TPWD
TWENTYNINE PALMS WATER DISTRICT

1 June 2022

Mr. Greg Middleton, PG, CHG
Senior Engineering Geologist
Cleanup Unit Chief
Regional Water Quality Control Board
Colorado River Basin Region
73-720 Fred Waring Drive, Suite 100
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Dear Mr. Middleton,

Attached is the 2021 Annual Groundwater Monitoring Report for Twentynine Palms Water District's (District) Salt Nutrient Management Plan. The enclosed report summarizes the activities conducted for the District's Groundwater Monitoring Implementation Plan and an update on considerations for implementing a Septic System Management Program.

Sincerely,

Matt Shragge
General Manager

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SNMP
2021 Groundwater Monitoring Report

31 May 2022

5/31/2022

Prepared for

Twentynine Palms Water District
72401 Hatch Road
Twentynine Palms, California 92277

KJ Project No. 2165029*00

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Section 1: Introduction and Background

1.1 Introduction

This 2021 Groundwater Monitoring Report summarizes the progress made on the two recommendations included in the Salt and Nutrient Management Plan (SNMP) (KJC 2014). The SNMP was prepared in 2014 for the Twentynine Palms Water District's (District) and the City of Twentynine Palms (City). The two recommendations in the SNMP were: 1) implement measures to improve the overall monitoring of the groundwater, and 2) implement a Septic System Management Program (SSMP) to limit the further impacts to groundwater. The first recommendation identified in the SNMP is being addressed via a Groundwater Monitoring Implementation Plan (Implementation Plan) which was approved by the Colorado River Basin Regional Water Quality Control Board (Regional Water Board) on 10 December 2019 (KJC 2017).

Sections 1 and 2 of this 2021 Groundwater Monitoring report provide introduction and background on the region and its characteristics. Sections 3 and 4 of this report describe the activities conducted in support of the first recommendation and include: (1) a summary of monitoring and data collection efforts performed; (2) a summary table of current and historical monitoring results; and (3) an assessment describing the groundwater conditions in each of the subbasins along with notes or recommendations for improving the effectiveness of the groundwater monitoring plan.

An update on the efforts made to address the second recommendation of the SNMP are provided in Section 5 of this report. Section 6 provides an update on funding opportunities to assist the City and the District with implementing the SNMP.

1.2 Background

The District is located in the high desert of southern California, approximately 72 miles due east of the City of San Bernardino and 35 miles northeast of the City of Palm Springs. It is located within the jurisdiction of the Regional Water Board and adheres to the water quality standards and control measures for surface and ground waters of the Colorado River Basin Region. These standards and control measures are contained in the Regional Water Board's Water Quality Control Plan for the Colorado River Basin Region (Basin Plan) (RWQCB 2019). The Basin Plan designates the beneficial uses for water bodies and establishes water quality objectives, waste discharge prohibitions, and other implementation measures to protect those beneficial uses.

In June 2014, the District submitted the SNMP prepared by Kennedy Jenks to develop a strategy for the District, along with the City, to monitor and protect the groundwater resources in the Twentynine Palms area. The need to develop the SNMP was cited in the State Water Resources Control Board's (State Water Board) *Water Quality Control Policy for Recycled Water* adopted as Resolution No. 2009-0011, amended in 2013 (Resolution No. 2013-0003) and again in 2018 (Resolution No. 2018-0057) (RWQCB 2009). The SNMP recognized the increased need to assess potential groundwater quality impacts from salt and nutrient sources

that are derived primarily from regional septic tanks. As noted above, the SNMP included recommendations for mitigation of these impacts.

In 2017, the City and District submitted the Implementation Plan prepared by Kennedy Jenks (KJC 2017) to address the first recommendation of the SNMP. The Implementation Plan included a detailed monitoring plan and schedule for the groundwater monitoring activities discussed in the SNMP. The Implementation Plan was approved by the Regional Water Board in a letter dated 10 December 2019 and consists of four phases:

- Phase 1 – Increase Sampling Frequency of the District's Existing Production Wells
- Phase 2 – Establish a Water Quality Monitoring Well Network Using Existing Wells
- Phase 3 – Installation of New Monitoring Wells
- Phase 4 – Conduct a One-Time Existing Conditions Sampling Event

To address the second SNMP recommendation, the City and District have been considering the feasibility of a community wastewater collection system. Information gathered as part of the Implementation Plan will be used to determine if such a system is required to protect public health and water quality in the Twentynine Palms area. In the meantime, the District proposed conducting public outreach and education to protect groundwater basins from septic system wastewater impacts.

In 2020, the COVID-19 pandemic delayed the initiation of work on the Implementation Plan phases and efforts to conduct public outreach and education to support the second SNMP recommendation.

Although COVID-19 restrictions were still in place for most of 2021, the District and City were able to conduct work in support of the SNMP's recommendations toward the end of the year as the restrictions began to lift.

Section 2: District Services and Water Use Characteristics

The following sections provide a description of the District, their services, and characteristics of water use activities.

2.1 District Services

The District service area encompasses approximately 87 square miles and includes the City (see Figure 1). Residential development is currently the single largest land use within the District, with the remaining land use made up of multi-family residential units, commercial properties, and minor light industry. As of 2020, the District serves 7,438 active connections, all of which are metered accounts; more than 90% of these accounts are residential. Commercial connections account for approximately 4%, and landscape irrigation and fire protection/non-potable connections account for less than 1% of the District's total connections.

The District's mission is to provide a safe and adequate supply of water at the lowest feasible cost to the people of the District and to preserve and protect the water resources within the established boundaries of the District. Potable water is limited in the District due to:

- Drought conditions
- Negligible infiltration of direct precipitation in thick alluvial deposit areas
- Substantial runoff lost to evaporation
- Naturally occurring soluble minerals, such as fluoride, hexavalent chromium, and arsenic.

2.2 Water Use Characteristics

Water provided by the District to its customers is derived solely from groundwater pumped from supply wells located along the southern limit of the service area. The District provides potable water treatment services. Additional details are provided in the following subsections.

2.2.1 Groundwater Use

The District overlies two non-adjudicated groundwater basins, the Twentynine Palms Valley Basin and the Joshua Tree Basin. Within the Twentynine Palms Valley Basin are the Mesquite Lake and Mainside subbasins. Within the Joshua Tree Basin are three subbasins: Indian Cove, Fortynine Palms, and Eastern subbasins. The District also overlies a portion of the Dale Valley Basin, but there is little to no pumping or historical data from this basin and the District has no production wells in this basin. Except for the Dale Valley Basin, the location of the subbasins and the District wells are shown on Figure 2.

The District had 18 total groundwater production wells in its history. There are currently seven (7) active production wells. The remaining wells are inactive and/or used for groundwater monitoring. Available information indicates that more than 400 private wells have also been constructed within the District's service area. Most of these wells are not currently operated. The

District collects groundwater level, water quality and water production data from its seven active production wells for use in groundwater management and other reporting purposes.

2.2.2 Groundwater Quality Trends

Groundwater quality in the region is variable. Minerals are added to the groundwater as it flows through the aquifer; water that spends more time in the aquifer tends to have higher concentrations of chemical constituents than water with a low residence time. Water near the mountain fronts, which gets recharged frequently, tends to be of high quality, with low concentrations of chemical constituents. This is the case in the Indian Cove, Fortynine Palms, and Eastern Subbasins, where groundwater is close to its source area. In the Mesquite Lake Subbasin, groundwater has had a longer residence time and therefore tends to have higher concentrations of minerals. A general summary of the spatial trends in groundwater quality, for the subbasins within the District's service area, is summarized in Section 2.2.4 of the Implementation Plan.

2.2.3 District Water Treatment

The District has historically pumped water from the Indian Cove, Fortynine Palms and Eastern Subbasins in the south due to the generally good water quality in these areas. However, the District does have to treat water from certain wells for naturally occurring constituents, including fluoride and arsenic.

The following information is summarized from Section 2.3 of the Implementation Plan:

- Elevated fluoride concentrations above the maximum contaminant level (MCL) are widespread across the District's service area.
- The District was granted a variance in 1993 from the California Primary MCL for fluoride[1].
- Fluoride concentrations in the Indian Cove, Fortynine Palms and Eastern Subbasins generally averages below 2 milligrams per liter (mg/L), but some have average concentrations greater than 3 mg/L. Use of this groundwater is allowed without fluoride treatment because of the variance.
- Fluoride concentrations in the Mesquite Lake Subbasin groundwater are generally well above 3 mg/L. Water is treated through the Twentynine Palms Fluoride Removal Water Treatment Plant.
- The MCL for arsenic was reduced from 50 micrograms per liter (µg/L) down to 10 µg/L by the State Water Board, Division of Drinking Water (DDW) in 2008. The District has been required to install an arsenic treatment system to comply.

[1] "The District shall not serve water containing fluoride levels in excess of 3.0 milligrams per liter (mg/L) or 75 percent of the U.S. Environmental Protection Agency (USEPA) Primary Drinking Water Standard (currently at 4.0 mg/L), whichever is higher." The variance is set to expire in 2023.

- Three production wells were shut down in 2014 due to concentrations greater than the MCL for total chromium; as of the writing of this report, one is still physically connected to the distribution system.

- A wellhead hexavalent chromium treatment system is still pending until a new MCL is established.

2.2.4 Wastewater Management

There is no community sewage system within the District service area and wastewater is disposed of through individual septic tank and tile field disposal systems. There are two major categories of onsite wastewater treatment systems in the Twentynine Palms area – residential and non-residential. Single family and multifamily households fall under the residential category. A variety of commercial (e.g., restaurants and hotels) and institutional (e.g., school) establishments and facilities fall into the non-residential wastewater category.

Section 3: Overview and Update of Implementation Plan Activities

The Implementation Plan addresses the first recommendation of the SNMP and is intended to provide water quality data to help determine if a sewer system would be required to protect public health and water quality in the District. It provides an adaptive approach for data collection efforts needed to make more informed decisions on the effects of septic tanks on groundwater supply. Enough time is needed to collect and analyze the data to determine if, based on scientific evidence, groundwater pollution and degradation in the area is caused by septic tanks. Existing wells that are in good condition, well documented, and in representative locations are used for this program.

The Implementation Plan includes the following activities to collect groundwater level and water quality data:

1) Document groundwater level and groundwater quality trends through time
2) Identify salt and nutrient constituents of concern
3) Identify potential sources of salts and nutrients
4) Identify existing monitoring well locations that will be used to track potential changes in water quality over time
5) Conduct fate/transport evaluations of the constituents of concern

3.1 Phased Approach

As mentioned in Section 1.2, the Implementation Plan consists of four phases. Phases 1 and 4 have been implemented. Implementation of Phases 2 and 3 activities have begun. The following subsections discuss the details and progress made for these four phases of the Implementation Plan.

3.1.1 Phase 1 – Increase Sampling Frequency of District's Existing District Production Wells

Prior to the submittal of the SNMP in 2014, the District collected water quality samples from the active groundwater production wells at least every 3 years as required by DDW. In 2015, the District began sampling these wells annually. A list of the District's active and inactive production wells is provided in the following table.

CURRENT GROUNDWATER MONITORING BY TWENTYNINE PALMS WATER DISTRICT

Well Name	Well Type	Water Levels	Water Quality – Other Constituents
4	Inactive	Not measured	Not analyzed
6	Inactive	Not measured	Not analyzed
7	Destroyed	Not measured	Not analyzed
8	Inactive	Not measured	Not analyzed
9	Inactive	Not measured	Not analyzed
10	Inactive	Not measured	Not analyzed
11	Destroyed	Not measured	Not analyzed
11-B	Active water supply	Monthly	Annually since 2020[a]
12	Active water supply	Monthly	Annually since 2015
14	Active water supply	Monthly	Annually since 2015
15	Active water supply	Monthly	Annually since 2015
16	Active water supply	Monthly	Annually since 2015
17	Active water supply	Monthly	Annually since 2015 every 6 years for VOCs
WTP-1	Active water supply	Monthly	Annually since 2015

Note:
a – Well 11-B replaced Well 11 in 2018.

For the 2021 reporting period, all seven active wells were sampled. The sampling and analysis plan proposed in the Implementation Plan for the wells is provided below and has been updated to reflect the current analytical information.

LIST OF PARAMETERS FOR ACTIVE PRODUCTION WELLS

Analyte	Units	EPA Test Method	Typical Lab PQL[a]
General Minerals, Cations, and Anions			
Boron	mg/L	200.7	0.1
Calcium	mg/L	200.7	1.0
Total Iron	mg/L	200.7	0.1
Manganese	mg/L	200.7	0.02
Potassium	mg/L	200.7	1.0
Total Alkalinity	mg/L	SM2320B	5.0
Bicarbonate	mg/L	SM2320B	5.0
Carbonate	mg/L	SM2320B	5.0
Hydroxide	mg/L	SM2320B	5.0
Bromide	mg/L	300.0	0.10
Chloride	mg/L	300.0	1.0
Fluoride	mg/L	300.0	0.10
Nitrate	mg/L	300.0	0.40
Nitrite	mg/L	300.0	0.40
Orthophosphate	mg/L	SM4500	0.020
Sodium	mg/L	200.7	1.0
Specific Conductivity	µmhos/cm	SM2510B	2.0

Analyte	Units	EPA Test Method	Typical Lab PQL[a]
Sulfate	mg/L	300.0	0.50
TDS	mg/L	SM2540C	5.0
Total organic carbon	mg/L	SM5310B	0.30
Field Sampling			
pH	s.u.	Field Probe[b]	NA
Dissolved Oxygen	mg/L	Field Probe	NA
Temperature	F	Field Probe	NA
Microbiological Analysis			
Total Coliform	P/A[c]	SM9223	NA
Fecal Coliform	P/A	SM9223	NA
Anthropogenic Analysis			
Sucralose	µg/L	3535/SPE	0.02
Caffeine	µg/L	3535/SPE	0.004
17B-estradiol	µg/L	3535/SPE	0.004
NDMA	µg/L	521/SPE	0.002
Triclosan	µg/L	3535/SPE	0.008
DEET	µg/L	3535/SPE	0.004

Notes:
a – PQL = practical quantitation level. The lowest level at which the method can confidently discern between two different values.
b – field measurements of pH were collected in the samples collected in April 2021.
c – P/A = presence (P) or absence (A) of bacteria in the sample.

In 2021, the samples collected from the seven active wells were analyzed for the constituents listed above. Historical laboratory analytical data, since the annual monitoring activities began in 2015, is provided in Table 1, including the results of the 2021 sampling event.

In addition to monitoring for general minerals, cation, and anion constituents, water level measurements from these wells are collected monthly, the data of which are not included in this report. Inactive wells listed are not currently monitored.

A discussion of the monitoring results is provided in Section 4.1. A copy of the laboratory analytical reports is provided in Appendix A. Copies of the field data sheets for the April sampling event are included as well.

3.1.2 Phase 2 – Establish a Water Quality Monitoring Well Network

Phase 2 of the groundwater monitoring program consists of establishing a network of existing monitoring locations throughout the Twentynine Palms area with appropriate spatial distribution to define the nature and extent of constituents of concern (COCs) related to septic systems discharges. The purpose is to define existing conditions and to collect long-term monitoring data to assess the potential future impacts to the beneficial use of groundwater. The objectives of the monitoring well network include the following:

- Establish background conditions for COCs. The monitoring network should include sufficient wells upgradient of Twentynine Palms to establish COC concentrations relatively unaffected by higher density or septic density areas.

- Monitor COC concentrations in high-density areas. The monitoring network should include sufficient wells to establish concentrations for the high-density areas.

- Define downgradient concentrations especially for high-density areas. The monitoring network should include sufficient wells to establish downgradient COC concentrations especially for the high-density areas.

Each of the different groundwater subbasins have separate well networks that can be used to establish the distribution of COCs.

The groundwater monitoring network should preferably consist of wells that have either a sufficient well construction record or have a long-term monitoring history. Currently, groundwater level monitoring is performed by the United States Geological Survey (USGS) primarily near the military base but also at locations in the Twentynine Palms area. Using wells with a history of groundwater level measurements is highly desirable, as measurements from these facilities provide a means to evaluate water quality in context with overall groundwater basin conditions. Of the recently monitored USGS wells (within the last 5 years), three are in the Indian Cove Subbasin, one is in the Fortynine Palms Subbasin, eight are in the Eastern Subbasin, nineteen are in the Mesquite Lake subbasin, and three are in the Dale Basin. Available information indicates that more than 400 private wells have also been constructed within the District's service area. The District has located and inspected about 250 private wells. See Figure 3 for locations of the wells in the Twentynine Palms area.

The Phase 2 activities will include the collection of water quality samples from a representative number of these wells in the appropriate areas. Coordination with the USGS and private well owners will be required to access these wells for this study.

In 2021, the District reached out to the USGS and checked the following databases for information about private wells located within the District's service area:

- Groundwater Ambient Monitoring and Assessment Program (GAMA)

- California Department of Water Resources (DWR) for access to well completion reports and the Water Data Library (WDL) Station Map

- Sustainable Groundwater Management Act (SGMA)

Additionally, the City installed three monitoring wells in a high density area (Project Phoenix wells) that will be considered for incorporation into the groundwater monitoring network.

The District also collected location and other well construction information for USGS, Private, District, and City wells in the region and compiled a short list of wells to be considered for inclusion in the groundwater monitoring well network. The wells include in this list are shown on Figure 4. A discussion of the information gathered is provided in Section 4.2.

3.1.3 Phase 3 – Installation of New Monitoring Wells

Phase 3 consists of a more focused monitoring network located in a limited number of areas where elevated nitrates have been detected. The purpose of Phase 3 is to define the vertical extent of nitrates and evaluate how local geology and vertical mixing within the aquifer may affect COC concentrations. It is also recommended to install a cluster of monitoring wells in key areas where elevated concentrations of COCs have been detected. The purpose of these monitoring well clusters is to provide more detailed geology, groundwater, and water quality data in these areas.

This data will be used to support additional analysis of the influence of the geology and other factors on the movement and attenuation of COCs in the Twentynine Palms area. For example, the underlying geology includes former lake deposits that may form barriers to vertical flow through the vadose zone and the presence of organics and other constituents may lead to denitrification and losses that may potentially limit the transport of COCs to the groundwater. This could also create stratification within the aquifer so that COCs may be found in the shallow groundwater but not be able to reach deeper portions of the groundwater aquifer. The objective is to collect data to improve our understanding of the fate and transport of COCs through the vadose zone and groundwater aquifers.

Four areas have been identified for further assessment. These include the following:

- Luckie Park is located along Utah Trail in the eastern part of Twentynine Palms. Existing shallow monitoring wells show elevated COC concentrations. This area is located near the former Shortz Playa and may have elevated naturally occurring total dissolved solids (TDS). The purpose is to evaluate vertical and horizontal mixing and the possible influence of geologic layering. Two monitoring well locations are planned with one near the existing Luckie Park well and another about 1,000 feet downgradient.

- Saddlehorn Drive is located along Utah Trail near the golf course. This area is also near the former Shortz Playa. Elevated COC concentrations were detected in a single well and are attributed to poor well construction. A single cluster of wells is planned to evaluate vertical and horizontal distribution of COCs and the possible influence of geologic layering from lake deposits.

- The District Well #4 has had elevated COC concentrations relative to other District wells. It is unclear if this is a regional or well specific issue. A single cluster of wells is planned to evaluate vertical and horizontal distribution of COCs near Well #4.

- The high-density residential area located near 2 Mile Road and Mesquite Springs Road overlies a thick vadose zone and potentially thin saturated interval of alluvial sediments. Two monitoring well locations are needed, one near the edge of the residential area and a second about 1,000 feet downgradient. The purpose of these two wells is to evaluate the potential for attenuation of COCs in these areas.

Monitoring will require one or more wells at each of the targeted areas. An initial deep pilot borehole will be drilled that will be geologically logged by a California licensed geologist and have a suite of borehole geophysical logs completed to provide detailed geologic data for each of these locations. Based on this information, the number of potential monitoring wells in the

cluster at each location will be determined. A downgradient monitoring well cluster will be added as appropriate. Downgradient locations are anticipated for the Luckie Park and the 2 Mile Road and Mesquite Springs Road locations. The monitoring wells will be constructed in a manner consistent with obtaining regular high-quality water quality data. The Sampling Plan detailed in Section 4 of the Implementation Plan will be implemented once funding is approved for this phase.

When funding opportunities are available (see Section 6 for more details), efforts will be made to acquire access, implement the design, install the wells, and conduct testing at these proposed locations.

3.1.4 Phase 4 – Conduct a One-Time Existing Conditions Sampling Event

The scope for Phase 4 is the collection of a one-time sample for COCs from as many existing domestic wells as possible. This effort requires outreach to and coordination with local property owners to obtain access to these wells to collect the water quality samples. A single event sampling program was recommended to obtain data from a large number of private wells from various parts of the study area to establish the areal extent of COCs and any potential impact to beneficial uses.

The activities to complete Phase 4 of the Implementation Plan were completed in November and December 2021. Based on local knowledge and receptivity of private landowners to allow their wells to be inspected and sampled for water quality, the District facilitated the procurement of property owner permission and collection of the water samples. A discussion of the information gathered is provided in Section 4.3.

Section 4: Assessment of Completed Implementation Plan Activities

The following sections provide an assessment of the activities for Phases 1, 2 and 4 that were completed in 2021.

- Section 4.1: Phase 1 - a summary of the monitoring and data collection efforts performed during the reporting period and a description of the groundwater conditions in each of the subbasins, as seen in the data collected.
- Section 4.2: Phase 2 – a discussion of the information gathered from several databases about wells located within the District's service area.
- Section 4.3: Phase 4 – a discussion of the activities performed and the data collected that completed the scope for this phase.

As mentioned in Section 3.1.3, funding is needed to move forward with Phase 3 efforts.

A discussion is provided in Section 4.4 about using the data collected to date to continue working on the tasks in the Implementation Plan to eventually satisfy the first recommendation of the SNMP.

4.1 Phase I Activities

Samples from the District's current production wells were collected in January and again in April of 2021 to obtain a complete analytical set of the general minerals, cations, and anions constituents listed in Section 3.1.1. Temperature measurements were also recorded at the time of collection. Measurements of pH were collected during the April sampling activities.

The primary COCs related to septic system discharges are nitrate and salts from the sewage. Salts can be monitored as individual constituents or as TDS. Other secondary COCs are included in the analysis to help identify potential septic system influences from residential and commercial/industrial areas.

A discussion of the results of the key COCs that were analyzed is provided in the subsequent sections.

4.1.1 Nitrates

Anthropogenic groundwater nitrate sources can come from many sources but are typically related to agriculture and wastewater. DDW has set the MCL for nitrate in drinking water at 45 mg/L for nitrate as nitrate (as NO_3) or 10 mg/L for nitrate as nitrogen (as N). These values are stoichiometrically equivalent. Nitrate concentrations in public drinking water supplies exceeding the MCL require water system actions to provide safe drinking water.

Nitrate concentrations in the samples collected in 2021 were below the MCL. The concentration in Well 14 (3.4 mg/L) was relatively higher than the other wells.

4.1.2 General Mineral Analysis

The general mineral analysis provides a means of characterizing the groundwater within each production zone and comparing the groundwater in each of the production zones in which a particular well is screened. A comparison of the data in the wells for 2021 shows an apparent difference in the chemical character makeup in groundwater from the Mesquite Lake Subbasin compared to the other subbasins, except for the Eastern subbasin since there is no production well in that subbasin. A closer look at the constituents detected in samples from the seven active production wells in 2021 follows:

- Of the minerals and metals analyzed, the following constituents were higher in Well WTP-1 (Mesquite Lake Subbasin) than the other five wells:
  - Total alkalinity
  - Bicarbonate
  - Chloride
  - Electrical conductivity
  - Fluoride
  - Sulfate
  - TDS
  - Arsenic
  - Boron
  - Potassium
  - Sodium
  - Vanadium
- Concentrations of Total Alkalinity, Bicarbonate, Chloride, Fluoride, TDS and Sodium were relatively lower in Well 15 (Indian Cove Subbasin) compared to the other wells.
- Concentrations of Arsenic were relatively higher in Well 11-B (Indian Cove Subbasin) compared to the other wells. This well was sampled several months after the other wells and this was the first sample collected from this well since it was installed in 2018. It replaced Well 11 and its arsenic concentrations in 2015 and 2016 were approximately 40% higher than the current levels from Well 11-B. Concentration of orthophosphate was relatively higher in Well 15 compared to the other wells.
- Concentrations of Calcium and Manganese were relatively higher in Well 14 (Fortynine Palms Subbasin) compared to the other wells.

4.1.3 Microbiological Analysis

Total coliform is a measurement of general coliform bacteria, the presence of which indicates that the water has had contact with plant or animal life. General coliforms are universally present and can be found in soil, animals, insects, etc. At high levels, coliforms indicate the presence of some type of waste which could include pathogens. Fecal coliforms indicate that the water has had contact with mammal or bird feces. The presence of total and fecal coliforms is an indication of human or animal waste; however, this does not conclusively indicate infiltration from septic tanks. For the purposes of this study, the presence of coliforms could indicate septic influence on the groundwater.

There were no detections of coliforms in the samples collected in 2021.

4.1.4 Anthropogenic Analysis

Anthropogenic parameters are more indicative of human activities. Certain constituents indicate the use of hormones, stimulants, pesticides, etc. There were no detections of the anthropogenic parameters in the samples collected from six of the seven wells. Well WTP-1 had low detections of sucralose and caffeine. Overall, there are no concerns with the levels of anthropogenic constituents in the samples collected in 2021.

4.1.5 Natural Constituents

Fluoride naturally occurs in the local groundwater and is a constituent of concern for the water delivery system in the District's service area. The DDW-mandated MCL for fluoride in drinking water is 2.0 mg/L. A discussion of the concentrations found in the seven active production wells in 2021 is provided below:

- Fluoride concentrations are below the MCL in the Indian Cove and Fortynine Palms Subbasins (Wells 11-B, 12 and 14-17).
- Groundwater in the Mesquite Lake Subbasin has a different chemical character with substantially higher fluoride concentrations. Fluoride was measured in Well WTP-1 in the Mesquite Lake Subbasin at 6.1 mg/L. A comparison of historical concentrations for this constituent shows a steady trend ranging from 5.7 mg/L to 6.2 mg/L.

Arsenic is a naturally occurring element in groundwater that forms from the erosion and breakdown of geologic deposits; however, arsenic can also be associated with contaminant plumes. The primary MCL for arsenic is 10 μg/L. The occurrence of arsenic in the Twentynine Palms area is from natural sources. In 2021, arsenic ranged from 2.6 ug/L to 5.4 ug/L but was not analyzed in the sample from Well 11-B due to an oversight.

4.2 Phase 2 Activities

Upon review of the readily available information in the databases listed in Section 3.1.2, a table was created to list the public and District-owned well information that was gathered. The locations of these wells are shown on Figure 4. More well information was available for the wells from the USGS database than what could be found for the District or private wells.

In 2022, District staff will continue to evaluate the gathered information to determine what missing information can be obtained, identify which of these wells are suitable for inclusion in the monitoring network, and lay out some initial steps for future planning under Phase 3.

4.3 Phase 4 Activities

Although a single event sampling program was recommended, the completion of these activities was conducted over four (4) sampling events in November and December 2021. Data from fifteen (15) private wells from various parts of the study area was obtained.

The results were summarized in a *Groundwater Sampling Technical Memorandum* which was prepared for inclusion in a report per the requirements of the Disadvantaged Community Grant

Program. The grant is discussed in more detail in Section 6. A copy of the memo is provided in Appendix B.

The requirement of the grant program that the memo was included in was *Task 8.2 Deliverables of Attachment C: Activity Descriptions in the Colorado River Funding Area DAC Involvement Grant Proposal* (October 2017).

4.4 Suggested Program Improvements and Implementation

As the Implementation Plan is conducted each year, part of its successful completion is a reflection on its effectiveness and consideration for improvement. The reflection should consider the success of the overall monitoring program and include suggestions about future implementation activities.

The following activities are anticipated to be completed in 2022:

- Phase 1 - continue to perform the production well sampling activities per Phase 1
- Phase 2 - further evaluate and advance the information gathered in 2021 to establish the Water Quality Monitoring Well Network and support future efforts and planning for Phase 3
- Phase 3 - await funding opportunities to install new monitoring wells per the information gathered from Phases 2 and 4
- Phase 4 - completed

Section 5: Septic System Management Program Update

5.1 Planning and Evaluation of SSMP

The second recommendation of the SNMP is to implement a SSMP to limit the further impacts of septic systems on groundwater. Due to the continual restrictions of the pandemic, little effort on planning and evaluating the feasibility of this program was made in 2021. Some conversations were conducted with the military base located to the north to collaborate on the construction of a wastewater treatment system. There have also been conversations for a city-owned wastewater treatment system within the city limits.

Continuing conversations and meetings are planned for the beginning of 2022 to discuss the wastewater and sewer project to support the SSMP, including the preparation of a wastewater treatment system feasibility study.

5.2 Public Participation and Educational Outreach

An opportunity to reach out to the public was afforded with the completion of sampling activities for Phase 4 in November and December 2021.

In preparation of the sampling activities, the District prepared and sent out a letter to private well owners to obtain permission to collect samples. As part of those outreach and sampling efforts, District staff can provide feedback to the property owner about the results of the testing of their well.

The District shall continue to consider future opportunities of public participation and educational outreach. During those considerations, District staff will discuss the tactical approaches that may be utilized to deliver activities, messages, and any recommendations to the public. However, such activities and efforts are dependent on the acquisition of appropriate funds to perform the work. Currently, there are no plans in 2022 to engage the public for participation and education opportunities.

Section 6: Funding Opportunities

6.1 Proposition 1 Disadvantaged Community Grant Program

In 2016, the District began working with the Mojave Water Agency Integrated Regional Water Management Plan group to access funding made available by the DWR for water related projects to assist disadvantaged communities.

In 2018, Mojave Water Agency (Agency) was awarded a grant from the DWR in the amount of $407,000 (Grant Agreement No. 4600012245). Of that grant amount, $50,000 was allocated to the District to assist with the activities necessary to implement Phase 4 of the Implementation Plan.

Quarterly reports have been submitted, through the Agency, to DWR documenting the District's progress on the monitoring activities. At the end of 2021, the project was completed and the final report submitted in March 2022.

Annual costs submitted to DWR for reimbursement are as follows:

- $900.00 in 2018 for admin costs
- $2,644.01 in 2019 for admin costs
- $6,095.00 in 2020 for admin costs
- $40,284.40 in 2021 for admin costs and to perform sampling and laboratory analytical activities

The cumulative total and completion of the project is $49,923.41.

6.2 Future Funding Opportunities

District staff continue to look for additional funds to support the work for Phase 3. At the writing of this report, there were no opportunities identified.

References

(KJC 2014) Kennedy/Jenks Consultants 2014. *Twentynine Palms Salt and Nutrient Management Plan, Final Report.* City of Twentynine Palms and Twentynine Palms Water District. KJ 1283001.00. 30 June.

(KJC 2017) Kennedy/Jenks Consultants 2017. *Twentynine Palms Water District Groundwater Monitoring Implementation Plan.* Twentynine Palms Water District. KJ 1744007.00. 27 December.

(RWQCB 2009) State of California Colorado River Basin Regional Water Quality Control Board. *Water Quality Control Policy for Recycled Water.* Resolution No. 2009-0011, amended in 2013 (Resolution No. 2013-0003) and again in 2018 (Resolution No. 2018-0057).

(RWQCB 2019) State of California Colorado River Basin Regional Water Quality Control Board. *Water Quality Control Plan for the Colorado River Basin Region. 8 January.* https://www.waterboards.ca.gov/coloradoriver/water_issues/programs/basin_planning/

Table

Table 1: Historical Groundwater Analytical Data

Kennedy Jenks

		Field Sampling		General Physical			General Chemical									General Chemical					Metals						Metals			Anion/Cation Balance			Microbiological Analysis		Anthropogenic Analysis					
Well ID	Sample Date	Dissolved Oxygen (mg/l)	Temperature °F	Apparent Color (color units)	Odor Threshold (ton)	Turbidity (NTU)	Total Alkalinity (as CaCO3) (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	EC (µmhos/cm)	F (mg/l)	Hydroxide (mg/l)	NO3-N (mg/l)	NO2-N (mg/l)	pH std units	SO4 (mg/l)	TDS (mg/l)	Ortho-phosphate (mg/l)	TOC (mg/l)	As (µg/L)	B (µg/L)	Br (µg/L)	Ca (µg/L)	Fe (µg/L)	Mg (µg/L)	Mn (µg/L)	K (µg/L)	Na (µg/L)	Hardness, Total (as CaCO3) (mg/l)	Total Anions (meq/l)	Total Cations (meq/l)	Total Coliform (MPN/100 ml)	Fecal Coliform (MPN/100 ml)	Sucralose (µg/L)	Caffeine (µg/L)	17B-Estradiol (µg/L)	NDMA (µg/L)	Triclosan (µg/L)	DEET (µg/L)
	MCL	N/A	N/A	15	3	5				500	1600	2		10	1	N/A	500	1000			10				300		50			N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A	N/A
Well 9	1/21/2015	N/A	74.0	ND	1	ND	78	95	ND	10.0	240	**2.1**[a]	ND	2.5	ND	8.0	11	140	N/A	N/A	9.6	120	N/A	15	ND	1.2	ND	1.3	37	41	2.36	2.49	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 9[b]	1/28/2016	N/A	73.4	NS	NS	NS	84	100	ND	9.9	260	1.9	ND	2.9	ND	7.8[c]	12	140	N/A	N/A	9.8	110	N/A	15	**950**	1.3	ND	1.4	45	42	2.48	2.85	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 11	1/21/2015	N/A	74.4	ND	1	ND	100	130	ND	10	290	**2.3**	ND	2.7	ND	8.1	13	160	N/A	N/A	15	110	N/A	15	ND	1.8	ND	1.8	46	44	3.00	2.95	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 11	1/28/2016	N/A	74.2	NS	NS	NS	100	120	ND	8.1	290	**2.4**	ND	2.3	ND	7.9	12	180	N/A	N/A	15	120	N/A	14	ND	1.7	33	1.7	54	42	2.73	3.23	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 11	1/18/2017	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 11-B[b]	1/17/2018	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 11-B	1/17/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 11-B	11/9/2020[d]	N/A	N/A	ND	1	0.10	92	110	ND	12	330	1.6	**ND**	2.2	ND	8	40	200	N/A	N/A	8.8	120	N/A	20	ND	2	ND	1.6	51	57	3.06	3.42	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 11-B	1/13/2021	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 11-B	4/28/2021	3.48	74.6	N/A	N/A	N/A	98	120	<5.0	8.3	280	2.0	<5.0	2.8	<0.4	8.38[c]	13	170	<0.02	<0.3	N/A	140	<0.1	14	<100	1.6	<20	1.3	48	N/A	N/A	N/A	A[d]	A[d]	<0.02	<0.004	<0.004	<0.002	<0.008	<0.004
Well 12	1/21/2015	N/A	73.9	ND	1	ND	76	93	ND	9.3	220	1.2	ND	1.8	ND	7.9	9.8	160	N/A	N/A	7	ND	N/A	19	ND	1.8	ND	1.3	24	55	2.18	2.18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 12	1/28/2016	N/A	74.2	NS	NS	NS	86	100	ND	8.8	250	1.2	ND	2.0	ND	7.7	11	160	N/A	N/A	6	120	N/A	21	ND	1.9	ND	1.5	30	61	2.32	2.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 12	1/18/2017	N/A	73.8	ND	1	ND	90	110	ND	8.8	240	1.7	ND	2.1	ND	8.2	9.7	170	N/A	N/A	7.2	ND	N/A	19	ND	1.6	ND	1.5	35	54	2.34	2.64	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 12	1/17/2018	N/A	74.5	ND	1	0.5	84	100	ND	13	300	1.0	ND	2.4	ND	7.9	30	180	N/A	N/A	4.3	130	N/A	21	ND	2.9	ND	1.7	37	64	2.68	2.94	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 12	1/17/2019	N/A	64.8	ND	1	ND	82	99	ND	14	380	1.3	ND	1.7	ND	8.2	72	260	N/A	N/A	4.7	210	N/A	23	ND	2.6	ND	1.6	54	67	3.58	3.75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 12	2/10/2020	N/A	73.8	ND	1	ND	88	110	ND	8	230	1.7	ND	2.1	ND	8.1	10	160	N/A	N/A	6.7	110	N/A	18	ND	1.5	ND	1.2	31	51	2.31	2.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 12	1/13/2021	N/A	66.2	ND	1	0.3	84	100	ND	20	260	1	ND	2.1	ND	8.0	21	160	N/A	N/A	5.2	110	N/A	24	ND	2.4	ND	1.4	34	70	2.41	2.91	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 12	4/28/2021	7.84	74.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.08[c]	N/A	N/A	<0.02	<0.3	N/A	N/A	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A[d]	A[d]	<20	<4.0	<4.0	<2.0	<8.0	<4.0
Well 14	1/21/2015	N/A	76.1	ND	1	ND	92	110	ND	13	280	0.74	ND	3.2	ND	7.8	15	180	N/A	N/A	2.9	ND	N/A	28	ND	4.9	ND	1.5	25	90	2.75	2.93	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 14	1/28/2016	N/A	75.6	NS	NS	NS	89	110	ND	10	270	0.78	ND	2.7	ND	7.7	13	160	N/A	N/A	ND	130	N/A	25	ND	4.4	ND	1.6	25	80	2.59	2.74	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 14	1/18/2017	N/A	74.9	ND	1	ND	94	120	ND	11	280	0.81	ND	2.7	ND	8.0	14	170	N/A	N/A	ND	ND	N/A	26	ND	4.5	ND	1.7	28	84	2.61	2.93	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 14	1/17/2018	N/A	80.3	ND	1	0.1	92	110	ND	14	300	0.75	ND	3.8	ND	7.8	15	170	N/A	N/A	2.5	110	N/A	28	ND	4.9	ND	1.8	25	90	2.55	2.94	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 14	1/17/2019	N/A	69.4	ND	1	ND	80	98	ND	17	420	0.89	ND	1.9	ND	8.0	86	290	N/A	N/A	ND	180	N/A	30	ND	4.9	ND	1.8	52	94	3.92	4.21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 14	2/10/2020	N/A	74.6	ND	1	ND	98	120	ND	14	280	0.74	ND	3.2	ND	8.3	13	200	N/A	N/A	2.2	ND	N/A	28	ND	4.6	ND	1.6	24	89	2.67	2.86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 14	1/13/2021	N/A	73.2	ND	1	ND	99	120	ND	15	300	0.77	ND	3.4	ND	7.7	15	180	N/A	N/A	2.8	ND	N/A	31	ND	5.2	ND	1.8	29	98	2.74	3.29	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 14	4/28/2021	6.3	77.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.79[c]	N/A	N/A	0.022	<0.3	N/A	N/A	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A[d]	A[d]	<20	<4.0	<4.0	<2.0	<8.0	<4.0
Well 15	1/21/2015	N/A	69.1	ND	1	1.4	69	84	ND	8.0	210	0.33	ND	2.9	ND	7.4	10	120	N/A	N/A	ND	ND	N/A	22	ND	4.3	ND	1.4	14	73	2.04	2.10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 15	1/28/2016	N/A	70.0	NS	NS	NS	70	86	ND	8.0	210	0.32	ND	2.8	ND	7.3	9.1	110	N/A	N/A	ND	100	N/A	23	**360**	4.3	ND	1.4	15	74	2.04	2.19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 15	1/18/2017	N/A	70.4	ND	1	ND	70	85	ND	7.3	210	0.35	ND	3.0	ND	7.7	8.9	120	N/A	N/A	ND	ND	N/A	22	ND	4.1	ND	1.5	15	72	1.8	2.13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 15	1/17/2018	N/A	80.9	ND	1	0.3	64	78	ND	7.7	210	0.31	ND	3.0	ND	7.4	9.5	130	N/A	N/A	ND	ND	N/A	21	ND	4.2	ND	1.7	14	69	1.71	2.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 15	1/17/2019	N/A	68.0	ND	1	ND	77	94	ND	5.8	200	0.31	ND	2.8	ND	7.6	8.1	110	N/A	N/A	ND	110	N/A	23	ND	4.3	ND	1.0	12	75	1.89	2.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 15	2/10/2020	N/A	70.0	ND	1	0.2	70	85	ND	6.5	200	0.35	ND	2.9	ND	8.1	8.1	130	N/A	N/A	ND	ND	N/A	22	ND	3.9	ND	1.3	13	72	1.76	2.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 15	1/13/2021	N/A	64.6	ND	1	0.8	70	86	ND	7.1	200	0.32	ND	2.8	ND	7.4	9	140	N/A	N/A	ND	ND	N/A	22	ND	4.3	ND	1.4	14	71	1.80	2.10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 15	4/28/2021	8.5	71.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.50[c]	N/A	N/A	**0.2**	<0.3	N/A	N/A	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A[d]	A[d]	<20	<4.0	<4.0	<2.0	<8.0	<4.0
Well 16	1/21/2015	N/A	77.3	ND	1	ND	94	120	ND	11	290	1.7	ND	1.6	ND	7.8	17	170	N/A	N/A	2.5	ND	N/A	27	ND	4.8	ND	1.9	27	89	2.84	2.97	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 16	1/28/2016	N/A	74.1	NS	NS	NS	110	130	ND	9.2	300	1.7	ND	1.6	ND	7.5	16	190	N/A	N/A	ND	130	N/A	28	ND	4.8	ND	2.1	32	89	2.93	3.24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 16	1/18/2017	N/A	74.4	ND	1	ND	120	150	ND	9.1	290	1.7	ND	1.6	ND	8.0	16	190	N/A	N/A	ND	ND	N/A	26	ND	4.6	ND	2.0	30	83	3.14	3.03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 16	1/17/2018	N/A	72.5	ND	1	0.2	110	130	ND	11	300	1.8	ND	1.7	ND	7.7	17	170	N/A	N/A	2.1	120	N/A	25	ND	4.4	ND	2.1	31	81	2.89	3.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 16	1/17/2019	N/A	69.8	ND	1	ND	87	110	ND	17	430	1.5	ND	1.5	ND	8.1	87	280	N/A	N/A	ND	200	N/A	36	ND	5.9	ND	2.0	49	110	4.17	4.47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 16	2/10/2020	N/A	76.8	ND	1	ND	100	130	ND	10	280	1.7	ND	1.6	ND	8.3	15	190	N/A	N/A	2.1	130	N/A	26	ND	4.2	ND	1.9	28	83	2.80	2.91	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 16	1/13/2021	N/A	74.3	ND	1	0.1	100	130	ND	10	290	1.8	ND	1.6	ND	7.9	16	170	N/A	N/A	ND	ND	N/A	27	ND	4.6	ND	2.2	32	86	2.84	3.18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 16	4/28/2021	73.4	76.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.74[c]	N/A	N/A	0.036	<0.3	N/A	N/A	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A[d]	A[d]	<20	<4.0	<4.0	<2.0	<8.0	<4.0
Well 17	1/21/2015	N/A	77.1	ND	1	ND	83	100	ND	9.8	220	0.7	ND	1.9	ND	7.8	10	140	N/A	N/A	3.3	ND	N/A	20	ND	3.6	ND	1.4	21	64	2.3	2.25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 17	1/28/2016	N/A	75.4	NS	NS	NS	83	100	ND	8.0	230	0.75	ND	2.1	ND	7.6	9.7	140	N/A	N/A	2.3	ND	N/A	20	ND	3.4	ND	1.5	24	63	2.26	2.36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 17	1/18/2017	N/A	73.9	ND	1	ND	81	98	ND	9.5	260	0.83	ND	1.8	ND	8.0	23	180	N/A	N/A	2.1	ND	N/A	21	ND	3.4	ND	1.7	31	67	2.4	2.72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 17	1/17/2018	N/A	81.0	ND	1	ND	80	98	ND	8.9	220	0.7	ND	2.0	ND	7.8	9.2	130	N/A	N/A	3.2	ND	N/A	19	ND	3.3	ND	1.6	23	62	2.09	2.26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 17	1/17/2019	N/A	69.3	ND	1	ND	72	88	ND	20	480	0.97	ND	1.4	ND	8.1	130	330	N/A	N/A	2.1	230	N/A	26	ND	4.1	ND	1.9	69	81	4.76	4.69	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 17	2/10/2020	N/A	77.4	ND	1	ND	82	100	ND	8.6	220	0.74	ND	2.1	ND	8.3	8.7	160	N/A	N/A	2.6	ND	N/A	21	ND	3.2	ND	1.3	22	65	2.10	2.30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 17	1/13/2021	N/A	73.9	ND	1	0.1	83	100	ND	9.1	230	0.71	ND	2.1	ND	7.9	8.8	150	N/A	N/A	2.6	ND	N/A	21	ND	3.6	ND	1.6	25	37	2.12	2.47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well 17	4/28/2021	0.3	77.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.85[c]	N/A	N/A	0.027	<0.3	N/A	N/A	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A[d]	A[d]	<20	<4.0	<4.0	<2.0	<8.0	<4.0
Well WTP-1	1/21/2015	N/A	78.4	ND	1	ND	160	190	ND	29	630	**6.1**	ND	1.1	ND	8.2	85	340	N/A	N/A	5.7	380	N/A	19	ND	4.1	ND	2.7	110	64	6.10	6.14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well WTP-1	1/28/2016	N/A	79.1	NS	NS	NS	160	200	ND	28	640	**6.2**	ND	1.2	ND	8.0	89	400	N/A	N/A	4.3	410	N/A	20	ND	4.3	ND	2.7	120	68	6.33	6.64	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well WTP-1	1/18/2017	N/A	77.7	ND	1	ND	170	200	ND	29	640	**5.7**	ND	1.3	ND	8.3	90	380	N/A	N/A	4.0	350	N/A	19	ND	4.2	ND	2.8	120	66	6.27	6.59	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well WTP-1	1/17/2018	N/A	82.5	ND	1	ND	160	190	ND	31	650	**6.1**	ND	1.3	ND	8.1	92	390	N/A	N/A	4.5	400	N/A	19	ND	4.1	ND	2.7	120	65	6.22	6.58	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well WTP-1	1/17/2019	N/A	71.2	ND	1	ND	160	200	ND	28	610	**5.9**	ND	1.2	ND	8.3	86	380	N/A	N/A	4.8	400	N/A	21	ND	4.2	ND	2.8	100	69	6.17	5.82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well WTP-1	2/10/2020	N/A	78.8	ND	1	ND	160	200	ND	29	610	**5.8**	ND	1.2	ND	8.4	87	370	N/A	N/A	4.6	430	N/A	20	ND	3.8	ND	2.3	110	65	6.21	6.16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well WTP-1	1/13/2021	N/A	77.9	ND	1	ND	160	200	ND	28	600	**6.1**	ND	1.3	ND	8.3	83	360	N/A	N/A	5.4	350	N/A	20	ND	4.1	ND	2.6	120	49	6.12	6.22	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well WTP-1	4/28/2021	62.3	78.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.16[c]	N/A	N/A	<0.02	<0.3	N/A	N/A	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A[d]	A[d]	**37**	**6.6**	<4.0	<2.0	<8.0	<4.0

Notes and Abbreviations

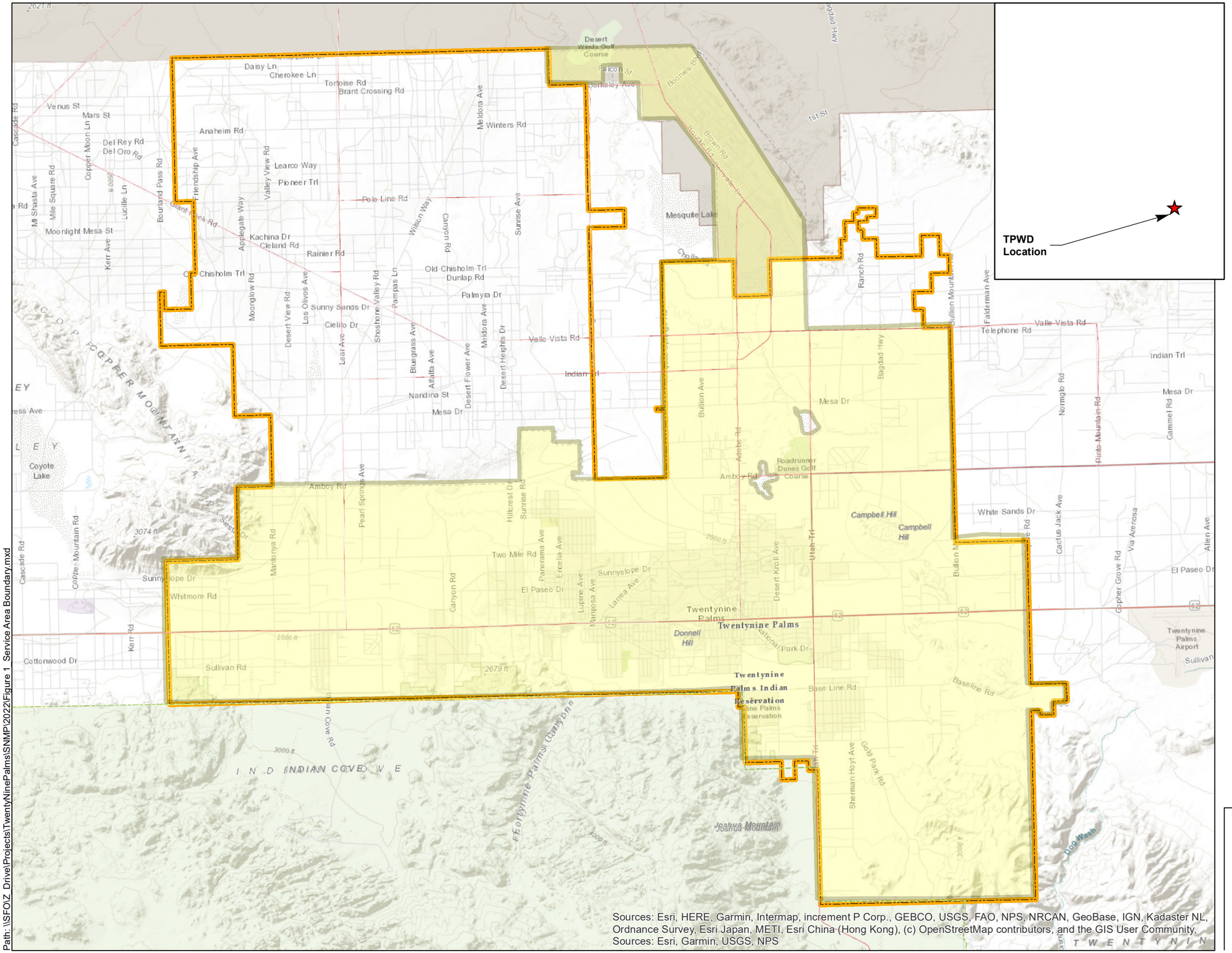
N/A = not analyzed or not applicable
ND = not detected
MPN/100 ml = Most probably number per 100 milliliters
< X = constituent not detected above the laboratory reporting limit, where X is the reporting limit

mg/l = milligrams per liter
µmhos/cm = micromhos per centimeter
°F = degrees Fahrenheit

As = Arsenic
B = Boron
Br = Bromide
Ca = Calcium
CaCO3 = Calcium Carbonate
Cl = Chloride
CO3 = Carbonate
EC = Specific Conductivity
F = Fluoride
Fe = Iron
HCO3 = Bicarbonate
K = Potassium
Mg = Magnesium
Mn = Manganese
Na = Sodium
NDMA = N-Nitrosodimethylamine
NO3-N = Nitrate as Nitrogen
NO2-N = Nitrite as Nitrogen
SO4 = Sulfate
TDS = Total Dissolved Solids
DEET = N, N-Diethyl-meta-toluamide

(a) Bold text indicates result greater than Maximum Contaminant Level (MCL) for the constituent.
(b) Well 9 went inactive after the 2016 sampling event. Well 11-B replaced Well 11 in 2017.
(c) pH measured in the field.
(d) Total and fecal coliform were measured using EPA Method SM9223 P/A in April 2021. P = present, A = absent.

Figures



Legend

- City of Twentynine Palms
- Twentynine Palms Water District Boundary

N

0 3,500 7,000

Feet

Kennedy Jenks

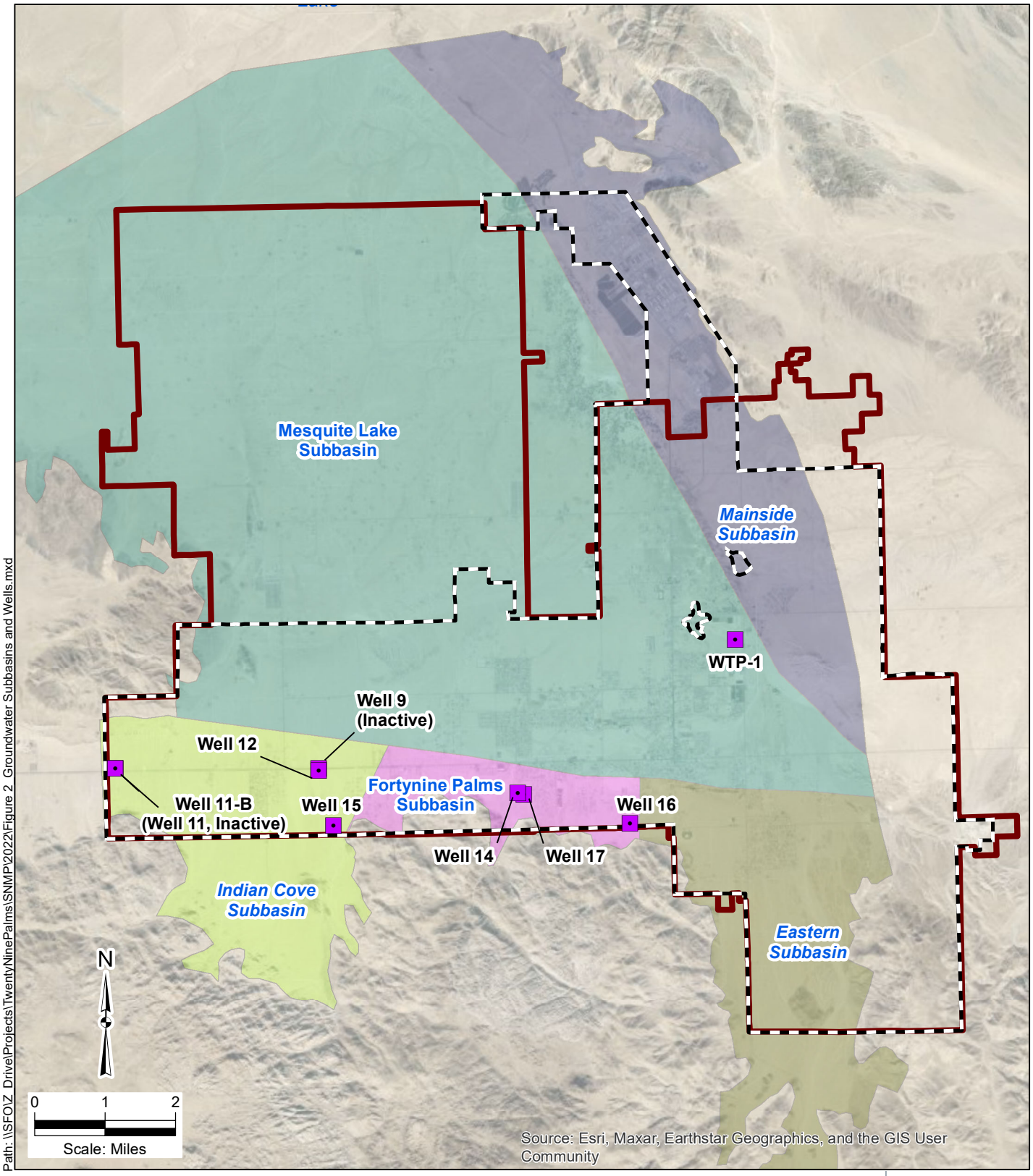
Twentynine Palms Water District
SNMP - 2021 Groundwater Monitoring Report
Twentynine Palms, CA

Twentynine Palms Water District Service Area Boundary

KJ 2165029.00

Figure 1

Path: \\SFO\Z_Drive\Projects\Twenty\NinePalms\SNMP\2022\Figure 1_Service Area Boundary.mxd



Path: \\SFO\Z_Drive\Projects\TwentyNinePalms\SNMP\2022\Figure 2_Groundwater Subbasins and Wells.mxd

Legend

- TPWD Active Water Supply Well
- City Limit
- Water District Boundary

Note:
1. Wells 9 and 11 became inactive in 2016. Well 11 was replaced with Well 11-B in 2018.

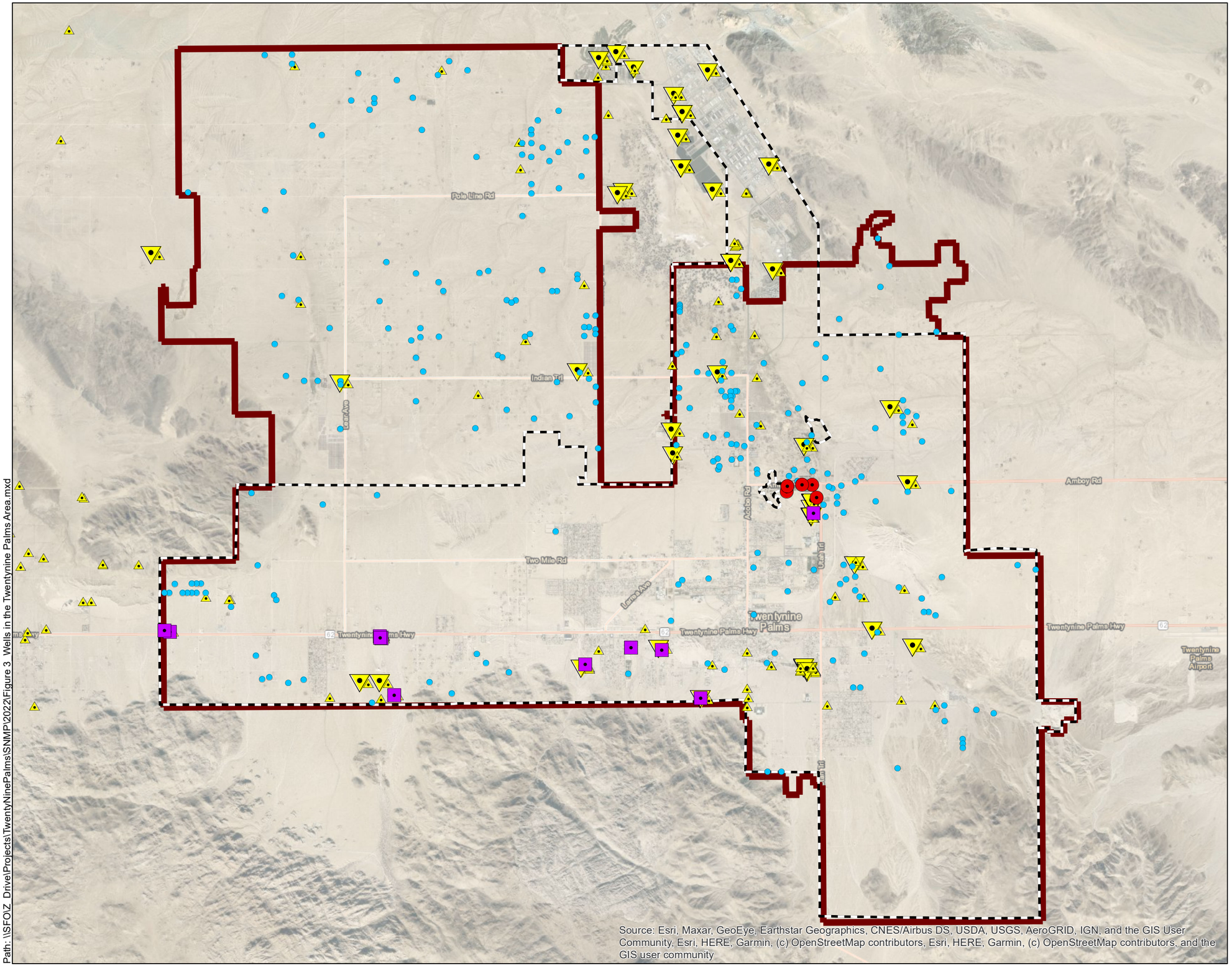
Kennedy Jenks

Twentynine Palms Water District
SNMP - 2021 Groundwater Monitoring Report
Twentynine Palms, CA

TPWD Groundwater Subbasins and Wells

K/J 2165029.00

Figure 2



Path: \\SFO\Z_Drive\Projects\TwentyNinePalms\SNMP\2022\Figure 3_Wells in the Twentynine Palms Area.mxd

LEGEND

- TPWD Monitoring Well
- TPWD Production Well
- Private Well
- USGS Monitored Well
- Current USGS Monitored Well
- City Limit
- Water District Boundary

Current Land Use

- Zone A
- Zone B
- Zone C
- Zone D
- Zone E
- Commercial Area
- Military Base

Zone A = High Density Residential (> 2 du/acre)
Zone B = High Density Residential (1 - 2 du/acre)
Zone C = Moderate Density Residential (0.5 - 1 du/acre)
Zone D = Low Density Residential (0.1 - 0.5 de/acre)
Zone E = Low Density Residential (< 0.1 du/acre)

Note: Data compiled from 2012 air photo anaysis

N

0 1 2
Miles

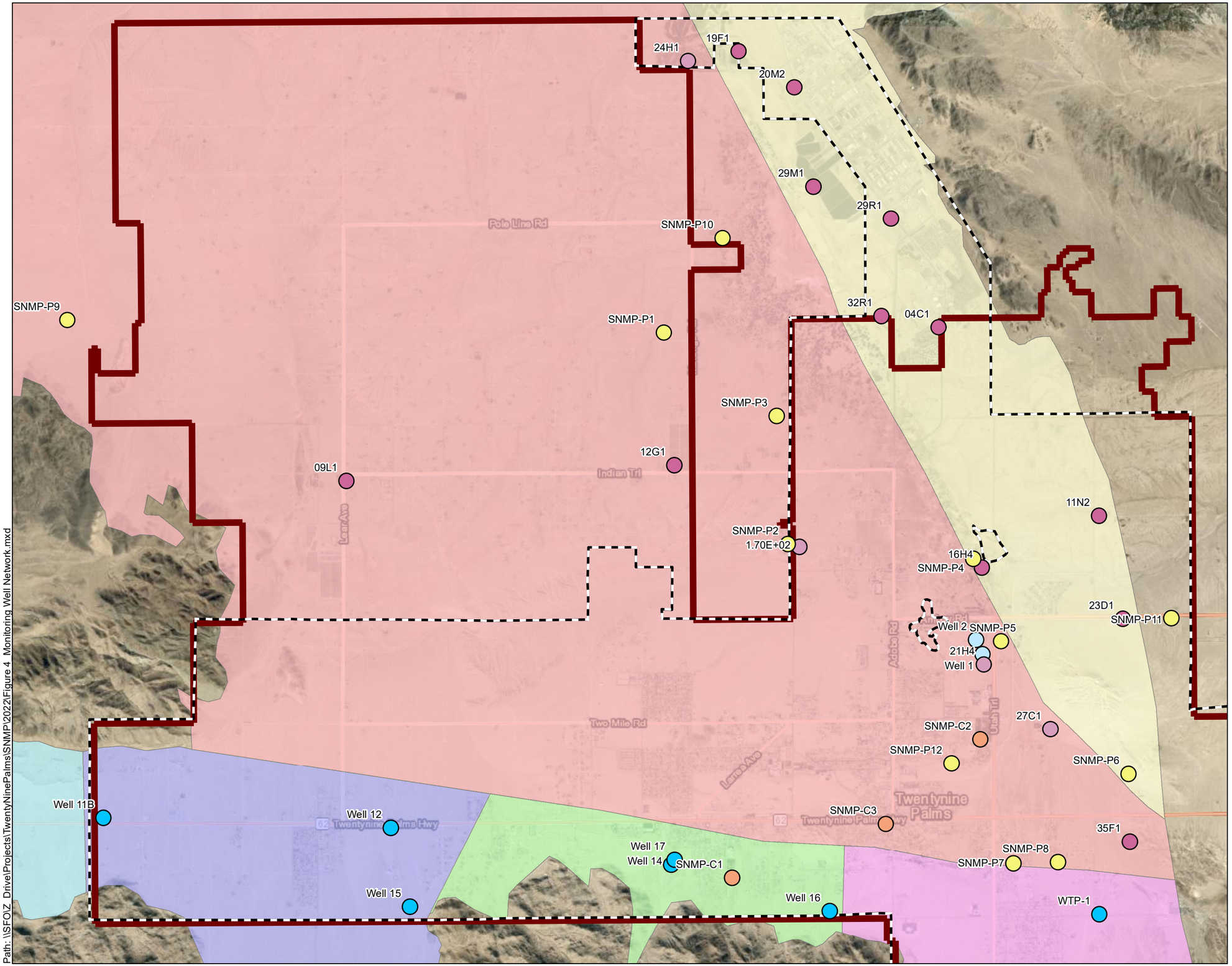
Kennedy Jenks

Twentynine Palms Water District
SNMP - 2021 Groundwater Monitoring Report
Twentynine Palms, CA

Wells in the Twentynine Palms Area

KJ 2165029.00

Figure 3



LEGEND

- City Limit
- Water District Boundary

Well by Owner Type, Status

- Private Well, Active
- City of 29 Palms, Active
- TWPD, Active
- TPWD, Inactive
- USGS, Active
- USGS, Inactive

Groundwater Subbasin

- Eastern Subbasin
- Fortynine Palms Subbasin
- Indian Cove Subbasin
- Joshua Tree Subbasin
- Main Side Subbasin
- Mesquite Subbasin

NOTE

Project Phoenix wells are located at SNMP-C3

N

0 6,800 13,600

Feet

Kennedy Jenks

Twentynine Palms Water District
SNMP - 2021 Groundwater Monitoring Report
Twentynine Palms, CA

Potential Wells for Inclusion in the TPWD Monitoring Well Network

K/J 2165029.00

Figure 4

Path: \\SFO\Z_Drive\Projects\TwentyNinePalms\SNMP\2022\Figure 4_Monitoring Well Network.mxd

Appendix A

Active Production Well Sample Laboratory Reports – 2021

Clinical Laboratory of San Bernardino, Inc.

Celebrating 50 Years of Analytical Service 1967-2017

Twentynine Palms Water District	Project: Well Analysis	Work Order: 21A0992
P.O Box 1735	Sub Project:	Received: 01/13/21 11:06
Twentynine Palms CA, 92277	Project Manager: Ray Kolisz	Reported: 06/23/21

Well 12 **21A0992-01 (Water)** **Sample Date:** 01/13/21 7:25 **Sampler:** Mike Minatrea

Analyte	Method	Result	Rep. Limit	MCL	Units	Prepared	Analyzed	Batch	Qualifier
Field Analyses									
Temperature (Field)	Field	**19.6**			°C	01/13/21	01/13/21	2103038	
General Physical Analyses									
Apparent Color	SM 2120BM	ND	3.0	15	Color Units	01/13/21	01/13/21	2103125	
Odor Threshold	EPA 140.1-M	**1**	1	3	TON	01/13/21	01/13/21	2103125	
Turbidity	EPA 180.1	**0.34**	0.10	5	NTU	01/13/21	01/13/21	2103125	
General Chemical Analyses									
Alkalinity, Total (as CaCO3)	SM 2320 B	**84**	5.0		mg/L	01/14/21	01/14/21	2103038	
Bicarbonate (HCO3)	SM 2320 B	**100**	5.0		mg/L	01/14/21	01/14/21	2103038	
Carbonate (CO3)	SM 2320B	ND	5.0		mg/L	01/14/21	01/14/21	2103038	
Chloride (Cl)	EPA 300.0	**10**	1.0	500	mg/L	01/14/21	01/14/21	2103068	
Langelier Index at Source Tmp	SM 203	**-0.09**				01/13/21	01/13/21	2103038	
Langelier Index at 60 C	SM 203	**0.52**				01/13/21	01/13/21	2103038	
Aggressive Index	SM 203	**11.70**				01/13/21	01/13/21	2103038	
Cyanide (CN)	SM4500CNF	ND	100	150	ug/L	01/14/21	01/14/21	2103130	
Specific Conductance (E.C.)	SM 2510B	**260**	2.0	1600	umhos/cm	01/14/21	01/14/21	2103038	
Fluoride (F)	EPA 300.0	**1.0**	0.10	2	mg/L	01/14/21	01/14/21	2103068	
Hydroxide (OH)	SM 2320B	ND	5.0		mg/L	01/14/21	01/14/21	2103038	
MBAS (LAS Mole. Wt 340.0)	SM 5540C	ND	0.10	0.5	mg/L	01/14/21	01/14/21	2103098	
Nitrate as N (NO3-N)	EPA 300.0	**2.1**	0.40	10	mg/L	01/14/21	01/14/21	2103068	
Nitrate + Nitrite (as N)	EPA 300.0	**2.1**	0.40	10	mg/L	01/14/21	01/14/21	2103068	
Nitrite as N (NO2-N)	EPA 300.0	ND	0.40	1	mg/L	01/14/21	01/14/21	2103068	
Perchlorate (ClO4)	EPA 314.0	ND	4.0	6	ug/L	01/20/21	01/21/21	2104087	
pH (Lab)	SM 4500HB	**8.0**			pH Units	01/14/21	01/14/21	2103038	
Sulfate (SO4)	EPA 300.0	**21**	0.50	500	mg/L	01/14/21	01/14/21	2103068	
Total Filterable Residue/TDS	SM 2540C	**160**	5.0	1000	mg/L	01/14/21	01/19/21	2103114	
Metals									
Aluminum (Al)	EPA 200.7	ND	50	200	ug/L	01/18/21	01/18/21	2104020	
Antimony (Sb)	EPA 200.8	ND	6.0	6	ug/L	01/19/21	01/19/21	2104037	
Arsenic (As)	EPA 200.8	**5.2**	2.0	10	ug/L	01/19/21	01/19/21	2104037	
Barium (Ba)	EPA 200.7	ND	100	1000	ug/L	01/18/21	01/18/21	2104020	
Beryllium (Be)	EPA 200.8	ND	1.0	4	ug/L	01/19/21	01/19/21	2104037	
Boron (B)	EPA 200.7	**110**	100		ug/L	01/18/21	01/18/21	2104020	
Cadmium (Cd)	EPA 200.8	ND	1.0	5	ug/L	01/19/21	01/19/21	2104037	
Calcium (Ca)	EPA 200.7	**24**	1.0		mg/L	01/25/21	01/25/21	2105020	
Chromium (+6)	EPA 218.6	**4.3**	1.0		ug/L	01/13/21	01/21/21	2103067	
Chromium (Total Cr)	EPA 200.8	ND	10	50	ug/L	01/19/21	01/19/21	2104037	
Copper (Cu)	EPA 200.7	ND	50	1000	ug/L	01/18/21	01/18/21	2104020	
Iron (Fe)	EPA 200.7	ND	100	300	ug/L	01/18/21	01/18/21	2104020	
Lead (Pb)	EPA 200.8	ND	5.0		ug/L	01/19/21	01/19/21	2104037	

Post Office Box 329 San Bernardino, CA 92402 (909) 825-7693 Fax (909) 825-7696 ELAP Number 1088

Twentynine Palms Water District	Project: Well Analysis	Work Order: 21A0992
P.O Box 1735	Sub Project:	Received: 01/13/21 11:06
Twentynine Palms CA, 92277	Project Manager: Ray Kolisz	Reported: 06/23/21

Well 12 **21A0992-01 (Water)** **Sample Date:** 01/13/21 7:25 **Sampler:** Mike Minatrea

Analyte	Method	Result	Rep. Limit	MCL	Units	Prepared	Analyzed	Batch	Qualifier
Metals									
Magnesium (Mg)	EPA 200.7	**2.4**	1.0		mg/L	01/25/21	01/25/21	2105020	
Manganese (Mn)	EPA 200.7	ND	20	50	ug/L	01/18/21	01/18/21	2104020	
Mercury (Hg)	EPA 200.8	ND	1.0	2	ug/L	01/20/21	01/20/21	2104063	
Nickel (Ni)	EPA 200.8	ND	10	100	ug/L	01/19/21	01/19/21	2104037	
Potassium (K)	EPA 200.7	**1.4**	1.0		mg/L	01/25/21	01/25/21	2105020	
Selenium (Se)	EPA 200.8	ND	5.0	50	ug/L	01/19/21	01/19/21	2104037	
Silver (Ag)	EPA 200.8	ND	10	100	ug/L	01/19/21	01/19/21	2104037	
Sodium (Na)	EPA 200.7	**34**	1.0		mg/L	01/25/21	01/25/21	2105020	
Thallium (Tl)	EPA 200.8	ND	1.0	2	ug/L	01/19/21	01/19/21	2104037	
Vanadium (V)	EPA 200.8	**5.6**	3.0		ug/L	01/19/21	01/19/21	2104037	
Zinc (Zn)	EPA 200.7	ND	50	5000	ug/L	01/18/21	01/18/21	2104020	
Anion / Cation Balance									
Hardness, Total (as CaCO3)	Calculated	**70**			mg/L	01/25/21	01/25/21	[CALC]	
Total Anions	Calculated	**2.41**			meq/L	01/25/21	01/14/21	[CALC]	
Total Cations	Calculated	**2.91**			meq/L	01/25/21	01/25/21	[CALC]	
% difference	Calculated	**19**				01/25/21	01/14/21	[CALC]	

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Clinical Laboratory of San Bernardino, Inc.

Celebrating 50 Years of Analytical Service 1967-2017

Twentynine Palms Water District	Project: Well Analysis	Work Order: 21A0992
P.O Box 1735	Sub Project:	Received: 01/13/21 11:06
Twentynine Palms CA, 92277	Project Manager: Ray Kolisz	Reported: 06/23/21

Well 14 **21A0992-02 (Water)** **Sample Date:** 01/13/21 7:49 **Sampler:** Mike Minatrea

Analyte	Method	Result	Rep. Limit	MCL	Units	Prepared	Analyzed	Batch	Qualifier
Field Analyses									
Temperature (Field)	Field	**22.9**			°C	01/13/21	01/13/21	2103038	
General Physical Analyses									
Apparent Color	SM 2120BM	ND	3.0	15	Color Units	01/13/21	01/13/21	2103125	
Odor Threshold	EPA 140.1-M	**1**	1	3	TON	01/13/21	01/13/21	2103125	
Turbidity	EPA 180.1	ND	0.10	5	NTU	01/13/21	01/13/21	2103125	
General Chemical Analyses									
Alkalinity, Total (as CaCO3)	SM 2320 B	**99**	5.0		mg/L	01/14/21	01/14/21	2103038	
Bicarbonate (HCO3)	SM 2320 B	**120**	5.0		mg/L	01/14/21	01/14/21	2103038	
Carbonate (CO3)	SM 2320B	ND	5.0		mg/L	01/14/21	01/14/21	2103038	
Chloride (Cl)	EPA 300.0	**15**	1.0	500	mg/L	01/14/21	01/14/21	2103068	
Langelier Index at Source Tmp	SM 203	**-0.14**				01/13/21	01/13/21	2103038	
Langelier Index at 60 C	SM 203	**0.43**				01/13/21	01/13/21	2103038	
Aggressive Index	SM 203	**11.61**				01/13/21	01/13/21	2103038	
Cyanide (CN)	SM4500CNF	ND	100	150	ug/L	01/14/21	01/14/21	2103130	
Specific Conductance (E.C.)	SM 2510B	**300**	2.0	1600	umhos/cm	01/14/21	01/14/21	2103038	
Fluoride (F)	EPA 300.0	**0.77**	0.10	2	mg/L	01/14/21	01/14/21	2103068	
Hydroxide (OH)	SM 2320B	ND	5.0		mg/L	01/14/21	01/14/21	2103038	
MBAS (LAS Mole. Wt 340.0)	SM 5540C	ND	0.10	0.5	mg/L	01/14/21	01/14/21	2103098	
Nitrate as N (NO3-N)	EPA 300.0	**3.4**	0.40	10	mg/L	01/14/21	01/14/21	2103068	
Nitrate + Nitrite (as N)	EPA 300.0	**3.4**	0.40	10	mg/L	01/14/21	01/14/21	2103068	
Nitrite as N (NO2-N)	EPA 300.0	ND	0.40	1	mg/L	01/14/21	01/14/21	2103068	
Perchlorate (ClO4)	EPA 314.0	ND	4.0	6	ug/L	01/20/21	01/21/21	2104087	
pH (Lab)	SM 4500HB	**7.7**			pH Units	01/14/21	01/14/21	2103038	
Sulfate (SO4)	EPA 300.0	**15**	0.50	500	mg/L	01/14/21	01/14/21	2103068	
Total Filterable Residue/TDS	SM 2540C	**180**	5.0	1000	mg/L	01/14/21	01/19/21	2103114	
Metals									
Aluminum (Al)	EPA 200.7	ND	50	200	ug/L	01/18/21	01/18/21	2104020	
Antimony (Sb)	EPA 200.8	ND	6.0	6	ug/L	01/19/21	01/19/21	2104037	
Arsenic (As)	EPA 200.8	**2.8**	2.0	10	ug/L	01/19/21	01/19/21	2104037	
Barium (Ba)	EPA 200.7	ND	100	1000	ug/L	01/18/21	01/18/21	2104020	
Beryllium (Be)	EPA 200.8	ND	1.0	4	ug/L	01/19/21	01/19/21	2104037	
Boron (B)	EPA 200.7	ND	100		ug/L	01/18/21	01/18/21	2104020	
Cadmium (Cd)	EPA 200.8	ND	1.0	5	ug/L	01/19/21	01/19/21	2104037	
Calcium (Ca)	EPA 200.7	**31**	1.0		mg/L	01/25/21	01/25/21	2105020	
Chromium (+6)	EPA 218.6	**3.9**	1.0		ug/L	01/13/21	01/21/21	2103067	
Chromium (Total Cr)	EPA 200.8	ND	10	50	ug/L	01/19/21	01/19/21	2104037	
Copper (Cu)	EPA 200.7	ND	50	1000	ug/L	01/18/21	01/18/21	2104020	
Iron (Fe)	EPA 200.7	ND	100	300	ug/L	01/18/21	01/18/21	2104020	
Lead (Pb)	EPA 200.8	ND	5.0		ug/L	01/19/21	01/19/21	2104037	

Post Office Box 329 San Bernardino, CA 92402 (909) 825-7693 Fax (909) 825-7696 ELAP Number 1088

Twentynine Palms Water District	Project: Well Analysis	Work Order: 21A0992
P.O Box 1735	Sub Project:	Received: 01/13/21 11:06
Twentynine Palms CA, 92277	Project Manager: Ray Kolisz	Reported: 06/23/21

Well 14 **21A0992-02 (Water)** **Sample Date:** 01/13/21 7:49 **Sampler:** Mike Minatrea

Analyte	Method	Result	Rep. Limit	MCL	Units	Prepared	Analyzed	Batch	Qualifier
Metals									
Magnesium (Mg)	EPA 200.7	**5.2**	1.0		mg/L	01/25/21	01/25/21	2105020	
Manganese (Mn)	EPA 200.7	ND	20	50	ug/L	01/18/21	01/18/21	2104020	
Mercury (Hg)	EPA 200.8	ND	1.0	2	ug/L	01/20/21	01/20/21	2104063	
Nickel (Ni)	EPA 200.8	ND	10	100	ug/L	01/19/21	01/19/21	2104037	
Potassium (K)	EPA 200.7	**1.8**	1.0		mg/L	01/25/21	01/25/21	2105020	
Selenium (Se)	EPA 200.8	ND	5.0	50	ug/L	01/19/21	01/19/21	2104037	
Silver (Ag)	EPA 200.8	ND	10	100	ug/L	01/19/21	01/19/21	2104037	
Sodium (Na)	EPA 200.7	**29**	1.0		mg/L	01/25/21	01/25/21	2105020	
Thallium (Tl)	EPA 200.8	ND	1.0	2	ug/L	01/19/21	01/19/21	2104037	
Vanadium (V)	EPA 200.8	**8.5**	3.0		ug/L	01/19/21	01/19/21	2104037	
Zinc (Zn)	EPA 200.7	ND	50	5000	ug/L	01/18/21	01/18/21	2104020	
Anion / Cation Balance									
Hardness, Total (as CaCO3)	Calculated	**98**			mg/L	01/25/21	01/25/21	[CALC]	
Total Anions	Calculated	**2.74**			meq/L	01/25/21	01/14/21	[CALC]	
Total Cations	Calculated	**3.29**			meq/L	01/25/21	01/25/21	[CALC]	
% difference	Calculated	**18**				01/25/21	01/14/21	[CALC]	

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Twentynine Palms Water District	Project: Well Analysis	Work Order: 21A0992
P.O Box 1735	Sub Project:	Received: 01/13/21 11:06
Twentynine Palms CA, 92277	Project Manager: Ray Kolisz	Reported: 06/23/21

Well 15 **21A0992-03 (Water)** **Sample Date:** 01/13/21 7:38 **Sampler:** Mike Minatrea

Analyte	Method	Result	Rep. Limit	MCL	Units	Prepared	Analyzed	Batch	Qualifier
Field Analyses									
Temperature (Field)	Field	**18.1**			°C	01/13/21	01/13/21	2103038	
General Physical Analyses									
Apparent Color	SM 2120BM	ND	3.0	15	Color Units	01/13/21	01/13/21	2103125	
Odor Threshold	EPA 140.1-M	**1**	1	3	TON	01/13/21	01/13/21	2103125	
Turbidity	EPA 180.1	**0.75**	0.10	5	NTU	01/13/21	01/13/21	2103125	
General Chemical Analyses									
Alkalinity, Total (as CaCO3)	SM 2320 B	**70**	5.0		mg/L	01/14/21	01/14/21	2103038	
Bicarbonate (HCO3)	SM 2320 B	**86**	5.0		mg/L	01/14/21	01/14/21	2103038	
Carbonate (CO3)	SM 2320B	ND	5.0		mg/L	01/14/21	01/14/21	2103038	
Chloride (Cl)	EPA 300.0	**7.1**	1.0	500	mg/L	01/14/21	01/14/21	2103068	
Langelier Index at Source Tmp	SM 203	**-0.84**				01/13/21	01/13/21	2103038	
Langelier Index at 60 C	SM 203	**-0.21**				01/13/21	01/13/21	2103038	
Aggressive Index	SM 203	**10.96**				01/13/21	01/13/21	2103038	
Cyanide (CN)	SM4500CNF	ND	100	150	ug/L	01/14/21	01/14/21	2103130	
Specific Conductance (E.C.)	SM 2510B	**200**	2.0	1600	umhos/cm	01/14/21	01/14/21	2103038	
Fluoride (F)	EPA 300.0	**0.32**	0.10	2	mg/L	01/14/21	01/14/21	2103068	
Hydroxide (OH)	SM 2320B	ND	5.0		mg/L	01/14/21	01/14/21	2103038	
MBAS (LAS Mole. Wt 340.0)	SM 5540C	ND	0.10	0.5	mg/L	01/14/21	01/14/21	2103098	
Nitrate as N (NO3-N)	EPA 300.0	**2.8**	0.40	10	mg/L	01/14/21	01/14/21	2103068	
Nitrate + Nitrite (as N)	EPA 300.0	**2.8**	0.40	10	mg/L	01/14/21	01/14/21	2103068	
Nitrite as N (NO2-N)	EPA 300.0	ND	0.40	1	mg/L	01/14/21	01/14/21	2103068	
Perchlorate (ClO4)	EPA 314.0	ND	4.0	6	ug/L	01/20/21	01/21/21	2104087	
pH (Lab)	SM 4500HB	**7.4**			pH Units	01/14/21	01/14/21	2103038	
Sulfate (SO4)	EPA 300.0	**8.5**	0.50	500	mg/L	01/14/21	01/14/21	2103068	
Total Filterable Residue/TDS	SM 2540C	**140**	5.0	1000	mg/L	01/14/21	01/19/21	2103114	
Metals									
Aluminum (Al)	EPA 200.7	ND	50	200	ug/L	01/18/21	01/18/21	2104020	
Antimony (Sb)	EPA 200.8	ND	6.0	6	ug/L	01/19/21	01/19/21	2104037	
Arsenic (As)	EPA 200.8	ND	2.0	10	ug/L	01/19/21	01/19/21	2104037	
Barium (Ba)	EPA 200.7	ND	100	1000	ug/L	01/18/21	01/18/21	2104020	
Beryllium (Be)	EPA 200.8	ND	1.0	4	ug/L	01/19/21	01/19/21	2104037	
Boron (B)	EPA 200.7	ND	100		ug/L	01/18/21	01/18/21	2104020	
Cadmium (Cd)	EPA 200.8	ND	1.0	5	ug/L	01/19/21	01/19/21	2104037	
Calcium (Ca)	EPA 200.7	**22**	1.0		mg/L	01/25/21	01/25/21	2105020	
Chromium (+6)	EPA 218.6	ND	1.0		ug/L	01/13/21	01/21/21	2103067	
Chromium (Total Cr)	EPA 200.8	ND	10	50	ug/L	01/19/21	01/19/21	2104037	
Copper (Cu)	EPA 200.7	ND	50	1000	ug/L	01/18/21	01/18/21	2104020	
Iron (Fe)	EPA 200.7	ND	100	300	ug/L	01/18/21	01/18/21	2104020	
Lead (Pb)	EPA 200.8	ND	5.0		ug/L	01/19/21	01/19/21	2104037	

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P.O Box 1735	Sub Project:	Received: 01/13/21 11:06
Twentynine Palms CA, 92277	Project Manager: Ray Kolisz	Reported: 06/23/21

Well 15 **21A0992-03 (Water)** **Sample Date:** 01/13/21 7:38 **Sampler:** Mike Minatrea

Analyte	Method	Result	Rep. Limit	MCL	Units	Prepared	Analyzed	Batch	Qualifier
Metals									
Magnesium (Mg)	EPA 200.7	**4.3**	1.0		mg/L	01/25/21	01/25/21	2105020	
Manganese (Mn)	EPA 200.7	ND	20	50	ug/L	01/18/21	01/18/21	2104020	
Mercury (Hg)	EPA 200.8	ND	1.0	2	ug/L	01/20/21	01/20/21	2104063	
Nickel (Ni)	EPA 200.8	ND	10	100	ug/L	01/19/21	01/19/21	2104037	
Potassium (K)	EPA 200.7	**1.4**	1.0		mg/L	01/25/21	01/25/21	2105020	
Selenium (Se)	EPA 200.8	ND	5.0	50	ug/L	01/19/21	01/19/21	2104037	
Silver (Ag)	EPA 200.8	ND	10	100	ug/L	01/19/21	01/19/21	2104037	
Sodium (Na)	EPA 200.7	**14**	1.0		mg/L	01/25/21	01/25/21	2105020	
Thallium (Tl)	EPA 200.8	ND	1.0	2	ug/L	01/19/21	01/19/21	2104037	
Vanadium (V)	EPA 200.8	**6.0**	3.0		ug/L	01/19/21	01/19/21	2104037	
Zinc (Zn)	EPA 200.7	ND	50	5000	ug/L	01/18/21	01/18/21	2104020	
Anion / Cation Balance									
Hardness, Total (as CaCO3)	Calculated	**71**			mg/L	01/25/21	01/25/21	[CALC]	
Total Anions	Calculated	**1.8**			meq/L	01/25/21	01/14/21	[CALC]	
Total Cations	Calculated	**2.1**			meq/L	01/25/21	01/25/21	[CALC]	
% difference	Calculated	**15**				01/25/21	01/14/21	[CALC]	

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Twentynine Palms Water District	Project: Well Analysis	Work Order: 21A0992
P.O Box 1735	Sub Project:	Received: 01/13/21 11:06
Twentynine Palms CA, 92277	Project Manager: Ray Kolisz	Reported: 06/23/21

Well 16 **21A0992-04 (Water)** **Sample Date:** 01/13/21 7:30 **Sampler:** Mike Minatrea

Analyte	Method	Result	Rep. Limit	MCL	Units	Prepared	Analyzed	Batch	Qualifier
Field Analyses									
Temperature (Field)	Field	**23.5**			°C	01/13/21	01/13/21	2103038	
General Physical Analyses									
Apparent Color	SM 2120BM	ND	3.0	15	Color Units	01/13/21	01/13/21	2103125	
Odor Threshold	EPA 140.1-M	**1**	1	3	TON	01/13/21	01/13/21	2103125	
Turbidity	EPA 180.1	**0.11**	0.10	5	NTU	01/13/21	01/13/21	2103125	
General Chemical Analyses									
Alkalinity, Total (as CaCO3)	SM 2320 B	**100**	5.0		mg/L	01/14/21	01/14/21	2103038	
Bicarbonate (HCO3)	SM 2320 B	**130**	5.0		mg/L	01/14/21	01/14/21	2103038	
Carbonate (CO3)	SM 2320B	ND	5.0		mg/L	01/14/21	01/14/21	2103038	
Chloride (Cl)	EPA 300.0	**10**	1.0	500	mg/L	01/14/21	01/14/21	2103068	
Langelier Index at Source Tmp	SM 203	**0.02**				01/13/21	01/13/21	2103038	
Langelier Index at 60 C	SM 203	**0.57**				01/13/21	01/13/21	2103038	
Aggressive Index	SM 203	**11.76**				01/13/21	01/13/21	2103038	
Cyanide (CN)	SM4500CNF	ND	100	150	ug/L	01/14/21	01/14/21	2103130	
Specific Conductance (E.C.)	SM 2510B	**290**	2.0	1600	umhos/cm	01/14/21	01/14/21	2103038	
Fluoride (F)	EPA 300.0	**1.8**	0.10	2	mg/L	01/14/21	01/14/21	2103068	
Hydroxide (OH)	SM 2320B	ND	5.0		mg/L	01/14/21	01/14/21	2103038	
MBAS (LAS Mole. Wt 340.0)	SM 5540C	ND	0.10	0.5	mg/L	01/14/21	01/14/21	2103098	
Nitrate as N (NO3-N)	EPA 300.0	**1.6**	0.40	10	mg/L	01/14/21	01/14/21	2103068	
Nitrate + Nitrite (as N)	EPA 300.0	**1.6**	0.40	10	mg/L	01/14/21	01/14/21	2103068	
Nitrite as N (NO2-N)	EPA 300.0	ND	0.40	1	mg/L	01/14/21	01/14/21	2103068	
Perchlorate (ClO4)	EPA 314.0	ND	4.0	6	ug/L	01/20/21	01/21/21	2104087	
pH (Lab)	SM 4500HB	**7.9**			pH Units	01/14/21	01/14/21	2103038	
Sulfate (SO4)	EPA 300.0	**16**	0.50	500	mg/L	01/14/21	01/14/21	2103068	
Total Filterable Residue/TDS	SM 2540C	**170**	5.0	1000	mg/L	01/14/21	01/19/21	2103114	
Metals									
Aluminum (Al)	EPA 200.7	ND	50	200	ug/L	01/18/21	01/18/21	2104020	
Antimony (Sb)	EPA 200.8	ND	6.0	6	ug/L	01/19/21	01/19/21	2104037	
Arsenic (As)	EPA 200.8	ND	2.0	10	ug/L	01/19/21	01/19/21	2104037	
Barium (Ba)	EPA 200.7	ND	100	1000	ug/L	01/18/21	01/18/21	2104020	
Beryllium (Be)	EPA 200.8	ND	1.0	4	ug/L	01/19/21	01/19/21	2104037	
Boron (B)	EPA 200.7	ND	100		ug/L	01/18/21	01/18/21	2104020	
Cadmium (Cd)	EPA 200.8	ND	1.0	5	ug/L	01/19/21	01/19/21	2104037	
Calcium (Ca)	EPA 200.7	**27**	1.0		mg/L	01/25/21	01/25/21	2105020	
Chromium (+6)	EPA 218.6	**5.1**	1.0		ug/L	01/13/21	01/21/21	2103067	
Chromium (Total Cr)	EPA 200.8	ND	10	50	ug/L	01/19/21	01/19/21	2104037	
Copper (Cu)	EPA 200.7	ND	50	1000	ug/L	01/18/21	01/18/21	2104020	
Iron (Fe)	EPA 200.7	ND	100	300	ug/L	01/18/21	01/18/21	2104020	
Lead (Pb)	EPA 200.8	ND	5.0		ug/L	01/19/21	01/19/21	2104037	

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Twentynine Palms Water District	Project: Well Analysis	Work Order: 21A0992
P.O Box 1735	Sub Project:	Received: 01/13/21 11:06
Twentynine Palms CA, 92277	Project Manager: Ray Kolisz	Reported: 06/23/21

Well 16 **21A0992-04 (Water)** **Sample Date:** 01/13/21 7:30 **Sampler:** Mike Minatrea

Analyte	Method	Result	Rep. Limit	MCL	Units	Prepared	Analyzed	Batch	Qualifier
Metals									
Magnesium (Mg)	EPA 200.7	**4.6**	1.0		mg/L	01/25/21	01/25/21	2105020	
Manganese (Mn)	EPA 200.7	ND	20	50	ug/L	01/18/21	01/18/21	2104020	
Mercury (Hg)	EPA 200.8	ND	1.0	2	ug/L	01/20/21	01/20/21	2104063	
Nickel (Ni)	EPA 200.8	ND	10	100	ug/L	01/19/21	01/19/21	2104037	
Potassium (K)	EPA 200.7	**2.2**	1.0		mg/L	01/25/21	01/25/21	2105020	
Selenium (Se)	EPA 200.8	ND	5.0	50	ug/L	01/19/21	01/19/21	2104037	
Silver (Ag)	EPA 200.8	ND	10	100	ug/L	01/19/21	01/19/21	2104037	
Sodium (Na)	EPA 200.7	**32**	1.0		mg/L	01/25/21	01/25/21	2105020	
Thallium (Tl)	EPA 200.8	ND	1.0	2	ug/L	01/19/21	01/19/21	2104037	
Vanadium (V)	EPA 200.8	**11**	3.0		ug/L	01/19/21	01/19/21	2104037	
Zinc (Zn)	EPA 200.7	ND	50	5000	ug/L	01/18/21	01/18/21	2104020	
Anion / Cation Balance									
Hardness, Total (as CaCO3)	Calculated	**86**			mg/L	01/25/21	01/25/21	[CALC]	
Total Anions	Calculated	**2.84**			meq/L	01/25/21	01/14/21	[CALC]	
Total Cations	Calculated	**3.18**			meq/L	01/25/21	01/25/21	[CALC]	
% difference	Calculated	**11**				01/25/21	01/14/21	[CALC]	

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Twentynine Palms Water District	Project: Well Analysis	Work Order: 21A0992
P.O Box 1735	Sub Project:	Received: 01/13/21 11:06
Twentynine Palms CA, 92277	Project Manager: Ray Kolisz	Reported: 06/23/21

Well 17 **21A0992-05 (Water)** **Sample Date:** 01/13/21 7:49 **Sampler:** Mike Minatrea

Analyte	Method	Result	Rep. Limit	MCL	Units	Prepared	Analyzed	Batch	Qualifier
Field Analyses									
Temperature (Field)	Field	**23.3**			°C	01/13/21	01/13/21	2103038	
General Physical Analyses									
Apparent Color	SM 2120BM	ND	3.0	15	Color Units	01/13/21	01/13/21	2103125	
Odor Threshold	EPA 140.1-M	**1**	1	3	TON	01/13/21	01/13/21	2103125	
Turbidity	EPA 180.1	**0.10**	0.10	5	NTU	01/13/21	01/13/21	2103125	
General Chemical Analyses									
Alkalinity, Total (as CaCO3)	SM 2320 B	**83**	5.0		mg/L	01/14/21	01/14/21	2103038	
Bicarbonate (HCO3)	SM 2320 B	**100**	5.0		mg/L	01/14/21	01/14/21	2103038	
Carbonate (CO3)	SM 2320B	ND	5.0		mg/L	01/14/21	01/14/21	2103038	
Chloride (Cl)	EPA 300.0	**9.1**	1.0	500	mg/L	01/14/21	01/14/21	2103068	
Langelier Index at Source Tmp	SM 203	**-0.19**				01/13/21	01/13/21	2103038	
Langelier Index at 60 C	SM 203	**0.37**				01/13/21	01/13/21	2103038	
Aggressive Index	SM 203	**11.54**				01/13/21	01/13/21	2103038	
Cyanide (CN)	SM4500CNF	ND	100	150	ug/L	01/14/21	01/14/21	2103130	
Specific Conductance (E.C.)	SM 2510B	**230**	2.0	1600	umhos/cm	01/14/21	01/14/21	2103038	
Fluoride (F)	EPA 300.0	**0.71**	0.10	2	mg/L	01/14/21	01/14/21	2103068	
Hydroxide (OH)	SM 2320B	ND	5.0		mg/L	01/14/21	01/14/21	2103038	
MBAS (LAS Mole. Wt 340.0)	SM 5540C	ND	0.10	0.5	mg/L	01/14/21	01/14/21	2103098	
Nitrate as N (NO3-N)	EPA 300.0	**2.1**	0.40	10	mg/L	01/14/21	01/14/21	2103068	
Nitrate + Nitrite (as N)	EPA 300.0	**2.1**	0.40	10	mg/L	01/14/21	01/14/21	2103068	
Nitrite as N (NO2-N)	EPA 300.0	ND	0.40	1	mg/L	01/14/21	01/14/21	2103068	
Perchlorate (ClO4)	EPA 314.0	ND	4.0	6	ug/L	01/20/21	01/21/21	2104087	
pH (Lab)	SM 4500HB	**7.9**			pH Units	01/14/21	01/14/21	2103038	
Sulfate (SO4)	EPA 300.0	**8.8**	0.50	500	mg/L	01/14/21	01/14/21	2103068	
Total Filterable Residue/TDS	SM 2540C	**150**	5.0	1000	mg/L	01/14/21	01/19/21	2103114	
Metals									
Aluminum (Al)	EPA 200.7	ND	50	200	ug/L	01/18/21	01/18/21	2104020	
Antimony (Sb)	EPA 200.8	ND	6.0	6	ug/L	01/19/21	01/19/21	2104037	
Arsenic (As)	EPA 200.8	**2.6**	2.0	10	ug/L	01/19/21	01/19/21	2104037	
Barium (Ba)	EPA 200.7	ND	100	1000	ug/L	01/18/21	01/18/21	2104020	
Beryllium (Be)	EPA 200.8	ND	1.0	4	ug/L	01/19/21	01/19/21	2104037	
Boron (B)	EPA 200.7	ND	100		ug/L	01/18/21	01/18/21	2104020	
Cadmium (Cd)	EPA 200.8	ND	1.0	5	ug/L	01/19/21	01/19/21	2104037	
Calcium (Ca)	EPA 200.7	**21**	1.0		mg/L	01/25/21	01/25/21	2105020	
Chromium (+6)	EPA 218.6	**6.6**	1.0		ug/L	01/13/21	01/21/21	2103067	
Chromium (Total Cr)	EPA 200.8	ND	10	50	ug/L	01/19/21	01/19/21	2104037	
Copper (Cu)	EPA 200.7	ND	50	1000	ug/L	01/18/21	01/18/21	2104020	
Iron (Fe)	EPA 200.7	ND	100	300	ug/L	01/18/21	01/18/21	2104020	
Lead (Pb)	EPA 200.8	ND	5.0		ug/L	01/19/21	01/19/21	2104037	

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P.O Box 1735	Sub Project:	Received: 01/13/21 11:06
Twentynine Palms CA, 92277	Project Manager: Ray Kolisz	Reported: 06/23/21

Well 17 **21A0992-05 (Water)** **Sample Date:** 01/13/21 7:49 **Sampler:** Mike Minatrea

Analyte	Method	Result	Rep. Limit	MCL	Units	Prepared	Analyzed	Batch	Qualifier
Metals									
Magnesium (Mg)	EPA 200.7	**3.6**	1.0		mg/L	01/25/21	01/25/21	2105020	
Manganese (Mn)	EPA 200.7	ND	20	50	ug/L	01/18/21	01/18/21	2104020	
Mercury (Hg)	EPA 200.8	ND	1.0	2	ug/L	01/20/21	01/20/21	2104063	
Nickel (Ni)	EPA 200.8	ND	10	100	ug/L	01/19/21	01/19/21	2104037	
Potassium (K)	EPA 200.7	**1.6**	1.0		mg/L	01/25/21	01/25/21	2105020	
Selenium (Se)	EPA 200.8	ND	5.0	50	ug/L	01/19/21	01/19/21	2104037	
Silver (Ag)	EPA 200.8	ND	10	100	ug/L	01/19/21	01/19/21	2104037	
Sodium (Na)	EPA 200.7	**25**	1.0		mg/L	01/25/21	01/25/21	2105020	
Thallium (Tl)	EPA 200.8	ND	1.0	2	ug/L	01/19/21	01/19/21	2104037	
Vanadium (V)	EPA 200.8	**9.8**	3.0		ug/L	01/19/21	01/19/21	2104037	
Zinc (Zn)	EPA 200.7	ND	50	5000	ug/L	01/18/21	01/18/21	2104020	
Anion / Cation Balance									
Hardness, Total (as CaCO3)	Calculated	**67**			mg/L	01/25/21	01/25/21	[CALC]	
Total Anions	Calculated	**2.12**			meq/L	01/25/21	01/14/21	[CALC]	
Total Cations	Calculated	**2.47**			meq/L	01/25/21	01/25/21	[CALC]	
% difference	Calculated	**16**				01/25/21	01/14/21	[CALC]	

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Twentynine Palms Water District	Project: Well Analysis	Work Order: 21A0992
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Twentynine Palms CA, 92277	Project Manager: Ray Kolisz	Reported: 06/23/21

Well WTP-1 **21A0992-06 (Water)** **Sample Date:** 01/13/21 8:06 **Sampler:** Mike Minatrea

Analyte	Method	Result	Rep. Limit	MCL	Units	Prepared	Analyzed	Batch	Qualifier
Field Analyses									
Temperature (Field)	Field	**25.5**			°C	01/13/21	01/13/21	2103038	
General Physical Analyses									
Apparent Color	SM 2120BM	ND	3.0	15	Color Units	01/13/21	01/13/21	2103125	
Odor Threshold	EPA 140.1-M	**1**	1	3	TON	01/13/21	01/13/21	2103125	
Turbidity	EPA 180.1	ND	0.10	5	NTU	01/13/21	01/13/21	2103125	
General Chemical Analyses									
Alkalinity, Total (as CaCO3)	SM 2320 B	**160**	5.0		mg/L	01/14/21	01/14/21	2103038	
Bicarbonate (HCO3)	SM 2320 B	**200**	5.0		mg/L	01/14/21	01/14/21	2103038	
Carbonate (CO3)	SM 2320B	ND	5.0		mg/L	01/14/21	01/14/21	2103038	
Chloride (Cl)	EPA 300.0	**28**	1.0	500	mg/L	01/14/21	01/14/21	2103068	
Langelier Index at Source Tmp	SM 203	**0.42**				01/13/21	01/13/21	2103038	
Langelier Index at 60 C	SM 203	**0.94**				01/13/21	01/13/21	2103038	
Aggressive Index	SM 203	**12.16**				01/13/21	01/13/21	2103038	
Cyanide (CN)	SM4500CNF	ND	100	150	ug/L	01/14/21	01/14/21	2103130	
Specific Conductance (E.C.)	SM 2510B	**600**	2.0	1600	umhos/cm	01/14/21	01/14/21	2103038	
Fluoride (F)	EPA 300.0	**6.1**	0.40	2	mg/L	01/14/21	01/14/21	2103110	
Hydroxide (OH)	SM 2320B	ND	5.0		mg/L	01/14/21	01/14/21	2103038	
MBAS (LAS Mole. Wt 340.0)	SM 5540C	ND	0.10	0.5	mg/L	01/14/21	01/14/21	2103098	
Nitrate as N (NO3-N)	EPA 300.0	**1.3**	0.40	10	mg/L	01/14/21	01/14/21	2103068	
Nitrate + Nitrite (as N)	EPA 300.0	**1.3**	0.40	10	mg/L	01/14/21	01/14/21	2103068	
Nitrite as N (NO2-N)	EPA 300.0	ND	0.40	1	mg/L	01/14/21	01/14/21	2103068	
Perchlorate (ClO4)	EPA 314.0	ND	4.0	6	ug/L	01/20/21	01/21/21	2104087	
pH (Lab)	SM 4500HB	**8.3**			pH Units	01/14/21	01/14/21	2103038	
Sulfate (SO4)	EPA 300.0	**83**	0.50	500	mg/L	01/14/21	01/14/21	2103068	
Total Filterable Residue/TDS	SM 2540C	**360**	5.0	1000	mg/L	01/14/21	01/19/21	2103114	
Metals									
Aluminum (Al)	EPA 200.7	ND	50	200	ug/L	01/18/21	01/18/21	2104020	
Antimony (Sb)	EPA 200.8	ND	6.0	6	ug/L	01/19/21	01/19/21	2104037	
Arsenic (As)	EPA 200.8	**5.4**	2.0	10	ug/L	01/19/21	01/19/21	2104037	
Barium (Ba)	EPA 200.7	ND	100	1000	ug/L	01/18/21	01/18/21	2104020	
Beryllium (Be)	EPA 200.8	ND	1.0	4	ug/L	01/19/21	01/19/21	2104037	
Boron (B)	EPA 200.7	**350**	100		ug/L	01/18/21	01/18/21	2104020	
Cadmium (Cd)	EPA 200.8	ND	1.0	5	ug/L	01/19/21	01/19/21	2104037	
Calcium (Ca)	EPA 200.7	**20**	5.0		mg/L	01/25/21	01/26/21	2105020	
Chromium (+6)	EPA 218.6	**6.7**	1.0		ug/L	01/13/21	01/21/21	2103067	
Chromium (Total Cr)	EPA 200.8	ND	10	50	ug/L	01/19/21	01/19/21	2104037	
Copper (Cu)	EPA 200.7	ND	50	1000	ug/L	01/18/21	01/18/21	2104020	
Iron (Fe)	EPA 200.7	ND	100	300	ug/L	01/18/21	01/18/21	2104020	
Lead (Pb)	EPA 200.8	ND	5.0		ug/L	01/19/21	01/19/21	2104037	

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Clinical Laboratory of San Bernardino, Inc.

Celebrating 50 Years of Analytical Service 1967-2017

Twentynine Palms Water District	Project: Well Analysis	Work Order: 21A0992
P.O Box 1735	Sub Project:	Received: 01/13/21 11:06
Twentynine Palms CA, 92277	Project Manager: Ray Kolisz	Reported: 06/23/21

Well WTP-1 **21A0992-06 (Water)** **Sample Date:** 01/13/21 8:06 **Sampler:** Mike Minatrea

Analyte	Method	Result	Rep. Limit	MCL	Units	Prepared	Analyzed	Batch	Qualifier
Metals									
Magnesium (Mg)	EPA 200.7	**4.1**	1.0		mg/L	01/21/21	01/21/21	2104108	
Manganese (Mn)	EPA 200.7	ND	20	50	ug/L	01/18/21	01/18/21	2104020	
Mercury (Hg)	EPA 200.8	ND	1.0	2	ug/L	01/20/21	01/20/21	2104063	
Nickel (Ni)	EPA 200.8	ND	10	100	ug/L	01/19/21	01/19/21	2104037	
Potassium (K)	EPA 200.7	**2.6**	1.0		mg/L	01/21/21	01/21/21	2104108	
Selenium (Se)	EPA 200.8	ND	5.0	50	ug/L	01/19/21	01/19/21	2104037	
Silver (Ag)	EPA 200.8	ND	10	100	ug/L	01/19/21	01/19/21	2104037	
Sodium (Na)	EPA 200.7	**120**	5.0		mg/L	01/25/21	01/25/21	2105020	
Thallium (Tl)	EPA 200.8	ND	1.0	2	ug/L	01/19/21	01/19/21	2104037	
Vanadium (V)	EPA 200.8	**24**	3.0		ug/L	01/19/21	01/19/21	2104037	
Zinc (Zn)	EPA 200.7	ND	50	5000	ug/L	01/18/21	01/18/21	2104020	
Anion / Cation Balance									
Hardness, Total (as CaCO3)	Calculated	**66**			mg/L	01/25/21	01/26/21	[CALC]	
Total Anions	Calculated	**6.12**			meq/L	01/25/21	01/14/21	[CALC]	
Total Cations	Calculated	**6.62**			meq/L	01/25/21	01/26/21	[CALC]	
% difference	Calculated	**8**				01/25/21	01/14/21	[CALC]	

pH (Lab) was analyzed ASAP but received and analyzed past the 15 minute hold time.

ND Analyte NOT DETECTED at or above the reporting limit

Stu Styles

Client Services Manager

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Clinical Laboratory of San Bernardino, Inc.

EDT Transfer Confirmation 1

Work Order: 21A0992
Report Date: 01/26/2021
Analyzing Lab: Clinical Laboratory of San Bernardino, Inc. ELAP 1088

TWENTYNINE PALMS WATER DISTRICT User ID: TAN System: 3610049

WELL 12 Station No.: 3610049-012 Sampled: 210113 07:25

COLOR	Result: ND	Units: UNITS	Entry No.: 00081	Analyzed: 210113
ODOR THRESHOLD @ 60 C	Result: 1	Units: TON	Entry No.: 00086	Analyzed: 210113
SPECIFIC CONDUCTANCE	Result: 260	Units:	Entry No.: 00095	Analyzed: 210114
PH (LABORATORY)	Result: 8.0	Units:	Entry No.: 00403	Analyzed: 210114
TOTAL ALKALINITY (AS CACO3)	Result: 84	Units: MG/L	Entry No.: 00410	Analyzed: 210114
BICARBONATE ALKALINITY	Result: 100	Units: MG/L	Entry No.: 00440	Analyzed: 210114
CARBONATE ALKALINITY	Result: ND	Units: MG/L	Entry No.: 00445	Analyzed: 210114
NITRATE (AS N)	Result: 2.1	Units: MG/L	Entry No.: 00618	Analyzed: 210114
NITRITE (N)	Result: ND	Units: MG/L	Entry No.: 00620	Analyzed: 210114
TOTAL HARDNESS (AS CACO3)	Result: 70	Units: MG/L	Entry No.: 00900	Analyzed: 210125
CALCIUM	Result: 24	Units: MG/L	Entry No.: 00916	Analyzed: 210125
MAGNESIUM	Result: 2.4	Units: MG/L	Entry No.: 00927	Analyzed: 210125
SODIUM	Result: 34	Units: MG/L	Entry No.: 00929	Analyzed: 210125
POTASSIUM	Result: 1.4	Units: MG/L	Entry No.: 00937	Analyzed: 210125
CHLORIDE	Result: 10	Units: MG/L	Entry No.: 00940	Analyzed: 210114
SULFATE	Result: 21	Units: MG/L	Entry No.: 00945	Analyzed: 210114
FLUORIDE (F) NATURAL - SOURCE	Result: 1.0	Units: MG/L	Entry No.: 00951	Analyzed: 210114
ARSENIC	Result: 5.2	Units: UG/L	Entry No.: 01002	Analyzed: 210119
BARIUM	Result: ND	Units: UG/L	Entry No.: 01007	Analyzed: 210118
BERYLLIUM	Result: ND	Units: UG/L	Entry No.: 01012	Analyzed: 210119
BORON	Result: 110	Units: UG/L	Entry No.: 01020	Analyzed: 210118
CADMIUM	Result: ND	Units: UG/L	Entry No.: 01027	Analyzed: 210119
CHROMIUM (HEXAVALENT)	Result: 4.3	Units: UG/L	Entry No.: 01032	Analyzed: 210121
CHROMIUM (TOTAL)	Result: ND	Units: UG/L	Entry No.: 01034	Analyzed: 210119
COPPER	Result: ND	Units: UG/L	Entry No.: 01042	Analyzed: 210118
IRON	Result: ND	Units: UG/L	Entry No.: 01045	Analyzed: 210118
LEAD	Result: ND	Units: UG/L	Entry No.: 01051	Analyzed: 210119
MANGANESE	Result: ND	Units: UG/L	Entry No.: 01055	Analyzed: 210118
THALLIUM	Result: ND	Units: UG/L	Entry No.: 01059	Analyzed: 210119
NICKEL	Result: ND	Units: UG/L	Entry No.: 01067	Analyzed: 210119
SILVER	Result: ND	Units: UG/L	Entry No.: 01077	Analyzed: 210119
VANADIUM	Result: 5.6	Units: UG/L	Entry No.: 01087	Analyzed: 210119
ZINC	Result: ND	Units: UG/L	Entry No.: 01092	Analyzed: 210118
ANTIMONY	Result: ND	Units: UG/L	Entry No.: 01097	Analyzed: 210119
ALUMINUM	Result: ND	Units: UG/L	Entry No.: 01105	Analyzed: 210118
SELENIUM	Result: ND	Units: UG/L	Entry No.: 01147	Analyzed: 210119
CYANIDE	Result: ND	Units: UG/L	Entry No.: 01291	Analyzed: 210114
FOAMING AGENTS (MBAS)	Result: ND	Units: MG/L	Entry No.: 38260	Analyzed: 210114
TOTAL DISSOLVED SOLIDS	Result: 160	Units: MG/L	Entry No.: 70300	Analyzed: 210119
LANGELIER INDEX @ 60 C	Result: 0.52	Units:	Entry No.: 71813	Analyzed: 210113
LANGELIER INDEX @ SOURCE TEMP.	Result: - 0.09	Units:	Entry No.: 71814	Analyzed: 210113
HYDROXIDE ALKALINITY	Result: ND	Units: MG/L	Entry No.: 71830	Analyzed: 210114
MERCURY	Result: ND	Units: UG/L	Entry No.: 71900	Analyzed: 210120
TURBIDITY (LAB)	Result: 0.3	Units: NTU	Entry No.: 82079	Analyzed: 210113
AGRESSIVENESS INDEX	Result: 11.70	Units:	Entry No.: 82383	Analyzed: 210113
NITRATE + NITRITE AS N	Result: 2.1	Units: MG/L	Entry No.: A-029	Analyzed: 210114
PERCHLORATE	Result: ND	Units: UG/L	Entry No.: A-031	Analyzed: 210121

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Clinical Laboratory of San Bernardino, Inc.

EDT Transfer Confirmation 1

Work Order: 21A0992
Report Date: 01/26/2021
Analyzing Lab: Clinical Laboratory of San Bernardino, Inc. ELAP 1088

WELL 15 — Station No.: 3610049-014 — Sampled: 210113 07:38

COLOR	Result: ND	Units: UNITS	Entry No.: 00081	Analyzed: 210113
ODOR THRESHOLD @ 60 C	Result: 1	Units: TON	Entry No.: 00086	Analyzed: 210113
SPECIFIC CONDUCTANCE	Result: 200	Units:	Entry No.: 00095	Analyzed: 210114
PH (LABORATORY)	Result: 7.4	Units:	Entry No.: 00403	Analyzed: 210114
TOTAL ALKALINITY (AS CACO3)	Result: 70	Units: MG/L	Entry No.: 00410	Analyzed: 210114
BICARBONATE ALKALINITY	Result: 86	Units: MG/L	Entry No.: 00440	Analyzed: 210114
CARBONATE ALKALINITY	Result: ND	Units: MG/L	Entry No.: 00445	Analyzed: 210114
NITRATE (AS N)	Result: 2.8	Units: MG/L	Entry No.: 00618	Analyzed: 210114
NITRITE (N)	Result: ND	Units: MG/L	Entry No.: 00620	Analyzed: 210114
TOTAL HARDNESS (AS CACO3)	Result: 71	Units: MG/L	Entry No.: 00900	Analyzed: 210125
CALCIUM	Result: 22	Units: MG/L	Entry No.: 00916	Analyzed: 210125
MAGNESIUM	Result: 4.3	Units: MG/L	Entry No.: 00927	Analyzed: 210125
SODIUM	Result: 14	Units: MG/L	Entry No.: 00929	Analyzed: 210125
POTASSIUM	Result: 1.4	Units: MG/L	Entry No.: 00937	Analyzed: 210125
CHLORIDE	Result: 7.1	Units: MG/L	Entry No.: 00940	Analyzed: 210114
SULFATE	Result: 8.5	Units: MG/L	Entry No.: 00945	Analyzed: 210114
FLUORIDE (F) NATURAL - SOURCE	Result: 0.32	Units: MG/L	Entry No.: 00951	Analyzed: 210114
ARSENIC	Result: ND	Units: UG/L	Entry No.: 01002	Analyzed: 210119
BARIUM	Result: ND	Units: UG/L	Entry No.: 01007	Analyzed: 210118
BERYLLIUM	Result: ND	Units: UG/L	Entry No.: 01012	Analyzed: 210119
BORON	Result: ND	Units: UG/L	Entry No.: 01020	Analyzed: 210118
CADMIUM	Result: ND	Units: UG/L	Entry No.: 01027	Analyzed: 210119
CHROMIUM (HEXAVALENT)	Result: ND	Units: UG/L	Entry No.: 01032	Analyzed: 210121
CHROMIUM (TOTAL)	Result: ND	Units: UG/L	Entry No.: 01034	Analyzed: 210119
COPPER	Result: ND	Units: UG/L	Entry No.: 01042	Analyzed: 210118
IRON	Result: ND	Units: UG/L	Entry No.: 01045	Analyzed: 210118
LEAD	Result: ND	Units: UG/L	Entry No.: 01051	Analyzed: 210119
MANGANESE	Result: ND	Units: UG/L	Entry No.: 01055	Analyzed: 210118
THALLIUM	Result: ND	Units: UG/L	Entry No.: 01059	Analyzed: 210119
NICKEL	Result: ND	Units: UG/L	Entry No.: 01067	Analyzed: 210119
SILVER	Result: ND	Units: UG/L	Entry No.: 01077	Analyzed: 210119
VANADIUM	Result: 6.0	Units: UG/L	Entry No.: 01087	Analyzed: 210119
ZINC	Result: ND	Units: UG/L	Entry No.: 01092	Analyzed: 210118
ANTIMONY	Result: ND	Units: UG/L	Entry No.: 01097	Analyzed: 210119
ALUMINUM	Result: ND	Units: UG/L	Entry No.: 01105	Analyzed: 210118
SELENIUM	Result: ND	Units: UG/L	Entry No.: 01147	Analyzed: 210119
CYANIDE	Result: ND	Units: UG/L	Entry No.: 01291	Analyzed: 210114
FOAMING AGENTS (MBAS)	Result: ND	Units: MG/L	Entry No.: 38260	Analyzed: 210114
TOTAL DISSOLVED SOLIDS	Result: 140	Units: MG/L	Entry No.: 70300	Analyzed: 210119
LANGELIER INDEX @ 60 C	Result: - 0.21	Units:	Entry No.: 71813	Analyzed: 210113
LANGELIER INDEX @ SOURCE TEMP.	Result: - 0.84	Units:	Entry No.: 71814	Analyzed: 210113
HYDROXIDE ALKALINITY	Result: ND	Units: MG/L	Entry No.: 71830	Analyzed: 210114
MERCURY	Result: ND	Units: UG/L	Entry No.: 71900	Analyzed: 210120
TURBIDITY (LAB)	Result: 0.8	Units: NTU	Entry No.: 82079	Analyzed: 210113
AGRESSIVENESS INDEX	Result: 10.96	Units:	Entry No.: 82383	Analyzed: 210113
NITRATE + NITRITE AS N	Result: 2.8	Units: MG/L	Entry No.: A-029	Analyzed: 210114
PERCHLORATE	Result: ND	Units: UG/L	Entry No.: A-031	Analyzed: 210121

WELL 16 — Station No.: 3610049-015 — Sampled: 210113 07:30

COLOR	Result: ND	Units: UNITS	Entry No.: 00081	Analyzed: 210113

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ODOR THRESHOLD @ 60 C	Result: 1	Units: TON	Entry No.: 00086	Analyzed: 210113
SPECIFIC CONDUCTANCE	Result: 290	Units:	Entry No.: 00095	Analyzed: 210114
PH (LABORATORY)	Result: 7.9	Units:	Entry No.: 00403	Analyzed: 210114
TOTAL ALKALINITY (AS CACO3)	Result: 100	Units: MG/L	Entry No.: 00410	Analyzed: 210114
BICARBONATE ALKALINITY	Result: 130	Units: MG/L	Entry No.: 00440	Analyzed: 210114
CARBONATE ALKALINITY	Result: ND	Units: MG/L	Entry No.: 00445	Analyzed: 210114
NITRATE (AS N)	Result: 1.6	Units: MG/L	Entry No.: 00618	Analyzed: 210114
NITRITE (N)	Result: ND	Units: MG/L	Entry No.: 00620	Analyzed: 210114
TOTAL HARDNESS (AS CACO3)	Result: 86	Units: MG/L	Entry No.: 00900	Analyzed: 210125
CALCIUM	Result: 27	Units: MG/L	Entry No.: 00916	Analyzed: 210125
MAGNESIUM	Result: 4.6	Units: MG/L	Entry No.: 00927	Analyzed: 210125
SODIUM	Result: 32	Units: MG/L	Entry No.: 00929	Analyzed: 210125
POTASSIUM	Result: 2.2	Units: MG/L	Entry No.: 00937	Analyzed: 210125
CHLORIDE	Result: 10	Units: MG/L	Entry No.: 00940	Analyzed: 210114
SULFATE	Result: 16	Units: MG/L	Entry No.: 00945	Analyzed: 210114
FLUORIDE (F) NATURAL - SOURCE	Result: 1.8	Units: MG/L	Entry No.: 00951	Analyzed: 210114
ARSENIC	Result: ND	Units: UG/L	Entry No.: 01002	Analyzed: 210119
BARIUM	Result: ND	Units: UG/L	Entry No.: 01007	Analyzed: 210118
BERYLLIUM	Result: ND	Units: UG/L	Entry No.: 01012	Analyzed: 210119
BORON	Result: ND	Units: UG/L	Entry No.: 01020	Analyzed: 210118
CADMIUM	Result: ND	Units: UG/L	Entry No.: 01027	Analyzed: 210119
CHROMIUM (HEXAVALENT)	Result: 5.1	Units: UG/L	Entry No.: 01032	Analyzed: 210121
CHROMIUM (TOTAL)	Result: ND	Units: UG/L	Entry No.: 01034	Analyzed: 210119
COPPER	Result: ND	Units: UG/L	Entry No.: 01042	Analyzed: 210118
IRON	Result: ND	Units: UG/L	Entry No.: 01045	Analyzed: 210118
LEAD	Result: ND	Units: UG/L	Entry No.: 01051	Analyzed: 210119
MANGANESE	Result: ND	Units: UG/L	Entry No.: 01055	Analyzed: 210118
THALLIUM	Result: ND	Units: UG/L	Entry No.: 01059	Analyzed: 210119
NICKEL	Result: ND	Units: UG/L	Entry No.: 01067	Analyzed: 210119
SILVER	Result: ND	Units: UG/L	Entry No.: 01077	Analyzed: 210119
VANADIUM	Result: 11	Units: UG/L	Entry No.: 01087	Analyzed: 210119
ZINC	Result: ND	Units: UG/L	Entry No.: 01092	Analyzed: 210118
ANTIMONY	Result: ND	Units: UG/L	Entry No.: 01097	Analyzed: 210119
ALUMINUM	Result: ND	Units: UG/L	Entry No.: 01105	Analyzed: 210118
SELENIUM	Result: ND	Units: UG/L	Entry No.: 01147	Analyzed: 210119
CYANIDE	Result: ND	Units: UG/L	Entry No.: 01291	Analyzed: 210114
FOAMING AGENTS (MBAS)	Result: ND	Units: MG/L	Entry No.: 38260	Analyzed: 210114
TOTAL DISSOLVED SOLIDS	Result: 170	Units: MG/L	Entry No.: 70300	Analyzed: 210119
LANGELIER INDEX @ 60 C	Result: 0.57	Units:	Entry No.: 71813	Analyzed: 210113
LANGELIER INDEX @ SOURCE TEMP.	Result: 0.02	Units:	Entry No.: 71814	Analyzed: 210113
HYDROXIDE ALKALINITY	Result: ND	Units: MG/L	Entry No.: 71830	Analyzed: 210114
MERCURY	Result: ND	Units: UG/L	Entry No.: 71900	Analyzed: 210120
TURBIDITY (LAB)	Result: 0.1	Units: NTU	Entry No.: 82079	Analyzed: 210113
AGRESSIVENESS INDEX	Result: 11.76	Units:	Entry No.: 82383	Analyzed: 210113
NITRATE + NITRITE AS N	Result: 1.6	Units: MG/L	Entry No.: A-029	Analyzed: 210114
PERCHLORATE	Result: ND	Units: UG/L	Entry No.: A-031	Analyzed: 210121

WELL 14 Station No.: 3610049-016 Sampled: 210113 07:49

COLOR	Result: ND	Units: UNITS	Entry No.: 00081	Analyzed: 210113
ODOR THRESHOLD @ 60 C	Result: 1	Units: TON	Entry No.: 00086	Analyzed: 210113
SPECIFIC CONDUCTANCE	Result: 300	Units:	Entry No.: 00095	Analyzed: 210114

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PH (LABORATORY)	Result: 7.7	Units:	Entry No.: 00403	Analyzed: 210114
TOTAL ALKALINITY (AS CACO3)	Result: 99	Units: MG/L	Entry No.: 00410	Analyzed: 210114
BICARBONATE ALKALINITY	Result: 120	Units: MG/L	Entry No.: 00440	Analyzed: 210114
CARBONATE ALKALINITY	Result: ND	Units: MG/L	Entry No.: 00445	Analyzed: 210114
NITRATE (AS N)	Result: 3.4	Units: MG/L	Entry No.: 00618	Analyzed: 210114
NITRITE (N)	Result: ND	Units: MG/L	Entry No.: 00620	Analyzed: 210114
TOTAL HARDNESS (AS CACO3)	Result: 98	Units: MG/L	Entry No.: 00900	Analyzed: 210125
CALCIUM	Result: 31	Units: MG/L	Entry No.: 00916	Analyzed: 210125
MAGNESIUM	Result: 5.2	Units: MG/L	Entry No.: 00927	Analyzed: 210125
SODIUM	Result: 29	Units: MG/L	Entry No.: 00929	Analyzed: 210125
POTASSIUM	Result: 1.8	Units: MG/L	Entry No.: 00937	Analyzed: 210125
CHLORIDE	Result: 15	Units: MG/L	Entry No.: 00940	Analyzed: 210114
SULFATE	Result: 15	Units: MG/L	Entry No.: 00945	Analyzed: 210114
FLUORIDE (F) NATURAL - SOURCE	Result: 0.77	Units: MG/L	Entry No.: 00951	Analyzed: 210114
ARSENIC	Result: 2.8	Units: UG/L	Entry No.: 01002	Analyzed: 210119
BARIUM	Result: ND	Units: UG/L	Entry No.: 01007	Analyzed: 210118
BERYLLIUM	Result: ND	Units: UG/L	Entry No.: 01012	Analyzed: 210119
BORON	Result: ND	Units: UG/L	Entry No.: 01020	Analyzed: 210118
CADMIUM	Result: ND	Units: UG/L	Entry No.: 01027	Analyzed: 210119
CHROMIUM (HEXAVALENT)	Result: 3.9	Units: UG/L	Entry No.: 01032	Analyzed: 210121
CHROMIUM (TOTAL)	Result: ND	Units: UG/L	Entry No.: 01034	Analyzed: 210119
COPPER	Result: ND	Units: UG/L	Entry No.: 01042	Analyzed: 210118
IRON	Result: ND	Units: UG/L	Entry No.: 01045	Analyzed: 210118
LEAD	Result: ND	Units: UG/L	Entry No.: 01051	Analyzed: 210119
MANGANESE	Result: ND	Units: UG/L	Entry No.: 01055	Analyzed: 210118
THALLIUM	Result: ND	Units: UG/L	Entry No.: 01059	Analyzed: 210119
NICKEL	Result: ND	Units: UG/L	Entry No.: 01067	Analyzed: 210119
SILVER	Result: ND	Units: UG/L	Entry No.: 01077	Analyzed: 210119
VANADIUM	Result: 8.5	Units: UG/L	Entry No.: 01087	Analyzed: 210119
ZINC	Result: ND	Units: UG/L	Entry No.: 01092	Analyzed: 210118
ANTIMONY	Result: ND	Units: UG/L	Entry No.: 01097	Analyzed: 210119
ALUMINUM	Result: ND	Units: UG/L	Entry No.: 01105	Analyzed: 210118
SELENIUM	Result: ND	Units: UG/L	Entry No.: 01147	Analyzed: 210119
CYANIDE	Result: ND	Units: UG/L	Entry No.: 01291	Analyzed: 210114
FOAMING AGENTS (MBAS)	Result: ND	Units: MG/L	Entry No.: 38260	Analyzed: 210114
TOTAL DISSOLVED SOLIDS	Result: 180	Units: MG/L	Entry No.: 70300	Analyzed: 210119
LANGELIER INDEX @ 60 C	Result: 0.43	Units:	Entry No.: 71813	Analyzed: 210113
LANGELIER INDEX @ SOURCE TEMP.	Result: - 0.14	Units:	Entry No.: 71814	Analyzed: 210113
HYDROXIDE ALKALINITY	Result: ND	Units: MG/L	Entry No.: 71830	Analyzed: 210114
MERCURY	Result: ND	Units: UG/L	Entry No.: 71900	Analyzed: 210120
TURBIDITY (LAB)	Result: ND	Units: NTU	Entry No.: 82079	Analyzed: 210113
AGRESSIVENESS INDEX	Result: 11.61	Units:	Entry No.: 82383	Analyzed: 210113
NITRATE + NITRITE AS N	Result: 3.4	Units: MG/L	Entry No.: A-029	Analyzed: 210114
PERCHLORATE	Result: ND	Units: UG/L	Entry No.: A-031	Analyzed: 210121

WELL WTP-1 Station No.: 3610049-018 Sampled: 210113 08:06

COLOR	Result: ND	Units: UNITS	Entry No.: 00081	Analyzed: 210113
ODOR THRESHOLD @ 60 C	Result: 1	Units: TON	Entry No.: 00086	Analyzed: 210113
SPECIFIC CONDUCTANCE	Result: 600	Units:	Entry No.: 00095	Analyzed: 210114
PH (LABORATORY)	Result: 8.3	Units:	Entry No.: 00403	Analyzed: 210114
TOTAL ALKALINITY (AS CACO3)	Result: 160	Units: MG/L	Entry No.: 00410	Analyzed: 210114

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BICARBONATE ALKALINITY	Result: 200	Units: MG/L	Entry No.: 00440	Analyzed: 210114
CARBONATE ALKALINITY	Result: ND	Units: MG/L	Entry No.: 00445	Analyzed: 210114
NITRATE (AS N)	Result: 1.3	Units: MG/L	Entry No.: 00618	Analyzed: 210114
NITRITE (N)	Result: ND	Units: MG/L	Entry No.: 00620	Analyzed: 210114
TOTAL HARDNESS (AS CACO3)	Result: 49	Units: MG/L	Entry No.: 00900	Analyzed: 210126
CALCIUM	Result: 20	Units: MG/L	Entry No.: 00916	Analyzed: 210126
SODIUM	Result: 120	Units: MG/L	Entry No.: 00929	Analyzed: 210125
CHLORIDE	Result: 28	Units: MG/L	Entry No.: 00940	Analyzed: 210114
SULFATE	Result: 83	Units: MG/L	Entry No.: 00945	Analyzed: 210114
FLUORIDE (F) NATURAL - SOURCE	Result: 6.1	Units: MG/L	Entry No.: 00951	Analyzed: 210114
ARSENIC	Result: 5.4	Units: UG/L	Entry No.: 01002	Analyzed: 210119
BARIUM	Result: ND	Units: UG/L	Entry No.: 01007	Analyzed: 210118
BERYLLIUM	Result: ND	Units: UG/L	Entry No.: 01012	Analyzed: 210119
BORON	Result: 350	Units: UG/L	Entry No.: 01020	Analyzed: 210118
CADMIUM	Result: ND	Units: UG/L	Entry No.: 01027	Analyzed: 210119
CHROMIUM (HEXAVALENT)	Result: 6.7	Units: UG/L	Entry No.: 01032	Analyzed: 210121
CHROMIUM (TOTAL)	Result: ND	Units: UG/L	Entry No.: 01034	Analyzed: 210119
COPPER	Result: ND	Units: UG/L	Entry No.: 01042	Analyzed: 210118
IRON	Result: ND	Units: UG/L	Entry No.: 01045	Analyzed: 210118
LEAD	Result: ND	Units: UG/L	Entry No.: 01051	Analyzed: 210119
MANGANESE	Result: ND	Units: UG/L	Entry No.: 01055	Analyzed: 210118
THALLIUM	Result: ND	Units: UG/L	Entry No.: 01059	Analyzed: 210119
NICKEL	Result: ND	Units: UG/L	Entry No.: 01067	Analyzed: 210119
SILVER	Result: ND	Units: UG/L	Entry No.: 01077	Analyzed: 210119
VANADIUM	Result: 24	Units: UG/L	Entry No.: 01087	Analyzed: 210119
ZINC	Result: ND	Units: UG/L	Entry No.: 01092	Analyzed: 210118
ANTIMONY	Result: ND	Units: UG/L	Entry No.: 01097	Analyzed: 210119
ALUMINUM	Result: ND	Units: UG/L	Entry No.: 01105	Analyzed: 210118
SELENIUM	Result: ND	Units: UG/L	Entry No.: 01147	Analyzed: 210119
CYANIDE	Result: ND	Units: UG/L	Entry No.: 01291	Analyzed: 210114
FOAMING AGENTS (MBAS)	Result: ND	Units: MG/L	Entry No.: 38260	Analyzed: 210114
TOTAL DISSOLVED SOLIDS	Result: 360	Units: MG/L	Entry No.: 70300	Analyzed: 210119
LANGELIER INDEX @ 60 C	Result: 0.94	Units:	Entry No.: 71813	Analyzed: 210113
LANGELIER INDEX @ SOURCE TEMP.	Result: 0.42	Units:	Entry No.: 71814	Analyzed: 210113
HYDROXIDE ALKALINITY	Result: ND	Units: MG/L	Entry No.: 71830	Analyzed: 210114
MERCURY	Result: ND	Units: UG/L	Entry No.: 71900	Analyzed: 210120
TURBIDITY (LAB)	Result: ND	Units: NTU	Entry No.: 82079	Analyzed: 210113
AGRESSIVENESS INDEX	Result: 12.16	Units:	Entry No.: 82383	Analyzed: 210113
NITRATE + NITRITE AS N	Result: 1.3	Units: MG/L	Entry No.: A-029	Analyzed: 210114
PERCHLORATE	Result: ND	Units: UG/L	Entry No.: A-031	Analyzed: 210121

WELL 17 Station No.: 3610049-021 Sampled: 210113 07:49

COLOR	Result: ND	Units: UNITS	Entry No.: 00081	Analyzed: 210113
ODOR THRESHOLD @ 60 C	Result: 1	Units: TON	Entry No.: 00086	Analyzed: 210113
SPECIFIC CONDUCTANCE	Result: 230	Units:	Entry No.: 00095	Analyzed: 210114
PH (LABORATORY)	Result: 7.9	Units:	Entry No.: 00403	Analyzed: 210114
TOTAL ALKALINITY (AS CACO3)	Result: 83	Units: MG/L	Entry No.: 00410	Analyzed: 210114
BICARBONATE ALKALINITY	Result: 100	Units: MG/L	Entry No.: 00440	Analyzed: 210114
CARBONATE ALKALINITY	Result: ND	Units: MG/L	Entry No.: 00445	Analyzed: 210114
NITRATE (AS N)	Result: 2.1	Units: MG/L	Entry No.: 00618	Analyzed: 210114
NITRITE (N)	Result: ND	Units: MG/L	Entry No.: 00620	Analyzed: 210114

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TOTAL HARDNESS (AS CACO3)	Result: 67	Units: MG/L	Entry No.: 00900	Analyzed: 210125
CALCIUM	Result: 21	Units: MG/L	Entry No.: 00916	Analyzed: 210125
MAGNESIUM	Result: 3.6	Units: MG/L	Entry No.: 00927	Analyzed: 210125
SODIUM	Result: 25	Units: MG/L	Entry No.: 00929	Analyzed: 210125
POTASSIUM	Result: 1.6	Units: MG/L	Entry No.: 00937	Analyzed: 210125
CHLORIDE	Result: 9.1	Units: MG/L	Entry No.: 00940	Analyzed: 210114
SULFATE	Result: 8.8	Units: MG/L	Entry No.: 00945	Analyzed: 210114
FLUORIDE (F) NATURAL - SOURCE	Result: 0.71	Units: MG/L	Entry No.: 00951	Analyzed: 210114
ARSENIC	Result: 2.6	Units: UG/L	Entry No.: 01002	Analyzed: 210119
BARIUM	Result: ND	Units: UG/L	Entry No.: 01007	Analyzed: 210118
BERYLLIUM	Result: ND	Units: UG/L	Entry No.: 01012	Analyzed: 210119
BORON	Result: ND	Units: UG/L	Entry No.: 01020	Analyzed: 210118
CADMIUM	Result: ND	Units: UG/L	Entry No.: 01027	Analyzed: 210119
CHROMIUM (HEXAVALENT)	Result: 6.6	Units: UG/L	Entry No.: 01032	Analyzed: 210121
CHROMIUM (TOTAL)	Result: ND	Units: UG/L	Entry No.: 01034	Analyzed: 210119
COPPER	Result: ND	Units: UG/L	Entry No.: 01042	Analyzed: 210118
IRON	Result: ND	Units: UG/L	Entry No.: 01045	Analyzed: 210118
LEAD	Result: ND	Units: UG/L	Entry No.: 01051	Analyzed: 210119
MANGANESE	Result: ND	Units: UG/L	Entry No.: 01055	Analyzed: 210118
THALLIUM	Result: ND	Units: UG/L	Entry No.: 01059	Analyzed: 210119
NICKEL	Result: ND	Units: UG/L	Entry No.: 01067	Analyzed: 210119
SILVER	Result: ND	Units: UG/L	Entry No.: 01077	Analyzed: 210119
VANADIUM	Result: 9.8	Units: UG/L	Entry No.: 01087	Analyzed: 210119
ZINC	Result: ND	Units: UG/L	Entry No.: 01092	Analyzed: 210118
ANTIMONY	Result: ND	Units: UG/L	Entry No.: 01097	Analyzed: 210119
ALUMINUM	Result: ND	Units: UG/L	Entry No.: 01105	Analyzed: 210118
SELENIUM	Result: ND	Units: UG/L	Entry No.: 01147	Analyzed: 210119
CYANIDE	Result: ND	Units: UG/L	Entry No.: 01291	Analyzed: 210114
FOAMING AGENTS (MBAS)	Result: ND	Units: MG/L	Entry No.: 38260	Analyzed: 210114
TOTAL DISSOLVED SOLIDS	Result: 150	Units: MG/L	Entry No.: 70300	Analyzed: 210119
LANGELIER INDEX @ 60 C	Result: 0.37	Units:	Entry No.: 71813	Analyzed: 210113
LANGELIER INDEX @ SOURCE TEMP.	Result: - 0.19	Units:	Entry No.: 71814	Analyzed: 210113
HYDROXIDE ALKALINITY	Result: ND	Units: MG/L	Entry No.: 71830	Analyzed: 210114
MERCURY	Result: ND	Units: UG/L	Entry No.: 71900	Analyzed: 210120
TURBIDITY (LAB)	Result: 0.1	Units: NTU	Entry No.: 82079	Analyzed: 210113
AGRESSIVENESS INDEX	Result: 11.54	Units:	Entry No.: 82383	Analyzed: 210113
NITRATE + NITRITE AS N	Result: 2.1	Units: MG/L	Entry No.: A-029	Analyzed: 210114
PERCHLORATE	Result: ND	Units: UG/L	Entry No.: A-031	Analyzed: 210121

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0/6/18

Clinical Lab of San Bernardino, Inc. Chain of Custody

WO 21A0992

21881 Barton Road Grand Terrace CA 92313 909 825-7693 / 516-A N 8th St. Lompoc CA 93436 805 737-7300

Client	Twentynine Palms Water District
Address:	P.O Box 1735
	Twentynine Palms, CA 92277
Client Contact:	Ray Kolisz
Phone No.:	(760) 367-7546 FAX No.: (760) 361-9523
System No.:	3610049
Project:	Well Analysis
Sampled By:	Mike Minatrea
Comments:	

Destination Laboratory
[X] Clinical Grand Terrace / ELAP 1088
[ ] Clinical Lompoc / ELAP 1678
[ ] Other:

Date	Time	Sample Identification		Container ID	Matrix	Sample Type	Unpreserved, Pint	Unpreserved, 1/2 Gallon	1 GP Bottle	Cr (VI) Buffer 1/2 pint	40mL Amber Vials, Na2S2O3(504)	1 Liter A.G., Na2SO3 (515)	2 Liter A.G., HCl (508.525)	250mL A.G MCAA (531)	250mL A.G., Na2S2O3 (547)	1 Liter A.G., Na2S2O3 (548, 1613)	1 Liter A.P., Na2S2O3 (549)	Total Containers	General Minerals	General Physical	Inorganic Chemicals	Corrosivity	Comments / PS Code	Turn Around Time (TAT)
1/13/21	7:25	Well 12	67.3°F	12	GW		1	1	1	1								4	X	X	X	X	-012	
	7:49	Well 14	73.2°F	14	GW		1	1	1	1								4	X	X	X	X	-016	
	7:38	Well 15	64.6°F	15	GW		1	1	1	1								4	X	X	X	X	-014	
	7:30	Well 16	74.3°F	16	GW		1	1	1	1								4	X	X	X	X	-015	
	7:49	Well 17	73.9°F	17	GW		1	1	1	1								4	X	X	X	X	-021	
	8:06	Well WTP - 1	77.9°F	WTP	GW		1	1	1	1								4	X	X	X	X	-018	

Matrix: DW - Drinking Water GW - Ground Water SW - Surface Water W - Water WW - Wastewater SWR - Stormwater Runoff S - Sludge O - Other

Use for Bacteria Samples / Sample Type: 1-Routine 2-Repeat 3-Replacement 4-Special D-Distribution W-Well

TAT: (10) Ten Day (5) Five Day Rush (2) Two Day Rush

Relinquished By (Sign)	Print Name / Company	Date / Time	Received By (Sign)	Print Name / Company
Mike Minatrea	Mike Minatrea TPWD	1/13/21 / 11:06		Cory Cusb

(Lab Use Only) Lompoc Lab Receipt Temp.: _____ °C

Shipped Via: [ ] Fed Ex [ ] Golden State Overnight [ ] UPS [ ] OnTrac [ ] USPS [ ] Other _____

Condition: [ ] On Wet Ice [ ] On Blu Ice [✓] Intact [ ] Custody Seals Samples / COC Checked By: _____ Work Order Logged By: _____

Receipt Comments: Clinical Lab Receipt Temp.: 20.3 °C

Clinical Laboratory of San Bernardino, Inc.

Celebrating 50 Years of Analytical Service 1967-2017

Twentynine Palms Water District	Project: Salt and Nutrient Management Plan	Work Order: 21D2316
P.O Box 1735	Sub Project: Salt and Nutrient Management Plan	Received: 04/28/21 13:27
Twentynine Palms CA, 92277	Project Manager: Ray Kolisz	Reported: 06/11/21

Well 12 **21D2316-01 (Water)** **Sample Date:** 04/28/21 10:15 **Sampler:** Russell Frechette

Analyte	Method	Result	Rep. Limit	MCL	Units	Prepared	Analyzed	Batch	Qualifier
Field Analyses									
Dissolved Oxygen (Field)	Field	**7.84**			mg/L	04/28/21	04/28/21	2118100	
pH (Field)	Field	**8.08**			pH Units	04/28/21	04/28/21	2118100	
Temperature (Field)	Field	**74.72**			°F	04/28/21	04/28/21	2118100	
Microbiology Analyses									
Total Coliform	SM 9223	A			P/A	04/28/21	04/29/21	2118101	
E. Coli	SM 9223	A			P/A	04/28/21	04/29/21	2118101	
General Chemical Analyses									
Ortho-Phosphate (PO4)	SM 4500 PE/H8048	ND	0.020		mg/L	04/28/21	04/28/21	2118069	
Total Organic Carbon	SM 5310B	ND	0.30		mg/L	04/29/21	04/29/21	2118088	

Well 14 **21D2316-02 (Water)** **Sample Date:** 04/28/21 9:00 **Sampler:** Russell Frechette

Analyte	Method	Result	Rep. Limit	MCL	Units	Prepared	Analyzed	Batch	Qualifier
Field Analyses									
Dissolved Oxygen (Field)	Field	**6.3**			mg/L	04/28/21	04/28/21	2118100	
pH (Field)	Field	**7.79**			pH Units	04/28/21	04/28/21	2118100	
Temperature (Field)	Field	**77.08**			°F	04/28/21	04/28/21	2118100	
Microbiology Analyses									
Total Coliform	SM 9223	A			P/A	04/28/21	04/29/21	2118101	
E. Coli	SM 9223	A			P/A	04/28/21	04/29/21	2118101	
General Chemical Analyses									
Ortho-Phosphate (PO4)	SM 4500 PE/H8048	**0.022**	0.020		mg/L	04/28/21	04/28/21	2118069	
Total Organic Carbon	SM 5310B	ND	0.30		mg/L	04/29/21	04/29/21	2118088	

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Twentynine Palms Water District	Project: Salt and Nutrient Management Plan	Work Order: 21D2316
P.O Box 1735	Sub Project: Salt and Nutrient Management Plan	Received: 04/28/21 13:27
Twentynine Palms CA, 92277	Project Manager: Ray Kolisz	Reported: 06/11/21

Well 15 **21D2316-03 (Water)** **Sample Date:** 04/28/21 10:30 **Sampler:** Russell Frechette

Analyte	Method	Result	Rep. Limit	MCL	Units	Prepared	Analyzed	Batch	Qualifier
Field Analyses									
Dissolved Oxygen (Field)	Field	**8.5**			mg/L	04/28/21	04/28/21	2118100	
pH (Field)	Field	**7.5**			pH Units	04/28/21	04/28/21	2118100	
Temperature (Field)	Field	**71.08**			°F	04/28/21	04/28/21	2118100	
Microbiology Analyses									
Total Coliform	SM 9223	A			P/A	04/28/21	04/29/21	2118101	
E. Coli	SM 9223	A			P/A	04/28/21	04/29/21	2118101	
General Chemical Analyses									
Ortho-Phosphate (PO4)	SM 4500 PE/H8048	**0.20**	0.020		mg/L	04/28/21	04/28/21	2118069	
Total Organic Carbon	SM 5310B	ND	0.30		mg/L	04/29/21	04/29/21	2118088	

Well 16 **21D2316-04 (Water)** **Sample Date:** 04/28/21 8:20 **Sampler:** Russell Frechette

Analyte	Method	Result	Rep. Limit	MCL	Units	Prepared	Analyzed	Batch	Qualifier
Field Analyses									
Dissolved Oxygen (Field)	Field	**73.4**			mg/L	04/28/21	04/28/21	2118100	
pH (Field)	Field	**7.74**			pH Units	04/28/21	04/28/21	2118100	
Temperature (Field)	Field	**76.02**			°F	04/28/21	04/28/21	2118100	
Microbiology Analyses									
Total Coliform	SM 9223	A			P/A	04/28/21	04/29/21	2118101	
E. Coli	SM 9223	A			P/A	04/28/21	04/29/21	2118101	
General Chemical Analyses									
Ortho-Phosphate (PO4)	SM 4500 PE/H8048	**0.036**	0.020		mg/L	04/28/21	04/28/21	2118069	
Total Organic Carbon	SM 5310B	ND	0.30		mg/L	04/29/21	04/29/21	2118088	

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Twentynine Palms Water District	Project: Salt and Nutrient Management Plan	Work Order: 21D2316
P.O Box 1735	Sub Project: Salt and Nutrient Management Plan	Received: 04/28/21 13:27
Twentynine Palms CA, 92277	Project Manager: Ray Kolisz	Reported: 06/11/21

Well 17 **21D2316-05 (Water)** **Sample Date:** 04/28/21 9:20 **Sampler:** Russell Frechette

Analyte	Method	Result	Rep. Limit	MCL	Units	Prepared	Analyzed	Batch	Qualifier
Field Analyses									
Dissolved Oxygen (Field)	Field	**0.3**			mg/L	04/28/21	04/28/21	2118100	
pH (Field)	Field	**7.85**			pH Units	04/28/21	04/28/21	2118100	
Temperature (Field)	Field	**77.52**			°F	04/28/21	04/28/21	2118100	
Microbiology Analyses									
Total Coliform	SM 9223	A			P/A	04/28/21	04/29/21	2118101	
E. Coli	SM 9223	A			P/A	04/28/21	04/29/21	2118101	
General Chemical Analyses									
Ortho-Phosphate (PO4)	SM 4500 PE/H8048	**0.027**	0.020		mg/L	04/28/21	04/28/21	2118069	
Total Organic Carbon	SM 5310B	ND	0.30		mg/L	04/29/21	04/29/21	2118088	

Well WTP-1 **21D2316-06 (Water)** **Sample Date:** 04/28/21 7:45 **Sampler:** Russell Frechette

Analyte	Method	Result	Rep. Limit	MCL	Units	Prepared	Analyzed	Batch	Qualifier
Field Analyses									
Dissolved Oxygen (Field)	Field	**62.3**			mg/L	04/28/21	04/28/21	2118100	
pH (Field)	Field	**8.16**			pH Units	04/28/21	04/28/21	2118100	
Temperature (Field)	Field	**78.9**			°F	04/28/21	04/28/21	2118100	
Microbiology Analyses									
Total Coliform	SM 9223	A			P/A	04/28/21	04/29/21	2118101	
E. Coli	SM 9223	A			P/A	04/28/21	04/29/21	2118101	
General Chemical Analyses									
Ortho-Phosphate (PO4)	SM 4500 PE/H8048	ND	0.020		mg/L	04/28/21	04/28/21	2118069	
Total Organic Carbon	SM 5310B	ND	0.30		mg/L	04/29/21	04/29/21	2118088	

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Twentynine Palms Water District	Project:	Salt and Nutrient Management Plan	Work Order: 21D2316
P.O Box 1735	Sub Project:	Salt and Nutrient Management Plan	Received: 04/28/21 13:27
Twentynine Palms CA, 92277	Project Manager:	Ray Kolisz	Reported: 06/11/21

Well 11B **21D2316-07 (Water)** **Sample Date:** 04/28/21 9:45 **Sampler:** Russell Frechette

Analyte	Method	Result	Rep. Limit	MCL	Units	Prepared	Analyzed	Batch	Qualifier
Field Analyses									
Dissolved Oxygen (Field)	Field	**3.48**			mg/L	04/28/21	04/28/21	2118100	
pH (Field)	Field	**8.38**			pH Units	04/28/21	04/28/21	2118100	
Temperature (Field)	Field	**74.64**			°F	04/28/21	04/28/21	2118100	
Microbiology Analyses									
Total Coliform	SM 9223	A			P/A	04/28/21	04/29/21	2118101	
E. Coli	SM 9223	A			P/A	04/28/21	04/29/21	2118101	
General Chemical Analyses									
Alkalinity, Total (as CaCO3)	SM 2320 B	**98**	5.0		mg/L	05/05/21	05/05/21	2118103	
Bicarbonate (HCO3)	SM 2320 B	**120**	5.0		mg/L	05/05/21	05/05/21	2118103	
Carbonate (CO3)	SM 2320B	ND	5.0		mg/L	05/05/21	05/05/21	2118103	
Chloride (Cl)	EPA 300.0	**8.3**	1.0	500	mg/L	04/28/21	04/28/21	2118062	
Specific Conductance (E.C.)	SM 2510B	**280**	2.0	1600	umhos/cm	04/29/21	05/05/21	2118103	
Fluoride (F)	EPA 300.0	**2.0**	0.10	2	mg/L	04/28/21	04/28/21	2118062	
Hydroxide (OH)	SM 2320B	ND	5.0		mg/L	05/05/21	05/05/21	2118103	
Nitrate as N (NO3-N)	EPA 300.0	**2.8**	0.40	10	mg/L	04/28/21	04/28/21	2118062	
Nitrite as N (NO2-N)	EPA 300.0	ND	0.40	1	mg/L	04/28/21	04/28/21	2118062	
pH (Lab)	SM 4500HB	**8.2**			pH Units	04/29/21	05/05/21	2118103	
Ortho-Phosphate (PO4)	SM 4500 PE/H8048	ND	0.020		mg/L	04/28/21	04/28/21	2118069	
Sulfate (SO4)	EPA 300.0	**13**	0.50	500	mg/L	04/28/21	04/28/21	2118062	
Total Filterable Residue/TDS	SM 2540C	**170**	5.0	1000	mg/L	04/29/21	04/30/21	2118090	
Total Organic Carbon	SM 5310B	ND	0.30		mg/L	04/29/21	04/29/21	2118088	
Metals									
Boron (B)	EPA 200.7	**140**	100		ug/L	05/03/21	05/03/21	2119012	
Calcium (Ca)	EPA 200.7	**14**	1.0		mg/L	05/04/21	05/04/21	2119033	
Iron (Fe)	EPA 200.7	ND	100	300	ug/L	05/03/21	05/03/21	2119012	
Magnesium (Mg)	EPA 200.7	**1.6**	1.0		mg/L	05/04/21	05/04/21	2119033	
Manganese (Mn)	EPA 200.7	ND	20	50	ug/L	05/03/21	05/03/21	2119012	
Potassium (K)	EPA 200.7	**1.3**	1.0		mg/L	05/04/21	05/04/21	2119033	
Sodium (Na)	EPA 200.7	**48**	1.0		mg/L	05/04/21	05/04/21	2119033	

pH (Lab) was analyzed ASAP but received and analyzed past the 15 minute hold time.

ND Analyte NOT DETECTED at or above the reporting limit

Post Office Box 329 San Bernardino, CA 92402 (909) 825-7693 Fax (909) 825-7696 ELAP Number 1088

Twentynine Palms Water District	Project:	Salt and Nutrient Management Plan	Work Order:	21D2316
P.O Box 1735	Sub Project:	Salt and Nutrient Management Plan	Received:	04/28/21 13:27
Twentynine Palms CA, 92277	Project Manager:	Ray Kolisz	Reported:	06/11/21

Stu Styles

Client Services Manager

Post Office Box 329 San Bernardino, CA 92402 (909) 825-7693 Fax (909) 825-7696 ELAP Number 1088

Clinical Laboratory of San Bernardino, Inc.

EDT Transfer Confirmation 1

Work Order: 21D2316
Report Date: 06/11/2021
Analyzing Lab: Clinical Laboratory of San Bernardino, Inc. ELAP 1088

TWENTYNINE PALMS WATER DISTRICT User ID: TAN System: 3610049

WELL 12	Station No.: 3610049-012				Sampled: 210428 10:15
PHOSPHATE, ORTHO (as PO4)	Result: ND	Units: mg/L	Entry No.: 00660	Analyzed: 210428	
TOTAL ORGANIC CARBON	Result: ND	Units: MG/L	Entry No.: 00680	Analyzed: 210429	
WELL 15	Station No.: 3610049-014				Sampled: 210428 10:30
PHOSPHATE, ORTHO (as PO4)	Result: 0.20	Units: mg/L	Entry No.: 00660	Analyzed: 210428	
TOTAL ORGANIC CARBON	Result: ND	Units: MG/L	Entry No.: 00680	Analyzed: 210429	
WELL 16	Station No.: 3610049-015				Sampled: 210428 08:20
PHOSPHATE, ORTHO (as PO4)	Result: 0.036	Units: mg/L	Entry No.: 00660	Analyzed: 210428	
TOTAL ORGANIC CARBON	Result: ND	Units: MG/L	Entry No.: 00680	Analyzed: 210429	
WELL 14	Station No.: 3610049-016				Sampled: 210428 09:00
PHOSPHATE, ORTHO (as PO4)	Result: 0.022	Units: mg/L	Entry No.: 00660	Analyzed: 210428	
TOTAL ORGANIC CARBON	Result: ND	Units: MG/L	Entry No.: 00680	Analyzed: 210429	
WELL WTP-1	Station No.: 3610049-018				Sampled: 210428 07:45
PHOSPHATE, ORTHO (as PO4)	Result: ND	Units: mg/L	Entry No.: 00660	Analyzed: 210428	
TOTAL ORGANIC CARBON	Result: ND	Units: MG/L	Entry No.: 00680	Analyzed: 210429	
WELL 17	Station No.: 3610049-021				Sampled: 210428 09:20
PHOSPHATE, ORTHO (as PO4)	Result: 0.027	Units: mg/L	Entry No.: 00660	Analyzed: 210428	
TOTAL ORGANIC CARBON	Result: ND	Units: MG/L	Entry No.: 00680	Analyzed: 210429	
WELL 11-B	Station No.: 3610049-022				Sampled: 210428 09:45
SPECIFIC CONDUCTANCE	Result: 280	Units:	Entry No.: 00095	Analyzed: 210505	
PH (LABORATORY)	Result: 8.2	Units:	Entry No.: 00403	Analyzed: 210505	
TOTAL ALKALINITY (AS CACO3)	Result: 98	Units: MG/L	Entry No.: 00410	Analyzed: 210505	
BICARBONATE ALKALINITY	Result: 120	Units: MG/L	Entry No.: 00440	Analyzed: 210505	
CARBONATE ALKALINITY	Result: ND	Units: MG/L	Entry No.: 00445	Analyzed: 210505	
NITRATE (AS N)	Result: 2.8	Units: MG/L	Entry No.: 00618	Analyzed: 210428	
NITRITE (N)	Result: ND	Units: MG/L	Entry No.: 00620	Analyzed: 210428	
PHOSPHATE, ORTHO (as PO4)	Result: ND	Units: mg/L	Entry No.: 00660	Analyzed: 210428	
TOTAL ORGANIC CARBON	Result: ND	Units: MG/L	Entry No.: 00680	Analyzed: 210429	
CALCIUM	Result: 14	Units: MG/L	Entry No.: 00916	Analyzed: 210504	
MAGNESIUM	Result: 1.6	Units: MG/L	Entry No.: 00927	Analyzed: 210504	
SODIUM	Result: 48	Units: MG/L	Entry No.: 00929	Analyzed: 210504	
POTASSIUM	Result: 1.3	Units: MG/L	Entry No.: 00937	Analyzed: 210504	
CHLORIDE	Result: 8.3	Units: MG/L	Entry No.: 00940	Analyzed: 210428	
SULFATE	Result: 13	Units: MG/L	Entry No.: 00945	Analyzed: 210428	
FLUORIDE (F) NATURAL - SOURCE	Result: 2.0	Units: MG/L	Entry No.: 00951	Analyzed: 210428	
BORON	Result: 140	Units: UG/L	Entry No.: 01020	Analyzed: 210503	
IRON	Result: ND	Units: UG/L	Entry No.: 01045	Analyzed: 210503	
MANGANESE	Result: ND	Units: UG/L	Entry No.: 01055	Analyzed: 210503	
TOTAL DISSOLVED SOLIDS	Result: 170	Units: MG/L	Entry No.: 70300	Analyzed: 210430	
HYDROXIDE ALKALINITY	Result: ND	Units: MG/L	Entry No.: 71830	Analyzed: 210505	

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CALIFORNIA LABORATORY SERVICES

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May 07, 2021

CLS Work Order #: 21D1639
COC #:

Stu Styles
Clinical Lab of San Bernardino
21881 Barton Road
Grand Terrace, CA 92324

Project Name: 21D2316

Enclosed are the results of analyses for samples received by the laboratory on 04/30/21 10:40. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.
Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233

CALIFORNIA LABORATORY SERVICES
Committed. Responsive. Flexible.

05/07/21 11:28

Clinical Lab of San Bernardino	Project: 21D2316	
21881 Barton Road	Project Number: [none]	**CLS Work Order #: 21D1639**
Grand Terrace, CA 92324	Project Manager: Stu Styles	COC #:

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Well 12 / 21D2316-01 (21D1639-01) Water Sampled: 04/28/21 10:15 Received: 04/30/21 10:40										
Bromide	ND	0.012	0.10	mg/L	1	2103519	04/30/21	04/30/21	EPA 300.0	
Well 14 / 21D2316-02 (21D1639-02) Water Sampled: 04/28/21 09:00 Received: 04/30/21 10:40										
Bromide	ND	0.012	0.10	mg/L	1	2103519	04/30/21	04/30/21	EPA 300.0	
Well 15 / 21D2316-03 (21D1639-03) Water Sampled: 04/28/21 10:30 Received: 04/30/21 10:40										
Bromide	ND	0.012	0.10	mg/L	1	2103519	04/30/21	04/30/21	EPA 300.0	
Well 16 / 21D2316-04 (21D1639-04) Water Sampled: 04/28/21 08:20 Received: 04/30/21 10:40										
Bromide	ND	0.012	0.10	mg/L	1	2103519	04/30/21	04/30/21	EPA 300.0	
Well 17 / 21D2316-05 (21D1639-05) Water Sampled: 04/28/21 09:20 Received: 04/30/21 10:40										
Bromide	ND	0.012	0.10	mg/L	1	2103519	04/30/21	04/30/21	EPA 300.0	
Well WTP-1 / 21D2316-06 (21D1639-06) Water Sampled: 04/28/21 07:45 Received: 04/30/21 10:40										
Bromide	ND	0.012	0.10	mg/L	1	2103519	04/30/21	04/30/21	EPA 300.0	
Well 11B / 21D2316-07 (21D1639-07) Water Sampled: 04/28/21 09:45 Received: 04/30/21 10:40										
Bromide	ND	0.012	0.10	mg/L	1	2103519	04/30/21	04/30/21	EPA 300.0	

CALIFORNIA LABORATORY SERVICES
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05/07/21 11:28

Clinical Lab of San Bernardino	Project: 21D2316	
21881 Barton Road	Project Number: [none]	**CLS Work Order #: 21D1639**
Grand Terrace, CA 92324	Project Manager: Stu Styles	COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2103519 - General Preparation											
Blank (2103519-BLK1)					Prepared & Analyzed: 04/30/21						
Bromide	ND	0.012	0.10	mg/L							
LCS (2103519-BS1)					Prepared & Analyzed: 04/30/21						
Bromide	2.12	0.012	0.10	mg/L	2.00		106	80-120			
LCS Dup (2103519-BSD1)					Prepared & Analyzed: 04/30/21						
Bromide	2.11	0.012	0.10	mg/L	2.00		105	80-120	0.7	20	
Matrix Spike (2103519-MS1)			**Source: 21D1606-05**		Prepared & Analyzed: 04/30/21						
Bromide	2.16	0.012	0.10	mg/L	2.00	ND	108	80-120			
Matrix Spike Dup (2103519-MSD1)			**Source: 21D1606-05**		Prepared & Analyzed: 04/30/21						
Bromide	2.22	0.012	0.10	mg/L	2.00	ND	111	80-120	3	20	

CALIFORNIA LABORATORY SERVICES
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05/07/21 11:28

Clinical Lab of San Bernardino	Project: 21D2316	
21881 Barton Road	Project Number: [none]	**CLS Work Order #: 21D1639**
Grand Terrace, CA 92324	Project Manager: Stu Styles	COC #:

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

This is a "MDL Report", thus if the report denotes an "ND" for a particular analyte, it should be noted that the analyte was not detected at or above the MDL.

SUBCONTRACT ORDER

Clinical Laboratory of San Bernardino

21D2316

21D1639

SENDING LABORATORY:

Clinical Laboratory of San Bernardino
21881 Barton Road
Grand Terrace, CA 92313
Phone: 909.825.7693
Fax: 909.825.7696
Project Manager: Stu Styles

RECEIVING LABORATORY:

CLS Labs
3249 Fitzgerald Rd.
Rancho Cordova, CA 95742
Phone :(916) 638-7301
Fax: (916) 638-4510

Please email results to Project Manager: Stu Styles
[ ] glaubig@clinical-lab.com [X] styles@clinical-lab.com [ ] jhernandez@clinical-lab.com [ ] fresquez@clinical-lab.com

California EDT transfer those samples with PS codes provided [ ] Yes [X] No
Water Trax Upload Client: _____ [ ] Yes [X] No
GeoTracker Upload Client: _____ [ ] Yes [X] No

Turn Around Time [ ] 10 Days [X] 5 Days [ ] Other __ Days

Subcontract Comments:

Analysis	Comments
Sample ID: Well 12 / 21D2316-01	**Sampled: 04/28/21 10:15 PS Code: 3610049-012** **Water** **WTX ID:**
Bromide EPA 300.0 - CLS *Containers Supplied:* 1/2 Pint Plastic (E)	
Sample ID: Well 14 / 21D2316-02	**Sampled: 04/28/21 09:00 PS Code: 3610049-016** **Water** **WTX ID:**
Bromide EPA 300.0 - CLS *Containers Supplied:* 1/2 Pint Plastic (E)	
Sample ID: Well 15 / 21D2316-03	**Sampled: 04/28/21 10:30 PS Code: 3610049-014** **Water** **WTX ID:**
Bromide EPA 300.0 - CLS *Containers Supplied:* 1/2 Pint Plastic (E)	
Sample ID: Well 16 / 21D2316-04	**Sampled: 04/28/21 08:20 PS Code: 3610049-015** **Water** **WTX ID:**
Bromide EPA 300.0 - CLS *Containers Supplied:* 1/2 Pint Plastic (E)	

Released By	Date / Time	Received By	Date / Time
[signature]	4/29/21	[signature]	04/29/21 10:00
[signature]	04/29/21 14:00	[signature]	4/30/21 10:10

SUBCONTRACT ORDER

Clinical Laboratory of San Bernardino

21D2316

21D1639

Analysis		Comments
Sample ID: Well 17 / 21D2316-05	**Sampled: 04/28/21 09:20 PS Code: 3610049-021** **Water** **WTX ID:**	
Bromide EPA 300.0 - CLS *Containers Supplied:* 1/2 Pint Plastic (E)		
Sample ID: Well WTP-1 / 21D2316-06	**Sampled: 04/28/21 07:45 PS Code: 3610049-018** **Water** **WTX ID:**	
Bromide EPA 300.0 - CLS *Containers Supplied:* 1/2 Pint Plastic (E)		
Sample ID: Well 11B / 21D2316-07	**Sampled: 04/28/21 09:45 PS Code: 3610049-022** **Water** **WTX ID:**	
Bromide EPA 300.0 - CLS *Containers Supplied:* 1/2 Pint Plastic (E)		

D. 4/30/21 1040 (1.4)

Released By	Date / Time	Received By	Date / Time
BJ Sly	04/29/21 14:00		
Released By	Date / Time	Received By	Date / Time

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Work Orders: 1D29047

Project: 21D2316

Attn: John Styles

Client: Clinical Laboratory of San Bernardino, Inc.
21881 Barton Road
Grand Terrace, CA 92313

Report Date: 6/09/2021

Received Date: 4/29/2021

Turnaround Time: 7 workdays

Phones: (909) 825-7693

Fax: (909) 825-7696

P.O. #:

Billing Code:

Dear John Styles,

Enclosed are the results of analyses for samples received 4/29/21 with the Chain-of-Custody document. The samples were received in good condition, at 2.9 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Sample Results

Sample: Well 12/ 21D2316-01 — Sampled: 04/28/21 10:15 by Client

1D29047-01 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: EPA 1694M-APCI		**Instr:** LCMS03				
Batch ID: W1E0459 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 10:02				**Analyst:** jna
17-b-Estradiol	ND	4.0	ng/l	1	05/14/21	
Method: EPA 1694M-ESI-		**Instr:** LCMS03				
Batch ID: W1E0458 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 10:01				**Analyst:** jna
Triclosan	ND	8.0	ng/l	1	05/14/21	
Method: EPA 1694M-ESI+		**Instr:** LCMS03				
Batch ID: W1E0457 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 09:56				**Analyst:** jna
Caffeine	ND	4.0	ng/l	1	05/13/21	
DEET	ND	4.0	ng/l	1	05/13/21	
Method: EPA 521		**Instr:** GCMS09				
Batch ID: W1E0036 — **Preparation:** EPA 521/SPE		**Prepared:** 05/03/21 09:52				**Analyst:** mld
N-Nitrosodimethylamine	ND	2.0	ng/l	1	05/06/21	
Surrogate(s)						
NDMA-d6	*100%*	*70-130*	*Conc: 25.6*		*05/06/21*	

Sample: Well 12/ 21D2316-01 — Sampled: 04/28/21 10:15 by Client

1D29047-01RE1 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: EPA 1694M-ESI+		**Instr:** LCMS03				
Batch ID: W1E0457 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 09:56				**Analyst:** jna
Sucralose	ND	20	ng/l	1	05/14/21	

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Sample Results

(Continued)

Sample: Well 14/ 21D2316-02 — Sampled: 04/28/21 9:00 by Client

1D29047-02 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: EPA 1694M-APCI		**Instr:** LCMS03				
Batch ID: W1E0459 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 10:02				**Analyst:** jna
17-b-Estradiol	ND	4.0	ng/l	1	05/15/21	
Method: EPA 1694M-ESI-		**Instr:** LCMS03				
Batch ID: W1E0458 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 10:01				**Analyst:** jna
Triclosan	ND	8.0	ng/l	1	05/15/21	
Method: EPA 1694M-ESI+		**Instr:** LCMS03				
Batch ID: W1E0457 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 09:56				**Analyst:** jna
Caffeine	ND	4.0	ng/l	1	05/13/21	
DEET	ND	4.0	ng/l	1	05/13/21	
Method: EPA 521		**Instr:** GCMS09				
Batch ID: W1E0036 — **Preparation:** EPA 521/SPE		**Prepared:** 05/03/21 09:52				**Analyst:** mld
N-Nitrosodimethylamine	ND	2.0	ng/l	1	05/07/21	
Surrogate(s)						
NDMA-d6	*107%*	*70-130*	*Conc: 27.4*		*05/07/21*	

Sample: Well 14/ 21D2316-02 — Sampled: 04/28/21 9:00 by Client

1D29047-02RE1 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: EPA 1694M-ESI+		**Instr:** LCMS03				
Batch ID: W1E0457 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 09:56				**Analyst:** jna
Sucralose	ND	20	ng/l	1	05/15/21	

Sample: Well 15/ 21D2316-03 — Sampled: 04/28/21 10:30 by Client

1D29047-03 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: EPA 1694M-APCI		**Instr:** LCMS03				
Batch ID: W1E0459 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 10:02				**Analyst:** jna
17-b-Estradiol	ND	4.0	ng/l	1	05/15/21	
Method: EPA 1694M-ESI-		**Instr:** LCMS03				
Batch ID: W1E0458 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 10:01				**Analyst:** jna
Triclosan	ND	8.0	ng/l	1	05/15/21	
Method: EPA 1694M-ESI+		**Instr:** LCMS03				
Batch ID: W1E0457 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 09:56				**Analyst:** jna
Caffeine	ND	4.0	ng/l	1	05/13/21	
DEET	ND	4.0	ng/l	1	05/13/21	
Method: EPA 521		**Instr:** GCMS09				
Batch ID: W1E0036 — **Preparation:** EPA 521/SPE		**Prepared:** 05/03/21 09:52				**Analyst:** mld
N-Nitrosodimethylamine	ND	2.0	ng/l	1	05/07/21	
Surrogate(s)						
NDMA-d6	*117%*	*70-130*	*Conc: 29.9*		*05/07/21*	

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Sample Results

(Continued)

Sample: Well 15/ 21D2316-03 — Sampled: 04/28/21 10:30 by Client

1D29047-03RE1 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: EPA 1694M-ESI+		**Instr:** LCMS03				
Batch ID: W1E0457 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 09:56				**Analyst:** jna
Sucralose	ND	20	ng/l	1	05/15/21	

Sample: Well 16/ 21D2316-04 — Sampled: 04/28/21 8:20 by Client

1D29047-04 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: EPA 1694M-APCI		**Instr:** LCMS03				
Batch ID: W1E0459 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 10:02				**Analyst:** jna
17-b-Estradiol	ND	4.0	ng/l	1	05/15/21	
Method: EPA 1694M-ESI-		**Instr:** LCMS03				
Batch ID: W1E0458 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 10:01				**Analyst:** jna
Triclosan	ND	8.0	ng/l	1	05/15/21	
Method: EPA 1694M-ESI+		**Instr:** LCMS03				
Batch ID: W1E0457 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 09:56				**Analyst:** jna
Caffeine	ND	4.0	ng/l	1	05/13/21	
DEET	ND	4.0	ng/l	1	05/13/21	
Method: EPA 521		**Instr:** GCMS09				
Batch ID: W1E0036 — **Preparation:** EPA 521/SPE		**Prepared:** 05/03/21 09:52				**Analyst:** mld
N-Nitrosodimethylamine	ND	2.0	ng/l	1	05/07/21	
Surrogate(s)						
NDMA-d6	*105%*	*70-130*	*Conc: 26.7*		*05/07/21*	

Sample: Well 16/ 21D2316-04 — Sampled: 04/28/21 8:20 by Client

1D29047-04RE1 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: EPA 1694M-ESI+		**Instr:** LCMS03				
Batch ID: W1E0457 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 09:56				**Analyst:** jna
Sucralose	ND	20	ng/l	1	05/15/21	

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Sample Results

(Continued)

Sample: Well 17/ 21D2316-05 — Sampled: 04/28/21 9:20 by Client

1D29047-05 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: EPA 1694M-APCI		**Instr:** LCMS03				
Batch ID: W1E0459 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 10:02				**Analyst:** jna
17-b-Estradiol	ND	4.0	ng/l	1	05/15/21	
Method: EPA 1694M-ESI-		**Instr:** LCMS03				
Batch ID: W1E0458 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 10:01				**Analyst:** jna
Triclosan	ND	8.0	ng/l	1	05/15/21	
Method: EPA 1694M-ESI+		**Instr:** LCMS03				
Batch ID: W1E0457 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 09:56				**Analyst:** jna
Caffeine	ND	4.0	ng/l	1	05/13/21	
DEET	ND	4.0	ng/l	1	05/13/21	
Method: EPA 521		**Instr:** GCMS09				
Batch ID: W1E0036 — **Preparation:** EPA 521/SPE		**Prepared:** 05/03/21 09:52				**Analyst:** mld
N-Nitrosodimethylamine	ND	2.0	ng/l	1	05/07/21	
Surrogate(s)						
NDMA-d6	*101%*	*70-130*	*Conc: 25.8*		*05/07/21*	

Sample: Well 17/ 21D2316-05 — Sampled: 04/28/21 9:20 by Client

1D29047-05RE1 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: EPA 1694M-ESI+		**Instr:** LCMS03				
Batch ID: W1E0457 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 09:56				**Analyst:** jna
Sucralose	ND	20	ng/l	1	05/15/21	

Sample: Well WTP -1/ 21D2316-06 — Sampled: 04/28/21 7:45 by Client

1D29047-06 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: EPA 1694M-APCI		**Instr:** LCMS03				
Batch ID: W1E0459 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 10:02				**Analyst:** jna
17-b-Estradiol	ND	4.0	ng/l	1	05/15/21	
Method: EPA 1694M-ESI-		**Instr:** LCMS03				
Batch ID: W1E0458 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 10:01				**Analyst:** jna
Triclosan	ND	8.0	ng/l	1	05/15/21	
Method: EPA 1694M-ESI+		**Instr:** LCMS03				
Batch ID: W1E0457 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 09:56				**Analyst:** jna
Caffeine	**6.6**	4.0	ng/l	1	05/13/21	
DEET	ND	4.0	ng/l	1	05/13/21	
Method: EPA 521		**Instr:** GCMS09				
Batch ID: W1E0036 — **Preparation:** EPA 521/SPE		**Prepared:** 05/03/21 09:52				**Analyst:** mld
N-Nitrosodimethylamine	ND	2.0	ng/l	1	05/07/21	
Surrogate(s)						
NDMA-d6	*96%*	*70-130*	*Conc: 24.7*		*05/07/21*	

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Sample Results

(Continued)

Sample: Well WTP -1/ 21D2316-06 — Sampled: 04/28/21 7:45 by Client

1D29047-06RE1 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: EPA 1694M-ESI+		**Instr:** LCMS03				
Batch ID: W1E0457 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 09:56				**Analyst:** jna
Sucralose	**37**	20	ng/l	1	05/15/21	

Sample: Well 11B/ 21D2316-07 — Sampled: 04/28/21 9:45 by Client

1D29047-07 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: EPA 1694M-APCI		**Instr:** LCMS03				
Batch ID: W1E0459 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 10:02				**Analyst:** jna
17-b-Estradiol	ND	4.0	ng/l	1	05/15/21	
Method: EPA 1694M-ESI-		**Instr:** LCMS03				
Batch ID: W1E0458 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 10:01				**Analyst:** jna
Triclosan	ND	8.0	ng/l	1	05/15/21	
Method: EPA 1694M-ESI+		**Instr:** LCMS03				
Batch ID: W1E0457 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 09:56				**Analyst:** jna
Caffeine	ND	4.0	ng/l	1	05/13/21	
DEET	ND	4.0	ng/l	1	05/13/21	
Method: EPA 521		**Instr:** GCMS09				
Batch ID: W1E0036 — **Preparation:** EPA 521/SPE		**Prepared:** 05/03/21 09:52				**Analyst:** mld
N-Nitrosodimethylamine	ND	2.0	ng/l	1	05/07/21	
Surrogate(s)						
NDMA-d6	*96%*	*70-130*	*Conc: 24.6*		*05/07/21*	

Sample: Well 11B/ 21D2316-07 — Sampled: 04/28/21 9:45 by Client

1D29047-07RE1 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: EPA 1694M-ESI+		**Instr:** LCMS03				
Batch ID: W1E0457 — **Preparation:** EPA 3535/SPE		**Prepared:** 05/10/21 09:56				**Analyst:** jna
Sucralose	ND	20	ng/l	1	05/15/21	

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Quality Control Results

Nitrosamines by CI GC/MS/MS, EPA 521

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1E0036 - EPA 521/SPE										
Blank (W1E0036-BLK1)				**Prepared: 05/03/21**	**Analyzed: 05/06/21**					
N-Nitrosodimethylamine	ND	2.0	ng/l							
Surrogate(s)										
NDMA-d6	*25.3*		*ng/l*	*25.0*		*101*	*70-130*			
LCS (W1E0036-BS1)				**Prepared: 05/03/21**	**Analyzed: 05/06/21**					
N-Nitrosodimethylamine	1.81	2.0	ng/l	2.00		90	50-150			
Surrogate(s)										
NDMA-d6	*24.3*		*ng/l*	*25.0*		*97*	*70-130*			
LCS Dup (W1E0036-BSD1)				**Prepared: 05/03/21**	**Analyzed: 05/06/21**					
N-Nitrosodimethylamine	2.25	2.0	ng/l	2.00		113	50-150	22	50	
Surrogate(s)										
NDMA-d6	*25.6*		*ng/l*	*25.0*		*102*	*70-130*			

PPCPs - Pharmaceuticals by LC/MSMS-ESI+

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1E0457 - EPA 3535/SPE										
Blank (W1E0457-BLK1)				**Prepared: 05/10/21**	**Analyzed: 05/13/21**					
Acetaminophen	ND	5.0	ng/l							
Atenolol	ND	4.0	ng/l							
Atorvastatin	ND	4.0	ng/l							
Caffeine	ND	4.0	ng/l							
Carbamazepine	ND	4.0	ng/l							
Ciprofloxacin	28.6	20	ng/l							B-06
Cotinine	ND	8.0	ng/l							
DEET	ND	4.0	ng/l							
Diazepam	ND	4.0	ng/l							
Fluoxetine	ND	4.0	ng/l							
Meprobamate	ND	4.0	ng/l							
Methadone	ND	4.0	ng/l							
Sulfamethoxazole	ND	4.0	ng/l							
TCEP	ND	10	ng/l							
TCPP	ND	50	ng/l							
Trimethoprim	ND	4.0	ng/l							
Blank (W1E0457-BLK2)				**Prepared: 05/10/21**	**Analyzed: 05/14/21**					
Azithromycin	ND	20	ng/l							QC-2
Phenytoin (Dilantin)	ND	4.0	ng/l							QC-2
Primidone	ND	4.0	ng/l							QC-2
Sucralose	ND	20	ng/l							QC-2
TDCPP	ND	50	ng/l							QC-2
LCS (W1E0457-BS1)				**Prepared: 05/10/21**	**Analyzed: 05/13/21**					
Acetaminophen	53.0	5.0	ng/l	50.0		106	66-156			
Atenolol	41.9	4.0	ng/l	40.0		105	56-164			
Atorvastatin	12.1	4.0	ng/l	40.0		30	0.1-173			
Caffeine	34.6	4.0	ng/l	40.0		86	55-152			

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Quality Control Results

(Continued)

PPCPs - Pharmaceuticals by LC/MSMS-ESI+ (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1E0457 - EPA 3535/SPE (Continued)										
LCS (W1E0457-BS1)				**Prepared: 05/10/21 Analyzed: 05/13/21**						
Carbamazepine	37.8	4.0	ng/l	40.0		94	60-135			
Ciprofloxacin	170	20	ng/l	200		85	51-168			
Cotinine	82.0	8.0	ng/l	80.0		102	68-155			
DEET	36.9	4.0	ng/l	40.0		92	45-135			
Diazepam	37.4	4.0	ng/l	40.0		93	58-127			
Fluoxetine	35.5	4.0	ng/l	40.0		89	55-150			
Meprobamate	55.5	4.0	ng/l	40.0		139	11-166			
Methadone	38.6	4.0	ng/l	40.0		97	62-137			
Sulfamethoxazole	45.6	4.0	ng/l	40.0		114	60-133			
TCEP	114	10	ng/l	100		114	25-149			
TCPP	628	50	ng/l	500		126	24-149			
Trimethoprim	37.1	4.0	ng/l	40.0		93	67-139			
LCS (W1E0457-BS2)				**Prepared: 05/10/21 Analyzed: 05/14/21**						
Azithromycin	198	20	ng/l	200		99	52-166			QC-2
Phenytoin (Dilantin)	34.2	4.0	ng/l	40.0		85	69-138			QC-2
Primidone	40.3	4.0	ng/l	40.0		101	54-147			QC-2
Sucralose	224	20	ng/l	200		112	50-150			QC-2
TDCPP	507	50	ng/l	500		101	20-158			QC-2
LCS Dup (W1E0457-BSD1)				**Prepared: 05/10/21 Analyzed: 05/13/21**						
Acetaminophen	59.4	5.0	ng/l	50.0		119	66-156	11	30	
Atenolol	42.1	4.0	ng/l	40.0		105	56-164	0.3	30	
Atorvastatin	16.6	4.0	ng/l	40.0		42	0.1-173	31	30	Q-12
Caffeine	38.6	4.0	ng/l	40.0		97	55-152	11	30	
Carbamazepine	35.5	4.0	ng/l	40.0		89	60-135	6	30	
Ciprofloxacin	188	20	ng/l	200		94	51-168	10	30	
Cotinine	86.6	8.0	ng/l	80.0		108	68-155	5	30	
DEET	37.2	4.0	ng/l	40.0		93	45-135	0.8	30	
Diazepam	38.1	4.0	ng/l	40.0		95	58-127	2	30	
Fluoxetine	37.3	4.0	ng/l	40.0		93	55-150	5	30	
Meprobamate	47.0	4.0	ng/l	40.0		118	11-166	16	30	
Methadone	38.8	4.0	ng/l	40.0		97	62-137	0.4	30	
Sulfamethoxazole	45.1	4.0	ng/l	40.0		113	60-133	1	30	
TCEP	85.9	10	ng/l	100		86	25-149	28	30	
TCPP	711	50	ng/l	500		142	24-149	12	30	
Trimethoprim	35.0	4.0	ng/l	40.0		87	67-139	6	30	
LCS Dup (W1E0457-BSD2)				**Prepared: 05/10/21 Analyzed: 05/14/21**						
Azithromycin	196	20	ng/l	200		98	52-166	0.8	30	QC-2
Phenytoin (Dilantin)	57.2	4.0	ng/l	40.0		143	69-138	50	30	BS-04, QC-2
Primidone	40.5	4.0	ng/l	40.0		101	54-147	0.4	30	QC-2
Sucralose	219	20	ng/l	200		110	50-150	2	30	QC-2
TDCPP	508	50	ng/l	500		102	20-158	0.08	30	QC-2

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Quality Control Results

(Continued)

PPCPs - Pharmaceuticals by LC/MSMS-ESI-

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1E0458 - EPA 3535/SPE										
Blank (W1E0458-BLK1)				**Prepared: 05/10/21 Analyzed: 05/14/21**						
Bisphenol A	29.6	4.0	ng/l							B
Diclofenac	ND	4.0	ng/l							
Gemfibrozil	ND	4.0	ng/l							
Ibuprofen	ND	4.0	ng/l							
Iopromide	ND	4.0	ng/l							
Naproxen	ND	4.0	ng/l							
Salicylic Acid	ND	100	ng/l							
Triclosan	ND	8.0	ng/l							
LCS (W1E0458-BS1)				**Prepared: 05/10/21 Analyzed: 05/14/21**						
Bisphenol A	111	4.0	ng/l	40.0		278	53-168			BS-H
Diclofenac	36.2	4.0	ng/l	40.0		90	37-218			
Gemfibrozil	36.8	4.0	ng/l	40.0		92	76-122			
Ibuprofen	33.9	4.0	ng/l	40.0		85	67-139			
Iopromide	36.8	4.0	ng/l	40.0		92	0.1-163			
Naproxen	37.9	4.0	ng/l	40.0		95	64-138			
Salicylic Acid	968	100	ng/l	1000		97	56-229			
Triclosan	86.0	8.0	ng/l	80.0		107	76-139			
LCS Dup (W1E0458-BSD1)				**Prepared: 05/10/21 Analyzed: 05/14/21**						
Bisphenol A	119	4.0	ng/l	40.0		298	53-168	7	30	BS-H
Diclofenac	43.5	4.0	ng/l	40.0		109	37-218	18	30	
Gemfibrozil	39.6	4.0	ng/l	40.0		99	76-122	8	30	
Ibuprofen	34.3	4.0	ng/l	40.0		86	67-139	1	30	
Iopromide	36.4	4.0	ng/l	40.0		91	0.1-163	1	30	
Naproxen	37.9	4.0	ng/l	40.0		95	64-138	0.1	30	
Salicylic Acid	990	100	ng/l	1000		99	56-229	2	30	
Triclosan	77.5	8.0	ng/l	80.0		97	76-139	10	30	

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Quality Control Results

(Continued)

PPCPs - Hormones by LC/MSMS-APCI

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1E0459 - EPA 3535/SPE										
Blank (W1E0459-BLK1)				**Prepared: 05/10/21**	**Analyzed: 05/14/21**					
17-a-Ethynylestradiol	ND	4.0	ng/l							
17-b-Estradiol	ND	4.0	ng/l							
Estrone	ND	4.0	ng/l							
Progesterone	ND	4.0	ng/l							
Testosterone	ND	4.0	ng/l							
LCS (W1E0459-BS1)				**Prepared: 05/10/21**	**Analyzed: 05/14/21**					
17-a-Ethynylestradiol	37.8	4.0	ng/l	40.0		95	68-159			
17-b-Estradiol	43.0	4.0	ng/l	40.0		108	65-146			
Estrone	41.0	4.0	ng/l	40.0		103	59-141			
Progesterone	37.6	4.0	ng/l	40.0		94	58-154			
Testosterone	35.5	4.0	ng/l	40.0		89	60-172			
LCS Dup (W1E0459-BSD1)				**Prepared: 05/10/21**	**Analyzed: 05/14/21**					
17-a-Ethynylestradiol	44.0	4.0	ng/l	40.0		110	68-159	15	30	
17-b-Estradiol	38.6	4.0	ng/l	40.0		96	65-146	11	30	
Estrone	43.1	4.0	ng/l	40.0		108	59-141	5	30	
Progesterone	34.6	4.0	ng/l	40.0		86	58-154	9	30	
Testosterone	36.1	4.0	ng/l	40.0		90	60-172	2	30	

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Notes and Definitions

Item	Definition
B	Blank contamination. The analyte was found in the associated blank as well as in the sample.
B-06	This analyte was found in the method blank, which was possibly contaminated during sample preparation. The batch was accepted since this analyte was either not detected or more than 10 times of the blank value for all the samples in the batch.
BS-04	The recovery of this analyte in LCS or LCSD was outside control limit. Sample was accepted based on the remaining LCS, LCSD or LCS-LL.
BS-H	The recovery of this analyte in the BS/LCS was over the control limit. Sample result is suspect.
Q-12	The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on the percent recoveries and/or other acceptable QC data.
QC-2	This QC sample was reanalyzed to complement samples that require re-analysis on different date. See analysis date.
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Analyses Accreditation Summary

Analyte	CAS #	Not By NELAP	ANAB ISO 17025
EPA 521 in Water			
N-Nitrosodimethylamine	62-75-9	✓	
NDMA-d6		✓	

Reviewed by:

Brandon Gee
Operations Manager/Senior PM

DoD-ELAP ANAB #L2457 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH # • ISO17025 ANAB #L2457.01 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • NV-DEP #NAC 445A • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

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Date of Report: 21/06/09

Sample ID No.: **1D29047-01**

Laboratory Name: Weck Laboratories, Inc.

Signature Lab Director:

Name of Sampler: Client

Date/Time Sample Collected: 21/04/28 1015

Date/Time Sample Received @ Lab: 21/04/29 1226

Date Analyses Completed: 21/05/06

System Name: TWENTYNINE PALMS WATER DISTRICT

System Number: 3610049

Name or Number of Sample Source: WELL 12

User ID: TAN

Station Number: 3610049-012

Date/Time of Sample: | 21 | 04 | 28 | 10 | 15
YY MM DD TT TT

Laboratory Code: 9588

Date of Analyses Completed: | 21 | 05 | 06 |
YY MM DD

Submitted By: Weck Laboratories, Inc.

Phone #: (626) 336-2139

TEST METHOD	CHEMICAL	Units	ENTRY #	ANALYSES RESULTS	MCL	DLR
	NITROSAMINES					
E521	N-Nitrosodimethylamine (NDMA) (*)	ug/L	34438	<0.002		

Laboratory Comments and Description of Additional Components Found (Comments in this section are for Client Information only and will NOT be transmitted to CDPH via EDT):

Well 12/ 21D2316-01 :

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Date of Report: 21/06/09

Sample ID No.: **1D29047-02**

Laboratory Name: Weck Laboratories, Inc.

Signature Lab Director:

Name of Sampler: Client

Date/Time Sample Collected: 21/04/28 0900

Date/Time Sample Received @ Lab: 21/04/29 1226

Date Analyses Completed: 21/05/07

System Name: TWENTYNINE PALMS WATER DISTRICT

System Number: 3610049

Name or Number of Sample Source: WELL 14

User ID: TAN

Station Number: 3610049-016

Date/Time of Sample: | 21 | 04 | 28 | 09 | 00
YY MM DD TT TT

Laboratory Code: 9588

Date of Analyses Completed: | 21 | 05 | 07 |
YY MM DD

Submitted By: Weck Laboratories, Inc.

Phone #: (626) 336-2139

TEST METHOD	CHEMICAL	Units	ENTRY #	ANALYSES RESULTS	MCL	DLR
	NITROSAMINES					
E521	N-Nitrosodimethylamine (NDMA) (*)	ug/L	34438	<0.002		

Laboratory Comments and Description of Additional Components Found (Comments in this section are for Client Information only and will NOT be transmitted to CDPH via EDT):

Well 14/ 21D2316-02 :

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Date of Report: 21/06/09

Sample ID No.: **1D29047-03**

Laboratory Name: Weck Laboratories, Inc.

Signature Lab Director:

Name of Sampler: Client

Date/Time Sample Collected: 21/04/28 1030

Date/Time Sample Received @ Lab: 21/04/29 1226

Date Analyses Completed: 21/05/07

System Name: TWENTYNINE PALMS WATER DISTRICT

System Number: 3610049

Name or Number of Sample Source: WELL 15

User ID: TAN

Station Number: 3610049-014

Date/Time of Sample: | 21 | 04 | 28 | 10 | 30
YY MM DD TT TT

Laboratory Code: 9588

Date of Analyses Completed: | 21 | 05 | 07 |
YY MM DD

Submitted By: Weck Laboratories, Inc.

Phone #: (626) 336-2139

TEST METHOD	CHEMICAL	Units	ENTRY #	ANALYSES RESULTS	MCL	DLR
	NITROSAMINES					
E521	N-Nitrosodimethylamine (NDMA) (*)	ug/L	34438	<0.002		

Laboratory Comments and Description of Additional Components Found (Comments in this section are for Client Information only and will NOT be transmitted to CDPH via EDT):

Well 15/ 21D2316-03 :

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Date of Report: 21/06/09

Sample ID No.: **1D29047-04**

Laboratory Name: Weck Laboratories, Inc.

Signature Lab Director:

Name of Sampler: Client

Date/Time Sample Collected: 21/04/28 0820

Date/Time Sample Received @ Lab: 21/04/29 1226

Date Analyses Completed: 21/05/07

System Name: TWENTYNINE PALMS WATER DISTRICT

System Number: 3610049

Name or Number of Sample Source: WELL 16

User ID: TAN

Station Number: 3610049-015

Date/Time of Sample: | 21 | 04 | 28 | 08 | 20
YY MM DD TT TT

Laboratory Code: 9588

Date of Analyses Completed: | 21 | 05 | 07 |
YY MM DD

Submitted By: Weck Laboratories, Inc.

Phone #: (626) 336-2139

TEST METHOD	CHEMICAL	Units	ENTRY #	ANALYSES RESULTS	MCL	DLR
	NITROSAMINES					
E521	N-Nitrosodimethylamine (NDMA) (*)	ug/L	34438	<0.002		

Laboratory Comments and Description of Additional Components Found (Comments in this section are for Client Information only and will NOT be transmitted to CDPH via EDT):

Well 16/ 21D2316-04 :

14859 Clark Avenue, City of Industry, CA 91745 Phone: (626) 336-2139 Fax: (626) 336-2634

www.wecklabs.com

WECK LABORATORIES, INC.
Analytical Laboratory Service - Since 1964

Date of Report: 21/06/09

Sample ID No.: **1D29047-05**

Laboratory Name: Weck Laboratories, Inc.

Signature Lab Director:

Name of Sampler: Client

Date/Time Sample Collected: 21/04/28 0920

Date/Time Sample Received @ Lab: 21/04/29 1226

Date Analyses Completed: 21/05/07

System Name: TWENTYNINE PALMS WATER DISTRICT

System Number: 3610049

Name or Number of Sample Source: WELL 17

User ID: TAN

Station Number: 3610049-021

Date/Time of Sample: | 21 | 04 | 28 | 09 | 20
YY MM DD TT TT

Laboratory Code: 9588

Date of Analyses Completed: | 21 | 05 | 07 |
YY MM DD

Submitted By: Weck Laboratories, Inc.

Phone #: (626) 336-2139

TEST METHOD	CHEMICAL	Units	ENTRY #	ANALYSES RESULTS	MCL	DLR
	NITROSAMINES					
E521	N-Nitrosodimethylamine (NDMA) (*)	ug/L	34438	<0.002		

Laboratory Comments and Description of Additional Components Found (Comments in this section are for Client Information only and will NOT be transmitted to CDPH via EDT):

Well 17/ 21D2316-05 :

14859 Clark Avenue, City of Industry, CA 91745 Phone: (626) 336-2139 Fax: (626) 336-2634

www.wecklabs.com

WECK LABORATORIES, INC.
Analytical Laboratory Service - Since 1964

Date of Report: 21/06/09

Sample ID No.: **1D29047-06**

Laboratory Name: Weck Laboratories, Inc.

Signature Lab Director:

Name of Sampler: Client

Date/Time Sample Collected: 21/04/28 0745

Date/Time Sample Received @ Lab: 21/04/29 1226

Date Analyses Completed: 21/05/07

System Name: TWENTYNINE PALMS WATER DISTRICT

System Number: 3610049

Name or Number of Sample Source: WELL WTP-1

User ID: TAN

Station Number: 3610049-018

Date/Time of Sample: | 21 | 04 | 28 | 07 | 45
YY MM DD TT TT

Laboratory Code: 9588

Date of Analyses Completed: | 21 | 05 | 07 |
YY MM DD

Submitted By: Weck Laboratories, Inc.

Phone #: (626) 336-2139

TEST METHOD	CHEMICAL	Units	ENTRY #	ANALYSES RESULTS	MCL	DLR
	NITROSAMINES					
E521	N-Nitrosodimethylamine (NDMA) (*)	ug/L	34438	<0.002		

Laboratory Comments and Description of Additional Components Found (Comments in this section are for Client Information only and will NOT be transmitted to CDPH via EDT):

Well WTP -1/ 21D2316-06 :

14859 Clark Avenue, City of Industry, CA 91745 Phone: (626) 336-2139 Fax: (626) 336-2634

www.wecklabs.com

WECK LABORATORIES, INC.
Analytical Laboratory Service - Since 1964

Date of Report: 21/06/09

Sample ID No.: **1D29047-07**

Laboratory Name: Weck Laboratories, Inc.

Signature Lab Director:

Name of Sampler: Client

Date/Time Sample Collected: 21/04/28 0945

Date/Time Sample Received @ Lab: 21/04/29 1226

Date Analyses Completed: 21/05/07

System Name: TWENTYNINE PALMS WATER DISTRICT

System Number: 3610049

Name or Number of Sample Source: WELL 11-B

User ID: TAN

Station Number: 3610049-022

Date/Time of Sample: | 21 | 04 | 28 | 09 | 45
YY MM DD TT TT

Laboratory Code: 9588

Date of Analyses Completed: | 21 | 05 | 07 |
YY MM DD

Submitted By: Weck Laboratories, Inc.

Phone #: (626) 336-2139

TEST METHOD	CHEMICAL	Units	ENTRY #	ANALYSES RESULTS	MCL	DLR
	NITROSAMINES					
E521	N-Nitrosodimethylamine (NDMA) (*)	ug/L	34438	<0.002		

Laboratory Comments and Description of Additional Components Found (Comments in this section are for Client Information only and will NOT be transmitted to CDPH via EDT):

Well 11B/ 21D2316-07 :

14859 Clark Avenue, City of Industry, CA 91745 Phone: (626) 336-2139 Fax: (626) 336-2634

www.wecklabs.com

SUBCONTRACT ORDER

Clinical Laboratory of San Bernardino

21D2316

1D29047

SENDING LABORATORY:

Clinical Laboratory of San Bernardino
21881 Barton Road
Grand Terrace, CA 92313
Phone: 909.825.7693
Fax: 909.825.7696
Project Manager: Stu Styles

RECEIVING LABORATORY:

Weck Lab, Analytical & Environmental
14859 E Clark Ave
Industry, CA 91745
Phone :(626) 336-2139
Fax: (626) 336-2634

Please email results to Project Manager: Stu Styles
[ ] glaubig@clinical-lab.com [✓] styles@clinical-lab.com [ ] jhernandez@clinical-lab.com [ ] fresquez@clinical-lab.com

California EDT transfer those samples with PS codes provided [✓] Yes [ ] No
Water Trax Upload Client: _____ [ ] Yes [✓] No
GeoTracker Upload Client: _____ [ ] Yes [✓] No

Turn Around Time [✓] 10 Days [ ] 5 Days [ ] Other __ Days

Subcontract Comments:

Analysis	Comments

Sample ID: Well 12 / 21D2316-01 **Sampled: 04/28/21 10:15 PS Code: 3610049-012**
Water **WTX ID:**

PPCP-Pharmaceuticals by LCMSMS-ESI+	Caffeine, DEET, Sucralose
PPCP-Pharmaceuticals by LCMSMS-ESI-	Triclosan
PPCP - Hormones by LCMSMS-APCI+	17-b-Estradiol
521 NDMA	

Containers Supplied:
500mL Amber Glass w/Na Thiosulfate (A) 500mL Amber Glass w/Na Thiosulfate (B) 250mL Amber Glass (C)
250mL Amber Glass (D)

Sample ID: Well 14 / 21D2316-02 **Sampled: 04/28/21 09:00 PS Code: 3610049-016**
Water **WTX ID:**

521 NDMA	
PPCP - Hormones by LCMSMS-APCI+	17-b-Estradiol
PPCP-Pharmaceuticals by LCMSMS-ESI-	Triclosan
PPCP-Pharmaceuticals by LCMSMS-ESI+	Caffeine, DEET, Sucralose

Containers Supplied:
500mL Amber Glass w/Na Thiosulfate (A) 500mL Amber Glass w/Na Thiosulfate (B) 250mL Amber Glass (C)
250mL Amber Glass (D)

Released By	Date / Time	Received By	Date / Time
[signature]	04/28/21 17:15	M Salazar	4/29/21
M Salazar	4/29/21 – 12:28	[signature] 2.9° 7039	4/29/21 15:26

SUBCONTRACT ORDER

Clinical Laboratory of San Bernardino

21D2316

ID 29047

Analysis	Comments

Sample ID: Well 15 / 21D2316-03 **Sampled: 04/28/21 10:30 PS Code: 3610049-014**
Water **WTX ID:**

PPCP - Hormones by LCMSMS-APCI+	17-b-Estradiol
PPCP-Pharmaceuticals by LCMSMS-ESI-	Triclosan
521 NDMA	
PPCP-Pharmaceuticals by LCMSMS-ESI+	Caffeine, DEET, Sucralose

Containers Supplied:

500mL Amber Glass w/Na Thiosulfate (A) 500mL Amber Glass w/Na Thiosulfate (B) 250mL Amber Glass (C)
250mL Amber Glass (D)

Sample ID: Well 16 / 21D2316-04 **Sampled: 04/28/21 08:20 PS Code: 3610049-015**
Water **WTX ID:**

PPCP-Pharmaceuticals by LCMSMS-ESI-	Triclosan
PPCP - Hormones by LCMSMS-APCI+	17-b-Estradiol
PPCP-Pharmaceuticals by LCMSMS-ESI+	Caffeine, DEET, Sucralose
521 NDMA	

Containers Supplied:

500mL Amber Glass w/Na Thiosulfate (A) 500mL Amber Glass w/Na Thiosulfate (B) 250mL Amber Glass (C)
250mL Amber Glass (D)

Sample ID: Well 17 / 21D2316-05 **Sampled: 04/28/21 09:20 PS Code: 3610049-021**
Water **WTX ID:**

PPCP - Hormones by LCMSMS-APCI+	17-b-Estradiol
PPCP-Pharmaceuticals by LCMSMS-ESI-	Triclosan
PPCP-Pharmaceuticals by LCMSMS-ESI+	Caffeine, DEET, Sucralose
521 NDMA	

Containers Supplied:

500mL Amber Glass w/Na Thiosulfate (A) 500mL Amber Glass w/Na Thiosulfate (B) 250mL Amber Glass (C)
250mL Amber Glass (D)

Sample ID: Well WTP-1 / 21D2316-06 **Sampled: 04/28/21 07:45 PS Code: 3610049-018**
Water **WTX ID:**

PPCP-Pharmaceuticals by LCMSMS-ESI+	Caffeine, DEET, Sucralose
521 NDMA	
PPCP - Hormones by LCMSMS-APCI+	17-b-Estradiol
PPCP-Pharmaceuticals by LCMSMS-ESI-	Triclosan

Containers Supplied:

500mL Amber Glass w/Na Thiosulfate (A) 500mL Amber Glass w/Na Thiosulfate (B) 250mL Amber Glass (C)
250mL Amber Glass (D)

Released By	Date / Time	Received By	Date / Time
BJ Shy	04/28/21 17:15	M Salazar	4/29/21
M Salazar	4/29/21 — 12:26	[illegible] 2-9 TO39	4/29/21 12:26

SUBCONTRACT ORDER

Clinical Laboratory of San Bernardino

21D2316

ID29047

Analysis	Comments

Sample ID: Well 11B / 21D2316-07 **Sampled: 04/28/21 09:45 PS Code: 3610049-022**
Water **WTX ID:**

521 NDMA

PPCP - Hormones by LCMSMS-APCI+ — 17-b-Estradiol

PPCP-Pharmaceuticals by LCMSMS-ESI- — Triclosan

PPCP-Pharmaceuticals by LCMSMS-ESI+ — Caffeine, DEET, Sucralose

Containers Supplied:

500mL Amber Glass w/Na Thiosulfate (A) 500mL Amber Glass w/Na Thiosulfate (B) 1 L Amber Glass (C)
1 L Amber Glass (D)

Released By	Date / Time	Received By	Date / Time
BJ	04/28/21 17:15	M. Salgar	4/29/21
M Salgar	4/29/21 - 12:26	[illegible]	4/29/21 12:24

Received By: T0234

Sample Receiving Check List

Date received: 4/29/21 Time: 1226 Kit ID#

Work Order #: 12 29047 # of Samples: 7 Initals: AYH

	Answer	Status: Yes	Status: No	Status: N/A	Comments
Number of Bottles in COC:	28				Verify that the number of containers
Number of Bottles Received:	28				
ID COC and Bottles Matching		✓			and ID match COC and Bottles
COC Present		✓			
COC properly completed?		✓			
Type of Ice (Blue/Wet)	WET				
Sample Volume sufficient?		✓			
Free Chlorine Tested?		✓			
pH verification		✓			
Preservation verification		✓			
VOC Sample Headspace?				✓	
Enough holding time for all tests?		✓			

Discrepancies and Notifications

Description of problem:

Person Notified: Phone #: Date/time:

Instructions from client/resolution:

Description of problem:

Person Notified: Phone #: Date/time:

Instructions from client/resolution:

Sample receipt verification completed by (initials): JG

Clinical Lab of San Bernardino, Inc. Chain of Custody

7-0-42

WO 21D2316

21881 Barton Road Grand Terrace CA 92313 909 825-7693 / 516-A N 8th St. Lompoc CA 93436 805 737-7300

Client	Twentynine Palms Water District
Address:	P.O Box 1735
	Twentynine Palms, CA 92277
Client Contact:	Ray Kolisz
Phone No.:	(760) 367-7546 FAX No.: (760) 361-9523
System No.:	3610049
Project:	Salt and Nutrient Management Plan
Sampled By:	Russell F
Comments:	

Destination Laboratory:
[X] Clinical Grand Terrace / ELAP 1088
[ ] Clinical Lompoc / ELAP 1678
[ ] Other:

Date	Time	Sample Identification	Container ID	Matrix	Sample Type	No. of Preserved Cont. Unpreserved, 1/2 Pint	Unpreserved, 1/2 Gallon	Sterile IDEXX Bottle	HNO3, 1Pint (Metals)	125mL A.G., HCl (TOC)	500mL A.G., Sodium Azide (PPCP)	500mL A.G., Na2S2O3 (S21)			Total Containers	Field pH	Field Temp (F)	Field D.O. (mg/L)	521 NDMA Only, PPCP +, PPCP-, PPCP - Hormones**	Bromide EPA 300.0 - CLS	TOC, o-PO4	Coliform SM 9223 P/A	Alkalinity (All Forms)	B, Ca, Fe, Mg, Mn, K, Na	Cl, F, NO2, NO3, SO4	E.C., pH	TDS		Comments PS Code	Turn Around Time (TAT)
4/28/21	10:15	Well 12 3610049-012	12	GW		2		1		1	2	2			8	8.08	74.72	7.84	X	X	X	X							-012	
4/28/21	9:00	Well 14 3610049-016	14	GW		2		1		1	2	2			8	7.79	77.08	6.3	X	X	X	X							-016	
4/28/21	10:30	Well 15 3610049-014	15	GW		2		1		1	2	2			8	7.50	71.08	8.50	X	X	X	X							-014	
4/28/21	8:20	Well 16 3610049-015	16	GW		2		1		1	2	2			8	7.74	76.02	73.4	X	X	X	X							-015	
4/28/21	9:20	Well 17 3610049-021	17	GW		2		1		1	2	2			8	7.65	77.52	.30	X	X	X	X							-021	
4/28/21	7:45	Well WTP-1 3610049-018	WTP	GW		2		1		1	2	2			8	8.16	78.9	62.3	X	X	X	X							-018	
4/28/21	9:45	Well 11B 3610049-022	11B	GW		1	1	1	1	1	2	2			9	8.38	74.64	3.48	X	X	X	X	X	X	X	X	X		-022	

Matrix: DW - Drinking Water GW - Ground Water SW - Surface Water W - Water WW - Wastewater SWR - Stormwater Runoff S - Sludge O - Other

Use for Bacteria Samples / Sample Type: 1-Routine 2-Repeat 3-Replacement 4-Special D-Distribution W-Well

TAT: (10) Ten Day (5) Five Day Rush (2) Two Day Rush

Relinquished By (Sign)	Print Name / Company	Date / Time	Received By (Sign)	Print Name / Company
	Russell Frechette TPWD			
	Mike Minalvea TPWD	1:27pm 4/28/21		Aylin P. CLSB

(Lab Use Only)

Condition: [ ] On Wet Ice [X] On Blu Ice [X] Intact [ ] Custody Seals Samples / COC Checked By: Work Order Logged By:

Receipt Comments: Clinical Lab Receipt Temp.: 25.4 °C

Page ___ of ___

TPWD PRODUCTION WELL MONITORING DATA SHEET

SNMP Annual Sampling Event

		Date: 4/28/2021	Time: 9:45
Sample Team:	TPWD District Technicians		
		Weather: Warm/Clear	
Production Well I.D. : Well 11B			
Reference Point Elevation: Not available		Well Diameter: 12"	
Well Condition:	Good		
Does this well require repair?	No	If yes, explain: _____	
Was Well running prior to collecting sample?	**Yes** No		
Time well turned on:	08:00	Well run time prior to collecting sample (hr):	1.75
Purge Method:	Open spigot; vent to atmosphere		
Purge Time (min):	5	Purge Rate (gpm): 1	
Ave Pumping Rate (gpm):	300		
Sample Method:	1/4" sample port		
Volume of Water Removed (gal):	5		

Time	Temp (F)	pH	Cond. (mS or uS)	Turbidity (NTUs)	D.O. (mg/l)	ORP (mv)	TDS (ppm)	Cumulative Water Removed/ Observations
9:45	74.64	8.38			3.48			
Notes:								

Sampling Time:	9:45 AM	Sampling Date:	4/28/2021
Sample ID: Well 11B		Laboratory:	Clinical Laboratory of San Bernardino

Analyzed for: Total Coliform, E. Coli, Alkalinity Series, Chloride, Fluoride, Nitrate, Nitrite, Ortho-Phosphate, Sulfate, TDS, TOC, General Metals, Bromide, 17-b-Estradiol, Triclosan, Caffeine, DEET, NDMA, Sucralose

Equipment Blank ID: @ Duplicate ID:

TPWD PRODUCTION WELL MONITORING DATA SHEET

SNMP Annual Sampling Event

					Date:	4/28/2021	Time:	10:15
Sample Team:	TPWD District Technicians							
					Weather:	Warm/Clear		
Production Well I.D. : Well 12								
Reference Point Elevation: Not available					Well Diameter:	12"		
Well Condition:	Good				Depth to Water (DTW):	Pre :	Post :	
Does this well require repair?		No	If yes, explain: _____					
Was Well running prior to collecting sample?		**Yes**	No					
Time well turned on:	10:00		Well run time prior to collecting sample (hr):					0.25
Purge Method:	Open spigot; vent to atmosphere							
Purge Time (min):	5	Purge Rate (gpm):	1					
Ave Pumping Rate (gpm):		300						
Sample Method:	1/4" sample port							
Volume of Water Removed (gal):		5						

Time	Temp (F)	pH	Cond. (mS or uS)	Turbidity (NTUs)	D.O. (mg/l)	ORP (mv)	TDS (ppm)	Cumulative Water Removed/ Observations
10:15	74.72	8.08			7.84			
Notes:								

Sampling Time:	10:15 AM	Sampling Date:	4/28/2021
Sample ID: Well 12		Laboratory:	Clinical Laboratory of San Bernardino

Analyzed for: Total Coliform, E. Coli, Ortho-Phosphate, TOC, Bromide, 17-b-Estradiol, Triclosan, Caffeine, DEET, NDMA, Sucralose

Equipment Blank ID: @ Duplicate ID:

TPWD PRODUCTION WELL MONITORING DATA SHEET

SNMP Annual Sampling Event

					Date:	4/28/2021	Time:	9:00
Sample Team:	TPWD District Technicians							
					Weather:	Warm/Clear		
Production Well I.D. : Well 14								
Reference Point Elevation: Not available					Well Diameter:	8"		
Well Condition:	Good				Depth to Water (DTW):	Pre :	Post :	
Does this well require repair?		No	If yes, explain: _____					
Was Well running prior to collecting sample?		**Yes**	No					
Time well turned on:	08:05		Well run time prior to collecting sample (hr):					~1.0
Purge Method:	Open spigot; vent to atmosphere							
Purge Time (min):	5	Purge Rate (gpm):	1					
Ave Pumping Rate (gpm):		500						
Sample Method:	1/4" sample port							
Volume of Water Removed (gal):		5						

Time	Temp (F)	pH	Cond. (mS or uS)	Turbidity (NTUs)	D.O. (mg/l)	ORP (mv)	TDS (ppm)	Cumulative Water Removed/ Observations
9:00	77.08	7.79			6.3			
Notes:								

Sampling Time:	9:00 AM	Sampling Date:	4/28/2021
Sample ID: Well 14		Laboratory:	Clinical Laboratory of San Bernardino

Analyzed for: Total Coliform, E. Coli, Ortho-Phosphate, TOC, Bromide, 17-b-Estradiol, Triclosan, Caffeine, DEET, NDMA, Sucralose

Equipment Blank ID: @ Duplicate ID:

TPWD PRODUCTION WELL MONITORING DATA SHEET

SNMP Annual Sampling Event

		Date: 4/28/2021	Time: 10:30
Sample Team:	TPWD District Technicians		
		Weather: Warm/Clear	
Production Well I.D. : Well 15			
Reference Point Elevation: Not available		Well Diameter: 4"	
Well Condition:	Good	Depth to Water (DTW): Pre :	Post :
Does this well require repair?	No	If yes, explain: _____	
Was Well running prior to collecting sample?	**Yes** No		
Time well turned on:	10:28	Well run time prior to collecting sample (hr):	2 min
Purge Method:	Open spigot; vent to atmosphere		
Purge Time (min):	2	Purge Rate (gpm): 1	
Ave Pumping Rate (gpm):	100		
Sample Method:	1/4" sample port		
Volume of Water Removed (gal):	2		

Time	Temp (F)	pH	Cond. (mS or uS)	Turbidity (NTUs)	D.O. (mg/l)	ORP (mv)	TDS (ppm)	Cumulative Water Removed/ Observations
10:30	71.08	7.50			8.50			
Notes:								

Sampling Time:	10:30 AM	Sampling Date:	4/28/2021
Sample ID: Well 15		Laboratory:	Clinical Laboratory of San Bernardino
Analyzed for: Total Coliform, E. Coli, Ortho-Phosphate, TOC, Bromide, 17-b-Estradiol, Triclosan, Caffeine, DEET, NDMA, Sucralose			
Equipment Blank ID:	@	Duplicate ID:	

TPWD PRODUCTION WELL MONITORING DATA SHEET

SNMP Annual Sampling Event

					Date:	4/28/2021	Time:	8:20
Sample Team:	TPWD District Technicians							
					Weather:	Warm/Clear		
Production Well I.D. : Well 16								
Reference Point Elevation: Not available					Well Diameter:	6"		
Well Condition:	Good				Depth to Water (DTW):	Pre :	Post :	
Does this well require repair?		No	If yes, explain: _____					
Was Well running prior to collecting sample?		**Yes**	No					
Time well turned on:	07:50		Well run time prior to collecting sample (hr):					0.5
Purge Method:	Open spigot; vent to atmosphere							
Purge Time (min):	5	Purge Rate (gpm):	1					
Ave Pumping Rate (gpm):		450						
Sample Method:	1/4" sample port							
Volume of Water Removed (gal):		5						

Time	Temp (F)	pH	Cond. (mS or uS)	Turbidity (NTUs)	D.O. (mg/l)	ORP (mv)	TDS (ppm)	Cumulative Water Removed/ Observations
8:20	76.02	7.74			73.4			
Notes:								

Sampling Time:	8:20 AM	Sampling Date:	4/28/2021
Sample ID: Well 16		Laboratory:	Clinical Laboratory of San Bernardino

Analyzed for: Total Coliform, E. Coli, Ortho-Phosphate, TOC, Bromide, 17-b-Estradiol, Triclosan, Caffeine, DEET, NDMA, Sucralose

Equipment Blank ID: @ Duplicate ID:

TPWD PRODUCTION WELL MONITORING DATA SHEET

SNMP Annual Sampling Event

					Date:	4/28/2021	Time:	9:20
Sample Team:	TPWD District Technicians							
					Weather:	Warm/Clear		
Production Well I.D. : Well 17								
Reference Point Elevation: Not available					Well Diameter:	12"		
Well Condition:	Good				Depth to Water (DTW):	Pre :	Post :	
Does this well require repair?		No	If yes, explain: _____					
Was Well running prior to collecting sample?		**Yes**	No					
Time well turned on:	08:00		Well run time prior to collecting sample (hr):					1.3
Purge Method:	Open spigot; vent to atmosphere							
Purge Time (min):	5	Purge Rate (gpm):	1					
Ave Pumping Rate (gpm):		800						
Sample Method:	1/4" sample port							
Volume of Water Removed (gal):		5						

Time	Temp (F)	pH	Cond. (mS or uS)	Turbidity (NTUs)	D.O. (mg/l)	ORP (mv)	TDS (ppm)	Cumulative Water Removed/ Observations
9:20	77.52	7.85			0.30			
Notes:								

Sampling Time:	9:20 AM	Sampling Date:	4/28/2021
Sample ID: Well 17		Laboratory:	Clinical Laboratory of San Bernardino

Analyzed for: Total Coliform, E. Coli, Ortho-Phosphate, TOC, Bromide, 17-b-Estradiol, Triclosan, Caffeine, DEET, NDMA, Sucralose

Equipment Blank ID: @ Duplicate ID:

TPWD PRODUCTION WELL MONITORING DATA SHEET

SNMP Annual Sampling Event

					Date:	4/28/2021	Time:	7:45
Sample Team:	TPWD District Technicians							
					Weather:	Warm/Clear		
Production Well I.D. : Well WTP-1								
Reference Point Elevation: Not available					Well Diameter:	16"		
Well Condition:	Good				Depth to Water (DTW):	Pre :	Post :	
Does this well require repair?		No	If yes, explain: _____					
Was Well running prior to collecting sample?		**Yes**	No					
Time well turned on:	20:00		Well run time prior to collecting sample (hr):					11.75
Purge Method:	Open spigot; vent to atmosphere							
Purge Time (min):	5	Purge Rate (gpm):	1					
Ave Pumping Rate (gpm):		2100						
Sample Method:	1/4" sample port							
Volume of Water Removed (gal):		5						

Time	Temp (F)	pH	Cond. (mS or uS)	Turbidity (NTUs)	D.O. (mg/l)	ORP (mv)	TDS (ppm)	Cumulative Water Removed/ Observations
7:45	78	8.16			62.3			
Notes:	Well turned on night before.							

Sampling Time:	7:45 AM	Sampling Date:	4/28/2021
Sample ID: Well WTP-1		Laboratory: Clinical Laboratory of San Bernardino	
Analyzed for: Total Coliform, E. Coli, Ortho-Phosphate, TOC, Bromide, 17-b-Estradiol, Triclosan, Caffeine, DEET, NDMA, Sucralose			
Equipment Blank ID:	@	Duplicate ID:	

Appendix B

Groundwater Sampling Technical Memorandum

Kennedy Jenks

27 January 2022

Groundwater Sampling Technical Memorandum

To: Ray Kolisz, General Manager, Twentynine Palms Water District

From: Katie McCoy, PE

Subject: *Project 8 – DWR Agreement 4600012245, Project Completion Summary*
K/J 1644229.03

This Groundwater Sampling Technical Memorandum (Tech Memo) addresses the requirement in *Task 8.2 Deliverables* of *Attachment C: Activity Descriptions* in the *Colorado River Funding Area DAC Involvement Grant Proposal* document dated October 2017.

This Tech Memo summarizes the results of the groundwater sampling events conducted as part of Phase 4 of the Twentynine Palms Water District's (TPWD) Groundwater Monitoring Implementation Plan dated 27 December 2017 (Implementation Plan). The Implementation Plan provides a detailed monitoring plan and time schedule for implementation of TPWD's Salt and Nutrient Management Plan (SNMP) dated June 2014.

Phase 4 of the Implementation Plan involved a one-time sampling event of existing groundwater conditions from as many wells as possible in the TPWD's approximate 400 private wells. The data collected from this event will support the understanding of existing conditions of groundwater, provide a baseline for groundwater conditions, and support the existing SNMP and its future updates.

A total of fifteen (15) wells were sampled on four (4) occasions as follows:

- Seven (7) wells on 15 November 2021
- Three (3) wells on 29 November 2021
- Four (4) wells on 13 December 2021
- One (1) well on 20 December 2021

The locations of these wells, the TPWD boundary, and the groundwater subbasins of the region are shown on the attached Figure 1.

After receiving permission from each private well owner, TPWD Staff purged each well and collected groundwater samples for laboratory analysis. Purging of each well was accomplished using the dedicated submersible pump and motor provided in each well. The well casing was cleared by turning on the hose bib to allow the water to run onto the ground surface until the pump and motor turned on. The private well owners only have well water available to them, so

discharging to the ground is an acceptable practice. After waiting five minutes to make sure the well casing cleared and a representative sample could be collected, District staff filled the sample bottles. One well is owned by the City of Twentynine Palms (#15 - City Monitoring Well 2N). The purged water from this well was collected and disposed of in the District's Water Treatment Plant Surface Impoundments.

The samples were analyzed by Clinical Laboratory of San Bernardino, Inc. (CA ELAP #1088) for general chemistry, metals, anions, cations, and microbial parameters. The specific list is as follows:

- Total Alkalinity ($CaCO_3$)
- Bicarbonate (HCO_3)
- Carbonate (CO_3)
- Chloride (Cl)
- Specific Conductance (EC)
- Fluoride (F)
- Hydroxide (OH)
- Methylene Blue Active Substance (MBAS)
- Nitrate as N (NO_3-N)
- pH
- Ortho-Phosphate (PO_4)
- Sulfate (SO_4)
- Total Filterable Residue (TDS)
- Total Organic Carbon (TOC)
- Arsenic (As)
- Boron (B)
- Calcium (Ca)
- Chromium (+6)
- Copper (Cu)
- Iron (Fe)
- Magnesium (Mg)
- Manganese (Mn)
- Potassium (K)
- Sodium (Na)
- Zinc (Z)
- Total Hardness ($CaCO_3$)
- Total Anions
- Total Cations
- Total Coliform
- Fecal Coliform

A table summarizing the laboratory analytical results is attached. The following is a general discussion of the results:

- Temperature of water purged from the wells was measured at the time of collection from six of the seven wells sampled on 15 November. The measurement was recorded on the chain of custody forms. The **temperature** in these six wells ranged from 68.1 to 114.1 degrees Fahrenheit with an average of 83.6.

  Temperature measurements were not collected from the wells on the subsequent sampling dates.

- Measurement of pH for each sample was performed as soon as possible at the lab but after the 15-minute hold time. **pH** measurements ranged from 7.6 to 8.9 with a median of 7.9.

- **Total Alkalinity** concentrations ranged from 37 to 290 milligrams per liter (mg/L) with an average of 137 mg/L.

- **Bicarbonate** concentrations ranged from 39 to 350 mg/L with an average of 166 mg/L.

- **Chloride** concentrations ranged from 7 to 250 mg/L with an average of 68 mg/L.

- **Specific Conductance** ranged from 200 to 2,700 micromhos per centimeter (umhos/cm) with an average of 1,052 umhos/cm.

- **Fluoride** concentrations ranged from 0.9 to 13 mg/L with an average of 7.3 mg/L. The secondary standard maximum contaminant level (MCL) for Fluoride is 2 mg/L. All samples except one had results greater than the secondary standard MCL.

- **Nitrate as N** concentrations ranged from <0.40 to 85 mg/L with an average of 12.0 mg/L.

- **Sulfate** concentrations ranged from 6.7 to 740 mg/L with an average of 235 mg/L.

- **Total Filterable Residue** concentrations ranged from 140 to 1,400 mg/L with an average of 649 mg/L. The secondary standard MCL upper limit for Total Filterable Residue is 1,000 mg/L. Three samples had results greater than the secondary standard MCL.

- **Ortho-phosphate** concentrations ranged from <0.020 to 0.120 mg/L with an average of 0.060 mg/L.

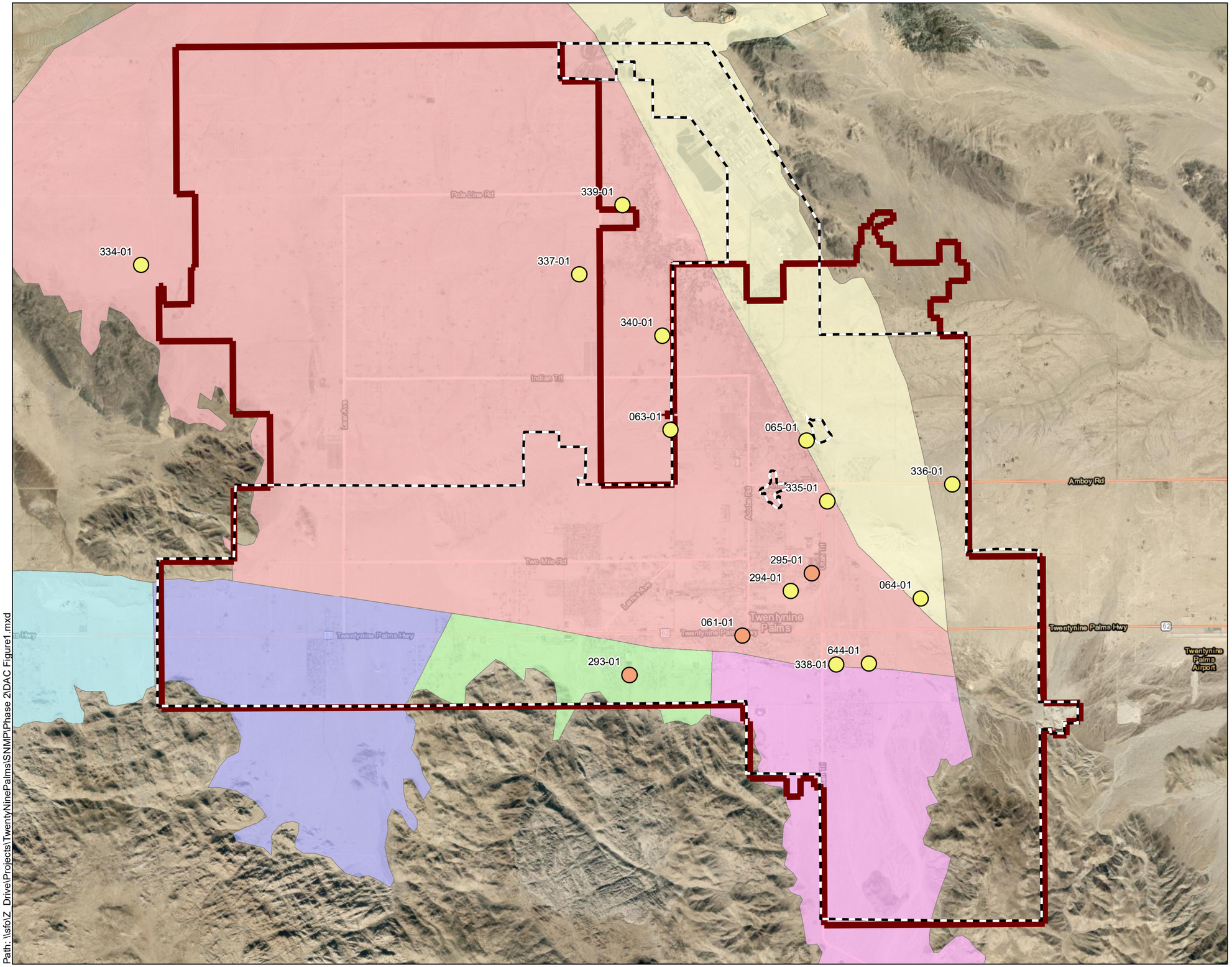
- **Arsenic** concentrations ranged from 3.7 to 130 micrograms per liter (ug/L) with an average of 20 ug/L. The primary standard MCL for Arsenic is 10 ug/L. Eight samples had results greater than the primary standard MCL.

- **Bromide** concentrations ranged from <100 to 1,800 ug/L with an average of 594 ug/L.

- **Calcium** concentrations ranged from 8.6 to 150 ug/L with an average of 42 ug/L.

- **Chromium (+6)** concentrations ranged from <1.0 to 40 ug/L with an average of 12.6 ug/L.

- **Magnesium** concentrations ranged from <1.0 to 23 mg/L with an average of 7.8 mg/L.
- **Potassium** concentrations ranged from <1.0 to 5.3 mg/L with an average of 3.3 mg/L.
- **Sodium** concentrations ranged from 35 to 610 mg/L with an average of 181 mg/L.
- **Total Hardness** concentrations ranged from 22 to 470 mg/L with an average of 133 mg/L.
- There were no detections above the laboratory reporting limit of the following parameters:
    - **Carbonate**
    - **Hydroxide**
    - **MBAS**
    - **Copper**
    - **Iron**
    - **Manganese**
    - **Fecal Coliform**
- There were no detections above the laboratory reporting limit of the following parameters except for one or two wells in the set, as noted below:
    - **Total Organic Carbon** (one well at 0.41 mg/L)
    - **Zinc** (one well at 400 ug/L)
    - **Total Coliform** (one well at 1.1 and one well at 5.1 MPN/100 ml)
- Seven (7) anthropogenic parameters were analyzed in all 15 wells but only 10 wells had lab results available at the time of writing.
    - There were no detections above the laboratory reporting limit for **17B-Estradiol, N-Nitrosodimethylamine, and Triclosan**.
    - Except two wells, there were no detections above the laboratory reporting limit for **Caffeine** (the two wells were at 4.9 and 5.3 nanograms per liter [ng/L]).
    - Except three wells, there were no detections above the laboratory reporting limit for **Sucralose** (the three wells were at 21, 150, and 62 ng/L) and **DEET** (the three wells were at 4.3, 4.1, and 7.2 ng/L).
    - **NDMA** concentrations ranged from 18.9 to 30.2 ng/L with an average of 23.5 ng/L.



LEGEND

- Private Well
- City of 29 Palms
- City Limit
- Water District Boundary

Groundwater Subbasin

- Eastern Subbasin
- Fortynine Palms Subbasin
- Indian Cove Subbasin
- Joshua Tree Subbasin
- Main Side Subbasin
- Mesquite Subbasin

N

0 6,800 13,600
Feet

Kennedy Jenks

Groundwater Sampling Technical Memorandum
Twentynine Palms, California

Location of Wells Sampled for Phase 4 of SNMP

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January 2022

Figure 1

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			Field Sampling	General Chemistry														Metals												Anion/Cation Balance				Microbiological Analysis		Anthropogenic Analysis						
Well ID	Well Name or Address	Sample Date	Temperature[b] °F	Total Alkalinity (as CaCO3) (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	EC (µmhos/cm)	F[a] (mg/l)	Hydroxide (mg/l)	MBAS (mg/l)	NO3-N (mg/l)	pH std units	SO4 (mg/l)	TDS (mg/l)	Ortho-phosphate (mg/l)	TOC (mg/l)	As (ug/L)	Bromide (ug/L)	Ca (mg/L)	Cr (+6) (ug/L)	Cu (ug/L)	Fe (ug/L)	Mg (mg/L)	Mn (ug/L)	K (mg/L)	Na (mg/L)	Zn (ug/L)	Hardness, Total (as CaCO3) (mg/l)	Total Anions (meq/l)	Total Cations (meq/l)	% Difference	Total Coliform[c] (MPN/100 ml)	Fecal Coliform[c] (MPN/100 ml)	Sucralose (ng/L)	Caffeine (ng/L)	17B-Estradiol (ng/L)	NDMA (ng/L)	N-Nitrosodimethylamine (ng/L)	Triclosan (ng/L)	DEET (ng/L)
	Maximum Contaminant Level		N/A	N/A	N/A	N/A	500	1600	2	N/A	0.5	10	N/A	500	1000	N/A	N/A	10	N/A	N/A	N/A	1,000	300	N/A	50	N/A	N/A	5,000	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
334-01	66966 Old Chisholm	11/15/2021	87.1	37	39	<5.0	25	720	**11**	<5.0	<0.10	<0.40	8.9	230	370	<0.020	<0.30	**24**	420	8.6	<1.0	<50	<100	<1.0	<20	<1.0	140	<50	22	6.71	6.52	2.8	<1.1	<1.1	<20	<4.0	<4.0	18.9	<2.0	<8.0	<4.0
335-01	74550 Michels Road	11/15/2021	68.1	170	210	<5.0	48	770	**7.2**	<5.0	<0.10	2.4	7.9	120	490	0.045	<0.30	**31**	410	49	9.5	<50	<100	7.9	<20	3.3	120	<50	150	7.67	8.4	9.1	<1.1	<1.1	<20	<4.0	<4.0	30.2	<2.0	<8.0	<4.0
336-01	75939 Aniboy	11/15/2021	114.4	200	240	<5.0	250	2700	**10**	<5.0	<0.10	0.7	8.4	740	**1400**	0.063	<0.30	**130**	1800	<10	35	<50	<100	<10	<20	<10	610	<50	<66	26.9	26.5	1.4	<1.1	<1.1	<20	<4.0	<4.0	20.2	<2.0	<8.0	**4.3**
337-01	71857 Kaiser Road	11/15/2021	78.9	52	61	<5.0	65	1100	**13**	<5.0	<0.10	<0.40	8.4	330	660	0.021	<0.30	**23**	530	21	<1.0	<50	<100	2.4	<20	2.0	200	<50	62	10.4	10	3.8	<1.1	<1.1	<20	<4.0	<4.0	25.0	<2.0	<8.0	<4.0
338-01	74656 Sullivan Road	11/15/2021	73.8	220	270	<5.0	15	530	**5.6**	<5.0	<0.10	<0.40	7.9	22	340	0.094	<0.30	9.8	250	41	<1.0	<50	<100	8.7	<20	3.3	69	<50	140	5.6	5.85	4.3	<1.1	<1.1	<20	4.9	<4.0	22.6	<2.0	<8.0	<4.0
339-01	1865 Alpine Ave	11/15/2021	N/A	62	76	<5.0	87	1100	**5.4**	<5.0	<0.10	<0.40	7.9	310	700	0.051	<0.30	5.3	380	38	6.0	<50	<100	4.5	<20	3.8	200	<50	110	10.4	11.1	5.9	<1.1	<1.1	<20	<4.0	<4.0	23.1	<2.0	<8.0	**4.1**
340-01	72988 Valle Vista Road	11/15/2021	79.2	48	59	<5.0	63	1100	**11**	<5.0	<0.10	<0.40	8.1	330	570	0.05	<0.30	5.8	430	23	<1.0	<50	<100	1.2	<20	2.4	210	<50	63	10.2	10.4	2.5	<1.1	<1.1	<20	<4.0	<4.0	29.9	<2.0	<8.0	<4.0
293-01	6895 El Sol Ave	11/29/2021	N/A	76	92	<5.0	7	200	1.3	<5.0	<0.10	1.6	7.6	6.7	140	0.041	<0.30	**23**	<100	9.3	8.0	<50	<100	<1.0	<20	<1.0	35	<50	23	1.9	2.0	4.2	<1.1	<1.1	<20	<4.0	<4.0	26.3	<2.0	<8.0	<4.0
294-01	74166 El Paseo Drive	11/29/2021	N/A	180	220	<5.0	99	1100	**3.9**	<5.0	<0.10	**15**	8.1	190	750	0.066	<0.30	**11**	530	65	5.0	<50	<100	9.3	<20	2.8	150	<50	200	10.6	10.6	0.52	<1.1	<1.1	**21**	<4.0	<4.0	22.2	<2.0	<8.0	<4.0
295-01	74362 Joe Davis Drive	11/29/2021	N/A	170	210	<5.0	66	880	**4.3**	<5.0	<0.10	5.3	7.6	150	560	0.059	<0.30	8.9	650	51	10	<50	<100	7.1	<20	2.7	120	<50	160	8.7	8.4	2.7	5.1	<1.1	150	<4.0	<4.0	24.0	<2.0	<8.0	<4.0
061-01	#15 City Monitoring Well	12/13/2021	N/A	290	350	<5.0	75	1600	0.9	<5.0	<0.10	**85**	7.6	89	**1200**	0.12	0.41	3.7	410	150	10	<50	<100	23	<20	3.6	150	<50	470	9.75	16	49	<1.1	<1.1	62	5.3	<4.0	22.7	<2.0	<8.0	7.2
063-01	4180 Mesquite Springs	12/13/2021	N/A	68	82	<5.0	110	1500	**11**	<5.0	<0.10	0.9	7.8	480	**1000**	0.038	<0.30	**11**	800	42	1.5	<50	<100	4.4	<20	5.3	290	<50	120	5.0	15.2	100	1.1	<1.1	<20	<4.0	<4.0	20.9	<2.0	<8.0	<4.0
064-01	8175 Singing Sands	12/13/2021	N/A	230	280	<5.0	37	930	**13**	<5.0	<0.10	2.8	8.2	150	590	0.084	<0.30	**23**	1100	9.3	40	<50	<100	3.1	<20	3.0	200	<50	36	9.44	9.5	0.61	<1.1	<1.1	<20	<4.0	<4.0	23.1	<2.0	<8.0	<4.0
065-01	74368 Raymond Drive	12/13/2021	N/A	140	170	<5.0	62	1200	**6.5**	<5.0	<0.10	5.0	7.9	350	770	0.065	<0.30	9.2	390	67	4.1	<50	<100	10	<20	5.2	160	<50	250	12.2	12.0	1.3	<1.1	<1.1	<20	<4.0	<4.0	22.2	<2.0	<8.0	<4.0
644-01	6885 Sahara Ave	12/20/2021	N/A	110	130	<5.0	12	350	**5.6**	<5.0	<0.10	1.2	7.8	31	190	0.045	<0.30	4.0	220	18	9.2	<50	<100	2.7	<20	2.3	54	400	56	3.41	3.53	3.5	<1.1	<1.1	<20	<4.0	<4.0	20.6	<2.0	<8.0	<4.0
		Minimum	68.1	37	39	<5.0	7	200	0.9	<5.0	<0.10	<0.40	7.6	6.7	140	<0.020	<0.30	3.7	<100	8.6	<1.0	<50	<100	<1.0	<20	<1.0	35	<50	22	1.9	2.0	0.5	<1.1	<1.1	<20	<4.0	<4.0	18.9	<2.0	<2.0	<4.0
		Maximum	114.4	290	350	<5.0	250	2700	13	<5.0	<0.10	85	8.9	740	1400	0.120	0.41	130	1800	150	40	<50	<100	23	<20	5.3	610	400	470	26.9	26.5	100	5.1	<1.1	150	5.3	<4.0	30.2	<2.0	<2.0	7.2
		Average (Median for pH)	83.6	137	166	<5.0	68	1052	7.3	<5.0	<0.10	12.0	7.9	235	649	0.060	0.41	20	594	42	12.6	<50	<100	7.8	<20	3.3	181	400	133	9.3	10.4	12.8	3.1	<1.1	77.7	5.1	<4.0	23.5	<2.0	<2.0	5.2

Notes and Abbreviations

N/A = not analyzed, not applicable, or not available
< X = not detected above the laboratory reporting limit indicated
MPN/100 ml = Most probably number per 100 milliliters
ug/L = micrograms per liter

mg/l = milligrams per liter
µmhos/cm = micromhos per centimeter
°F = degrees Fahrenheit

As = Arsenic
B = Boron
Ca = Calcium
Cl = Chloride
Cr (+6) = Chromium 6
Cu = Copper

CO3 = Carbonate
EC = Specific Conductance
F = Fluoride
Fe = Iron
HCO3 = Bicarbonate
K = Potassium

Mg = Magnesium
Mn = Manganese
Na = Sodium
NO3-N = Nitrate as Nitrogen
SO4 = Sulfate
TDS = Total Dissolved Solids
Zn = Zinc

(a) **Bold** text indicates result greater than Maximum Contaminant Level (MCL) for the constituent.
(b) Temperature measured in the field.
(c) Total and fecal coliform were measured using EPA Method SM9221