Superfund Program
U.S. Environmental Protection Agency
Region 2
Proposed Plan for Remedy Modification

Cosden Chemical Coatings Superfund Site
City of Beverly, Burlington County, New Jersey
July 2022

EPA ANNOUNCES PROPOSED PLAN FOR REMEDY MODIFICATION

This Proposed Plan describes the alternatives that the United States Environmental Protection Agency (EPA) considered to remediate contaminated groundwater source areas at the Cosden Chemical Coatings Superfund Site (Site) located in the of City of Beverly, Burlington County, New Jersey, as an amendment to the remedy for contaminated groundwater selected in the 1992 Record of Decision (ROD), as modified by the 1998 Explanation of Significant Differences (ESD). This Proposed Plan also identifies EPA's preferred alternative for amending the ROD and provides the rationale for this preference.

The Site cleanup is being addressed in one phase or Operable Unit. In 1992, a ROD was issued for the Site building demolition and disposal; cleanup of contaminated soil with onsite treatment and disposal; and extraction, treatment, and reinjection of contaminated groundwater associated with the Site. In 1998, EPA issued an ESD to: 1) clarify that offsite disposal of polychlorinated biphenyl (PCB)-contaminated soil (estimated to be 3,700 cubic yards) would occur instead of onsite treatment; 2) require the excavation and offsite disposal of a relatively small amount of soil contaminated with volatile organic compounds (VOCs); 3) incorporate a soil vapor extraction (SVE) component in the remedy; and 4) clarify cleanup objectives. The lead soil cleanup goal was changed from 500 milligrams per kilogram (mg/kg) to 400 mg/kg. The Site's building demolition and soil remedy conducted in accordance with the 1992 ROD and 1998 ESD are complete and are not being modified by this Proposed Plan. This plan evaluates alternatives for addressing the remaining groundwater source area contamination where concentrations are the highest including in the vicinity of monitoring wells MW-03, MW-103, MW-105, MW-109 and MW-110 at the Site. The preferred alternative described in this Proposed Plan includes groundwater remediation using in-situ treatment in source areas.

This Proposed Plan was developed by EPA, the lead agency for the Site, in consultation with the New Jersey Department of Environmental Protection (NJDEP), the support agency. EPA is issuing this Proposed Plan as part of its public participation

MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD:
July 29, 2022 - August 29, 2022
EPA will accept written comments on the Proposed Plan during the public comment period.

PUBLIC MEETING:
August 16, 2022 at 6:00 PM
EPA will hold a **Virtual Public Meeting** on **EST** to explain the Proposed Plan and the other alternatives presented in the Feasibility Study. To register for the public meeting, visit https://USEPACosdenChemical.eventbrite.com

To learn more about the public meeting, visit www.epa.gov/superfund/cosden-chemical or contact Natalie Loney, Community Involvement Coordinator at loney.natalie@epa.gov or (212) 637-3639.

Anyone interested in receiving materials for the public meeting in hard copy should either email or call Ms. Loney with such a request by August 11, 2022.

The Administrative Record file containing the documents used in developing the alternatives and preferred cleanup plan is available for public review at www.epa.gov/superfund/cosden-chemical

EPA's website for the Cosden Chemical Coatings Site:
www.epa.gov/superfund/cosden-chemical

responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA or Superfund) and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). EPA will select a final remedy for contaminated groundwater source areas at the Site after reviewing and considering all information submitted during the 30-day public comment period.

This Proposed Plan summarizes information that can be found in greater detail in the Focused Feasibility Study (FFS) and other documents contained in the administrative record file for this Site. EPA and the State encourage the public to review these documents to gain a more comprehensive understanding of the Site and Superfund activities that have been conducted at the Site.

Community Role in Selection Process

EPA relies on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the FFS report and this Proposed Plan have been made available to the public for a public comment period that begins on July 29, 2022 and concludes on August 29, 2022. A virtual public meeting will be held via webinar and telephone conference on August 16, 2022 at 6:00 PM to present the conclusions of the FFS, to elaborate further on the reasons for recommending the preferred alternative, and to receive public comments. Written comments on the Proposed Plan should be addressed to: Tamara Rossi, Remedial Project Manager, New Jersey Remediation Branch, U.S. Environmental Protection Agency, 290 Broadway, 19th floor, New York, NY 10007 or via e-mail at rossi.tamara@epa.gov. Comments received at the public meeting, as well as written comments, will be documented in the Responsiveness Summary section of the Amended ROD, the document that will formalize the selection of the remedy.

EPA 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 all the alternatives presented in this Proposed Plan.

SITE DESCRIPTION

The Cosden Chemical Coatings Corporation (Cosden Chemical) was a paint formulation and manufacturing company that began operating in 1945 and produced coatings for industrial applications. The company recycled solvents (substances that can dissolve other substances) used in the manufacturing process until 1974. After 1974, the company stored solvents onsite in drums and in underground tanks. Some of these drums and tanks leaked, causing soil and groundwater contamination. On April 22, 1980, the Burlington County Department of Public Safety reported the Site conditions to NJDEP after a grass fire occurred at the Site. Subsequent visits by the NJDEP revealed the presence of surface spills and several hundred unsecured drums.

NJDEP undertook various court actions against Cosden Chemical and engaged in negotiations with the company, resulting in a judicial consent order on February 5, 1985 that ordered Cosden Chemical to clean up the facility. Cosden Chemical initiated the cleanup in February 1985 but abandoned cleanup efforts after removing 88 of 695 drums. In January 1986, NJDEP undertook an emergency removal of the drummed material and cleanup of surface spills around the drum storage areas.

In June 1989, EPA initiated emergency cleanup activities at the Site by constructing a fence around areas of soil contamination and began removing the remaining drums, paint cans, pigment bags, mixing tanks, and underground storage tank contents. On May 28, 1990, as the removal action was nearly completed, a fire occurred inside the process building which consumed a majority of the building.

On May 31, 1990, the building was condemned by the Beverly City building inspector.

EPA placed the Site on the National Priorities List in July 1987. The additional actions EPA took to address Site contamination are discussed in the "Scope and Role of Response Action" section below.

The plant owner ceased operations in May 1989 and subsequently did not finance or undertake the remedial investigation or feasibility study (RI/FS) or remediation of the Site.

EPA issued the ROD in September 1992, selecting a remedy for contaminated buildings, soil, and groundwater, and the ESD in September 1998 to explain changes made to the remedy based on data EPA collected during the remedial design. The issuance of both included public meetings and public comment periods.

SITE CHARACTERISTICS

The Site is located in the southeastern corner of the City of Beverly in Burlington County, New Jersey (Figure 1) at the intersection of Manor Road and Cherry Street within a residential area of Beverly. The property is bounded on the north and east by residential streets, on the south by Conrail tracks and farmland, and on the west by undeveloped land. The nearest residence is approximately 300 feet to the north of the Site. The Beverly Elementary School is located 0.2 miles to the northeast. The neighboring area is suburban with some light industry.

According to EPA's EJSCREEN, there are no demographic indicators for the City of Beverly that identify it as a community with environmental justice concerns. South of the Site, there are some demographic indicators that indicated that this area is above the 80th percentile when compared to

Figure 1 Site Location City of Beverly, NJ

national percentiles for communities over age 64, low income, and linguistically isolated.

The Delaware River is approximately 4,000 feet to the north of the Site, and Rancocas Creek is approximately 1.5 miles to the southwest of the Site. The population within a one-mile radius of the Site is approximately 800 people.

Two former public supply wells owned and operated by New Jersey American Water Company are located approximately 3,200 feet north of the Site but are no longer in use. New Jersey American Water closed the two supply wells more than twenty years ago and replaced them with a larger surface water treatment plant along the Delaware River.

The hazardous substances still present at the Site are VOCs and metals in groundwater. Specifically, the VOCs consist of total xylenes, ethylbenzene, toluene, and trichloroethene and the metals are lead and chromium. The Conceptual Site Model for the Site indicates that these contaminants are currently

located only in groundwater on the Site in a plume estimated to be approximately 9,000 square feet (0.21 acres) in size and located 20 to 25 feet below the ground's surface (bgs).

No non-aqueous phase liquid (NAPL) has been found in wells since 2010, and NAPL was not visually noted in any boring in at least the past five years (see "What is a Principal Threat" text box below). Only groundwater contamination from contaminated soils which have been removed from the Site remains. Thus, no principal threats currently exist at the Site.

SCOPE AND ROLE OF RESPONSE ACTION

EPA conducted an RI/FS between 1988 and 1992, after the Site was listed on the NPL. The 1992 ROD identified the following Remedial Action Objectives (RAOs) for the remedy:

- Prevent exposure to contaminant sources that present a significant human health risk; and,
- Restore contaminated groundwater to drinking water standards.

The 1992 ROD was modified by an ESD that EPA issued in 1998. As a result of the 1992 ROD and 1998 ESD, the remedy included the following components to meet the Site RAOs:

- Decontamination and demolition of the building on the Site with disposal of the building debris at an appropriate offsite facility;
- Excavation of soils with offsite treatment (if necessary) and disposal;
- Construction of a soil vapor extraction (SVE) system to address the remaining contaminants present in soil above the water table (the vadose zone); and,
- Extraction of contaminated groundwater with onsite treatment and recharge to the underlying aquifer.

WHAT ARE THE "CONTAMINANTS OF CONCERN?"

EPA identified Volatile Organic Compounds and metals as the contaminants that pose the greatest potential risk to human health at this site.

Volatile Organic Compounds (VOCs)- The primary VOCs of concern present on the Site are toluene, ethylbenzene, trichloroethene (TCE), and total xylenes. VOCs are colorless, highly flammable industrial chemicals that easily evaporate. They occur naturally in coal tar and petroleum. They are commonly used in paint, thinners, lacquer thinners, moth repellents, air fresheners, hobby supplies, wood preservatives, aerosol sprays, degreasers, automotive products, and dry cleaning fluids. They are also used in a variety of industrial processes, such as in the solvents that Cosden Chemical used. VOCs do not readily bind to soil, so it can easily move into groundwater. Health effects of VOCs can vary greatly according to the compound and can range from being highly toxic to having no known health effects. Some, such as TCE, are known to cause cancer. VOCs can cause damage to the liver, kidneys, and central nervous system. Short-term exposure can cause eye and respiratory tract irritation, headaches, dizziness, visual disorders, fatigue, loss of coordination, allergic skin reactions, nausea, and memory impairment.

Metals- The primary metals of concern present on the Site are lead and chromium. Metals are naturally occurring elements and are generally mined and concentrated or refined for use in industry. They are used in a wide range of applications, including to make paint pigments such as those made by Cosden Chemical. In very small amounts, many of these metals are necessary to support life. However, in larger amounts, they become toxic. They may build up in biological systems and become a significant health hazard.

This amendment described in this Proposed Plan adds an additional RAO (described below) to the existing remedy addressing the remaining groundwater source area contamination where concentrations are the highest, including in the vicinity of monitoring wells MW-03, MW-103, MW-105, MW-109 and MW-110 at the Site. This RAO supplements the existing Site RAOs.

SITE BACKGROUND

Building Demolition

In 1995 and 1996, EPA decontaminated and demolished the remnants of the former Cosden Chemical process building. All demolition debris, including asbestos, was disposed of offsite.

Soils

The contaminated soils remediation was conducted by the EPA Region 2 Removal Action Branch with technical support provided by EPA's Environmental Response Team (ERT). ERT performed an extensive screening effort at the Site employing x-ray fluorescence (XRF) technology to identify the concentrations and depths of inorganic contamination (principally lead and chromium). The data were used to define the area and depth of the excavation. The soil remediation was accomplished in phases between June 1999 and March 2002.

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 groundwater generally is not considered to be a source material; however, Non-Aqueous Phase Liquids (NAPLs) in groundwater 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.

The soil cleanup was conducted to meet the NJDEP Residential Direct Contact Soil Cleanup Criterion (RDCSCC) for lead in effect at that time, 400 milligrams per kilogram (mg/kg). For PCBs, the soil cleanup objective was based on the EPA PCB cleanup policy recommending a residential cleanup goal of 1 mg/kg for unrestricted residential use. However, post-excavation sampling indicated that the soil remediation ultimately met NJDEP's more stringent RDCSCC in effect at that time of 0.49 mg/kg for PCBs.

All contaminated soils, underground storage tanks, and residual liquids were sent offsite for disposal and/or treatment, as necessary. A remedial action report, dated September 2003, was prepared to document the soil portion of the cleanup which included the excavation and disposal of 13,000 tons of contaminated soil, solid waste, and debris, four underground storage tanks, and 2,600 gallons of liquid waste.

Groundwater

EPA entered into an Interagency Agreement with the United States Army Corps of Engineers (USACE) Baltimore District to prepare the remedial design for the groundwater remediation and oversee remedial construction. The largest element of the remedial design/remedial construction was the groundwater extraction and treatment system (GETS). Construction of the GETS began in July 2006. The remedy achieved construction completion status in July 2007. Award of the long term remedial action (LTRA) contract was made in June 2009, at which time ten years of LTRA began.

In addition to the GETS, an SVE system was installed, including three banks of SVE wells and collection lines that allowed contaminated vapors to be extracted from the vadose zone, the subsurface area that extends from the ground surface to the groundwater table. A fence was installed around the treatment facilities to provide security and prevent

trespassing. The SVE system started operation in 2007, and was shut down in June 2010, after groundwater levels increased when the nearby public supply wells were closed, thus submerging the SVE wells underwater.

Data indicated that the GETS efficiently removed contaminants from the groundwater prior to onsite reinjection. The primary contaminants of concern in groundwater, as identified in the 1992 ROD, are ethylbenzene, toluene, xylene, trichloroethene (TCE), lead, and chromium. The GETS reduced levels of all contaminants present in extracted groundwater to meet the New Jersey Groundwater Quality Standards (GWQS) Class IIa standards before the groundwater was reinjected back into the aquifer.

EPA began a pilot study in August 2017 to test the effectiveness of In-Situ Chemical Oxidation (ISCO) in reducing VOC concentrations in groundwater. The pilot study was conducted to address remaining contamination that had been identified using a Membrane Interface Probe/Hydraulic Profiling Tool (MIPHPT). The revised conceptual Site model for soil and groundwater includes a fairly uniform layer of soil impacted largely by xylenes. This layer ranges from 20-24 feet deep and two to four feet thick; however, most of the contamination is located in the interval of 20-22 feet bgs. Some evidence suggests that a shallow lower permeability unit could be present resulting in a shallow perched water-bearing unit in some portions of the Site. It appears that in limited areas, high concentrations of VOCs or limited immobile solvent material could be sorbed to soil particles beneath the water table particularly in the area where the Cosden Chemical production plant underground storage tanks existed. EPA and USACE determined that ISCO could more quickly address this remaining contamination than the GETS. The GETS was shut-down in May 2018, due in part to the potential for ISCO treatment materials to enter the treatment plant during the pilot study.

Since the pilot study began, EPA has installed 16 monitoring wells to focus monitoring activities where VOC concentrations are highest, including monitoring wells MW-03, MW-103, MW-105, MW-109 and MW-110. Four rounds of injections of persulfate with a sodium hydroxide activator were performed between 2017 and 2021. Groundwater monitoring was conducted before and after each injection event to establish baseline concentrations that could be used to evaluate treatment effectiveness.

Vapor Intrusion

Vapor intrusion can occur when volatile contaminants in groundwater underneath enter commercial and residential buildings volatilize and enter the buildings as contaminated vapors. Since the primary contaminants of concern at the Site are VOCs, vapor intrusion was evaluated in March 2004 via vapor intrusion sampling. There were no VOCs detected above EPA's screening criteria, and EPA determined that the vapor intrusion pathway was not complete. The results of this evaluation remain valid since the concentrations of VOCs in groundwater have continued to decline since 2004 and no VOCs are detected above standards in offsite wells. There are no buildings unrelated to the extraction/treatment/reinjection on the Site.

CURRENT NATURE AND EXTENT OF CONTAMINATION

In 2015 and 2016, EPA performed MIPHPT investigations at the Site to identify where contamination was still present in groundwater and found that contamination was generally present at depths between 20 and 25 feet bgs. Sixteen new monitoring wells were installed on the Site to target this depth. As described above, EPA initiated an ISCO pilot study to determine if ISCO could address the remaining contamination. Field work took place between August 2017 and May 2021. Thousands of individual groundwater contaminant analyses were obtained during the ISCO pilot study.

The most recent concentrations of contaminants in the new monitoring wells after four rounds of ISCO injections as part of the pilot study are summarized below:

Ethylbenzene – After injections, some of the new monitoring wells did not report any detectable concentrations of ethylbenzene (non-detect). The highest detected concentration was 13,800 micrograms per liter (µg/L) in 2021. This is a reduction from the previous maximum concentration of 25,200 µg/L in 2018.

Toluene – Concentrations ranged from non-detect to 957 µg/L in 2021. This is a reduction from the maximum concentration of 3,220 µg/L in 2018.

Total Xylenes – Concentrations in 2021 ranged from 1.1 µg/L to 59,100 µg/L. This is a reduction from the previous maximum concentration of 114,000 µg/L in 2018. The highest concentrations are around monitoring wells MW-03, MW-103, MW-105, MW-109 and MW-110.

Trichloroethene – Concentrations in 2021 ranged from non-detect to 53.3 µg/L. This is a reduction from the previous maximum concentration of 3,220 µg/L in 2018.

Total Lead – Concentrations in 2021 ranged from non-detect to 15 µg/L.

Total Chromium – Concentrations in 2021 ranged from non-detect to 1,500 µg/L.

With the exception of total chromium in a single monitoring well, total lead and total chromium concentrations remained below NJDEP GWQS in groundwater before the ISCO pilot study. Total lead and total chromium concentrations are now above NJDEP GWQS primarily in portions of the Site where ISCO injections were concentrated. This is due to the oxidizing conditions created by the persulfate that was injected for the ISCO treatment. These metal concentration increases due to ISCO are typically transitory and will re-equilibrate after injections cease, so that the metal concentrations will return to the pre-injection state.

The area of residual higher levels of toluene, ethylbenzene, and total xylenes (TEX) contamination generally coincides with groundwater total xylene concentration greater than 1,000 µg/L and was reduced from 0.77 acres prior to the ISCO pilot study to 0.21 acres post-pilot study. This area is the remaining source area at the Site. See Figure 2.

Major Conclusions of the Pilot Study

- The 16 new monitoring wells installed during the pilot study helped to delineate the extent of TEX and the magnitude of the remaining TEX groundwater contamination at the site. In addition, water-level elevations measured using new and existing monitoring wells confirmed the direction of shallow groundwater flow was westerly across the Site.

- Overall, the ISCO injections were successful in eliminating or reducing TEX concentrations at monitoring wells within targeted treatment zones. Fourteen monitoring wells showed significant declines (greater than 50%) in TEX compound concentrations between initial sampling in 2017 and the May 2021 sampling.

- Total xylene concentrations in groundwater remained high in some monitoring wells. For example, the total xylene concentration at MW-103 was 37,400 µg/L in May 2021 and the total xylene result for MW-110 was 28,600 µg/L in October 2020 indicating additional injections would be necessary to achieve drinking water standards (1,000 µg/L) established as cleanup levels.

- Ethylbenzene levels during the same period decreased by nearly 50%. At well MW-105, total xylene concentrations decreased from 59,000 µg/L (November 2017) to 5,160*J* (estimated) µg/L (May 2021), and ethylbenzene

concentrations showed a similar approximate 10-fold decrease.

- Based upon pilot study calculations, the volume of contaminated groundwater was reduced by the four rounds of ISCO injections by approximately 73%. This calculation used the saturated aquifer thickness of 25 feet and the square footage of the total xylene plume greater than 1,000 µg/L before and after injections. More specifically, the plume was estimated as roughly 33,500 ft^2 (0.77 acres) prior to injections and about 9,000 ft^2 (0.21 acres) after injections.

Emerging Contaminants

Per- and polyfluoroalkyl substances (PFAS) – Six monitoring wells were sampled for PFAS in April 2021. NJDEP has developed GWQS for three specific PFAS chemicals: Perfluorononanoic Acid (PFNA, 13 nanograms per liter (ng/L)), Perfluorooctane Sulfonate (PFOS, 13 ng/L), and Perfluorooctanoic Acid (PFOA, 14 ng/L). PFNA concentrations ranged from non-detect at MW-10I to 19 ng/L at MW-8S. MW-8S is the most hydraulically upgradient monitoring well on the Site. PFOS concentrations ranged from non-detect at MW-9S to 66.8 ng/L at MW-3. PFOA concentrations ranged from 41.8 ng/L at MW-10I to 253 ng/L at MW-8S. MW-10I and PZ-10S, the most downgradient Site wells, reported detections of PFAS above NJDEP GWQS. The highest reported concentrations of PFAS at PZ-10S was PFOA at 81 ng/L.

1,4-Dioxane - Four on-site monitoring wells were sampled for 1,4-dioxane in November 2019. All of the monitoring wells sampled reported non-detect values. Downgradient monitoring well MW-10I did not report detections of 1,4-dioxane, but downgradient monitoring well MW-108 reported 1.3J µg/L in November 2019. In 2021, eight on-site monitoring wells, including downgradient monitoring well MW-108, were sampled for 1,4-dioxane, with a detection limit below NJDEP

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 releases. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Step 1. Hazard Identification: In this step, the chemicals 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, fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Step 2. Exposure Assessment: In this step, the different 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/or 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.

Step 3. 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.

Step 4. Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all contaminants of concern. 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.

GWQS (0.4 µg/L). MW-108 reported 0.406 µg/L in April 2021. All other monitoring wells reported non-detect values in 2021.

1,2,3-Trichloropropane - Four on-site monitoring wells (MW-103, MW-104, MW-105, and MW-110) were sampled for 1,2,3-tricholoropropane in March 2021. All monitoring wells were non-detect for 1,2,3-trichloropropane with a detection limit below the 0.03 µg/L NJDEP GWQS.

Additional investigation of PFAS contamination is required in order to determine the nature and extent of that contamination and whether the PFAS contaminants are Site-related. The amendment described in this Proposed Plan does not address PFAS contamination.

SUMMARY OF SITE RISKS

As part of the 1988-1992 Remedial Investigation, EPA conducted a baseline risk assessment to determine the current and future effects of contaminants on human health and 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 human health risk assessment (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 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. Since this Proposed Plan addresses groundwater and the remedy selected in the 1992 ROD and modified by the 1998 ESD successfully addressed soil contamination at the Site, this section specifically focuses on risks in the 1992 risk assessment associated with groundwater.

Human Health Risks

EPA conducted a four-step human health risk assessment (HHRA) to assess Site-related cancer risks and noncancer health hazards in the absence of any remedial action. The four-step process is comprised of: Hazard Identification, Exposure Assessment, Toxicity Assessment, and Risk Characterization (refer to the text box "What is Risk and How is it Calculated").

The HHRA began with selecting COPCs in groundwater that could potentially cause adverse health 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 COPCs identified included VOCs, SVOCs, metals, pesticides, and PCBs.

The HHRA assumed that future land use at the Site could include residential development. Thus, the HHRA focused on health effects for both children and adults resulting from future direct contact with contaminated groundwater (e.g., through ingestion of volatile contaminants) in the event a well was installed at the Site for potential use as tap water. A complete summary of all exposure scenarios can be found in the HHRA.

In the HHRA, two types of toxic health effects were evaluated for COPCs: cancer risk and noncancer hazard. Calculated cancer risk estimates for each receptor were compared to EPA's target risk range of $1x10^{-6}$ (one-in-one million) to $1x10^{-4}$ (one-in-ten thousand) for excess cancer risks. The calculated noncancer hazard index (HI) estimates were compared to EPA's target threshold value of 1. The following section provides an overview of the cancer risks and noncancer hazard associated with exposure to groundwater at the Site.

Groundwater - EPA determined that ingestion of contaminated groundwater in a future use scenario presented an elevated risk to human health since the hazard indices were estimated to be 16 for children

and 11 for adults, exceeding EPA's noncancer hazard threshold (i.e., HI of 1). Additionally, residential adult ingestion of groundwater as drinking water yielded a cancer risk of $3x10^{-4}$, exceeding EPA's target risk range of $1x10^{-6}$ to $1x10^{-4}$.

Table 1: Summary cancer risks and hazard indices associated with groundwater.

Receptor	**Cancer Risk**	**Hazard Index**
Future Resident Ingestion (Adult)	**$3x10^{-4}$**	**11**
Future Resident Ingestion (Child)	$9x10^{-5}$	**16**

The majority of risk and hazard identified in the 1992 risk assessment and displayed in Table 1 was driven by inorganic compounds (i.e., beryllium, antimony, arsenic and manganese) in shallow groundwater, which was impacted by contamination in overlying soils and has since been addressed. However, the concentrations of the following contaminants were found in groundwater above promulgated federal and/or state Maximum Contaminant Levels (drinking water standards) and also contributed to the human health risk: toluene, ethylbenzene, xylene and trichloroethene. As a result of the pilot study, chromium and lead currently exceed drinking water standards. These exceedances are expected to be transitory and will re-equilibrate so that the metal concentrations will return to the pre-injection state over time.

As mentioned in the "Site Background" section above, vapor intrusion exposure was evaluated in March 2004 via vapor intrusion sampling. There were no VOCs detected above EPA's screening criteria, and it was determined that the vapor intrusion pathway was not complete.

Ecological Risks

The ecological risk assessment portion of the 1992 risk assessment did not identify any endangered species, sensitive ecosystems, or sensitive habitats on the Site and concluded that adverse impacts to onsite plants and animals from site related contamination are not likely.

Based on the findings of the HHRA, it is EPA's current judgment that the preferred alternative identified in this Proposed Plan is necessary to protect public health or welfare or the environment.

REMEDIAL ACTION OBJECTIVES

The following additional RAO is identified for the amended remedial action and supplements the existing Site RAOs:

- Reduce contaminant mass in the source area such that the maximum dissolved-phase concentration of xylene is lowered between 97-98 percent.

SUMMARY OF REMEDIAL 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 and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) of CERCLA 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) of CERCLA, 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 assures protection of human health and the environment and 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).

EPA is proposing to modify the remedy selected in the 1992 ROD, as modified by the 1998 ESD, to include alternatives for addressing the remaining

groundwater source area contamination where concentrations are the highest including in the vicinity of monitoring wells MW-03, MW-103, MW-105, MW-109 and MW-110 at the Site.

Detailed descriptions of the remedial alternatives summarized in this Proposed Plan for addressing site-wide groundwater contamination are provided in the FFS report.

Common Elements for the Alternatives

Both alternatives described below would require ICs, such as a Classification Exception Area/Well Restriction Area (CEAs/WRA), which is a restriction established under New Jersey regulations that would provide notice that the groundwater does not meet designated use requirements and would restrict groundwater uses or activities which could result in direct contact with contaminated groundwater. A NJDEP CEA/WRA would be established to restrict future groundwater use activities that would expose users to contaminants at levels that may pose human health risk, until the RAO is met. Long Term Monitoring (LTM) would be used as a basis for evaluating the terms of the CEA/WRA and monitoring the progress of lowering the concentration of COCs.

Original Remedy – Groundwater Extraction and Treatment

Capital Cost:	$555,650
Annual O&M Cost:	$747,000
Total Present Worth Cost:	$10,322,320
Time to attain RAO:	30 years
Construction Timeframe:	1 year

The Groundwater Extraction and Treatment remedial alternative consists of groundwater collection, treatment, and reinjection of the treated groundwater. This alternative also includes a LTM program. As part of the remedy selected in 1992, a groundwater extraction and treatment system was constructed at the Site and operated from July 2009 through June 2018. Contaminated groundwater would be pumped from the subsurface through two extraction wells, identified as RW-1 and RW-2, and conveyed to the treatment system, which is located within a dedicated building on the Site. The treatment system includes a pretreatment system for metals removal by addition of hydrogen peroxide and multi-media filtration. The water then passes through two granular activated carbon (GAC) vessels, in series, to remove VOC contamination. The treated water then is routed to a tank for filter and GAC vessel backwashing or is discharged to the reinjection trenches. The reinjection trenches consist of two banks and each bank contains two trenches for a total of four possible reinjection trenches. The system was shut down in June 2018 when EPA decided to perform the ISCO pilot study.

This alternative consists of repairing the treatment plant, specifically supervisory control and data acquisition (SCADA) system upgrades, replacement of media in both the multi-media and carbon filters, other general repairs, and the installation of two new extraction wells that would be placed to target the remaining source area contamination. The treatment plant would then be operated for an estimated 30 years to attain groundwater RAOs.

Preferred Alternative – In-Situ Treatment

Capital Cost:	$913,500
Annual O&M Cost:	$40,000
Total Present Worth Costs:	$1,409,900
Time to attain RAO:	~5 years
Construction Timeframe:	N/A

This in-situ treatment alternative consists of ISCO which utilizes oxidants injected into the groundwater aquifer in the source areas to transform harmful contaminants into less toxic byproducts. At the Site, the ISCO pilot study involved the injection of sodium persulfate oxidant and sodium hydroxide activator into the subsurface to determine its

effectiveness in reducing levels of remaining VOC contamination from the groundwater. This remedial alternative involves several rounds of additional ISCO injections, followed by sampling after each injection event. Additional sampling and analysis would need to be performed to evaluate if additional injection treatment, such as in-situ alternative chemical oxidants or in-situ chemical reduction, would be required to fully address the residual contaminants at the Site. EPA does not expect additional treatment for metals that may become elevated after the ISCO injections will be necessary because metal concentration increases due to ISCO are typically transitory and will re-equilibrate so that the metal concentrations will return to the pre-injection state over time.

Based on the findings of the ISCO pilot study, this alternative would consist of an estimated five rounds of ISCO injections targeting the remaining source areas, followed by an estimated 10 years of monitoring to ensure additional injections are not needed and metal concentrations re-equilibrate.

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. See box entitled "The Nine Superfund Evaluation Criteria" for a more detailed description of these criteria.

This section of the Proposed Plan evaluates the relative performance of each alternative against the nine criteria, noting how each alternative compares to the other options under consideration. A more detailed analysis of alternatives can be found in the FFS report.

THE NINE SUPERFUND EVALUATION CRITERIA

1. Overall Protectiveness of Human Health and the Environment evaluates whether 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.

Threshold Criteria

Overall Protection of Human Health and the Environment

Both alternatives would be equally protective of human health. The exposure pathways to human receptors would be eliminated by restrictions placed on the use of groundwater within the area of groundwater contamination, while groundwater is treated by either extraction and treatment (Original Remedy) or in-situ treatment (Preferred Alternative).

Compliance with ARARs

Both alternatives are expected to achieve compliance with chemical-specific ARARs for groundwater, consisting of New Jersey GWQS. Both alternatives also would comply with potential action-specific ARARs, such as those applicable to managing stormwater runoff; minimizing land disturbances; installation, operation, and abandonment of wells; waste characterization and storage; air quality control; and noise pollution. No location-specific ARARs were identified.

Balancing Criteria

Long-Term Effectiveness and Permanence

Both alternatives are expected to be protective in the long term and permanent because both alternatives would permanently treat groundwater contamination. Long-term monitoring, and ICs, including a CEA/WRA, would help ensure that each alternative remains effective in preventing exposure to contaminants. However, the Preferred Alternative is estimated to attain the RAO for reducing source area contaminant mass in a significantly shorter time than the Original Remedy, so that long-term effectiveness could be achieved more quickly.

Although residents in the Site vicinity are currently connected to a municipal drinking water supply, ICs, such as groundwater use restrictions, would be used to prevent the installation of any private wells within the area covered by the restrictions, until the RAO is met.

Potential impacts to the Site from climate change have been assessed, and the performance of the remedy is currently not at risk due to the expected effects of climate change in the region and near the Site.

Reduction of Toxicity, Mobility, or Volume through Treatment

Both alternatives reduce toxicity, mobility, and volume of the VOCs in groundwater through treatment of COCs.

The Original Remedy would treat less contaminant mass than the Preferred Alternative since direct treatment with injection would directly target the primary source areas of contamination.

Short-Term Effectiveness

The Preferred Alternative is expected to attain the RAO for reducing source area contaminant mass in approximately 5 years, whereas the Original Remedy is expected to attain the RAO in 30 years. Both alternatives rely on ICs, including a CEA/WRA, to protect human health until the RAO is achieved.

There are no significant short-term risks to the community or the environment associated with either alternative although there are normal construction related risk for construction workers performing upgrades to the groundwater extraction and treatment system as part of the Original Remedy.

Workers performing ISCO injections under the Preferred Alternative and groundwater sampling/

monitoring under both alternatives have the potential to be exposed temporarily to contaminants, but this risk would be minimized by the use of personal protective equipment and implementation of a Health and Safety Plan.

Implementability

Both alternatives are implementable onsite. There are no significant technical implementability issues associated with either alternative. The goods and services needed to implement both alternatives are readily available. However, the Original Remedy has greater implementability challenges associated with start-up and long-term operation of the groundwater extraction and treatment system. There are no implementation issues associated with the Preferred Alternative since set up and operation of treatment system is temporary and relatively easy to construct, operate and remove at completion. 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.

Cost

The Original Remedy has a higher cost for groundwater extraction and treatment, with a total present worth cost of $10.3 million over a period of 30 years. The Preferred Alternative has a lower cost, with a total present worth cost of $1.4 million. The present worth calculation assumes that construction would begin in 2023 and assumes a 7 percent discount rate.

Alternative	**Capital Cost**	**O&M Cost**	**Total Present Worth Cost**
Groundwater Extraction and Treatment	$556,000	$747,000	$10.3 million
In-Situ Chemical Treatment	$914,000	$40,000	$1.4 million

State / Support Agency Acceptance

The State of New Jersey concurs with EPA's Preferred Alternative as presented in this Proposed Plan.

Community Acceptance

Community acceptance of the Preferred Alternative will be evaluated after the public comment period ends and will be described in the ROD Amendment for the Site.

SUMMARY OF THE PREFERRED ALTERNATIVE

Based upon an evaluation of the remedial alternatives, EPA proposes in-situ treatment as the preferred remedial alternative for the remaining source of groundwater contamination at the Cosden Chemical Coatings Superfund Site.

This Alternative consists of an estimated five rounds of in-situ chemical injections targeting the remaining groundwater contamination source areas with sampling rounds completed before, between, and after each round of injections. After all injection rounds are completed, a period of monitoring will follow to allow for re-equilibration of metal concentrations and ensure that additional injections are not needed.

ISCO injections would be designed to achieve the source area RAO by destroying the remaining COCs in their groundwater source areas. It is estimated that five injections would be required for concentrations to attain the RAO. The exact placement of the injections, concentrations of injection chemicals, and sampling plan would be determined based upon the ISCO pilot study results.

The LTM program would be implemented to track and monitor changes in the groundwater contamination to ensure the RAO is attained. The results from the long-term monitoring program would be used to evaluate the migration of

contaminants and changes in site-related COCs over time.

Institutional controls in the form of a CEA/WRA would be established to ensure that the remedy remains protective until the RAO is achieved for protection of human health over the long term. Institutional controls such as a deed notice would be recorded in property records if it is determined that future land use at the Site would result in exposure leading to unacceptable risk.

The total estimated present worth cost for the Preferred Alternative is $1,409,900. Further details of the cost are presented in the FFS Report. 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.

This alternative would ultimately result in a reduction of contaminant levels in groundwater within approximately five years to achieve the RAO.

Basis for the Remedy Preference

In-situ treatment uses proven technologies which are effective at reducing contaminant mass to achieve VOC reductions in groundwater, as was demonstrated by the ISCO Pilot Study performed at the Site. The Preferred Alternative will be more effective than the Original Remedy in eliminating the remaining source areas for the groundwater contamination by targeting ISCO injections precisely where the remaining contamination is located.

Furthermore, during implementation, EPA can adjust additional injection locations and concentrations to target the contamination depending on sampling results collected between injection rounds. This can be completed at a finer scale than could be achieved with the Original Remedy. Thus, the Preferred Alternative is expected to be more effective than the Original Remedy in achieving the desired results of treating the remaining sources of contamination in the groundwater.

EPA expects that the Preferred Alternative will not disrupt residences since it requires minimal, temporary infrastructure that will not need to be maintained, whereas the extraction and treatment equipment needed for the Original Remedy would require maintenance over time.

The Preferred Alternative is predicted to attain remediation goals in a shorter time frame than the Original Remedy, at a lower cost. Residents in the Site vicinity are currently connected to a municipal drinking water supply. This water supply is treated to meet federal and state drinking water standards before distribution.

The Preferred Alternative will achieve ARARs. While the Preferred Alternative will not treat metal concentrations in groundwater, metal concentration increases due to ISCO are typically transitory and will re-equilibrate so that the metal concentrations will return to the pre-injection state over time. Thus, the Preferred Alternative is expected to result in compliance with ARARs for VOCs and metals.

The LTM program would be implemented to track and monitor changes in the groundwater contamination to ensure the RAO is attained. The results from the LTM program will be used to evaluate the migration of contaminants and changes in site-related COCs over time.

ICs in the form of a CEA/WRA would be established to ensure that the remedy remains protective until the RAO is achieved for protection of human health over the long term.

The environmental benefits of the Preferred Alternative could be enhanced by giving consideration, during the remedial activities, to technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy.

Though EPA proposes in-situ treatment as the preferred alternative, the groundwater extraction and treatment system would remain in place in its current condition, though not operating, until the effectiveness of the source remedy is determined to be fully successful.

Based upon the information currently available, EPA believes the preferred alternative meets the threshold criteria *(protection of human health and the environmen*t and c*ompliance with ARARs*) and provides the best balance of tradeoffs among the other alternatives with respect to the balancing criteria. The preferred alternative satisfies the following statutory requirements of CERCLA: 1) the proposed remedy is protective of human health and the environment; 2) it complies with ARARs; 3) it is cost effective; 4) it utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and 5) it satisfies the preference for treatment as a principal element. LTM would be performed to assure the protectiveness of the remedy. With respect to the two modifying criteria of the comparative analysis (*state acceptance* and *community acceptance*), NJDEP concurs with the proposed remedy.

COMMUNITY PARTICIPATION

EPA and NJDEP provided information regarding the cleanup of the Site to the public through meetings, the administrative record file for the Site, and announcements published in the local newspaper. EPA and NJDEP encourage the public to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted.

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 the Cosden Chemical Coatings Superfund Site, please contact:

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Written comments on this Proposed Plan should be submitted on or before to Tamara Rossi at the address or email below.

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Figure 2. Total xylene concentrations in groundwater before and after ISCO pilot study