Record of Decision
U.S. Environmental Protection Agency
Region 9

Mid-Basin Operable Unit
Rockets, Fireworks, and Flares Superfund Site
San Bernardino County, CA
EPA ID: CAN000905945

September 2, 2022

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Acronyms and Abbreviations

§	Section
§§	Sections
µg/L	microgram(s) per liter
AHPA	Archaeological and Historic Preservation Act
amsl	above mean sea level
APE-West	American Promotional Events–West
ARAR	Applicable or Relevant and Appropriate Requirement
ARPA	Archaeological Resources Protection Act
BACT	best available control technology
bgs	below ground surface
CA	California
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
COC	chemical of concern
COVID-19	coronavirus disease 2019
CWA	Clean Water Act
DLR	detection limit for reporting
DOJ	U.S. Department of Justice
DTSC	California Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
ESA	Endangered Species Act
ESD	explanation of significant differences
FS	Feasibility Study
Goodrich Corporation	B.F. Goodrich Corporation
gpm	gallon(s) per minute

HQ	hazard quotient
LGAC	liquid-phase granular-activated carbon
MBOU	Mid-Basin Operable Unit
MCL	maximum contaminant level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NPL	Superfund National Priorities List
NPV	Net Present Value
NRHP	National Register of Historic Places
O&M	operations and maintenance
OU	operable unit
PCE	tetrachloroethylene
PHG	public health goal
PRP	potentially responsible party
PSI	Pyro Spectaculars Inc.
RAIS	Risk Assessment Information System
RAO	Remedial Action Objective
RASP	Rialto Ammunition Backup Storage Point
RCB	Rialto-Colton Groundwater Basin
RCRA	Resource Conservation and Recovery Act
RfD	reference dose
RFF Site	Rockets, Fireworks, and Flares Superfund Site
RI	Remedial Investigation
ROD	Record of Decision
SAOU	Source Area Operable Unit
SBFCD	San Bernardino County Flood Control District
SCAQMD	South Coast Air Quality Management District
SDWA	Safe Drinking Water Act
Site	Rockets, Fireworks, and Flares Superfund Site
STLC	soluble threshold limit concentration
TCE	trichloroethene
TTLC	total threshold limit concentration

U.S.C.	U.S. Code
UIC	underground injection control
VOC	volatile organic compound
Water Board	California Regional Water Quality Control Board, Santa Ana Region
WSA	Water Spreading Agreement
WVWD	West Valley Water District

Part 1: The Declaration

1.1 Site Name and Location

The Rockets, Fireworks, and Flares Superfund Site (RFF Site, or Site) is located in San Bernardino County, California. The Site was formerly known as the B.F. Goodrich site. See Figure 1 for the Site location. The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) ID for the Site is CAN000905945.

1.2 Statement of Basis and Purpose

This decision document presents the selected remedy for the Mid-Basin Operable Unit (MBOU or OU2) of the RFF Site. The selected remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the Administrative Record for the Site. The State of California was consulted on the proposed remedy in accordance with CERCLA Section 121 (f) (42 U.S. Code [U.S.C.] Section [§] 9621 (f)) and concurs with the selected remedy.

1.3 Assessment of Site

The response action selected in this Record of Decision (ROD) is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment, and/or from pollutants or contaminants from this Site which may present an imminent and substantial endangerment to public health or welfare.

1.4 Description of Selected Remedy

U.S. Environmental Protection Agency's (EPA's) selected remedy for the MBOU is a groundwater extraction and treatment system intended to protect human health by preventing exposure to groundwater affected by Site contaminants, protect drinking water supply wells threatened by Site-related contamination, and protect and restore the groundwater resource. The selected remedy is the second of two remedies which address contaminated groundwater at the Site. EPA's first groundwater remedy, known as the Source Area Operable Unit (SAOU), addresses the most contaminated groundwater at the Site; this second remedy addresses contaminated groundwater that has moved past (i.e., downgradient of) the area targeted by EPA's SAOU. EPA is also evaluating the feasibility of cleaning up contaminated soil at the 160-acre source area at the Site.

The remedy for the MBOU includes the following remedy components:

- Groundwater extraction wells to pump contaminated water to the surface in two areas: the "leading edge" of contamination where Site-related perchlorate concentrations remain above drinking water standards; and a mid-plume area where contaminant concentrations are higher. The preliminary estimate of the average extraction rate needed in the leading-edge area is 2,400 gallons per minute (gpm). Extraction in the mid-basin area will vary over time from zero up to about 2,000 gpm.

- Water treatment systems to remove perchlorate, the most prevalent Site contaminant, from the extracted groundwater to levels below the California drinking water standard. A biological treatment process and/or ion exchange technology will be used to remove perchlorate from the groundwater. The need for water treatment systems to remove other constituents will be determined during remedial design.
- Pipelines and pumps to convey the contaminated water from the groundwater extraction wells to the treatment plant, and from the treatment plant to one or more end use locations. After treatment, the water will be delivered to one or more local drinking water utilities which will distribute the water to their customers, and to existing groundwater recharge basins and/or groundwater injection wells where the treated water will be returned to the Rialto-Colton Groundwater Basin (RCB).
- A groundwater monitoring program to provide data to determine if the remedy is achieving its objectives, including hydraulic control of contamination in the leading-edge area and progress in reducing concentrations of Site-related contamination throughout the MBOU.

The remedy will require new construction and is expected to make use of existing wells, water treatment systems, and pipelines. Decisions about the exact location of any new groundwater wells, the water treatment location, and pipeline locations will be made during the design phase of the project.

The total present worth cost for the Selected Remedy is estimated at $31.0 to $37.2 million.

1.5 Statutory Determinations

The Selected Remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, is cost-effective, and utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable.

This remedy also satisfies the statutory preference for treatment as a principal element of the remedy (i.e., reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment).

Because this remedy will take more than 5 years to complete and will result in hazardous substances, pollutants, or contaminants remaining onsite above levels that allow for unlimited use and unrestricted exposure during the time cleanup is ongoing, a policy review will be conducted within 5 years after construction is complete to ensure that the remedy is protective of human health and the environment.

1.6 ROD Data Certification Checklist

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the Administrative Record for this Site.

- Chemicals of concern (COCs) and their respective concentrations (Section 2.6.1 and Table 3)
- Baseline risk represented by the COCs (Section 2.6)
- Cleanup levels established for COCs and the basis for these levels (Table 11)

- Current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD (Section 2.5)
- Potential groundwater use that will be available at the Site as a result of the selected remedy (Section 2.11.2)
- Estimated capital, annual operation and maintenance (O&M), and total present value costs, discount rate, and the number of years over which the remedy cost estimates are projected (Section 2.11.3)
- Key factors that led to selecting the remedy (Section 2.11.1)

1.7 Authorizing Signature

This ROD documents the remedy for contaminated groundwater at the MBOU of the RFF Site. The Director of the Regional Superfund Division has been delegated the authority to approve and sign this ROD. The State of California concurs with the selected remedy.

MICHAEL MONTGOMERY

Digitally signed by MICHAEL MONTGOMERY
Date: 2022.09.02 15:34:02 -07'00'

Michael M. Montgomery, Director
Superfund and Emergency Management Division
U.S. Environmental Protection Agency Pacific Southwest Region

Date

Part 2: Decision Summary

2.1 Site Name, Location, and Brief Description

The RFF Site is located in San Bernardino County, California (CA).

See Figure 1 for the Site location and Figure 2 for an aerial photo of a portion of western San Bernardino County which includes the Site (looking to the northwest toward the San Gabriel and San Bernardino Mountains).

EPA's CERCLIS ID for the Site is: CAN000905945.

EPA is the lead agency for the Site. The California Department of Toxic Substances Control (DTSC) is the primary State agency supporting EPA's efforts. EPA has also worked cooperatively with a second State agency, the California Regional Water Quality Control Board, Santa Ana Region (Water Board).

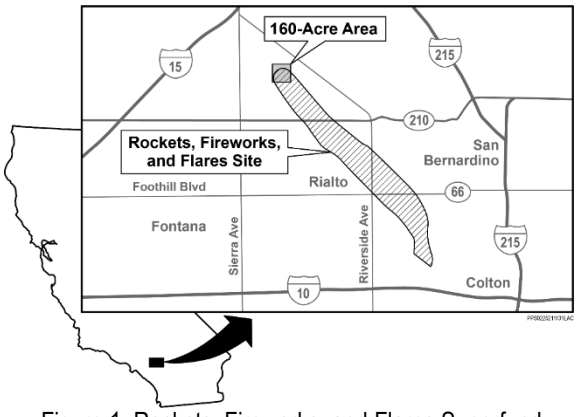

Figure 1. Rockets, Fireworks, and Flares Superfund Site Location

Currently, cleanup work at the Site is financed by Potentially Responsible Parties (PRPs). Section 2.2, Site History and Enforcement Activities, provides additional detail on the source of cleanup monies.

The Site includes contaminated soil and groundwater in an industrial area in Rialto, California known as the "160-acre area" and contaminated groundwater that has spread to the south and east into the cities of Colton and San Bernardino. The 160-acre area is where most or all of the Site contaminants appear to have entered the groundwater and where testing has identified the highest levels of groundwater contamination.

Figure 2. Aerial Photo of the Rialto-Colton Area (looking northwest)

2.2 Site History and Enforcement Activities

The following sections provide a Site history and summarize enforcement activities and community participation activities at the Site.

2.2.1 Site Activities that Contributed to the Contamination

The 160-acre area is part of a larger area developed by the U.S. Army in the 1940s as an inspection, consolidation, and storage facility for ammunition and other ordnance in transit to the Port of Los Angeles. The facility, known as the Rialto Ammunition Backup Storage Point (RASP), included a network of rail spurs to store rail cars, bunkers adjacent to the rail spurs, concrete storage igloos, and magazines used to store ammunition.

The U.S. Army ceased operations at the RASP in about 1946. Since then, the 160-acre area has been used by a variety of defense contractors, fireworks manufacturers, and others who used perchlorate salts and other chemicals in their manufacturing activities or products.

From about 1952 to 1957, West Coast Loading Corporation manufactured photoflash flares and ground-burst simulators, both containing potassium perchlorate, disposed of wastes onsite, and used its facility in 1957 to dry ammonium perchlorate.

From about 1957 to 1962, B.F. Goodrich Corporation (Goodrich Corporation) developed, tested, and produced solid-fuel rocket propellant and solid-fuel missile and rocket motors containing ammonium perchlorate, used chlorinated solvents in its operations, and disposed of wastes in one or more onsite pits.

From about 1968 to 1987, Pyrotronics manufactured, tested, and distributed pyrotechnics containing potassium perchlorate, and disposed of wastes onsite.

Since 1979, Pyro Spectaculars Inc. (PSI), a public display fireworks operator, wholesaler, and importer and exporter of fireworks, has operated on the 160-acre area. PSI tested fireworks, burned waste materials, and disposed of wastes onsite. Since about 1989, American Promotional Events–West (APE-West) has operated on the 160-acre area. APE-West tested and stored fireworks containing potassium perchlorate and burned defective and off-spec fireworks onsite.

2.2.2 Site Investigations and Enforcement Activities

The Water Board led investigation and cleanup efforts at the Site from 2002 until about 2008. They issued approximately 23 directives to current and past property owners and tenants pursuant to State authority, requiring submittal of information, soil testing, and/or groundwater testing. The DTSC has also directed and overseen soil testing on a portion of the Site.

EPA directed and/or conducted investigation efforts at the Site beginning in about 2003, initially complementing State efforts and beginning in about 2009 as the lead agency. EPA added the Site to the Superfund National Priorities List (NPL) in September 2009. EPA efforts included oversight of soil sampling, soil gas sampling, and groundwater well installation and sampling conducted by the Goodrich Corporation in 2004, oversight of soil and soil gas sampling by Emhart Industries (a corporate successor to West Coast Loading Corporation) in 2004, 2006, and 2007, and additional groundwater well installation and sampling conducted by the Goodrich Corporation between 2013 and 2022.

EPA enforcement efforts at the Site included issuance of a Unilateral Administrative Order for Remedial Investigation (RI) work (2003), notifications to PRPs of potential CERCLA liability (2008), negotiation of an Administrative Order on Consent for RI work (2009), assistance to the U.S. Department of Justice (DOJ) in the filing of a complaint on EPA's behalf pursuant to CERCLA and the Resource Conservation and Recovery Act (RCRA) seeking reimbursement of costs and performance of response actions (2010), issuance of "Special Notice" letters inviting

PRPs at the Site to participate in settlement negotiations with EPA, and negotiation of an Administrative Consent Order and six Consent Decrees to resolve the litigation (2012–2017). Two of the six Consent Decrees require the performance of cleanup work at the Site.

2.2.3 Community Participation

The June 2021 Remedial Investigation/Feasibility Study (RI/FS) Report and January 2022 Proposed Plan for the MBOU of the RFF Site were made available to the public on January 24, 2022. They can be found in the Administrative Record and the information repository maintained by EPA at the Region 9 Office in San Francisco and are available online via links available on the EPA Site webpage at www.epa.gov/superfund/rff. A notice of the availability of the Proposed Plan and more than 150 documents considered in developing the Plan was published in the San Bernardino Sun newspaper on January 24, 2022. EPA recorded and made available on YouTube a presentation describing its Proposed Plan in lieu of a public meeting due to the coronavirus disease 2019 (COVID-19) pandemic. On January 25, 2022, EPA sent postcards by regular mail to approximately 516 parties announcing the availability of the Proposed Plan, explaining how to view the plan and the YouTube presentation about the plan, and explaining when and how to submit comments on the plan.

EPA also sent copies of the Proposed Plan by email on January 24, 2022 to representatives of the cities of Rialto, Colton, and Riverside, and other State and local agencies. A public comment period was held from January 24, 2022 to February 23, 2022. EPA's responses to comments received during this period are included in the Responsiveness Summary, which is part of this ROD.

Previous efforts to inform and engage the community about EPA's cleanup work at the Site included interviews of local residents, business representatives, representatives of neighborhood watch groups, and government officials (2010), development of a Site Community Involvement Plan (2013), preparation of fact sheets, additional interviews to gauge community interest and better understand technical assistance needs of the community related to EPA cleanup efforts (2015), regular updates to State and local agency representatives through participation in meetings generally held quarterly, and regular updates to the Site webpage.

2.3 Scope and Role of Operable Unit

EPA has organized its work at the Site into three operable units (OUs). The term "operable unit" describes a separate action in the cleanup of a large or complicated Superfund site.

The three RFF OUs are:

- Operable Unit 1, known as the "Source Area Operable Unit" (SAOU or OU1)
- Operable Unit 2, known as the "Mid-Basin Operable Unit" (MBOU or OU2)
- Operable Unit 3, known as the "Soils Operable Unit" (OU3)

Figure 3 shows the approximate location of OU3 (the 160-acre area) and the two groundwater OUs (OUs 1 and 2).

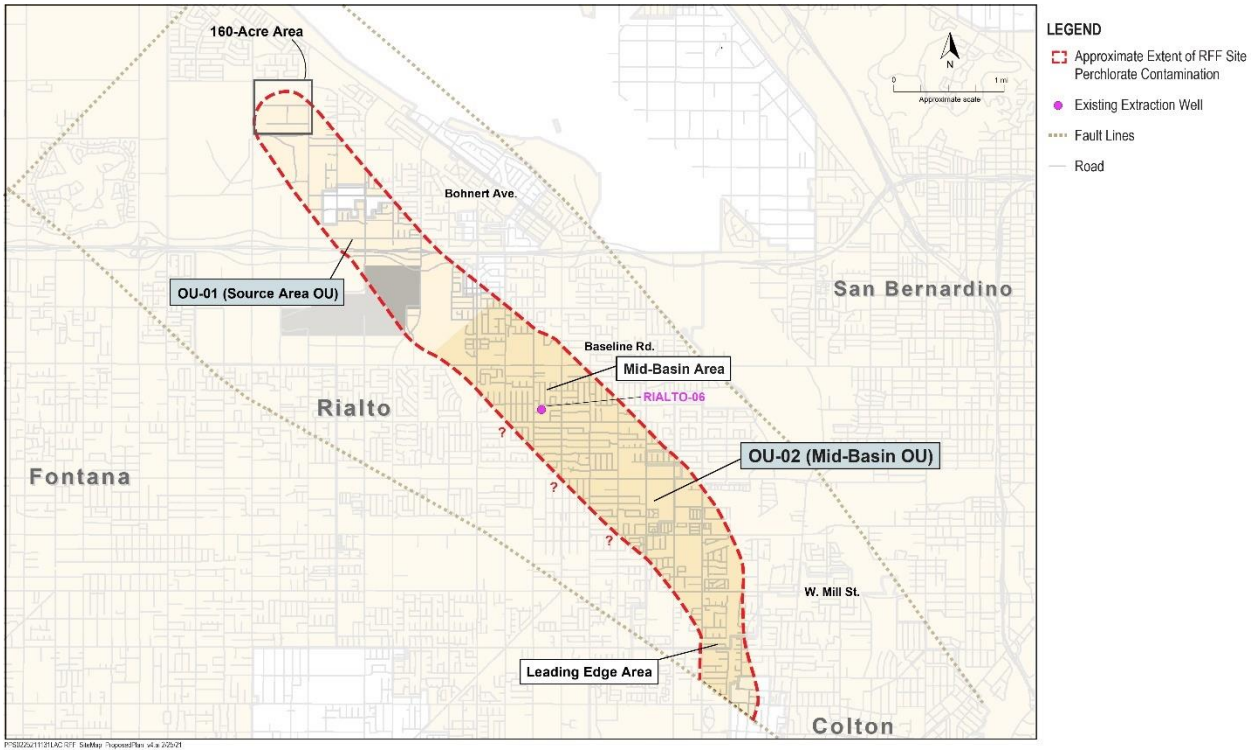

Figure 3. Rockets, Fireworks, and Flares Superfund Site Operable Units

EPA's OU1 (the SAOU) is the first of the two planned groundwater remedial actions at the Site. EPA selected a remedy for OU1 in 2010. The SAOU targets the most contaminated groundwater at the Site, which extends from the 160-acre area about 1.5 miles to the southeast and is intended to intercept and remove contaminated groundwater originating at and near the 160-acre source area. The cleanup facilities needed to implement EPA's 2010 plan have been constructed and are expected to begin operation in mid-2022. They include a new groundwater extraction well, expansion of an existing water treatment system, and other facilities needed to convey untreated and treated groundwater.

EPA's OU2 (the MBOU), the subject of this ROD, targets contaminated groundwater exceeding Federal or State drinking water standards (known as maximum contaminant levels or MCLs) which has moved past the area targeted by OU1. The groundwater contamination targeted for cleanup as part of OU2 is approximately 4 miles long, up to 1 mile wide, and ranges from about 250 to 800 feet below ground.

EPA's OU3 (the Soils OU) addresses contaminated soils at the 160-acre area. EPA will determine the need for cleanup at OU3 at a future date.

2.4 Site Characteristics

The following sections provide a conceptual site model, an overview of the Site, and a summary of groundwater resources, chemical contaminants, site sampling strategy, known or suspected sources of contamination, and the nature and extent of groundwater contamination targeted by this remedy.

2.4.1 Conceptual Site Model

The conceptual model for the Site (Figure 4) is that perchlorate and other COCs were released to the environment at multiple locations at the 160-acre area over a period of decades. Perchlorate release mechanisms are assumed to have included onsite disposal in one or more unlined pits, leakage or overflow from an onsite impoundment, airborne dispersion of material handled during manufacturing, disposal of contaminated rinse water onto unpaved areas, and at least one explosion. Releases probably began in the 1950s, and possibly earlier. Volatile organic compounds (VOCs) are assumed to have been released to the environment in multiple locations at the 160-acre area by onsite disposal in one or more unlined pits and/or other means.

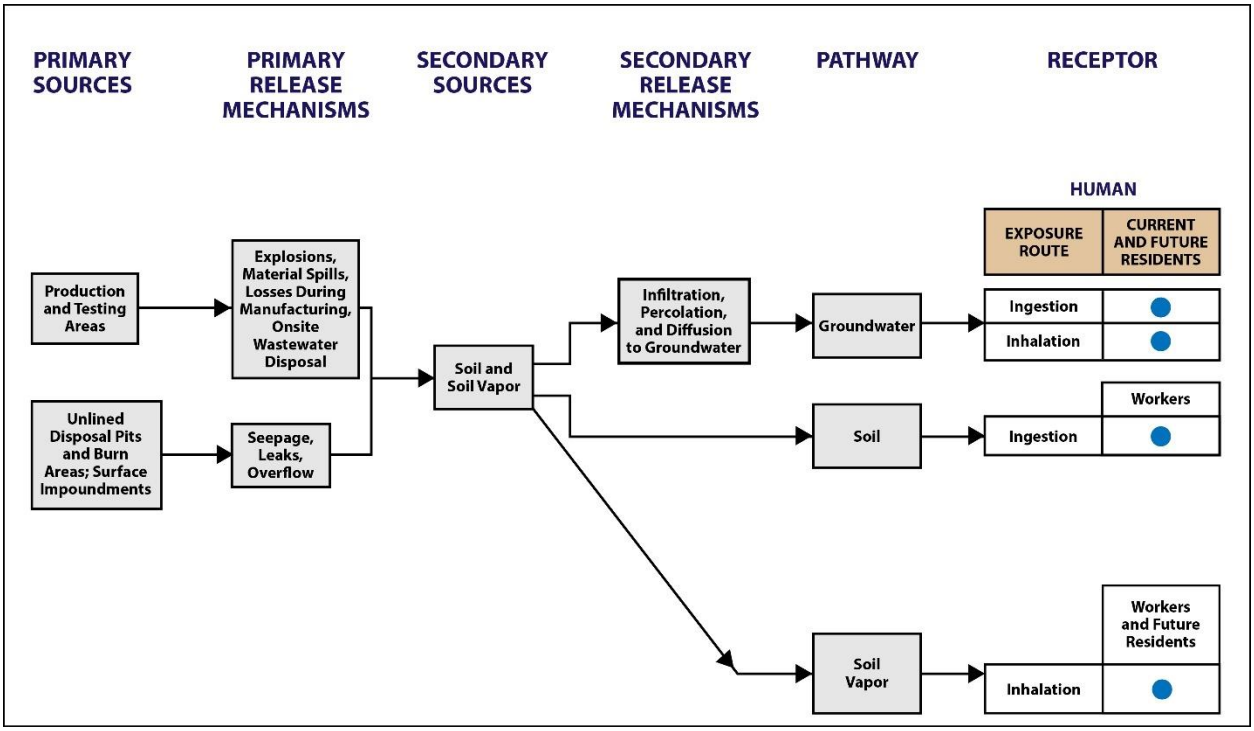

Figure 4. Conceptual Rockets, Fireworks, and Flares Superfund Site Model

The contaminants released to the environment contaminated surface soils, then moved downward to the groundwater through the several-hundred-foot-thick vadose zone. The downward movement of contaminants is the result of infiltration and percolation of rainfall and other liquids and (for VOCs) diffusion.

Above-average rainfall in the Rialto-Colton area during the winter of 2004–2005 resulted in a significant increase in groundwater levels later in 2005 and a one to two order-of-magnitude increase in groundwater contaminant concentrations in wells in the 160-acre area. Additional periods of above-average rainfall since 2004–2005 have also been followed by increases in contaminant concentrations in the groundwater. The increase in contaminant levels suggests that a significant amount of contaminant mass is still present in the vadose zone.

The contaminated groundwater poses a risk to human health if used for potable water supply. Large municipal water supply production wells are used to extract groundwater at and near the Site.

2.4.2 Site Overview

The RFF Site includes contaminated soil and groundwater in a 160-acre industrial area in Rialto, CA, and contaminated groundwater that has spread from the 160-acre area over a distance of about 6 miles to the south and east. The land surface at the Site gently slopes from an elevation of more than 1,600 feet above mean sea level (amsl) at the 160-acre area to less than 1,100 feet amsl at the leading-edge area of groundwater contamination. Most rainfall at the Site occurs from about November through April, with mean annual precipitation in the City of San Bernardino (located approximately 7 miles east of the Site) of approximately 16 inches. The average maximum summer temperature is 96 degrees Fahrenheit in July and August; the average winter minimum is 41 degrees Fahrenheit in December.

There are no perennial streams, rivers, or natural wetlands at the Site. The most prominent surface water feature at the Site is the Cactus Wash, which is a former stream channel that has been channelized and altered to accommodate development, provide flood control, and allow imported water to percolate into the ground to recharge the groundwater aquifer. Figure 5 shows the location of the Cactus Basins, part of the Cactus Wash.

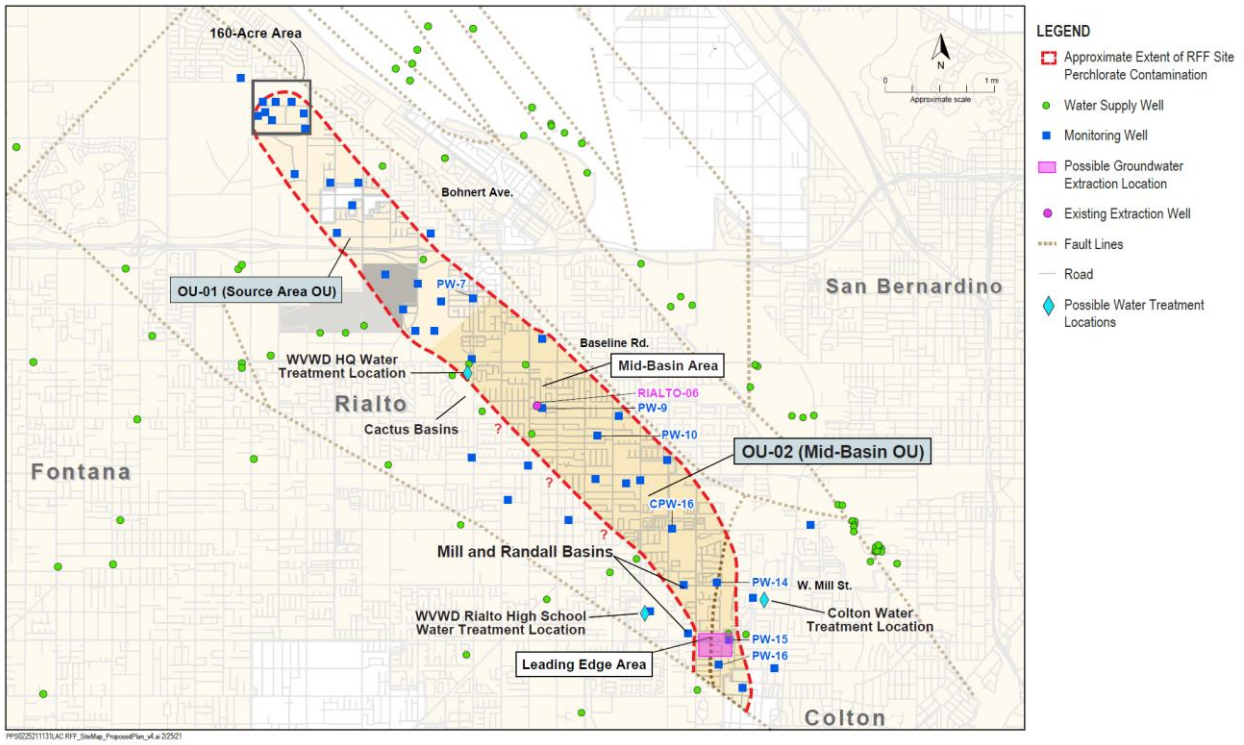

Figure 5. Rockets, Fireworks, and Flares Superfund Site Extent of Groundwater Contamination

2.4.3 Sampling Strategy

The RI at the Site began in the early 2000s and the RI for the MBOU began in about 2006. The RI has included soil and soil gas sampling at the 160-acre area, installation of groundwater monitoring wells, periodic water level monitoring, and the periodic collection and analysis of groundwater samples. These data have been used to monitor groundwater flow directions and hydraulic gradients and characterize and delineate the extent of groundwater contamination.

Sitewide, there are more than 175 wells, well zones, and piezometers. Many of the groundwater monitoring wells have more than one sampling zone to allow water level monitoring and the collection of water samples from multiple depths. Generally, a sample collected from the shallowest zone of a multilevel monitoring well is designated with the suffix "A" (e.g., PW-10A), the next deepest sample is labeled with the suffix "B" (e.g., PW-10B), and so on. Some of the wells with only one sampling zone were constructed in clusters of three or more wells to allow water level monitoring and sample collection from multiple depths at adjacent locations.

In the MBOU, in 2021, groundwater samples were collected and analyzed from 114 wells or well zones. Water levels were monitored in a similar number of wells. About 33 of the wells were in nine clusters of three or four wells. The other 81 well zones were in 16 wells with between five and seven zones per well. Wells have generally been monitored and sampled annually and groundwater samples analyzed for VOCs and perchlorate.

The Goodrich Corporation completed the majority of the sampling in 2006 and from 2013 to 2021. EPA conducted sampling between about 2008 and 2012.

Additional details about the groundwater sampling conducted for the MBOU are provided in the June 2021 Feasibility Study Report and multiple groundwater sampling reports and summary tables included in the Administrative Record. Table 1 lists the reports and data summaries.

Table 1. Groundwater Sampling Reports and Data Summaries

Report Date	Includes SAOU data	Includes MBOU data
March 24, 2005	x	
October 21, 2006	x	x
March 5, 2008	x	x
March 25, 2008	x	x
April 22, 2008		x
September 1, 2008	x	
November 3, 2008	x	
January 1, 2009	x	x
March 24, 2009	x	x
April 2, 2009	x	x
May 27, 2009	x	x
August 4, 2009		x
December 1, 2009	x	x
January 25, 2010	x	x
February 1, 2010	x	
April 1, 2010	x	x
August 1, 2010	x	x
November 7, 2011	x	x
September 18, 2012	x	x
February 27, 2013	x	x
September 1, 2013	x	
December 10, 2013		x
July 1, 2014	x	
October 1, 2014	x	
December 1, 2014	x	
December 3, 2014		x
February 1, 2015		x
March 1, 2015	x	x
April 27, 2015	x	
May 8, 2015	x	

Table 1. Groundwater Sampling Reports and Data Summaries		
Report Date	**Includes SAOU data**	**Includes MBOU data**
October 1, 2015	x	
November 23, 2015		x
January 1, 2016		x
May 2, 2016		x
May 9, 2016		x
October 1, 2016		x
November 1, 2016	x	
May 8, 2017		x
November 1, 2017	x	
January 22, 2018		x
February 21, 2018		x
March 22, 2018	x	x
June 1, 2018		x
November 1, 2018	x	
December 14, 2018		x
July 30, 2019		x
October 31, 2019	x	
December 3, 2019		x
December 9, 2019		x
July 2, 2020	x	
September 29, 2020		x
November 19, 2020		x
November 11, 2021		x
January 1, 2022	x	

Although they played a limited role in developing the MBOU remedy, the Administrative Record also includes groundwater reports for wells upgradient of the MBOU. The reports were prepared as part of the SAOU. Table 1 also lists the reports and data summaries prepared for the SAOU.

A limited number of groundwater samples have been analyzed for stable oxygen and chlorine isotopes to help distinguish between Site-related perchlorate and perchlorate likely to be naturally occurring or present from the past use of perchlorate-contaminated fertilizers. Nitrogen-rich fertilizers containing trace amounts of perchlorate were imported from the Atacama Desert in Chile in the early to mid-1900s and applied to high value crops like citrus once common in the mid-basin area. The reports and data summaries describing the stable oxygen and chlorine isotopic analyses are available in the Administrative Record and listed in Table 1.

2.4.4 Known or Suspected Sources of Contamination.

Groundwater testing at locations on or at the downgradient end of the 160-acre area (including the PW-2, PW-3, and PW-4 groundwater monitoring wells) indicates that there are multiple locations on the 160-acre area where COCs have reached the groundwater. Groundwater testing upgradient of the 160-acre area indicates that there are only minor sources of perchlorate and no sources of trichloroethene (TCE) or other VOCs immediately upgradient of the 160-acre area. Soil and soil gas testing have identified multiple locations where COCs have been spilled, dumped, or otherwise released at ground surface on the 160-acre area. Additional information on known and suspected sources of contamination is provided in documents listed in the Administrative Record for the SAOU ROD.

Employees of businesses that operated at the 160-acre area in the 1950s and 1960s have testified that perchlorate and cleaning solvents were used at the Site. The chemicals contaminated the soil and groundwater from disposal in unlined pits, leakage or overflow from a waste storage area, contaminated rinse water, and explosions.

2.4.5 Types of Contamination and Media Affected

The most prevalent contaminant at the Site is perchlorate. Perchlorate is an inorganic chemical used as an oxidizer in rocket propellant, flares, fireworks, and other products. Another contaminant, TCE, is also present at some locations. TCE is a VOC widely used as a cleaning solvent in the 1950s and 1960s. Other VOCs have been sporadically detected, generally at concentrations below State and Federal drinking water standards. Table 2 lists the COCs at the MBOU.

Table 2. Chemicals of Concern at the Mid-Basin Operable Unit

Chemical of Concern	Characteristics	Affected Media (MBOU)	2021 Concentration (MBOU)
Perchlorate	Inorganic	Groundwater	Up to 400 µg/L
TCE	VOC	Groundwater	Up to 11 µg/L
PCE	VOC	Groundwater	Up to 2.1 µg/L

Notes:
µg/L = microgram(s) per liter
PCE = tetrachloroethylene

Perchlorate, TCE, and PCE, when dumped or spilled, can persist in groundwater for decades.

The MBOU only addresses contaminated groundwater. Contaminants in soil on the 160-acre area will be addressed by OU3.

2.4.6 Nature and Extent of Contamination at the Site

Sitewide

The Site addresses an area of contaminated groundwater more than 6 miles in length and up to 1 mile wide. The contaminants are dissolved in and move with the groundwater, generally from the northwest to the southeast. The affected groundwater is primarily in the RCB, and may extend into the Riverside-Arlington Basin (also known as the Riverside North Basin). Section 2.5 provides additional information on the groundwater.

Figures 5 and 6 show the approximate extent of Site-related contamination in excess of drinking water MCLs. Figure 7 shows well locations and the maximum perchlorate concentrations detected at each location in groundwater samples analyzed in the SAOU between January and March 2022. Figure 8 shows similar information for the MBOU in June and July 2021.

Sitewide, the highest perchlorate concentration detected in groundwater is 10,000 micrograms per liter (µg/L). This concentration, more than 1,500 times the California MCL of 6 µg/L, was detected at a groundwater monitoring well located on the 160-acre area in April 2006, after above-average rainfall in early 2005. The peak TCE concentration of 1,500 µg/L was also detected at a groundwater monitoring well located on the 160-acre area in July 2006. This concentration is 300 times the Federal and California MCL of 5 µg/L.

In 2021, the highest perchlorate and TCE concentrations measured at the Site were 400 µg/L and 50 µg/L respectively.

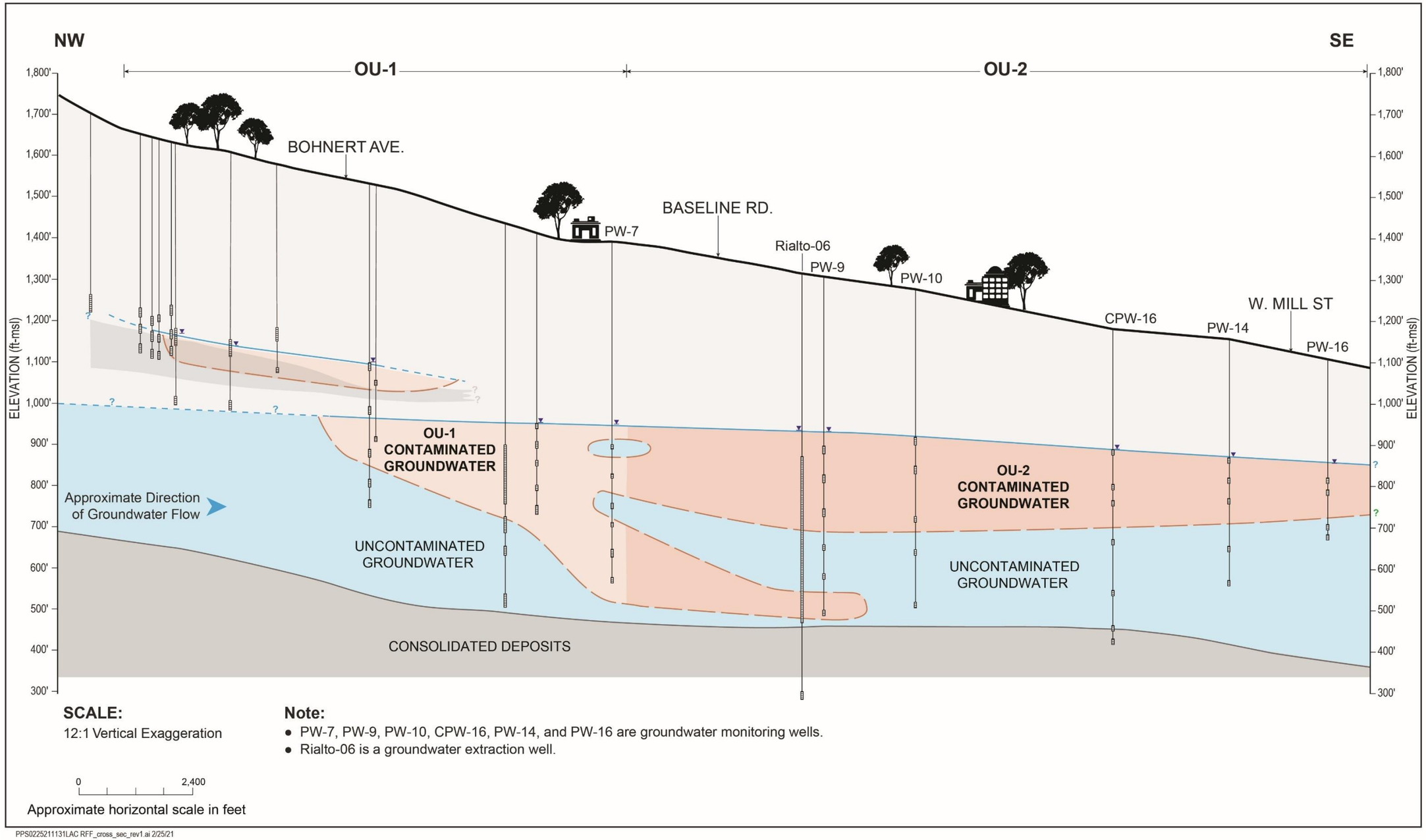

Figure 6. Rockets, Fireworks, and Flares Superfund Site Vertical Extent of Groundwater Contamination

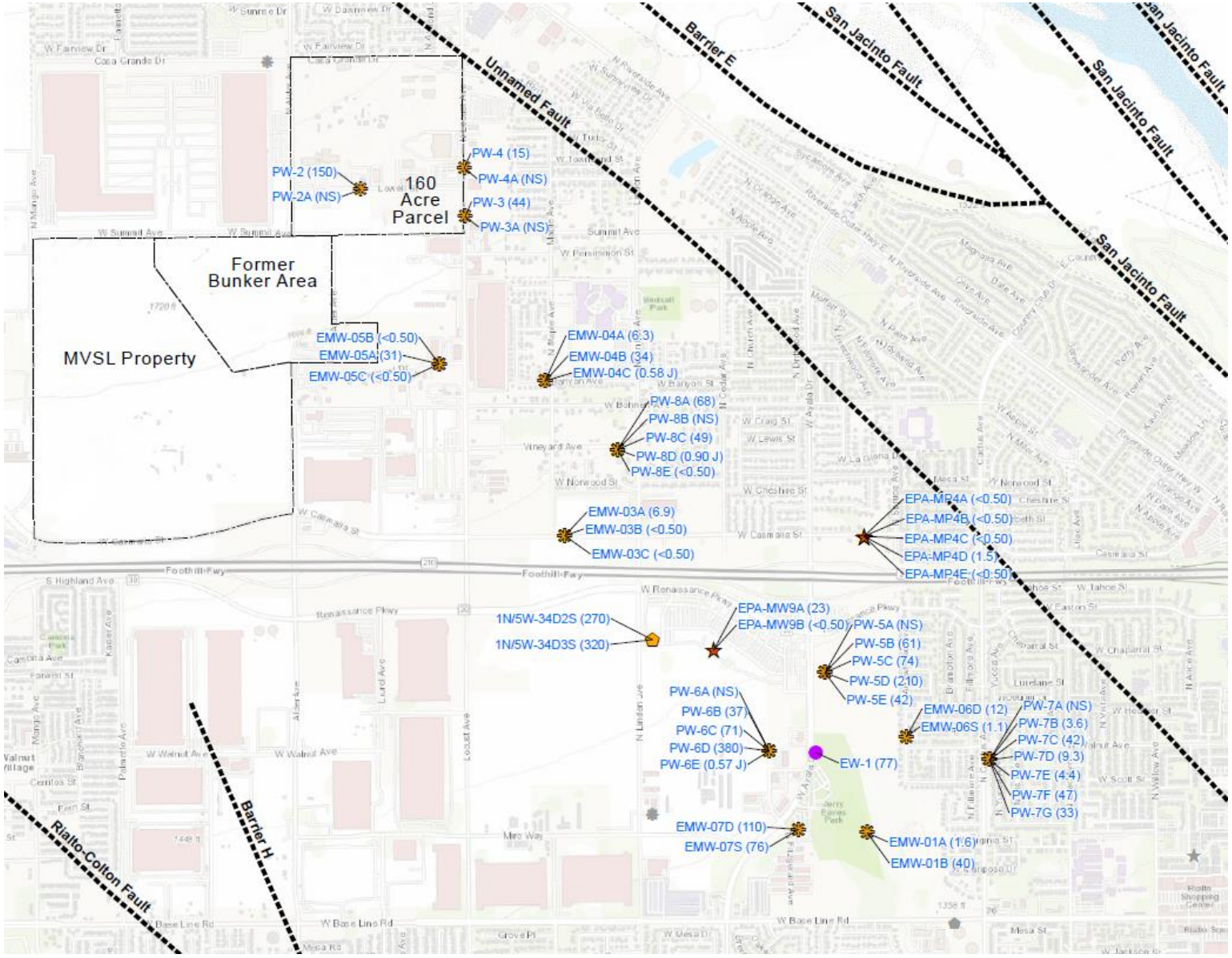

Figure 7. Rockets, Fireworks, and Flares Superfund Site SAOU Well Locations and Perchlorate Concentrations between January and March 2022

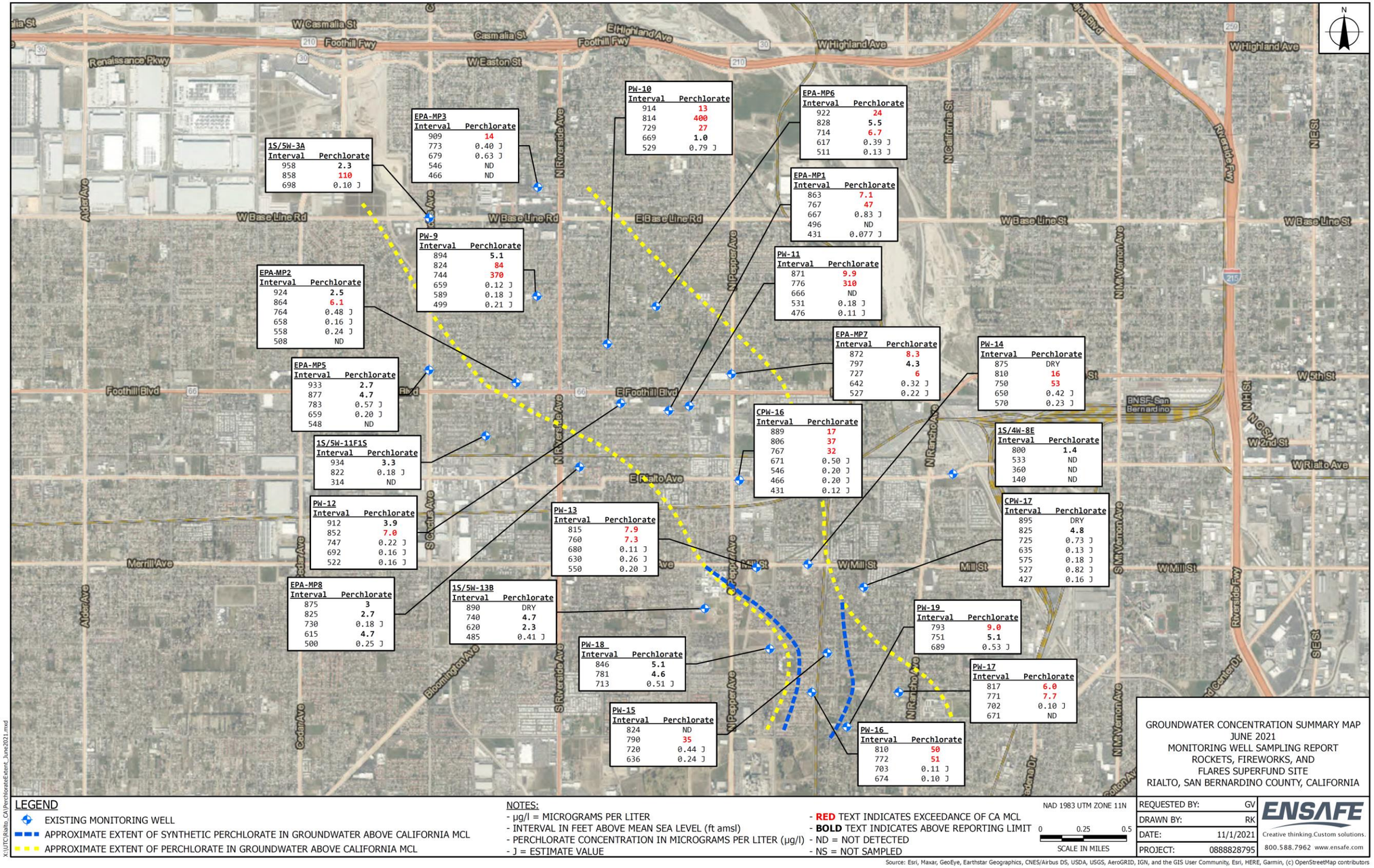

Figure 8. Rockets, Fireworks, and Flares Superfund Site MBOU Well Locations and Perchlorate Concentrations in June and July 2021

The Mid-Basin Operable Unit

Perchlorate appears to have arrived in the MBOU in the late 1990s. Figure 9 shows perchlorate concentrations at a City of Rialto-water supply well (well 06) which is located near the upgradient end of the MBOU, steadily increasing from about 2000 to 2008. Concentrations have since declined.

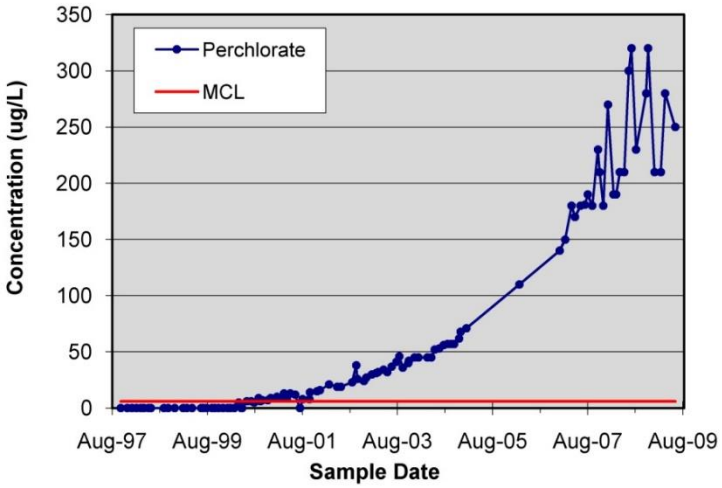

Figure 9. Rockets, Fireworks, and Flares Superfund Site Perchlorate Concentrations at the Rialto-06 Drinking Water Well

In the MBOU, in 2021, perchlorate concentrations ranged from 400 µg/L to the low tens of µg/L. Higher concentrations have generally been in the northwestern (upgradient) portion of the MBOU. The highest measured perchlorate concentration in the mid-basin area has been 781 µg/L (at well PW10 in 2013). Figure 5 shows well locations.

The highest concentrations of perchlorate have generally been measured along a 3-mile long northwest to southeast arc that includes wells PW9, PW10, PW11, CPW-16, PW-14, PW-15, and PW16. In 2021, the highest perchlorate concentrations at each of these seven wells were 370, 400, 310, 37, 53, 35, and 51 µg/L respectively.

The TCE concentrations at the seven wells have been much lower than the perchlorate concentrations. In 2021, they were 11, 7.2, 4.1, 0.9., 0.9, 0.5, and 0.5 µg/L respectively. The four measurements less than 1 µg/L are "J flagged," meaning the values are approximate.

In 2021, four VOCs other than TCE were detected above their Federal or State MCL. They were benzene, MTBE, 1,2-dichloroethane (1,2-DCA), and 1,2,3-trichloropropane. Benzene was detected in five wells or well zones at a maximum concentration of 31 µg/L; MTBE was detected in two well zones at a maximum concentration of 30 µg/L; 1,2-DCA was detected in 26 well zones at a maximum concentration of 9.3 µg/L; and 1,2,3-trichloropropane was detected in one well zone at a maximum concentration of 0.43 µg/L. Other VOCs were sporadically detected at concentrations below their Federal and State MCL.

At the upgradient end of the MBOU, contamination is present from about 900 feet amsl down to 500 feet amsl. At the leading edge of the MBOU, the contamination is present from about 860 feet amsl down to 720 feet amsl.

Some of the perchlorate present in groundwater at the Site appears to be the result of past use of nitrogen-rich fertilizers containing trace amounts of perchlorate. The perchlorate in the fertilizer is believed to have been carried by irrigation water into the subsurface, contaminating the groundwater. In addition, low levels of naturally occurring perchlorate may be present in groundwater. Analyses of stable oxygen and chlorine isotopes have been completed on

groundwater samples collected from several monitoring wells (e.g., PW-15, PW-16 and PW-19) to distinguish the origin of the perchlorate detected in the samples.

Test results from 2004 to 2021 are included in the Administrative Record.

Perchlorate has been found in several groundwater supply wells in the MBOU, including the Rialto-06 well and the Colton 17 well. Both wells were shut down after the contamination was discovered and later resumed operation after water treatment systems were installed.

2.4.7 Groundwater Modeling

EPA has relied on several different groundwater flow models to help evaluate the effectiveness of remedial alternatives at the Site. Two models were used to evaluate remedial alternatives for the MBOU: a numerical groundwater flow and contaminant transport model known as the "Joint Groundwater Model" and a simpler model which made use of analytical equations presented in the EPA guidance document entitled "A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems," EPA 600/R 08/003, January 2008. The modeling is described in the June 2021 FS Report.

2.5 Current and Potential Future Site and Resource Uses

2.5.1 Groundwater

The groundwater at the Site is an important source of drinking water for the cities of Rialto, Colton, and Fontana. Most or all of the Site is located in the RCB. In recent years, the RCB supplied approximately 17,500 acre-feet of groundwater per year (more than 15 million gallons of water per day) through large municipal water supply wells which pump water from hundreds of feet below ground. That is enough water to meet the needs of tens of thousands of area residents. See Figure 5 for water supply well locations.

The RCB is an alluvial basin located south of the San Gabriel and San Bernardino Mountains, an east-west trending mountain range in southern California. The basin is approximately 10 miles long, 1.5 to 3.5 miles wide, and is bounded by geologic faults on its western, northern, and eastern sides.

The RCB is filled with unconsolidated alluvial material consisting of sand, gravel, and boulders interbedded with lenticular deposits of silt and clay. Alluvial sediments in much of the RCB are about 500 to 1,000 feet deep. The unconsolidated alluvium is underlain by partly consolidated and consolidated continental deposits. The basement complex consists of metamorphic and igneous rocks.

The unconsolidated alluvial material contains groundwater in multiple water-bearing layers. In 2020, at the 160-acre area, the depth to groundwater was more than 460 feet below ground surface (bgs). The shallowest aquifer, known as the Intermediate Aquifer, is unconfined, about 50 to 100 feet thick, and is underlain by a laterally extensive aquitard. The aquifer is comprised of multiple thin water-bearing units separated by thin aquitards and dry intervals. Below the laterally extensive aquitard is a deeper water-bearing layer known as the Regional Aquifer (also referred to as the middle and lower water-bearing units). It is generally unconfined to partly confined and is about 300 to 500 feet thick. Potentiometric heads have been as much as 150 feet higher in the Intermediate Aquifer than in the underlying Regional Aquifer, resulting in a strong downward hydraulic gradient between the two aquifers. About one to one and half miles to the

southeast of the 160-acre area, only the Regional Aquifer is present. The Intermediate Aquifer is not present at the MBOU.

Groundwater flow in the RCB is strongly influenced by the presence of geologic faults that restrict groundwater flow. Groundwater in the Intermediate Aquifer generally flows to the southeast, parallel to two major faults, at a speed of up to several feet per day. Groundwater in the Regional Aquifer generally flows to the southeast at an average rate of about one to two feet per day. Near the leading edge of the MBOU contamination, groundwater flow direction shifts from northwest-southeast to north-south. Groundwater elevations and flow rates in the RCB vary both seasonally and year to year. The primary cause of the variability is year-to-year changes in precipitation and associated recharge. Seasonal and year-to-year variability in groundwater pumping also affects water levels and groundwater flow directions.

Historical water level measurements from water supply wells screened in the Regional Aquifer indicate that water levels have varied by over 100 feet during the period of record (1962-present). From 2001 to 2021, drought and increased groundwater production caused groundwater levels to drop about 70 feet.

The primary source of water to the RCB is subsurface inflow from adjacent groundwater basins. Most groundwater leaves the RCB via municipal drinking water supply wells or as subsurface flow into adjacent groundwater basins.

2.5.2 Groundwater Rights

Four water utilities are responsible for most of the groundwater pumping in the RCB: the City of Rialto, WVWD, the City of Colton, and Fontana Water Company. A 1961 Decree entered in San Bernardino County Superior Court restricts pumping of groundwater from the RCB (*The Lytle Creek Water & Improvement Company vs. Fontana Ranchos Water Company, et al., Action 81264*). The Decree allows unlimited pumping from the basin by parties to the Decree if the average of the spring-high water levels at three wells specified in the Decree ("index wells") exceeds 1,002.3 feet amsl. When the level is between 969.7 and 1,002.3 feet amsl, a party's entitlement is limited to quantities specified in the Decree. If the average spring-high water level drops below 969.7 feet amsl, as it has since 2008, the entitlement is reduced by 1% for every foot the average is below 969.7 feet amsl, but not by more than 50%. Restrictions are recalculated annually by the San Bernardino Valley Municipal Water District.

Designated existing or potential beneficial uses for the RCB in the 2008 State of California Water Quality Control Plan are municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply.

Because the selected remedy only addresses groundwater, current and reasonably anticipated future land uses have limited relevance to the selected remedy. The primary relevance is in the selection of locations for facilities constructed as part of the remedy. These decisions will be made post-ROD, during the remedial design phase.

Land use at the Site is primarily residential, with some industrial and commercial uses and limited open space.

2.6 Summary of Site Risks

EPA is taking action at the MBOU because the groundwater at the Site is a current source of drinking water to tens of thousands of residents and businesses, the levels of contamination in

groundwater exceed drinking water standards, the calculated Site-specific Hazard Quotient value for perchlorate exceeds one, and contaminated groundwater continues to spread into uncontaminated and less contaminated portions of the groundwater aquifer.

EPA's decision to take action is supported by a baseline risk assessment, which estimates the risks posed by the Site if no action is taken. The baseline risk assessment, included in its entirety as Section 3 of the "Technical Memorandum, OU-2 ARARs, RAOs, and Baseline Risk Assessment, Rockets, Fireworks, and Flares Superfund Site Operable Unit 2," dated October 2015," identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the baseline risk assessment for this Site.

No risks to wildlife or other ecological receptors have been identified or are expected.

2.6.1 Contaminant Identification

Perchlorate, TCE, and PCE were identified as COCs in groundwater in the MBOU based on the laboratory analysis of groundwater samples.

Table 3 presents the COCs and exposure point concentration (EPC) for each of the COCs in the groundwater. An EPC is a concentration used to estimate exposure and risk associated with each COC in the groundwater. For each of the three COCs, the table includes the range of concentrations detected, the frequency of detection (i.e., the number of times the chemical was detected compared to the number of sample results used in the risk assessment), the EPC, and the statistic used to calculate the EPC. The table indicates that perchlorate was the most frequently detected COC.

Statistics recommended by EPA's ProUCL Version 5.0 were used to calculate EPCs. The 95% Kaplan-Meier Chebyshev Upper Confidence Limit was used as the EPC for perchlorate; the 95% Approximate Gamma Kaplan-Meier Upper Confidence Limit was used as the EPC for TCE; and the 95% Kaplan-Meier (Percentile Bootstrap) Upper Confidence Limit was used as the EPC for PCE.

The groundwater sampling results used to calculate the EPCs were obtained and evaluated in accordance with procedures detailed in EPA-approved field and laboratory planning documents.

Table 3. Summary of Chemicals of Concern and Exposure Point Concentrations

Scenario Timeframe: Current or Future Resident
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Minimum Conc. Detected (µg/L)	Maximum Conc. Detected (µg/L)	Frequency of Detection	EPC (µg/L)	Statistical Measure Used to Calculate the EPC
Groundwater	Perchlorate	0.62	476	51 of 106	49.9	95% KM Chebyshev UCL
	TCE	0.2	21.2	14 of 103	1.63	95% Approximate Gamma KM-UCL
	PCE	0.5	2.5	6 of 103	0.39	95% KM (Percentile Bootstrap) UCL

Exposure Assessment Notes:
EPC= Exposure Point Concentration

µg/L = micrograms per liter
KM = Kaplan-Meier
UCL= upper confidence limit

In the exposure assessment, EPA identifies possible exposure scenarios and pathways of concern based on the conceptual site model for the Site. The pathway of concern is exposure to contaminated groundwater by current and future residents who receive drinking water from groundwater wells at the Site. Exposure could occur through ingestion of perchlorate or VOCs present in the groundwater, or inhalation of VOCs during showering and other activities that enhance the movement of volatile chemicals from water to air.

Exposure through dermal contact is not expected to be a significant pathway for any of the COCs. Nor is the volatilization of contaminants in the aquifer and upward movement of the contaminants to the surface (i.e., vapor intrusion) expected to be a significant pathway, given the depth to groundwater (more than 200 feet).

In keeping with EPA guidance, the risk assessment assumes that Federal and State drinking water regulations that prohibit or limit the use of contaminated water are not enforced.

The exposure assessment is described in more detail in Section 3.3 of the October 2015 Technical Memorandum.

2.6.2 Toxicity Assessment

Tables 4 and 5 provide toxicity information indicating the potential for the three COCs to adversely affect exposed individuals. Two of the three COCs have toxicity data indicating their potential for adverse carcinogenic health effects in humans; all three have toxicity data indicating their potential for adverse noncarcinogenic health effects in humans.

Table 4. Cancer Toxicity Data Summary`

Pathways: Ingestion and Dermal			
Chemical of Concern	**Ingestion Slope Factor**	**Slope Factor Units**	**Source**
TCE	4.60 x 10-2	(mg/kg-day)-1	IRIS
PCE	5.40E-01	(mg/kg-day)-1	OEHHA
Pathway: Inhalation			
Chemical of Concern	**Unit Risk**	**Units**	**Source**
TCE	4.10 x 10-6	(µg/m^3)-1	IRIS
PCE	5.90E-06	(µg/m^3)-1	OEHHA

Key
IRIS: Integrated Risk Information System, EPA
OEHHA= California Office of Environmental Health Hazard Assessment

Table 5. Non-Cancer Toxicity Data Summary`					
Pathways: Ingestion and Dermal					
Chemical of Concern	**Chronic/ Subchronic**	**Oral RfD Value**	**Oral RfD Units**	**Primary Target Organ**	**Source**
Perchlorate	chronic	7.00E-04	mg/kg-day	Endocrine system (thyroid)	IRIS
TCE	chronic	5.00E-04	mg/kg-day	Developmental; immune system	IRIS
PCE	chronic	6.00E-03	mg/kg-day	Nervous system; ocular	IRIS
Pathway: Inhalation					
Chemical of Concern	**Chronic/ Subchronic**	**Inhalation RfC**	**Inhalation RfC Units**	**Primary Target Organ**	**Source**
Perchlorate	-	-	-	-	-
TCE	chronic	2.00E-03	mg/m^3	Developmental; immune system	IRIS
PCE	chronic	4.00E-02	mg/m^3	Nervous system; ocular	IRIS

Key
IRIS: Integrated Risk Information System, EPA
OEHHA= California Office of Environmental Health Hazard Assessment

2.6.3 **Risk Characterization**

The risk characterization summarizes and combines outputs of the exposure and toxicity assessments to characterize baseline risks associated with exposure to contaminated groundwater.

For carcinogens, risks are generally expressed as the incremental probability that an individual could develop cancer over a lifetime as a result of exposure to the carcinogen. The risk estimates are probabilities often expressed in scientific notation (e.g., 1×10^{-6} or 10^{-6}). An excess lifetime cancer risk of $1x10^{-6}$ indicates that an individual experiencing the reasonable maximum exposure estimate has a 1 in 1,000,000 chance of developing cancer as a result of Site-related exposure. This is referred to as an excess lifetime cancer risk because it would be in addition to the risks individuals face from non-Site causes such as smoking or exposure to the sun. The chance that a typical individual would develop cancer from non-Site sources has been estimated to be as high as one in three. EPA's generally acceptable risk range for site-related exposures is 10^{-6} to 10^{-4}, with the 10^{-6} risk level used as the "point of departure."

Table 6 provides cancer risk estimates for TCE and PCE for each relevant exposure pathway, and the combined risk from TCE and PCE. The risk estimates were calculated using the online Risk Assessment Information System (RAIS) calculators available at https://rais.ornl.gov. These risk estimates are based on a reasonable maximum exposure and were developed by using conservative assumptions about the frequency and duration of a potential exposure to the

groundwater, as well as the toxicity of the COCs. The combined risk is equal to 1.2×10^{-5}, exceeding EPA's 1×10^{-6} "point of departure."

Table 6. Risk Characterization Summary—Carcinogens

Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Ground-Water	Ground-Water	Tap Water	Perchlorate	NA	NA	NA	NA
			TCE	2.99×10^{-6}	3.29×10^{-6}	4.90×10^{-7}	6.76 x 10-6
			PCE	2.72×10^{-6}	4.13×10^{-7}	1.61×10^{-6}	4.75 x 10-6
Total Risk =							**1.2 x 10-5**

Key
N/A: Route of exposure is not applicable to this medium.

The potential for noncarcinogenic effects was also evaluated by comparing the estimated exposure level over a specified time period with a reference dose (RfD) derived for a similar exposure period. An RfD represents a level that an individual may be exposed to that is not expected to cause any deleterious effect. The ratio of exposure to toxicity is called a hazard quotient (HQ). An HQ less than 1 indicates that a receptor's estimated dose of a single contaminant is less than the RfD, and that toxic noncarcinogenic effects from that chemical are unlikely. An HQ greater than 1 indicates that Site-related exposures may present a risk to human health.

Table 7 provides HQs for each route of exposure and the sum of hazard quotients for all routes of exposure. The risk estimates were calculated using the RAIS calculators. The Site-specific HQ for perchlorate exceeds 1, indicating potential health impacts from exposure to contaminated groundwater at the Site.

Table 7. Risk Characterization Summary—Non-Carcinogens

Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Total
Ground-water	Groundwater	Tap Water	Perchlorate	Endocrine system (thyroid)	2.47	N/A	0.01	2.48
			TCE	Developmental; immune system	0.11	0.39	0.02	0.52
			PCE	Nervous system; ocular	0.002	0.005	0.001	0.008

Key
Hazard Quotient = CDI/RfD, where CDI = Chronic daily intake and RfD = Reference dose
Hazard Quotients included in table are age-weighted averages of child and adult hazard quotients

The response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment, and 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.

2.6.4 Uncertainties

Key sources of uncertainty in the risk assessment include limitations in the human and animal studies used to calculate the toxicity values in Tables 4 and 5 and uncertainty about the current and future level of exposure to Site contaminants.

In accordance with EPA guidance for a baseline human health risk assessment, the risk assessment assumes that drinking water regulations that prohibit or limit the consumption of contaminated water are not enforced. This assumption is likely to lead to an overestimation of actual exposure and associated risks and hazards.

2.6.5 Summary of Ecological Risk Assessment

This action addresses risks to human health that could result from human consumption and use of contaminated groundwater. Because there is no known exposure pathway in which ecological receptors could be exposed to contaminated groundwater, no risks to wildlife or other ecological receptors are expected.

EPA will evaluate the potential for construction-related impacts on ecological receptors, if any, when preliminary locations are identified for the construction of any new groundwater wells, water treatment facilities, pipelines, and/or other components of the remedy.

2.7 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the MBOU of the RFF Site are to:

- prevent the spread of groundwater where Site-related contaminant concentrations exceed California or Federal drinking water standards to protect drinking water supply wells and groundwater resources threatened by the contamination;
- remove contaminants until the concentrations of Site-related contaminants in the groundwater aquifer are below California and Federal MCLs (i.e., “aquifer restoration”); and
- protect human health by preventing exposure to groundwater affected by Site contaminants.

As noted above, the groundwater at the Site is a current source of drinking water to tens of thousands of residents and businesses.

2.8 Description of Remedial Alternatives

EPA identified four cleanup options for the mid-basin area. The four options are labeled: Alternative 1, Alternative 2, Alternative 3, and a “no-action” option which EPA established as a baseline for comparison. The no-action option does not include active cleanup or monitoring.

2.8.1 Description of Remedy Components

The three “action” alternatives include the following components:

- **Extraction of Contaminated Groundwater.** Groundwater extraction would occur in two areas: i) an area about 6 miles from the 160-acre area where Site-related perchlorate concentrations remain above drinking water standards (the "leading edge" of contamination); and ii) an area about 3 miles from the 160-acre area between the SAOU and the leading edge of Site-related contamination (the "mid-plume" area). The remedial alternatives assume the use of the existing Rialto-06 water supply well in the mid-plume area and the construction of a new well in the leading-edge area. Figure 5 shows the location of the Rialto-06 well and the area where leading-edge extraction is assumed to occur.

  The total groundwater extraction and treatment capacity is assumed to be 3,150 gpm. Pumping rates in the two areas are assumed to change over time, with most of the extraction occurring in the leading-edge area at rates intended to hydraulically contain Site-related contaminated groundwater.

- **Treatment of the Extracted Groundwater to Destroy or Remove Contaminants.** Water treatment systems would remove perchlorate from the groundwater, using an above-ground biological treatment process which uses microbes to destroy the perchlorate and/or an ion exchange (IX) technology. Biological and ion exchange systems would provide similar levels of treatment. Treatment residuals may include spent resin (ion exchange) and waste biomass (biological treatment). The remedial alternatives assume the use of existing biological and ion exchange water treatment systems at the WVWD Headquarters location. Other existing treatment systems in the mid-basin area may be used, and/or new treatment systems may be constructed. Figure 5 shows the WVWD Headquarters location and the locations of other existing treatment systems.

  The remedial alternatives assume that the groundwater would not need to be treated to remove TCE or PCE because current and expected TCE and PCE concentrations in the mid-basin area are generally well below the levels allowed by drinking water standards.

- **Pipelines, Pumps, and other Conveyance Systems to Transport the Groundwater.** Conveyance systems would move water from the extraction wells to the treatment plant(s) and from the treatment plant to the delivery location(s). Delivery locations may include an existing water utility pipeline or reservoir, an existing groundwater recharge basin, or a groundwater reinjection location. Existing conveyance systems in the mid-basin area may be used, and/or new conveyance systems may be constructed. The remedial alternatives assume the use of an existing pipeline to move untreated water from the Rialto-06 location to the water treatment location and the construction of a new pipeline to move untreated water from the leading-edge extraction location to the water treatment location. The alternatives assume the use of existing and/or new pipelines to move treated water from the assumed water treatment location to the delivery location(s), depending on the remedial alternative.

- **Groundwater Monitoring.** The monitoring network would generate data to be used to optimize the operation of the groundwater extraction and treatment systems and evaluate the performance of the cleanup. The network will mostly consist of existing wells but may include construction of new wells.

2.8.2 Common Elements and Distinguishing Features of Each Remedial Alternative

The elements described in Section 2.8.1 are common to the three action alternatives.

Table 8 summarizes key Applicable or Relevant and Appropriate Requirements (ARARs) associated with the action alternatives. They were considered in developing the RAOs and are expected to apply to all three remedial action alternatives.

Table 8. Key Applicable or Relevant and Appropriate Requirements	
ARAR	**Importance**
Federal Safe Drinking Water Act (SDWA), 42 U.S.C. § 300 et seq., National Primary Drinking Water Standards, including 40 CFR 141.61 and 40 CFR 141.62	To be used to establish treatment standards for perchlorate and VOCs present in the extracted groundwater and cleanup goals for the aquifer
State of California Domestic Water Quality and Monitoring Regulations, California Safe Drinking Water Standards (MCLs), 22 CCR §§ 64431, 64444	
California Porter-Cologne Water Quality Act, California Water Code 13240 Water Quality Control Plan (Basin Plan) for the Santa Ana River Basin, Chapters 2 (Plans and Policies), 3 (Beneficial Uses), and 4 (Water Quality Objectives)	To be used to establish additional treatment requirements for groundwater recharge, groundwater reinjected into the aquifer, or groundwater discharged to surface water.

The principal difference between the remedial alternatives is the assumed use of the groundwater after the contaminants are removed. The possible uses are delivery to a local water utility for distribution to residents and businesses, and recharge or reinjection back into the groundwater aquifer, as summarized in Table 9 and described further in the following sections.

Table 9. Remedial Alternatives		
Remedial Alternative	**Groundwater Extraction and Treatment**	**Use of Treated Water**
No-Action	-	
1	Groundwater extraction in the leading edge and mid-plume areas, ion exchange and/or biological treatment for perchlorate removal, pipelines and pumps (i.e., conveyance systems), groundwater monitoring	Drinking water supply
2		Groundwater recharge and/or groundwater reinjection
3		Drinking water supply, groundwater recharge, and/or groundwater reinjection

The No-Action Alternative

The No-Action Alternative does not require active remediation or monitoring. It has no direct cost. It is included to provide a baseline for comparison to the other remedial alternatives.

Alternative 1: Pump and Treat Contaminated Groundwater and Use Treated Water as Drinking Water Supply

Alternative 1 includes groundwater extraction wells, water treatment systems, and conveyance systems capable of extracting, treating, and distributing up to 3,150 gpm of contaminated groundwater. It also includes a groundwater monitoring and performance evaluation program. Alternatives 2 and 3 include these same elements.

Alternative 1 assumes that all of the extracted and treated groundwater is used as drinking water supply after contaminant removal and that existing conveyance systems would move treated water from the water treatment location into WVWD's potable water distribution system. Implementing this alternative would require the acquisition of water rights for 100% of the extracted and treated groundwater. It is assumed that water rights made available by WVWD in accordance with a 2017 Site remediation agreement between Goodrich Corporation and WVWD would be used. In 2022 the water rights available from WVWD were less than the assumed system capacity of 3,150 gpm. Available rights depend on groundwater levels in three wells monitored in accordance with the 1961 decree and are recalculated annually by the San Bernardino Valley Municipal Water District.

Alternative 1 (as well as Alternatives 2 and 3) requires O&M, primarily affecting the groundwater extraction and water treatment components of the alternatives. Typical O&M requirements include labor, electricity usage, water testing, and disposal of treatment residuals. The type and frequency of maintenance activities, and the frequency at which system components will need to be replaced, are expected to be similar to that required at existing water purveyor wells and treatment systems.

Alternative 1 (as well as Alternatives 2 and 3) does not include any Institutional Controls.

Table 10 provides the estimated capital, annual O&M, and total present value costs of the alternative. Alternative 1 is expected to take from one to 2 years to construct, and to operate for a period of years to decades. Alternatives 2 and 3 would require similar timeframes to construct and operate.

Alternative 2: Pump and Treat Contaminated Groundwater and Recharge or Reinject the Treated Water

Alternative 2 assumes the same extraction and treatment components as Alternative 1. In contrast to Alternative 1, Alternative 2 assumes non-drinking water end use of the extracted and treated water. The assumed end use is recharge or reinjection of the treated water back into the groundwater aquifer (rather than direct use as drinking water supply). The level of treatment is assumed to be the same whether the treated water is used as drinking water supply, recharged, or reinjected. The alternative assumes that existing conveyance systems would move treated water from the treatment location to one or more existing groundwater recharge basins but that new conveyance systems may be needed to move water to two newly constructed groundwater injection wells. If used, Alternative 2 (and 3) would require O&M specific to groundwater injection wells.

It is assumed that water rights would not be needed for the extraction of groundwater that would be returned to the aquifer.

Alternative 3: Pump and Treat Contaminated Groundwater and Use the Treated Water as Drinking Water Supply or for Recharge/Reinjection

Alternative 3 assumes the same extraction and treatment components as Alternatives 1 and 2.

Alternative 3 combines the end use options in Alternatives 1 and 2. It would include use of the treated groundwater as drinking water supply and recharge or reinjection of the treated water back into the aquifer. It is assumed that most of the treated groundwater would be used as drinking water supply but that the limited availability of water rights in the RCB may at times

restrict the ability to use the treated water as drinking water. The end uses of the treated water would depend on the water rights available each year.

The alternative is assumed to make use of existing conveyance systems to move treated water from the water treatment location into WVWD's potable water distribution system (as in Alternative 1) and existing groundwater recharge basins (as in Alternative 2), and may require new conveyance systems to move water to two newly constructed groundwater injection wells.

2.8.3 Expected Outcome of Each Alternative

Alternative 1 would limit further downgradient movement of groundwater contaminated with Site-related perchlorate and VOCs, reduce risk to human health, and help protect the future use of drinking water supply wells and groundwater resources. Over a period of decades, Alternative 1 is expected to remove Site-related contaminants until aquifer cleanup levels are achieved. Alternative 1 will also provide a reliable, long-term supply of clean water for municipal (e.g., drinking water) use by one or more local water utilities.

Alternatives 2 and 3 would also limit further downgradient movement of contaminated groundwater, reduce risk to human health, and help protect groundwater resources. Groundwater extraction and treatment rates would not be subject to available water rights, as in Alternative 1, potentially increasing the rate of contaminant removal and increasing the likelihood that complete hydraulic control would occur.

Alternative 3 would also provide a reliable, long-term supply of clean water for municipal (e.g., drinking water) use.

2.9 Summary of Comparative Analysis of Alternatives

The following sections summarize the comparative analysis of alternatives based on the June 2021 FS Report. Separate sections address each of the nine remedy selection criteria. EPA categorizes the nine criteria into three groups: (1) threshold criteria, (2) balancing criteria, and (3) modifying criteria.

An alternative must meet the threshold criteria to be the selected remedy. The threshold criteria are "overall protection of human health and the environment" and "compliance with Applicable or Relevant and Appropriate Requirements ('ARARs')." The comparison of alternatives is based primarily on the balancing criteria. The balancing criteria are "Long-Term Effectiveness and Permanence," "Reduction of Toxicity, Mobility, or Volume through Treatment," "Short-Term Effectiveness," "Implementability," and "Cost." The modifying criteria are "State Acceptance" and "Community Acceptance."

2.9.1 Overall Protection of Human Health and the Environment

The Overall Protection of Human Health and the Environment criterion addresses whether or not an alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, and/or institutional controls.

The evaluation of Overall Protection of Human Health and Environment is based largely on the long-term effectiveness criterion. Alternatives 1, 2, and 3 would reduce risks posed by the Site through extraction and treatment of contaminated groundwater and are considered protective.

They would not exacerbate Site conditions. The No-Action Alternative is not considered protective.

Alternatives 1 through 3 would reduce short- and long-term risks to human health and the environment by limiting the spread of contaminated groundwater into less-contaminated areas and depths and eventually providing aquifer restoration. This would reduce impacts on downgradient water supply wells and protect future uses of less-contaminated and uncontaminated portions of the aquifer. Because of potential water rights limitations with Alternative 1, Alternatives 2 and 3 would likely provide greater protection of human health by achieving higher rates of groundwater extraction and more robust hydraulic control than Alternative 1.

Alternatives 1 through 3 would reduce the toxicity, mobility, and volume of the contaminants or contaminated groundwater. The perchlorate treatment technologies (and VOC treatment technologies, if necessary) would be effective in meeting Federal and State drinking water standards. Alternatives 1 and 3 also offer the benefit of making available a clean water supply source to one or more water utilities whose wells are currently affected or threatened by Site-related contamination.

The negative impacts associated with the alternatives include the disruption that would result from installation of pipelines and other components of the remedy, and the impacts of handling and disposing of treatment residuals (e.g., spent resin and/or waste biomass).

Limitations of the No-Action Alternative include the increased potential for human exposure to contaminated groundwater; the increased likelihood that concentrations of Site-related COCs will increase at active water supply wells downgradient of the MBOU; the increased cost and difficulty of operating existing water treatment facilities if contaminant concentrations increase; and the increased cost, difficulty, and time required for control and restoration of the contaminated portions of the aquifer.

2.9.2 Compliance with Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA and NCP § 300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as ARARs, unless such ARARs are waived under CERCLA § 121(d)(4).

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site.

Only those State standards that are identified by a state in a timely manner, are more stringent than Federal requirements, and are promulgated and uniformly applied may be applicable.

Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that, while not applicable to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site,

address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site.

Only those State standards that are identified in a timely manner, are more stringent than Federal requirements, and are promulgated and uniformly applied, may be relevant and appropriate.

The compliance with ARARs criterion addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of Federal and State environmental statutes or provides a basis for invoking a waiver.

All the alternatives, except the No-Action Alternative, have common ARARs associated with groundwater cleanup actions that incorporate construction and operation of pump and treat systems. These include Federal and State drinking water standards and, if treated water is recharged or reinjected, the California Porter-Cologne Water Quality Act). Most of the ARARs are associated with use of the treated groundwater and management and disposal of treatment residuals.

Acquisition of permits would not be necessary for onsite activities.

All the active alternatives would attain their respective Federal and State ARARs, except as described in Section 2.12.2.

2.9.3 Long-Term Effectiveness

Long-term effectiveness and permanence refer to residual risk, and the ability of a remedy to maintain reliable protection of human health and the environment over time, once the RAOs are met. Residual risk can result from exposure to untreated waste or treatment residuals. The magnitude of the risk depends on the nature and quantity of the wastes and the adequacy and reliability of controls, if any, that are used to manage untreated waste and treatment residuals. For this remedy, untreated waste refers to contaminated groundwater not removed from the aquifer. Treatment residuals may include spent resin and waste biomass.

The performance of the alternatives in relation to this criterion has been evaluated primarily by estimating the extent to which each alternative prevents the migration of contaminated groundwater into clean and less-contaminated areas. The evaluation also considers the relative magnitude of the treatment residuals.

The three action alternatives may differ in their long-term effectiveness. All three action alternatives are expected to achieve RAOs if the target groundwater extraction rates can be achieved, particularly the 2,400 gpm estimated to be necessary in the leading-edge area. However, during extended dry periods that result in low water levels in the RCB, available water rights may limit the ability of Alternative 1 to pump at the targeted rate, resulting in less contaminant removal and potentially resulting in additional plume migration. The water rights currently available for the MBOU cleanup are largely held by WVWD. In the 2019–2020 water year, the WVWD water rights available for the cleanup would have allowed groundwater extraction at an average rate of less than 2,200 gpm. Available water rights depend on regional groundwater levels and may vary year to year. The availability of water rights is not expected to impact Alternatives 2 or 3, which assume that some (Alternative 3) or all (Alternative 2) of the treated water is returned to the aquifer.

Because Alternative 1 may not be fully effective at preventing the spread of contaminated groundwater during extended dry periods, it is ranked lower in relation to the "Long-term Effectiveness and Permanence" criterion.

Also considered in relation to this evaluation criterion is the health risk resulting from treatment residuals. In Alternatives 1 through 3, the ion exchange or biological treatment systems for perchlorate and liquid-phase granular-activated carbon (LGAC) for VOCs (if necessary), the spent resin, spent carbon and waste biomass would be transported offsite for regeneration or disposal. Compliance with RCRA and U.S. Department of Transportation regulations would result in minimal risks associated with spent carbon and spent resin treatment residuals. The magnitude of the residual risks from treatment residuals for Alternatives 2 and 3 would be slightly higher than for Alternative 1 because the higher average extraction rates would generate slightly more waste.

The No-Action Alternative, in which no active remediation or monitoring occurs, is ranked low in relation to the Long-Term Effectiveness and Permanence criterion. If no action is taken, contaminated groundwater will continue to spread, increasing the likelihood of future increases in contaminant concentrations in clean and less contaminated portions of the aquifer and increasing the eventual cost, difficulty, and time required for restoration of the aquifer.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining onsite above levels that allow for unlimited use and unrestricted exposure, a policy review will be conducted within 5 years after completion of construction to ensure that the remedy is, or will be, protective of human health and the environment.

2.9.4 Reduction of Toxicity, Mobility, or Volume through Treatment

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

Alternatives 1 through 3 all satisfy the statutory preference for treatment and would employ treatment technologies that would reduce the volume of contaminants by inhibiting contaminant migration, and reduce the toxicity and volume of contaminants or contaminated groundwater by reducing contaminant concentrations to low or non-detectable levels in groundwater pumped to the surface for treatment.

The ion exchange and biological treatment processes assumed for perchlorate removal would permanently remove the contaminants from the extracted groundwater, greatly reducing mobility. Although VOC treatment is not expected to be needed, if implemented, the LGAC or other VOC treatment technologies would also permanently remove the contaminants from the extracted groundwater.

All of the likely treatment technologies are partially or fully destructive technologies in that most or all of the contaminants are ultimately sequestered or converted to non-toxic products. The biological process considered for perchlorate removal is a destructive technology. The use of disposable ion exchange resin for perchlorate treatment may also result in permanent destruction of the perchlorate if the resin is incinerated. With LGAC, the contaminants are typically destroyed when the carbon is reactivated.

Alternatives 1 through 3 are ranked similarly for this criterion, although there would be a small difference in toxicity, mobility, and volume reduction under Alternative 1 because the average extraction rate over time is likely to be lower.

2.9.5 Short-Term Effectiveness

Short-term effectiveness addresses adverse impacts that may be posed to workers, the community, and the environment during construction of the remedy.

All three action alternatives are assigned a high ranking for short-term effectiveness. They are expected to include construction of a new groundwater extraction well, pipeline construction, and installation of groundwater monitoring wells. They may include construction of new water treatment systems or expansion of existing systems. The amount of new construction will be determined during remedial design. None of the alternatives pose unmitigable risks to the community during construction, nor do any of the alternatives pose unmitigable risks to workers beyond typical hazards associated with large construction projects.

It is expected that Alternatives 1 through 3 would require 1 to 2 years to construct and would use similar construction methods. Noise and dust abatement during construction, along with onsite treatment or offsite disposal of any contaminated purge water from well installation and development, would protect the community during construction.

There may be minor differences between the alternatives in the time required for construction if Alternatives 2 or 3 were to incorporate injection wells because of the additional time required for well construction and installation of the pipelines needed to convey water from the treatment plant to the injection wells.

2.9.6 Implementability

Implementability addresses the technical and administrative feasibility during design, construction, and operation of a remedy. It also considers factors such as the availability of services and materials, administrative feasibility, and coordination with other governmental entities.

None of the alternatives are assigned a high ranking for the implementability criterion, reflecting the need to acquire land or arrange access for the construction of extraction wells, treatment facilities, and/or conveyance facilities, and other difficulties associated with a construction project in a developed area. Goodrich Corporation has an agreement in place with WVWD that provides access to WVWD's water rights, treatment facilities, and other infrastructure and provides for WVWD use of the treated water for drinking water supply. This increases the implementability of Alternatives 1 and 3. Even with this agreement in place, none of the alternatives are assigned the highest ranking for this evaluation criterion, reflecting water rights limitations and the likely need to arrange access for construction in a developed area.

Alternative 3 is assigned the highest ranking, reflecting the incorporation of recharge as a backup end use option when water rights limit drinking water use. Alternative 2 is likely to face obstacles related to the recharge and/or reinjection of the treated groundwater. It would require coordination with other users of the recharge basins, and is expected to require an agreement with local water management agencies for use of the recharge basins. It may also require additional coordination with local water utilities for use of their infrastructure for non-drinking water end uses. Alternatives 2 and 3 also potentially require injection wells and additional water

conveyance systems beyond those required for Alternative 1, increasing the likelihood that difficulties would be encountered in acquiring property or arranging access, resulting in potential delays. Similar to Alternative 2, Alternative 3 would also require coordination with other users of the recharge basins and an agreement to allow recharge and/or reinjection of treated groundwater, although the amount to be recharged and/or reinjected would be less.

Implementation of each alternative would require the fabrication of pumps and conveyance pipe, but none of the required equipment or materials are out of the ordinary and all required services and materials are likely to be available, including qualified contractors for construction and operation of the technologies under consideration.

The extraction, treatment, and conveyance technologies included in Alternatives 1 through 3 are widely used and are generally known to be proven and reliable. The biological treatment process for perchlorate removal is less widely used than ion exchange, although it has been demonstrated to be effective. No significant difficulties are expected because of the type of technologies employed.

Alternatives 1 through 3 include an extensive monitoring program to evaluate remedy performance and to provide early warning of changes in contaminant concentrations or groundwater flow that may require modifications in extraction rates, well locations, or treatment methods to ensure attainment of RAOs and ARARs.

None of the remedial alternatives is expected to interfere with the implementation of future response actions at the Site.

2.9.7 **Cost**

The estimated Net Present Value (NPV) of the least expensive action alternative (Alternative 1) is $30.4 million. The estimated NPV of the most expensive alternative (Alternative 2) is $31.7 to $38.4 million. The cost estimates for all three alternatives assume the use of existing WVWD infrastructure. A range of costs is provided for Alternatives 2 and 3 to reflect the possibility that some of the treated groundwater may need to be reinjected resulting in increased capital and O&M costs. The NPV is a measure of the capital and O&M costs over a period of 30 years. It is calculated as the sum of the capital and O&M costs, with O&M costs discounted to the present at a rate of 7% per year.

No direct costs are associated with the No-Action Alternative. Costs are summarized in Table 10.

Table 10. Evaluation and Comparison of Remedial Alternatives							
Alternative	**Overall Protection of Human Health and Environment**	**Compliance with ARARs**	**Long-Term Effectiveness and Permanence**	**Reduction of Toxicity, Mobility, or Volume Through Treatment**	**Short-term Effectiveness**	**Implementability**	**Capital Cost (O&M) [Net Present Value]**
No-Action Alternative	No protection to human health or the environment.	NA	Low—Does not provide hydraulic control or cleanup	NA	NA	NA	$0
1.	Yes	Yes	Med.—Potentially less control because of water rights limitations. Minimal risk from treatment residuals.	High—Meets preference for treatment and provides significant reduction of Significant reduction of toxicity and volume	High—No unmitigable risks during construction and implementation.	Med.—Uses proven technologies, but there are administrative issues to be resolved, primarily associated with potable end use and water rights limitations.	$9.1 ($1.6–$1.9/yr) [$30.4]
2.	Yes	Yes	High—Better than Alt. 1 because there are no water rights limitations.	High—Same as Alt. 1	High—Similar to Alt. 1, but potentially more pipeline/well construction.	Med.—Uses proven technologies, but there are administrative issues to be resolved, primarily for recharge/reinjection and use of water purveyor infrastructure.	$9.1–$14.1 ($1.7–$2.1/yr) [$31.7–$38.4]
3.	Yes	Yes	High—Same as Alt. 2.	High—Same as Alt. 1	High—Same as Alt. 2	Med. to High—Similar to Alts. 1 and 2, but without the water rights limitations and with less water recharged and/or reinjected.	$9.1–$14.1 ($1.7–$2.0/yr) [$31.0–$37.2]

Notes:

NA= Not Applicable.

Costs are millions of dollars.

In Alternatives 2 and 3, the range of capital costs reflects the possible construction of groundwater reinjection wells and associated conveyance facilities.

The range of O&M costs reflects the assumed decrease in O&M costs after the first 6 years of operation (Alternatives 1, 2, and 3) and the possible use of wells (Alternatives 2 and 3).

NPV = Net Present Value. The NPV estimates assume 30 years of O&M and a 7% discount rate.

2.9.8 State Acceptance

The State of California supported EPA's preferred alternative and concurs with the selected remedy.

2.9.9 Community Acceptance

During the public comment period, one comment explicitly supported EPA's preferred alternative. None of the comments supported the no action alternative. Several comments made recommendations that EPA will address during the design, permitting, construction, or monitoring of the remedy (i.e., after EPA selects a remedy) and do not express a preference for or oppose a particular remedial alternative.

2.10 Principal Threat Waste

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a Site wherever practicable. Generally, "Principal Threat Wastes" are source materials that include hazardous substances, pollutants, or contaminants and act as a source of direct exposure or a reservoir for migration of contamination to groundwater or other media. The MBOU does not address source materials and no Principal Threat Waste is known to be present.

2.11 Selected Remedy

2.11.1 Summary of the Rationale for the Selected Remedy

Based on CERCLA requirements, the results of the MBOU remedial investigation and feasibility study, and public comments received on its January 2022 proposed cleanup plan, EPA has chosen Alternative 3, its preferred alternative, as the selected remedy. The selected remedy is a groundwater pump and treat system which will be designed to hydraulically contain the leading edge of Site-related contamination to protect downgradient groundwater resources, include the extraction and treatment of additional groundwater in the mid-plume area to speed cleanup, make the treated groundwater available as a source of drinking water to local water utilities, and recharge or reinject into the aquifer treated groundwater that cannot be used as drinking water.

EPA believes that the selected remedy will be more effective and more easily implemented than the other remedial alternatives considered in EPA's January 2022 Proposed Plan for the MBOU, and that these advantages justify the higher cost compared to Alternative #1. The increased effectiveness and implementability are largely due to the multiple end use options to be provided for the treated groundwater (potable use, recharge and/or reinjection). Overall, the selected remedy provides the best balance of tradeoffs among the remedial alternatives with respect to the balancing and modifying criteria described in Section 2.9.

EPA received comments from six entities on its proposed cleanup plan during the public comment period. One commenter supported EPA's proposal. None of the other commenters supported a particular remedial alternative. Many of the comments raise issues which will be addressed during remedy design. The State of California concurs with EPA's selected remedy.

2.11.2 Description of the Selected Remedy

EPA's selected remedy for the MBOU includes groundwater extraction, water treatment, multiple end use options for the treated groundwater, conveyance systems for the untreated and treated groundwater, and groundwater monitoring (Figure 10).

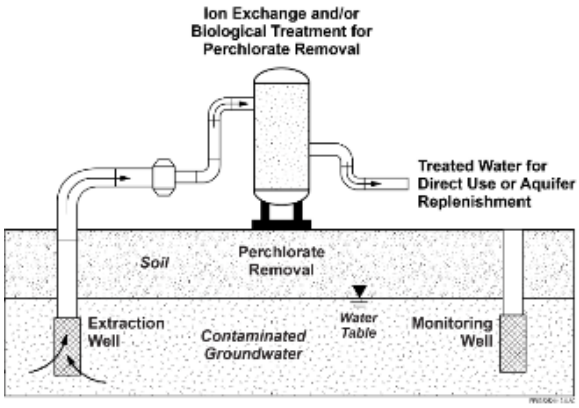

Figure 10. Selected Remedy Components

The remedy shall be designed, constructed, and operated to provide sufficient hydraulic control to prevent further migration of Site-related contamination from the MBOU leading-edge area into clean or less contaminated portions of the aquifer.

Compliance with the performance criterion shall be verified by demonstrating hydraulic control of the target area and reducing groundwater concentrations at compliance locations (specified below) over time. Compliance shall initially be determined by demonstrating hydraulic control, which is anticipated shortly after startup. After the remedy has operated for a period of time, expected to be several years, compliance shall be determined by demonstrating continued hydraulic control and a decrease in Site-related contaminant concentrations in compliance wells.

The compliance points shall be at least two compliance monitoring wells or well clusters downgradient of the leading-edge extraction wells and adequately located to verify that Site-related groundwater contamination migrating through the leading-edge area is intercepted by the remedy extraction wells.

Groundwater Extraction

The remedy includes the operation of groundwater extraction wells to pump contaminated water to the surface, where contaminants will be removed. Groundwater extraction will occur in two areas i) an area about 6 miles from the 160-acre area where Site-related perchlorate concentrations remain above drinking water standards (the "leading edge" of contamination); and ii) an area about 3 miles from the 160-acre area between the SAOU and the leading edge of Site-related contamination (the "mid-plume" area). Figure 5 shows the expected location of the mid-plume extraction (at or near the location of the Rialto-06 well) and the area where leading-edge extraction will occur.

Extraction may occur at existing wells, new wells, or both. Existing wells under consideration are the Rialto-06 well owned by the City of Rialto and currently under lease to WVWD, and the Colton 17 well owned by the City of Colton. Decisions about the use of existing wells and the exact locations of any new wells will be made during remedial design. Land would need to be acquired or access arrangements made for installation of any new wells. Factors to be considered in determining whether to use existing wells include proximity of the wells to water treatment locations, the well's location in relation to Site-related contamination, well construction, the need for agreements with water utilities or other third parties for use of the wells, cost, and community or stakeholder concerns.

Extraction in the leading-edge area would occur at rates needed to hydraulically contain the movement of Site-related contamination. The preliminary estimate of the average rate needed for

containment is 2,400 gpm. The leading-edge extraction well or wells will be designed and constructed with sufficient capacity to account for uncertainty in the properties of the groundwater aquifer and the concentrations of Site-related contamination. Additional capacity will also be required if pumping rates are anticipated to vary seasonally to accommodate the needs of the end user or users of the water. The average target pumping rate will be determined during remedial design based on updated estimates of the area and depth of Site-related contamination exceeding drinking water standards. The estimated depth of Site-related contamination in the leading-edge area is approximately 250 to 400 feet bgs.

Extraction in the mid-basin area will vary over time from zero up to about 2,000 gpm based in part on contaminant concentrations. If existing groundwater extraction, treatment, and conveyance systems are available, as expected, extraction in the mid-basin area is expected to occur initially at or near 2,000 gpm, which is near the maximum rate possible with existing infrastructure.

Over the life of the remedy, most of the extraction is expected to occur in the leading-edge area.

The selected remedy does not target cleanup of perchlorate from non-Site sources such as Chilean fertilizer and naturally occurring perchlorate, although it will remove non-Site perchlorate where mixed with Site-related contamination from the 160-acre area. Analyses of the ratios of stable isotopes may be used to distinguish Site-related contamination from non-Site sources.

Water Treatment

The remedy includes the operation of water treatment systems to remove contaminants exceeding MCLs from the extracted groundwater. The water treatment systems shall be designed with the capacity to treat water at or above the maximum planned groundwater extraction rate.

A biological treatment process and/or ion exchange will be used to remove perchlorate, the primary contaminant in the groundwater. Biological treatment processes use microbes to destroy the perchlorate; ion exchange uses a synthetic resin or other media to transfer contaminants from the water to the removal media.

If necessary to meet MCLs, LGAC or other technologies would be required to remove TCE or PCE from the groundwater.

Any spent resin or other treatment residuals requiring disposal shall be sent to an EPA-approved facility for treatment and/or disposal.

The purpose of this response action is to control health risks posed by exposure to contaminated groundwater. Table 11 provides the cleanup levels for the treated groundwater and the aquifer for the MBOU chemicals of concern.

Table 11. Cleanup Levels for Chemicals of Concern (COCs)

Media: Groundwater
Groundwater Use: Drinking Water

COC	Federal MCL (µg/L)	California MCL (µg/L)	Cleanup Level (µg/L)	Basis for Cleanup Level
Perchlorate	none	6	6	Compliance with State ARAR
TCE	5	5	5	Compliance with Federal ARAR
PCE	5	5	5	Compliance with Federal ARAR

Notes:

1. µg/L = micrograms per liter
2. At current (2021) concentrations in the mid-basin area, treatment for TCE or PCE is unlikely to be needed.
3. In practice, the water treatment technologies are expected to reduce concentrations to levels substantially below cleanup levels.

Treatment is expected to occur at one or more existing water treatment facilities and make use of existing water treatment systems. Existing water treatment facilities at or near the Site are located at: i) the WVWD Headquarters location, where existing biological and ion exchange systems are expected to be available; ii) a WVWD site near Rialto High School, where existing ion exchange systems are expected to be available; and iii) a City of Colton water treatment location, where existing ion exchange systems are expected to be available. See Figure 5 for locations. An agreement between Goodrich Corporation and WVWD is in place to make available existing water treatment systems at the two WVWD water treatment facilities.

Treated Water End Use and Conveyance

After the contaminants are removed, the extracted and treated groundwater will be used as drinking water supply and/or returned to the RCB.

The remedy includes the operation of conveyance systems (e.g., pipelines, pumps, and storage tanks) to move the contaminated water from the extraction wells to the water treatment locations, and from the water treatment locations to the delivery locations. The delivery locations will include one or more drinking water utilities which will distribute the water to their customers, and one or more locations where the treated water will be returned to the RCB. The treated water may be returned to the RCB at existing groundwater recharge basins or via newly constructed injection wells. If injection wells are needed, two or more wells would be constructed.

New conveyance systems will be constructed as part of the remedy. Easements or other access arrangements will be required. Some existing conveyance systems and recharge basins may also be used, including a pipeline connecting the Rialto-06 well to the WVWD Headquarters water treatment location, existing water utility water distribution systems, the existing Cactus flood control basins operated by the San Bernardino County Flood Control District, and other flood control basins owned and operated by San Bernardino County. Three water utilities have infrastructure at or near the MBOU and water rights in the RCB: WVWD, the City of Rialto, and the City of Colton.

Decisions about which water utilities will accept and distribute water from the remedy, whether existing conveyance systems and recharge basins will be used, the locations of new pipelines and conveyance systems, and the locations of injection wells, if used, will be made during remedial design. An agreement between Goodrich Corporation and WVWD provides for WVWD to distribute the treated water and makes available certain WVWD conveyance systems. Factors to be considered in determining the end uses of the treated groundwater include proximity to the water treatment location(s); available water rights; available capacity in existing flood control/groundwater recharge basins; the need for agreements with water utilities, San Bernardino County Flood Control District, and other third parties; cost; community concerns; and stakeholder concerns. See Figure 5 for locations of existing recharge basins.

The selected remedy allows any combination of potable use, recharge, and reinjection. It is anticipated that most of the treated groundwater will be used as drinking water supply (i.e., for potable use) and that the end uses of the treated water will vary seasonally and from year to year.

Groundwater Monitoring

The remedy includes a groundwater monitoring and performance evaluation program to demonstrate hydraulic control of Site-related contamination and progress in reducing contaminant concentrations in the MBOU area to the cleanup levels identified in Table 11. Groundwater monitoring shall occur upgradient and downgradient of the leading-edge extraction location(s).

The groundwater monitoring and performance evaluation program shall also provide early warning of changes in the nature or extent of contamination upgradient of the groundwater extraction locations and changes in groundwater elevations. Upgradient conditions that could affect system operations include changes in the lateral or vertical extent of contamination, changes in contaminant concentrations, or detection of new contaminants which could require changes to extraction rates or water treatment system operation.

The groundwater monitoring and performance evaluation program is expected to rely on a combination of new and existing wells.

If there are no suitably constructed existing monitoring wells located within several hundred feet of the leading-edge extraction well(s), a nested piezometer pair may be required near the extraction well(s) to provide water level data to help define the size of the extraction well capture zone and assist in evaluating hydraulic control.

As described above, two compliance monitoring points are required downgradient of the leading-edge extraction well(s) to support evaluation of hydraulic control and to monitor progress in reducing contaminant concentrations to chemical-specific ARARs. Depending on the final extraction location, the compliance monitoring points could be either new or existing monitoring wells. The compliance wells should be located no more than approximately 1,500 feet downgradient of the extraction well(s) and monitor depths similar to the extraction well screened interval.

There is a moderate to high level of uncertainty about groundwater flow conditions downgradient of the planned leading-edge extraction area due to the limited number of monitoring locations and the presence of geologic faults that may affect flow directions.

Decisions about the number, location, and design of the new monitoring wells needed to satisfy groundwater monitoring objectives shall be made during remedial design. Monitoring frequencies and the types of analyses shall also be determined during remedial design. The monitoring program is expected to include water level measurements, analysis of groundwater samples for chemicals of concern and other chemicals that could affect the operation of the remedy, and analysis of groundwater samples to distinguish Site-related perchlorate from non-Site perchlorate.

Future Remedy Changes

The remedy may change as a result of the remedial design and construction processes. If appropriate, changes to the remedy described in the ROD will be documented in a technical memorandum, an Explanation of Significant Differences (ESD), or amendment to this ROD.

2.11.3 Summary of the Estimated Remedy Costs

Tables 12a and 12b provide summaries of the estimated capital, O&M, and present value costs of the major components of the selected remedy. Both tables describe costs for Alternative 3. Two tables are provided because Alternative 3 allows recharge or reinjection of a portion of the

treated water. Table 12a assumes that the portion of the treated water not supplied for potable drinking water use is recharged at an existing groundwater recharge basin; Table 12b assumes that this portion is reinjected directly into the aquifer. The information in the tables is based on the best available information regarding the anticipated scope of the remedy. Changes in costs may occur as a result of new information, data collected during the remedial design phase, or changes in the configuration of the remedy. Major changes may be documented in the form of a memorandum, ESD, or ROD amendment. As is the practice at Federal Superfund sites, the cost estimates are order-of-magnitude engineering estimates expected to be within +50 to -30% of the actual cost.

Table 12a. Detailed Cost Estimate for the Selected Remedy—Drinking Water End Use with Surface Recharge

Capital Costs (Drinking Water/Recharge End Use)

Major System/Component		**Quantity**	**Unit Cost**	**Cost**
Mobilization and Permitting		1	$160,000	$160,000
Extraction Well, Booster Pump and Conveyance				
Land Acquisition		1	$375,000	$375,000
Extraction Well and Development		1	$1,510,515	$1,510,515
Well Pump, Booster Pump and Wellhead Facilities		1	$403,694	$403,694
Storage Tank		1	$211,723	$211,723
Groundwater Conveyance		26,450 LF	$90	$2,380,500
Bore and Jack Beneath Railroad		250 LF	$558	$139,450
Asphalt Repair for Pipe Trench		8,817 SY	$98	$861,036
Valves, Treatment Plant Connection, Erosion Control, Traffic Control		1	$140,000	$140,000
Construction Contingency		15%		$847,038
Engineering and Project Management				
Project Management		15%		$1,054,343
Engineering Design		5%		$351,448
Construction Management/QC		10%		$702,896
TOTAL ESTIMATED CAPITAL COSTS				$9,137,643

Annual O&M Costs (Drinking Water/Recharge End Use)

Equip. Name	**Years**	**Units**	**Unit Cost**	**Cost**
Long-Term Groundwater Monitoring	30	Year	$165,000	$165,000
Fluidized Bed Reactor				
Labor	30	Year	$326,900	$326,900
Electricity	30	Year	$141,900	$141,900
Water Quality Testing	30	Year	$39,000	$39,000
Chemicals	30	Year	$184,200	$184,200
Maintenance, Structures and Equipment	30	Year	$356,800	$356,800
Consultants/Professional Services	30	Year	$86,600	$86,600
Permit, Sampling, Analysis, Reporting and Discharge Fee	30	Year	$56,400	$56,400
Other Treatment Systems				
FXB System	30	Year	$300,000	$300,000
Ion Exchange System	6	Year	$276,000	$276,000
Estimated Annual O&M Costs		30 Years		$1,656,300

Table 12a. Detailed Cost Estimate for the Selected Remedy—Drinking Water End Use with Surface Recharge			
Capital Costs (Drinking Water/Recharge End Use)			
Major System/Component	**Quantity**	**Unit Cost**	**Cost**
Estimated Annual Ion Exchange O&M Costs	6 Years		$276,000
NET PRESENT VALUE OF THE ESTIMATED O&M COSTS			$21,868,660
TOTAL ESTIMATED PRESENT WORTH FOR SELECTED REMEDY			$31,010,000

Table 12b. Detailed Cost Estimate for the Selected Remedy—Drinking Water End use with Reinjection				
Capital Costs (Drinking Water/Reinjection End Use)				
Major System/Component		**Quantity**	**Unit Cost**	**Cost**
Mobilization and Permitting		1	$235,000	$235,000
Extraction Well, Booster Pump and Conveyance				
Land Acquisition		1	$375,000	$375,000
Extraction Well and Development		1	$1,510,515	$1,510,515
Well Pump, Booster Pump and Wellhead Facilities		1	$403,694	$403,694
Storage Tank		1	$211,723	$211,723
Groundwater Conveyance		26,450 LF	$90	$2,380,500
Bore and Jack Beneath Railroad		250 LF	$558	$139,450
Asphalt Repair for Pipe Trench		8,817 SY	$98	$861,036
Valves, Treatment Plant Connection, Erosion Control, Traffic Control		1	$140,000	$140,000
Injection Wells, Conveyance and Storage Tank				
Land Acquisition		1	$300,000	$300,000
Injection Wells and Development		1	$1,711,800	$1,711,800
Storage Tank (100,000 gallons)		1	$210,026	$210,026
Storage Tank Sitework, Installation and Connections		1	$133,388	$133,388
Conveyance to Injection Wells		8,000 LF	$90	$720,000
Asphalt Repair for Pipe Trench		800 SY	$98	$78,128
Valves, Connections, Erosion Control, Traffic Control		1	$76,000	$76,000
Contingency				
Construction Contingency		15%		$1,342,689
Engineering and Project Management				
Project Management		15%		$1,624,343
Engineering Design		5%		$541,448
Construction Management/QC		10%		$1,082,896
TOTAL ESTIMATED CAPITAL COSTS				$14,077,643
Annual O&M Costs (Drinking Water/Reinjection End Use)				
Equip. Name	**per Unit**	**Units**	**Unit Cost**	**Cost**
Long-Term Groundwater Monitoring	30	Year	$165,000	$165,000
Fluidized Bed Reactor				
Labor	30	Year	$326,900	$326,900
Electricity	30	Year	$141,900	$141,900
Water Quality Testing	30	Year	$39,000	$39,000
Chemicals	30	Year	$184,200	$184,200

Table 12b. Detailed Cost Estimate for the Selected Remedy—Drinking Water End use with Reinjection				
Capital Costs (Drinking Water/Reinjection End Use)				
Major System/Component	**Quantity**		**Unit Cost**	**Cost**
Maintenance, Structures and Equipment	30	Year	$356,800	$356,800
Consultants/Professional Services	30	Year	$86,600	$86,600
Permit, Sampling, Analysis, and Reporting	30	Year	$9,600	$9,600
Other Treatment Systems				
FXB System	30	Year	$300,000	$300,000
Ion Exchange System	6	Year	$276,000	$276,000
Injection Wells				
Electricity	30	Year	$90,000	$90,000
Maintenance, Redevelopment, Sampling and Reporting	30	Year	$38,750	$38,750
Injection Well O&M Contingency (15%)	30	Year	$19,313	$19,313
Estimated Annual O&M Costs		30 Years		$1,758,063
Estimated Annual Ion Exchange O&M Costs		6 Years		$276,000
NET PRESENT VALUE OF THE ESTIMATED O&M COSTS				$23,131,000
TOTAL ESTIMATED PRESENT WORTH FOR THE SELECTED REMEDY				$37,209,000

Notes:

The Net Present Value of the Estimated O&M costs and the Total Estimated Present Worth for the Selected Remedy are based on a 7% discount rate and 30 years of O&M. Capital cost estimates are not discounted.

Treatment locations, treatment technologies and pipeline routes may change during remedial design, affecting costs. Cost estimates are expected to be within a +50 to -30% accuracy range.

2.11.4 Expected Outcomes of Selected Remedy

The selected remedy will limit further downgradient movement of groundwater contaminated with Site-related perchlorate and VOCs, reduce risk to human health, and help protect future uses of drinking water supply wells and groundwater resources. Through removal of Site-related contaminants, the selected remedy is expected to lead to restoration of the aquifer, allowing for unrestricted use. Achieving this outcome may take several decades.

The remedy will start protecting downgradient areas shortly after startup and will continue to protect downgradient areas during the full range of expected future groundwater conditions.

Groundwater cleanup levels for the primary COCs are summarized in Table 11. EPA will use Federal and State drinking water MCLs as the cleanup levels for the aquifer and also for the treated groundwater. If the treated water is distributed to local water utilities as potable water supply (the expected end use option for the majority of the treated water), the extracted water will be treated to lower levels as required by the California State Water Resources Control Board Division of Drinking Water. Treated groundwater from the remedy is expected to provide a reliable, long-term supply of clean water for municipal (e.g., drinking water) use by one or more local water utilities.

2.12 Statutory Determinations

This section provides a brief, Site-specific description of how the selected remedy satisfies the statutory requirements of CERCLA §121, as required by NCP §300.430(f)(5)(ii) and explains the 5-year review requirement for the selected remedy.

2.12.1 Protection of Human Health and the Environment

The selected remedy, Alternative 3, will protect human health by extracting and treating contaminated groundwater. These actions will prevent contaminated groundwater from moving into clean or less contaminated portions of the groundwater aquifer and remove contaminants from the aquifer. The remedy targets groundwater where contaminant concentrations in 2021 were up to 67 times the level allowed in drinking water. The groundwater aquifer is a current source of drinking water to tens of thousands of people.

If no action is taken, contaminated groundwater will continue to spread, increasing the likelihood of future increases in contaminant concentrations in downgradient portions of the aquifer, increasing risk by increasing the likelihood of exposure, and increasing the eventual cost, difficulty, and time required for restoration of the aquifer.

The selected remedy includes above-ground water treatment systems to remove the COCs from the extracted groundwater. After treatment, the extracted groundwater will achieve all ARARs identified in this ROD. The remedy also requires compliance with ARARs associated with the disposal of treatment residuals to eliminate or minimize short-term risks and cross-media impacts. The remedy includes an extensive monitoring program to evaluate the performance of the remedy.

There is no known exposure pathway by which ecological receptors could be exposed to contaminated groundwater at the Site.

2.12.2 Compliance with Applicable or Relevant and Appropriate Requirements

The selected remedy of groundwater extraction and treatment shall comply with ARARs as described in Tables 13 through 15, except, potentially, during studies and investigations undertaken pursuant to CERCLA § 104(b) (CERCLA § 104(b) activities) during remedial design. EPA expects to fully comply with ARARs during most CERCLA § 104(b) activities, but there may be activities during which EPA concludes that it is not practicable to comply fully. Such activities may include discharges of untreated or partially treated groundwater resulting from the development and testing of new groundwater extraction wells, but may also include other temporary high flow, high volume discharges.

In such cases, EPA will evaluate the practicability of fully complying with ARARs, and comply with the EPA policy that removal actions "will comply with ARARs to the extent practicable, considering the exigencies of the circumstances." Studies and investigations undertaken pursuant to CERCLA § 104(b) are considered removal actions (40 CFR 300.415(j)).

Table 16 provides a list of other Federal requirements which should be considered in designing and implementing the remedy.

ARARs are frozen at the time the ROD is signed, but offsite requirements are not (e.g., drinking water standards applicable to treated water delivered for potable use). Offsite requirements in effect at the time the action occurs must be met, even if they differ from those in effect at the time the ROD is signed.

Table 13. Chemical-specific Applicable or Relevant and Appropriate Requirements				
Source	**Citation**	**ARAR Status**	**Description of Requirement**	**Action to be Taken to Attain Requirement**
SDWA, 42 U.S.C. §§ 300f–300j-26	National Primary Drinking Water Standards, including 40 CFR 141.61 and 40 CFR 141.62	Relevant and Appropriate	Establishes national primary drinking water standards, including MCLs, to protect the quality of water in public water systems. MCLs are enforceable standards and represent the maximum concentrations of contaminants permissible in a public water system.	Water treatment systems will reduce the concentration of COCs in need of treatment to below EPA MCLs. MCLs also provide cleanup levels for the groundwater aquifer.
State of California Domestic Water Quality and Monitoring Regulations	California SDWA Standards, 22 CCR §§ 64431, 64444	Relevant and Appropriate	Establishes California MCLs. Some California MCLs are more stringent than the Federal MCLs, and California has MCLs established MCLs for chemicals for which there are no Federal MCLs.	Water treatment systems will reduce the concentration of perchlorate to below California MCLs. The California MCL for perchlorate also provides the cleanup level for the groundwater aquifer. There is a California MCL for perchlorate but no Federal MCL.

Note:
CCR = California Code of Regulations
CFR = Code of Federal Regulations

Table 14. Action-specific Applicable or Relevant and Appropriate Requirements				
Source	**Citation**	**ARAR Status**	**Description of Requirement**	**Action to be Taken to Attain Requirement**
Clean Air Act, South Coast Air Quality Management District (SCAQMD)	SCAQMD Regulation XIII, comprising Rules 1301–1313, SCAQMD Rule 1401, SCAQMD Rule 1401.1, SCAQMD Rules 401–403	Potentially Applicable	Rules 1301–1313 establish new source review requirements. Rule 1303 requires that all new sources of air pollution in the district use best available control technology (BACT) and meet emission offset requirements for all new sources that emit in excess of 1 pound per day of VOCs. SCAQMD Rule 1401 requires that best available control technology for toxics (T-BACT) be employed for new stationary operating equipment if the cumulative carcinogenic impact from air toxics would exceed the maximum individual cancer risk limit of 1 in 1 million (1 × 10-6) without T-BACT. SCAQMD Rule 1401.1 applies to discharges that are within 500 feet of a school and requires that the discharges from a facility not create a cancer risk in excess of 1 in 1 million (1 × 10-6) at the school. SCAQMD Rule 401 limits visible emissions from a point source. SCAQMD Rule 402 prohibits discharge of material that is odorous or causes injury, nuisance, or annoyance to the public. SCAQMD Rule 403 limits downwind particulate concentrations.	Construction activities must comply with applicable SCAQMD requirements. If air stripping is used to remove VOCs from groundwater, air emissions must meet substantive SCAQMD requirements, if applicable.
RCRA Subtitle C Hazardous Waste Identification and Generator Requirements and California Hazardous Waste Requirements	22 CCR, Division 4.5, Chapter 11 (Identification and Listing of Hazardous Waste)	Potentially Applicable	A solid waste is a RCRA hazardous waste if it exhibits any of the characteristics of ignitability, corrosivity, reactivity, or toxicity identified in 22 CCR §§ 66261.21, 66261.22(a)(1), 66261.22(a)(2), 66261.23, 66261.24(a)(1), 22 CCR § 66262.11, and 22 CCR § 66260.200, or if it is listed as a hazardous waste in Article 4 of Chapter 11. Wastes can also be classified as non-RCRA, State-only hazardous wastes if they exceed the soluble threshold limit concentration or total threshold limit concentration values listed in 22 CCR § 66261.24(a)(2).	Wastes generated during remedial action (e.g., drill cuttings from well installation, soil from pipeline installation, spent resin or other wastes generated during water treatment) will be characterized and managed in accordance with substantive provisions of any applicable RCRA and California requirements.
Federal SDWA Underground Injection Control (UIC) Regulations, 42 U.S.C. § 300f et seq.	40 CFR 144.12-144.13	Potentially Applicable	Prohibits injection wells from 1) causing a violation of primary MCLs in the receiving waters, and 2) adversely affecting the health of persons. Provides that contaminated groundwater that has been treated may be reinjected into the formation from which it is withdrawn if such injection is conducted pursuant to a CERCLA cleanup and is approved by EPA.	Groundwater reinjected into the aquifer will be treated to comply with UIC requirements.
RCRA § 3020	42 U.S.C. § 6939b(b)	Potentially Applicable	Provides that the ban on the disposal of hazardous waste into a formation that contains an underground source of drinking water shall not apply to the injection of contaminated groundwater into the aquifer if: (i) such injection is part of a response action authorized by CERCLA; (ii) such contaminated groundwater is treated to substantially reduce hazardous constituents prior to such injection; and (iii) such response action will, upon completion, be sufficient to protect human health and the environment.	Groundwater determined to be hazardous waste will be reinjected into the aquifer only if it is treated as part of the CERCLA response action and the action is protective of human health and the environment.
California Porter-Cologne Water Quality Act, California Water Code 13240	Water Quality Control Plan (Basin Plan) for the Santa Ana River Basin, Chapters 2 (Plans and Policies), 3 (Beneficial Uses), and 4 (Water Quality Objectives)	Potentially Relevant and Appropriate	The California Porter-Cologne Water Quality Act incorporates the requirements of the Federal Clean Water Act and implements additional standards and requirements for surface waters and groundwaters of the State. The Water Board formulates and enforces water quality standards as defined in the Basin Plan. The Basin Plan identifies the beneficial uses of surface and ground waters and establishes water quality objectives necessary to protect beneficial uses. Water	The reinjection of treated water into the aquifer or temporary discharges to surface water during design, construction, or operation of the remedy must comply with relevant and appropriate provisions of Chapters 2, 3 and 4 of the Basin Plan.

Table 14. Action-specific Applicable or Relevant and Appropriate Requirements				
Source	**Citation**	**ARAR Status**	**Description of Requirement**	**Action to be Taken to Attain Requirement**
			quality objectives impose limitations on receiving waters, rather than on discharges. The Basin Plan also incorporates State Water Resources Control Board Resolution 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California." Resolution 68-16 requires maintenance of existing State water quality unless it is demonstrated that a change will benefit the people of California, will not unreasonably affect present or potential uses, and will not result in water quality less than that prescribed by other State policies.	
Federal Water Pollution Control Act 33 U.S.C. §§ 1311, 1314(b)		Potentially Applicable	Establishes effluent limitations and criteria for discharges from point sources	Temporary discharges to surface water during design, construction, or operation must comply with applicable provisions.
Federal Water Pollution Control Act 33 U.S.C. § 1342, 1344	33 CFR 323.1 et seq.	Potentially Relevant and Appropriate	Provides requirements for discharges from point sources into waters of the United States. Waters of the United States are defined in 40 CFR 122.2. Includes dredge and fill requirements for discharges into the navigable waters of the United States.	Temporary discharges to surface water during design, construction, or operation must comply with relevant and appropriate provisions.
California Toxics Rule	40 CFR 131.36(d)(10)(ii)	Potentially Applicable	The California Toxics Rule is a Federal regulation promulgated under the Federal Water Pollution Control Act that sets numeric criteria for certain pollutions in inland waters. It applies to waters assigned an aquatic life or human health use classification in a California Regional Water Quality Control Plan.	Temporary discharges to surface water during design, construction, or operation must comply with applicable provisions.
California Land Disposal Restrictions, Requirements	22 CCR § 66268.1 et seq. Also 22 CCR §§ 66268.3, 66268.7, 66268.9, 66268.40 and 66268.50	Potentially Applicable	Defines hazardous wastes that cannot be disposed of to land without treatment.	Hazardous wastes generated during the treatment of groundwater and planned for offsite disposal must comply with substantive requirements. Wastes would be characterized before shipment offsite to determine whether land disposal restriction treatment standards apply and, if so, whether the waste meets applicable treatment standards.
California Hazardous Waste Regulations	22 CCR § 66262.34(a)(1)(A)	Potentially Relevant and Appropriate	Hazardous waste stored onsite should be stored in compliance with regulations cited in this section.	Hazardous wastes generated and stored onsite must comply with substantive requirements.
California Hazardous Waste Regulations	22 CCR § 66265.170 et seq. (Article 9) 22 CCR § 66265.190 et seq. (Article 10)	Potentially Applicable	Regulates the use and management of hazardous waste in containers, compatibility of hazardous wastes with containers, and special requirements for certain hazardous wastes.	Hazardous waste generated and accumulated onsite must comply with substantive requirements.

Table 15. Location-specific Applicable or Relevant and Appropriate Requirements				
Requirement	**Citation**	**Applicable or Relevant and Appropriate?**	**Description of Requirement**	**Action to be Taken to Attain Requirement**
National Historic Preservation Act (NHPA), 54 U.S.C. § 300101 et seq. Historic Sites Act of 1935, 54 U.S.C. §§ 320101–320106	36 CFR Parts 60.4, 62, 63, 65, 68, 800	Potentially Applicable	The NHPA requires Federal agencies to take into account the effect of any federally assisted undertaking or licensing on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places (NRHP). The Historical Sites Act authorizes the Secretary of the Interior to designate sites, buildings and objects of national significance as natural landmarks for listing on the National Registry of Natural Landmarks.	EPA will evaluate whether any site, building, or object encountered during remedial action may be eligible. To date, no sites, buildings and objects of national significance have designated as having historic value to warrant inclusion in the NRHP, or listed as a national natural landmark under the Historic Sites Act.
The Archaeological and Historic Preservation Act (AHPA), 16 U.S.C. § 469 et seq. Archaeological Resources Protection Act (ARPA), 16 U.S.C. § 470	43 CFR Part 7	Potentially Applicable	The AHPA provides for the preservation of historical and archaeological data that might be destroyed through alteration of terrain as a result of a Federal construction project or a federally licensed activity or program. The ARPA prescribes steps to be taken by investigators to preserve data.	EPA will evaluate whether any terrain which may be altered during the remedial action may affect archaeological or historical data. If remedial activities would cause irreparable loss or destruction of significant scientific, prehistoric, historical, or archaeological data, mandatory data recovery and preservation activities would be necessary.

Table 15. Location-specific Applicable or Relevant and Appropriate Requirements				
Requirement	**Citation**	**Applicable or Relevant and Appropriate?**	**Description of Requirement**	**Action to be Taken to Attain Requirement**
The Endangered Species Act (ESA), 16 U.S.C. § 1531, et seq. California Endangered Species Act, California Fish and Game Code, Division 3, Chapter 1.5 Native Plants Protection Act, California Fish and Game Code, Division 2, Chapter 10	50 CFR Part 17; 50 CFR Part 402 CCR §§ 2050–2089 14 CCR § 670.5	Potentially Applicable	The Federal ESA requires consultation with the resource agencies for remedial actions that may affect threatened or endangered species or their critical habitat. Section 7 of the ESA requires that Federal agencies consider whether their actions will jeopardize the existence of species that are listed as threatened or endangered by the United States Fish and Wildlife Service or the National Marine Fisheries Service or their critical habitat. The California ESA establishes additional requirements for the protection of native threatened or endangered species. The Native Plants Protection Act establishes requirements for the protection of endangered or rare plants native to California.	EPA will evaluate planned construction locations for threatened or endangered species and their critical habitat, and comply with substantive provisions of these three acts if applicable species and/or habitat may be affected by planned remedial actions, including consultation with appropriate resource agencies. Recovery areas for an endangered insect, the Delhi Sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*, DSF), have been identified in the City of Colton.
Migratory Bird Treaty Act, 16 U.S.C. § 703 California Fish and Game Code, Division 4	50 CFR 10.13 CCR §§ 3003, 3005, 3511, 3513	Potentially Applicable	The Federal act protects migratory birds, and any part, nest, or egg of any such bird, native to the United States or its territories. Regulations codified at 50 CFR 10.13 provide a list of migratory birds protected by the act. CCR establishes additional provisions and regulations to protect migratory birds.	EPA will consult with the U.S. Fish and Wildlife Service and comply with substantive provisions of applicable requirements if planned remedial activities may affect migratory birds.

Table 15. Location-specific Applicable or Relevant and Appropriate Requirements				
Requirement	**Citation**	**Applicable or Relevant and Appropriate?**	**Description of Requirement**	**Action to be Taken to Attain Requirement**
Native American Graves Protection and Repatriation Act (NAGPRA), 25 U.S.C. §§ 3001–3013. California Native American Graves Protection and Repatriation Act, California Health and Safety Code 8010–8011	43 CFR Part 10	Potentially Applicable	The Federal and State acts address the identification, protection and appropriate disposition of human remains, funerary objects, sacred objects, and objects of cultural patrimony. The California Act allows for the protection and repatriation of Native American Tribes not federally recognized.	EPA will comply with substantive provisions of applicable requirements if human remains, funerary objects, sacred objects, or objects of cultural patrimony are encountered during remedy construction.

Table 16. Other Federal Requirements		
Requirement	**Description of Requirement**	**Action to be Taken to Attain Requirement**
Executive Order 11593 Protection and Enhancement of the Cultural Environment	Requires that Federal agencies take timely steps to make records of any property listed on the NRHP that may be substantially altered by a Federal action.	EPA will determine during remedial design if remedial activities may affect any properties listed on the NRHP.
Executive Order 11988 on Floodplain Management	Requires that Federal agencies evaluate the potential effects of activities in a floodplain to avoid, to the extent possible, adverse effects associated with direct and indirect development. EPA has developed guidance relevant to this Executive Order, the *Policy on Floodplains and Wetlands Assessments for CERCLA Actions* (EPA, 1985).	EPA will determine during remedial design if planned remedial activities may occur in a floodplain and avoid adverse effects to the extent possible.
Protection of Wetlands Executive Order 11990	Requires avoidance to the extent practicable of adverse impacts associated with the destruction or loss of wetlands and to avoid support of new construction in wetlands if a practical alternative exists. Wetlands are defined as waters of the United States in 40 CFR 122.2. Wetlands include those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstance do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.	EPA will determine during remedial design if planned remedial activities may affect wetlands. If so, EPA will avoid impacts to the extent practicable.
Indian Sacred Sites Executive Order 13007	To the extent practicable, where permitted by law, and not clearly inconsistent with essential agency functions, requires executive branch agencies to (1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious	EPA will determine during remedial design if planned remedial activities may occur on Federal lands and sacred Indian sites may be present. If so, EPA

Table 16. Other Federal Requirements		
Requirement	**Description of Requirement**	**Action to be Taken to Attain Requirement**
	practitioners and (2) avoid adversely affecting the physical integrity of such sacred sites.	will comply with the Executive Order to the extent practicable.

2.12.3 Cost-Effectiveness

EPA must select a remedy that is cost effective. The NCP defines a cost-effective remedy as one whose "costs are proportional to its overall effectiveness." Overall effectiveness is determined by evaluating three of the balancing criteria (long-term effectiveness; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness) and then comparing overall effectiveness to cost.

In EPA's judgment, the selected remedy for the MBOU is cost-effective in that its overall effectiveness is proportional to its costs. The estimated present worth cost of the Selected Remedy (Alternative 3) is $31.0 million to $37.2 million, depending on whether groundwater reinjection wells are constructed and used. The selected remedy is slightly more expensive ($0.6 million to $6.8 million) than Alternative 1 but judged more effective. The selected remedy is similar in cost to Alternative 2 with a similar level of effectiveness. EPA judges the No-Action Alternative as neither protective of human health nor cost-effective. Table 17 summarizes the costs and effectiveness of the alternatives.

Table 17. Cost and Effectiveness						
Alternative	**Cost-Effective?**	**Present Worth Cost**	**Incremental Cost**	**Long-Term Effectiveness and Permanence**	**Reduction of Toxicity, Mobility, or Volume Through Treatment**	**Short-Term Effectiveness**
No Action	No	---	---	No hydraulic control, contaminant removal, and risk reduction	No reduction of toxicity, mobility, or volume	---
Alternative 1: Pump and Treat Contaminated Groundwater and Use Treated Water as Drinking Water Supply	Yes	$30,430,000	+$30,430,000	Significant hydraulic control, contaminant removal, and risk reduction	Significant reduction of toxicity and volume	No unmitigable risks during construction and implementation.
Alternative 3: Pump and Treat Contaminated Groundwater and Use the Treated Water as Drinking Water Supply or for Recharge/ Reinjection	Yes	$31,010,000 to $37,200,000	-$580,000 to +$6,777,000	- Potential for increased contaminant removal - Higher confidence of complete hydraulic control	Potential for greater reduction of toxicity, mobility, or volume.	Same as Alternative 1
Alternative 2: Pump and Treat Contaminated Groundwater and Recharge or Reinject the Treated Water	Yes	$31,690,000 to $38,400,000	+$680,000 to +$1,200,000	Same as Alternative 3	Same as Alternative 3	Same as Alternative 1

Notes:

The no action alternative is not considered to be cost-effective.

Alternatives are listed in order of increasing cost. Incremental cost is the difference between the listed alternative and the preceding alternative.

Alternative 3, EPA's selected remedy, provides a potentially greater return on investment compared to the other alternatives.

2.12.4 Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner and provides the best balance of tradeoffs in terms of the five balancing criteria, while also consideringthe statutory preference for treatment as a principal element and bias against offsite treatment and disposal and considering State and community acceptance.

The selected remedy employs treatment technologies that would reduce the toxicity and volume of contaminated groundwater by inhibiting contaminant migration, and reduce the volume of contaminants by removing contaminants from the extracted groundwater.

The selected remedy is expected to be more effective than Alternative 1 because it provides multiple end use options. The effectiveness of Alternative 1 may be limited during extended dry periods that result in low groundwater levels in the RCB. Low groundwater levels reduce the available water rights and may limit the ability of Alternative 1 to pump at the targeted rate, potentially resulting in additional plume migration. The selected remedy is expected to be more easily implemented than Alternative 2 because of the agreements in place that provide access to water rights, treatment facilities, and other infrastructure and provides arrangements to use the treated water for drinking water supply. These criteria were key factors and decisive in the selection decision. The selected remedy is similar to the other action alternatives in the Reduction of Toxicity, Mobility, or Volume through Treatment and Short-Term Effectiveness criteria. There would be minor differences in toxicity, mobility, or volume reduction if limited water rights reduced the average extraction and treatment rate of Alternative 1.

Comments received on EPA's January 2022 proposal indicate that the community generally supports EPA's selected remedy. One comment explicitly supported EPA's preferred alternative. Several commenters made recommendations, such as recommending that water treatment occur close to the leading-edge extraction location to minimize disruption to local communities, maximizing the use of the treated groundwater for potable water use, or using a particular groundwater recharge basin, which will be addressed after EPA selects a remedy (i.e., during the design, permitting, construction, and monitoring of the remedy).

2.12.5 Preference for Treatment as a Principal Element

Although no principal threat wastes are present, the MBOU remedy will use treatment to remove contaminants from the extracted groundwater. By utilizing treatment as a significant element of the remedy, the remedy will support the statutory preference that remedies employ treatment as a principal element.

2.12.6 Five-Year Review Requirements

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining onsite above levels that allow for unlimited use and unrestricted exposure, a policy review will be conducted within 5 years after completion of construction to ensure that the remedy is, or will be, protective of human health and the environment.

2.13 Documentation of Significant Changes

The Proposed Plan for the MBOU was released for public comment on January 24, 2022. The Proposed Plan identified as EPA's preferred alternative the groundwater extraction, treatment, conveyance, and monitoring facilities included in Alternative 3.

EPA has carefully considered all comments submitted during the public comment period and determined that no changes are needed to the preferred alternative identified in EPA's January 2022 proposal.

Part 3: Responsiveness Summary

The purpose of this Responsiveness Summary is to provide EPA's responses to comments received on the January 2022 Proposed Plan for the MBOU of the RFF Site. During the public comment period, EPA received six sets of comments on its proposal. All comments were submitted electronically (by email).

The six sets of comments can be summarized as follows.

- All six sets of comments were from public agencies located at or near the Site.
- Four of the six sets of comments were from public water suppliers affected by or with an interest in groundwater contamination in the RCB.

3.1 Stakeholder Issues and Lead Agency Responses

One comment supports EPA's preferred remedial alternative. A second comment expresses a preference for remedial alternatives that make use of an existing network of groundwater recharge basins known as the Cactus Basins. EPA's response to these comments is that the selected remedy includes use of the Cactus Basins for recharge as one of several end use options for the groundwater extracted and treated as part of the cleanup.

A third commentor recommends that EPA choose the remedial alternative that minimizes disruption to local communities.

One comment questions an assumption (the assumed water treatment location for groundwater extracted in the leading-edge area) made in the evaluation of the remedial alternatives. EPA responds that the water treatment location assumed in the evaluation of remedial alternatives does not commit or bind EPA to the assumed location. As stated in the proposed cleanup plan and ROD, a decision about the water treatment location will be made during the design phase of the project.

One comment questions whether the groundwater contamination addressed by the MBOU has been adequately characterized. EPA responds that the extent of contamination has been characterized to develop and select a remedy. EPA completed a multi-year remedial investigation which included the installation and sampling of 25 groundwater monitoring wells. Most of the wells are multi-depth wells which allow the collection of discrete groundwater samples from five or more depths per well. Groundwater sampling activities will continue in support of the design of the MBOU remedy and to evaluate the performance of the remedy after it begins operation. EPA expects the performance monitoring activities to include the groundwater monitoring downgradient of the leading-edge groundwater extraction location.

One comment expresses disappointment about a lack of participation in the development of the proposed cleanup plan and requests that EPA hold a public meeting in the City of Rialto to provide notice to the community about its proposal. EPA responds that it provided ample notice to the community about its proposal through a notice of availability published in a local newspaper, an announcement placed on the EPA Site webpage, an email announcement, and postcards sent by regular mail to parties on EPA's mailing list. EPA did not hold an in-person public meeting in the Rialto area due to the COVID-19 pandemic.

Several comments relate to topics to be addressed after EPA selects a remedy (i.e., during the design, permitting, construction, or monitoring of the remedy). The topics include the water treatment location (recommending treatment close to the leading-edge extraction location and the use of existing wells and water treatment systems operated by the City of Colton), the chemicals in the groundwater which will require treatment, the end use of the treated groundwater (recommending that EPA maximize use of the treated groundwater for potable water use), where groundwater may be recharged (recommending use of the existing Cactus Basins), and the need to minimize risks and environmental harm to the community during the cleanup. EPA responds that it has convened a design working group, which includes representatives of the cities and agencies most affected by decisions to be made during design, to discuss and provide input to EPA on key design decisions.

Two comments address the importance of not delaying the cleanup.

No single issue was raised by a significant number of commenters. Because EPA did not receive a large number of comments, and the comments address a variety of issues, EPA has prepared point-by-point responses to all comments received. The responses are provided in Appendix A, along with the comments in their entirety.

3.2 Technical and Legal Issues

Technical or legal issues raised by the comments are addressed in the point-by-point responses provided in Appendix A.

Appendix A
Detailed Responses to Comments

Comments by Marcus L. Fuller, City Manager, sent on behalf of the City of Rialto. Comment letter dated February 22, 2022

Comment Rialto-1. Why was the City of Rialto not invited to participate in the development of the Feasibility Study Report prepared in coordination by US EPA and Goodrich / UTC and their consultants? As a community that first raised awareness of the perchlorate contamination in the Rialto-Colton groundwater basin leading to the Consent Decree causing its cleanup, the City as an important stakeholder and municipal water supplier, should have been consulted prior to EPA's approval of the Feasibility Study Report and its public release as part of the proposed cleanup plan.

↳EPA Response: EPA agrees that the city is an important stakeholder in the cleanup and is formally responding to the city's comments and concerns in this Responsiveness Summary. Before releasing its proposed cleanup plan, EPA representatives discussed the cleanup with city staff and elected officials on multiple occasions. EPA carefully considered the city's comments before finalizing its cleanup plan and, as explained below, has determined that most of the city's comments are relevant to decisions to be made after the cleanup plan is finalized, during the design of the selected remedy.

Comment Rialto-2. Alternative 3 is identified by EPA as its Preferred Alternative and includes Alternatives 1 and 2 to allow for extraction and treatment for both drinking water supply and groundwater recharge dependent upon the availability of groundwater rights for extraction. Extraction is proposed in the "leading-edge" area of the groundwater contamination and is a key component of the Preferred Alternative. Extraction would begin after new facilities (conveyance systems including pipelines, pumps and tanks) are constructed and become operational. The Feasibility Study Report assumed treatment of contaminated groundwater extracted from the leading-edge area occurring at the West Valley Water District (WVWD) Headquarters far from the leading-edge area where there are two existing treatment systems located nearby (one at Rialto High School owned by WVWD, and one located just east of Macy Street and north of Ellen Street owned by the City of Colton). Why weren't these two treatment plants assumed to be used for treatment of contaminated groundwater in the leading-edge area in EPA's Feasibility Study Report as opposed to the treatment plant at WVWD Headquarters located several miles away?

↳EPA Response: The June 2021 Feasibility Study Report prepared in support of EPA's selected remedy assumed treatment of extracted groundwater at the West Valley Water District Headquarters (WVWD HQ) site to reflect a 2017 agreement between Goodrich Corporation and WVWD. The agreement makes available existing water treatment systems at the HQ site and rights to pump water in the Rialto-Colton Groundwater Basin (RCB). As noted in the comment, the use of the WVWD HQ site is an assumption. EPA is not selecting water treatment locations as part of this Record of Decision (ROD) and is not committed to or bound by the treatment location assumed in the Feasibility Study Report. As stated in the proposed cleanup plan and this ROD, a decision about the water treatment location will be made during the design phase of the project. EPA has convened a design working group, which includes representatives of the cities and agencies most affected by decisions to be made during design, to consider treatment sites other than the WVWD HQ site, including the two locations identified in the comment.

EPA supports the use of the Rialto High School water treatment location over the WVWD HQ location due to the shorter distance to the planned leading-edge extraction location. Other benefits include: the availability of two ion exchange systems at the Rialto High School location; proximity to the WVWD water distribution system; and provisions for use of the location in the 2017 Site remediation agreement between Goodrich Corporation and WVWD.

Comment Rialto-3. EPA should identify in its proposed cleanup plan the alternative that will result in the least disruption to the communities of Colton, Rialto and San Bernardino. The alternative suggested in EPA's Feasibility Study Report with treatment of contaminated groundwater occurring at WVWD Headquarters located at Baseline Road / Cactus Avenue will require construction of approximately 5 miles of new pipelines in City streets, to convey untreated contaminated groundwater with the potential for future leakage and environmental harm to an area designated as both disadvantaged and environmental justice communities. These new pipelines will cause City residents and business owners to face a permanent risk of exposure to contaminated groundwater either through the rupture, leakage or other failures of the new facilities to be constructed. These risks will have a detrimental impact on the communities through which they extend. The proposed cleanup plan does not identify this risk or how it will be minimized or avoided.

↳EPA Response: EPA agrees that it should attempt to minimize disruption to nearby communities caused by the construction and operation of its selected remedy, including the temporary disruption associated with well, treatment plant, and pipeline construction.

The comment expresses concern about the potential for pipelines carrying contaminated groundwater to fail and cause environmental harm. EPA believes that the risk of failure is low, the likelihood that city residents and business owners would be exposed to contaminated groundwater in the event of a pipeline failure is low, and that if a pipeline failed and exposure occurred, there would be little or no risk to human health or the environment. The primary contaminant in the groundwater is perchlorate, which presents a health risk if ingested. Perchlorate is not volatile and does not present a health risk via inhalation. Nor does perchlorate, at the levels present in the groundwater, present a health risk from occasional contact with the skin. A preliminary estimate of the perchlorate concentration in groundwater extracted in the leading-edge area is less than 35 micrograms per liter. Using this concentration and the EPA toxicity value for perchlorate (oral reference dose of 7.0 x 10-4 mg/kg-day), exposure to the community during a pipeline leak or equipment failure would not result in an appreciable risk.

The groundwater may contain a second contaminant, TCE, at low levels. A preliminary estimate of the TCE concentration in groundwater extracted in the leading-edge area is less than 1 microgram per liter. This concentration is below the level allowed in drinking water (5 micrograms per liter [µg/L]) and would not present a significant health risk in the unlikely event of a pipeline leak.

Comment Rialto-4. EPA should ensure the risks imposed on the community through the proposed cleanup plan are minimized to the greatest extent possible by identifying in the final cleanup plan a location for the treatment of extracted contaminated groundwater closest to the point of extraction as possible thereby reducing the length of any new conveyance pipelines that are required. The proposed cleanup plan does not address this and leaves the location of the treatment plant to be determined at a later date.

↳EPA Response: EPA's selected remedy will clean up contamination in the community's drinking water. EPA does not agree that pipelines carrying contaminated water pose a significant risk to the community but will, nevertheless, consider the city's preferences, and those of other

interested parties, in making decisions about water treatment locations during the design phase of the project. Please also see responses to comments Rialto-2 and Rialto-3.

Comment Rialto-5. The proposed cleanup plan states: "The Preferred Alternative was developed to take full advantage of a 2017 agreement between Goodrich Corporation and WVWD." The proposed cleanup plan further states: "The agreement is expected to speed the cleanup by making WVWD infrastructure and water rights available. The infrastructure made available by the agreement includes an existing well in the mid-basin area (the Rialto-06 well), an existing pipeline that conveys water from the well to the existing WVWD water treatment systems, and use of existing water treatment systems capable of removing perchlorate." The cities of Rialto and Colton, and WVWD, are cooperative partners in the management of the Rialto-Colton groundwater basin, and the referenced 2017 agreement should not be solely relied upon as the basis for the proposed cleanup plan, nor the final cleanup plan approved by EPA. Why weren't Colton and Rialto consulted prior to EPA identifying and selecting its Preferred Alternative?

↳EPA Response: EPA agrees that the 2017 agreement should not be the sole basis for its final cleanup plan (or the sole basis for decisions made during the design phase of the project). Please see responses to comments Rialto-3 and Rialto-4.

The referenced statement ("*The agreement is expected to speed the cleanup by making WVWD infrastructure and water rights available*") was intended to communicate that using existing infrastructure already committed to the cleanup should speed the cleanup effort and minimize construction impacts on the local community. Siting and constructing a new water treatment plant or other new infrastructure is likely to take much longer than making use of existing infrastructure. Negotiating an agreement for the use of infrastructure not addressed in the 2017 agreement could also cause significant delay.

Comment Rialto-6. The proposed cleanup plan acknowledges that "Groundwater extraction, water treatment, and pipeline locations may change from those assumed in the Feasibility Study Report. Final locations would be chosen during the remedial design process, after EPA finalizes its cleanup plan. During the design process, EPA would also determine which existing water treatment systems would be used and whether injection wells are needed to return the treated groundwater to the aquifer." EPA should only consider the existing water treatment systems located closest to the leading-edge area for treatment of contaminated groundwater extracted in that area.

↳EPA Response: Please see responses to comments Rialto-3, Rialto-4, and Rialto-5.

Comment Rialto-7. The proposed cleanup plan states: "One or more new wells may be needed in the leading-edge area to supplement the existing well, along with a pipeline to convey water from the new well to the water treatment location. Easements or other access arrangements would probably be required for new pipelines." Approvals from the cities of Colton, Rialto and San Bernardino will also be required to the extent new conveyance pipelines are proposed within City streets. Plans identifying the location of any new conveyance pipelines and other facilities located in public rights-of-way will require review and approval by the City. Encroachment permits will be required to authorize construction of any new facilities in public rights-of-way. All these City actions will require EPA to ensure to the City that the final cleanup plan approved by EPA minimizes to the greatest extent possible any required use of public rights-of-way.

The City reserves the right to deny approval of plans or issuance of encroachment permits for excessive lengths of conveyance pipelines that are proposed by EPA in the final cleanup plan that are unnecessary given the availability of existing facilities located closer to the extraction point in the leading-edge area.

Under "Implementability" of the proposed cleanup plan, EPA acknowledges "Alternative 2 is likely to face obstacles related to the recharge and/or reinjection of the treated groundwater. It would require coordination with other users of the recharge basins, and is expected to require an agreement with local water management agencies for use of the recharge basins. It may also require additional coordination with local water utilities for use of their infrastructure for non-drinking water end uses and the acquisition of land for and construction of injection wells. Alternative 3 would also require coordination with other users of the recharge basins, land acquisition, and an agreement to allow recharge and/or reinjection of treated groundwater, although the amount to be recharged and/or reinjected would be less." EPA has failed to identify the City's concerns previously provided to EPA on the disproportionate impact on the City's disadvantaged and economic justice areas on the proposal in its Feasibility Study Report caused by construction of excessive lengths of new conveyance pipelines for transmission of untreated contaminated groundwater, and the opposition by the community to this proposal. Further, any construction of new pipelines or other facilities within public rights-of-way will require the express approval of the respective local agency (Colton, San Bernardino, or Rialto).

We are aware of a concern by WVWD of its continuing obligations to operate the treatment facility at its Headquarters location due to a provision in its Funding Agreement with the California Department of Public Health (Agreement No. 84-10C15 and Project No. P84-3610004-801). Specifically, Section 9 "Operation and Maintenance of Project" indicates that "Upon project completion, and for a period of 20 years, which is the reasonably expected useful life of the Project, Supplier shall, as further consideration for this funding, commence and continue operations of the Project; cause the Project to be operated in an efficient and economical manner; provide for the making of all repairs, renewals, and replacements necessary for the effective operation of the Project; and cause the Project to be maintained in as good of condition as upon its construction, ordinary and reasonable ware and depreciation excepted. Failure by Supplier to operate and maintain the Project in accordance with this provision may, at the option of State, be considered a material breach of Agreement and may be treated as a default under Article A-24 of the Standard Conditions." The City reasonably believes this provision has prompted WVWD to pursue in EPA's Feasibility Study Report an alternative that ensures the treatment facility at its Headquarters located furthest from the leading-edge area is identified for continued treatment of contaminated groundwater. EPA should not rely upon this as the basis for a final cleanup plan. EPA should, in fact, base its decision on the alternative that provides the least environmental harm to the community.

↳EPA Response: EPA is aware of the environmental justice issues facing the community impacted by the contamination and will continue to work with the communities to address these issues as they arise during the design, construction, and operation of its cleanup remedy. Please also see responses to comments Rialto-2 through Rialto-5.

Comment Rialto-8. The City requests a public meeting to be scheduled by EPA in the City of Rialto as an opportunity for EPA to provide notice to the community of the proposed cleanup plan and its analysis of the alternatives considered, including the construction of any new conveyance pipelines and facilities for transmission of untreated contaminated groundwater.

↳EPA Response: EPA provided notice of its proposed cleanup plan to the community through a notice of availability published in the San Bernardino Sun newspaper, an announcement placed on the EPA Site webpage at https://www.epa.gov/superfund/rff, an email announcement sent to representatives of the City of Rialto and other local stakeholders, and postcards sent by regular mail to approximately 516 parties on EPA's RFF Site mailing list. EPA also recorded a presentation that describes EPA's proposal and the alternatives EPA considered and made the presentation available on its Site webpage. Due to the coronavirus disease 2019 (COVID-19) pandemic, EPA did not hold a public meeting in the Rialto area.

EPA will continue to work with representatives of the City of Rialto and other affected agencies during the design of the remedy. Please also see responses to comments Rialto-2 through Rialto-5.

Comments by Wendy Wang, BEST BEST & KRIEGER LLP, sent on behalf of the City of Colton. Comment letter dated February 22, 2022

<u>Comment Colton-1.</u> Delays to implementation of an adequate cleanup plan would result in further migration of the plume and potential contamination of wells down gradient from the current location of the plume.

The Proposed Plan as currently drafted does not provide the most expedient cleanup solution and does not mitigate the continual plume migration while the final OU-2 cleanup remedy is being planned/constructed. As an initial matter, Colton is concerned with the time it would take to implement the Proposed Plan, which would allow the plume to migrate beyond the current leading-edge area and impact Colton's other wells and water supplies. Specifically, if the plume migration is not stopped, the plume may migrate to the Riverside North Basin and impact Colton's wells in that basin.

As the Proposed Plan acknowledges, Colton has an existing ion exchange system in the mid-basin that is capable of treating and removing contaminations from the groundwater. Colton also has wells capable of pumping contaminated groundwater and existing infrastructure to transport the contaminated groundwater to its treatment plant. Colton's existing facilities should be used either as part of the permanent solution or as an intermediary measure to mitigate plume migration while the permanent solution is being constructed. Use of Colton's existing facilities will expedite the cleanup process and mitigate any impact of the plume migration while additional infrastructure for the OU-2 is constructed

↳<u>EPA Response</u>: EPA agrees that delays in implementing its cleanup plan should be minimized to the extent possible. The design working group described in response to comment Rialto-2 is considering the feasibility, advantages, and disadvantages of using Colton's existing wells, water treatment systems, and pipelines and whether their use is likely to expedite the cleanup and minimize plume migration in the leading-edge area. The group has also been asked to evaluate the feasibility of continuing to operate existing Colton wells and ion exchange systems in the mid-basin area as an intermediary measure.

Also please see responses to comments Riverside-2 and Riverside-4 on perchlorate detected in Colton's Well 24 and the past impacts of Colton's wells on plume movement in the leading-edge area.

Comments by Todd M. Corbin General Manager, City of Riverside Public Utilities, sent on behalf of the City of Riverside. Comment letter dated February 22, 2022

Comment Riverside-1. The Rockets, Fireworks, and Flare plume has traveled a great distance from the original site and continues to advance further within and into the Riverside North Basin. The plume maps included in the June 11, 2021 Feasibility Study OU-2, demonstrate that the extent of the leading edge of the plume has not been fully characterized. Furthermore, Figure 2-4 depicts the perchlorate plume using the State's Maximum Contaminant Level (MCL) of 6 parts per billion (ppb) as the metric to define the plume. In moving forward with characterizing the OU-2 remediation plan, the plume should be defined by the State's Perchlorate Detection Limit for Reporting Purposes (DLR), or by commonly used laboratory low level perchlorate detection methods which in many cases have a detection limit of 0.1or 0.5 ppb. Given that the technology to detect perchlorate down to these low levels is widely practiced and available, and since the Public Health Goal (PHG) is 1 ppb; plume concentrations below 6 ppb should be identified as a best practice and to provide transparency to the ratepayers who can be adversely impacted by contaminants found in their water supply. Furthermore, Riverside believes that additional monitoring wells are needed in the Riverside North Basin to identify the full extent of perchlorate originating from the RFF site which is one of the sources of perchlorate in the Rialto-Colton Basin.

↳EPA Response: EPA believes that the extent of leading-edge contamination has been characterized to the extent necessary to develop and select a remedy. Groundwater sampling activities will continue in support of the design of the MBOU remedy and to evaluate the performance of the remedy after it begins operation. Performance monitoring activities may include the construction of additional groundwater monitoring wells downgradient of the leading-edge groundwater extraction location.

The comment notes that Figure 2-4 in the 2021 Feasibility Study report depicts the perchlorate plume using the State's maximum contaminant level (MCL) of 6 parts per billion (ppb) and requests that the plume be defined by California's Detection Limit for Reporting Purposes (DLR), or by commonly used laboratory low level perchlorate detection methods. The current DLR for perchlorate is 2 µg/L. EPA agrees that perchlorate concentrations should be measured to levels lower than the State MCL of 6 µg/L. During the remedial investigation, EPA generally achieved detection limits of 0.1 to 0.5 µg/L. In addition to depicting the approximate area of perchlorate contamination exceeding the 6 µg/L MCL, Figure 2-4 shows the measured perchlorate concentration at each of 24 monitoring wells in the OU2 area whatever the measured concentration. Concentrations are reported as low as 0.1 µg/L.

Comment Riverside-2. The OU-2 proposed plan identifies the vicinity of Colton wells 15, 17 & 24 for extracting and treating groundwater. This strategy is intended to limit the advancement of the synthetic perchlorate plume originating from the RFF Site from continuing into the Riverside North Basin. However, perchlorate that has traveled past the planned OU-2 remediation vicinity will continue to be present in the Riverside Basin and must be addressed and removed.

↳EPA Response: The selected remedy will include monitoring to provide information on perchlorate that has moved past the leading-edge extraction area. These data will be used to

evaluate the performance of the project, optimize its operation, and evaluate the need for any modifications to the remedy.

Between 2015 and 2020, perchlorate concentrations in Colton Well 24 (located downgradient of the planned leading-edge extraction area) ranged from 6.3 to 9.7 µg/L. Some of the perchlorate present in groundwater at Colton 24 and other locations in the leading-edge area appears to originate from the past use of fertilizers containing trace amounts of perchlorate. Perchlorate-contaminated fertilizers were applied to high value crops like citrus once common in the mid-basin area. EPA's selected remedy does not target cleanup of naturally occurring perchlorate or perchlorate from the use of perchlorate-containing fertilizer, although it will remove perchlorate from non-Site sources where mixed with Site-related contamination from the 160-acre area.

In 2017, a groundwater sample was collected from Colton-24 and analyzed for stable oxygen and chlorine isotopes to help distinguish between Site-related perchlorate and perchlorate likely to be naturally occurring or present from past fertilizer use. Based on the stable isotope concentrations, the perchlorate measured in the well was estimated to be 28% synthetic. The non-synthetic fraction was assumed to be from perchlorate-contaminated fertilizer use or naturally occurring. As an indicator of the amount of Site-related perchlorate that may have moved beyond the planned leading-edge extraction area, a 28% synthetic fraction at 10 µg/L perchlorate represents a synthetic perchlorate concentration of less than 3 µg/L.

Perchlorate concentrations in Colton Well 24 from 2015 to 2020 have been added to the Administrative Record.

Comment Riverside-3. Success criteria that the EPA will use to evaluate the effectiveness of the OU-2 remediation efforts should consider using the State's DLR as a metric to ensure that perchlorate originating from the RFF Superfund Site be removed from the Inland Empire's water supply consistent with State of California public health guidelines. Communities within the Inland Empire have a right to clean, reliable supplies of water, as is echoed in the State's Human Right to Water legislation. Treatment technologies for removing perchlorate from water have been in use for multiple decades now and have demonstrated the efficient and economic feasibility of removing perchlorate from water sources to non-detectable levels such as California's DLR. Furthermore, State regulations are continuing to evolve, and it is anticipated that the State of California will lower the Maximum Contaminant Level to be consistent with the Public Health Goal.

In 2004, California's PHG for perchlorate was 6 ppb. However, in 2015, the Office of Environmental Health Hazard Assessment updated the PHG to 1 ppb to reflect the current science on health impacts of perchlorate on infants, and the amount of water they consume. In 2017, the Division of Drinking Water recommended establishing a lower DLR to gather additional occurrence data and consider revising the MCL if the new data supports the development of a new standard. The revised perchlorate DLR was approved and became effective July 1, 2021. The EPA's evaluation of the plume using 6 ppb seems to be counter to the State's regulation in re-evaluating the MCL in the near future.

↳EPA Response: The Superfund law (CERCLA § 121) requires that Superfund cleanups be protective of human health and the environment and comply with "Applicable or Relevant and Appropriate Requirements" (ARARs). State requirements can be ARARs if they are more stringent than Federal requirements and have been promulgated, meaning that they are of general applicability and legally enforceable. EPA has determined that the California Maximum Contaminant Level for perchlorate in drinking water is relevant and appropriate and should be used as the cleanup level for the groundwater aquifer.

The California DLR is neither applicable nor relevant and appropriate as a cleanup level. A DLR is defined in 22 CCR § 64671.15 as the "minimum level at or above which any analytical finding of a contaminant in drinking water resulting from monitoring … shall be reported."

As the comment notes, MCLs can change and California could, at a future date, reduce the MCL for perchlorate. A change in the perchlorate MCL would have an impact on the cleanup if the current MCL is no longer protective of human health. EPA will periodically evaluate the protectiveness of its selected remedy to ensure that cleanup requirements remain protective. Formal evaluations (5-year reviews) will occur every 5 years as long as hazardous substances, pollutants, or contaminants remain onsite above levels that allow for unlimited use and unrestricted exposure.

The comment notes that treatment technologies can remove perchlorate from water sources to non-detectable levels such as the California's DLR. We expect that the treatment technologies used as part of the MBOU remedy will remove perchlorate from the groundwater to well below the 6 µg/L MCL. Treated groundwater used as drinking water will also be subject to permit requirements set by the State of California.

Comment Riverside-4. Once implemented, an adaptive management strategy should be initiated to evaluate the OU-2 treatment efforts and to ensure groundwater quality is significantly improving and that the remediation plan is not adversely impacting groundwater quantity in the Riverside North Basin. The existing Colton production wells have been active for the last 30+ years and yet perchlorate has continued to bypass the wells and enter the Riverside North Basin. A robust monitoring well network should be considered in conjunction with the extraction well(s) to continually evaluate the effectiveness of the remediation and to monitor any potential downgradient impacts.

↳EPA Response: EPA agrees that its selected remedy should include monitoring of groundwater quality and periodic evaluations of the effectiveness of the remedy. Annual Performance Evaluation Reports will evaluate compliance with EPA's cleanup objectives, which include preventing the spread of Site-related contamination and reducing contaminant concentrations in groundwater to the cleanup levels identified in this ROD. In addition, "5-year reviews" will be completed as long as hazardous substances, pollutants, or contaminants remain onsite above levels that allow for unlimited use and unrestricted exposure.

The comment includes a statement about the impact of existing Colton production wells on contaminant movement. EPA is aware of three Colton wells in or near the planned leading-edge extraction area, known as Colton wells 15, 17, and 24. Based on data collected during the MBOU remedial investigation, Colton Well 15 appears to be located to the east of the Site-related contamination and its use probably has a limited impact on the migration of Site contaminants. Pumping at Colton 17 and 24 has probably helped limit the migration of Site-related contamination but pumping rates at these wells have been less than the expected remedial pumping rate in the leading-edge area and the Colton wells are not optimally placed or constructed (e.g., they extract water over a large vertical interval) to intercept Site-related contamination. According to pumping records provided by the City of Colton, Well 17 operated at about 25% of the preliminary leading-edge pumping rate over the last 10 years (2011–2021) and did not operate between September 2015 and August 2018. Pumping records for Colton's 15, 17 and 24 wells have been added to the Administrative Record.

Comment Riverside-5. By extracting contaminated groundwater in the Rialto-Colton Basin, the remediation plan may limit the volume of underflow that historically flowed into the Riverside North. Basin. Two of the treatment alternatives include recharging all or a portion of the extracted and

treated water at the Cactus Basins. Riverside is in favor of these alternatives because it could alleviate any potential water level impacts that could be caused by restricting underflow. Riverside encourages the EPA to consider installing groundwater monitoring wells in the vicinity of Cactus Basin so that the treated, reintroduced water is fully characterized, and any impacts or benefits are understood.

In addition to the Rialto Decree, the Western-San Bernardino Judgment provides a framework for extractions occurring within the Rialto-Colton and Riverside Basin. Extractions from the Colton Basin and Riverside North for use within San Bernardino Valley Municipal Water District's service area are not limited. However, San Bernardino Valley shall provide the water to maintain a water level of 822.04 feet above mean sea level computed by averaging 3 index wells. 2018 marked the first year since implementation of the 1969 Western San Bernardino Judgment in which the average water level occurred below the threshold. Water levels have since continued to occur below the threshold. Riverside requests the EPA ensure that the remediation plan is neutral to, or benefits, groundwater levels within the vicinity of the index wells, which are located in the vicinity of the Santa Ana River, downgradient to the Interstate 10 and 215 interchange.

↳EPA Response: The comment expresses concern that EPA's selected remedy could limit underflow into the Riverside North Basin. We note that the remedy is not expected to result in a significant change in the volume of groundwater being extracted from the RCB. Groundwater extracted as part of the remedy and delivered for potable use will comply with the 1961 RCB decree and associated water rights limitations. We anticipate that any water extracted by the remedy that exceeds the available water rights would be returned to the basin via groundwater recharge or reinjection. Because the remedy is not expected to result in a substantive change to the volume of water extracted, the remedy is unlikely to result in a significant change in groundwater flow into the Riverside North Basin.

We note Riverside's preference for alternatives that include recharge at the Cactus Basins. Potential recharge/reinjection is a component of the selected remedy, with the locations to be selected during the design phase. The remedy will include monitoring in the vicinity of location(s) where the treated groundwater from the remedy is recharged or reinjected.

Given the distance from the leading-edge groundwater extraction area to the Interstate 10 and Interstate 215 interchange and that the remedy is not expected to significantly change the volume of water extracted from the RCB, we do not expect the cleanup to have an impact on groundwater levels at the index wells monitored as part of the Western-San Bernardino Judgment.

Comments by Ricky S. Manbahal, General Manager, sent on behalf of the West Valley Water District. Comment letter dated February 23, 2022

Comment WVWD-1. Support for Alternative 3: As part of its support for Alternative 3, WVWD notes that it is critical to expeditiously pursue the remedial objectives of preventing the spread of contamination the removal of perchlorate from the leading edge of the contamination plume to prevent the spread of contaminated groundwater and human exposure to site contaminants. Utilizing WVWD's pumping rights and the existing agreement as part of Alternative 3 will ensure that the removal of the contaminated groundwater from the aquifer will be completed in a timely manner.

↳EPA Response: EPA notes WVWD's support for Alternative 3 (EPA's preferred alternative) and agrees it is critical to minimize delays in implementing its selected remedy.

Comment WVWD-2. Underground Pipeline: Transmission of raw water with perchlorates above the maximum contaminant level (MCL) has been voiced as a potential public health concern by a significant stakeholder. The EPA, whose mission is to protect public health, should address this concern by either clearly explaining how this concern is being mitigated nationwide (if indeed it is a public health concern) or otherwise stating why mitigation is not required (if indeed that is EPA's opinion). We are aware of many influent pipelines running throughout the country carrying water above drinking water MCLs, which EPA has seemingly not prohibited or required mitigation. We bring up this concern because there is currently an influent pipeline running in the City of Rialto with perchlorate above the MCL.

↳EPA Response: EPA does not believe that pipelines carrying contaminated groundwater from the planned extraction locations to the water treatment location(s) will present a significant public health risk to the community in the unlikely event the pipelines leak. Please see the response to comment Rialto-3.

Comment WVWD-3. Basin Recharge: WVWD anticipates that one of the other stakeholders may make comments preferring any recharge be done at recharge basins and not via injection wells. WVWD would take no exception to such comment and in response would further state that if surface recharge is selected that such recharge be done at the Cactus Basins (rather than at the Mills Basin), which would provide more widespread public benefit to the stakeholders of the Rialto Basin because that location — further up in hydraulic gradient of the basin and within the perchlorate plume area — would provide a positive groundwater dilution effect.

↳EPA Response: Decisions about the need for groundwater injection wells and the use of existing recharge basins will be made during the design phase of the project.

Comment WVWD-4. Strongly Supports: WVWD strongly supports the comments made from the representatives of the EPA at the 1/31/2022 workgroup meeting and reflected in the EPA plan, where it was stated that a desirable secondary public benefit for this project is to maximize the use of the Leading Edge Area effluent for potable water use first and to use the effluent for recharge as minimally as possible.

↳EPA Response: The comment appears to refer to a brief summary of EPA's proposed MBOU cleanup plan provided at a January 2022 design workgroup meeting. Similar statements are included in EPA's proposed MBOU cleanup plan. The plan states that "*After the contaminants are removed, the extracted and treated groundwater would be used as drinking water supply,*

recharged, or reinjected into the aquifer. Most of the water is expected to be used as drinking water supply. Any treated water not used for drinking water supply, because of water rights or other limitations, would be recharged or reinjected into the aquifer."

Comment WVWD-5. Strongly Supports: WVWD, as a fellow purveyor of the Rialto Basin, supports the City of Colton's comments made at the 1/31/2022 workgroup meeting stating that the operation of seizing the perchlorate plume at the Leading Edge Area should not be unduly delayed.

↳EPA Response: Comment noted.

Comment WVWD-6. 1,2,3-Trichloropropane (TCP) above the MCL and as high as 25 ppt was detected in January 2022 in a well a bit upstream of the Leading Edge Area. If TCP is detected in the new well in the Leading Edge Area, accommodation for this will be required. Does the FBR biological system treat TCP or, alternatively, do the other 2 proposed treatment sites have room to install GAC vessels to treat TCP?

Nitrates above the MCL are known to be found in wells near and upstream of the Leading Edge Area. If the new well at the Leading Edge Area has nitrates above the MCL, accommodation for this will be required. Does the FBR biological system treat nitrates or, alternatively, do the other two proposed treatment sites have room to install additional IX vessels targeting nitrates? (It is WVWD's understanding that IX vessels targeting perchlorate may not sufficiently address nitrates, in which case another set of IX vessels would be required). Additionally, brine disposal will also need to be addressed.

↳EPA Response: EPA expects to monitor for a wide range of constituents in the groundwater during the design phase of the remedy to ensure that the water treatment systems are capable of achieving all standards relevant to the planned end uses of the water.

In response to the comment, EPA obtained laboratory reports which indicate that the referenced concentration of 1,2,3-Trichloropropane (1,2,3-TCP) was detected in a WVWD water supply well located about one mile to the northwest of the planned leading-edge extraction area. Additional data obtained from the same well indicates that 1,2,3-TCP was detected in 2018, 2019, 2020, and 2021 at concentrations between 5 and 8 nanograms per liter (ng/L). The California MCL for 1,2,3-TCP in drinking water is 5 ng/L.

EPA also obtained publicly available data which indicate that nitrate has been detected at a WVWD water supply well located about one mile to the northwest of the planned leading-edge extraction area at concentrations above the Federal and State MCL for nitrate in drinking water.

During the design phase of the project, EPA will consider the likelihood that 1,2,3-TCP, nitrate, or other constituents not identified as chemicals of concern will need to be removed from groundwater extracted as part of the MBOU remedy, and the capability of existing water treatment systems that may be used as part of the remedy to remove any constituents requiring treatment.

Information provided by WVWD on 1,2,3-TCP and nitrate concentrations in selected WVWD wells, and other water quality information obtained from publicly available sources, have been added to the Administrative Record.

Comment WVWD-7. The ultimate selection of the treatment site should consider the possibility of perchlorate, TCP, TCE, and nitrates being simultaneously present in the new Leading Edge Area well at levels above the MCLs.

↳EPA Response: Comment noted. EPA agrees that the availability of land, among other factors, should be considered in choosing the water treatment location.

Comment WVWD-8. Page 14 of the proposed clean-up plan (and other pages) state that WVWD's Pump Year-ending 2020 rights were available at an average rate of 2,065 gpm. WVWD's data tracking shows that the actual water rights in that production year that were available to the project were 3,561 AF, which calculates out to a higher average gpm than the one stated.

↳EPA Response: WVWD provided information to EPA clarifying the basis for the comment. WVWD's estimate of the water rights available for the cleanup in the pumping year ending in 2020 (3,561 acre-feet) corresponds to pumping at an average rate of 2,208 gallons per minute, slightly higher than EPA's estimate of 2,065 gpm. The information provided by WVWD has been added to the Administrative Record.

Comment WVWD-9. Extraction in the mid-plume area is identified in the future to decrease to 750 gpm (Page 9 of Cleanup Plan). The party performing said extraction would like to reserve its right to potentially pump at a higher rate than that.

↳EPA Response: As described in the ROD, EPA expects that the groundwater extraction rate at the Rialto-06 well will initially be at or near the capacity of the well and then decrease after extraction in the leading-edge area begins. Exaction rates in the mid-plume area are expected to vary over time, depending on future contaminant concentrations in the groundwater, available water rights, and other factors.

Comments by Anne E. Sturdivant, Assistant Executive Officer, Santa Ana Regional Water Quality Control Board. Comment letter dated February 23, 2022

Comment RWQCB-1. The Cleanup Plan states that groundwater will be treated and may be discharged into the Cactus Basins for infiltration back into the aquifer. The discharges should be implemented in accordance with the substantive requirements of the Santa Ana Regional Water Quality Control Board's (Santa Ana Water Board) Order Number R8-2012-0027, National Pollutant Discharge Elimination System (NPDES) No. CAG918001—"General Groundwater Cleanup Permit for Discharges to Surface Waters of Extracted and Treated Groundwater Resulting from the Cleanup of Groundwater Polluted by Petroleum Hydrocarbons, Solvents, Metals and/or Salts." (Order No. R8-2012-0027). On August 23, 2012, the Santa Ana Water Board approved Discharge Authorization and Monitoring and Reporting Program No. R8- 2012-0027-007, under General Order No. R8-2012-0027, authorizing WVWD to discharge treated groundwater, extracted from wells WVWD-11 and Rialto-06, into the Cactus Basins.

The Cleanup Plan also states that the treated groundwater will be reinjected into the aquifer. Reinjection of the treated groundwater should be implemented in accordance with the substantive requirements of Santa Ana Water Board Order No. R8-2002-0033 "General Waste Discharge Requirements for the Reinjection/Percolation of Extracted and Treated Groundwater Resulting from the Cleanup of Groundwater Polluted by Petroleum Hydrocarbons, Solvents and/or Petroleum Hydrocarbons Mixed with Lead and/or Solvents", as amended by Order No. R8-2003-0085 and Order R8-2013-0020.

The proposed infiltration and/or reinjection of treated groundwater into the aquifer should also be implemented in accordance with the substantive requirements specified in and the State Water Resources Control Board's Antidegradation Policy (Resolution 68-16).

↳EPA Response: EPA anticipates discussing permitting requirements (and/or the substantive requirements of any permits applicable or relevant and appropriate to onsite actions) associated with recharge and reinjection of groundwater extracted and treated as part of the remedy with the Water Board during the design phase of the project.

Comments by MICHAEL R. PERRY, Supervising Planner Environmental Management, San Bernardino County Department of Public Works. Comment letter dated February 22, 2022

Comment SBC-1. We are aware there may be storm drains in and around the site that may be affected by the proposed Project. When planning for or altering existing or future storm drains, be advised that the Project is subject to the Rialto MPD, dated February 2009. It is to be used as a guideline for drainage in the area and is available at the San Bernardino County Department of Public Works-Flood Control Planning Section. Any revision to the drainage should be reviewed and approved by the Jurisdictional Agency. Should construction of new, or alterations to existing storm drains be necessary as part of the Proposed Project, their impacts and any required mitigation should be discussed within the Draft EA and the Groundwater Cleanup Plan before the document is adopted by the Lead Agency

↳EPA Response: The cleanup is being conducted under CERCLA, which is the functional equivalent of the National Environmental Policy Act (NEPA) process. As such, this response action is exempt from the NEPA or California Environmental Quality Act (CEQA) process and an Environmental Assessment (EA) is not being prepared. Also, by law, CERCLA response actions are exempted from requirements to obtain Federal, State or local permits related to any activities conducted onsite. Where applicable, the substantive requirements of the relevant permitting requirements will be followed. EPA will obtain any permits needed for offsite work.

Comment SBC-2. The current Water Spreading Agreement (WSA) with West Valley Water District (WVWD) for Cactus Basin No. 2 required letters of approval from both the United States Environmental Protection Agency and the Regional Water Quality Control Board. Please note that the WSA with WVWD limits the amount of water that may be discharged to the basin on an annual basis. Any new agreements or the amending of the existing agreement should require that the amount of the discharge to the basin be reevaluated by the above listed agencies for approval. The impacts and associated mitigation for increased discharges as well as amendments to the WSA should be included within the Draft EA and Groundwater Cleanup Plan prior to adoption by the Lead Agency.

↳EPA Response: EPA will evaluate the potential impacts of planned recharge on groundwater and contaminant movement during the design phase of the project based on updated estimates of the timing and volume of water proposed for recharge into the Cactus Basins or other recharge basins, if any. EPA will also consult with WVWD and other agencies as appropriate on the need to amend the current WSA or develop a new agreement. As described in response to comment SBC-1, no EA is being prepared.

Comment SBC-3. According to the most recent FEMA Flood Insurance Rate Map, Panels 06071C7920H, 8657H, dated August 28, 2008; and 06071C7940J, 8657J, 8676J, 8677J, 8678J, and 8679J, dated September 2, 2016, the Project lies within A, AE, X-shaded (500-yr. floodplain, protected by a levee), and X. Impacts associated with the project's occurrence in the Flood Zone areas mentioned and their mitigation, should be discussed within the Draft EA and Groundwater Cleanup Plan prior to adoption by the Lead Agency.

↳EPA Response: Consistent with Executive Order 11988 on Floodplain Management, EPA will determine during the design phase if planned remedial activities may occur in a floodplain and avoid adverse effects to the extent possible.

Comment SBC-4. The proposed Project is adjacent to a San Bernardino County Flood Control District (SBCFCD) facilities and right-of-way for the Rialto Channel/Cactus Basins, (2-120/2-104) Be advised that any encroachments on SBCFCD's facilities or right-of way will require a permit from the SBCFCD prior to start of the project. If you have any questions regarding this process, please contact the FCD Permit Section at (909) 387-7995. The necessity for permits, and any impacts associated with them, should be addressed in the Draft EA and Groundwater Cleanup Plan prior to adoption and certification.

↳EPA Response: EPA will obtain any permits needed for offsite work. As stated in the response to comment SBC-1, permits are not required for onsite work.