US EPA Superfund Program Proposed Plan
Orange County North Basin Superfund Site Interim Remedy
Orange County, California

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY · REGION 9 · SAN FRANCISCO, CA · JANUARY 2026

INTRODUCTION

The United States Environmental Protection Agency (EPA), Region 9, is seeking public comments on this Proposed Plan for an interim action to address groundwater contamination at the Orange County North Basin (OCNB) Superfund Site in Orange County, California. All drinking water served in the Orange County Groundwater Basin meets state and federal drinking water requirements, but the spreading of the commingled groundwater plume ("the plume") threatens the ongoing availability of groundwater resources. EPA's objectives for the interim remedy are to prevent direct contact (such as ingestion and dermal contact) with groundwater impacted by several contaminants of concern (COCs) that are present at levels not protective of human health, and to prevent further migration of the most contaminated portion of the plume (referred to as the "Target Area"). Restoration of the contaminated groundwater aquifers will be addressed in a future Record of Decision (ROD) selecting the *final* remedial action for the Site. This Proposed Plan summarizes the interim remedial alternatives that were considered by EPA in a document called the Feasibility Study Report (FS) and highlights the key factors that led to the identification of the preferred alternative. The FS describes the remedial alternatives in detail and is available for public review at the Information Repositories listed on **Page 19**.

EPA prepared this Proposed Plan to: (1) inform the community about the history and environmental findings at the Site; (2) describe the remedial alternatives and EPA's preferred alternative and explain the reasons for the preference; (3) solicit public comments on the remedial alternatives and on EPA's preferred alternative; and (4) describe how the public can become involved. EPA will select the interim remedial alternative (also referred to as "the interim remedy") after considering state and community input. EPA encourages you to read this Proposed Plan and other related environmental studies for the Site. EPA will hold three community meetings (see inset box above) and a public comment period between January 5, 2026 and February 19,

Public Comment Period

January 5, 2026 to February 19, 2026

EPA will accept written comments on Proposed Plan during the public comment period. Comments may be submitted to EPA by letter or email to:

Amanda Cruz
Remedial Project Manager EPA Region 9
75 Hawthorne Street
San Francisco, CA 94105-3901
Email: cruz.amanda@epa.gov

Public Meetings

IN-PERSON PUBLIC MEETINGS will be held by EPA at the following dates and times:

January 21, 2026 6 PM - 7 PM
Buena Park Community Center 6688 Beach Blvd.
Buena Park, CA 90621

January 22, 2026 5:30 PM - 7:30 PM
Fullerton Community Center
340 W Commonwealth Ave. Fullerton, CA 92832

January 29, 2026 5 PM – 6 PM
Brookhurst Community Center
2271 Crescent Ave.
Anaheim, CA 92801

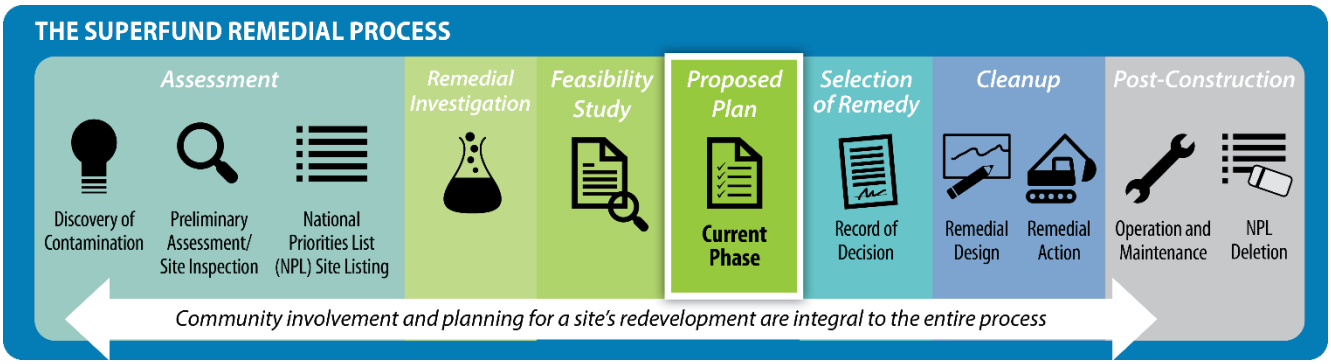
Note: This document contains figures that are not fully compliant with Section 508 of the Rehabilitation Act. For assistance or to obtain accessible versions of these figures, please contact the individuals listed above

2026. Comments may be submitted to EPA during the public comment period orally during the community meetings, or in writing to the contact listed on **Page 1**. Public input on the Proposed Plan and supporting information for the alternatives is an important part of the remedy selection process. EPA may select an interim remedy different from the preferred alternative based on public comments. Therefore, EPA encourages the public to comment on all remedial alternatives presented in this Proposed Plan. EPA is proposing as its preferred interim remedial alternative for the OCNB Site *Alternative 4 - Extraction and Treatment at Centralized Treatment Plant with Discharge to Injection Wells and Institutional Controls*. More detail on the alternative and the selection process is provided in this Proposed Plan.

As the lead agency for the Site, EPA will make a final selection of the interim remedy to be implemented at the Site, with input from the state through the California Department of Toxic Substances Control (DTSC) and the Santa Ana Regional Water Quality Control Board (SARWQCB). EPA will then document the selected interim remedy in a decision document called a Record of Decision, or ROD, after considering all comments from the state and public. The ROD will include a Responsiveness Summary, which will present public comments received on the Proposed Plan along with EPA's responses to those comments.

EPA is issuing this Proposed Plan as part of the public participation requirements under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, 42 U.S. Code Section 9617, known as "Superfund", and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), as set forth in 40 Code of Federal Regulations Section 300.430(f)(2). Environmental investigations and cleanup of the OCNB plume are following the CERCLA process, as outlined in **Figure 1**. Community participation activities to this point have included outreach during the proposed listing of the Site on the National Priorities List (NPL), and extensive collaboration with the Cities of Anaheim, Fullerton, Buena Park, and local water suppliers.

FIGURE 1: The Superfund Remedial Process



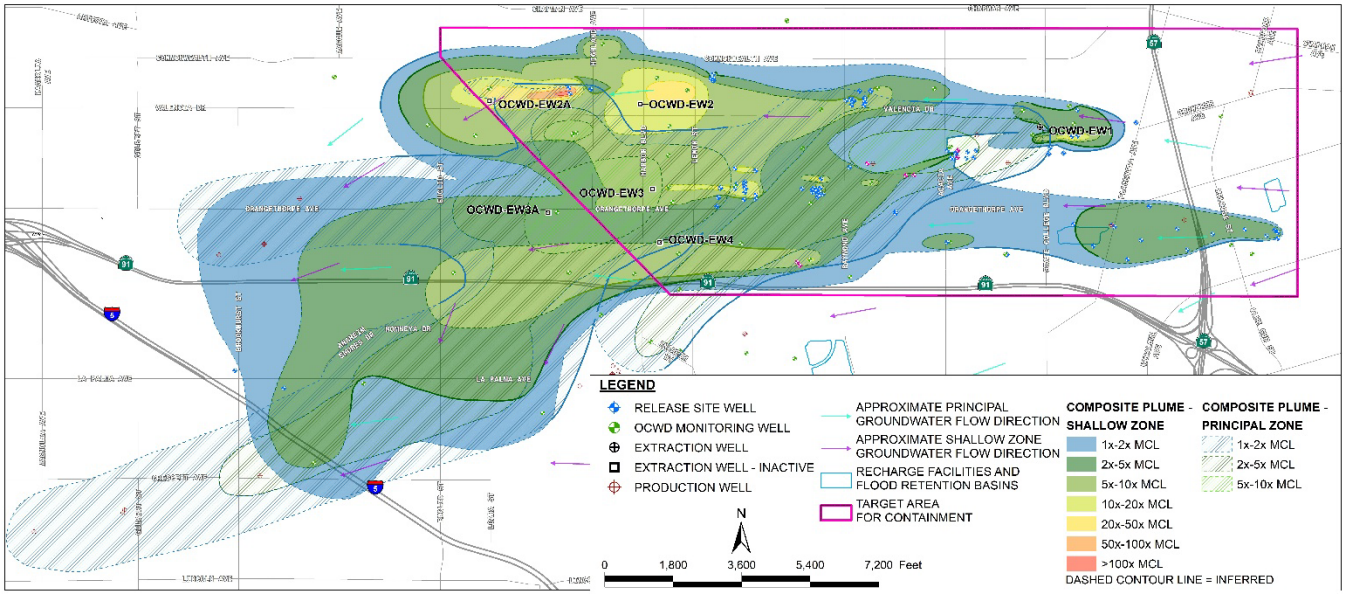
SITE BACKGROUND

The OCNB Superfund Site is in the northern portion of the Orange County Groundwater Basin (referred to as North Basin), primarily within the cities of Fullerton and Anaheim, California. The Site encompasses a plume of VOCs and a SVOC that extends over approximately 6.4 square miles: between ½-mile east of State Route (SR)-57 and westward; north of Lincoln Avenue; east of Magnolia Avenue; and south of Chapman and Commonwealth Avenues **(Figure 2)**.

Industrial facilities that have operated in the area since the 1950s – including electronics manufacturing, metals processing and plating, aerospace manufacturing, rubber and plastics manufacturing, and dry cleaning – are known or suspected to have released contaminants to soil and groundwater contributing to the regional groundwater contamination in North Basin groundwater. Contaminant source site cleanups at individual facilities are being conducted under state oversight (DTSC and SARWQCB). Contaminants frequently detected in environmental media at these sites include trichloroethene (TCE), tetrachloroethene (PCE), and other

chlorinated solvents. A few of these cleanups have been completed, while additional source identification and remediation is ongoing at multiple source sites.

FIGURE 2: Composite Shallow and Principal Zone Combined Plume Extent



Contamination has reached North Basin drinking water supply wells at concentrations approaching or exceeding federal and California Maximum Contaminant Levels (MCLs) and a California Notification Level (NL) for drinking water. To date, five municipal drinking water production wells and one private production well have been taken out of service in the cities of Fullerton and Anaheim due to VOC and SVOC contamination.

Orange County Water District (OCWD), the agency responsible for managing and protecting the Orange County Groundwater Basin, has performed investigations and supporting actions in the North Basin since 1990 to evaluate regional contamination. OCWD has installed approximately 100 groundwater monitoring wells and six groundwater extraction wells, and they routinely sample monitoring and drinking water production wells throughout the area. These investigations identified widespread VOC and SVOC contamination in the North Basin and found increasing concentration trends in monitoring and production wells, indicating further migration and expansion of the plume.

In 2016, OCWD equipped one of the six extraction wells (OCWD-EW1, located in the northeast portion of the North Basin **[Figure 2]**) with extraction pumps for localized containment of VOC and SVOC contaminants. Well EW-1 has removed approximately 190 pounds of the VOCs PCE and TCE from the aquifer through December 2024. The discharge from EW-1 is treated at the Orange County Sanitation District wastewater treatment plant and then at OCWD's Groundwater Replenishment System (GWRS) prior to being recharged to groundwater.

On October 14, 2016, EPA and OCWD entered into an Administrative Settlement Agreement with OCWD to conduct a Remedial Investigation (RI) and Feasibility Study (FS) to characterize the nature and extent of contamination within the North Basin area; and support the development of an interim remedy to address groundwater within the designated containment area of the OCNB Site where the highest contaminant concentrations and most of the source sites are located, known as the Target Area **(Figure 2)**. Concurrently, EPA pursued listing the Site on the NPL. On September 3, 2020, EPA added the OCNB Site to the NPL.

OCNB Interim RI activities were completed between September 2017 and August 2019 to identify the nature and extent of groundwater contamination in the Target Area of the OCNB Site. Twenty-three new monitoring wells were installed and multiple rounds of groundwater sampling were performed at new and existing wells.

The findings were published in the 2022 OCNB Interim RI Report, which identified unacceptable human health risk from VOCs and SVOC, collectively referred to as contaminants of concern (COCs), in groundwater. Data from the RI was then used to support the 2025 OCNB Interim Remedy FS. The FS identified and evaluated remedial alternatives to address COCs in the Target Area. The FS identifies potential risks related to direct contact with contaminated groundwater – which is a hypothetical scenario since wells with COCs above drinking water limits are shut down. Importantly, all water being served to the public within the North Basin service areas meets state and federal drinking water requirements.

SITE CHARACTERISTICS

COMMINGLED GROUNDWATER PLUME WITH MULTIPLE SOURCES

The Orange County Groundwater Basin is divided into three main aquifer systems: Shallow (approximately 80 to 200 feet below ground surface [bgs]), Principal (200 to greater than 500 feet bgs), and Deep zones (extending to greater than 2,000 feet bgs). The interim remedy RI/FS focused on dissolved VOC and SVOC contamination in the Shallow and Principal zones. Contamination in the aquifer systems originated from multiple industrial sites within the North Basin area. Over time, movement of VOC and SVOC contamination from these individual facilities has combined into a commingled contaminant plume within the Shallow and Principal zones (**Figure 2**).

A pattern of increasing concentrations has been identified in wells near the leading edge - or front - of the plume, indicating dissolved COCs continue to spread with the flow of groundwater in a southwesterly direction within the Shallow and Principal zones of the North Basin. Based on the distribution and concentrations of COCs, contamination will continue to increase and/or remain above acceptable exposure levels in both the Shallow and Principal zones without remedial action to address these contaminants in groundwater.

The Target Area occupies 5 square miles in the North Basin (**Figure 2**) and includes most of the known or suspected contaminant source sites, which is a subset of the total plume. The purpose of the interim remedy is to address COCs in groundwater in the Shallow zone within the Target Area.

GROUNDWATER USE

The Orange County Groundwater Basin is a Class II aquifer, which means that the groundwater is used as a drinking water source. Land use within the area of impacted groundwater is mixed and includes commercial/ light industrial, residential, park, and open space. The beneficial uses of groundwater in the basin include municipal, industrial, and agricultural supply. Groundwater makes up 85 percent of the potable water supply for central, northern and western Orange County. Locally, potable water supply is the primary beneficial groundwater use, with approximately 34 production wells within or downgradient of the North Basin, including wells owned by the Cities of Anaheim and Fullerton, Golden State Water Company, and Page Avenue Mutual Water Company. To date, five municipal drinking water production wells and one private production well have been taken out of service due to COC concentrations that exceeded drinking water requirements. All drinking water served in the Orange County Groundwater Basin meets state and federal drinking water requirements, but the spreading of the plume threatens the ongoing availability of groundwater resources.

CONTAMINANTS OF CONCERN

The following VOCs are detected in groundwater within the North Basin at concentrations that exceed federal or state MCLs and are considered COCs for the OCNB Site:

- Tetrachloroethene (PCE)
- Trichloroethene (TCE)
- 1,1-Dichloroethene (1,1-DCE)

- 1,2,3-trichloropropane (1,2,3-TCP)
- 1,2-dichloroethane (1,2-DCA)

In addition to the above contaminants, the SVOC 1,4-dioxane was selected as a COC based on its widespread distribution in the North Basin area, and its contribution to the cumulative excess lifetime cancer risk exceeding 1×10^{-4}. Because there is no federal or state MCL for 1,4-dioxane, the acceptable exposure level is the California NL.

The VOCs 1,2,3-TCP and 1,2-DCA were detected at concentrations exceeding the MCLs at fewer locations and within the footprint of the other COCs. Therefore, the distribution of COCs discussed in the Interim Remedy RI and FS reports focuses on the "primary" COCs PCE, TCE, 1,1-DCE, and 1,4-dioxane.

The distribution of the combined COC plume in groundwater is shown on **Figure 2**. The extent of the plume in the Shallow zone extends approximately 5.5 miles long and 1.25 miles wide. Downward movement of groundwater from the Shallow zone into the Principal zone has allowed vertical migration of dissolved COCs into the Principal zone, particularly in areas where there is no fine-grained geological unit separating the zones. COC contamination in the Principal zone extends approximately 5.25 miles long and 0.75 miles wide (**Figure 2**). COCs have migrated to depths of about 150 feet bgs in the eastern portion of the North Basin, and approximately 500 feet bgs in the southwestern portion. COC concentrations in the Shallow zone are generally higher than in the Principal zone. The highest concentrations, up to 120 times the MCL for TCE (5 parts per billion or ppb), have been detected in the northwestern portion of the North Basin. In the Principal zone, contaminant concentrations are up to 10 times the MCL for PCE (5 ppb) in the central northeastern portion of the North Basin.

Elevated concentrations of non-COCs (including nitrate, perchlorate, and per- and polyfluoroalkyl substances [PFAS]) have also been detected in the North Basin. These contaminants appear to be associated with activities up-gradient of the North Basin and not directly related to the known source sites within the North Basin. OCWD continues to monitor PFAS in the North Basin, and SARWQCB is the lead agency for identifying suspected PFAS source sites.

SCOPE AND ROLE

The interim remedy alternatives address the most contaminated part of the OCNB plume, preventing further migration of COCs from the Target Area. EPA is concurrently preparing the plume RI/FS for an interim remedy for the entire extent of the plume, including the area downgradient and outside of the Target Area. Restoration of the aquifer to beneficial use will be addressed in a future ROD selecting the final remedial action for the Site.

The media of concern for the interim remedy is groundwater. Source facilities and associated source site contamination will be investigated and remediated under the authority of state agencies.

SUMMARY OF SITE RISKS

The interim remedy RI includes a baseline human health risk assessment for the OCNB Superfund Site that quantifies potential risks to human and ecological receptors in the absence of any cleanup action. The assessment considered *potential* risks to humans for the following hypothetical exposure scenarios: (1) risks to residents exposed to untreated groundwater as tap water (2) risks to landscapers exposed to untreated groundwater as tap water during work activities; and (3) qualitative evaluation of risks to car wash workers[1]

[1] Risk assessment guidance is not available for exposure scenarios for car wash workers. There is a large degree of uncertainty in the health risk calculations for this receptor, which are extrapolated from the landscape worker scenario.

exposed to untreated groundwater as tap water during work activities. Given that all water being served to the public within the North Basin service area meets state and federal drinking water requirements, there are no known current human health risks via direct contact of groundwater. However, the spreading of the plume threatens the ongoing availability of groundwater resources.

Vapor intrusion could potentially pose human health concerns at individual facilities at the OCNB Superfund Site. The state, through SARWQCB and DTSC, is evaluating vapor intrusion at several facilities within the current Site footprint. Vapor intrusion is not evaluated as part of the interim remedy.

HUMAN HEALTH RISK SUMMARY

Potential risk associated with chemicals that cause cancer (carcinogens) is defined in terms of the probability of a person getting cancer from long-term exposure to a contaminant. This probability is expressed as the number of excess cancers that would occur within a population over and above the cancers that would occur even had the populace not been exposed to the contaminants. An excess cancer probability greater than 10^{-4} (1 in 10,000) indicates that there may be unacceptable carcinogenic health effects. Remedial action is generally warranted when carcinogenic health risks are above acceptable risk range of 1 x 10^{-4} and 1 x 10^{-6} (between 1 in 10,000 and 1 in a million).

For chemicals that do not cause cancer, but may cause other health effects (noncarcinogens), the potential for negative health effects is expressed in terms of a Hazard Index. A Hazard Index greater than one indicates that there may be unacceptable noncarcinogenic health effects. Remedial action is generally not warranted when the Hazard Index is equal to or less than 1.

Risk for Residents from exposure to untreated groundwater as tap water

The estimated carcinogenic risk for residential exposure to untreated Shallow zone groundwater as drinking water is $4x10^{-4}$, or 4 in 10,000; risk for use of untreated Principal zone groundwater as drinking water is $3x10^{-4}$, or 3 in 10,000. The COCs that contribute the highest carcinogenic risk include PCE and TCE. The Hazard Index from noncarcinogenic effects is 18 for Shallow zone groundwater and 23 for Principal zone groundwater – primarily due to TCE. Risk for future potential residents exposed to COCs in untreated Shallow and Principal zone groundwater exceeds EPA's acceptable carcinogenic risk range (between 1 in 10,000 and 1 in a million) and noncarcinogenic Hazard Index of 1.

Risk for Landscapers of exposure to untreated groundwater as tap water during work

The estimated carcinogenic risk for landscapers using untreated Shallow zone or Principal zone groundwater during work activities ($2x10^{-4}$ [2 in 10,000]) exceeds EPA's acceptable carcinogenic risk range (between 1 in 10,000 and 1 in a million). The COCs that contribute the highest carcinogenic risk include PCE and TCE. The total noncarcinogenic Hazard Index exceeds 1 for exposure to both Shallow zone groundwater (Hazard Index = 6) and Principal zone groundwater (Hazard Index = 10). The COCs that contributed the highest noncarcinogenic Hazard Index included TCE and PCE.

Risk for Car Wash Workers exposed to untreated groundwater as tap water during work

The estimated carcinogenic risks and noncarcinogenic Hazard Index were conservatively estimated based on the risks calculated for a landscape worker. Assuming increased incidental ingestion and skin surface exposure to untreated water for car wash work compared to landscape work, the carcinogenic risks and noncarcinogenic hazard index were calculated to be double for the car wash worker. Thus, the estimated carcinogenic risks for the car wash worker exposed to untreated Shallow or Principal zone groundwater during work activities ($4x10^{-4}$ [4 in 10,000]) exceeds EPA's acceptable carcinogenic risk range (between 1 in 10,000 and 1 in a million). The total noncarcinogenic Hazard Index exceeds 1 for exposure to both Shallow zone groundwater (Hazard Index = 12) and Principal zone groundwater (Hazard Index = 19).

Remedial action is generally warranted when risks estimated for each exposure scenario exceed EPA's acceptable carcinogenic risk range of 10^{-4} and 10^{-6} and/or the noncarcinogenic Hazard Index of 1.

TABLE 1: Risk Assessment Summary

Groundwater Type	Receptor	Excess Lifetime Cancer Risk	Noncancer Hazard Index
Shallow Zone Groundwater	Resident	4×10^{-4}	18
	Landscaper	2×10^{-4}	6
	Car Wash Worker	4×10^{-4}	12
Principal Zone Groundwater	Resident	3×10^{-4}	23
	Landscaper	2×10^{-4}	10
	Car Wash Worker	4×10^{-4}	19

ECOLOGICAL RISK SUMMARY

The RI considered potential risk to ecological receptors, but due to the depth of groundwater and lack of discharge to the ocean or surface waters, the RI determined there is no complete exposure pathways to ecological receptors from the plume.

BASIS FOR ACTION

It is 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 this Site which may present an imminent and substantial endangerment to public health or welfare.

PRINCIPAL THREAT WASTE

The NCP establishes an expectation that the 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 groundwater, surface water or air, or acts as a source for direct exposure. Contaminated groundwater generally is not considered to be a source material. There are no principal threat wastes known to be present in the Target Area groundwater of the North Basin.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) describe what the proposed Site remedy is expected to accomplish. RAOs are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered (TBC) guidance, site-specific risk-based levels, and background. While the proposed interim remedy does not aim to restore groundwater to its beneficial use, the interim remedy is expected to address COCs within the Target Area. The RAOs presented in **Table 2** below reflect this scope.

TABLE 2: Remedial Action Objectives

1	Prevent exposure via direct contact (e.g., ingestion, dermal contact, and inhalation of vapors coming from water while showering) with contaminated groundwater with concentrations of trichloroethene, tetrachloroethene, 1,1-dichloroethene, 1,4-dioxane, 1,2-dichloroethane, and 1,2,3-trichloropropane that exceed acceptable exposure levels.
2	Prevent further lateral migration outside of the containment area of the COCs trichloroethene, tetrachloroethene, 1,1-dichloroethene, and 1,4-dioxane in the Shallow zone. Prevent further vertical migration of COCs from the containment area in the Shallow zone to protect the beneficial use as drinking water in the Principal zone.

Acceptable exposure levels for COCs in the North Basin are based on ARARs (e.g., MCLs) or risk-based levels within the risk range of 10^{-4} and 10^{-6} in accordance with the NCP. An MCL is not established for 1,4-dioxane, so the acceptable exposure level was calculated to be as close as possible to the EPA point of departure for cancer risk (1×10^{-6}, which corresponds to as concentration of 0.46 ppb). However, due to laboratory detection limit considerations, that number is modified to 1 ppb, which corresponds to the California NL.

TABLE 3: Acceptable Exposure Levels

COC	Federal MCL (ppb)	California MCL (ppb)	Acceptable Exposure Level (ppb)	Source
PCE	5	5	5	Federal MCL
TCE	5	5	5	Federal MCL
1,1-DCE	7	6	6	California MCL
1,2,3-TCP	None	0.005	0.005	California MCL
1,2-DCA	5	0.5	0.5	California MCL
1,4-Dioxane	None	1 NL	1	California NL

The limited scope of the interim remedy does not include restoration of groundwater to drinking water quality standards. Final cleanup levels for groundwater will be selected as part of the final remedy determination for the Site. During interim remedy implementation a water quality assessment of the Site will establish the pre-remediation concentrations and spatial distribution of COCs within the Shallow and Principal Aquifers for assessing the achievement of RAO 2.

SUMMARY OF REMEDIAL ALTERNATIVES

Section 121 of CERCLA, 42 U.S.C. § 9621 requires that any remedy selected to address contamination at a site must be protective of human health and the environment, cost-effective, in compliance with regulatory and statutory provisions ARARs, and consistent with the NCP, 40 C.F.R. § 300.430, to the extent practicable.

EPA developed remedial action alternatives for the Target Area through the FS process and these alternatives are summarized below. Remedial alternatives are expected to reduce risks from potential exposure to and prevent further migration of COCs, meeting the interim remedy RAOs. In-situ treatment alternatives (e.g., injection, permeable reactive barrier, soil vapor extraction, air sparging) were eliminated from consideration because they were determined to be infeasible based on (1) the size of the Target Area (2,000 acres), (2) the depth of contamination in the Shallow zone (80 to 200 feet bgs), (3) heterogeneity of aquifer materials, and (4) the magnitude of necessary property rights coordination for the estimated 1,750 borings and

injection wells needed. Monitored natural attenuation (monitoring the persistence or reduction of contaminants via naturally-occurring processes) was thoroughly evaluated as an additional approach in the FS for completeness and transparency in the decision-making process. However, the RI Report shows that the plume is not stable. There are also no other lines of evidence showing that natural attenuation is occurring. The COCs in groundwater would not attenuate sufficiently to meet the RAOs without the addition of a more active remedial alternative. Because monitored natural attenuation is not feasible and does not meet the criterion for overall protection of human health and the environment, it was removed from consideration as an alternative and is not discussed further in this Proposed Plan.

COMMON ELEMENTS

After consideration of numerous approaches, EPA has identified several alternatives that – while distinct from each other – each rely on groundwater extraction, treatment, and discharge ("pump-and-treat") for containment of COC impacted groundwater within the Target Area. Each of the pump-and-treat alternatives evaluated as part of the detailed analysis share some technical common elements. These common elements are described below. Descriptions of the unique elements that distinguish Alternatives 2 through 6 based on treatment and discharge approaches are included in the remedial alternative descriptions that follow.

Pump-and-Treat Alternatives
2 – Send water to GWRS*
3 – Send water to drinking water supplier
4 – Return water to aquifer with injection wells
5 – Return water to aquifer with recharge basin
6 – Two treatment plants, return water to aquifer with injection wells and recharge basin

***** Alternative 2 uses existing wastewater treatment plant. Alternatives 3 through 6 require new water treatment plants

Institutional Controls – Institutional controls (ICs) are non-engineered tools, such as administrative and legal measures, designed to minimize exposure to contamination and protect the integrity of a CERCLA response action. There are four categories of ICs: proprietary controls, governmental controls, enforcement and permit tools with IC components, and informational devices. Alternatives 2 through 6 incorporate ICs to prevent the construction and operation of production wells that could expose receptors to COCs in the Target Area or facilitate their migration. Agencies involved in permitting, construction, and operation of production wells can implement ICs to preclude exposure to contaminated groundwater.

Groundwater Extraction and Treatment – Alternatives 2 through 6 use groundwater extraction for containment of COC impacted groundwater within the Target Area using 17 extraction wells within the Shallow zone. The extracted groundwater will be treated by a groundwater treatment plant (Alternatives 3, 4, 5, and 6) or by the existing Orange County Sanitation District wastewater treatment plant and replenishment system (Alternative 2). The FS used numerical modeling with particle tracking to identify the number and capacity of extraction wells needed to achieve sufficient capture to prevent further migration of COCs beyond the Target Area. The final number, location, and pumping rates of extraction wells will be determined during the Remedial Design phase, following interim remedy selection.

Alternatives 3 through 5 rely on one centralized treatment plant. The location of the treatment plant and design capacity varies slightly between alternatives based on treated water discharge assumptions. Alternative 6 relies on two separate treatment plants to treat the total volume of extracted groundwater, with differing discharge options for each treatment plant.

Alternatives 2 through 6 include construction of pipelines within public property (including city streets) and Alternatives 3 through 6 include construction of treatment and discharge facilities. The amount of construction varies between alternatives, but construction phases can be performed simultaneously. Therefore, construction timeframes are anticipated to be similar between Alternatives 2 through 6.

Groundwater Monitoring – For performance monitoring of Alternatives 2 through 6, the FS estimated the need for approximately 20 additional groundwater monitoring wells (10 in the Shallow zone and 10 in the Principal zone) and annual groundwater monitoring. A baseline water quality assessment of the Site will establish the pre-remediation concentrations and spatial distribution of COCs. Annual groundwater monitoring data during interim remedy operation will allow for comparisons to baseline conditions for assessing the achievement of RAO 2.

Following is a summary of each alternative considered:

ALTERNATIVE 1 – NO ACTION

Present Worth Cost Estimate: $0
Capital Cost Estimate: $0
Annual O&M Cost Estimate: $0

EPA is required to consider a No Action alternative for comparison with other remedial alternatives. The No Action alternative provides a baseline for evaluation of risk to the public if no action is taken. The No Action alternative does not involve any treatment or removal of COCs within the Target Area. Under this alternative, pathways for potential human exposure and for COC migration will persist.

There is no cost associated with this alternative, and it would not protect human health and the environment. The No Action alternative does *not* meet Interim Remedy RAOs and does not comply with ARARs.

ALTERNATIVE 2 – GROUNDWATER EXTRACTION WITH DISCHARGE TO PUBLICLY OWNED TREATMENT WORKS (POTW)/GROUNDWATER REPLENISHMENT SYSTEM (GWRS), INSTITUTIONAL CONTROLS (ICS)

Present Worth Cost Estimate: $301.4 million
Capital Cost Estimate: $50.1 million
Annual O&M Cost Estimate: $20.0 million

Alternative 2 is groundwater extraction and discharge to the existing publicly-owned treatment works (POTW)/Groundwater Replenishment System (GWRS) for treatment, and ICs.

Under Alternative 2, extracted groundwater (6,351 gallons per minute [gpm] or 4,100 million gallons per year) would be conveyed to existing sanitary sewer trunk lines that deliver wastewater to an existing POTW operated by the Orange County Sanitation District. Approximately 29,000 feet of piping (4- to 26-inch diameter) would be needed to deliver extracted groundwater to sewer trunk lines. The discharge piping will connect to the sewer trunk lines on Orangethorpe Avenue and State College Boulevard. Extracted groundwater must meet standards contained in the Orange County Sanitation District wastewater discharge regulations (Ordinance No. OCSD-53). The POTW-treated effluent would be discharged to the GWRS for advanced treatment and use for managed aquifer recharge in the Orange County Groundwater Basin. The GWRS is operated by the OCWD in cooperation with the Orange County Sanitation District. GWRS treatment includes microfiltration, reverse osmosis, and advanced oxidation using ultraviolet light and hydrogen peroxide. Capital costs for Alternative 2 include monitoring and extraction well installation, piping network construction, project management, design and construction management, and implementation of ICs. Annual O&M costs include direct costs such as electricity for extraction pump operation, pump maintenance costs, O&M labor costs, and Orange County Sanitation District discharge fees.

Currently, GWRS does not have adequate capacity to accept the full volume of extracted groundwater. Sufficient capacity will be available only if future sewer flows decrease sufficiently to provide available unused capacity in the GWRS. The GWRS currently is under construction for its third and final expansion and adding more capacity to the GWRS is not an available option because no room exists on OCWD's property for a fourth expansion.

ALTERNATIVE 3 – GROUNDWATER EXTRACTION AND TREATMENT AT CENTRALIZED TREATMENT PLANT WITH DISCHARGE TO DIRECT POTABLE USE, ICS

Present Worth Cost Estimate: $234.1 million
Capital Cost Estimate: $113.5 million
Annual O&M Cost Estimate: $9.4 million

Alternative 3 is groundwater extraction and treatment at a centralized treatment plant with discharge to direct potable use, and ICs. For alternatives that include recharge to the aquifer (Alternatives 3 through 6), the Santa Ana RWQCB waste discharge permit provides standards for the treated water (Order No. R8-2002-0033 and Amending Order No. R8-2013-0020). Discharge standards for recharge of treated groundwater include MCLs for the VOCs and the California NL for 1,4-dioxane.

Under Alternative 3, extracted groundwater would be conveyed to a centralized treatment plant (assumed to be located near West Rosslynn Avenue and Harbor Boulevard in the City of Fullerton) where it would be treated to remove COCs, and made available to a local water purveyor (City of Fullerton) for distribution. For use of treated groundwater for potable consumption, the water served must meet federal and state drinking water requirements. The treatment plant would include multiple steps to reach drinking water requirements, starting with particulate filters to remove suspended solids, liquid-phase granular activated carbon (LGAC) beds to remove VOCs, and an ultraviolet advanced oxidation process (UV AOP) unit to remove 1,4-dioxane. The treatment plant would be designed for a flow rate of 6,351 gpm. Capital costs for Alternative 3 include direct costs of monitoring and extraction well installation, piping network construction, treatment plant construction, LGAC system, and UV AOP system. Annual O&M costs include direct costs such as electricity for pumps, UV AOP system, pump maintenance, routine O&M labor, LGAC media changeouts and disposal, UV AOP lamp replacements, treatment additives, lab analysis, and periodic reporting costs. Modifications to the City of Fullerton distribution system to accommodate the treated groundwater, as well as additional treatment that may be required by the City of Fullerton (e.g., to reduce total dissolved solids) would be the financial responsibility of the water purveyor and are not included in the cost for this alternative.

The City of Fullerton has declined to accept the treated groundwater for potable use, based on the infrastructure and funding constraints, administrative uncertainties with OCWD, and concerns about total dissolved solids levels in treated groundwater.

ALTERNATIVE 4 – GROUNDWATER EXTRACTION AND TREATMENT AT CENTRALIZED TREATMENT PLANT WITH DISCHARGE TO INJECTION WELLS, ICS (*PREFERRED ALTERNATIVE*)

Present Worth Cost Estimate: $248.9 million
Capital Cost Estimate: $118.0 million
Annual O&M Cost Estimate: $10.2 million

Alternative 4 is groundwater extraction and treatment at a centralized treatment plant with discharge to the Shallow zone aquifer through injection wells, and ICs. The Santa Ana RWQCB waste discharge permit provides standards for the treated water (Order No. R8-2002-0033 and Amending Order No. R8-2013-0020). Discharge standards for recharge of treated groundwater include MCLs for the VOCs and the California NL for 1,4-dioxane.

Under Alternative 4, extracted groundwater would be conveyed to a centralized treatment plant to remove COCs, and returned to the aquifer system via injection wells. Approximately 35,000 feet of piping (6-inch to 28-inch diameter) would be constructed to convey groundwater to the centralized treatment plant and treated water to an injection wellfield (assumed to be located on North East Street in the area between the 91 Freeway and the Raymond Flood Control Basin, in the City of Anaheim). The treatment plant would be designed for a

flow rate of approximately 6,546 gpm. The treatment plant process includes particulate filters to remove suspended solids, LGAC to remove VOCs, and a UV AOP unit to remove 1,4-dioxane. The injection wellfield would include 17 Shallow zone injection wells with a capacity of 500 gpm each. Injection well capacity above the treatment plant flow rate is included to account for regular well maintenance. Capital costs for this alternative include direct costs of monitoring and extraction well installation, piping network construction, treatment plant construction, LGAC system, and UV AOP system. Annual O&M costs include direct costs such as electricity for pumps, UV AOP system, pump maintenance, routine O&M labor, LGAC media changeouts and disposal, UV AOP lamp replacements, treatment additives, lab analysis and periodic reporting costs.

ALTERNATIVE 5 – GROUNDWATER EXTRACTION AND TREATMENT AT CENTRALIZED TREATMENT PLANT WITH DISCHARGE TO INFILTRATION BASIN, ICS

Present Worth Cost Estimate: $271.9 million
Capital Cost Estimate: $147.7 million
Annual O&M Cost Estimate: $9.5 million

Alternative 5 is groundwater extraction and treatment at a centralized treatment plant with discharge to an infiltration basin, and ICs. The Santa Ana RWQCB waste discharge permit provides standards for infiltration to the aquifer (Order No. R8-2002-0033 and Amending Order No. R8-2013-0020). Discharge standards for recharge of treated groundwater include MCLs for the VOCs and the California NL for 1,4-dioxane.

Under Alternative 5, extracted groundwater would be conveyed to a centralized treatment plant to remove COCs, and returned to the aquifer system via an infiltration basin. Alternative 5 requires the purchase of approximately 6 acres of geologically suitable land for construction of a new recharge basin to accept the treated groundwater. Approximately 42,000 feet of piping (6-inch to 26-inch diameter) would be constructed to convey groundwater to the centralized treatment plant and bring treated water to the adjacent recharge basin (assumed to be located east of state route 57 and north of state route 91, approximately 2,200 feet south of OCWD's La Jolla Recharge Basin, in the City of Anaheim). The treatment plant would be designed for a flow rate of 6,351 gpm. The treatment plant process includes particulate filters to remove suspended solids, LGAC to remove VOCs, and a UV AOP unit to remove 1,4-dioxane. Capital costs for this alternative include direct costs of monitoring and extraction well installation, piping network construction, infiltration basin property acquisition and construction, treatment plant construction, LGAC system, and UV AOP system. Annual O&M costs include direct costs such as electricity for pumps, UV AOP system, pump maintenance, routine O&M labor, LGAC media changeouts and disposal, UV AOP lamp replacements, treatment additives, lab analysis and periodic reporting costs.

ALTERNATIVE 6 – GROUNDWATER EXTRACTION AND TREATMENT AT DUAL TREATMENT PLANTS WITH DISCHARGE TO INFILTRATION BASIN AND INJECTION WELLS, ICS

Present Worth Cost Estimate: $300.5 million
Capital Cost Estimate: $151.6 million
Annual O&M Cost Estimate: $11.7 million

Alternative 6 is groundwater extraction and treatment at dual treatment plants with discharge to infiltration basin and injection wells, and ICs. The Santa Ana RWQCB waste discharge permit provides standards for infiltration/injection to the aquifer (Order No. R8-2002-0033 and Amending Order No. R8-2013-0020). Discharge standards for recharge of treated groundwater include MCLs for the VOCs and the NL for 1,4-dioxane.

Under Alternative 6, groundwater would be conveyed to one of two treatment plants. The groundwater from one group of extraction wells would be conveyed to a dedicated treatment plant to remove COCs and returned to the

aquifer system via an adjacent infiltration basin (assumed to be located east of state route 57 and north of state route 91, approximately 2,200 feet south of OCWD's La Jolla Recharge Basin, in the City of Anaheim). Groundwater from a second group of extraction wells would be conveyed to a second treatment plant to remove COCs and returned to the aquifer via injection wells (assumed to be located on North East Street in the area between the 91 Freeway and the Raymond Flood Control Basin, in the City of Anaheim). Approximately 47,000 feet of piping (6-inch to 22-inch diameter) would be constructed to convey groundwater to the two treatment plants. Alternative 6 requires purchase of approximately 3-acres of geologically suitable land for construction of a recharge basin, and adjacent treatment plant with flow rate of 2,873 gpm. An additional treatment plant would be constructed with flow rate of 3,673 gpm and discharge to 10 injection wells completed in the Shallow zone. The treatment plant process for both plants includes particulate filters to remove suspended solids, LGAC to remove VOCs, and a UV AOP unit to remove 1,4-dioxane. Capital costs for this alternative include direct costs of monitoring and extraction well installation, piping network construction, infiltration basin property acquisition and construction, treatment plant construction for both plants, injection well construction, LGAC system, and UV AOP system. Annual O&M costs include direct costs such as electricity for pumps, UV AOP system, pump maintenance, routine O&M labor, LGAC media changeouts and disposal, UV AOP lamp replacements, treatment additives, lab analysis and periodic reporting costs.

EVALUATION OF ALTERNATIVES

EPA uses nine criteria specified in the NCP at 40 CFR § 300.430(e)(9)(iii) to evaluate the alternatives and select remedial actions (refer to the inset below for a more detailed description of the evaluation criteria). This section summarizes the relative performance of each alternative against the nine criteria and each other. A detailed analysis of alternatives is provided in the 2025 Interim Remedy FS Report.

The alternatives are evaluated against two threshold criteria: overall protection of human health and the environment, and compliance with ARARs. For four of the five balancing criteria—long-term effectiveness and permanence, reduction of toxicity, mobility and volume through treatment, short-term effectiveness, and implementability—each alternative is rated using a qualitative five-point scale: good, fair to good, fair, poor to fair, and poor. These ratings are based on experience and professional judgment. For the fifth balancing criterion, cost, the rating scale is modified to: low, low to moderate, moderate, moderate to high, and high. The two modifying criteria—state/support agency acceptance and community acceptance—are evaluated after the close of the public comment period for the Proposed Plan.

Overall Protection of Human Health and the Environment

Alternative 1 (No Action) is not protective of human health and the environment because it would not prevent direct contact with COCs in groundwater and would allow COCs in groundwater to continue to migrate beyond the Target Area. Alternatives 2 through 6 are protective of human health and the environment. Alternatives 2-6 include ICs that would prevent exposure by restricting use of and access to COCs in groundwater within the Target Area. Alternatives 2 through 6 extract COC impacted groundwater to prevent further migration of COCs from the Target Area. Alternatives 2 through 6 achieve RAOs. Because Alternative 1 does not achieve RAOs and is not protective of human health and the environment, it is not further discussed under the remaining evaluation criteria.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Section 121(d) of CERCLA, 42 U.S.C. § 9621(d) and Section 300.430(f)(1)(ii)(B) of the NCP, 40 C.F.R. §300.430(f)(1)(ii)(B), require that remedial actions at CERCLA sites must at least attain legally applicable or relevant and appropriate federal and state environmental requirements, standards, criteria, and limitations, which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA Section 121(d)(4). "Applicable" requirements are those cleanup standards, standards of control, or other substantive requirements, criteria, or limitations promulgated under federal or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA Site. 40 C.F.R. § 300.5. Only those state standards that are more stringent than federal requirements

Evaluation Criteria for Superfund Remedial Alternatives

1. Overall Protection of Human Health and the Environment: evaluates how risks to human health and the environment are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs): evaluates whether an alternative meets federal and state environmental statutes, regulations, and other requirements, 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 Through Treatment: evaluates whether and how an alternative uses treatment to reduce the harmful effects of 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 and impacts posed to workers, residents, and the environment during implementation.

6. Implementability: considers the technical and administrative ability to implement an alternative, including factors such as the availability of materials and services.

7. Cost: evaluates the 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 any State comments on EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.

9. Community Acceptance: considers any community comments on EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

may be applicable. "Relevant and appropriate" requirements are those standards that while not being directly applicable, address problems or situations sufficiently similar to those encountered at the site that their application is well-suited to the particular circumstance. 40 C.F.R. § 300.5.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Section 121(d) of CERCLA, 42 U.S.C. § 9621(d) and Section 300.430(f)(1)(ii)(B) of the NCP, 40 C.F.R. §300.430(f)(1)(ii)(B), require that remedial actions at CERCLA sites must at least attain legally applicable or relevant and appropriate federal and state environmental requirements, standards, criteria, and limitations, which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA Section 121(d)(4). "Applicable" requirements are those cleanup standards, standards of control, or other substantive requirements, criteria, or limitations promulgated under federal or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA Site. 40 C.F.R. § 300.5. Only those state standards that are more stringent than federal requirements may be applicable. "Relevant and appropriate" requirements are those standards that while not being directly applicable, address problems or situations sufficiently similar to those encountered at the site that their application is well-suited to the particular circumstance. 40 C.F.R. § 300.5.

Section 121(d)(4)(A) of CERCLA provides that EPA may select an action that does not meet an ARAR if the selected action "is only part of a total remedial action that will attain such level or standard of control when completed." The proposed action is an interim remedial action and will be part of a total remedial action to address contaminated groundwater at the Site. While the future final remedial action aims to restore the aquifer to beneficial use, this interim remedial action focuses on preventing human exposure to COC impacted groundwater within the Target Area and preventing the migration of COCs from the Shallow zone within this area. The future final remedial action will be selected to address remaining unacceptable risks presented by the plume and restore the Shallow and Principal zones to beneficial use.

Alternatives 2 through 6 each meet the identified ARARs for treatment and discharge of extracted groundwater. Attainment of chemical-specific ARARs in groundwater

within the aquifer will be addressed in a future decision document for the final Site remedy that addresses the restoration of groundwater.

Long-Term Effectiveness and Permanence

Alternatives 2 through 6 each are rated good. Each alternative includes the extraction and treatment of groundwater to contain COC impacted groundwater in the Shallow zone of the Target Area. The extracted groundwater will be treated by a groundwater treatment plant (Alternatives 3, 4, 5, and 6) or by the Orange County Sanitation District wastewater treatment plant and replenishment system (Alternative 2). Alternatives also include performance monitoring, and ICs to prevent direct contact with COC impacted groundwater within the Shallow zone of the Target Area. Alternatives 2 through 6 are each expected to satisfy the interim remedy RAOs in the long-term, but each would require maintenance of the conveyance pipelines and treatment infrastructure, routine groundwater quality and performance monitoring, and maintenance of ICs during the lifetime of the interim remedy. Although the preferred alternative (Alternative 4) is not expected to restore the Shallow and Principal zones to beneficial use, it is expected that implementation of the preferred alternative will significantly reduce COC mass in the Shallow zone and therefore reduce time to reach restoration.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternatives 2 through 6 are rated good because they include groundwater extraction and treatment to reduce the mass of COCs and contain impacted groundwater in the Shallow zone within the Target Area. Extracted groundwater will be treated to meet ARARs before discharge. Spent carbon will be sent for regeneration at permitted facilities, where the COCs will be destroyed, either thermally or chemically. The AOP treatment process will destroy 1,4-dioxane.

Short-Term Effectiveness

Alternative 2 (Groundwater Extraction & Discharge to POTW/GWRS) is rated fair/good because it relies on existing treatment systems. Reduced infrastructure construction (i.e., no additional treatment plant construction) may result in lower environmental impacts and short-term risks to construction workers. This alternative may require longer to reach RAOs because the GWRS currently does not have capacity to treat the full volume of extracted groundwater.

Alternative 3 (Extraction/Treatment & Discharge to Direct Potable Use) is rated fair because it relies on a newly constructed treatment system and additional pipeline construction. Alternatives 3 through 6 generate treatment residuals (e.g., spent carbon and particulate filters) that require proper waste management. The City of Fullerton has indicated that the infrastructure and funding constraints, administrative uncertainties with OCWD, and concerns about total dissolved solids levels in treated groundwater would have to be addressed prior to accepting treated water for potable use. Resolution of these items, if feasible, would delay the time required to reach RAOs.

Alternatives 4 through 6 require construction of new conveyance pipelines and treatment systems, which represent some environmental impact and short-term risk to construction workers. Potential risks to workers can be mitigated through appropriate occupational health and safety practices. These alternatives will also generate some treatment residuals that require waste management. Alternative 4 (Extraction/Treatment & Discharge to Injection Wells) is rated fair/good because it requires less demolition and construction compared to Alternatives 5 and 6. Alternatives 5 (Extraction/Treatment & Discharge to Infiltration Basin) and 6 (Extraction/Treatment at Dual Treatment Plants & Discharge to Infiltration Basin and Injection Wells) are rated fair because they require more significant infrastructure for implementation of the infiltration basin and construction of multiple treatment plants and may have higher short-term risks and longer time to implementation compared to Alternative 4.

Implementability

Alternatives 2 through 6 are each expected to meet the RAOs and be protective of human health and the environment. However, Alternative 2 (Extraction & Discharge to POTW/GWRS) is currently not implementable

because the GWRS cannot accommodate the full volume of extracted groundwater from the interim remedy. Alternative 3 (Extraction/Treatment & Discharge to Direct Potable Use) is currently not implementable because the City of Fullerton has declined to accept the full volume of treated groundwater (in an April 2025 letter to EPA) based on the infrastructure and funding constraints, administrative uncertainties with OCWD, and concerns about total dissolved solids levels in treated groundwater. However, Alternatives 2 and 3 have been retained for potential selection, as the limiting factors (i.e., capacity or administrative concerns) may change in the future and allow for implementation of these alternatives. In addition, the remedial design process may determine that optimization would include a combination of components of the alternatives. Any post-ROD change to the interim remedy will be properly evaluated and documented in accordance with the NCP.

Alternative 2 (Extraction/Treatment & Discharge to POTW/GWRS) is ranked as poor for current implementability because the GWRS currently lacks the capacity to accept the full volume of extracted groundwater, which would require an additional flow rate of 6,351 gpm. Adding a fourth expansion to accommodate this is not feasible due to space limitations on OCWD's property. However, with the recent decline in flow rates into Orange County Sanitation District treatment plants, additional capacity may become available in the future.

Alternative 3 (Extraction/Treatment & Discharge to Direct Potable Use) is ranked as poor/fair because the City of Fullerton would need to upgrade and modify its distribution system to accommodate the treated groundwater. This would include constructing a new pump station and upgrading pipelines, valves, and electrical components. Additionally, the level of total dissolved solids, a secondary MCL, in the treated groundwater is likely to exceed the city's acceptance requirements. However, if implemented, Alternative 3 would alleviate 42% of the City of Fullerton’s current water demand. The City of Fullerton has declined to accept the full volume of treated groundwater.

Alternatives 4 through 6 each use established technologies with commercially available equipment and are implementable. Alternative 4 (Extraction/Treatment & Discharge to Injection Wells) is the most easily implementable and ranked fair/good because it requires the least amount of new conveyance pipeline and acquired land for construction of treatment and discharge infrastructure. Anticipated potential technical challenges include clogging of injection wells and will likely require periodic maintenance and regular backflushing to maintain injection capacity. Alternative 5 (Extraction/Treatment & Discharge to Infiltration Basin) and Alternative 6 Extraction/Treatment at Dual Treatment Plants & Discharge to Infiltration Basin and Injection Wells) are ranked fair. Alternative 5 requires acquisition of a relatively large area of developed land, and areas favorable for surface recharge are in the far eastern portion of the North Basin Area. Alternative 6 requires acquisition of developed land for two treatment plant locations an infiltration basin, and construction and annual O&M of two complex groundwater treatment plants.

Cost

The present worth costs over a presumed 30-year period are presented in **Table 4** and discussed in detail in the FS Report. The cost estimates are based on the best available current information and have an expected accuracy of plus-50 to minus-30 percent. Alternative 1: No Action has no cost because no activities are implemented. The highest present worth cost is Alternative 2 at $301.4 million.

TABLE 4: Remedial Alternative Cost Comparison

Cost Category	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Present Worth Cost[1]	$301.4 million	$234.1 million	$248.9 million	$271.9 million	$300.5 million
Capital Cost	$50.1 million	$113.5 million	$118.0 million	$147.7 million	$151.6 million
Annual O&M Cost	$20.0 million	$9.4 million	$ 10.2 million	$9.5 million	$ 11.7 million

[1] Assumes a 7% discount rate on periodic costs over a 30-year period.

State/Support Agency Acceptance

Two state agencies (the DTSC and SARWQCB) have been involved during the OCNB Interim Remedy RI/FS process. State/Support Agency acceptance will be evaluated upon receipt of all Regulatory Agency comments on the proposed plan and will be described in the Interim ROD.

Community Acceptance

Community acceptance will be evaluated after the public comment period ends and all comments are reviewed. Comments received during the public comment period will be addressed in the Responsiveness Summary section of the OCNB Interim ROD. The ROD is the document in which the EPA will select the interim remedy.

TABLE 5: Remedial Alternatives Evaluation Summary

EVALUATION CRITERIA	Alternative 1 No Action	Alternative 2 Extraction & Discharge to POTW/ GWRS, ICs	Alternative 3 Extraction/ Treatment & Discharge to Direct Potable Use, ICs	Alternative 4 (Preferred) Extraction/ Treatment & Discharge to Injection Wells, ICs	Alternative 5 Extraction/ Treatment & Discharge to Infiltration Basin, ICs	Alternative 6 Extraction/ Treatment at Dual Treatment Plants, Discharge to Infiltration Basin and Injection Wells, ICs
Overall Protectiveness	No	Yes	Yes	Yes	Yes	Yes
Compliance with State and Federal Requirements	NA	Yes	Yes	Yes	Yes	Yes
Long-term Effectiveness and Permanence	Poor	Good	Good	Good	Good	Good
Reduction of Toxicity, Mobility, or Volume	Poor	Good	Good	Good	Good	Good
Short-term Effectiveness	NA	Fair/Good	Fair	Fair/Good	Fair	Fair
Implementability	NA	Poor	Poor/Fair	Fair/Good	Fair	Fair
Present Worth Cost (in millions)	0	$301.4	$234.1	$248.9	$271.9	$300.5

NOTES:

Cost estimates are considered order-of-magnitude with an expected accuracy of plus 50 to minus 30 percent.

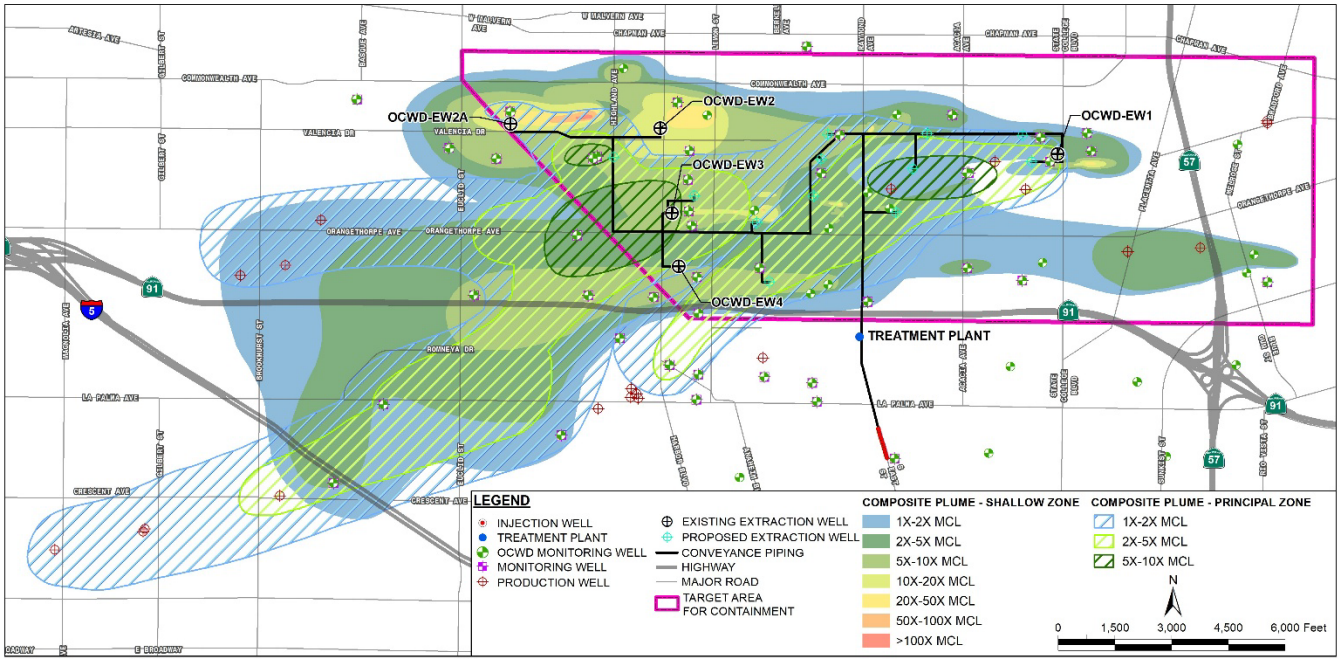
State Agency and Community Acceptance – State agency and community acceptance of the preferred alternative will be evaluated after the public comment period.

NA = not applicable

PREFERRED ALTERNATIVE AND BASIS FOR PREFERENCE

Based on evaluation of interim remedial alternatives using the first seven of the nine NCP criteria, EPA proposes Alternative 4 - Groundwater Extraction and Treatment at Centralized Treatment Plant with Discharge to Injection Wells and ICs as the preferred interim remedy for OCNB Superfund Site. The conceptual layout of Alternative 4 is shown in **Figure 3** and **Figure 4.** The final layout would be updated and optimized during the Remedial Design process.

FIGURE 3: Alternative 4 Groundwater Extraction and Treatment, Discharge to Injection Wells



The Preferred Alternative 4 includes:

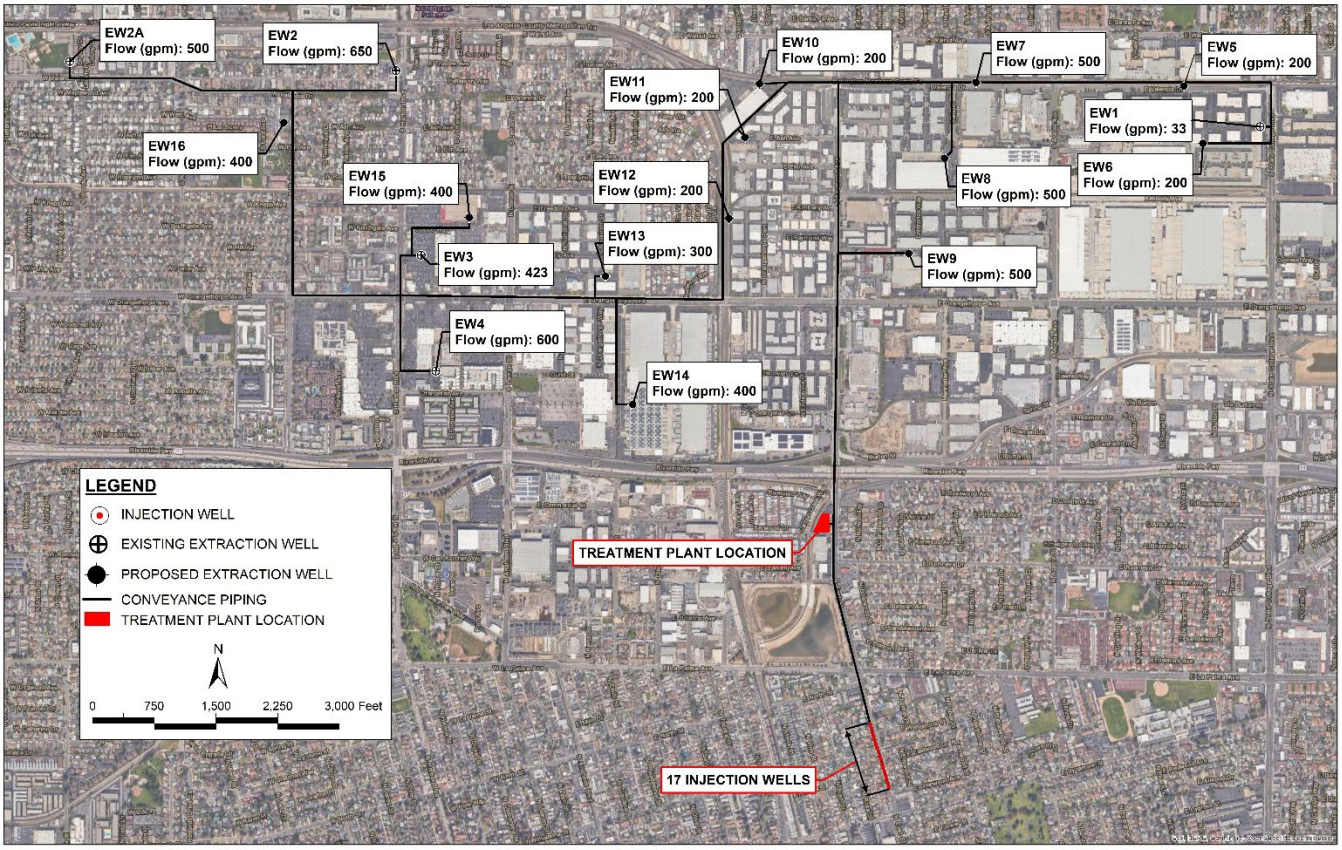
- Installation of 17 extraction wells within the Shallow zone to achieve plume containment within the Target Area
- Conveyance of extracted groundwater to a centralized treatment plant for removal of COCs using particulate filters, LGAC, and UV AOP technologies
- Installation of an injection wellfield including 17 Shallow zone injection wells to return treated groundwater to the aquifer
- Performance monitoring with 20 additional groundwater monitoring wells and annual groundwater monitoring to compare COC concentrations at the Target Area after interim remedy startup with COC concentrations at baseline (i.e., prior to startup).
- ICs to prevent direct contact with COCs in groundwater until the Shallow and Principal aquifers are restored to beneficial use

The total estimated present-worth cost for the preferred alternative over a 30-year period is $248.9 million. 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 details on projected costs are presented in the FS Report. The preferred alternative would prevent further vertical and lateral migration of COCs from the Shallow zone within the Target Area.

Alternative 1 (No Action) will not protect human health and the environment or meet RAOs or ARARs. Alternative 2 (Extraction & Discharge to POTW/GWRS) and Alternative 3 (Extraction/Treatment & Discharge

to Direct Potable Use) were not selected because the discharge options are currently not capable of accepting the entire volume of treated groundwater. Preferred Alternative 4 (Extraction/Treatment & Discharge to Injection Wells) is the most cost-effective and implementable alternative. Alternative 5 (Extraction/Treatment & Discharge to Infiltration Basin) and Alternative 6 (Extraction/Treatment at Dual Treatment Plants & Discharge to Infiltration Basin and Injection Wells) require additional land acquisition and O&M for infiltration basin infrastructure and multiple treatment plants, impacting cost, implementability, and short-term effectiveness.

FIGURE 4: Alternative 4 Site Plan



STATUTORY DETERMINATIONS

Preferred Alternative 4 meets CERCLA threshold criteria and provides the best outcomes among the other alternatives with respect to the primary balancing criteria. EPA expects the preferred alternative to satisfy the statutory requirements in CERCLA § 121(b): 1) be protective of human health and the environment; 2) comply with ARARs); 3) be cost-effective; 4) use permanent solutions and alternative treatment technologies to the maximum extent practical; and 5) satisfy the preference for treatment as a principal element.

FIVE-YEAR REVIEWS

Because this remedy 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.

INFORMATION REPOSITORIES

OCNB Superfund Site Interim RI and FS Reports and other Site-related technical documents are part of the Administrative Record for the interim remedy. The Administrative Record is available for review at the locations listed below. The Administrative Record for the Site can also be accessed online at https://www.epa.gov/superfund/orange-county-north-basin.

EPA REGION 9 SUPERFUND RECORDS CENTER

75 Hawthorne Street, Room 3100
San Francisco, CA 94105
(415) 947 – 8717

ANAHEIM CENTRAL LIBRARY

7150 La Palma Avenue
Buena Park, CA 90620
(714) 826-4100 Ext.

BUENA PARK LIBRARY DISTRICTS

500 West Broadway
Anaheim, CA 92805
(714) 765-1880

FULLERTON PUBLIC LIBRARY

353 West Commonwealth Avenue
Fullerton, CA 92832
(714) 738-6333

SITE CONTACTS AND PUBLIC COMMENT

For additional copies or other information on the OCNB Superfund Site Interim Remedy Proposed Plan, or to submit comments in writing or email during the **public comment period January 5, 2026 to February 19, 2026**, please contact the following:

Amanda Cruz
Remedial Project Manager
EPA Region 9
75 Hawthorne Street
San Francisco, CA 94105-3901
Email: cruz.amanda@.epa.gov

In addition to written comments, EPA will accept public comments orally during the community meetings listed on **Page 1**. EPA will review the transcript of all formal oral comments received at the meetings and all written comments received during the formal comment period before making a final decision on the interim remedy. EPA will prepare a written response to all the formal written and oral comments received. Comments and responses will become part of the official public record. The transcript of comments and EPA's written responses will be issued in a document called the Responsiveness Summary which will be included when EPA releases the ROD for the interim remedy. If you have any clarification questions about the proposed plan, please call Amanda Cruz at (415) 972-3084. EPA will announce the publication of the Interim ROD and final decision on the interim remedial action through the local media and via EPA's website.