

The four components of the selected remedy effectively address contamination in soil at the Madison property. The results of the risk assessment indicate unacceptable risk from exposure to soil containing lead. The response actions selected in this ROD will address contaminated soils on the Madison property that present this unacceptable risk and may also act as a source to groundwater, and thereby, will eliminate the exposure pathway associated with unacceptable risk and eliminate the soil-to-groundwater pathway, while allowing the commercial/industrial use of the Madison property.

STATUTORY DETERMINATIONS

As was previously noted, CERCLA Section 121(b)(1) mandates that a remedial action must be protective of human health and the environment, cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to reduce the volume, toxicity or mobility of the hazardous substances, pollutants, or contaminants permanently and significantly at a site. CERCLA Section 121(d) further specifies that a remedial action must attain a degree of cleanup that satisfies ARARs under federal and state laws unless a waiver can be justified pursuant to CERCLA Section 121(d)(4).

Protection of Human Health and the Environment

The selected remedy will be protective of human health and the environment by removing contaminated soil that poses a direct contact or ecological threat. The combination of soil removal and capping will prevent human receptor exposure to contaminants and prevent contaminant migration from soil to surface water or groundwater. Where the soil is capped, institutional controls such as a deed notice, will be put in place to ensure the capping remains effective at protecting human health and the environment. Implementation of the selected remedy will not present unacceptable short-term risks or adverse cross-media impacts.

Compliance with ARARs

EPA expects that the selected remedy will comply with federal and New Jersey ARARs. A complete list of ARARs can be found in Appendix II-A (Table 1).

The chemical-specific ARARs for lead, cadmium, and zinc in the soil include the NJNRSRS for the ingestion-dermal exposure pathway. Although not an ARAR, the NJDEP MGWSRS are considered a TBC advisory and are being used as an RG for unsaturated soils.

Location-specific ARARs that may be applicable to soils in OU3 include the New Jersey Flood Hazard Area Control Act Regulations.

Action-specific ARARs for soil excavation and off-site disposal include the Federal Resource Conservation and Recovery Act, Federal Hazardous Materials Transportation Law, New Jersey Hazardous Waste and Solid Waste Regulations, and the New Jersey Soil Erosion and Sediment Control Act.

Cost Effectiveness

EPA has determined that the selected remedy is cost effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness." (NCP §300.430 (f)(1)(ii)(D)). EPA evaluated the "overall effectiveness" of those alternatives that satisfied the threshold criteria (i.e., were both protective of human health and the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, or volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to costs to determine cost effectiveness. The relationship of the overall effectiveness of the selected remedy was determined to be proportional to costs and hence, the selected remedy represents a reasonable value for the money to be spent. The selected remedy is cost-effective as it has been determined to provide the greatest overall protectiveness for its present worth costs.

Utilization of Permanent Solutions and Alternative Treatment Technologies

EPA has determined that the selected remedy utilizes permanent solutions and treatment technologies to the maximum extent that is practicable. Contaminated soil in the unpaved areas of OU3 will be removed and those areas will be backfilled with clean soil. In the paved areas of OU3, where soil contaminants are present, capping will be used.

The selected remedy will provide adequate long-term control of risks to human health and the environment through eliminating and/or preventing exposure to the contaminated soils. The selected remedy is protective against short-term risks.

Preference for Treatment as a Principal Element

Treatment is not an element of the selected remedy because contaminated soil is being addressed through a combination of removal and capping. Treatment was initially considered in the Development and Screening of Remedial Alternatives Technical Memorandum (January 2022); however, treatment was not retained for further evaluation in the FS due to significant implementation challenges presented by the presence of buildings and active facility operations. Additionally, no source materials constituting principal threats will be addressed within the scope of this action. Remedies selected for past operable units (OU1 and OU2) have met the statutory preference for treatment.

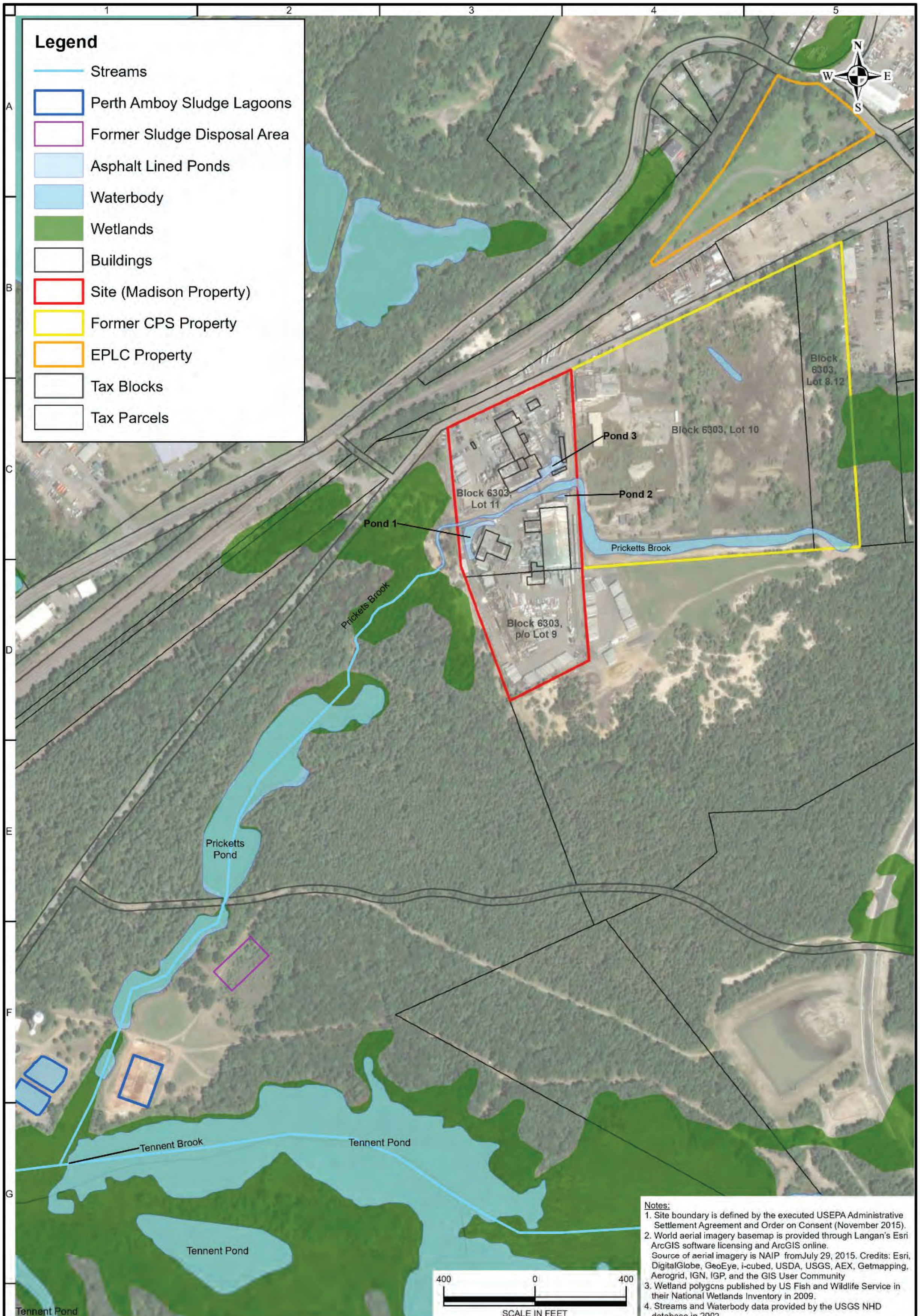
Five-Year Review Requirements

The selected remedy for OU3 involves capping, consisting of retaining existing paving, and upgrading it as necessary, on the areas of the Madison property that are already paved. Therefore, contamination will be left in place at levels above those that allow for unlimited use and unrestricted exposure. A statutory five-year review will be conducted within five years of initiation of the remedial action for the Site to ensure that the remedy is, or will be, protective of human health and the environment.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the Site was released for public comment on June 1, 2023. The comment period closed on July 3, 2023. The Proposed Plan identified Alternative 2 as the preferred alternative to address soil contamination and monitoring of sediment and surface water. Upon review of all comments submitted, EPA determined that no significant changes to the selected remedy, as it was presented in the Proposed Plan, were warranted.

APPENDIX I: Figures



LANGAN

300 Kimball Drive
Parsippany, NJ 07054
T: 973.560.4900 F: 973.560.4901 www.langan.com

Langan Engineering & Environmental Services, Inc.
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan International LLC
Collectively known as Langan

NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project

CPS/MADISON SUPERFUND SITE

OLD BRIDGE TOWNSHIP

MIDDLESEX COUNTY NEW JERSEY

Drawing Title

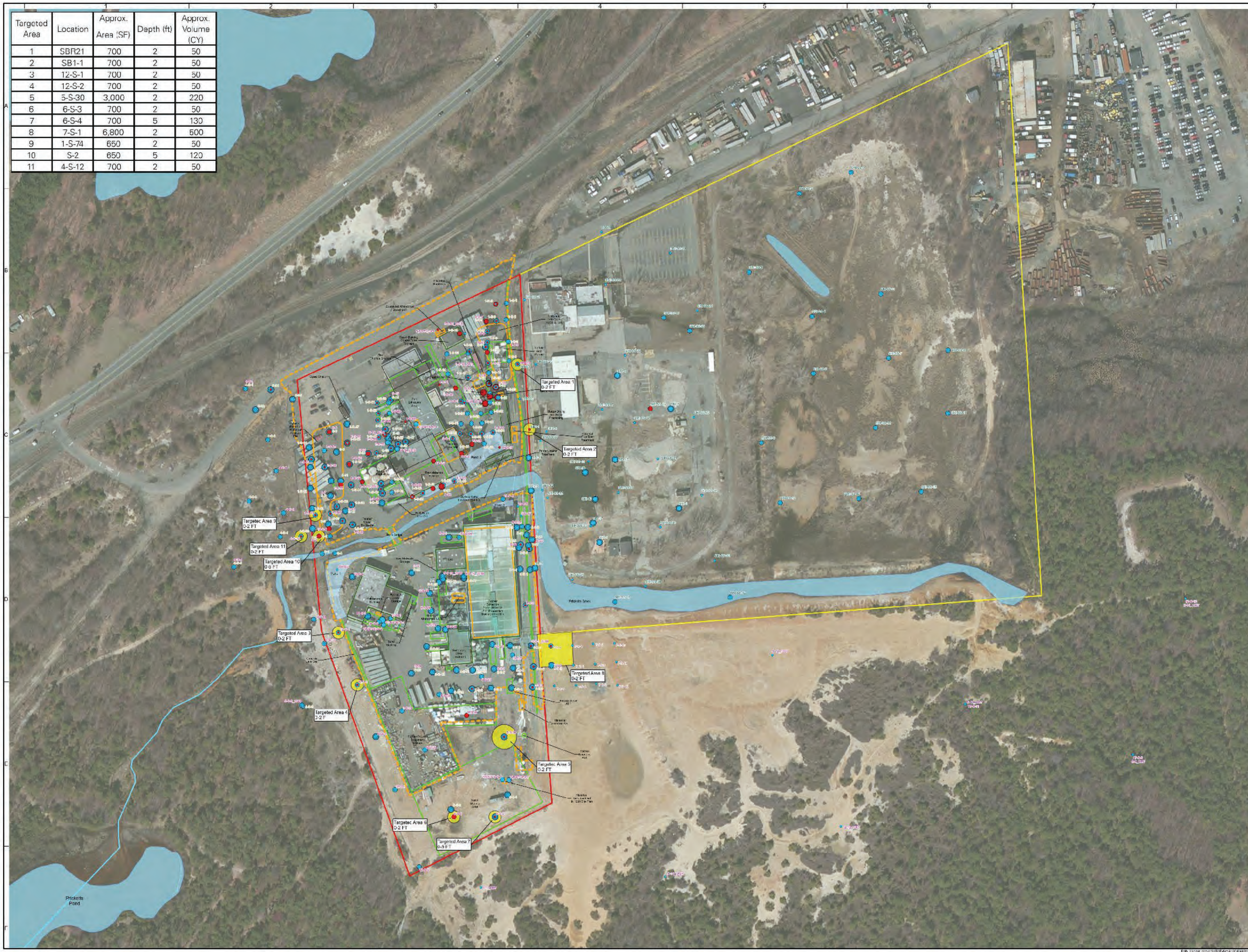
SITE AREA

Project No.	100484401
Date	5/30/2017
Scale	1"=400'
Drawn By	JR
Last Revised	7/26/2022

Figure

1

Targeted Area	Location	Approx. Area (SF)	Depth (ft)	Approx. Volume (CY)
1	SBR21	700	2	50
2	SB1-1	700	2	50
3	12-S-1	700	2	50
4	12-S-2	700	2	50
5	5-S-30	3,000	2	220
6	6-S-3	700	2	50
7	6-S-4	700	5	130
8	7-S-1	6,800	2	500
9	1-S-74	650	2	50
10	S-2	650	5	120
11	4-S-12	700	2	50



N E S W

Legend

- Non-Detect Soil Sample
- Detected Non-Exceedance Soil Sample
- Soil Sample with PRG Exceedance

For Historical Samples:
- 3 or C (Deep) 5-11.5 ft bgs
- 2 or B (Intermediate) 1.5-5 ft bgs
- 1 or A (Shallow) 0-2.5 ft bgs

For 2018/2019 RI (Remedial Investigation) Samples:
- 5 ft bgs
- 2-5 ft bgs
- 0-2 ft bgs

Sample location labels are color coded as follows:
- 1-B-11 2018/2019 RI, Langan
- SB-1 2016 RIR, Princeton Geoscience
- 7-S-1 December 1997 Soil Sampling, Madison Industries
- S-1 September 1997 Soil Sampling, Madison Industries
- 1-S-1 1996 Phase I RIR, Madison Industries
- S-1 1993 RIR, Converse Consultants East
- Stream
- Waterbody
- Asphalt Lined Ponds
- Buildings
- Historical Site Features
- Current Site Features
- Site (Madison Property)
- Former CPS Property
- Impervious Surface
- Targeted Remediation Areas

0 100 200
SCALE IN FEET

LANGAN

Project

CPS/MADISON SUPERFUND SITE

OLD BRIDGE TOWNSHIP

MIDDLESEX COUNTY NEW JERSEY

Drawing Title

MADISON PRIMARY RISK DRIVING COPCS SOIL ANALYTICAL RESULTS COMPARED TO PRGS AND TARGETED REMEDIATION AREAS

Project No. 100484401	Figure 2
Date 1/10/2023	
Scale 1"=100'	
Drawn By PDT	
Submission Date	

APPENDIX II-A: ARARs and TBC Tables

Table 1 – ARARs and TBCs

Madison Superfund Site
Old Bridge Township, New Jersey
September 2023

ARAR	Statute/Regulation	Criteria	Citation	Description	Comments
Chemical	New Jersey Statutes and Rules	NJDEP Non-Residential Soil Remediation Standards (NRSRS) for Ingestion-Dermal Pathway	N.J.A.C. 7:26D; last amended May 17, 2021.	Non-residential standards for soil. See Tables 2B and 2C.	Relevant and appropriate for OU3 soil.
		NJDEP Residential Soil Remediation Standards (RSRS) for Ingestion-Dermal Pathway	N.J.A.C. 7:26D; last amended May 17, 2021.	Residential standards for soil. See Tables 2B and 2C.	Relevant and appropriate for OU3 soil for delineating restriction areas in deed notice.
		NJDEP Migration to Groundwater Site Remediation Standards	N.J.A.C. 7:26D; last amended May 17, 2021.	Standards for soil for pathway to groundwater. See Tables 2B and 2C.	TBC. Evaluated as basis for OU3 soil RGs.
Chemical	NJDEP Site Remediation Program	Alternative Remediation Standards Technical Guidance for Soil and Soil Leachate for the Migration to Groundwater Exposure Pathway	Guidance Version 1.0, May 2021.	Provides guidance on the development of Alternative Remediation Standards for the migration to groundwater exposure pathway.	TBC for OU3 soil.
Location	New Jersey Statutes and Rules	Flood Hazard Area Control Act Regulations	N.J.A.C. 7:13-10, 11; last amended July 15, 2019.	Delineates flood hazard areas and regulates use. Protects floodplains through requirements for construction and development activities	Substantive requirements may be applicable to OU3 soil.
Action	42 U.S.C. § 6921 et seq.	Resource Conservation and Recovery Act (RCRA)	40 CFR 257	Establishes criteria for use in determining which solid waste disposal facilities and practices pose a reasonable probability of adverse effects on health or the environment.	Applicable to OU3 soil.
			40 CFR 260	Establishes procedures and criteria for modification or revocation of any provision in 40 CFR 260-265.	Applicable to OU3 soil.
			40 CFR 261	Identifies solid wastes which are subject to regulation as hazardous wastes.	Applicable to OU3 soil.
			40 CFR 262	Provides general requirements for generators of hazardous waste including registration, manifesting, packaging, recordkeeping, and accumulation.	Applicable to OU3 soil.
			40 CFR 263	Establishes standards which apply to persons transporting manifested hazardous waste within the United States.	Applicable to OU3 soil.
			40 CFR 264 and 265	Regulate storage of hazardous waste.	Applicable to OU3 soil.
			40 CFR 268	Contains land disposal restrictions.	Applicable to OU3 soil.
Action	49 U.S.C. § 5101 et seq.	Federal Hazardous Materials Transportation Law	49 CFR 107 and 171-177	Regulates the transportation of hazardous materials, and includes the procedures for the packaging, labeling, manifesting, and transporting of hazardous waste to a licensed off-site disposal facility.	Applicable to OU3 soil.
Action	New Jersey Statutes and Rules	Hazardous Waste Regulations	N.J.A.C. 7:26G; last amended April 8, 2021.	Procedure for identifying and listing hazardous wastes. Applies to any person who generates, transports, stores, treats or disposes of a hazardous waste. Establishes standards for disposal of hazardous wastes generated during remediation and the requirements for waste transporters, manifesting, and recordkeeping.	Applicable to OU3 soil.

Action	New Jersey Statutes and Rules	Solid Waste Management Act (NJSWMA) and Rules	N.J.S.A. §13:1E-1, et seq. N.J.A.C 7:26	Establishes standards and procedures pertaining to, among other things, the management, treatment and disposal of solid wastes.	Applicable to OU3 soil.
Action	New Jersey Statutes and Rules	Soil Erosion and Sediment Control Act Standards for Soil Erosion and Sediment Control	N.J.A.C. 2:90	The New Jersey Department of Agriculture, Freehold Soil Conservation District governs all soil disturbances greater than 5,000 square feet.	Applicable to OU3 soil.
Action	New Jersey Statutes and Rules	NJDEP Technical Requirements for Site Remediation	N.J.A.C. 7:26E-5; last amended August 6, 2018.	Technical requirements to remediate a contaminated site and ensure that the remediation is protective of public health and safety and of the environment.	Substantive requirements may be relevant and appropriate to OU3 soil.
Action	NJDEP Site Remediation Program	Technical Guidance on Capping of Sites Undergoing Remediation	Guidance Version 1.0, July 14, 2014.	Provides guidance on technical and regulatory consideration in selecting a type of cap, and cap design.	TBC for OU3 soil.
Action	NJDEP Site Remediation Program	NJDEP Guidance Document Capping of Inorganic and Semivolatile Contaminants for the Impact to Ground Water Pathway	Guidance Version 1.0, March 2014.	Identifies situations in which capping is an allowable remedial option for the migration to water pathway.	TBC for OU3 soil.

Table 2: Remediation Goals for OU3 Soils

Contaminant of Concern	NJDEP NRSRS Saturated Soil RG	MGW Unsaturated Soil RG	Unit
Cadmium	1,100	11.9	mg/kg
Lead	800	90	mg/kg
Zinc	390,000	3,120	mg/kg

Notes:
NJDEP NRSRS – New Jersey Department of Environmental Protection Non-Residential Soil Remediation Standards for the Ingestion-Dermal Exposure Pathway, last revised May 17, 2021.
MGWSRS – Migration to Groundwater Soil Remediation Standard. The MGW cleanup goals consist of either the NJDEP Default MGWSRS value or the site-specific MGWSRS value, depending on which is less stringent.
RG – Remediation Goal
RGs for unsaturated soil were selected for each contaminant as the lower of: (1) the MGWSRS and (2) the NJDEP NRSRS.
RGs for saturated soil are the NJDEP NRSRS.

APPENDIX II-B: Risk Tables

Table 3
Selection of Exposure Pathways

Scenario Timeframe	Source Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Soil	Surface Soil 0 to 2 feet	All Soil Exposure Areas	Outdoor Industrial Worker	Adult	Incidental Ingestion	Quantitative	Potentially complete exposure pathway that will be evaluated in the risk assessment.
						Dermal Contact	Quantitative	
						Inhalation of Volatile Emissions	Quantitative	
						Inhalation of Particulates	Quantitative	
				Indoor Industrial Worker	Adult	Incidental Ingestion	Qualitative	Potentially complete exposure pathway that will not be quantified because a more highly exposed receptor (outdoor worker) is included.
						Dermal Contact	Qualitative	
						Inhalation of Volatile Emissions	Qualitative	
						Inhalation of Particulates	Qualitative	
						Inhalation of Volatile Emissions (Indoor Air)	Qualitative	Potentially complete exposure pathway that will not be quantified due to uncertainties with modeling and low levels of volatiles in site soils.
				Construction/Utility Worker	Adult	Incidental Ingestion	Quantitative	Potentially complete exposure pathway that will be evaluated in the risk assessment.
						Dermal Contact	Quantitative	
						Inhalation of Volatile Emissions	Quantitative	
						Inhalation of Particulates	Quantitative	
				Trespasser	Adult and Youth (6 to 18)	Incidental Ingestion	Quantitative	Potentially complete exposure pathway that will be evaluated in the risk assessment.
						Dermal Contact	Quantitative	
						Inhalation of Volatile Emissions	Quantitative	
						Inhalation of Particulates	Quantitative	
		Subsurface Soil > 2 feet	All Soil Exposure Areas	Outdoor Industrial Worker	Adult	Incidental Ingestion	None	Pathway incomplete. Worker assumed to be limited to surface activities only.
						Dermal Contact	None	
						Inhalation of Volatile Emissions	None	
						Inhalation of Particulates	None	
				Indoor Industrial Worker	Adult	Incidental Ingestion	None	Pathway incomplete. Worker assumed to be limited to surface activities only.
						Dermal Contact	None	
						Inhalation of Volatile Emissions	None	
						Inhalation of Particulates	None	
						Inhalation of Volatile Emissions (Indoor Air)	Qualitative	Potentially complete exposure pathway that will not be quantified due to uncertainties with modeling and low levels of volatiles in site soils.
				Construction/Utility Worker	Adult	Incidental Ingestion	Quantitative	Potentially complete exposure pathway that will be evaluated in the risk assessment.
						Dermal Contact	Quantitative	
						Inhalation of Volatile Emissions	Quantitative	
						Inhalation of Particulates	Quantitative	
				Trespasser	Adult and Youth (6 to 18)	Incidental Ingestion	None	Pathway incomplete. Trespasser assumed to be limited to surface activities only.
						Dermal Contact	None	
						Inhalation of Volatile Emissions	None	
						Inhalation of Particulates	None	
Current/Future	Surface Water	Surface Water	Prickett's Brook - Onsite	Outdoor Industrial Worker	Adult	Incidental Ingestion	Quantitative	Potentially complete exposure pathways that will be evaluated in the risk assessment.
						Dermal Contact	Quantitative	
				Trespasser	Adult and Youth (6 to 18)	Incidental Ingestion	Quantitative	Potentially complete exposure pathways that will be evaluated in the risk assessment.
						Dermal Contact	Quantitative	
			Prickett's Brook - Offsite /	Recreational Visitor	Adult and Youth (6 to 18)	Incidental Ingestion	Quantitative	Potentially complete exposure pathways that will be evaluated in the risk assessment.
						Dermal Contact	Quantitative	
	Sediment	Sediment	Prickett's Brook - Onsite	Outdoor Industrial Worker	Adult	Incidental Ingestion	Quantitative	Potentially complete exposure pathways that will be evaluated in the risk assessment.
						Dermal Contact	Quantitative	
				Trespasser	Adult and Youth (6 to 18)	Incidental Ingestion	Quantitative	Potentially complete exposure pathways that will be evaluated in the risk assessment.
						Dermal Contact	Quantitative	
			Prickett's Brook - Offsite /	Recreational Visitor	Adult and Youth (6 to 18)	Incidental Ingestion	Quantitative	Potentially complete exposure pathways that will be evaluated in the risk assessment.
						Dermal Contact	Quantitative	

Summary of Selection of Exposure Pathways

This table describes the exposure pathways associated with the varying media (soil, sediment and surface water) that were evaluated in the human health risk assessment along with the rationale for the inclusion of each pathway. Exposure media, exposure points, and characteristics of receptor populations are also included.

Table 4
Risk Characterization Summary - Lead
Medium-Specific Exposure Point Concentration and Resultant Risk Estimates

Scenario Timeframe: Current/Future
Receptor Population: Outdoor Industrial Worker
Receptor Age: Adult
Exposure Medium: Surface Soil (0 - 2 ft bgs)

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration[1] (EPC)	EPC Units	Lead Risk[2]
				Min	Max					
Soil	Surface Soil	Sitewide	Lead	1.1	33,700	mg/kg	77/79	855	mg/kg	16.4%

Scenario Timeframe: Current/Future
Receptor Population: Outdoor Industrial Worker
Receptor Age: Adult
Exposure Medium: Surface Soil (0 - 2 ft bgs)

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration[1] (EPC)	EPC Units	Lead Risk[2]
				Min	Max					
Soil	Surface Soil	Northern Plant (NP) Areas 1/9	Lead	1.1	33,700	mg/kg	43/44	1,477	mg/kg	42.5%

Scenario Timeframe: Current/Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult
Exposure Medium: Surface and Subsurface Soil (0 - 15 ft bgs)

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration[1] (EPC)	EPC Units	Lead Risk[2]
				Min	Max					
Soil	Surface and Subsurface Soil	Northern Plant (NP) Areas 1/9	Lead	1.1	33,700	mg/kg	88/92	777	mg/kg	38.1%

Footnotes:
(1) The EPC for lead was calculated as the arithmetic mean of all samples collected from a given soil depth interval.
(2) Lead risks are expressed as the probability of having a blood lead level greater than 5 micrograms per deciliter (µg/dL); EPA's risk reduction goal for the Site is to limit the probability of fetal blood lead concentration exceeding 5µg/dL to 5% or less.

Definitions:
ft bgs = Feet below ground surface
mg/kg= milligram per kilogram

Table 5
Summary of Cancer Risk and Noncancer Hazard Estimates

Exposure Area	Outdoor Industrial Worker		Construction/Utility worker	
	Noncancer Hazard Index	Cancer Risk	Noncancer Hazard Index	Cancer Risk
Northern Plant (NP) Areas 1/9	0.16	2.3E-06	0.79	2.6E-07
Southern Plant (SP) Areas 3/8	0.014	2.2E-06	0.046	1.6E-07
Southern Plan (SP) Area 5	0.049	1.7E-06	0.34	1.2E-07
Southern Plan (SP) Area 6/12	0.12	1.6E-06	0.54	8.4E-08
Southern Plan (SP) Area 10	0.14	2.0E-06	0.78	1.2E-07
Sitewide	0.18	2.0E-06		
Offsite Area 4	0.043	5.1E-06	0.54	1.8E-06
Offsite Area 14	0.14	7.4E-06	0.34	5.9E-07
Prickett's Brook- Onsite	0.034	6.1E-06		
Exposure Area	**Adult Trespasser**		**Youth Trespasser (6-18 years)**	
	Noncancer Hazard Index	Cancer Risk	Noncancer Hazard Index	Cancer Risk
Northern Plant (NP) Areas 1/9	0.026	4.3E-07	0.039	3.4E-07
Southern Plant (SP) Areas 3/8	0.0025	4.2E-07	0.0035	2.7E-07
Southern Plan (SP) Area 5	0.0082	3.3E-07	0.012	2.1E-07
Southern Plan (SP) Area 6/12	0.019	3.0E-07	0.029	1.9E-07
Southern Plan (SP) Area 10	0.022	3.8E-07	0.033	2.4E-07
Sitewide	0.03	3.7E-07	0.044	2.9E-07
Offsite Area 4	0.0075	9.6E-07	0.011	7.8E-07
Offsite Area 14	0.024	1.4E-06	0.034	9.1E-07
Prickett's Brook- Onsite	0.041	8.7E-06	0.048	1.2E-05
Exposure Area	**Adult Recreational Visitor**		**Youth Recreational Visitor (6-18 years)**	
	Noncancer Hazard Index	Cancer Risk	Noncancer Hazard Index	Cancer Risk
Prickett's Brook-Offsite	0.32	1.7E-05	0.4	1.9E-05
Prickett's Pond	0.077	7.0E-07	0.093	6.4E-07
Tennent Pond	0.066	7.8E-07	0.083	4.8E-07

Footnotes:

Shaded cell= not applicable/evaluated

APPENDIX II-C: Cost Estimate

Table 6: Conceptual Cost Estimate for Institutional Controls, Monitoring, and Maintenance

Component 2: Legal and Administrative Controls - Deed Notice

CONCEPTUAL COST ESTIMATE SUMMARY

Prepared by Langan

Site: CPS/Madison Superfund Site

Date: January 2023

Description: Physical, legal, or administrative controls that restrict potential exposures to site-related COPCs. Deed notices are legal documents and addenda filed by the property owners with the local and state authorities documenting areas of known remnant contamination and limiting Site activity or future land use of the property within the defined limits of the notice. The purpose of the presumed deed notice under this alternative would be to limit property use to non-residential only within the Madison property, and thereby limit the potential for human contact with COPCs in soil. This alternative is easy to implement within the Madison Property, but would require owner approval to implement for off-site properties (i.e., the Runyon Watershed property). This remedy may restrict the future land development/use at the Site and can be implemented in combination with other GRAs such as existing or supplemental engineering control mechanisms. The remedy would require issuance of a Soil Remedial Action Permit or equivalency that would specify on-going monitoring and maintenance requirements, and which would require periodic (biennial) reporting. Separate permits or equivalent would be needed for each affected property owner.

DISCLAIMER

1 This estimate is an approximate cost of construction and reflects available cost information for construction located in New Jersey. No present worth analysis was completed in establishing overall project costs. Subtotals are rounded to the nearest 1,000 and final totals are rounded to the nearest 10,000.
2 This estimate is based on Langan's prior experience, RS Means 2021, and quotes obtained from vendors and subcontractors (e.g., remediation contractor, landfill facility, driller, and laboratory). This estimate does not guarantee that proposals, bids or actual costs will be the same as or within any specific percentage of this estimate of probable construction cost.
3 The estimate does not include fees or maintenance costs for engineering controls.

Assumptions and Notes:

1 Deed notices are legal documents and addenda filed by the property owners with the local and state authorities documenting areas of known remnant contamination and limiting site activity or future land use of the property within the defined limits of the notice. It is assumed a deed notice will be filed as part of the legal and administrative controls.
2 A biennial report will be submitted to the NJDEP every 2 years for 30 years following remediation. The certification will involve a site visit and brief letter report.
3 A field inspection along with photograph documentation of the condition of the engineering controls will occur every quarter for 30 years following remediation.
4 Concrete cap repairs are assumed on years 5, 10, 15, 20, 25, and 30 with approximately $34,000 in contractor costs each repair.
5 The net present value discount rate is 7%.
6 Sediment sampling at 12 locations will occur on years 5, 10, 15, 20, 25, and 30, and a report will be submitted to the NJDEP and EPA document findings.
7 Surface water sampling will occur on years 2, 4, 6, 8, 10, 15, 20, and 30, and a report will be submitted to the NJDEP and EPA to document findings.
8 All costs, including management, labor, field supplies, contractors and/or laboratory fees are included in long term costs.
9 Project management is assumed to be 10% of total professional costs.

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Task 1: Pre-Design Investigation					
1.1 Sampling Design and Health & Safety Plan	1	LS	$7,500	$8,000	
1.2 Coordination with Madison Client	1	LS	$5,000	$5,000	
1.3 Mobilization/Demobilization	1	LS	$2,500	$3,000	
1.4 Delineation of Unpaved Residential Exceedances (Northern Plant)	1	LS	$10,000	$10,000	Assumes 12 boring locations and collecting and analyzing up to 13 soil samples.
1.5 Delineation of Unpaved Residential Exceedances (Southern Plant)	1	LS	$9,000	$9,000	Assumes 6 boring locations and collecting and analyzing up to 7 soil samples.
1.6 Cap Inspection and Effectiveness Evaluation	1	LS	$15,000	$15,000	
1.7 Data Reduction	1	LS	$59,000	$59,000	Creation of tables, figures, and internal discussion.
1.8 Project Management	1	LS	$11,000	$11,000	
SUBTOTAL				**$120,000**	
Task 2: Deed notice					
2.1 Legal fees	1	LS	$25,000	$25,000	
2.2 Survey	1	LS	$25,000	$25,000	
2.3 Project Management	1	LS	$5,000	$5,000	
SUBTOTAL				**$50,000**	
Task 3: Annual Performance Inspection					
Annual Cost					
3.1 Field coordination, inspection, and documentation	1	per year	$2,150	$3,000	Assumes quarterly inspections every year for 30 years. Assumes one half-day for field staff to visually inspect and photo-document the condition of site. Includes brief summary for LSRP file.
3.2 Biennial certification	0.5	per year	$3,915	$2,000	Langan Engineering experience.
SUB TOTAL				**$5,000**	
Task 4: Long Term Maintenance and Inspections					
Five Year Cost					
4.1 Concrete Cap Maintenance/Repair	1	per event	$33,200	$34,000	Assume concrete repairs are needed every 5 years with approximately $34,000 in contractor costs starting at year 1
SUB TOTAL				**$34,000**	
Task 5: Sediment and Surface Water Monitoring					
5.1 Design and Specs	1	LS	$36,500	$37,000	
5.2 Surveying	1	LS	$14,500	$15,000	
5.3 Long Term Maintenance and Monitoring					
Sediment Sampling and Reporting	0.2	per year	$18,926	$4,000	Sediment sampling to occur on years 5, 10, 15, 20, 25, and 30.
Surface Water Sampling and Reporting	0.6	per year	$16,920	$11,000	Surface water and groundwater sampling to occur semi-annual for years 1 and 2, annual for 3 – 10, and then 12, 14, 16, 18, 20, 25, and 30
5.4 Long Term Reporting	0.5	each report	$3,400	$2,000	Assumes a brief memorandum will be submitted to EPA/NJDEP to document concentration trends over time. Reports will be submitted bienially.
				$69,000	
Capital Cost (Task 1, 2, 5.1 and 5.2)					
Subtotal				**$222,000**	
Contingency	**25**	**%**		**$55,500**	
FINAL TOTAL - Design and Capital Cost				**$280,000**	
Long-Term Cost (Task 3, 4, 5.3, and 5.4)					
FINAL TOTAL - Long-Term Cost (Present Worth/NPV)				**$620,000**	*Net Present Value (NPV) estimate for 30 years of annual performance monitoring* Assumes current discount rate of 7%
FINAL TOTAL - OVERALL (Present Worth/NPV)				**$900,000**	

LS - Lump sum

Table 7: Conceptual Cost Estimate for Excavation (Unpaved Areas)

Component 3: Existing Cap Plus Excavation and Off-Site Disposal (Unpaved Areas)

CONCEPTUAL COST ESTIMATE SUMMARY

Prepared by Langan

Site: CPS/Madison Superfund Site

Date: January 2023

Description: Capping refers to the placement of materials, usually at the ground surface, to create a physical barrier to prevent potential receptors from coming into contact with affected soil. In this option, the existing concrete cap at the site will help to prevent soil erosion (by wind and water, and disturbance by humans (i.e., in high traffic areas) and also helps to prevent infiltration of surface water (thereby reducing leaching of soil contaminants and mitigating the soil-to-groundwater pathway). The purpose of maintaining the existing cap under this alternative would be to limit soil contact on the Madison property, and thereby limit the potential for human contact with COPCs in soil. This remedial alternative requires long-term monitoring and maintenance and issuance of a Soil Remedial Action Permit or equivalency that would specify on-going monitoring and maintenance requirements, and which would require periodic (biennial) reporting (see institutional control task). Additionally, several areas which do not include an existing cap will be excavated to remove concentrations of COPCs that exceed PRGs.

DISCLAIMER

1. This estimate is an approximate cost of construction and reflects available cost information for construction located in New Jersey. No present worth analysis was completed in establishing overall project costs. Subtotals are rounded to the nearest 1,000 and final totals are rounded to the nearest 10,000.
2. This estimate is based on Langan's prior experience, RS Means 2021, and quotes obtained from vendors and subcontractors (e.g., remediation contractor, landfill facility, driller, and laboratory). This estimate does not guarantee that proposals, bids or actual costs will be the same as or within any specific percentage of this estimate of probable construction cost.

Assumptions and Notes:

1. A Pre-Design Investigation (PDI) is needed for verifying delineation of various areas of concern. Reporting is assumed to document the results of the PDI.
2. Impacted soil that is covered with an existing cap will be left in place. 11 areas of concern on the periphery of the site that do not have an existing cap will be excavated.
3. Costs, including management, labor, field supplies, contractors and/or laboratory fees are included in long term costs
4. Project management is assumed to be 10% of total professional costs.
5. Estimate for Support of Excavation is not included in this cost estimate and it is not anticipated to be needed for excavation activities.

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	NOTES
Task 1: Pre-Design Investigation and Cap Evaluation					
1.1 Sampling Design and Health & Safety Plan	1	LS	$7,500	$8,000	
1.2 Coordination with Madison Client	1	LS	$5,000	$5,000	
1.3 Mobilization/Demobilization	1	LS	$5,000	$5,000	
1.4 11 unpaved areas Pre-Excavation investigation	1	LS	$163,000	$163,000	Assumes 165 boring locations and collecting and analyzing up to 330 soil samples.
1.5 Excavation Extents Survey	1	LS	$10,000	$10,000	
1.6 Data Reduction	1	LS	$30,000	$30,000	Creation of tables, figures, and internal discussion.
1.7 Project Management	1	LS	$23,000	$23,000	
SUBTOTAL				**$244,000**	
Task 2: Capping and Targeted Excavation for Unpaved Areas - Design, Bidding, Contracting					
2.1 Full-scale Design and Work Plan	1	LS	$20,000	$20,000	Excavation work plan of Unpaved Areas
2.2 Bid Package	1	LS	$15,000	$15,000	
2.3 Bid and Contract Selection	1	LS	$10,000	$10,000	
2.4 Health & Safety Plan	1	LS	$2,500	$3,000	
2.5 Office Engineering/Coordination					
2.5.1 Subcontracts	1	LS	$2,000	$2,000	
2.5.2 Coordination	1	LS	$2,000	$2,000	
2.5.3 Scheduling	1	LS	$2,000	$2,000	
2.5.4 RFI (Request for Information)	1	LS	$2,000	$2,000	
2.6 Project Management	1	LS	$4,000	$4,000	
SUBTOTAL				**$60,000**	
Task 3: Permitting (Presented as Permit Equivalents)					
3.1 Flood Hazard Area Permit	1	LS	$10,000	$10,000	Permit Equivalents under CERLCA assumed
3.2 Soil Erosion and Sediment Control Certification	1	LS	$5,000	$5,000	Permit Equivalents under CERLCA assumed
3.3 Storm Water Permitting	1	event	$15,000	$15,000	Permit Equivalents under CERLCA assumed
3.4 Soil Movement Permit	1	LS	$10,000	$10,000	Permit Equivalents under CERLCA assumed
3.5 Soil Remedial Action Permit	1	LS	$5,000	$5,000	Permit Equivalents under CERLCA assumed
SUB TOTAL				**$45,000**	
Task 4: Excavation					
4.1 Mobilization/Demobilization and site setup	1	LS	$10,000	$10,000	Assumes 5 day Mob/Demob
4.2 Excavation/Stockpiling of Material (non-Haz)	1400	CY	$35.00	$49,000	Assumes excavation of top two feet of material for Targeted Areas 1-6, 8, 9, 11 and five feet for Targeted Areas 7 and 10. Assumes direct load to trucks as much as possible.
4.3 Storm water Control	4000	SY	$3.13	$13,000	Assumes silt fence to be installed downgradient of disturbed areas
4.4 Backfilling	1400	CY	$35.00	$49,000	Assumes 1:1 replacement with backfill material
4.5 Backfilling (Material Cost)	1400	CY	$21.00	$30,000	
4.6 Office Engineering/Coordination	1	LS	$5,000	$5,000	
4.7 Engineering Oversight	10.6	DAY	$2,500	$27,000	Assumes 500 CY of material moved a day
4.8 Project Management	1	LS	$18,000	$18,000	
SUB TOTAL				**$191,000**	
Task 5: Waste Disposal					
5.1 Waste Class Characterization	10	Sample	$500	$5,000	Assumes 1 sample every 200 cubic yards
5.2 Non Haz Soil Disposal	1,575	ton	$26.80	$43,000	Assumes excavation of top two feet of material for Targeted Areas 1-6, 8, 9, 11 and five feet for Targeted Areas 7 and 10. Assumes direct load to trucks as much as possible.
5.3 Hazardous Soil Transport and Disposal	525	ton	$280.00	$147,000	Assumes 1350-1400 total cubic yards of material are disposed off-site and 25% is hazardous.
5.3 Office Engineering/Coordination	1	LS	$1,000	$1,000	
5.4 Engineering Oversight	20	Day	$2,500	$50,000	
5.5 Project Management	1	LS	$13,000	$13,000	
SUB TOTAL				**$259,000**	
Task 6: Remedial Action Report					
6.1 Report creation	1	LS	$30,000	$30,000	
6.2 Management	1	LS	$5,000	$5,000	
SUB TOTAL				**$35,000**	
Design and Capital Cost (Task 1-6)					
Subtotal				**$834,000**	
Contingency	**25**	**%**		**$208,500**	
FINAL TOTAL - Design and Capital Cost				**$1,050,000**	
FINAL TOTAL - OVERALL				**$1,050,000**	

LS - Lump sum
SF - square feet
CY - cubic yard

APPENDIX III

ADMINISTRATIVE RECORD INDEX

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL
05/30/2023

REGION ID: 02

Site Name: CPS/MADISON INDUSTRIES
CERCLIS ID: NJD002141190
OUID: 03
SSID: 0283
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
630538	05/30/2023	ADMINISTRATIVE RECORD INDEX FOR OU3 FOR THE CPS/MADISON INDUSTRIES SITE	2	Administrative Record Index		(US ENVIRONMENTAL PROTECTION AGENCY)
376340	11/02/2015	ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT FOR REMEDIAL INVESTIGATION / FEASIBILITY STUDY FOR THE CPS/MADISON INDUSTRIES SITE	49	Agreement		BZURA,BRUCE (MADISON INDUSTRIES)|MUGDAN,WALTER (US ENVIRONMENTAL PROTECTION AGENCY)
630504	11/02/2015	ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT FOR REMEDIAL INVESTIGATION / FEASIBILITY STUDY - APPENDIX A STATEMENT OF WORK FOR THE CPS/MADISON INDUSTRIES SITE	32	Legal Instrument		BZURA,BRUCE (MADISON INDUSTRIES)|MUGDAN,WALTER (US ENVIRONMENTAL PROTECTION AGENCY)
630889	03/23/2020	SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT FOR OU3 FOR THE CPS/MADISON INDUSTRIES SITE	408	Report		(ENVIRONMENTAL RISK SOLUTIONS LLC)
630887	11/17/2020	BASELINE HUMAN HEALTH RISK ASSESSMENT FOR OU3 FOR THE CPS/MADISON INDUSTRIES SITE	1142	Report		(ENVIRONMENTAL RISK SOLUTIONS LLC)
677056	04/27/2023	NJDEP'S APPROVAL OF THE PROPOSED PLAN FOR OU3 FOR THE CPS/MADISON INDUSTRIES SITE	1	Letter	WOODALL,BRENNAN (US ENVIRONMENTAL PROTECTION AGENCY)	JOSHI,AJ (NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION)
677041	05/03/2023	US EPA'S CONDITIONAL APPROVAL OF THE REMEDIAL INVESTIGATION REPORT FOR OU3 FOR THE CPS/MADISON INDUSTRIES SITE	1	Letter	(LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES)	WOODALL,BRENNAN (US ENVIRONMENTAL PROTECTION AGENCY)

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL

05/30/2023

REGION ID: 02

Site Name: CPS/MADISON INDUSTRIES
CERCLIS ID: NJD002141190
OUID: 03
SSID: 0283
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
677043	05/03/2023	US EPA'S CONDITIONAL APPROVAL OF THE FEASIBILITY STUDY REPORT FOR OU3 FOR THE CPS/MADISON INDUSTRIES SITE	1	Letter	(LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES)	WOODALL,BRENNAN (US ENVIRONMENTAL PROTECTION AGENCY)
677038	05/12/2023	REMEDIAL INVESTIGATION REPORT FOR OU3 FOR THE CPS/MADISON INDUSTRIES SITE	3281	Report		(LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES)
677039	05/12/2023	REMEDIAL INVESTIGATION REPORT - FIGURES FOR OU3 FOR THE CPS/MADISON INDUSTRIES SITE	59	Report		(LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES)
677040	05/12/2023	REMEDIAL INVESTIGATION REPORT - APPENDIX T BASELINE ECOLOGICAL RISK ASSESSMENT FOR OU3 FOR THE CPS/MADISON INDUSTRIES SITE	6623	Report		(LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES)
677042	05/12/2023	FEASIBILITY STUDY REPORT FOR OU3 FOR THE CPS/MADISON INDUSTRIES SITE	291	Report		(LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES)
652515	05/30/2023	PROPOSED PLAN FOR OU3 FOR THE CPS/MADISON INDUSTRIES SITE	18	Publication		(US ENVIRONMENTAL PROTECTION AGENCY)

APPENDIX IV

STATE LETTER OF CONCURRENCE

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
CONTAMINATED SITE REMEDIATION & REDEVELOPMENT
401 East State Street
P.O. Box 420, Mail Code 401-06
Trenton, New Jersey 08625-0420
Tel. (609) 292-1250 • Fax (609) 777-1914
www.nj.gov/dep

PHILIP D. MURPHY
Governor

TAHESHA L. WAY
Lt. Governor

SHAWN M. LATOURETTE
Commissioner

September 21, 2023

Pat Evangelista, Director
Emergency and Remedial Response Division
U.S. Environmental Protection Agency Region II
290 Broadway, New York, NY 10007-1866

Re: CPS/Madison Superfund Site Record of Decision for Operable Unit 3
Old Bridge, Middlesex County

Dear Mr. Evangelista:

The New Jersey Department of Environmental Protection (Department) has completed its review of the Record of Decision (ROD), which addresses Operable Unit 3 (OU3). The Department concurs with the selected remedy, namely Alternative 2 – Excavation in Unpaved Areas and Off-Site Disposal.

The major components of the OU3 remedy include the following:

- Excavation and off-site disposal of 1,320 cubic yards of contaminated soil from unpaved areas on the Madison property;
- Use of existing pavement on the Madison property as an engineering control, in the form of capping, over contaminated soils;
- Long-term monitoring of sediment and surface water; and
- Institutional controls.

The selected remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. The remedy is necessary to protect public health, welfare, and the environment.

The Department appreciates the opportunity to participate in the decision-making process to select an appropriate remedy. If you have any questions, please contact Gwen Zervas at (609) 292-1251, or by email at Gwen.Zervas@dep.nj.gov.

Sincerely,

David E. Haymes
Assistant Commissioner

APPENDIX V

RESPONSIVENESS SUMMARY

APPENDIX V

RESPONSIVENESS SUMMARY

Operable Unit 3 of the CPS/Madison Site

Old Bridge, New Jersey

INTRODUCTION

This Responsiveness Summary provides a summary of the public's comments and concerns regarding the Proposed Plan for Operable Unit (OU) 3 of the CPS/Madison Site ("Site") and EPA's responses to those comments.

All comments summarized in this document have been considered in EPA's final decision for the selection of the cleanup response for OU3 of the Site. This Responsiveness Summary is divided into the following sections:

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

This section provides the history of the community involvement and interests regarding the Site.

II. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS AND RESPONSES

This section contains summaries of oral and written comments received by EPA at the public meeting and during the public comment period, and EPA's responses to these comments.

The last section of this Responsiveness Summary includes attachments, which document public participation in the remedy selection process for OU3. They are as follows:

Attachment A contains the Proposed Plan that was distributed to the public for review and comments.

Attachment B contains the public notice that appeared in the Home News Tribune.

Attachment C contains the transcript of the public meeting.

Attachment D contains the written public comments received during the public comment period. Note: personal information, such as email addresses, home addresses, and phone numbers contained in the letters and emails were redacted to protect the privacy of the commenters.

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

The subject of the Record of Decision and Responsiveness Summary is the Third Operable Unit (OU3) of the CPS/Madison Site in Old Bridge, New Jersey.

On June 1, 2023, EPA released the Proposed Plan for OU3 to the public for comment. Supporting documentation comprising the administrative record was made available to the public at the EPA Region 2 Superfund Records Center, 290 Broadway, 18th Floor, New York, New York 10007 and EPA's website for the Site at https://www.epa.gov/superfund/cps-madison.

EPA published notice of the start of the public comment period, which ran from June 1 to July 3, 2023, and the availability of the above-referenced documents in the Home News Tribune on June 6, 2023. A news release announcing the Proposed Plan, which included the public meeting date, time, and location, was issued to media outlets and posted on EPA's Region 2 website on June 1, 2023.

A public meeting was held on June 15, 2023, at the Old Bridge Senior Center, 1 Old Bridge Plaza, Old Bridge, New Jersey. The purpose of this meeting was to inform local officials and interested members of the public about the Superfund process, to present the Proposed Plan for OU3, receive comments and respond to questions. At the meeting, EPA reviewed the history of the Site, the results of the investigation of contamination at the Site and the remedial alternatives developed for OU3, and details about the Proposed Plan, before taking questions from meeting attendees. The transcript of this public meeting is included in this Responsiveness Summary as Attachment C.

II. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS AND RESPONSES

A. SUMMARY OF QUESTIONS AND EPA'S REPONSES FROM THE PUBLIC MEETING CONCERNING THE CPS/MADISON SITE – One individual provided comments during the public meeting. The comments are provided below with EPA's responses. As needed, EPA has included further clarification to its responses made during the public meeting.

Comment #1: One commenter asked if the City of Perth Amboy had received any compensation for the loss of the 32 municipal wells in the Perth Amboy wellfield that were closed in the 1970s and if the groundwater would ever be clean enough to reopen those wells.

EPA Response: EPA cannot pursue cost recovery on behalf of Perth Amboy, nor is EPA aware if Perth Amboy has a basis to pursue claims for compensation related to municipal wells. The long-term objective of the Superfund cleanup that is the subject of the OU3 Record of Decision and the Record of Decision for OU1 and OU2 (September 2019) is to restore the groundwater for public use.

Comment #2: One commenter asked if EPA expects the ongoing groundwater pump and treatment systems to eventually eliminate any further threats to groundwater from the Site.

EPA Response: As stated above, the long-term objective at this Site is to restore the groundwater for public use. In order to achieve this, the selected cleanup actions for the Site include using the ongoing pump and treatment systems, in combination with chemical oxidation to treat groundwater, and actions to address the source areas of contaminants in soils. This Record of Decision for OU3 documents EPA's selected remedial action to address soils at the Madison property. Please see the Record of Decision for OU1 and OU2 (September 2019) at www.epa.gov/superfund/cps-madison for full details on the other cleanup actions that have been selected for the Site.

Comment #3: One commenter asked if the facilities at the Site were presently contributing to the groundwater contamination.

EPA Response: The facilities on the Madison property that are currently operating must adhere to federal and state regulations pertaining to their specific operations. These regulations have been established to protect human health and the environment and many of them were not in place in the past when historic operations at the Site originally resulted in soil and groundwater contamination. There are no facilities currently operating at the CPS property. Contamination present in soils at the Site may be contributing to groundwater contamination, therefore, the remedies selected for OU2 and OU3 will address soil contamination.

B. WRITTEN COMMENTS AND EPA'S REPONSES RECEIVED DURING THE PUBLIC COMMENT PERIOD FROM THE COMMUNITY – The public comment period is the time during which EPA accepts comments from the public on proposed actions and decisions. The public comment period ran from June 1, 2023, to July 3, 2023. EPA's responses to the written comments are provided below.

Comment #4: One commenter expressed concern that Madison Industries and Old Bridge Chemicals continue to emit harmful substances.

EPA Response: See EPA Response to Comment #3.

Comment #5: One commenter expressed concern that there is contamination in the surface structures on the Site that would not be addressed by the cleanup.

EPA Response: Contamination exceeding EPA's acceptable risk range has been identified in the soils located beneath the pavement and buildings in some areas on the Madison property. This contamination has not been identified in the building or pavement materials. EPA has determined it is technically impracticable to treat the soils in these areas due to the presence of buildings and active facility operations at the Site. Further, EPA has determined that capping in these areas will be fully protective of human health and the environment and is an appropriate element of the remedy in these areas. Additionally, excavation will be used to address contaminated soils in areas where pavement is not present and soils are exposed.

Comment #6: One commenter stated that the companies responsible for contamination should close their operations and not operate within the watershed.

EPA Response: The Superfund program's objective is to address contamination that presents an unacceptable risk to human health and the environment. In the course of the investigation process, EPA takes into account the current use of the site under evaluation, and the reasonably anticipated future use. The remedial alternatives evaluated in the OU3 Proposed Plan are premised on the assumption that the use of the properties that make up the Site will remain commercial or industrial. It is expected that upon completion of the OU1, OU2 and OU3 remedies, impacts to the watershed will be eliminated. Sampling will be used to evaluate progress towards this goal.

EPA is sensitive to the needs of the community and has provided an opportunity for the public to comment on the Proposed Plan. Input from the community was given consideration in the evaluation of the nine criteria for remedy selection and additional community outreach and engagement will continue through the remedial design and remedial action phases of the CPS/Madison Site.

ATTACHMENT A

PROPOSED PLAN

Superfund Program
U.S. Environmental Protection Agency
Region 2
Proposed Plan

CPS/Madison Superfund Site
Operable Unit 3
Old Bridge, New Jersey
June 2023

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan describes the alternatives that the U.S. Environmental Protection Agency (EPA) considered to address contaminated soil at the Madison Industries/Old Bridge Chemicals portion of the CPS/Madison Superfund Site (Site), Operable Unit 3 (OU3), identifies EPA's preferred alternative, and describes the rational for this preference. The Site is located in Old Bridge Township, New Jersey (Figure 1).

The preferred alternative calls for the excavation of soil and the use of existing pavement as a cap. Excavated material would be disposed of off-site. Sediment and surface water would be monitored, following remedy implementation. Institutional controls would be implemented in the form of a deed notice.

Madison Industries, Inc. (Madison) completed a comprehensive Remedial Investigation (RI) pursuant to a 2015 Administrative Settlement and Order on Consent (AOC) with EPA. The RI activities were conducted by Madison and were overseen by EPA. The RI included sampling of soil, sediment, and surface water throughout OU3. The results of this investigation identified areas of soil contamination where remedial action is required.

This Proposed Plan contains descriptions and evaluations of the cleanup alternatives considered for OU3. This Proposed Plan was developed by EPA, the lead agency, in consultation with the New Jersey Department of Environmental Protection (NJDEP), the support agency. EPA, in consultation with NJDEP, will select a final soil remedy after reviewing and considering all information submitted during the 30-day public comment period.

EPA, in consultation with NJDEP, may modify the Preferred Alternatives or select another response action presented in this Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on the alternatives presented in this Proposed Plan.

MARK YOUR CALENDARS

PUBLIC COMMENT PERIOD
June 1, 2023 – July 3, 2023
EPA will accept written comments on the Proposed Plan during the public comment period.

PUBLIC MEETING
June 15, 2023, 6:30 PM
EPA will hold a public meeting to explain the Proposed Plan and alternatives presented in the Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at the Old Bridge Senior Center, 1 Old Bridge Plaza, Old Bridge, New Jersey 08857

For more information, see the administrative record at the following locations:

EPA Records Center, Region 2
290 Broadway, 18th Floor
New York, New York 10007-1866
(212) 637-4308
Hours: Monday-Friday – 9 A.M. to 5 P.M. by appointment

Online at the CPS/Madison Site Profile Page
https://www.epa.gov/superfund/cps-madison

Send comments on the Proposed Plan to:

Brennan Woodall, Remedial Project Manger
U.S. EPA, Region 2
290 Broadway, 19th Floor
New York, NY 10007-1866
Telephone: 212-637-3215
Email: woodall.brennan@epa.gov

EPA's website for the CPS/Madison Site:
https://www.epa.gov/superfund/cps-madison

EPA is issuing this Proposed Plan as part of its community relations program under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or

652515

Superfund) 42 U.S.C. § 9617(a), and Section 300.435(c) (2) (ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This Proposed Plan summarizes information that can be found in greater detail in the OU3 RI and Feasibility Study (FS) Reports, as well as other related documents contained in the administrative record file. The location of the administrative record is provided on the previous page. EPA and NJDEP encourage the public to review these documents to gain a more comprehensive understanding of the site-related Superfund activities performed by Madison, under EPA and NJDEP oversight.

SITE DESCRIPTION

The Site is comprised of two adjacent facilities located along Water Works Road in Old Bridge Township, Middlesex County, New Jersey (Figure 1). The Site acts as a source area for groundwater contamination that flows southwest, into the Runyon Watershed.

CPS Chemical Facility: The CPS Chemical Company (CPS) property is approximately 30 acres, located at 570 Water Works Road. The CPS facility, which is no longer active, is located within the western portion of the property and is approximately 6.7 acres. From 1967, until it ceased operations in 2001, organic chemicals used in the production of water treatment agents, lubricants, oil field chemicals, and anti-corrosive agents were processed at this facility, by CPS and then by Ciba Specialty Chemicals, Inc. (Ciba), which acquired the operations in 1998. While the main office and a storage building remain, the process equipment and storage tanks that were located at the south end of the facility were demolished and removed from the Site in 2005. This portion of the Site is now inactive.

Madison Industries Facility: The Madison property is 15 acres located at 554 Water Works Road. The Madison property is bordered to the east by the CPS property and to the west by the Perth Amboy wellfield. Madison has operated the facility (formerly known as “Food Additives”) in the northern half (Northern Plant Area) of this property since 1967, producing inorganic chemicals used in fertilizer, pharmaceuticals, and food additives. On the southern half (Southern Plant Area) of the property, Madison’s sister company, Old Bridge Chemicals, Inc., operates a plant that produces mostly zinc salts and copper sulfate. The Northern Plant Area is almost entirely paved or otherwise covered with impervious surfaces (such as buildings and tank farms) while approximately 2/3 of the Southern Plant Area is paved or covered with impervious surfaces.

Runyon Watershed: The Runyon Watershed is mostly undeveloped land which borders the Madison property to the southwest. The watershed contains the Perth Amboy wellfield which lies approximately 3,000 feet southwest (downgradient) of the CPS and Madison properties. The wellfield supplies over 5,000 gallons per minute (gpm) to the City of Perth Amboy. The extracted water is treated to remove solids and metals using an on-site clarification and filtration system. Contaminants have entered the watershed via groundwater and to a lesser extent by surface water from the CPS and Madison properties.

SITE HISTORY

In the early 1970s, releases of organic compounds and metals from the CPS and Madison properties resulted in the closing of 32 wells in the Perth Amboy wellfield. In 1979, a state court ordered the companies to perform a remedial investigation under the supervision of NJDEP. The investigation led to a 1981 court order for the companies to implement a remediation program to address groundwater contamination emanating from each of the properties, On September 1, 1983, the Site was placed on the National Priorities List (NPL) with New Jersey as the lead agency.

In 1991 and 1992, CPS and Madison installed an off-site groundwater collection system consisting of six recovery wells (three wells operated by each company) to protect the Perth Amboy wellfield. Between 1993 and 2000 the groundwater surrounding these recovery wells achieved the clean-up goals in place at that time; the recovery wells were shut down and replaced by wells on each of the company’s properties which are collectively known as the Interim Remedial Measure (IRM) wells.

In 1998, NJDEP established a Classification Exception Area (CEA) and a Well Restriction Area (WRA) encompassing the area of the volatile organic groundwater plume, covering approximately 32 acres, to a depth of 80 feet. In 1999, NJDEP established CEAs and WRAs encompassing the areas of two metals plumes, which are approximately 20.7 acres, and 2.2 acres, to a depth of 80 feet.

In 1992, Madison filed for bankruptcy protection and in 2001, Ciba closed the CPS Chemical facility. In 2003, NJDEP requested that EPA take the lead role in overseeing the Superfund cleanup.

In 2005, EPA entered into an administrative order on consent (AOC) with Ciba which required Ciba to perform a remedial investigation and feasibility study (RI/FS) to determine the extent of contamination of all contaminants of concern in groundwater (i.e., CPS and Madison impacts to groundwater), referred to as Operable Unit (OU) 1, and of CPS-related impacts to soil, referred to as OU2, determine if an action was needed to address the contamination, and identify potential alternatives to address the contamination. BASF Corporation (BASF) acquired Ciba in 2010, at which time BASF assumed the obligations of Ciba as its corporate successor, including responsibility for the RI/FS required in the 2005 AOC. BASF completed that RI/FS in August of 2018. EPA issued a Proposed Plan in April 2019, identifying the preferred alternative to address contamination. EPA released the Record of Decision (ROD) in September 2019, documenting the selection of remedies to address contamination in groundwater (both organic and metals contamination), (OU1) and soil on the CPS property (OU2).

In 2015, Madison entered into an AOC with EPA, which required Madison to perform an RI/FS to address contamination in soil (at the Madison property) and sediment in Prickett's Brook and Prickett's Pond on-site and downstream of the Madison property. The RI/FS was completed in May 2023 and is the basis for this Proposed Plan, along with other information in the administrative record file.

SITE CHARACTERISTICS

The Site is relatively flat, ranging from 20 to 25 feet above mean sea level (AMSL). Most of the Site lies within a 100-year flood hazard area, except for a small area in the northeast corner of the CPS Property that is 28 feet AMSL. The facilities are mostly surfaced with asphalt or concrete, except for the three-acre area of the former tank farm that was demolished by Ciba in 2005. The Magothy Formation, which underlies the Site, is used as a drinking water aquifer. Two of the geologic units of the Magothy lie directly under the Site, the Old Bridge sand, and the Perth Amboy fire clay. The Old Bridge sand is between 60 and 70 feet thick beneath the Site and readily conducts water. The fire clay is discontinuous under the Site but acts as a confining unit in some areas. Below the Magothy is the Raritan Formation which is also a drinking water aquifer.

Groundwater under the Site generally flows southwest towards the Perth Amboy supply wells which are approximately half a mile downgradient.

Prickett's Brook, an intermittent stream on the Site, flows west along the southern border of the CPS property (Figure 1). The brook turns north along the border between the CPS and Madison properties until it turns west again and bisects the Madison property. From Madison it enters the Runyon Watershed and travels southwest through Prickett's Pond and eventually reaches Tennent Pond. Prickett's Brook and the downgradient ponds are not used for recreational purposes.

EPA conducted an Environmental Justice Screen for the Site using EJScreen 2.11. The EJ index percentiles for nearly all of the environmental and socioeconomic indicators for the area immediately adjacent to the Site are either below or comparable to state and/or national averages; therefore, the results did not suggest that there would be communities with environmental justice concerns immediately adjacent to the Site.

SUMMARY OF SITE INVESTIGATIONS

Performance Monitoring Program

Beginning in 1991, under the direction of NJDEP, CPS and Madison installed the IRM wells downgradient of the CPS property, to intercept Site groundwater contamination entering the Runyon Watershed. A Performance Monitoring Program (PMP) was initiated to evaluate the effectiveness of the IRM pump and treatment systems. Pursuant to the PMP, BASF and Madison continue to monitor the IRM wells, which have been reconfigured several times to adjust to reduced contaminant levels in the plumes. The IRM system for the Madison property has been operating since 1997, with occasional configuration adjustments.

The Remedial Investigation

In October 1992, NJDEP executed separate Administrative Consent Orders (ACOs) with CPS and Madison, for each to perform an RI/FS to determine the nature and extent of potential source areas of contamination, including soils and sediment contamination at their respective facilities, and to identify potential treatment technologies. CPS conducted its RI/FS in three phases, documented in three reports submitted in 1993, 1994, and 1996.

Madison completed its RI/FS in July 2001. NJDEP did not issue a record of decision and asked EPA to take over in 2003.

In 2003, EPA assumed responsibility from NJDEP as lead agency overseeing the Superfund cleanup. Since filing for bankruptcy protection in 1992, Madison Industries and Old Bridge Chemical have reorganized and are currently active entities. In 2015, Madison entered into an AOC with EPA to perform an RI/FS for Operable Unit 3 (OU3), consisting of the contaminated soil at the Madison property. In 2018, Madison submitted an RI/FS Work Plan for OU3 to address data gaps in the 2001 RI and provide more current data on the status of Site contamination. The main focus of the RI/FS was soil at the Madison property and sediment and surface water in Prickett's Pond and Prickett's Brook. The final Remedial Investigation Report was submitted in May 2023.

Summary of the Remedial Investigation

The full results of the OU3 RI can be found in the OU3 CPS/Madison Remedial Investigation Report (May 2023) which is in the administrative record file.

RI sampling of soil, sediment, and surface water by Madison, under EPA oversight, began in 2018 and continued to 2019. Additional sampling was conducted in 2021 for the Focused Baseline Ecological Risk Assessment.

The results of sample analyses were screened to determine if the levels of contamination posed a potential harm to human health and/or the environment. This was done by comparing the measured values of contaminants to standards that are protective of human health or ecological receptors.

The soil sample analytical results were compared to NJDEP's Residential Soil Remediation Standards (NJRSRS) for the Ingestion-Dermal and Inhalation Exposure Pathways, the Non-residential Soil Remediation Standards (NJNRSRS) for the Ingestion-Dermal and Inhalation Exposure Pathways, and the Migration to Groundwater Soil Remediation Standards (MGWSRS). The default MGWSRS were developed to be protective of the majority of sites when no site-specific information is available. When site-specific information is available, site-specific MGWSRS can be developed. For OU3 soils, site-specific MGWSRS were developed by analyzing the site-specific leachability of the contaminants in accordance with the NJDEP Alternative Remediation Standards Technical Guidance for Soil and Soil Leachate for the Migration to Groundwater Exposure Pathway. The recommended MGWSRS were determined by comparing their site-specific value to the default MGWSRS and selecting the highest value per NJDEP guidance. The sediment sample analytical results were compared to the lowest effect levels for ecological receptors and surface water results were compared to NJDEP's Surface Water Quality Standards (SWQS) for Fresh Water. In addition, a human health risk assessment and an ecological risk assessment were conducted to determine if levels of contaminants exceeded EPA's acceptable risk range. Explanations of the results of the human health and ecological risk assessments are provided in separate sections later in this document. The results of the RI showed that metals including lead, cadmium, and zinc are the major contaminants of concern (COCs) in OU3 soils.

Madison On-site Soils

Inorganic Contamination (Metals) The RI Report identified several metals in soils that exceeded at least one of the NJDEP remediation standards. The metals identified in the RI include arsenic, cadmium, copper, lead, mercury, silver, and zinc. Most exceedances were detected in or around the Northern Plant Area, with fewer exceedances being detected in the Southern Plant Area. Metals with concentrations exceeding the SRS were found at depths up to 8 feet, with most exceedances occuring between 0 to 2 feet below ground surface (bgs). Lead, zinc, and cadmium were identified at concentrations above the NJNRSRS and/or MGWSRS most frequently, while copper was only detected above the NJRSRS. Silver occurrence in soil appears to be co-located with the distribution of cadmium, copper, lead, and zinc. Arsenic was detected in one location above the NJNRSRS. This location also had NJRSRS or MGWSRS exceedances of copper, lead, and zinc. Mercury was detected in one location above the MGWSRS. Arsenic and mercury were also detected at similar concentrations in off-site and background samples. Their distribution appears to be random and not indicative of a spill or release.

As previously discussed in the 2019 ROD for OU1 and OU2, metals originating from the Madison property have migrated to groundwater.

Volatile organic compounds (VOCs) A limited variety and number of organic compounds were identified in soil above the SRS. Three VOCs were identified in a small number of shallow soil (1-4.5 ft.) samples at concentrations that slightly exceeded the MGWSRS. They are benzene, methylene chloride, and trichloroethylene (TCE). Benzene exceeded the MGWSRS in two samples in the Northern Plant Area, methylene chloride exceeded the MGWSRS in two samples in the Southern Plant Area, and TCE exceeded the MGWSRS in one sample in the Northern Plant Area. No VOCs were detected above the NJRSRS or NJNRSRS.

Semi-volatile organic compounds (SVOCs) Two SVOCs were identified in a small number of shallow soil (1-2 ft.) samples at concentrations exceeding the SRS. Benzo(a)pyrene exceeded the NJRSRS in one sample in the Northern Plant Area and 2-Methylnaphthalene exceeded the MGWSRS in two samples in the Northern Plant Area. No other SVOCs were detected above the SRS.

Total polychlorinated biphenyls (PCBs) were detected above the NJRSRS in one sample in the Northern Plant Area as well as in one of the background locations.

Sediment

Cadmium, copper, lead, and zinc were the most common contaminants found at the highest concentrations above the Lowest Effects Levels (LELs) for the NJDEP Ecological Screening Criteria (ESC). Other constituents found above these criteria include arsenic, chromium, cobalt, mercury, nickel, cyanide, and eight organic compounds (including some VOCs/SVOCs, pesticides, and PCBs). These other constituents were found less frequently and based on their distribution, do not appear to be related to the Madison property.

Surface Water

Cadmium, copper, lead, and zinc were again the most common contaminants found at the highest concentrations above the SWQS for fresh water. Other constituents found above these criteria include arsenic, beryllium, chromium, cobalt, nickel, silver, vanadium, and ten organic compounds (including some VOCs/SVOCs and PCBs). These other constituents were found less frequently, and their distribution patterns do not suggest the Madison property is a source. The presence and distribution of the VOCs is consistent with discharge of VOC-impacted groundwater from the CPS property.

SCOPE AND ROLE OF OPERABLE UNIT

Due to the complexity of working with two facilities and varying land uses, EPA is addressing the cleanup of the Site in several phases called operable units. OU1 addresses groundwater contamination emanating from both facilities and impacting the Perth Amboy wellfield. OU2 addresses contaminated soil on the CPS property that is a direct contact hazard and acts as a contaminant source to groundwater. OU3 addresses contaminated soil on the Madison property that is a direct contact hazard and acts as a contaminant source to groundwater and sediment/surface water in Prickett's Brook and Prickett's Pond. This Proposed Plan addresses OU3, which is expected to be the final action for the CPS/Madison Site. The selection of remedies for OU1 and OU2 is documented in the 2019 ROD.

WHAT ARE THE "CONTAMINANTS OF CONCERN" (COCs)?

EPA has identified three metals as the primary contaminants of concern within OU3 soils that pose the greatest potential risk to human health and the environment. The primary contaminants of concern within OU3 are lead, zinc, and cadmium. Contamination likely occurred as a result of operations to produce zinc products.

Lead: Lead is hazardous. At high levels of exposure lead can cause nervous system damage, stunted growth, kidney damage, and delayed development. Lead is considered a probable human carcinogen.

Cadmium: Cadmium is hazardous. Chronic exposure can result in kidney, bone, and lung disease. Cadmium is considered a probable human carcinogen.

Zinc: Zinc is a common element found in air, soil, and water, and is present in all foods. It is an essential nutrient that helps the immune system and metabolism function. Zinc, combined with other elements to form zinc compounds, is widely used in industry to make products or in manufacturing processes. At very high levels of exposure, zinc may cause short-term flu-like illness, nausea/vomiting, skin irritation, and damage to the pancreas.

WHAT IS A "PRINCIPAL THREAT"?

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to ground water, surface water or air, or acts as a source for direct exposure. Contaminated ground water generally is not considered to be a source material; however, Non-Aqueous Phase Liquids (NAPLs) in ground water may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

PRINCIPAL THREAT WASTE

Principal Threat Waste is defined in the box above. Although cadmium, lead, and zinc in soil may act as sources to groundwater or surface water, these sources are not highly mobile and are not considered principal threat wastes at this OU.

SUMMARY OF SITE RISKS

As part of the RI/FS, a baseline risk assessment consisting of a Human Health Risk Assessment (HHRA), Screening Level Ecological Risk Assessment (SLERA), Baseline Ecological Risk Assessment (BERA), and a focused Ecological Risk Assessment (ERA) were conducted to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects caused by hazardous substance exposure in the absence of any actions to control or mitigate these exposures under current and future site uses.

In the HHRA, cancer risk and noncancer health hazard estimates are based on current reasonable maximum exposure (RME) scenarios. The estimates were developed by taking into account various health protective assumptions about the concentrations, frequency, and duration of an individual’s exposure to chemicals selected as contaminants of potential concerns (COPCs), as well as the toxicity of these contaminants.

Ecological risk was evaluated in three steps, where representative ecological receptors were identified, and measurement and assessment endpoints were developed to identify potential risk from contaminants of potential ecological concern (COPECs) to those receptors.

Human Health Risk Assessment Summary

A four-step human health risk assessment process was used for assessing site-related cancer risks and noncancer health hazards. The four-step process is comprised of Hazard Identification, Exposure Assessment, Toxicity Assessment, and Risk Characterization (see box below, “What is Risk and How is it Calculated”).

The HHRA began with selecting COPCs in various media at the Site (i.e., surface soil, subsurface soil, sediment, and surface water) that could potentially cause adverse effects in exposed populations. COPCs were selected by comparing the maximum detected concentrations of the contaminants identified with state and federal risk-based screening values. The screening of each COPC was conducted separately for each medium of interest and exposure area.

The Site was divided into the following exposure areas based on historical and current use of the Site, current land features and anticipated future use of the Site:

- Northern Plant (NP) Areas 1/9
- Southern Plant (SP) Areas 3/8
- Southern Plant (SP) Area 5
- Southern Plant (SP) Area 6/12
- Southern Plant (SP) Area 10
- Sitewide (combining all the exposure areas)
- Off-site Area 4
- Off-site Area 14
- Prickett’s Brook (On-site and Off-site)
- Prickett’s Pond
- Tennent Pond

The current and anticipated future use of the Madison property is industrial. As such, the following receptors and exposure pathways were evaluated for the on-site and off-site soil areas and surface water and sediment features of Prickett’s Brook, and for the off-site surface water and sediment features of Prickett’s Pond and Tennent Pond:

WHAT IS RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the contaminants of potential concern (COPCs) at the site in various media (*i.e.*, soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other noncancer health hazards, such as changes in the normal functions of organs within the body (*e.g.*, changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and noncancer health hazards.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COPCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for noncancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one in ten thousand excess cancer risk;" or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6}, corresponding to a one in ten thousand to a one in a million excess cancer risk. For noncancer health effects, a "hazard index" (HI) is calculated. The key concept for a noncancer HI is that a "threshold" (measured as an HI of less than or equal to 1) exists below which noncancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a noncancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the site.

- Current/future outdoor industrial worker: exposure to soil via incidental ingestion, dermal contact, and inhalation of particulate emissions in ambient air. Incidental ingestion and dermal contact with sediment and surface water in the on-site portion of Prickett's Brook.
- Current/future construction/utility worker: exposure to surface and subsurface soil (0-15 ft below ground surface) via incidental ingestion, dermal contact, and inhalation of particulate emissions in ambient air.
- Adult and Youth (6-18 years old) trespassers: exposure to surface soils via incidental ingestion, dermal contact, and inhalation of particulate emissions in ambient air. Incidental ingestion and dermal contact with sediment and surface water while wading in the on-site portion of Prickett's Brook.
- Adult and Youth (6-18 years old) recreational visitors: incidental ingestion and dermal contact with sediments and surface water while wading or hiking in/near the off-site portion of Prickett's Brook, and to Prickett's Pond and Tennent Pond.

For contaminants other than lead, exposure point concentrations (EPCs) were estimated using either the maximum detected concentration of a contaminant or the 95% upper-confidence limit (UCL) of the average concentration. Chronic daily intakes were calculated based on reasonable maximum exposure (RME), which is the highest exposure reasonably anticipated to occur at the Site. The RME is intended to estimate a conservative exposure scenario that is still within the range of possible exposures.

For contaminants other than lead, two types of toxic health effects were evaluated in the risk assessment: cancer risk and noncancer hazard. Calculated cancer risk estimates for each receptor were compared to EPA's target risk of 10^{-6} (one-in-one million) to 10^{-4} (one-in-ten thousand). The calculated noncancer hazard index (HI) estimates were compared to EPA's target threshold value of 1.

Since there are no published quantitative toxicity values for lead, it is not possible to evaluate cancer and noncancer risk estimates from lead using the same methodology as the other COPCs. However, since the toxicokinetics (the absorption, distribution, metabolism, and excretion of toxins in the body) of lead are well understood, lead risks are assessed based on blood lead level (PbB), which can be correlated with both exposure and adverse health effects. Consequently, when screening indicated further evaluation was necessary, lead risks were evaluated using blood lead models, which predict PbB based on the total lead intake from various environmental media. More specifically, lead risks for adolescent and adult receptors at the Site were assessed using EPA's Adult Lead Methodology (ALM). Consistent with EPA guidance, EPCs for lead were based on the arithmetic mean of all the samples within the exposure area from the appropriate depth interval. Results of the ALM were compared to the regional risk reduction goal for lead which is to limit the probability of a child or developing fetus' blood lead level (PbB) from exceeding 5 micrograms per deciliter (μg/dL) to 5% or less.

A summary of the numeric findings of the HHRA is shown in Table 1. A complete discussion of the exposure pathways and estimates of risk is available in the administrative record for the Site.

Estimates of cancer risk, noncancer hazard and lead risk for all exposure areas and receptors evaluated at the Site are shown in Table 1. As shown, the noncancer hazard estimates did not exceed the threshold value of 1 for all receptors evaluated. Further, all calculated cancer risk estimates fell within EPA's target threshold of 10^{-6} to 10^{-4}. For lead, results of the ALM modeling show the predicted probabilities of a fetal blood lead concentration exceeding 5 μg/dL surpassed EPA's risk reduction goal of 5% for: a sitewide outdoor industrial worker, and an outdoor industrial worker and construction worker on the Northern Plant Areas 1/9. Predicted probability exceedances for the outdoor industrial worker exposed to lead in surface soil ranged between 16.4% sitewide and 42.5% for the Northern Plant Areas 1/9. The construction worker's predicted probability of a fetal blood lead level exceeding 5 μg/dL was estimated at 38.1%. Exposure to lead in surface and subsurface soil on the Northern Plant Areas 1/9 was the media of concern for the construction worker.

Metals from the Madison property have migrated to groundwater and are present at levels exceeding the New Jersey Groundwater Quality Standards.

Ecological Risk Assessment

As described above, there were three evaluations conducted to evaluate the potential ecological risk

WHAT IS *ECOLOGICAL* RISK AND HOW IS IT CALCULATED?

A Superfund baseline ecological risk assessment is an analysis of the potential adverse health effects to biota caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current and future land and resource uses. The process used for assessing site-related ecological risks includes:

Problem Formulation: In this step, the contaminants of potential ecological concern (COPECs) at the site are identified. Assessment endpoints are defined to determine what ecological entities are important to protect. Then, the specific attributes of the entities that are potentially at risk and important to protect are determined. This provides a basis for measurement in the risk assessment. Once assessment endpoints are chosen, a conceptual model is developed to provide a visual representation of hypothesized relationships between ecological entities (receptors) and the stressors to which they may be exposed.

Exposure Assessment: In this step, a quantitative evaluation is made of what plants and animals are exposed to and to what degree they are exposed. This estimation of exposure point concentrations includes various parameters to determine the levels of exposure to a chemical contaminant by a selected plant or animal (receptor), such as area use (how much of the site an animal typically uses during normal activities); food ingestion rate (how much food is consumed by an animal over a period of time); bioaccumulation rates (the process by which chemicals are taken up by a plant or animal either directly from exposure to contaminated soil, sediment or water, or by eating contaminated food); bioavailability (how easily a plant or animal can take up a contaminant from the environment); and life stage (e.g., juvenile, adult).

Ecological Effects Assessment: In this step, literature reviews, field studies or toxicity tests are conducted to describe the relationship between chemical contaminant concentrations and their effects on ecological receptors, on a media-, receptor- and chemical-specific basis. In order to provide upper and lower bound estimates of risk, toxicological benchmarks are identified to describe the level of contamination below which adverse effects are unlikely to occur and the level of contamination at which adverse effects are more likely to occur.

Risk Characterization: In this step, the results of the previous steps are used to estimate the risk posed to ecological receptors. Individual risk estimates for a given receptor for each chemical are calculated as a hazard quotient (HQ), which is the ratio of contaminant concentration to a given toxicological benchmark.
In general, an HQ above 1 indicates the potential for unacceptable risk. The risk is described, including the overall degree of confidence in the risk estimates, summarizing uncertainties, citing evidence supporting the risk estimates and interpreting the adversity of ecological effects.

associated with the CPS/Madison Site – A SLERA, a BERA and a focused ERA. These documents can be found in the administrative record.

The SLERA evaluated all detected compounds in soil, sediment, and surface water. The conclusions were that metals, specifically cadmium, copper, lead, nickel, vanadium, and zinc, in sediment and surface water have a potential for adverse effects in vertebrate invertivores. The recommendation from the SLERA was to proceed with further site-specific evaluations to assess the potential for adverse effects in invertivores.

The BERA was conducted focusing on the site-related metals (cadmium, copper, lead and zinc) in soil, sediment, and surface water. The conclusions were that elevated risks were identified in aquatic receptors for the evaluated metals in surface water and sediment; however, toxicity tests and invertebrate surveys did not show any toxicity or impact to community structure suggesting that the metals are not bioavailable.

The focused ERA was then conducted to investigate site-specific bioavailability and toxicity of metals in the sediment. The focused evaluation included measuring sediment bioaccumulation of metals in invertebrates, sediment toxicity in invertebrates, sediment chemical residue analysis and updated food web models. The result of this evaluation indicates sporadic sediment toxicity to invertebrates that is not directly correlated to sediment concentrations of Madison property-related metals. The toxicity may be related to groundwater discharge associated with OU1 and OU2 or may be associated with upstream impacts. It is expected that as remedial actions are implemented for the other operable units, if the toxicity is associated with groundwater discharge, it will decrease over time. A long-term monitoring program to measure toxicity associated with groundwater discharge, as well as to include additional baseline sediment sampling, is part of each remedial alternative for OU3.

Based on the results of the HHRA and ecological risk assessments, a remedial action is necessary to protect public health, welfare, and the environment from actual or threatened releases of hazardous substances.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards such as Applicable or Relevant and Appropriate Requirements (ARARs), to-be-considered (TBC) advisories, criteria and guidance, and site-specific risk-based levels. The primary objective of any remedial strategy is overall protectiveness.

The following RAOs were developed to address the human health and ecological risks discussed above for OU3 contaminated media:

- Prevent migration of on-going sources of Madison property-related soil contaminants to groundwater that pose a potential risk to human health and the environment.

- Prevent ingestion, dermal, and inhalation exposure to Madison property-related soil contaminants that pose unacceptable human health risk to the current and future industrial worker and construction/utility worker.

- Prevent the potential erosion and migration of soil containing Madison-property related contaminants to surface water and sediment.

Achieving the RAOs relies on the remedial alternatives' ability to meet final remediation goals/cleanup levels derived from Preliminary Remediation Goals (PRGs), which are based on such factors as ARARs, risk, and background levels of contaminants in the environment that occur naturally or are from other industrial sources. In this Proposed Plan, EPA selected the more stringent of the NJNRSRS for the Ingestion-Dermal Exposure Pathway and the NJDEP recommended MGWSRS as the preliminary remediation goals (PRGs) for COCs in the OU3 unsaturated soils. Lead was identified as a COC for OU3 soils because lead drives the human health risk identified in the HHRA. Cadmium and zinc were identified as COCs for OU3 soils because both cadmium and zinc exceed the recommended MGWSRS in OU3 soils. The list of PRGs may be found in Table 2. PRGs may be further modified through the evaluation of alternatives and will be used to select the clean-up goals in the OU3 ROD.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA requires that each selected remedy be protective of human health and the environment, be cost effective, comply with other statutory laws, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

Potential technologies applicable to soil remediation were identified and screened by effectiveness, implementability, and cost criteria, with emphasis on effectiveness. Those technologies that passed the initial screening were then assembled into remedial alternatives.

For the active alternatives, the proposed depths of excavation are based on the soil boring data taken during the RI. These depths were used to estimate the quantity of soil to be addressed and the associated costs. The actual depths and quantity of soil to be addressed will be finalized during the remedial design phase and implementation of the selected remedy. Full descriptions of each proposed alternative can be found in the May 2023 Feasibility Study Report which is in the administrative record file.

The time frames below are for construction and do not include the time to negotiate with the responsible party, design a remedy, or the time to procure necessary contracts. Five-year reviews will be conducted as a component of the alternatives that would leave contamination in place above levels that allow for unlimited use and unrestricted exposure.

Soil Alternatives:

Common Elements for Active Alternatives

Each soil alternative contains the following common elements:

- Use of existing paved areas on the Madison property as a cap to protect against direct contact hazards to human health and to address the migration to groundwater pathway in these areas. The existing paved areas will be assessed to determine if they meet NJDEP capping requirements and, if they do not, upgraded to meet them. This will also include ongoing inspections, maintenance, and reporting to ensure the continued effectiveness of a cap on these areas.
- Long-term sediment and surface water monitoring to assess the effectiveness of remedial actions, once implemented, for OU1, OU2, and soil within OU3. A workplan for this monitoring will be developed during the remedial design.
- Institutional controls (in the form of a deed notice) to restrict the Madison property to non-residential uses. A deed notice would also define the restricted areas on the Madison property and provide a description of engineering controls in the restricted areas and specify actions to be taken if a restricted area is to be disturbed. In addition, a deed notice would require annual inspections to determine that the engineering controls remain protective of human health and the environment and biennial certifications to document continued protectiveness of the remedial action.

Alternative 1 – No Action

Capital Cost:	*$0*
Annual O&M Cost:	*$0*
Present Worth Cost:	*$0*
Construction Time Frame:	*N/A*
Estimated Time to Achieve RAOs:	*N/A*

The NCP requires that a "No Action" alternative be evaluated to establish a baseline for comparison with other remedial alternatives. Under this alternative, no action would be taken to remediate the contaminated soil on the Madison property.

Alternative 2 – Excavation in Unpaved Areas and Off-Site Disposal; Use of Existing Pavement as a Cap; Institutional Controls

Capital Cost:	*$1,330,000*
Annual O&M Cost:	*$620,000*
Present Worth Cost:	*$1,950,000*
Construction Time Frame:	*18 months*
Estimated Time to Achieve RAOs:	*5 years*

In addition to the common elements, this alternative employs excavation and off-site disposal of contaminated soils. Soils in unpaved areas where site

COCs exceed PRGs would be excavated and staged on-site prior to characterization sampling and off-site disposal at a permitted disposal facility. Excavated areas would be backfilled with certified clean fill. In areas where the site is paved, the existing pavement would act as a cap over contaminated soils, as detailed earlier in the Common Elements for Active Alternatives section. This alternative would provide immediate removal of contaminated soil that presents a direct contact hazard and eliminate the potential migration to groundwater pathway.

Approximately 1,320 cubic yards (cy) of soil would be excavated under this alternative. The 1,320 cy would contain approximately 16,000 square feet (sf) of soil, between 2-5 feet in depth, from 11 areas impacted by site COCs. The 11 areas are mostly located along the perimeter of the Madison property where soil is not currently covered by pavement (Figure 2).

Alternative 3 – Capping of Unpaved Areas Exceeding PRGs; Use of Existing Pavement as a Cap; Institutional Controls

Capital Cost:	*$830,000*
Annual O&M Cost:	*$620,000*
Present Worth Cost:	*$1,450,000*
Construction Time Frame:	*18 months*
Estimated Time to Achieve RAOs:	*5 years*

In addition to the common elements, this alternative involves placing a cap of impermeable material (such as asphalt or concrete) over impacted soils in unpaved areas where site COCs exceed PRGs (Figure 2). In areas where the site is paved, the existing pavement would act as a cap over contaminated soils, as detailed earlier in the Common Elements for Active Alternatives section. Capping would address human health concerns and control potential impacts to groundwater; therefore, this alternative would address both the direct contact hazard posed by the contaminated soil and the potential migration to groundwater pathway. The placement of additional impermeable material on the property may also require improved stormwater management controls due to a reduction in water storage capacity for the property.

EVALUATION OF ALTERNATIVES

The NCP lists nine criteria that EPA uses to evaluate the remedial alternatives individually and against each other to select a remedy. This section of the Proposed Plan profiles the relative performance of each alternative against the nine criteria, noting how it compares to the other options under consideration. Seven of the nine evaluation criteria are discussed below. The final two criteria, “State Acceptance” and “Community Acceptance” are discussed at the end of the document. A detailed analysis of each of the alternatives is in the FS Report.

THE NINE SUPERFUND EVALUATION CRITERIA

1. Overall Protectiveness of Human Health and the Environment evaluates whether and how an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.

3. Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.

4. Reduction of Toxicity, Mobility, or Volume (TMV) of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

5. Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, the community, and the environment during implementation.

6. Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

7. Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

8. State/Support Agency Acceptance considers whether the State agrees with the EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.

***9.* Community Acceptance** considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

Evaluation of Soil Alternatives

1. Overall Protection of Human Health and the Environment

Alternative 1, No Action, would not be protective of human health or the environment because no action would be taken to address soil contamination. For this reason, Alternative 1 was eliminated from further consideration under the remaining eight criteria.

Alternative 2 would be protective of human health and the environment by removing soil in unpaved areas to meet PRGs. In paved areas where impacted soils exceed PRGs, the existing pavement would serve as a cap to mitigate the direct contact and MGW pathways. A deed notice would be required for areas that have soil contamination remaining above the NJRSRS for the ingestion-dermal exposure pathway, to restrict the use of the property to non-residential use, define the restricted areas, and describe engineering controls.

Alternative 3 would also be protective of human health and the environment. Alternative 3 would require capping to be placed over unpaved areas with PRG exceedances to address the ingestion-dermal and MGW pathways. Similar to Alternative 2, existing paved areas would serve as a cap and a deed notice would be required to restrict the property to non-residential uses, define the restricted areas, and describe engineering controls.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

The chemical-specific ARARs and related PRGs for cadmium, lead, and zinc would be met under Alternative 2 as exceedances of the NJNRSRS for the ingestion-dermal pathway would either be (1) removed via excavation or (2) would remain but exposure would be controlled via the existing cap(s). In the case of Alternative 3, the chemical-specific ARARs would be met by capping unpaved areas where there are PRG exceedances as well as the existing cap(s).

Location-specific ARARs would be met by Alternatives 2 and 3 during the construction phase by following substantive requirements for construction and development in flood hazard areas.

Action-specific ARARs would be met by Alternative 2 during the construction phase by proper design and implementation of the action including disposal of excavated soil at the appropriate disposal facility. Action-specific ARARs would be met by Alternative 3 during the construction phase by following NJDEP's substantive technical requirements for site remediation.

3. Long-Term Effectiveness and Permanence

Alternative 2 affords the greatest degree of long-term effectiveness and permanence because it removes the soils impacted by COCs in the unpaved areas and has greater climate resilience than Alternative 3.

To a lesser degree than Alternative 2, the capping of unpaved impacted areas included under Alternative 3 would reduce potential mobility and exposure concerns posed by the COCs by mitigating the potential migration to groundwater and direct contact pathways. Additionally, the addition of impermeable caps required under Alternative 3 would increase the amount of stormwater runoff and could make the Madison property more susceptible to flooding. Therefore, in considering climate resiliency, Alternative 3 may provide a lesser degree of long-term effectiveness and permanence compared to Alternative 2.

For both alternatives, the caps would require maintenance for the foreseeable future.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

Neither of the soil alternatives include treatment, so there would be no reduction of toxicity, mobility, or volume through treatment under any alternative.

5. Short-Term Effectiveness

Alternative 2 would pose some short-term risks during implementation. Risks to site workers, the community and the environment include potential short-term exposure to contaminants during excavation of soil. Potential risks would be addressed via implementation of a health and safety plan, air monitoring, and the use of dust control technologies, as needed, during earth disturbances. An exclusion zone would be established during excavation activities to restrict Madison facility workers from entering the excavation area. Remediation workers and anyone entering the exclusion zone would be required to wear personal protective equipment to prevent exposure to COCs.

Alternative 3 presents less short-term risks during implementation. Capping is unlikely to require the disturbance of impacted soils beyond grading that may be required to prepare the subbase prior to cap installation. Any potential risks arising from the disturbance of impacted soil would be addressed using the same measures listed for Alternative 2.

The construction timeframe for both Alternative 2 and Alternative 3 would be approximately 18 months.

6. Implementability

Alternatives 2 and 3 have common implementability issues related to the removal of soil (Alternative 2) and installation of caps (Alternative 3). The technologies needed for both alternatives are proven and conventional. Contractors needed to perform the work for both alternatives are readily available. Coordination with other agencies including NJDEP will be required. Pursuant to the permit exemption at Section 121(e)(1) of CERCLA, 42 U.S.C. § 9621(e)(1), no permits would be required for on-site work although substantive requirements of otherwise-required permits would be met. Both Alternative 2 and Alternative 3 will also require filing a deed notice, followed by periodic inspections, and submission of biennial certifications to NJDEP.

7. Cost

The total estimated present worth costs, calculated using a 7% discount rate, are: $1,950,000 for Alternative 2; and $1,450,000 for Alternative 3.

8. State Acceptance

The State of New Jersey concurs with EPA's preferred alternative for OU3 of the CPS/Madison Superfund Site, as presented in this Proposed Plan.

9. Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be described in the Record of Decision. Based on public comment, the preferred alternative could be modified from the version presented in this Proposed Plan. The Record of Decision is the document that formalizes the selection of the remedy for a site.

PREFERRED ALTERNATIVE

The preferred alternative for cleanup of OU3 is Alternative 2, Excavation in Unpaved Areas and Off-Site Disposal; Institutional Controls. Alternative 2 includes the following remedial activities to address inorganic contaminants at the Madison property:

- Use of existing paved areas as a cap to protect against direct contact hazards to human health and address the migration to groundwater pathway in these areas.
- Excavation of soils contaminated with lead, cadmium, and zinc from the unpaved areas and disposal of the soils off-site.
- Institutional controls in the form of a deed notice restricting the future use of the Madison property to prohibit residential use.
- Long-term sediment and surface water monitoring to assess the effectiveness of remedial actions, once implemented, for OU1, OU2, and soil within OU3. A workplan for this monitoring will be developed during the remedial design.

The environmental benefits of the preferred remedial alternative may be enhanced by employing design technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy.[1]

Basis for the Remedy Preference

The preferred alternative was selected over other alternatives because it is expected to achieve the greatest degree of long-term effectiveness and permanence by removing impacted soils in the unpaved areas. The preferred alternative will be protective of human health and the environment, comply with all ARARs, and be easily implementable with little short-term risk. The preferred alternative reduces the risk from OU3 contaminants within approximately 18 months, at a cost comparable to other alternatives and should be reliable over the long-term.

1 https://www.epa.gov/greenercleanups/epa-region-2-clean-and-green-policy

Though the preferred alternative would be protective, it would not achieve levels that would allow for unrestricted use. Therefore, institutional controls, consisting of a deed notice restricting the future use of the Madison property, would be required. Five-year reviews would also be conducted.

COMMUNITY PARTICIPATION

EPA provided information regarding the cleanup of OU3 through meetings, the administrative record file for OU3 and announcements published in the local newspaper and online. EPA encourages the public to gain a more comprehensive understanding of the Site and the RI activities that have been conducted.

The dates for the public comment period; the date, the location and time of the public meeting; and the locations of the administrative record file are provided on the front page of this Proposed Plan.

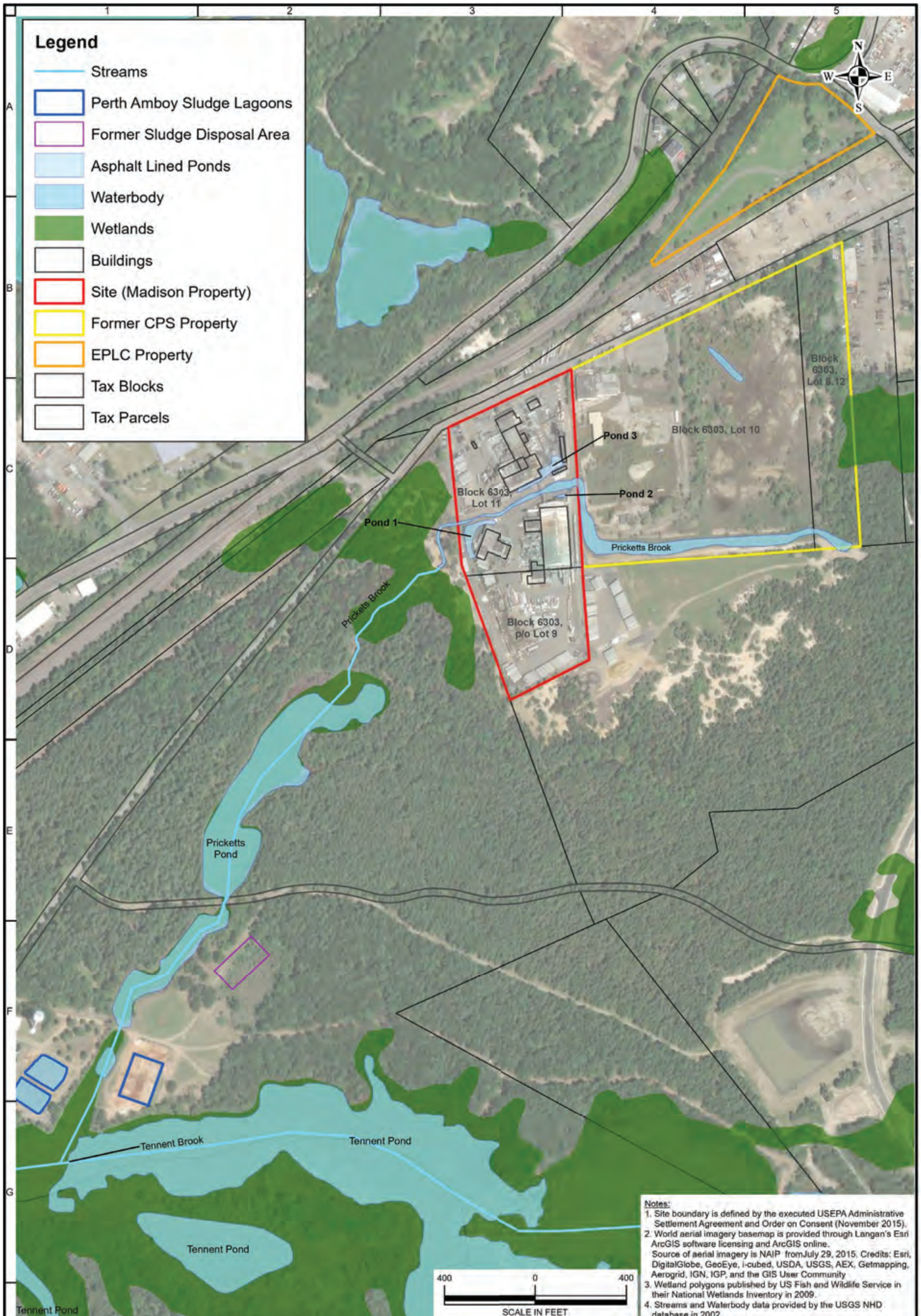
For further information on EPA's Preferred Alternative for CPS/Madison – OU3 contact:

Brennan Woodall, Remedial Project Manager
Woodall.Brennan@epa.gov
(212) 637-3215

Pat Seppi, EPA Community Relations
Seppi.Pat@epa.gov
(646) 369-0068

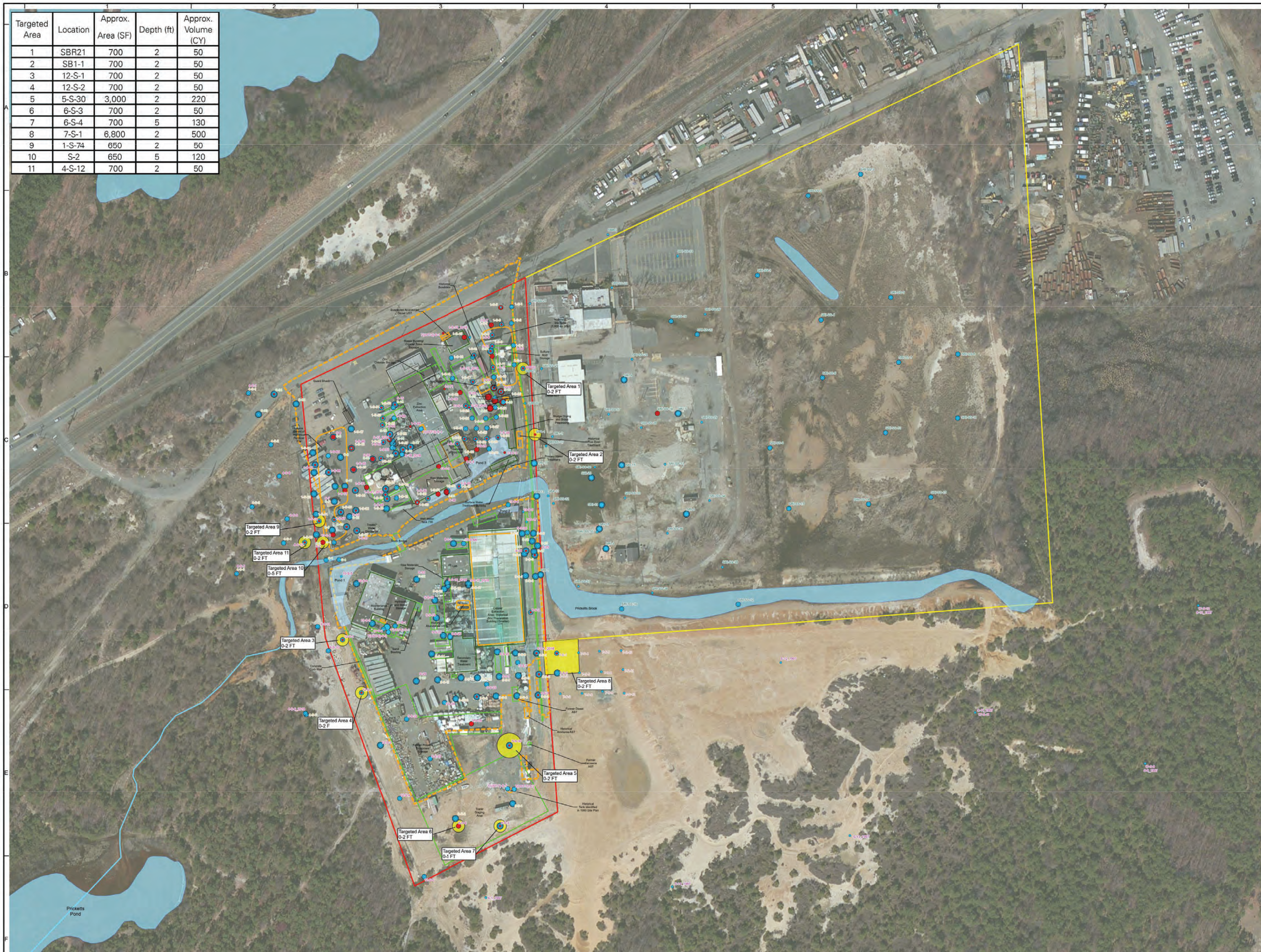
U.S. EPA
290 Broadway 19th Floor
New York, New York 10007-1866

On the Web at:
https://www.epa.gov/superfund/cps-madison



LANGAN 300 Kimball Drive Parsippany, NJ 07054 T: 973.560.4900 F: 973.560.4901 www.langan.com Langan Engineering & Environmental Services, Inc. Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. Langan International LLC Collectively known as Langan NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400	Project **CPS/MADISON SUPERFUND SITE** OLD BRIDGE TOWNSHIP MIDDLESEX COUNTY NEW JERSEY	Drawing Title **SITE AREA**	Project No. 100484401 Date 5/30/2017 Scale 1"=400' Drawn By JR Last Revised 7/26/2022	Figure 1

Targeted Area	Location	Approx. Area (SF)	Depth (ft)	Approx. Volume (CY)
1	SBR21	700	2	50
2	SB1-1	700	2	50
3	12-S-1	700	2	50
4	12-S-2	700	2	50
5	5-S-30	3,000	2	220
6	6-S-3	700	2	50
7	6-S-4	700	5	130
8	7-S-1	6,800	2	500
9	1-S-74	650	2	50
10	S-2	650	5	120
11	4-S-12	700	2	50



N W E S

Legend

- Non-Detect Soil Sample
- Detected Non-Exceedance Soil Sample
- Soil Sample with PRG Exceedance

For Historical Samples:
- 3 or C (Deep):5-11.5 ft bgs
- 2 or B (Intermediate):1.5-6 ft bgs
- 1 or A (Shallow):0-2.5 ft bgs

For 2018/2019 RI (Remedial Investigation) Samples:
- >5 ft bgs
- 2-5 ft bgs
- 0-2 ft bgs

Sample location labels are color-coded as follows:
- 1-S-11 2018/2019 RI, Langan
- SRI-1 2015 RIR, Princeton Geoscience
- 7-S-1 December 1997 Soil Sampling, Madison Industries
- S-1 September 1997 Soil Sampling, Madison Industries
- 1-S-1 1996 Phase II RIR, Madison Industries
- S-1 1993 RIR, Converse Consultants East
- Streams
- Waterbody
- Asphalt Lined Ponds
- Buildings
- Historical Site Features
- Current Site Features
- Site (Madison Property)
- Former CPS Property
- Impervious Surface
- Targeted Remediation Areas

0 100 200
SCALE IN FEET

Notes:
1. Site boundary is defined by the executed USEPA Administrative Settlement Agreement and Order on Consent (November 2015).
2. World aerial imagery basemap is provided through Langan's Esri ArcGIS software licensing and ArcGIS online. Source of aerial imagery is NAIP fromJuly 29, 2015. Credits: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community
3. Streams data provided by the USGS NHD database in 2002.
4. All sample locations that are not presented in this figure but were presented in Figures 7A and 7B do not have available soil analytical results for the constituent of concern.
5. The location of sample, CPS1H, could not be verified. Cadmium and copper were not detected in this sample. Lead and zinc were detected, but not in exceedance of the respective regulatory criteria.
6. Only the three shallowest sample results at SRI-1, SRI-3, SRI-5, SRI-7, SRI-9, SRI-11, SRI-13, SRI-15, SRI-17, SRI-19, and SRI-20 are provided. Deeper samples were collected and the analytical results were provided in the 2016 SCSR, prepared by Langan. The analytical results for all deeper samples were below criteria.
7. Depth identifiers listed above apply to all 2018/2019 sample locations, with the exception of 12-S-3 (where the deepest sample collected was from 3-5 ft bgs), 7(UST-2)-S-1 (where the only sample was collected from 1.0-3.5 ft bgs), and 7(UST-7)-S-1 (where the only sample was collected from 2.5-5.5 ft bgs).

LANGAN

300 Kimball Drive, Parsippany, NJ 07054
T: 973.560.4900 F: 973.560.4901 www.langan.com

NEW JERSEY NEW YORK VIRGINIA CALIFORNIA PENNSYLVANIA CONNECTICUT FLORIDA
ABU DHABI ATHENS DOHA DUBAI ISTANBUL

Langan Engineering & Environmental Services, Inc.
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan International LLC
Collectively known as Langan

NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project

CPS/MADISON SUPERFUND SITE

OLD BRIDGE TOWNSHIP

MIDDLESEX COUNTY NEW JERSEY

Drawing Title

MADISON PRIMARY RISK DRIVING COPCS SOIL ANALYTICAL RESULTS COMPARED TO PRGS AND TARGETED REMEDIATION AREAS

Project No.	100484401
Date	1/10/2023
Scale	1"=100'
Drawn By	PDT
Submission Date	
Figure	2

Table 1: Summary of Noncancer Hazard, Cancer Risk, and Lead Risk Estimates

Exposure Area	Outdoor Industrial Worker			Construction/Utility worker			Adult Tresspasser			Youth Tresspasser (6-18 years)		Adult Recreational Visitor			Youth Recreational Visitor (6-18 years)	
	Noncancer Hazard Index	Cancer Risk	Lead Risk[1]	Noncancer Hazard Index	Cancer Risk	Lead Risk[1]	Noncancer Hazard Index	Cancer Risk	Lead Risk[1]	Noncancer Hazard Index	Cancer Risk	Noncancer Hazard Index	Cancer Risk	Lead Risk[1]	Noncancer Hazard Index	Cancer Risk
Northern Plant (NP) Areas 1/9	0.16	2.3E-06	**42.5%**	0.79	2.6E-07	**38.1%**	0.026	4.3E-07	0.7%	0.039	3.4E-07					
Southern Plant (SP) Areas 3/8	0.014	2.2E-06	--	0.046	1.6E-07	--	0.0025	4.2E-07	--	0.0035	2.7E-07					
Southern Plan (SP) Area 5	0.049	1.7E-06	0.1%	0.34	1.2E-07	0.0%	0.0082	3.3E-07	0.0%	0.012	2.1E-07					
Southern Plan (SP) Area 6/12	0.12	1.6E-06	--	0.54	8.4E-08	--	0.019	3.0E-07	--	0.029	1.9E-07					
Southern Plan (SP) Area 10	0.14	2.0E-06	--	0.78	1.2E-07	--	0.022	3.8E-07	--	0.033	2.4E-07					
Sitewide	0.18	2.0E-06	**16.4%**				0.03	3.7E-07	0.2%	0.044	2.9E-07					
Offsite Area 4	0.043	5.1E-06	--	0.54	1.8E-06	--	0.0075	9.6E-07	--	0.011	7.8E-07					
Offsite Area 14	0.14	7.4E-06	--	0.34	5.9E-07	--	0.024	1.4E-06	--	0.034	9.1E-07					
Prickett's Brook- Onsite	0.034	6.1E-06	0.0%				0.041	8.7E-06	0.0%	0.048	1.2E-05					
Prickett's Brook-Offsite												0.32	1.7E-05	0.0%	0.4	1.9E-05
Prickett's Pond												0.077	7.0E-07	0.0%	0.093	6.4E-07
Tennent Pond												0.066	7.8E-07	0.0%	0.083	4.8E-07

Footnotes:

1 lead risks are expressed as predicted probability of fetal blood lead concetrations exceeding 5 µg/dL

(shaded) not evaluated

-- lead not a COPC for this exposure area

outlined and bolded denote predicted fetal blood lead concentrations that exceed reference values

Table 2: Preliminary Remediation Goals for Soil

Contaminant of Concern	NJDEP NRSRS	NJDEP MGWSRS	Recommended MGWSRS	PRG	Unit
Cadmium	1,100	1.9	11.9	**11.9**	mg/kg
Lead	800	90	90	**90**	mg/kg
Zinc	390,000	930	3,120	**3,120**	mg/kg

Notes:

NJDEP NRSRS – New Jersey Department of Environmental Protection Non-Residential Soil Remediation Standards for the Ingestion-Dermal Exposure Pathway, last revised May 17, 2021.

NJDEP MGWSRS – New Jersey Department of Environmental Protection Migration to Groundwater Soil Remediation Standards, last revised May 17, 2021.

PRG – Preliminary Remediation Goal

Site-specific MGWSRS were calculated for various metals.

The Recommended MGWSRS consists of either the NJDEP Default MGWSRS value or the site-specific value, depending on which is less stringent.

PRGs were selected for each contaminant as the lower of: (1) the Recommended MGWSRS and (2) the NJDEP NRSRS.

ATTACHMENT B

PUBLIC NOTICE

EPA United States Environmental Protection Agency

EPA INVITES PUBLIC COMMENT ON THE PROPOSED PLAN FOR THE CPS/MADISON SUPERFUND SITE IN OLD BRIDGE, NEW JERSEY

The U.S. Environmental Protection Agency (EPA) is proposing a plan to address contaminated soil and groundwater at the CPS/Madison Superfund site in Old Bridge, New Jersey.

EPA is taking comments from the public on the proposed cleanup plan for this site from **Thursday June 1st, 2023** to **Monday July 3rd, 2023**. EPA will consider comments submitted during the comment period before making a final decision. Stakeholders are encouraged to review the plan, attend the public meeting, and comment on the cleanup alternatives. Comments may be emailed to woodall.brennan@epa.gov or mailed to Brennan Woodall, US EPA, 290 Broadway, 19th Floor, New York, NY 10007-1866 no later than **July 3rd, 2023.**

EPA will hold an in-person public meeting on **June 15th, 2023** at **6:30pm** at the Senior Center, 1 Old Bridge Plaza, Old Bridge, NJ. For more information, please contact EPA's Community Involvement Coordinator, Pat Seppi at seppi.pat@epa.gov or visit https://www.epa.gov/superfund/cps-madison.

AP-GCI1069183-01

ATTACHMENT C

PUBLIC MEETING TRANSCRIPT

CPS MADISON PRAP PUBLIC MEETING

June 15, 2023

Video Runtime: 0:31:18

(Beginning of Video Recording.)

SHEREEN KANDIL: Get started. To take care of some of your time. Welcome to the CPS Madison Public meeting. I'm Shereen Kandil (phonetic). I'm the community affairs team lead and the Public Affairs Office at EPA. Pat Seppi (phonetic), who is the Community Involvement coordinator, some of you might know her. She couldn't make it tonight. So I'm here representing Pat.

And we just -- we're going to do some introductions and get right into the presentation, just so you know who we all are. Like I said, I'm Shereen. Brennan Woodall (phonetic) is the remedial project manager for this site.

We also have Rich Puvogel (phonetic), who's the section supervisor. We have Chuck Nace (phonetic), who's also a section supervisor. We have Ula Kinahan (phonetic). And Abby is the ecological risk assessor. So we're all here.

We're going to get right into the presentation, and then we're going to do a Q&A right after the presentation. So, Brennan, are you good?

BRENNAN WOODALL: Yeah.

SHEREEN KANDIL: All right.

BRENNAN WOODALL: Thanks, Shereen.

SHEREEN KANDIL: You're welcome.

BRENNAN WOODALL: Okay. Good evening, everyone. Once again, my name is Brennan. I'm the project manager for the CPS Madison site. Tonight, I'll be walking you through our proposed cleaning plan that we recently issued for the site.

To give you some context, if you're unfamiliar with what a proposed plan is, a proposed plan is a document that we issue after performing an investigation at the site. This document will summarize the results of the investigation and the cleanup options that were considered during the investigation.

Finally, the proposed plan also presents the cleanup option that we prefer and are proposing to perform. So this presentation will summarize the proposed plan, but you can find more details about the information we go over tonight by reading the full proposed plan document on our website.

And there's a link to that in the back in the update, as well as at the end of the function.

All right. The discussion will be broken down into four parts. We'll do a brief background, go through some site history. We'll get to the cleanup plan, and then we'll have plenty of time for questions. And the presentation part will last about 20 minutes.

Okay. First, I want to give you a background of the location and surrounding features of the site. So this is an aerial photo of the site. It's located on Old Waterworks Road. I've got my laser pointer here. Old Waterworks Road kind of just runs right along the top of the site here, these red and yellow boundaries.

Now, this section of Old Waterworks Road also sits just south of Bordentown Avenue, or County Road 615. And that runs right along here.

Now, although we're talking about one superfund site here, there are actually two properties that sit adjacent to each other that make up the site. So we can think of the site in two parts.

First part is the CPS property, which is outlined in yellow here in the top right corner of the photo. A few years back in 2019, we selected some cleanup actions to address soil in this part of the site, the CPS part, as well as groundwater for the whole site.

Some of you may recall that as we went through the same process as we're going through now, and we had a public meeting for that just like this one.

So the second part of the site is the Madison property, which is outlined in red over here. And we have it labeled as well. As you can guess, the Madison portion of the site is the focus of tonight's presentation. And I want to give you a few details about (inaudible).

The property is approximately 15 acres in size. Madison has operated a facility in the northern half of the property since 1967, and that facility produces inorganic chemicals that are used in fertilizer, pharmaceuticals, and food additives.

On the southern half of the property, a

second facility, Madison's sister company, Old Bridge Chemicals, operates and they produce zinc salts and copper sulfates. Those compounds are used in a wide range of applications, again, like pesticides and pharmaceuticals.

On this slide, there are just a couple more things I'd like to point out to you. There is a brook called Prickett's Brook. It starts over here, and it runs from east to west along the bottom boundary of the CPS property. And then it cuts through the middle of the Madison property here.

Then you can see it kind of travels down southwest, first into this pond called Crickets Pond, and then finally down here, you can see it goes into Tennant Pond as well.

Now, I'm showing you this because for this proposed plan, we looked at soil on the Madison property as well as surface water and sediment in these water bodies. So I just wanted to provide some context as to where those features are relative to the site.

And then finally, I just want to point out the location of the Perth Amboy well field, which you can see down here. This is located south of the CPS Madison site and it supplies drinking water to the City of Perth Amboy.

This well field plays an important part in the site's history, which I'll talk about briefly on the next slide.

So next, we're going to look at how the site came to be a superfund site and what has taken place at the site since then. Now, I want to go over some of the major milestones in the site's history that have gotten us to where we are today.

I'll reiterate that this is just a summary of the site's history because there is a lot of history with this site, but I've laid out a few milestones here that should give you a good overall understanding of the history.

Our discussion of the history begins in the 1970s when a series of wells in the Perth Amboy well field became impacted by groundwater contamination coming from operations off of the CPS and Madison facilities. Those wells had to be shut down, and new wells were installed downgradient --

farther downgradient in an area that was not impacted by the contamination.

As a result of this event, in 1979, New Jersey State Court ordered the companies at both CPS and Madison to perform an investigation to determine the extent of the contamination on their sites in the well field.

In 1981, this investigation led to another state court order to implement a groundwater remediation program. It was also around this time that the site was brought to EPA's attention, and EPA listed CPS Madison as a superfund site in 1983. And that's important because when a site goes on our superfund list, it becomes eligible for us to spend money on that site. That is money that specifically comes from, you know, collection set aside for superfund sites. At the time of the listing, New Jersey was the lead agency on the site.

In 1991 and 1992, the companies placed extraction wells near the Perth Amboy well field. These extraction wells would capture the contamination coming off of the site and prevent it from reaching the Perth Amboy drinking water supply wells. Those extraction wells worked really well. In between 1993 and 2000, the groundwater around those wells began to achieve cleanup goals.

So since the groundwater near the well field was achieving cleanup goals, those wells were shut down, and new extraction wells were installed on the CPS and Madison properties themselves, which is closer to the sources of contamination.

So the new wells continued to capture contamination coming from the site. And those wells are still in operation today. Still in operation and treating groundwater.

Next on our list here in 2003, at New Jersey's request, EPA took over the lead role in overseeing the superfund cleanup. And then between 2005 and 2019, additional investigations took place to investigate soil at the CPS property and further characterized groundwater contamination coming off of the site.

In 2019, at the end of this investigation, EPA selected clean-up actions to address site wide groundwater contamination and contaminated soil on the CPS property. As I mentioned earlier in the presentation, when we were looking at that aerial photo and we pointed out CPS.

Those actions are currently in the engineering phase and are being designed. Also during this time period in 2015, EPA entered into an order with Madison to perform an investigation of the Madison property.

Now, that brings us to where we are today. The Madison investigation is complete, and EPA has issued this proposed plan to address soil contamination on the Madison property.

Just kind of a quick summary there of some major milestones and what we're here for today.

On the next slide, I'm going to summarize the results of the investigation. So the purpose of a remedial investigation is to find out, one, what type of contaminants are there are, and two, where are those contaminants?

Now, there are a lot of other questions

we ask and a lot of other information we gather, but those are some of the two big ones. Based on previous investigations at CPS Madison, we already had some knowledge that the type of soil contamination at the Madison property mainly consisted of inorganics, or in other words, metals. This investigation confirmed that and identified the primary contaminants of concern as lead, cadmium, and zinc.

As a part of the investigation, we also perform risk assessments to determine if the contaminants have the potential to affect human health or the environment. If we determine that there is unacceptable risk, that is a level of risk that falls outside of our acceptable range, that triggers an action for us to address that unacceptable risk. The process is very in-depth, and you can find extensive details about it in the proposed plan. But right now, I just want to summarize the results of those risk assessments.

So for human health, we found unacceptable risk associated with potential future exposures to soil on the Madison property, and that unacceptable risk was associated associated with lead.

For the environment, we found that there was some toxicity towards invertebrates associated with the sediment in the water bodies that were investigated. However, that toxicity could not be directly connected to the metals coming from Madison, which suggests that there are other factors also contributing to that toxicity.

So next, I'm going to talk about the goals that we set in order to address the unacceptable risk and the contamination that have been identified during the remedial investigation.

So these are our remedial action objectives, but we can also think of them simply as our goals for the cleanup. These goals direct our decisions on the cleanup in order to ensure that the actions we take are protective of human health and the environment.

When we establish these objectives, they have the tendency to get pretty specific and wordy. So I've summarized them here. But you can also find the full objectives in the full proposed plan document.

The first objective is to prevent soil contamination from migrating to the groundwater. The second objective is to prevent human exposure to soil contamination. And the third objective is to prevent soil contamination from migrating to surface water and sediment.

So this kind of steers our path in the next phase of the investigation. And on the next slide, I'll talk about the cleanup options that have been considered, and one one word we use to refer to those cleanup options is alternatives.

So we developed three alternatives for the Madison cleanup. The first alternative looks at what happens if we take no action. Now, this is an alternative that's only used as a baseline to compare to the other alternatives.

The second alternative includes removal of contaminated soil in the unpaved areas on the Madison property. Now, a large proportion of the Madison property is paved or otherwise covered in impervious surfaces. So to address contamination under these paved areas, the second alternative also calls for the existing pavement on this property to be used as a cap or a protective barrier over the contaminated soil that is not removed and already under the pavement.

For our third alternative, instead of removing soil in the unpaved areas, this alternative calls for placing a cap over soil contamination in those unpaved areas. So that would mean placing pavement over those unpaved areas. Like alternative two, alternative three would also use the existing pavement on the property as a cap over the contaminated soil that's already under pavement.

And there are two additional elements that are common components to both alternatives two and three. Those elements are long term monitoring of sediment and surface water to assess the effectiveness of the selected alternative for the Madison soils, as well as the alternatives that were selected for groundwater and for the CPS soils back in 2019 once all alternatives have been implemented.

The second element is institutional controls, and that's in the form of a deed notice on the Madison property. And a deed, notice what that does is it would it would restrict the Madison property to nonresidential uses only.

So in the next slide, I'll briefly talk about the process that we use and the criteria that we look at to evaluate each alternative and ultimately select one.

So the process we used to come up with possible cleanup alternatives starts very broad, and we screen out technologies and actions and narrow that list down until we have a list of the best alternatives that we've determined are available to us.

At this stage, the alternatives then go through a comprehensive evaluation where we compare them against these nine criteria, and we also compare them against one another.

I won't read through all of the criteria here, but I put them up here in case you're interested in reading through them. One thing I do want to point out, though, is the group column on the left side of this table.

We divide the nine criteria into these three groups, threshold, balancing, and modifying. For the threshold criteria, any alternative that could possibly be chosen has to pass the threshold criteria. If it doesn't pass, it doesn't move on, move forward in this process.

The alternatives that pass the threshold criteria, the next five criteria are the balancing criteria are used to differentiate between the remaining alternatives in the five different areas. You can see here numbers three through number seven.

After this stage, EPA will select a preferred alternative, and we put it into the proposed plan and start the public comment period. Now, this is where the last two criteria or the modifying criteria come in. This is where we ask you to take a look at the proposed plan and send us your comments and your feedback and your questions. Once the public comment period ends, we will address all of that comment -- all of those comments and questions, and we'll make a final decision on the cleanup.

On the next slide, I'll go ahead and introduce EPA's preferred alternative. So EPA's preferred alternative is alternative number two.

And if you recall, this alternative calls for the excavation of contaminated soil, the unpaved areas on the Madison property. Approximately 1320 cubic yards of soil would be removed in total from these areas.

It also calls for the existing pavement on the property to be used as a cap over contaminated soil. These paved areas will be assessed to determine if they're meeting the requirements to function as a cap and be protected, and if necessary, they'll be upgraded to meet those requirements.

The component also -- this component of the alternative also includes ongoing inspections and maintenance, and those would be to ensure that the cap remains effective over these areas.

Additionally, alternative two includes

the common elements that I discussed earlier. Those were long term monitoring of sediment and surface water and the placement of institutional controls in the form of that deed notice on the Madison property. And once again, the deed notice would restrict the Madison property to nonresidential uses (inaudible).

So the estimated cost of alternative two is approximately 1.95 million. And on this slide I've got a visual representation of the alternative to hopefully kind of give a better picture of what's going on here.

So if you'll recall from the beginning of the presentation, this is an aerial photo of the Madison site again, just we're zoomed in a little closer this time. Same as before, this red line shows the boundaries of the Madison property.

Now, around and within the -- within the Madison boundaries, you'll see an orange dashed line. And let me go ahead and zoom in for you so you can see a little brighter.

So I can't use my laser pointer and zoom in at the same time. But at the very top of the screen above the red line, you'll see that orange dashed line. Now that represents the areas of the site that are paved. And this is where under alternative two, the existing pavement would be used as a cap.

So I zoomed in on the northern half a little bit. I'll go ahead and come down and we can look at the southern half as well. And as you can see, about most of the northern half of the property is paved, and about two thirds of the southern half of the property was paved.

And one other thing I want to draw your attention to on this slide is these yellow circles and squares. Right there. Right there, for example. These areas illustrate the unpaved areas that are targeted for the soil removal under this alternative.

There are 11 of these areas in total. And again, these areas are where the 1320 cubic yards of soil would be removed under this alternative.

So that concludes the presentation. And next, we can take any questions or go back and look at any slides again that you want to see.

Before we take any questions, I do just want to mention that we released this proposed plan on June 1st, and that's the start of the public comment period. And again, that's where we take questions and comments from the public on the proposed plan. And that comment period will end on July 3rd.

So after that point, we'll address any feedback or comments or questions that we've received. So if you have any written comments that you'd like to send in after you leave today, you can send them to me, and you can email me or send them by snail mail to the address listed there.

And then anything we talk about today will be captured in a transcript, and those will also be included as part of the public comment period.

SHEREEN KANDIL: Great and any questions beyond the public comment period, you can always reach out to the community involvement coordinator Pat Seppi, who is not here.

So because we're doing it this way, if

you can just state your -- your name before your question or comment, that would be great just so that we have --

BRENNAN WOODALL: Don't all ask at once.

BILL SCHULTZ: Bill Schultz at Riverkeeper. Perth Amboy lost use of 35 wells was (inaudible). Did the city ever receive any compensation for the loss of those wells or is there any way the city can get the -- something -- get something out of the loss of the use of a property?

BRENNAN WOODALL: Rich, do you remember anything?

RICH PUVOGEL: I don't recall exactly, but that's an action taken by the city against parties who are responsible for that because it was shown that the cost recovery for the city.

BILL SCHULZ: Is it likely that or even possible that the site -- the ground water can be cleaned up enough for it to reopen those wells?

RICH PUVOGEL: That's the long term objective of the cleanup to eventually have the groundwater restored to its -- to public use for the long term to eventually get there. But we're concentrating, and we're looking at the soil at Madison (inaudible). (Inaudible) for the groundwater pumping has been going on since the 1990s, and it's gone back (inaudible) towards the source areas and the pumping continues to capture the -- the contaminants coming off the source areas.

And this remedy, it would certainly help that process (inaudible) potential solution for sources to the (inaudible).

BRENNAN WOODALL: I add that looking at the plumes in the 1990s when we first started those wells to capture that contamination, and looking at them through the years till today, those plumes, the organics and the metals and from dramatically from where they originally were.

We do actually have some slides that we had in our first public meeting when we went over groundwater that kind of shows how those shrink over the years. It all goes up in the (inaudible) to be able to see.

All right. So this first one here,

we've got an organic benzene in 1994. There are a couple of years here. 2004. And then 2014. Let me just -- just so we're clear, with kind of yellowish green color is the groundwater plume. But the (inaudible).

BILL SCHULTZ: (Inaudible).

BRENNAN WOODALL: Yeah, those -- those wells have been working extremely well. It's good to see. And if you've got a benzene plume as well. 1991. 2002. 2016. We have (inaudible). 1996. 2004. 2014. Just to kind of give a quick picture of how we changed since those wells were first put it.

BILL SCHULTZ: Now there is no ongoing contamination from the site is there? (Inaudible) new --

BRENNAN WOODALL: Well, CPS is -- there are no current operations on CPS site. Madison Industries still has to (inaudible) facilities. But --

BILL SCHULTZ: Are they contributing to groundwater contamination at this time?

BRENNAN WOODALL: It's -- so when I was talking about the contamination in the soil on the site, one reason we want to address that is because that soil contamination can serve as a source for groundwater.

Now, I also showed that most of the site is paved, and that wasn't so kind of early on in the site's history when a lot of this kind of -- we first discovered the groundwater contamination.

That, in itself, could be contributing to and could well -- could be helping to prevent the soil contamination from getting to the groundwater today. When you have the ground -- the soil contamination in the unsaturated part of the soil and you have payment over that, you don't have things like erosion and infiltration of like rainwater or surface water runoff that could carry those soil contaminants into the groundwater.

Now, part of what we'll do in the remedial design is inspect the existing pavement and upgrade it, if necessary, to make sure that that can be functional and effective as a cap, to make sure that there is no additional contributing -- contributions to the groundwater contamination from any soil contamination that's -- that's left under that area.

And for the unpaved areas, that's why we want to remove that soil contamination so that it can't go anywhere else. It's not -- propose -- it's not providing unacceptable risk as a human health hazard as well.

BILL SCHULTZ: So your groundwater contamination from your sites has been reduced very dramatically. Continue with your -- this is a pump and treat operation, I assume. Right?

BRENNAN WOODALL: Yes and no. Yeah.

BILL SCHULTZ: (Inaudible) pumping, do you eventually see the -- no further threats to groundwater from the site?

BRENNAN WOODALL: Possible. I mean, long term, I mean, that would be -- that would be the hope. See how well that continues to work.

So part of the alternatives that were chosen in 2019 for the metals, the alternative that was chosen was to continue this -- this pump and treat system. But on top of that, for the organics, what we're looking at doing is using chemical oxidation, not only in the organics that were in the CPS soils, but also the organics in that groundwater plume, and using that to transform those organics into other compounds that would be (inaudible), and that would eliminate the source area contributing to that -- to that groundwater plume.

So part of the groundwater remedy for the organics is to try out that chemical oxidation before kind of seeing if we need the pump and treat from those wells that are on the CPS property to continue those pump and treat wells.

It may be that that chemical oxidation is successful enough that we would no longer need those wells at some point, but we'll continue to use those pump and treat wells until we know for sure how that remedy is working. And for the metals plume, the remedy is to continue that pump and treat system, so.

BILL SCHULTZ: Okay. Thank you.

BRENNAN WOODALL: Yeah.

RICH PUVOGEL: Anybody else have any other questions?

SHEREEN KANDIL: And so, as Brennan

mentioned, you can provide comments, questions until July 3rd, and you can send it via email or snail mail. If you have questions beyond this proposed plan, you can reach out to Brennan or Pat Seppi. We thank you for coming. And if you haven't taken a fact sheet, they're out on the table, and we appreciate it.

RICH PUVOGEL: And Brennan's contact information is on the fact sheet as well.

BRENNAN WOODALL: Yes, happy to (inaudible).

SHEREEN KANDIL: Great. Have a great night.

BILL SCHULTZ: Thank you.

BRENNAN WOODALL: Thanks, guys.

(End of Video Recording.)

CERTIFICATE

I, Wendy Sawyer, do hereby certify that I was authorized to and transcribed the foregoing recorded proceedings, and that the transcript is a true record, to the best of my ability.

DATED this 29th day of June, 2023.

____

WENDY SAWYER, CDLT

ATTACHMENT D

WRITTEN COMMENTS

Woodall, Brennan

From:	Vincent Mackiel
Sent:	Monday, July 3, 2023 3:51 PM
To:	Woodall, Brennan
Subject:	CPS/Madison Superfund Site--Operational Unit 3--Old Bridge, NJ--June 2023

Vincent Mackiel

July 3, 2023

Mr. Brennan Woodall
Remedial Program Manager
USEPA, Region 2
290 Broadway, 18 floor
New York, NY 10007-1866

Dear Mr Woodall:

Please accept my comments regarding the CPS/Madison Industries Superfund Site ID #652515.
I am affected as a resident by the pollution that originates in the watershed that eventually comes into the tap water for drinking,washing and through treatment by-products in Perth Amboy, NJ.

As the cleanup plan mentions--32 wells have been closed from decades of disturbing off loading industrial behavior in the watershed by the chemical firms.

Presently the Madison Old Bridge Chemical Plants continue to admit harmful substances. Your record documents the need to extract lead, cadmium and zinc with clean fill in area OU3. But,the allowance for surface structures to hold contamination violates any real complete cleanup effort.

In OU3 addressing soil on Madison property that is a direct contact hazard and acts as a contaminant source to groundwater and surface water of Prickett's Brook and Prickett's Pond.

These conditions in such a natural watershed area can only be solved by redirecting the chemical firms development completely away from the watershed, meaning the closure of those companies.

I am hopeful, one day, I can drink cleaner water in Perth Amboy.

Respectfully,

Vincent Mackiel

APPENDIX C

CPS / MADISON SUPERFUND SITE

Old Bridge, Middlesex County, New Jersey

REMEDIAL DESIGN/REMEDIAL ACTION

STATEMENT OF WORK

For Operable Unit 1 (Metals Contamination) and Operable Unit 3

TABLE OF CONTENTS

1. INTRODUCTION

1.1 Purpose of SOW. This SOW sets forth the procedures and requirements for implementing the Work.

1.2 Structure of the SOW

- Section 2 (Community Involvement) sets forth EPA's and Settling Defendants' responsibilities for community involvement.
- Section 3 (Coordination and Supervision) contains the provisions for selecting the Supervising Contractor and Project Coordinators regarding the Work.
- Section 4 (Remedial Design) sets forth the process for developing the Remedial Design, which includes the submission of specified primary deliverables.
- Section 5 (Remedial Action) sets forth requirements regarding the completion of the Remedial Action, including primary deliverables related to completion of the Remedial Action.
- Section 6 (Reporting) sets forth Settling Defendants' reporting obligations.
- Section 7 (Deliverables) describes the contents of the supporting deliverables and the general requirements regarding Settling Defendants' submission of, and EPA's review of, approval of, comment on, and/or modification of, the deliverables.
- Section 8 (Schedules) sets forth the schedule for submitting the primary deliverables, specifies the supporting deliverables that must accompany each primary deliverable, and sets forth the schedule of milestones regarding the completion of the Remedial Action.
- Section 9 (State Participation) addresses State participation.
- Section 10 (References) provides a list of references, including URLs.

1.3 The Scope of the Remedy includes the actions described in the Selected Remedy Section of the CPS/Madison Site OU3 Record of Decision (ROD) signed in September 2023, and the actions described for metal contaminants in groundwater in the Selected Remedy Section of the CPS/Madison Site OU1/OU2 ROD signed in September 2019. The major components of the selected remedy for OU3 include removal of contaminated soil above the remediation goals (RGs), use of existing paved areas as a cap over contaminated soils, implementation of appropriate institutional controls, and long-term sediment and surface water monitoring. The major components of the selected remedy for metal contaminants in groundwater include continued operation of the Madison Interim Remedial Measure (IRM) pump and treatment system, groundwater monitoring, and continuation of institutional controls. For purposes of this Section 1.3, and for the Decree, the Scope of the Remedy does not include the components of the remedy selected for organic contamination in groundwater, which is associated with contamination on the CPS property.

1.4 The terms used in this SOW that are defined in CERCLA, in regulations promulgated under CERCLA, or in the Consent Decree ("Decree"), have the meanings assigned to them in CERCLA, in such regulations, or in the Decree, except that the term "Paragraph" or "¶" means a paragraph of the SOW, and the term "Section" means a section of the SOW, unless otherwise stated.

2. COMMUNITY INVOLVEMENT

2.1 As requested by EPA, Settling Defendants shall conduct community involvement activities under EPA's oversight as provided for in, and in accordance with this Section. Such activities must include designation of a Community Involvement Coordinator ("CI Coordinator").

2.2 Community Involvement Responsibilities

(a) EPA has the lead responsibility for developing and implementing community involvement activities at the Site. Previously, EPA developed a Community Involvement Plan ("CIP") for the Site. In accordance with 40 C.F.R. § 300.435(c), EPA shall review the existing CIP and determine whether it should be revised to describe further public involvement activities during the Work that are not already addressed or provided for in the existing CIP.

(b) **Settling Defendants' CI Coordinator**. As requested by EPA, Settling Defendants shall, within 15 days, designate and notify EPA of Settling Defendants' CI Coordinator (Settling Defendants' CI Coordinator). Settling Defendants may hire a contractor for this purpose. Settling Defendants' notice must include the name, title, and qualifications of the Settling Defendants' CI Coordinator. Settling Defendants' CI Coordinator shall coordinate his/her activities with EPA's CI Coordinator, provide support regarding EPA's community involvement activities, and, as requested by EPA's CI Coordinator, provide draft responses to the public's inquiries including requests for information or data about the Site. The Settling Defendants' CI Coordinator has the responsibility to ensure that when they communicate with the public, the Settling Defendants protect any "Personally Identifiable Information" ("PII") (*e.g.* sample results from residential properties) in accordance with "EPA Policy 2151.0: Privacy Policy."

(c) As requested by EPA, Settling Defendants shall participate in community involvement activities, including participation in public meetings that may be held or sponsored by EPA to explain activities at or relating to the Site (with interpreters present for community members with limited English proficiency). Settling Defendants' support of EPA's community involvement activities may include providing online access to initial submissions and updates of deliverables to: (1) any Community Advisory Groups, (2) any Technical Assistance Grant ("TAG") recipients and their advisors, and (3) other entities to provide them with a reasonable opportunity for review and comment. EPA may describe in its CIP Settling Defendants' responsibilities for community involvement activities. All community involvement activities conducted by Settling Defendants at EPA's request are subject to EPA's oversight. Upon EPA's request, Settling Defendants shall establish, as early as is feasible, a community information repository at or near the Site, as provided in the CIP, to house one copy of the administrative record.

(d) **Information for the Community**. As requested by EPA, Settling Defendants shall develop and provide to EPA information about the design and implementation of the remedy including: (1) any validated data from monitoring of impacts to communities as provided in the Community Impacts Mitigation Plan under ¶ 7.7(f); (2) results from unvalidated sampling as provided under ¶ 7.7(e)(7); (3) a copy of the Community Impacts Mitigation Plan required under ¶ 7.7(f); (4) schedules prepared under Section 8; (5) dates that Settling Defendants completed each task listed in the schedules; and (6) digital photographs of the Work being performed, together with descriptions of the Work depicted in each photograph, the purpose of the Work, the equipment being used, and the location of the Work. The EPA Project Coordinator may use this information for communication to the public via EPA's website, social media, or local and mass media. The information provided to EPA should be suitable for sharing with the public and the education levels of the community as indicated in EJ Screen. Translations should be in the dominant language(s) of community members with limited English proficiency.

3. COORDINATION AND SUPERVISION

3.1 Project Coordinators

(a) Settling Defendants' Project Coordinator must have sufficient technical expertise to coordinate the Work. Settling Defendants' Project Coordinator may not be an attorney representing any Settling Defendant in this matter. Settling Defendants' Project Coordinator may assign other representatives, including other contractors, to assist in coordinating the Work.

(b) EPA shall designate and notify the Settling Defendants of EPA's Project Coordinator and Alternate Project Coordinator. EPA may designate other representatives, which may include its employees, contractors, and/or consultants, to oversee the Work. EPA's Project Coordinator/Alternate Project Coordinator will have the same authority as a remedial project manager and/or an on-scene coordinator, as described in the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"). This includes the authority to halt the Work and/or to conduct or direct any necessary response action when it is determined that conditions at the Site constitute an emergency or may present an immediate threat to public health or welfare or the environment due to a release or threatened release of Waste Material.

(c) Settling Defendants' Project Coordinator shall communicate with EPA's Project Coordinator at least monthly.

3.2 **Supervising Contractor**. Settling Defendants' proposed Supervising Contractor must have sufficient technical expertise to supervise the Work and a quality assurance system that complies with the most recent version of *Quality Systems for Environmental Data and Technology Programs -- Requirements with Guidance for Use* (American National Standard), ANSI/ASQC E4 (Feb. 2014).

3.3 **Procedures for Disapproval/Notice to Proceed**

(a) Settling Defendants shall designate, and notify EPA, within 10 days after the Effective Date, of the names, titles, contact information, and qualifications of the Settling Defendants' proposed Project Coordinator and Supervising Contractor, whose qualifications shall be subject to EPA's review for verification based on objective assessment criteria (*e.g.*, experience, capacity, technical expertise) and do not have a conflict of interest with respect to the project.

(b) EPA shall issue notices of disapproval and/or authorizations to proceed regarding any proposed Project Coordinator and Supervising Contractor, as applicable. If EPA issues a notice of disapproval, Settling Defendants shall, within 30 days, submit to EPA a list of supplemental proposed Project Coordinators and/or Supervising Contractors, as applicable, including a description of the qualifications of each. Settling Defendants may select any coordinator/contractor covered by an authorization to proceed and shall, within 21 days, notify EPA of Settling Defendants' selection.

(c) EPA may disapprove the proposed Project Coordinator, the Supervising Contractor, or both, based on objective assessment criteria (*e.g.*, experience, capacity, technical expertise), if they have a conflict of interest regarding the project, or any combination of these factors.

(d) Settling Defendants may change their Project Coordinator and/or Supervising Contractor, or both, by following the procedures of ¶¶ 3.3(a) and 3.3(b).

(e) Notwithstanding the procedures of ¶¶ 3.3(a) through 3.3(d), Settling Defendants have proposed, and EPA has authorized Settling Defendants to proceed, regarding the following Project Coordinator and Supervising Contractor: [**name and contact information**].

4. REMEDIAL DESIGN

4.1 **Remedial Design Work Plan ("RDWP")**. Settling Defendants shall submit a RDWP for EPA approval. The RDWP must include:

(a) Plans for implementing all Remedial Design activities identified in this SOW, in the RDWP, or required by EPA to be conducted to develop the Remedial Design;

(b) A description of the overall management strategy for performing the Remedial Design, including a proposal for phasing of design and construction, if applicable;

(c) A description of the proposed general approach to contracting, construction, operation, maintenance, and monitoring of the Remedial Action as necessary to implement the Work;

(d) A description of the responsibility and authority of all organizations and key personnel involved with the development of the Remedial Design;

(e) Descriptions of any areas requiring clarification and/or anticipated problems (*e.g.*, data gaps);

(f) Description of any proposed pre-design investigation;

(g) Descriptions of any applicable permitting requirements and other regulatory requirements;

(h) Description of plans for obtaining access in connection with the Work, such as property acquisition, property leases, and/or easements; and

(i) The following supporting deliverables described in ¶ 7.7 (Supporting Deliverables): Health and Safety Plan and Emergency Response Plan.

4.2 Institutional Controls Implementation and Assurance Plan ("ICIAP"). Settling Defendants shall submit a proposed ICIAP for EPA approval. The ICIAP should describe plans to implement, maintain, monitor, and enforce the Institutional Controls ("ICs") at the Site. The ICIAP shall include plans to commence implementing ICs as early as is feasible, including before EPA approval of the 100% design under ¶ 4.6. The ICIAP also should include procedures for effective and comprehensive review of implemented ICs, procedures for the solicitation of input from affected communities regarding the implementation of ICs, procedures to periodically review and determine if the ICs are having their intended effect, and if not, procedures for the development, approval and implementation of alternative, more effective ICs. Settling Defendants shall develop the ICIAP in accordance with *Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites*, OSWER 9355.0-89, EPA/540/R-09/001 (Dec. 2012), and *Institutional Controls: A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites*, OSWER 9200.0-77, EPA/540/R-09/02 (Dec. 2012). Settling Defendants also shall consider including in the ICIAP the establishment of effective Long-Term Stewardship procedures including those described in EPA Memorandum: *Advanced Monitoring Technologies and Approaches to Support Long-Term Stewardship* (July 20, 2018). The ICIAP must include the following additional requirements:

(a) Locations of recorded real property interests (*e.g.*, easements, liens) and resource interests in the property that may affect ICs (*e.g.*, surface, mineral, and water rights) including accurate mapping and geographic information system (GIS) coordinates of such interests; and

(b) Legal descriptions and survey maps that are prepared according to current American Land Title Association ("ALTA") Survey guidelines and certified by a licensed surveyor.

4.3 Settling Defendants shall communicate regularly with EPA to discuss design issues as necessary, as directed or determined by EPA.

4.4 **Pre-Design Investigation ("PDI")**. The purpose of the PDI is to address data gaps by conducting additional field investigations.

(a) **PDI Work Plan**. Settling Defendants shall submit a PDI Work Plan ("PDIWP") for EPA approval. The PDIWP must include:

(1) An evaluation and summary of existing data and description of data gaps;

(2) A sampling plan including media to be sampled, contaminants or parameters for which sampling will be conducted, location (areal extent and depths), and number of samples;

(3) A proposed schedule for start of the PDI and major events including sampling, provision of validated data, and submittal of the PDI Evaluation Report, and the proposed schedule shall include the proposed time period between receipt of validated PDI sampling results and submittal of the PDI Evaluation Report;

(4) Cross references to quality assurance/quality control ("QA/QC") requirements set forth in the Quality Assurance Project Plan ("QAPP") as described in ¶ 7.7(d); and

(5) The following supporting deliverables described in ¶ 7.7 (Supporting Deliverables): Field Sampling Plan and Quality Assurance Project Plan.

(b) Following the PDI, Settling Defendants shall submit a PDI Evaluation Report for approval. This report must include:

(1) Summary of the investigations performed;

(2) Summary of investigation results;

(3) Summary of validated data (*i.e.*, tables and graphics);

(4) Data validation reports and laboratory data reports;

(5) Narrative interpretation of data and results;

(6) Results of statistical and modeling analyses;

(7) Photographs documenting the work conducted;

(8) Conclusions and recommendations for Remedial Design, including design parameters and criteria;

(9) A design criteria report, as described in the *Remedial Design/Remedial Action Handbook*, EPA 540/R-95/059 (June 1995);

(10) Preliminary drawings and specifications, including cutlines for soil excavations;

(11) Descriptions of permit requirements, if applicable;

(12) A description of monitoring and control measures to protect human health and the environment, such as air monitoring, and measures to reduce and manage traffic, noise, odors, and dust, during the Remedial Action in accordance with the Community Involvement Handbook pp.53-66 (text box on p. 55) to minimize community impacts; and

(13) Updates of all supporting deliverables required to accompany the RDWP and the following additional supporting deliverables described in ¶ 7.7 (Supporting Deliverables): Site Wide Monitoring Plan, Community Impacts Mitigation Plan.

(c) EPA may require Settling Defendants to supplement the PDI Evaluation Report and/or to perform additional pre-design studies.

4.5 Pre-final (90%) Remedial Design. Settling Defendants shall submit the Pre-final (90%) Remedial Design for EPA's comment. The Pre-final Remedial Design must be a continuation and expansion of the PDI Evaluation Report and must address EPA's comments regarding the PDI Evaluation Report. The Pre-final Remedial Design will serve as the approved Final (100%) Remedial Design if EPA approves the Pre-final Remedial Design without comments. The Pre-final Remedial Design must include:

(a) A complete set of construction drawings and specifications that are: (1) suitable for procurement; and (2) follow the Construction Specifications Institute's MasterFormat 2020;

(b) A survey and engineering drawings showing existing Site features, such as elements, property borders, easements, and Site conditions;

(c) Pre-final versions of the same elements and deliverables as are required for the PDI Evaluation Report;

(d) A specification for photographic documentation of the Remedial Action;

(e) A description of how the Remedial Action will be implemented in a manner that minimizes environmental impacts in accordance with EPA's *Principles for Greener Cleanups* (Aug. 2009) and EPA Region 2's Clean and Green Policy;

(f) Any proposed revisions to the Remedial Action Schedule that is set forth in ¶ 8.3 (Remedial Action Schedule); and

(g) Updates of all supporting deliverables required to accompany the PDI Evaluation Report and the following additional supporting deliverables described in ¶ 7.7 (Supporting Deliverables): Construction Quality Assurance/Quality Control Plan; O&M Plan; and O&M Manual.

4.6 **Final (100%) Remedial Design**. Settling Defendants shall submit the Final (100%) Remedial Design, including a complete set of construction drawings and specifications certified by a registered professional engineer suitable for procurement for EPA approval. The Final Remedial Design must address EPA's comments on the Pre-final (90%) Remedial Design and must include final versions of all Pre-final Remedial Design deliverables.

5. REMEDIAL ACTION

5.1 **Remedial Action Work Plan ("RAWP")**. Settling Defendants shall submit a RAWP for EPA approval that includes:

(a) A proposed Remedial Action Construction Schedule in the Gantt chart format;

(b) An updated health and safety plan that covers activities during the Remedial Action; and

(c) Plans for satisfying permitting requirements, including obtaining permits for off-site activity and for satisfying substantive requirements of permits for on-site activity.

5.2 **Meetings and Inspections**

(a) **Preconstruction Conference**. Settling Defendants shall hold a preconstruction conference with EPA and others as directed or approved by EPA and as described in the *Remedial Design/Remedial Action Handbook*, EPA 540/R-95/059 (June 1995). Settling Defendants shall prepare minutes of the conference and shall distribute the minutes to all Parties.

(b) **Periodic Communications**. During the construction portion of the Remedial Action (Remedial Action Construction), Settling Defendants shall communicate weekly with EPA, and others as directed or determined by EPA, to discuss construction issues. Settling Defendants shall distribute an agenda and list of attendees to all Parties prior to each meeting or telephone call. Settling Defendants shall prepare minutes of the meetings or calls and shall distribute the minutes to all Parties.

(c) **Inspections**

(1) EPA or its representative shall conduct periodic inspections of or have an on-site presence during the Work. At EPA's request, the Supervising Contractor or other designee shall accompany EPA or its representative during inspections.

(2) Settling Defendants shall provide on-site office space for EPA personnel to perform their oversight duties. The minimum office requirements are a private office with at least 100 square feet of floor/trailer space, an office desk with chair, a four-drawer file cabinet, as well as access to facsimile, reproduction, wireless internet access, and sanitation facilities.

(3) Settling Defendants shall provide personal protective equipment needed for EPA personnel and any oversight officials to perform their oversight duties.

(4) Upon notification by EPA of any deficiencies in the Remedial Action Construction, Settling Defendants shall take all necessary steps to correct the deficiencies and/or bring the Remedial Action Construction into compliance with the approved Final Remedial Design, any approved design changes, and/or the approved RAWP. If applicable, Settling Defendants shall comply with any schedule provided by EPA in its notice of deficiency.

5.3 Permits

(a) As provided in CERCLA § 121(e), and Section 300.400(e) of the NCP, no permit is required for any portion of the Work conducted entirely on-site *(i.e.*, within the areal extent of contamination or in very close proximity to the contamination and necessary for implementation of the Work). Where any portion of the Work that is not on-site requires a federal or state permit or approval, Settling Defendants shall submit timely and complete applications and take all other actions necessary to obtain all such permits or approvals.

(b) Settling Defendants may seek relief under the provisions of Section XI (Force Majeure) of the Decree for any delay in the performance of the Work resulting from a failure to obtain, or a delay in obtaining, any permit or approval referenced in ¶ 5.3(a) and required for the Work, provided that they have submitted timely and complete applications and taken all other actions necessary to obtain all such permits or approvals.

(c) Nothing in the Decree or this SOW constitutes a permit issued under any federal or state statute or regulation.

5.4 Emergency Response and Reporting

(a) **Emergency Action**. If any event occurs during performance of the Work that causes or threatens to cause a release of Waste Material on, at, or from the Site and that either constitutes an emergency situation or that may present an immediate threat to public health or welfare or the environment, Settling Defendants shall: (1) immediately take all appropriate action to prevent, abate, or minimize such release or threat of release; (2) immediately notify the authorized EPA officer (as specified in ¶ 5.4(c)) orally; and (3) take such actions in consultation with the authorized EPA officer and in accordance with all applicable provisions of the Health and Safety Plan, the Emergency Response Plan, and any other deliverable approved by EPA under the SOW.

(b) **Release Reporting**. Upon the occurrence of any event during performance of the Work that Settling Defendants are required to report under CERCLA § 103 or Section 304 of the Emergency Planning and Community Right-to-Know Act ("EPCRA"), Settling Defendants shall immediately notify the authorized EPA officer orally.

(c) The "authorized EPA officer" for purposes of immediate oral notifications and consultations under ¶ 5.4(a) and ¶ 5.4(b) is the EPA Project Coordinator, the EPA Alternate Project Coordinator (if the EPA Project Coordinator is unavailable), or the EPA National Response Center Hotline at (800) 424-8802 (if neither EPA Project Coordinator is available).

(d) For any event covered by ¶ 5.4(a) and ¶ 5.4(b), Settling Defendants shall: (1) within 14 days after the onset of such event, submit a report to EPA describing the actions or events that occurred and the measures taken, and to be taken, in response thereto; and (2) within 30 days after the conclusion of such event, submit a report to EPA describing all actions taken in response to such event.

(e) The reporting requirements under ¶ 5.4 are in addition to the reporting required by CERCLA § 103 or EPCRA § 304.

5.5 Off-Site Shipments

(a) Settling Defendants may ship hazardous substances, pollutants, and contaminants from the Site to an off-Site facility only if they comply with CERCLA § 121(d)(3), and 40 C.F.R. § 300.440. Settling Defendants will be deemed to be in compliance with CERCLA § 121(d)(3) and 40 C.F.R. § 300.440 regarding a shipment if Settling Defendants obtain a prior determination from EPA that the proposed receiving facility for such shipment is acceptable under the criteria of 40 C.F.R. § 300.440(b).

(b) Settling Defendants may ship Waste Material from the Site to an out-of-state waste management facility only if, prior to any shipment, they provide notice to the appropriate state environmental official in the receiving facility's state and to the EPA Project Coordinator. This notice requirement will not apply to any off-Site shipments when the total quantity of all such shipments does not exceed

10 cubic yards. The notice must include the following information, if available: (1) the name and location of the receiving facility; (2) the type and quantity of Waste Material to be shipped; (3) the schedule for the shipment; and (4) the method of transportation. Settling Defendants also shall notify the state environmental official referenced above and the EPA Project Coordinator of any major changes in the shipment plan, such as a decision to ship the Waste Material to a different out-of-state facility. Settling Defendants shall provide the notice after the award of the contract for Remedial Action construction and before the Waste Material is shipped.

(c) Settling Defendants may ship Investigation Derived Waste (IDW) from the Site to an off-Site facility only if they comply with CERCLA § 121(d)(3), 40 C.F.R. § 300.440, *EPA's Guide to Management of Investigation Derived Waste*, OSWER 9345.3-03FS (Jan. 1992), and any IDW-specific requirements contained in the Record of Decision. Wastes shipped off-Site to a laboratory for characterization, and RCRA hazardous wastes that meet the requirements for an exemption from RCRA under 40 CFR § 261.4(e) shipped off-site for treatability studies, are not subject to 40 C.F.R. § 300.440.

5.6 Remedial Action Construction Completion

(a) For purposes of this ¶ 5.6, "Remedial Action Construction" includes the implementation of, as applicable, the removal of contaminated soil to meet OU3 Performance Standards, backfilling of excavated areas with clean fill, capping, and implementing appropriate institutional controls.

(b) **Inspection of Constructed Remedy**. Settling Defendants shall schedule a pre-final inspection upon completion of remedial action construction, as defined in ¶ 5.6(a). The pre-final inspection must be attended by Settling Defendants and EPA and/or their representatives. Settling Defendants shall note any deficiencies in the Pre-Final Inspection Report and submit the Pre-Final Inspection Report to EPA. After completion of the work identified in the Pre-Final Inspection Report, Settling Defendants shall schedule a final inspection that must be attended by Settling Defendants and EPA and/or their representatives.

(c) **Remedial Action Report**. Following the final inspection, Settling Defendants shall submit a "Remedial Action Report" requesting EPA's determination that Remedial Action Construction has been completed. The Remedial Action Report must: (1) include a statement by a registered professional engineer and by Settling Defendants' Project Coordinator that the remedial action construction has been completed;; (2) include as-built drawings signed and stamped by a registered professional engineer; (3) be prepared in accordance with Chapter 2 (Remedial Action Completion) of EPA's *Close Out Procedures for NPL Sites* guidance (May 2011), as supplemented by *Guidance for Management of Superfund Remedies in Post Construction*, OLEM 9200.3-105 (Feb. 2017); (4) contain data to demonstrate that OU3 Performance Standards have been achieved; and (5) be certified in accordance with ¶ 7.5 (Certification). This report shall include the information specified in ¶ 5.6(d).

(d) **Post Excavation Data Tables & Associated Figures.** After the remedial action construction completion that involves excavation, Settling Defendants shall submit a plan view drawing for the OU3 areas using the base map survey labeled "Confirmation Sample Locations" that depicts the area of soil contamination that was removed, elevation depth of the excavated area, the sample locations (with sample identifiers) used to bound the area of contamination both vertically and horizontally, property lines and significant features of the property to EPA. Settling Defendants shall also submit a plan view drawing using the base map survey labeled "Final Excavation Limits" that depicts the final excavation limits of the contaminated area, the coordinates that define the areal extent of excavation limits, the elevation depths of the excavation limits of the contaminated area and the same significant features as indicated in the "Confirmation Sample Locations" figure. Settling Defendants shall also submit data summary tables that list the Chemical Abstracts Service number for the contaminant of concern, the name of the contaminants of concern, the corresponding OU3 Performance Standards for each contaminant of concern, sample identification number that corresponds to the survey coordinates and sample identification numbers on the drawings, the dates of sample collection, sample depth indicated as elevation and feet below ground surface, and the analytical values for contaminants of concern at each sample point used to bound the area of soil contamination.

(e) If EPA determines that Remedial Action Construction is not complete, EPA shall so notify Settling Defendants. EPA's notice must include a description of, and schedule for, the activities that Settling Defendants must perform to complete Remedial Action Construction. EPA's notice may include a schedule for completion of such activities or may require Settling Defendants to submit a proposed schedule for EPA approval. Settling Defendants shall perform all activities described in the EPA notice in accordance with the schedule.

(f) If EPA determines, based on the initial or any subsequent Remedial Action Report, that Remedial Action Construction is complete, EPA shall so notify Settling Defendants.

5.7 Certification of Remedial Action Completion

(a) **Remedial Action Completion**. The Remedial Action is "Complete" for purposes of this ¶ 5.7 when it has been fully performed and the Performance Standards for OU1 (metals contamination) and OU3 have been achieved.

(b) **Monitoring Report**. Settling Defendants shall submit a Monitoring Report to EPA requesting EPA's Certification of Remedial Action Completion. The report must: (1) include certifications by a registered professional engineer and by Settling Defendants' Project Coordinator that the Remedial Action is complete; (2) be prepared in accordance with Chapter 2 (Remedial Action Completion) of

EPA's *Close Out Procedures for NPL Sites* guidance (May 2011), as supplemented by *Guidance for Management of Superfund Remedies in Post Construction*, OLEM 9200.3-105 (Feb. 2017); (3) contain monitoring data to demonstrate that Performance Standards for OU1(metals contamination) have been achieved; and (4) be certified in accordance with ¶ 7.5 (Certification).

(c) If EPA concludes that the Remedial Action is not Complete, EPA shall so notify Settling Defendants. EPA's notice must include a description of any deficiencies. EPA's notice may include a schedule for addressing such deficiencies or may require Settling Defendants to submit a schedule for EPA approval. Settling Defendants shall perform all activities described in the notice in accordance with the schedule.

(d) If EPA concludes, based on the initial or any subsequent Monitoring Report requesting Certification of Remedial Action Completion, that the Remedial Action is Complete, EPA shall so certify to Settling Defendants. This certification will constitute the Certification of Remedial Action Completion for purposes of the Decree, including Section XIV of the Decree (Covenants by Plaintiff). Certification of Remedial Action Completion will not affect Settling Defendants' remaining obligations under the Decree.

5.8 Periodic Review Support Plan ("PRSP"). Settling Defendants shall submit the PRSP for EPA approval. The PRSP addresses the studies and investigations that Settling Defendants shall conduct to support EPA's reviews of whether the Remedial Action is protective of human health and the environment in accordance with CERCLA § 121(c) (also known as "Five-Year Reviews"). Settling Defendants shall develop the plan in accordance with *Comprehensive Five-year Review Guidance*, OSWER 9355.7-03B-P (June 2001), and any other relevant five-year review guidances.

5.9 Certification of Work Completion

(a) **Work Completion Inspection**. Settling Defendants shall schedule an inspection for the purpose of obtaining EPA's Certification of Work Completion. The inspection must be attended by Settling Defendants and EPA and/or their representatives.

(b) **Work Completion Report**. Following the inspection, Settling Defendants shall submit a report to EPA requesting EPA's Certification of Work Completion. The report must: (1) include certifications by a registered professional engineer and by Settling Defendants' Project Coordinator that the Work, including all O&M activities, is complete; and (2) be certified in accordance with ¶ 7.5 (Certification). If the Monitoring Report submitted under ¶ 5.7(b) includes all elements required under this ¶ 5.9(b), then the Monitoring Report suffices to satisfy all requirements under this ¶ 5.9(b).

(c) If EPA concludes that the Work is not complete, EPA shall so notify Settling Defendants. EPA's notice must include a description of the activities that Settling

Defendants must perform to complete the Work. EPA's notice must include specifications and a schedule for such activities or must require Settling Defendants to submit specifications and a schedule for EPA approval. Settling Defendants shall perform all activities described in the notice or in the EPA-approved specifications and schedule.

(d) If EPA concludes, based on the initial or any subsequent report requesting Certification of Work Completion, that the Work is complete, EPA shall so certify in writing to Settling Defendants. Issuance of the Certification of Work Completion does not affect the following continuing obligations: (1) activities under the Periodic Review Support Plan; (2) obligations under Sections VII (Property Requirements), and XVII (Records) of the Decree; (3) Institutional Controls obligations as provided in the ICIAP; and (4) reimbursement of EPA's Future Response Costs under Section X (Payments for Response Costs) of the Decree.

6. REPORTING

6.1 Progress Reports. Commencing 30 days following lodging of the Decree and until EPA approves the Remedial Action Completion, Settling Defendants shall submit progress reports to EPA on a monthly basis by the 15th day of the following month, or as otherwise requested by EPA. The reports must cover all activities that took place during the prior reporting period, including:

(a) The actions that have been taken toward achieving compliance with the Decree;

(b) A summary of all results of sampling, tests, and all other data received or generated by Settling Defendants;

(c) A description of all deliverables that Settling Defendants submitted to EPA;

(d) A description of all activities relating to Remedial Action Construction that are scheduled for the next six weeks, as well as a description of all activities relating to Remedial Design, Institutional Controls, O&M, and/or monitoring scheduled for the next six weeks;

(e) An updated Remedial Action Construction Schedule, together with information regarding percentage of completion, delays encountered or anticipated that may affect the future schedule for implementation of the Work, and a description of efforts made to mitigate those delays or anticipated delays; and

(f) A description of any modifications to the work plans or other schedules that Settling Defendants have proposed or that have been approved by EPA.

6.2 Notice of Progress Report Schedule Changes. If the schedule for any activity described in the Progress Reports, including activities required to be described under ¶ 6.1(d), changes, Settling Defendants shall notify EPA of such change at least seven days before performance of the activity.

7. DELIVERABLES

7.1 Applicability. Settling Defendants shall submit deliverables for EPA approval or for EPA comment as specified in the SOW. If neither is specified, the deliverable does not require EPA's approval or comment. Paragraphs 7.2 (In Writing) through 7.4 (Technical Specifications) apply to all deliverables. Paragraph 7.5 (Certification) applies to any deliverable that is required to be certified. Paragraph 7.6 (Approval of Deliverables) applies to any deliverable that is required to be submitted for EPA approval.

7.2 In Writing. As provided in ¶ 81 of the Decree, all deliverables under this SOW must be in writing unless otherwise specified.

7.3 General Requirements for Deliverables. All deliverables must be submitted by the deadlines in the Remedial Design Schedule or Remedial Action Schedule, as applicable. Settling Defendants shall submit all deliverables to EPA in electronic form. Technical specifications for sampling and monitoring data and spatial data are addressed in ¶ 7.4. All other deliverables shall be submitted to EPA in the electronic form specified by the EPA Project Coordinator. If any deliverable includes maps, drawings, or other exhibits that are larger than 8.5" by 11", Settling Defendants shall also provide EPA with paper copies of such exhibits.

7.4 Technical Specifications

(a) Sampling and monitoring data should be submitted in standard regional Electronic Data Deliverable ("EDD") format, which can be found at https://www.epa.gov/superfund/region-2-superfund-electronic-data-submission. Other delivery methods may be allowed if electronic direct submission presents a significant burden or as technology changes.

(b) Spatial data, including spatially-referenced data and geospatial data, should be submitted: (1) in the ESRI File Geodatabase format; and (2) as unprojected geographic coordinates in decimal degree format using North American Datum 1983 ("NAD83") or World Geodetic System 1984 (WGS84) as the datum. If applicable, submissions should include the collection method(s). Projected coordinates may optionally be included but must be documented. Spatial data should be accompanied by metadata, and such metadata should be compliant with the Federal Geographic Data Committee ("FGDC") Content Standard for Digital Geospatial Metadata and its EPA profile, the EPA Geospatial Metadata Technical Specification. An add-on metadata editor for ESRI software, the EPA Metadata Editor ("EME"), complies with these FGDC and EPA metadata requirements and is available at https://edg.epa.gov/EME/.

(c) Each file must include an attribute name for each site unit or sub-unit submitted. Consult https://www.epa.gov/geospatial/geospatial-policies-and-standards for any further available guidance on attribute identification and naming.

(d) Spatial data submitted by Settling Defendants does not, and is not intended to, define the boundaries of the Site.

7.5 Certification. All deliverables that require compliance with this paragraph must be signed by the Settling Defendants' Project Coordinator, or other responsible official of Settling Defendants, and must contain the following statement:

> I certify under penalty of perjury that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

7.6 Approval of Deliverables

(a) **Initial Submissions**

(1) After review of any deliverable that is required to be submitted for EPA approval under the Decree or the SOW, EPA shall: (i) approve, in whole or in part, the submission; (ii) approve the submission upon specified conditions; (iii) disapprove, in whole or in part, the submission; or (iv) any combination of the foregoing.

(2) EPA also may modify the initial submission to cure deficiencies in the submission if: (i) EPA determines that disapproving the submission and awaiting a resubmission would cause substantial disruption to the Work; or (ii) previous submission(s) have been disapproved due to material defects and the deficiencies in the initial submission under consideration indicate a bad faith lack of effort to submit an acceptable deliverable.

(b) **Resubmissions**. Upon receipt of a notice of disapproval under ¶ 7.6(a) (Initial Submissions), or if required by a notice of approval upon specified conditions under ¶ 7.6(a), Settling Defendants shall, within 30 days or such longer time as specified by EPA in such notice, correct the deficiencies and resubmit the deliverable for approval. After review of the resubmitted deliverable, EPA may: (1) approve, in whole or in part, the resubmission; (2) approve the resubmission upon specified conditions; (3) modify the resubmission; (4) disapprove, in whole or in part, the resubmission, requiring Settling Defendants to correct the deficiencies; or (5) any combination of the foregoing.

(c) **Implementation**. Upon approval, approval upon conditions, or modification by EPA under ¶ 7.6(a) (Initial Submissions) or ¶ 7.6(b) (Resubmissions), of any deliverable, or any portion thereof: (1) such deliverable, or portion thereof, will be incorporated into and enforceable under the Decree; and (2) Settling Defendants shall take any action required by such deliverable, or portion thereof. The implementation of any non-deficient portion of a deliverable submitted or resubmitted under ¶ 7.6(a) or ¶ 7.6(b) does not relieve Settling Defendants of any liability for stipulated penalties under Section XIII (Stipulated Penalties) of the Decree.

(d) If: (1) an initially submitted deliverable contains a material defect and the conditions are met for modifying the deliverable under ¶ 7.6(a)(2); or (2) a resubmitted deliverable contains a material defect; then the material defect constitutes a lack of compliance for purposes of this Paragraph.

7.7 **Supporting Deliverables**. Settling Defendants shall submit each of the following supporting deliverables for EPA approval, except as specifically provided. Settling Defendants shall develop the deliverables in accordance with all applicable regulations, guidances, and policies (see Section 10 (References)). Settling Defendants shall update each of these supporting deliverables as necessary or appropriate during the course of the Work, and/or as requested by EPA.

(a) **Health and Safety Plan (“HASP”)**. The HASP describes all activities to be performed to protect on site personnel and area residents from physical, chemical, and all other hazards posed by the Work. Settling Defendants shall develop the HASP in accordance with EPA’s *Emergency Responder Health and Safety Manual* and Occupational Safety and Health Administration (“OSHA”) requirements under 29 C.F.R. §§ 1910 and 1926. The HASP should cover Remedial Design activities and should be, as appropriate, updated to cover activities during the Remedial Action and updated to cover activities after Remedial Action completion. EPA does not approve the HASP but will review it to ensure that all necessary elements are included and that the plan provides for the protection of human health and the environment.

(b) **Emergency Response Plan (“ERP”)**. The ERP must describe procedures to be used in the event of an accident or emergency at the Site (for example, power outages, water impoundment failure, treatment plant failure, slope failure, etc.). The ERP must include:

(1) Name of the person or entity responsible for responding in the event of an emergency incident;

(2) Plan and date(s) for meeting(s) with the local community, including local, State, and federal agencies involved in the cleanup, as well as local emergency squads and hospitals;

(3) Spill Prevention, Control, and Countermeasures (“SPCC”) Plan (if applicable), consistent with the regulations under 40 C.F.R. part 112,

describing measures to prevent, and contingency plans for, spills and discharges;

(4) Notification activities in accordance with ¶ 5.4(b) (Release Reporting) in the event of a release of hazardous substances requiring reporting under CERCLA § 103 or EPCRA § 304; and

(5) A description of all necessary actions to ensure compliance with ¶ 5.4 of the SOW in the event of an occurrence during the performance of the Work that causes or threatens a release of Waste Material from the Site that constitutes an emergency or may present an immediate threat to public health or welfare or the environment.

(c) **Field Sampling Plan ("FSP")**. The FSP addresses all sample collection activities. The FSP must be written so that a field sampling team unfamiliar with the project would be able to gather the samples and field information required. Settling Defendants shall develop the FSP in accordance with *Guidance for Conducting Remedial Investigations and Feasibility Studies*, EPA/540/G 89/004 (Oct. 1988).

(d) **Quality Assurance Project Plan ("QAPP")**. The QAPP must include a detailed explanation of Settling Defendants' quality assurance, quality control, and chain of custody procedures for all treatability, design, compliance, and monitoring samples. Settling Defendants shall develop the QAPP in accordance with EPA Directive CIO 2105.1 (Environmental Information Quality Policy, 2021), the most recent version of *Quality Management Systems for Environmental Information and Technology Programs – Requirements with Guidance for Use*, ASQ/ANSI E-4 (Feb. 2014, and *Guidance for Quality Assurance Project Plans*, EPA QA/G-5, EPA Office of Environmental Information (Dec. 2002). Settling Defendants shall collect, produce, and evaluate all environmental information at the Site in accordance with the approved QAPP.

(e) **Site Wide Monitoring Plan ("SWMP")**. The purpose of the SWMP is to obtain baseline information regarding the extent of contamination in affected media at the Site; to obtain information, through short- and long- term monitoring, about the movement of and changes in contamination throughout the Site, before, during, and after implementation of the Remedial Action; to obtain information regarding contamination levels to determine whether Performance Standards are achieved; and to obtain information to determine whether to perform additional actions, including further Site monitoring. The SWMP must include:

(1) Description of the environmental media to be monitored;

(2) Description of the data collection parameters, including existing and proposed monitoring devices and locations, schedule and frequency of monitoring, analytical parameters to be monitored, and analytical methods employed;

(3) Description of how performance data will be analyzed, interpreted, and reported, and/or other Site-related requirements;

(4) Description of verification sampling procedures;

(5) Description of deliverables that will be generated in connection with monitoring, including sampling schedules, laboratory records, monitoring reports, and monthly and annual reports to EPA and State agencies;

(6) Description of proposed additional monitoring and data collection actions (such as increases in frequency of monitoring, and/or installation of additional monitoring devices in the affected areas) in the event that results from monitoring devices indicate changed conditions (such as higher than expected concentrations of the contaminants of concern or groundwater contaminant plume movement);

(7) A plan to immediately provide to EPA any unvalidated sampling data from Community Areas as defined in ¶ 7.7(f) affected by the remedy that exceed removal management levels or three times remedial cleanup levels, whichever is lower; and

(f) **Community Impacts Mitigation Plan ("CIMP")**. A plan to expedite sampling and analysis in Community Areas as defined in ¶ 7.7(f) affected by the remedy (particularly in situations where EPA determines that unvalidated sampling data indicates substantial exceedances of cleanup standards), including procedures for expedited analysis, validation, and communication of sampling results to affected communities. The CIMP describes all activities to be performed: (1) to reduce and manage the impacts from remedy implementation (*e.g.*, air emissions, traffic, noise, odor, temporary or permanent relocation) to residential areas, schools, playgrounds, healthcare facilities, or recreational or impacted public areas ("Community Areas") from and during remedy implementation, (2) to conduct monitoring in Community Areas of impacts from remedy implementation, (3) to expeditiously communicate validated remedy implementation monitoring data, (4) to make adjustments during remedy implementation in order to further reduce and manage impacts from remedy implementation to affected Community Areas, (5) to expeditiously restore community resources damaged during remediation such as roads and culverts, and (6) to mitigate economic effects that the Remedial Action will have on the community, if any, by structuring remediation contracts to allow more local business participation. The CIMP should contain information about impacts to Community Areas that is sufficient to assist EPA's Project Coordinator in performing the evaluations recommended under the *Superfund Community Involvement Handbook*, OLEM 9230.0-51 (March 2020), pp. 53-56.

(g) **Construction Quality Assurance Plan ("CQAP") and Construction Quality Control Plan ("CQCP")**. The purpose of the CQAP is to describe planned and systemic activities that provide confidence that the Remedial Action construction will satisfy all plans, specifications, and related requirements, including quality objectives. The purpose of the CQCP is to describe the activities to verify that Remedial Action construction has satisfied all plans, specifications, and related requirements, including quality objectives. The CQAP/CQCP ("CQA/CP") must:

(1) Identify, and describe the responsibilities of, the organizations and personnel implementing the CQA/CP;

(2) Describe the Performance Standards required to be met to achieve Completion of the Remedial Action;

(3) Describe the activities to be performed: (i) to provide confidence that Performance Standards will be met; and (ii) to determine whether Performance Standards have been met;

(4) Describe verification activities, such as inspections, sampling, testing, monitoring, and production controls, under the CQA/CP;

(5) Describe industry standards and technical specifications used in implementing the CQA/CP;

(6) Describe procedures for tracking construction deficiencies from identification through corrective action;

(7) Describe procedures for documenting all CQA/CP activities; and

(8) Describe procedures for retention of documents and for final storage of documents.

(h) **O&M Plan**. The O&M Plan describes the requirements for inspecting, operating, and maintaining the Remedial Action. Settling Defendants shall develop the O&M Plan in accordance with *Guidance for Management of Superfund Remedies in Post Construction*, OLEM 9200.3-105 (Feb. 2017). The O&M Plan must include the following additional requirements:

(1) Description of Performance Standards required to be met to implement the Record of Decision;

(2) Description of activities to be performed: (i) to provide confidence that Performance Standards will be met; and (ii) to determine whether Performance Standards have been met;

(3) **O&M Reporting**. Description of records and reports that will be generated during O&M, such as daily operating logs, laboratory records, records of operating costs, reports regarding emergencies, personnel and maintenance records, monitoring reports, and monthly and annual reports to EPA and State agencies;

(4) Description of corrective action in case of systems failure, including: (i) alternative procedures to prevent the release or threatened release of Waste Material which may endanger public health and the environment or may cause a failure to achieve Performance Standards; (ii) analysis of vulnerability and additional resource requirements should a failure occur; (iii) notification and reporting requirements should O&M systems fail or be in danger of imminent failure; and (iv) community notification requirements; and

(5) Description of corrective action to be implemented in the event that Performance Standards are not achieved; and a schedule for implementing these corrective actions.

(i) **O&M Manual**. The O&M Manual serves as a guide to the purpose and function of the equipment and systems that make up the remedy. Settling Defendants shall develop the O&M Manual in accordance with *Guidance for Management of Superfund Remedies in Post Construction*, OLEM 9200.3-105 (Feb. 2017).

8. SCHEDULES

8.1 Applicability and Revisions. All deliverables and tasks required under this SOW must be submitted or completed by the deadlines or within the time durations listed in the Remedial Design and Remedial Action Schedules set forth below. Settling Defendants may submit proposed revised Remedial Design Schedules or Remedial Action Schedules for EPA approval. Upon EPA's approval, the revised Remedial Design and/or Remedial Action Schedules supersede the Remedial Design and Remedial Action Schedules set forth below, and any previously-approved Remedial Design and/or Remedial Action Schedules.

8.2 Remedial Design Schedule

	Description of Deliverable, Task	**¶ Ref.**	**Deadline**
1	RDWP (including HASP, ERP)	4.1	45 days after EPA's Authorization to Proceed regarding Supervising Contractor (¶ 3.3)
2	ICIAP	4.2	45 days after EPA Authorization to Proceed regarding Supervising Contractor (¶ 3.3)
3	PDIWP (including FSP, QAPP)	4.4(a)	90 days after EPA's Authorization to Proceed regarding Supervising Contractor (¶ 3.3)
4	PDI Evaluation Report (including SWMP, CIMP)	4.4(a)	45 days after receipt of validated PDI sampling results
5	Pre-final (90%) Remedial Design (including CQA/CP, O&M Plan, O&M Manual)	4.5	60 days after EPA approval of the PDI Evaluation Report
6	Final (100%) Remedial Design	4.6	30 days after EPA approval on Pre-final (90%) Remedial Design

8.3 Remedial Action Schedule

	Description of Deliverable / Task	**¶ Ref.**	**Deadline**
1	Commence to Implement ICIAP	4.2	30 days after EPA Notice of Authorization to Proceed with ICIAP
2	Award Remedial Action contract		45 days after EPA Notice of Authorization to Proceed with Remedial Action
3	RAWP	5.1	60 days after Award of RA Contract
4	Pre-Construction Conference	5.2(a)	15 days after Approval of RAWP
5	Start of Construction		60 days after Approval of RAWP
6	Completion of Construction		As per schedule in the EPA approved RAWP
7	Pre-final Inspection	5.6(b)	21 days after completion of construction
8	Pre-final Inspection Report	5.6(c)	15 days after completion of Pre-final Inspection
9	Final Inspection	5.6(b)	15 days after Completion of Work identified in Pre-final Inspection Report
10	Remedial Action Report	5.6(c)	60 days after Final Inspection
11	Periodic Review Support Plan	5.8	90 days after Final Inspection

9. STATE PARTICIPATION

9.1 Copies. Settling Defendants shall, at any time they send a deliverable to EPA, send a copy of such deliverable to the State. EPA shall, at any time it sends a notice, authorization, approval, disapproval, or certification to Settling Defendants, send a copy of such document to the State.

9.2 **Review and Comment**. The State will have a reasonable opportunity for review and comment prior to:

(a) Any EPA notice to proceed under ¶ 3.3 (Procedures for Disapproval/Notice to Proceed);

(b) Any EPA approval or disapproval under ¶ 7.6 (Approval of Deliverables) of any deliverables that are required to be submitted for EPA approval; and

(c) Any approval or disapproval of the Construction Phase under ¶ 5.6 (Remedial Action Construction Completion), any disapproval of, or Certification of Remedial Action Completion under ¶ 5.7 (Certification of Remedial Action Completion), and any disapproval of, or Certification of Work Completion under ¶ 5.9 (Certification of Work Completion).

10. REFERENCES

10.1 The following regulations and guidance documents, among others, apply to the Work. Any item for which a specific URL is not provided below is available on one of the three EPA web pages listed in ¶ 10.2:

(a) A Compendium of Superfund Field Operations Methods, OSWER 9355.0-14, EPA/540/P-87/001a (Aug. 1987).

(b) CERCLA Compliance with Other Laws Manual, Part I: Interim Final, OSWER 9234.1-01, EPA/540/G-89/006 (Aug. 1988).

(c) Guidance for Conducting Remedial Investigations and Feasibility Studies, OSWER 9355.3-01, EPA/540/G-89/004 (Oct. 1988).

(d) CERCLA Compliance with Other Laws Manual, Part II, OSWER 9234.1-02, EPA/540/G-89/009 (Aug. 1989).

(e) Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties, OSWER 9355.5-01, EPA/540/G90/001 (Apr.1990).

(f) Guidance on Expediting Remedial Design and Remedial Actions, OSWER 9355.5-02, EPA/540/G-90/006 (Aug. 1990).

(g) Guide to Management of Investigation-Derived Wastes, OSWER 9345.3-03FS (Jan. 1992).

(h) Permits and Permit Equivalency Processes for CERCLA On-Site Response Actions, OSWER 9355.7-03 (Feb. 1992).

(i) Guidance for Conducting Treatability Studies under CERCLA, OSWER 9380.3-10, EPA/540/R-92/071A (Nov. 1992).

(j) National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule, 40 C.F.R. part 300 (Oct. 1994).

(k) Guidance for Scoping the Remedial Design, OSWER 9355.0-43, EPA/540/R-95/025 (Mar. 1995).

(l) Remedial Design/Remedial Action Handbook, OSWER 9355.0-04B, EPA/540/R-95/059 (June 1995).

(m) EPA Guidance for Data Quality Assessment, Practical Methods for Data Analysis, QA/G-9, EPA/600/R-96/084 (July 2000).

(n) Comprehensive Five-year Review Guidance, OSWER 9355.7-03B-P, EPA/540-R-01-007 (June 2001).

(o) Guidance for Quality Assurance Project Plans, EPA QA/G-5, EPA Office of Environmental Information (Dec. 2002) https://www.epa.gov/quality/guidance-quality-assurance-project-plans-epa-qag-5.

(p) Institutional Controls: Third-Party Beneficiary Rights in Proprietary Controls, OECA (Apr. 2004).

(q) EPA Guidance on Systematic Planning Using the Data Quality Objectives Process, QA/G-4, EPA/240/B-06/001 (Feb. 2006).

(r) EPA Requirements for Quality Management Plans, QA/R-2, EPA/240/B-01/002 (Mar. 2001, reissued May 2006).

(s) EPA National Geospatial Data Policy, CIO Policy Transmittal 05-002 (Aug. 2005), https://www.epa.gov/geospatial/epa-national-geospatial-data-policy.

(t) Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration, OSWER 9283.1-33 (June 2009).

(u) Principles for Greener Cleanups (Aug. 2009), https://www.epa.gov/greenercleanups/epa-principles-greener-cleanups.

(v) EPA Region 2 Clean and Green Policy, available at https://www.epa.gov/greenercleanups/epa-region-2-clean-and-green-policy

(w) Close Out Procedures for National Priorities List Sites, OSWER 9320.2-22 (May 2011).

(x) Groundwater Road Map: Recommended Process for Restoring Contaminated Groundwater at Superfund Sites, OSWER 9283.1-34 (July 2011).

(y) Recommended Evaluation of Institutional Controls: Supplement to the "Comprehensive Five-Year Review Guidance," OSWER 9355.7-18 (Sep. 2011).

(z) Plan EJ 2014: Legal Tools, EPA Office of General Counsel (Dec. 2011), https://www.epa.gov/environmentaljustice/plan-ej-2014-legal-tools.

(aa) Construction Specifications Institute's MasterFormat 2020, available from the Construction Specifications Institute, http://www.csinet.org/masterformat.

(bb) Updated Superfund Response and Settlement Approach for Sites Using the Superfund Alternative Approach, OSWER 9200.2-125 (Sep. 2012)

(cc) Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites, OSWER 9355.0-89, EPA/540/R-09/001 (Dec. 2012), https://semspub.epa.gov/work/HQ/175446.pdf.

(dd) Institutional Controls: A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites, OSWER 9200.0-77, EPA/540/R-09/02 (Dec. 2012), https://semspub.epa.gov/work/HQ/175449.pdf.

(ee) EPA's Emergency Responder Health and Safety Manual, OSWER 9285.3-12 (July 2005 and updates), https://www.epaosc.org/_HealthSafetyManual/manual-index.htm.

(ff) Broader Application of Remedial Design and Remedial Action Pilot Project Lessons Learned, OSWER 9200.2-129 (Feb. 2013).

(gg) Guidance for Evaluating Completion of Groundwater Restoration Remedial Actions, OSWER 9355.0-129 (Nov. 2013).

(hh) Groundwater Remedy Completion Strategy: Moving Forward with the End in Mind, OSWER 9200.2-144 (May 2014).

(ii) Quality Management Systems for Environmental Information and Technology Programs -- Requirements with Guidance for Use, ASQ/ANSI E-4 (February 2014), available at https://webstore.ansi.org/.

(jj) Guidance for Management of Superfund Remedies in Post Construction, OLEM 9200.3-105 (Feb. 2017), https://www.epa.gov/superfund/superfund-post-construction-completion.

(kk) Advanced Monitoring Technologies and Approaches to Support Long-Term Stewardship (July 20, 2018), https://www.epa.gov/enforcement/use-advanced-monitoring-technologies-and-approaches-support-long-term-stewardship.

(ll) Superfund Community Involvement Handbook, OLEM 9230.0-51 (March 2020). More information on Superfund community involvement is available on the Agency's Superfund Community Involvement Tools and Resources web page at https://www.epa.gov/superfund/superfund-community-involvement-tools-and-resources.

(mm) EPA directive CIO 2105.1 (Environmental Information Quality Policy, 2021), https://www.epa.gov/sites/production/files/2021-04/documents/environmental_information_quality_policy.pdf.

10.2 A more complete list may be found on the following EPA web pages:

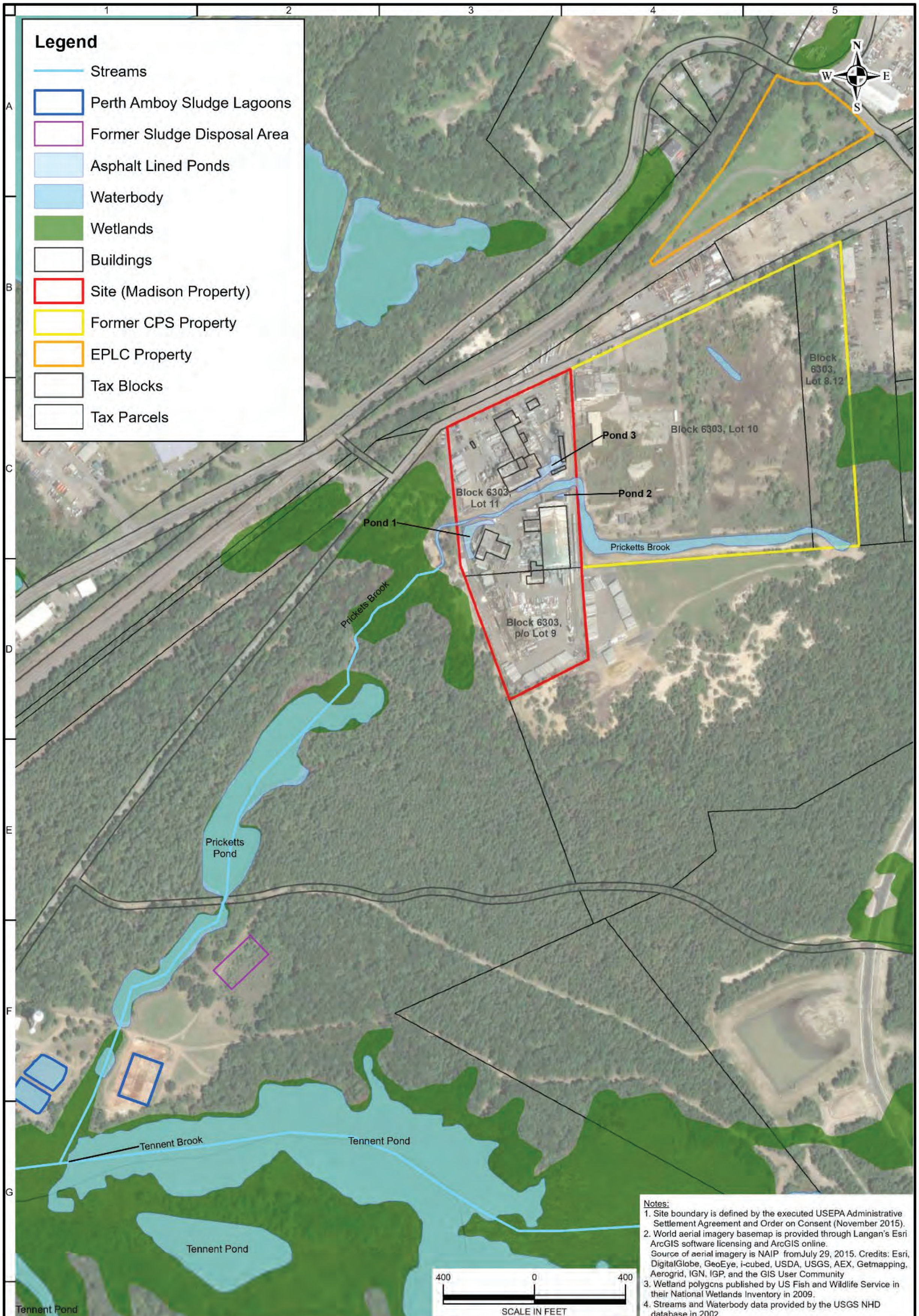
(a) Laws, Policy, and Guidance at https://www.epa.gov/superfund/superfund-policy-guidance-and-laws;

(b) Search Superfund Documents at https://www.epa.gov/superfund/search-superfund-documents; and

(c) Test Methods Collections at: https://www.epa.gov/measurements/collection-methods.

10.3 For any regulation or guidance referenced in the Decree or SOW, the reference will be read to include any subsequent modification, amendment, or replacement of such regulation or guidance. Such modifications, amendments, or replacements apply to the Work only after Settling Defendants receive notification from EPA of the modification, amendment, or replacement.

APPENDIX D



LANGAN
300 Kimball Drive
Parsippany, NJ 07054
T: 973.560.4900 F: 973.560.4901 www.langan.com

Langan Engineering & Environmental Services, Inc.
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan International LLC
Collectively known as Langan

NJ CERTIFICATE OF AUTHORIZATION No. 24GA27996400

Project

CPS/MADISON SUPERFUND SITE

OLD BRIDGE TOWNSHIP

MIDDLESEX COUNTY NEW JERSEY

Drawing Title

SITE AREA

Project No.	100484401
Date	5/30/2017
Scale	1"=400'
Drawn By	JR
Last Revised	7/26/2022

Figure

1

APPENDIX E

List of Settling Defendants

Arnet Realty Company, L.L.C.

Old Bridge Minerals, Inc.

HB Warehousing, LLC