

Semi-Annual Plume Status Report

South Archibald Plume October 2023

CONTAMINANTS

The primary contaminant is trichloroethene (TCE). The California maximum contaminant level (MCL) for TCE is 5 micrograms per liter ($\mu\text{g/l}$). The maximum TCE concentration detected in a groundwater sample collected from wells within the plume during the last five years (July 2018 to June 2023) is 90 $\mu\text{g/l}$.

LOCATION

The South Archibald TCE plume is located in the southern Chino Basin within the City of Ontario. Exhibit 1 shows the spatial extent of the plume with detectable TCE concentrations equal to or greater than 0.5 $\mu\text{g/l}$, as delineated by the Chino Basin Watermaster (Watermaster) for the *2022 State of the Basin Report*.¹ This extent is based on the five-year maximum TCE concentration measured over the period of July 2017 to June 2022. The TCE plume is about 23,200 feet long, extending southward from State Route 60 to approximately Kimball Avenue, and is about 14,300 feet wide extending from Grove Avenue to Turner Avenue. Exhibit 1 also shows the approximate extent of the plume, and extent greater than 5 $\mu\text{g/l}$, delineated by the responsible parties during the most recent sampling event in 2022.

REGULATORY ORDERS

- Draft Cleanup and Abatement Orders (CAOs) — Six Draft CAOs were issued in 2005 to the following parties: Aerojet-General Corporation, The Boeing Company, Northrop Grumman Corporation, Lockheed Martin Corporation, General Electric Company, and United States Department of Defense.
- Draft CAO R8-2012-00XX for the City of Ontario, City of Upland, and Inland Empire Utilities Agency (IEUA), Former Ontario-Upland Sewage Treatment Plant (Regional Recycling Plant No. 1), City of Ontario, San Bernardino County — This CAO was issued jointly to the City of Ontario, City of Upland, and IEUA.
- Stipulated Settlement and CAO No. R8-2016-0016 for the City of Ontario, the City of Upland, the IEUA, Aerojet Rocketdyne, Inc.², The Boeing Company, General Electric Company, Lockheed Martin Corporation and the United States of America, Former Ontario-Upland

¹ West Yost. (2023). *Optimum Basin Management Program – 2022 State of the Basin Report*. Prepared for the Chino Basin Watermaster. June 2023.

² Formerly known as Aerojet-General Corporation.

Sewage Treatment Plant (Regional Recycling Plant No. 1) City of Ontario— This was the final CAO issued to all parties previously issued draft CAOs in 2005 and 2012, excluding Northrop Grumman.

REGULATORY AND MONITORING HISTORY

In the mid-1980s, as part of its work associated with the Chino Basin Storage Program, the Metropolitan Water District of Southern California took water quality samples that indicated that TCE was present in private wells in the southern Chino Basin. The Santa Ana Regional Water Quality Control Board (Santa Ana Water Board) confirmed this with subsequent rounds of sampling.

The Santa Ana Water Board issued Draft CAOs in 2005 for six different parties who were tenants on the Ontario Airport property. On a voluntary basis, four of the parties — Aerojet-General Corporation, The Boeing Company, General Electric Company, and Lockheed Martin Corporation, collectively the ABGL parties, worked together, along with the U.S. Department of Defense, to investigate the source of contamination. Part of the investigations included collecting water quality samples from private wells and taps at residences and the construction and sampling of four triple-nested monitoring wells (ABGL wells) in the northern portion of the plume. Alternative water systems were provided to private residences in the area where groundwater was contaminated with TCE above the MCL.

In 2008, Santa Ana Water Board staff conducted research pertaining to the likely source of TCE contamination. Based on their work, Santa Ana Water Board staff identified discharges of wastewater to the RP-1 treatment plant and associated disposal areas that potentially contained TCE, as the potential sources. The Santa Ana Water Board identified several industries, including some previously identified tenants of the Ontario Airport property, that likely used TCE solvents before and during the early 1970s, and discharged wastes to the Cities of Ontario and Upland sewage systems tributary to the RP-1 treatment plant and disposal areas. In 2012, the Santa Ana Water Board issued an additional Draft CAO jointly to the City of Ontario, City of Upland, and IEUA as the previous and current operators of the RP-1 treatment plant and disposal area (collectively the RP-1 parties).

Under the Santa Ana Water Board's oversight from 2007 through 2014, the ABGL parties and the RP-1 parties individually and jointly conducted sampling at private residential wells and taps approximately every two years in the region where groundwater was potentially contaminated with TCE. By 2014, all private wells and taps in the area of the plume had been sampled at least once as part of the monitoring program. The report documenting this data was published in November 2014.³ Both the ABGL and RP-1 parties provided potable water to residences in the area where well water contained TCE concentrations equal to or above 80 percent of the MCL for TCE (e.g., equal to or greater than 4.0 µg/l) by either water tank systems where potable water is delivered via truck or by bottled water service.

In July 2015, the RP-1 parties completed a draft feasibility study report for the South Archibald plume (Feasibility Study).⁴ The Feasibility Study established cleanup objectives for domestic water supply and plume remediation and evaluated alternatives to accomplish these objectives. In August 2015, the RP-1 parties prepared a Draft Remedial Action Plan (RAP) to present the preferred plume remediation and domestic water

³ Erler & Kalinowski, Inc. (2014). *Supplemental Data Report Trichloroethene Plume Central Chino Basin*. Prepared for Aerojet Rocketdyne, Boeing, General Electric, and Lockheed Martin. November 19, 2014.

⁴ Dudek. (2015). *Draft Feasibility Study Report South Archibald Plume, Ontario, California*. Prepared for City of Ontario, City of Upland, and Inland Empire Utilities Agency. July 2015.

supply alternatives.⁵ A public review period followed, and two community meetings were held in September 2015 to educate the public about the plume, the Feasibility Study, and the RAP, and to solicit comments on these reports. In November 2015, the revised Draft Feasibility Study and RAP and responses to comments were completed to address input from the public, ABGL, and other parties.^{6,7}

In September 2016, the Santa Ana Water Board issued the Final Stipulated Settlement and CAO R8-2016-0016 (Stipulated CAO) collectively to the RP-1 parties and the ABGL parties (excluding Northrop Grumman). The Stipulated CAO was adopted by all parties in November 2016, thus approving the preferred plume remediation and domestic water supply alternatives identified in the RAP. The parties also reached a settlement agreement that aligned with the Stipulated CAO and authorized funding to initiate implementation of the plume remediation alternative.

In July 2021, the RP-1 parties collaborated with the Santa Ana Water Board and Watermaster to distribute a Community Fact Sheet to residences overlying the plume on the health and environmental impacts of the groundwater contaminants of TCE and other potential contaminants such as per- and polyfluoroalkyl substances (PFAS), their presence in the area of the plume, and sampling resources.⁸

REMEDIAL ACTION

Plume Remediation. The plume remediation alternative identified in the Feasibility Study, RAP, and Stipulated CAO involves the use of previously existing and newly constructed Chino Basin Desalter Authority (CDA) wells and treatment facilities. The RP-1 parties and the CDA reached a Joint Facility Development Agreement for implementation of a project designed to remediate the South Archibald plume by modifying the CDA facilities to treat TCE and other VOCs, as well as using existing facilities (i.e. reverse osmosis membranes) to treat total dissolved solids (TDS) and nitrate. *Proposition 1 Grant Agreement No. D1712507* (Prop 1 Grant Agreement) provided funding for the proposed project, including the construction and operation of three new CDA wells (II-10, II-11, and II-12), a dedicated pipeline to convey groundwater produced from these wells to the Chino-II Desalter treatment facility, and replacement of existing decarbonators at Chino-II Desalter with an air stripping system to remove TCE and other VOCs from the water treated through the reverse osmosis (RO) trains. A new pipeline was also constructed to allow existing CDA well I-11 to be pumped into the new dedicated pipeline to the Chino-II Desalter for treatment via the new air-stripping system. Construction of CDA wells II-10 and II-11 was completed in September 2015. The equipping of these wells was completed in 2018, and pumping initiated at wells II-11 and II-10 in July and September 2018, respectively. The construction of an onsite monitoring well near the proposed location of well II-12 was completed in 2019 (well II-MW-3) and the construction of well II-12 was completed in November 2020. The CDA completed the equipping of well II-12 in July 2021, and pumping began on August 24, 2021. In January 2022 the Inland Empire Utilities Agency (IEUA) submitted a request to the Santa Ana Water Board to certify the Construction Completion

⁵ Dudek. (2015). *Draft Remedial Action Plan South Archibald Plume, Ontario, California*. Prepared for City of Ontario, City of Upland, and Inland Empire Utilities Agency. August 2015.

⁶ Dudek. (2015). *Draft Feasibility Study Report South Archibald Plume, Ontario, California*. Prepared for City of Ontario, City of Upland, and Inland Empire Utilities Agency. November 2015.

⁷ Dudek. (2015). *Draft Remedial Action Plan South Archibald Plume, Ontario, California*. Prepared for City of Ontario, City of Upland, and Inland Empire Utilities Agency. November 2015.

⁸ Santa Ana Water Board. (2021). Community Fact Sheet.

https://documents.geotracker.waterboards.ca.gov/regulators/deliverable_documents/9334058463/20210407_CommunityFactSheet_SouthArchibaldPrivateWells-Short_ADA_Final.pdf

of the northern well project, all new pipelines, and the modifications of the decarbonator at Chino-II Desalter.

Domestic Water Supply. The domestic water supply alternative identified in the Feasibility Study and RAP is a hybrid between the installation of tank systems for some residences where potable water is delivered from the City of Ontario and the installation of a pipeline to connect some residences to the City of Ontario potable water system. Pursuant to the Stipulated CAO, the Cities of Ontario and Upland have assumed the responsibility for implementing the domestic water supply alternative for private residences currently receiving bottled water due to TCE groundwater contamination. In February 2017, the Cities of Ontario and Upland submitted a *Domestic Water Supply Work Plan* to the Santa Ana Water Board (2017 Work Plan), outlining the approach to provide alternative water supplies to affected residences receiving bottled water.⁹ The Santa Ana Water Board approved the 2017 Work Plan on March 3, 2017.¹⁰ At that time, 32 residences were using tank systems that were previously installed and 21 residences were receiving bottled water. The alternative water supply options included: 1) installation of a tank system; 2) connection to an existing City of Ontario water main; 3) connection to a future City of Ontario water main; or 4) remain on bottled water. In accordance with the schedule in the Stipulated CAO and the work plan, tank systems would be installed within six months of resident consent, connections to Ontario's existing municipal water system would be constructed within three months of resident consent, and construction and connection to a new water main would occur within 18 months of resident consent. Additionally, bottled water would be supplied to any newly affected residents immediately upon determining that TCE is present at concentrations greater than 4 µg/l. The City of Ontario performs annual monitoring of private wells and taps in the area potentially affected by the plume to support the Stipulated CAO and 2017 Work Plan.

MONITORING AND REPORTING

Pursuant to the Stipulated CAO and the 2017 Work Plan, the Cities of Ontario and Upland collect annual groundwater quality samples at about 50-60 private wells and taps at about 45 residential and agricultural locations within the plume. The purpose of groundwater sampling is to: 1) evaluate the lateral extent of the plume per the Stipulated CAO, 2) identify locations where concentrations of TCE in private water supply wells are above the MCL, 3) identify locations where concentrations of TCE that were previously above the MCL are now below 80 percent of the MCL, and 4) identify residences that may be able to participate in the City of Ontario's alternative water supply program. The Cities of Ontario and Upland have conducted seven rounds of sampling since 2017, and the results are reported in annual groundwater monitoring reports submitted to the Santa Ana Water Board. The annual reports are available on the State Water Resources Control Board's GeoTracker online portal.¹¹

From 2019 to 2021, the IEUA and CDA worked with the California State Water Resources Control Board (State Board) and the Santa Ana Water Board to design a monitoring and reporting plan pursuant to the Prop 1 Grant Agreement for funding the expansion of the CDA facilities to cleanup TCE in the South Archibald plume, and the high nitrates and TDS in groundwater. The final monitoring and reporting plan (Prop 1 Monitoring Plan) was completed in January 2021 and includes collecting samples at the CDA

⁹ Dudek. (2017). *Domestic Water Supply Work Plan South Archibald Plume, Ontario, California*. Prepared for the City of Ontario, City of Upland. February 2017.

¹⁰ Santa Ana Water Board. (2017). *Domestic Water Supply Workplan – South Archibald Trichloroethylene Plume, Ontario, California*. Letter to the City of Ontario from Kurt Berchtold. March 3, 2017.

¹¹ https://geotracker.waterboards.ca.gov/profile_report?global_id=T10000004658

production and monitoring wells within and near the plume and nearby agency-owned wells.¹² Two of the CDA monitoring wells (II-MW-4 and II-MW-5) were constructed at the request of the Santa Ana Water Board and State Board for monitoring at two additional locations in the plume: one location within the area of the highest concentration of TCE within the plume (II-MW-5), and one location just upgradient of CDA well II-12 (II-MW-4).^{13,14} Construction of four multi-depth well casings (a,b,c,d) at II-MW-5 was completed in February 2021 and in March 2021 one well casing at II-MW-4 was completed. The locations of II-MW-5 (a,b,c,d) and II-MW-4 are shown in Exhibit 1 along with the location of the monitoring well II-MW-3. The Prop 1 Monitoring Plan includes sampling for TCE, nitrate, and TDS, as well as additional constituents 1,2,3-trichloropropane (1,2,3-TCP), 1,4-dioxane, perchlorate, and hexavalent chromium. All of these constituents except for 1,4-dioxane are currently monitored at all the CDA wells except for II-MW-5, as required by the State Water Resources Control Board Division of Drinking Water (DDW). Per the Prop 1 Monitoring Plan, sampling for these additional constituents was to be performed at all four well casings at II-MW-5 once at the time of completion of construction and again after one year. If the sampling results showed concentrations of these constituent(s) above 80 percent of their respective MCLs¹⁵ or California notification levels (NLs), these constituents would be added to the Prop 1 Monitoring Plan for the CDA monitoring wells. Sampling at the four well casings at II-MW-5 occurred in March 2021 after construction and results showed that concentrations for all of these constituents were above 80 percent of their respective MCLs or NLs for at least one well in the cluster. Sampling was not performed at II-MW-5 for quarters 2, 3, and 4 in 2021 and for quarter 1 of 2022 due to the well not having a pump installed. Sampling occurred quarterly after that using a portable pump. In April 2023, the IEUA submitted official correspondence to the Santa Ana Water Board informing them of their plans for installing permanent pumps at Well-II-MW-5 so sampling events will not be missed moving forward.¹⁶

The Prop 1 Monitoring Plan also requires Operational Reports¹⁷ to be submitted quarterly and annually that include the data collected during that period. Additionally, the groundwater data is uploaded to the State Board's GeoTracker website.

In addition to the monitoring performed by the CDA and the RP-1 Parties, Watermaster routinely collects groundwater samples at private wells in the plume area. Watermaster uses the data obtained from its own monitoring efforts, with monitoring data collected by the CDA, IEUA and the City of Ontario, to delineate the South Archibald TCE plume as part of the biennial Chino Basin State of the Basin Report.

¹² Hazen and Sawyer. (2021). *Monitoring Plan – Chino Basin Improvement and Groundwater Clean-up Project*. Prepared for CDA and IEUA. January 2021.

¹³ CDA Board of Directors July 2020 Meeting Agenda and Minutes.
https://www.chinodesalter.org/AgendaCenter/ViewFile/Agenda/_07022020-309

¹⁴ Santa Ana Water Board. (2020). *Comments on Responses to Comments on Monitoring and Reporting Plan and Request for Additional Monitoring for Inland Empire Utilities Agency and Chino Basin Desalter Authority Clean-Up Project (Grant Agreement No. D1712507)*. April 24, 2020.

¹⁵ The MCL for hexavalent chromium is a proposed MCL that will likely be adopted in 2024.

¹⁶ Email Correspondence with DTSC on April 27, 2023.

¹⁷ Operational Reports are required to be submitted after the end of the grant term in 2024.

RECENT ACTIVITY

In accordance with the Stipulated CAO, the most recent annual sampling event by the Cities of Ontario and Upland at private wells and taps in the plume area was conducted in September through November 2022. The results are documented in the *2022 Annual Groundwater Monitoring Report*.¹⁸

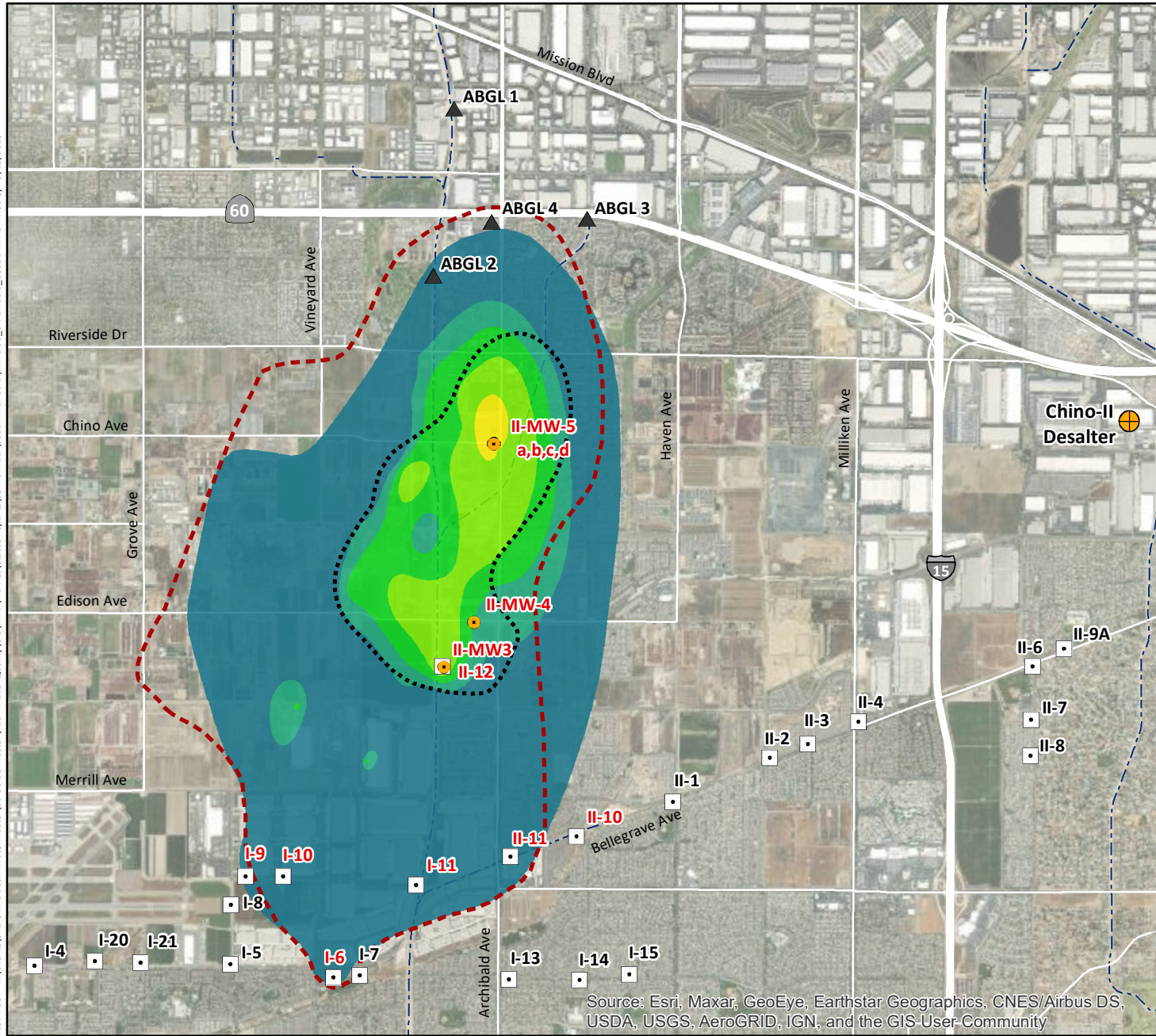
Additionally, as of June 2023, the CDA collected TCE sample data: monthly at CDA wells I-6, I-9, I-10, and II-12 ; and quarterly at CDA wells I-11, II-10, II-11, II-MW-4, and II-MW-5 (a,b,c,d). TCE was detected in all the CDA wells listed above except for wells I-9 and II-10, and the highest concentration of TCE detected at a CDA well from January 2023 to June 2023 was 40 µg/l at CDA well II-MW-5c.

In July 2023, the City of Ontario submitted their private water supply annual well sampling workplan for review by the Santa Ana Water Board.¹⁹ The plan includes collecting groundwater samples from approximately 70 properties, as well as an additional 19 private wells identified as candidate samples. Additionally, the Santa Ana Water Board will collect split samples for 1,4-dioxane, 1,2,3-TCP, hexavalent chromium, and PFAS at up to ten private wells. IEUA has agreed to provide the technical field support during sample collection. The Santa Ana Water Board provided comments on the workplan on September 5, 2023.

¹⁸ Dudek. (2022). *Annual Groundwater Monitoring Report South Archibald TCE Plume – Ontario, California*. Prepared for the City of Ontario and City of Upland. December 2022.

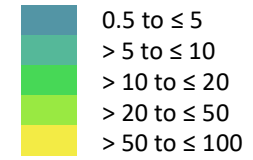
¹⁹ EEC Environmental. (2023). *Workplan – Private Water Supply Well Sampling*. Prepared for the City of Ontario. July 7, 2023.

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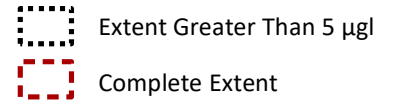
Maximum TCE Concentration (µg/l)

July 2017 to June 2022

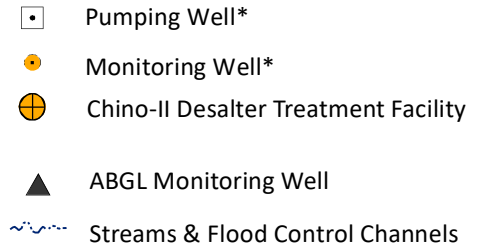


(Delineated by Chino Basin Watermaster in the 2022 State of the Basin Report)

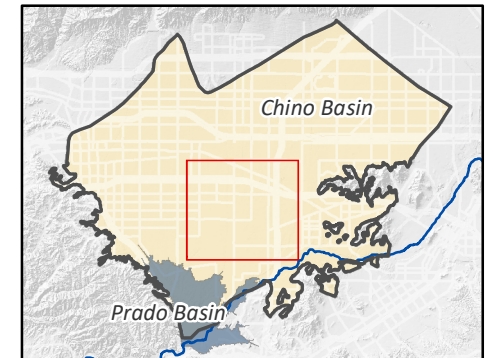
Approximate Extent of the Plume Delineated in the 2022 Annual Groundwater Monitoring Report



Chino Basin Desalter Authority Facilities:

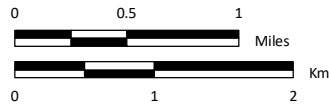


*Red labels indicate wells that are specifically discussed in the report.



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Prepared by:



Prepared for:

Chino Basin Watermaster
Semi-Annual Plume Report
South Archibald



South Archibald
TCE Plume

Exhibit 1