Prepared for:

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1210 South Highway 395
Olancha, California 93549

REVISED ADDITIONAL SITE INVESTIGATION WORK PLAN

Olancha Spring Water Bottling Facility
1210 South U.S. Highway 395
Olancha, California

Prepared by:

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engineers | scientists | innovators

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Project Number: SB0746

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Geosyntec
consultants

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Prepared for:

Crystal Geyser Roxane

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1.0 INTRODUCTION

Geosyntec Consultants, Inc. (Geosyntec), on behalf of Crystal Geyser Roxane (CGR), is submitting the following Additional Site Investigation Work Plan (Plan) for the CGR Bottling Facility (site) located at 1210 South U.S. Highway 395, near Olancha, California (**Figure 1**). The Plan presents the proposed methodology for additional environmental groundwater investigation in response to the Lahontan Regional Water Quality Control Board (RWQCB) Investigative Order Number R6V-2014-0063 (Order) dated July 24, 2014 and an e-mail from Ms. Lisa Scoralle of the RWQCB dated October 26, 2015. The Order was issued by the RWQCB based on waste water discharges that CGR generates as part of their business operations. The October 2015 e-mail presented comments on Geosyntec's Phase 2 Site Investigation (Geosyntec, 2015c) and requested additional work. This Plan is designed to address the requested investigation work plan requirements of the RWQCB Order and comments provided by the RWQCB in their October 26, 2015 e-mail. The Plan is organized as follows:

- Section 1.0 – *Introduction.*
- Section 2.0 – *General Site Description.* A brief description of the site is presented, including the locations of three waste water ponds located on the site.
- Section 3.0 – *Previous Environmental Site Studies*. A summary of the recent environmental investigations is presented.
- Section 4.0. – *Site Conceptual Geology and Hydrogeology*. This section includes a general Hydrogeological Site Conceptual Model for the site.
- Section 5.0. – *Investigation Objectives and Design*. Provides the investigation objectives and a basis for the phased approach to the site investigation.
- Section 6.0. – *Field Methodology*. Procedural information on drilling, soil sampling, well installation, and water sampling is presented.
- Section 7.0 – *Schedule and Report Preparation*. A schedule of the proposed investigation activities and reporting is presented.

2.0 GENERAL SITE DESCRIPTON

The site is an irregularly shaped property that consists of approximately 170 acres adjacent to Highway 395 approximately 3 miles north of Olancha, California (**Figure 1**). CGR operates a spring water bottling facility using groundwater production wells for bottled water supply and for domestic and industrial purposes. The facility consists of two large bottling-production and warehouse buildings, CGR North and CGR South that house CGR's bottling production lines (**Figure 2**). A complete description of the bottling facility processes was submitted in the *Facility Waste Generation and Discharge Systems Report* dated October 16, 2014 (CGR, 2014).

In the past, CGR discharged waste water into three ponds on the site: the Fire Pond (FP); the Arsenic Pond (AP); and the East Pond (EP). The AP has been decommissioned following CGR learning that the AP potentially was releasing impacted liquids into the soil and groundwater, while the EP and FP are still in use and are being permitted under a Waste Discharge Requirements (WDR) industrial discharge permit (in progress). The locations of these ponds are shown on **Figure 2**. The *Facility Waste Generation and Discharges Report* describe waste discharge to these ponds (CGR, 2014). The FP and EP primarily receives ozonated filtered rinse water with small concentrations of ammonia, chlorine and phosphoric acid. The AP previously received water generated during the regeneration process for the arsenic filtration system. This investigation and past environmental investigations are primarily focused on potential impacts to soil and groundwater caused by discharge to these ponds.

3.0 PREVIOUS ENVIROMENTAL SITE STUDIES

There have been numerous hydrogeological site studies relating to the CGR spring water bottling operations. These hydrogeological studies and associated reports were listed in in Geosyntec's report dated August 14, 2015 (Geosyntec, 2015c). More recently, several workplans and investigation reports prepared in response to the RWQCB Order have been prepared. The workplans and reports are as follows:

- Facility Waste Generation and Discharges Report, October 16, 2014. Completed by CGR.
- Site Investigation Workplan, Olancha Spring Water Bottling Facility, Olancha, California. October 17, 2014. Completed by Geosyntec Consultants.
- Supplemental Site Investigation Work Plan, Olancha Spring Water Bottling Facility, Olancha, California. November 20, 2014. Completed by Geosyntec Consultants.
- Phase 1 Site Groundwater Investigation Report, Olancha Spring Water Bottling Facility, Olancha, California. February 16, 2015. Completed by Geosyntec Consultants.
- Site Investigation Work Plan Addendum, Olancha Spring Water Bottling Facility, Olancha, California. May 29, 2015. Completed by Geosyntec Consultants.
- Phase 2 Site Groundwater Investigation Report, Olancha Spring Water Bottling Facility, Olancha, California. August 14, 2015. Completed by Geosyntec Consultants.
- Third Quarter 2015 Groundwater Report, Olancha Spring Water Bottling Facility, Olancha, California. October 15, 2015. Completed by Geosyntec Consultants.
- Fourth Quarter 2015 Groundwater Report, Olancha Spring Water Bottling Facility, Olancha, California. January 15, 2016. Completed by Geosyntec Consultants.
- First Quarter 2016 Groundwater and Soil Vapor Monitoring Report, Olancha Spring Water Bottling Facility, Olancha, California, April 28, 2016. Completed by Geosyntec Consultants.

The primary investigation reports are the *Phase 1 Site Groundwater Investigation Report*, dated February 16, 2015 and the *Phase 2 Site Groundwater Investigation Report*, Olancha, dated August 14, 2015. The Phase 1 investigation was completed as a screening evaluation to preliminarily evaluate the groundwater conditions in the areas around the AP, the EP, and the FP, as well as near the cooling tower on the north side of the northern site bottling facility. A total of 10 "grab" groundwater samples were collected to gather screening level data in order to better evaluate groundwater quality conditions and identify appropriate locations for groundwater monitoring wells. Additionally, production waste water samples were collected from both the northern and southern bottling plants and at water discharge locations of the AP, EP, and FP for characterization and comparison to groundwater quality. The results of the Phase 1 Investigation indicated that the primary constituents of concern in the groundwater in the investigation areas are metals. Of the metals detected, the primary metal of concern exceeding the corresponding Maximum Contaminant Level (MCLs) was arsenic. Additionally, elevated concentrations of sulfate and total dissolved solids (TDS) were also detected at concentrations exceeding their secondary MCLs in borings adjacent to the AP. Based on the data collected during the Phase 1 Site groundwater investigation, installation of groundwater monitoring wells was recommended for the areas surrounding the AP, EP, and FP to verify the Phase 1 screening data. The Plan Addendum dated May 29, 2015 (Geosyntec, 2015b) was approved by the RWQCB in correspondence dated June 29, 2015.

The Phase 2 field investigation was conducted in June and July 2015 to further evaluate the soil, soil vapor, and groundwater conditions in the areas around the AP, the EP, and the FP (Geosyntec, 2015c). The monitoring wells and soil vapor probe sampling location were selected based on data obtained from the Phase 1 Site screening level investigation (Geosyntec, 2015a). Additionally quarterly groundwater monitoring was completed in 2015. Results of the Phase 2 investigation and groundwater monitoring are summarized as follows:

- A total of nine groundwater monitoring wells and one temporary soil vapor probes were installed and soil, soil vapor, and groundwater samples were collected and analyzed. The location of the monitoring wells and soil vapor probe are shown in **Figure 2**. The groundwater gradient in the area of the EP and AP was calculated to be 0.006 towards the northeast. Soil sample results indicate that arsenic, cobalt, mercury, and molybdenum were detected at concentrations exceeding one or more published screening level. Of the metals detected in soil, only detections of arsenic and molybdenum exceeded the California median background for soil concentrations (UCR/DTSC, 1996). Arsenic exceeded the median background concentration in soil samples collected across the site indicating relatively high naturally occurring concentrations of arsenic in site soil. Molybdenum exceeded the medium background concentration in one sample collected from boring MW-1. Geosyntec concluded that the distribution and concentrations of the detected metals indicate that there have been no significant impacts to soil due to waste water discharges at the site. However, the RWQCB, in their e-mail dated October 26, 2015, noted that anomalously high metal concentrations were detected in a soil sample collected at location MW-01 (**Figure 2**) relative to other soil samples collected at the site. The MW-01 sample soil was collected adjacent to and slightly upgradient of the FP at a depth of 15 feet. The source of the metals in the MW-1 soil sample has not been established and Geosyntec does not believe this result is related to CGR's waste water discharges at the site.

- Soil vapor results include samples collected from probe SV-01 located adjacent to the AP and the valve distribution box (**Figure 2**). All soil vapor sample results were much lower than the most stringent screening levels for even residential vapor intrusion concerns. Based on the soil vapor sample results and the soil and groundwater sample results, there has not been a significant release of VOCs in the area around the valve distribution box.
- The groundwater sample analytical results did not contain detections of VOCs or SVOCs indicating there are no significant VOC or SVOC impacts to groundwater due to waste water discharges at the site.
- The primary groundwater constituents of concern are metals. In particular, antimony and arsenic were detected at concentrations above background levels (arsenic background is assumed to be approximately 16 µg/L to approximately 28 µg/L)[1] and exceeding their MCLs of 6 and 10 µg/L, respectively. **Figure 3** summarizes dissolved antimony and arsenic concentrations from the First quarter 2016 groundwater monitoring event. The elevated occurrences of antimony and arsenic were primarily located in wells located adjacent and downgradient of the AP (wells MW-4, MW-5, and MW-9). A slightly elevated level of dissolved arsenic was also reported in well MW-7 (47.9 ug/L) in the Phase 2 investigation, but concentrations of arsenic concentrations have decreased to within background levels in this well since the 3rd quarter

[1] Range of arsenic concentrations based on annual sample results in 2012 and 2013 from CGR production wells CGR-1, CGR-3, CGR-5, CGR-6, and CGR-7.

2015 sampling event (**Figure 3**). No other metals in groundwater samples collected from monitoring wells were detected above background levels.

- Elevated concentrations of sulfate and TDS were also detected at concentrations exceeding their upper secondary MCLs in monitoring wells located adjacent to the AP (MW-04 and MW-05). **Figure 4** summarizes TDS, sulfate, chloride, sodium, alkalinity and phosphate concentrations in the site monitoring wells. No other constituents were detected above their primary or upper secondary MCLs in well samples with the exception of residual chlorine, which was detected above its MCL in well MW-7 during the Phase 2 investigation.

Based on data collected during the Phase 1 and 2 investigations and quarterly groundwater monitoring conducted in 2015 and First quarter 2016, there has been a release from the AP that includes the metals arsenic and antimony. The elevated arsenic concentrations detected in wells MW-04, MW-05, and MW-9 are found proximal and downgradient of the AP. The extent of the impacts has not been fully delineated.

4.0 HYDROGEOLOGICAL SITE CONCEPTUAL MODEL

A hydrogeological site conceptual model (SCM), based on the information collected during the Phase 1 and Phase 2 investigations and past hydrogeological investigations, is presented in this section.

The site is located in the southern portion of the Owens Valley Groundwater Basin (DWR, 2003). The basin occupies a structural valley that, in the vicinity of the site, is bounded on the west by the granitic bedrock of the Sierra Nevada Mountains and on the east by the sedimentary bedrock of the Inyo Mountains. To the east of the site and in the middle portion of the valley is the dry Owens Lake. The dry Owens Lake is a desert playa where salts are generated at the surface via evaporation processes.

A hydrogeological conceptual model illustration of the site is provided in **Figure 5**. The major groundwater bearing unit in the basin is a thick sequence of alluvium that has been derived from erosion of bedrock in the bordering mountain areas. The alluvium beneath the site is principally derived from the Sierra Nevada Mountains to the west and generally consists of sands and gravels. These alluvial sands and gravels are interbedded or interfingered with finer-grained lacustrine deposits (i.e., lake deposits from the ancient Owens Lake). The sequence of alluvium and lacustrine deposits beneath the site is at least 750 feet thick (JMM, 1993).

The alluvial sand and gravels and lacustrine clays and silts were encountered during drilling investigations at the site. The observed sequence of lacustrine and alluvial sediments beneath the site is the result of deposition associated with ancient fluctuations of water levels in Owens Lake. Alluvial materials derived from the Sierra Nevada Mountains were deposited along the shoreline while fine-grained lacustrine materials were deposited in the shallow lake waters. As the elevation of the lake varied, the shoreline moved laterally, causing interfingering of the coarse alluvial materials and the fine-grained lake deposits. The lacustrine deposits generally consist of silts, clays and very fine sands and have a relatively high organic content. Based on regional models and site drilling logs, the percentage of fine-grained material (lacustrine deposits) generally increases to the east. That is, the occurrence or presence of fine-grained silts and clays in the subsurface increases as one moves from the Sierra Nevada Mountain range towards the dry Owens Lake. It should also be noted that an ancient shoreline deposit, generally consisting of light brown to white fine to coarse sands with some gravel, is located on the site. The shoreline deposit is shown on **Figure 2**. The AP and the EP are located on the shoreline deposit.

Groundwater beneath the site is mostly derived from precipitation (rainfall) and snowmelt in the Sierra Nevada Mountains to the west. Surface water runs off the Sierra Nevada mountain front and infiltrates the alluvium near the mountain base. Surface water or runoff quickly percolates into the sandy and gravelly alluvium and moves downward to the groundwater table. Some groundwater recharge also may occur from underflow through bedrock fractures and from direct precipitation on the valley floor.

Groundwater in the alluvium flows eastward, away from the Sierra Nevada Mountains and towards the central portion of the basin or towards the dry Owens Lake. The Owens Lake is a groundwater discharge area where up-flowing groundwater is evaporated and, consequently, evaporite salts are produced.

Shallow groundwater beneath the site occurs under unconfined conditions; although where fine-grained layers are present, local semi-confined conditions may occur. The upper aquifer material beneath the site is referred to as the Shallow Zone. The Shallow Zone is defined herein as the saturated sand and gravel aquifer that overlies the fine grained lacustrine layer that occurs at a depth of approximately 80 feet. All monitoring wells installed during this investigation are completed in the upper-most portion of the Shallow Zone.

The depth to the shallow groundwater table beneath the site gradually decreases towards the east. A small and sometimes subtle escarpment extends from the area north of the site (Cabin Bar Ranch) along an approximate north-south trend to the southern portion of the site. A series of springs occurs along this subtle escarpment. This escarpment is interpreted to be associated with the presence of an underlying fault referred to as the Spring-line fault. The interpreted Spring-line fault location is shown on **Figure 2**. The AP and EP are located east of the fault, whereas the FP is located west the fault. The fault is generally interpreted to act as a leaky groundwater barrier and the aligned springs and seeps are caused by a small rise of shallow groundwater and the subsequent intersection of groundwater with ground surface along the fault. An alternate interpretation is that the rise of groundwater is associated with the increase is fine-grained lacustrine deposits towards the east causing a permeability barrier. However, the linear nature of the spring locations suggests the fault interpretation is more likely. Whatever the cause, it is clear that the easterly groundwater flow is impeded and subsequently produces a rise of the groundwater table resulting in observed springs/seeps along a linear trend in the central and eastern portions of the site. This rise of groundwater in the area, together with the high regional evaporation rate, has created soils with high salt content.

Located on the site, and on the Cabin Bar Ranch property directly adjacent and to the north of the site, there are production wells, domestic water supply wells, observation monitoring wells, and piezometers. Additionally, there are active domestic water supply wells and one municipal production well in the town of Cartago. The production wells and domestic wells at the site and at Cabin Bar Ranch are completed in the deeper portions of the Shallow Zone. Some observation wells at the site and at Cabin Bar Ranch are completed in the Deep Zone. **Figure 6** shows production well, domestic well, and piezometer/monitoring well locations that are color coded based on their completion depths within the upper portion of the Shallow Zone, lower portion of the Shallow Zone, or within the Deep Zone. The well completion depths of the associated site and Cabin Bar Ranch wells are provided in **Table 1**. Based on previous studies completed by Geosyntec and others, there is some leakage between the Deep and Shallow Zones, however, there is a site-wide upward groundwater gradient based on comparison of water levels in co-located observation wells completed in the Deep and Shallow zones respectively. That is, wells completed in the Deep Zone have static water level at a higher elevation than those completed in the Shallow Zone. This condition can be seen at observation wells OW-7U and OW-7M, and at OW-10U and OW-10M for example. The majority of the wells, except for monitoring wells associated with this investigation, associated with the site have been installed west of the Spring-line fault. Wells OW-8U, OW-8US, OW-8M, OW-9U, and P-15 are the only other wells installed east of the Spring-line fault. Groundwater quality and water levels are monitored at the Cabin Bar Ranch on a quarterly basis in accordance with the Groundwater Monitoring, Mitigation, and Reporting Plan (GMMRP) dated June 18, 2014 (GMMRP, Geosyntec Consultants, 2014). The GMMRP monitoring program was developed to evaluate potential water level and water quality impacts due to proposed pumping at the Cabin Bar Ranch facility. The GMMRP quarterly groundwater monitoring program was initiated in March 2016, and pertinent data will be provided to update this SCM and investigation results as they are available.

Groundwater quality is an important component for the current groundwater investigation. Generally, concentrations of TDS, sodium, carbonate and metals, including arsenic in the Shallow Zone is expected to increase to the east toward the dry Owens Lake where up-flow of groundwater and evaporation processes have created salt pans. As noted in previous reports (Geosyntec, 2015a and 2015c) and based on previous investigations at the site, arsenic, at levels above the MCL of 10 µg/L, is well known to be a naturally occurring element in the soil, alluvium, and groundwater in the site region. Generally, elevated arsenic concentrations are characteristic of groundwater derived from the Eastern Nevada watershed. Arsenic concentrations at several of the site groundwater monitoring wells installed in the Phase 2 investigation (2015a) are within the range of expected naturally occurring background concentrations. Site production wells located west of the Spring Line fault, which produce from deeper portions of the Shallow Zone, have arsenic in the approximate range of 16 to 28 µg/L[2]. It is assumed that naturally occurring arsenic concentrations in groundwater increase east of the Spring Line fault and reach very high levels beneath dry Owens Lake. Shallow groundwater sampling (< ~10 feet) by others beneath the eastern portion of Owens Lake documented arsenic concentrations in the range of 1,400 –163,000 µg/L (Levy et. al., 1999). Levy et. al. also reports very high salinity (up to 300,000 mg/L) in the shallow Owens Lake groundwater. It is likely that these elevated concentrations are associated with the fine grained lacustrine deposits and salt deposits. Thus, as the presence of these layers increases, it is expected that naturally occurring arsenic concentrations as well as TDS will likewise increase. However, this expected increase is a general trend and will also be dependent on the volume of fine-grained lacustrine sediment encountered in each area.

As noted in the previous paragraphs, the AP and EP are located east of the Spring Line Fault. The discharge of metals to the AP in particular, has resulted in locally elevated levels of antimony and arsenic in locations proximal and downgradient to the AP and EP. The groundwater gradient in this area is towards the northeast. Therefore, any migration of the groundwater plume is towards the dry Owens Lake, where groundwater is extremely saline with elevated natural concentrations of arsenic in the shallow groundwater. Although the shallow groundwater in the Owens Valley Groundwater Basin is designated for beneficial use, the groundwater beneath the dry Owens Lake proximal to the Site is not currently being produced nor can foreseeably be used as a drinking water resource. Additional lithologic and groundwater quality information obtained from the proposed additional site investigation will be used to update the SCM.

4.1 MODFLOW Groundwater Model Update

A hydrogeological groundwater model originally developed for the Cabin Bar Ranch in 2014 was updated and applied to evaluate groundwater flow conditions in the vicinity of the AP. The original model prepared using MODFLOW™ software was calibrated based on data collected from hydrogeologic investigations conducted on the Cabin Bar Ranch property as well as at the site. The original model was used to estimate the impacts to groundwater levels, spring flow, and other water supply wells in the area based on future pumping scenarios at Cabin Bar Ranch.

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[2] Range of arsenic concentrations based on annual sample results in 2012 and 2013 from CGR production wells CGR-1, CGR-3, CGR-5, CGR-6, and CGR-7.

This model was updated to include water levels and spring flows based on data collected at the site and vicinity in February 2016. The updated model was used to estimate:

1. Groundwater flow in the area of both the site and Cabin Bar Ranch;

2. Capture zones of all significant production wells based on current and projected pumping rates; and

3. Groundwater particle track in the area of the former AP.

Updates to the model include groundwater levels in all site and Cabin Bar Ranch wells based on monitoring conducted in December 2015, inclusion of all the monitoring wells associated with the Order (MW-01 through MW-09) as well as monitoring wells and piezometers installed as part of the Cabin Bar Ranch project and the GMMRP program. Additionally, the model was updated to include an estimate of hydraulic conductivity[3] in the areas east of the Spring-line fault to represent the inter-fingered, fine-grained lacustrine deposits found in these areas.

The updated model results are provided in **Appendix A**. The results of the updated model indicate that groundwater flows to the east from the Sierra Nevada Mountains and into the alluvial deposits west of the Spring-line fault, then rises to the ground surface along a line of springs identified near the Spring-line fault. East of the Spring-line fault, groundwater flows to the northeast and ultimately discharges at the dry Owens Lake. The capture zone analysis indicated that the current pumping from the site production wells and from the Cartago Mutual Water District production well, and proposed future pumping at the Cabin Bar Ranch, will not draw water from east of the Spring-line fault towards the west. The particle track analysis also indicates that groundwater in the area of the former AP will migrate to the northeast and discharge at dry Owens Lake (an area of very high TDS and arsenic in groundwater). The model clearly indicates that groundwater originating at and near the AP will not impact any pumping wells (current or foreseeably planned) including those of the Cartago Mutual Water District.

[3] The hydraulic conductivity east of the spring line fault was estimated at approximately 250 ft/day to account for the fine-grained silts and clay lacustrine deposits found east of the Spring-line fault.

5.0 INVESTIGATION OBJECTIVES AND DESIGN

The objectives and investigative design of the field investigation outlined in this Plan are as follows:

- The RWQCB in their October 2015 e-mail noted that anomalously high metal concentrations were detected in a soil sample collected at location MW-01 relative to other soil samples collected at the site. The MW-01 sample soil was collected at a depth of 15 feet. Arsenic and molybdenum exceeded the median background concentration in the sample collected from MW-01. To further evaluate potential soil metal impacts in the area of MW-01 (northwest of the FP) one additional boring will be completed. The boring will be completed approximately 10 feet southeast of MW-01 (between the MW-01 location and the FP. The additional samples will be collected in order to evaluate whether or not the metals in MW-01 may have come from the FP or if it is more likely that the metals in the MW-01 sample are of a natural origin. The location of the additional boring (B-1) is presented on **Figure 7**.
- The RWQCB in their October 2015 e-mail indicated that further investigation is necessary evaluate the full lateral extent of groundwater impacts. Six additional monitoring wells to further delineate potential impacts to shallow groundwater will be installed. One monitoring well will be located east of the FP (MW-10). Four monitoring wells will be located in the vicinity of the AP (MW-11, MW-12, MW-13, and MW-15). One monitoring well (MW-14) will be completed southwest of the EP to further evaluate water quality background conditions. The location of the six additional monitoring wells is shown on **Figure 7**.
- The RWQCB in their October 2015 e-mail indicated that further investigation of the vertical extent of groundwater impacts is necessary. The vertical extent of groundwater impacts will be conducted by completing a soil boring to obtain lithology to a depth of approximately 40 feet below ground surface (ft bgs) using direct push technology in the area between the former AP and MW-04 (Figure 6). Following boring completion, groundwater grab samples will be collected in all water bearing zones (i.e. in saturated coarse grained layers) to obtain a vertical profile of the water quality. A groundwater monitoring well, MW-15, will also be installed near MW-03 to evaluate water levels and groundwater quality in the area upgradient from the former AP. In addition, vertical gradients will be evaluated by measuring groundwater level elevations in MW-03 and MW-15, and at MW-12, OW-8US and deep monitoring well OW-8U. Well OW-8US is screened in a deeper portion (from 55 to 75 feet

below ground surface [bgs]) of the shallow groundwater zone. OW-8U is located in the proposed MW-12 area and is screened in a deeper aquifer from 190 to 230 feet bgs.

6.0 FIELD METHODOLOGY

The field methodology proposed in the plan is outlined in Sections 6.1 through 6.6 below. A Sampling and Analysis Plan (SAP) detailing soil and groundwater sample collection procedures, direct push, and hollow-stem auger drilling procedures, and well installation, development and sampling procedures is presented in the *Site Investigation Work Plan* (Geosyntec 2014).

6.1 Pre-field Preparation

The Health & Safety Plan (HASP) prepared for the Phase 1 and Phase 2 investigations will be reviewed and modified if necessary. The HASP includes an analysis of the site work hazards and potential chemical exposures associated with the field work proposed for this Plan. Sub-contractors working on the project will provide their own personnel with Health & Safety Plans. All site personnel will be required to have forty-hour health and safety training (CFR 1919.120).

Permits for the soil boring near MW-01 are not anticipated to be required for the direct push borings. Permits for the groundwater monitoring wells will be obtained from the County of Inyo as necessary.

6.2 Direct Push Drilling, Soil Sampling, and Grab Groundwater Sampling

One (1) direct push boring, B-01, will be completed using the dual tube direct push drilling system in the northwest corner of the FP in the vicinity of monitoring well MW-01. The dual tube direct push drilling method includes an outer drive casing as it is advanced to total depth, sealing the borehole to reduce the potential for cross contamination. Continuous soil core samples and grab groundwater samples will be collected using the dual tube direct push drilling method. The preliminary direct push boring location is shown on **Figure 7**[4.] Specifically, the boring will be located approximately 10 feet southeast of MW-01. The exact location of the boring may change slightly depending upon access conditions encountered in the field. The completion of the boring will enable collection of the following data:

- Lithologic data in the shallow soils adjacent to the FP and MW-01;

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[4] The direct push boring location shown on Figure 6 is preliminary and may be moved slightly based on site access limitations.

- A direct push drill rig will be used to core a borehole to approximately the top of groundwater as measured in MW-01. Continuous soil core will be recovered from the direct push boring to evaluate lithology in this area. The lithology will be logged in general accordance with the Unified Soil Classification System, under the direct supervision of a California Professional Geologist. Soil samples will be collected approximately every 5 feet for laboratory analysis. The soil cores will be inspected for any obvious signs of contamination (staining, odors, PID), and if signs of contamination are present. It is anticipated that three (3) soil samples from the boring will be selected for laboratory analyses; and
- After collection, the soil samples will immediately be placed in a cooler with ice, and will be transported for overnight delivery to a State-certified laboratory under standard Chain-of-Custody documentation.

Following sampling, the borings will be destroyed by placing a neat-cement or cement-bentonite grout mixture from total depth to ground surface utilizing the dual tube system drive casing.

One direct push boring, B-02, will be completed approximately half the distance between the former AP and monitoring well MW-04 (**Figure 7**). The completion of this boring will enable collection of the following data:

- Continuous coring will be conducted to obtain detailed lithology to a target depth of approximately 40 ft bgs;
- The dual-tube sampling system will be used so that the shallow zone of coarse grained sands will be cased off and will minimize potential cross contamination to deeper zones;
- Upon completion, the borehole will be backfilled with neat cement grout mixture to ground surface through the drive pipe of the direct push rig;
- Based on lithology encountered during drilling B-02, a second boring adjacent to the initial boring, will be advanced using the dual tube direct push methodology. Grab groundwater samples will be collected using the dual tube system drive casing and/or Hydropunch® sampling system (or functional equivalent). Geosyntec will attempt to collect grab groundwater samples from all water bearing units between the top of the water table to the total depth of the previous boring (approximately 40 feet). Coarse grained sediments (i.e. sands or

silty sands rather than clays or silts) will be targeted for groundwater grab sampling;

  - The purpose of these grab samples will be to delineate the contaminant plume in the vertical direction in the area immediately downgradient of the former AP;

- The grab groundwater samples will be analyzed for dissolved and total CAM 17 metals. Grab groundwater samples will be collected using either a peristaltic pump or a disposable bailer. The water bearing zone targeted for each grab sample will be "developed" by low flow purging using a peristaltic pump or with the disposable bailer to reduce the turbidity in the grab sample. An aliquot of groundwater will be collected in a one-liter unpreserved container. The aliquot will be shaken to homogenize the suspended sediment in the sample. The aliquot will then be poured into a 500 milliliter (ml) non-preserved bottle for total metals analysis, and the remainder of the aliquot will be filtered in the field and poured into a preserved 500-ml bottle supplied by the laboratory for dissolved metals analysis.

6.3 Groundwater Monitoring Well Installation

A total of six 2-inch diameter PVC monitoring wells will be installed (MW-10 through MW-15). Monitoring wells will be installed using a trackmounted combination hollow-stem auger (HSA) and direct push drill rig. A summary of the anticipated well design is presented below; however, this design may change depending on lithology encountered during drilling.

During drilling, continuous soil core samples will be collected at each monitoring well location using the dual tube direct push rig. The field geologist will prepare a boring log describing lithology. Based on the lithology observed during direct push drilling, the well will be constructed with the well screen completed within the upper water bearing interval. All reasonable effort will be made not to install well screen across multiple water bearing zones to reduce the potential for cross contamination. However, if no significant water bearing zones are encountered, (for example if lithology is all fine grained laucustrine deposits, or if there are multiple coarse grained units less than 1 foot in thickness to the total depth of the borehole), the target depth of the boreholes will be approximately 10 feet below the top of the static water table.

Following dual tube direct push soil sampling, the drill rig will be converted to HSA and a borehole will be drilled with an 8-inch HSA. The monitoring wells will then be installed with the screen interval installed within the upper-most water bearing zone based on the lithology encountered as described above.

The monitoring wells will be constructed of 2-inch diameter flush threaded Schedule 40 PVC blank casing and 0.010-inch slotted screen. The selection of the well screen length and depth interval for each monitoring well be made after a lithologic log has been generated and a target monitoring zone has been selected for each monitoring well location. Geosyntec will select target monitoring zones, and select appropriate well screen lengths, that minimize the potential for the well screens to be installed across multiple water bearing units).

The annulus between the screen interval and the borehole wall will be filled with #2/12 sand that will extend from the bottom of the borehole to approximately two feet above the top of the screen. Approximately 2 feet of bentonite pellets will be placed above the filter pack and hydrated with water at one-foot lift intervals to provide a transition seal. The sand and bentonite pellets will be installed through the HSA. A surface/sanitary seal will be installed by placing neat cement grout or cement-bentonite grout through the HSAs from the top of the transition seal to ground surface. The field geologist will record construction details of each well and of all materials installed in the borehole. The monitoring wells will be completed at the surface with three-foot tall monument well boxes set in a concrete pad. The location and elevation of each monitoring well will be surveyed for position and well head elevation by a licensed California land surveyor.

The wells will be developed a minimum of 48 hours after installation. Each well will be developed using a surge block, bailer, and submersible pump. Development will continue until turbidity is reduced to approximately 50 NTUs.

6.3.1 Well Installation for MW-15

Monitoring well MW-15 is intended to be used as a vertical delineation well, and therefore, the well screen will be installed at a deeper zone than the other monitoring wells associated with the Site investigation. Additionally, this well will be used to evaluate water levels in shallow and deep screened wells. Geosyntec will take all reasonable effort to reduce the potential for creating a vertical conduit for contaminants in the upper portion of the saturated zone. Therefore, well MW-15 will be located upgradient from the AP adjacent to MW-03 (Figure 7). Well MW-03 has not shown evidence of contaminant impacts based on quarterly monitoring samples collected and therefore it is Geosyntec’s professional judgement that drilling and installation of MW-15 is not expected to create a vertical conduit for contamination. Additionally, the construction details of this well will have been designed prior to HSA drilling based on continuous core soil sampling using the dual tube sampling methodology. The well can be installed quickly and efficiently, reducing the amount of time the borehole is open and thereby reducing potential vertical contaminant transport during drilling. Potable water will be maintained in the stem of the auger during drilling to reduce heaving sands as well.

6.4 Groundwater Sampling and Groundwater Level Measurements

Groundwater level measurements and samples will be collected from the six additional monitoring wells and well OW-8US. In addition, groundwater levels will be measured in well OW-8U completed in the deeper aquifer. As part of normal procedure groundwater levels will be measured with an electric water level indicator to the nearest 0.01 foot. In the case of OW-8U and OW-8US, artesian conditions have occurred in the past, and therefore a pressure device may be used to measure groundwater levels.

The additional monitoring wells and well OW-8US will be sampled as part of current quarterly monitoring program in order to sample all site wells as a group. Groundwater samples will be collected using low flow sampling methodology. See Geosyntec (2014) for detailed groundwater sampling procedures. During well purging groundwater will be monitored in the field for pH, temperature, electrical conductivity, dissolved oxygen, oxidation reduction potential, free chlorine and total residual chlorine.

Due to a disparity between dissolved and total metals results from monitoring well samples, the following methodology is proposed for collection of total and dissolved metals analysis. An aliquot of groundwater will be collected in a one-liter unpreserved container. The aliquot will be shaken to homogenize the suspended sediment in the sample. The aliquot will then be poured into a 500 milliliter (ml) non-preserved bottle for total metals, and the remainder of the aliquot will be filtered in the field and poured into a preserved 500-ml bottle supplied by the laboratory for dissolved metals.

6.5 Laboratory Analyses

Soil and groundwater samples will be sent to Eurofins Calscience Environmental Laboratories in Garden Grove, California. Shipping packages containing the samples will be delivered to the laboratory via overnight delivery. Soil and groundwater samples will be shipped in coolers containing wet ice. All samples will be transferred to the analytical laboratory under proper Chain-of Custody (COC) protocol.

The following constituents will be analyzed in the B-01 soil sample:

- CAM 17 metals using EPA Methods 6010B/7471A

Note that we are proposing to only analyze the soil samples for metals as other constituents analyzed during the Phase 2 investigation including in nearby monitoring wells (MW-01 and MW-02) do not appear to have concentrations that indicate any pollutant impacts. The previous soil sample collected from the MW-01 boring contained elevated metals concentrations and, therefore, the soil samples collected from the proposed soil boring (B-01) will be analyzed for metals to evaluate if potential leaks from the FP are contributing to elevated soil metals concentrations in this area or if the metal concentrations observed in MW-01 are most likely from natural sources.

The following constituents will be analyzed in grab groundwater samples:

- CAM 17 metals (total and dissolved) using EPA Method 6020 ICP/MS

The following constituents will be analyzed in groundwater monitoring well samples:

- CAM 17 metals (total and dissolved) using EPA Method 6020 ICP/MS
- Priority Pollutants-Organics (VOCs and SVOCs) using EPA Methods 8260B and 8270C
- Total and Fecal Coliform using SM 9221B;
- Methylene Blue Active Substances using SM 5540C;
- General Minerals (sodium, calcium, magnesium, chloride, bicarbonate, and sulfate) using EPA Method 300.0;
- Total Dissolved Solids using SM 2540C;
- Total phosphate and phosphorus using SM 4500; and,
- Total nitrogen, nitrate as nitrogen, ammonia, and Total Kjeldahl nitrogen using SM 4500.

A list of the proposed methods for the analytical schedule and associated minimum reporting limits were provided in Geosyntec (2014).

6.6 Investigative Derived Waste

All soil cuttings from drilling activities will be placed into Department of Transportation (DOT) approved 55-gallon steel drums and clearly labeled. All decontamination water, well development water, and well purge and sampling water will also be placed in DOT approved 55-gallon steel drums, and labeled. A composite soil sample and composite waste water sample will be collected from the drums and analyzed for a waste profile as required by the selected licensed waste disposal facility. It is anticipated that one composite soil sample will be collected for waste profiling purposes for the selected disposal facility.

7.0 SCHEDULE AND REPORT PREPARATION

Following approval from the RWQCB, the additional field investigation will be initiated. The soil sampling and well installation/development investigation (Sections 6.1- 6.3) will be initiated with 45 days of RWQCB approval. Field work will require approximately 7 days to complete. The new groundwater monitoring wells will be first sampled as part of the quarterly groundwater monitoring program.

An Additional Site Investigation Report will be submitted to the RWQCB. The report will contain a summary of the findings of the investigations, including a description of the lithology, boring logs and well completion logs, well development logs, and results of the laboratory soil analyses. The report will also include site cross-section. The report will also include recommendations for additional field work, if necessary.

An anticipated schedule is as follows:

- RWQCB approval – July 15, 2016
- Completion of Field Investigation – August 31, 2016
- Submittal of Additional Site Investigation Report – November 30, 2016.

8.0 REFERENCES

CGR, 2014, Facility Waste Generation and Discharges Report, October 16, 2014.

Department of Water Resources 2003, California's Groundwater, Bulletin 118.

Geosyntec 2014, Site Investigation Workplan, Olancha Spring Water Bottling Facility, 1210 South U.S. Highway 395, Olancha, California, October 17, 2014.

Geosyntec 2015a, Phase 1 Site Groundwater Investigation Report, Olancha Spring Water Bottling Facility, 1210 South U.S. Highway 395, Olancha, California, February 16, 2015.

Geosyntec 2015b, Site Investigation Work Plan Addendum, Olancha Spring Water Bottling Facility, 1210 South U.S. Highway 395, Olancha, California, May 29, 2015.

Geosyntec 2015c, Phase 2 Site Groundwater Investigation Report, Olancha Spring Water Bottling Facility, Olancha, California. August 14, 2015.

Geosyntec 2015d, Third Quarter 2015 Groundwater Report, Olancha Spring Water Bottling Facility, Olancha, California. October 15, 2015.

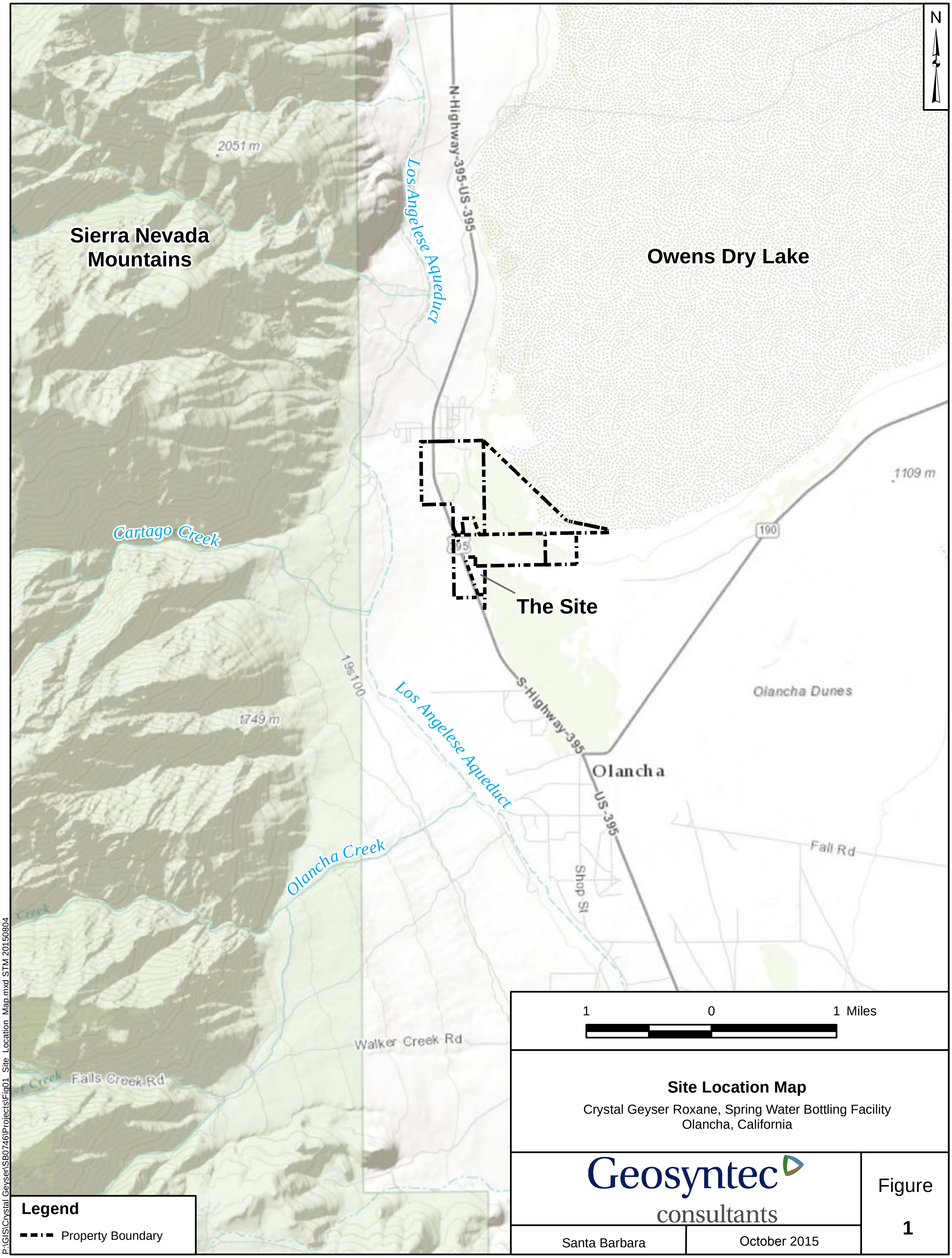
Geosyntec 2016a, Fourth Quarter 2015 Groundwater Report, Olancha Spring Water Bottling Facility, Olancha, California. January 15, 2016.

Geosyntec 2016b, First Quarter 2016 Groundwater Report, Olancha Spring Water Bottling Facility, Olancha, California. April 28, 2016.

D.B. Levy, J.A. Schramke, K.J. Esposito, T.A. Erickson and J.C. Moore 1999, The shallow ground water chemistry of arsenic, fluorine, and major elements: Eastern Owens Lake, California, Appl. Geochem. 14 (1999),

James M. Montgomery, 1993, Environmental Impact Report/Environmental Assessment for the Anheuser-Busch Companies Los Angeles Brewery Water Supply Study.

FIGURES



Site Location Map

Crystal Geyser Roxane, Spring Water Bottling Facility
Olancha, California

Geosyntec consultants

Santa Barbara | October 2015

Figure 1

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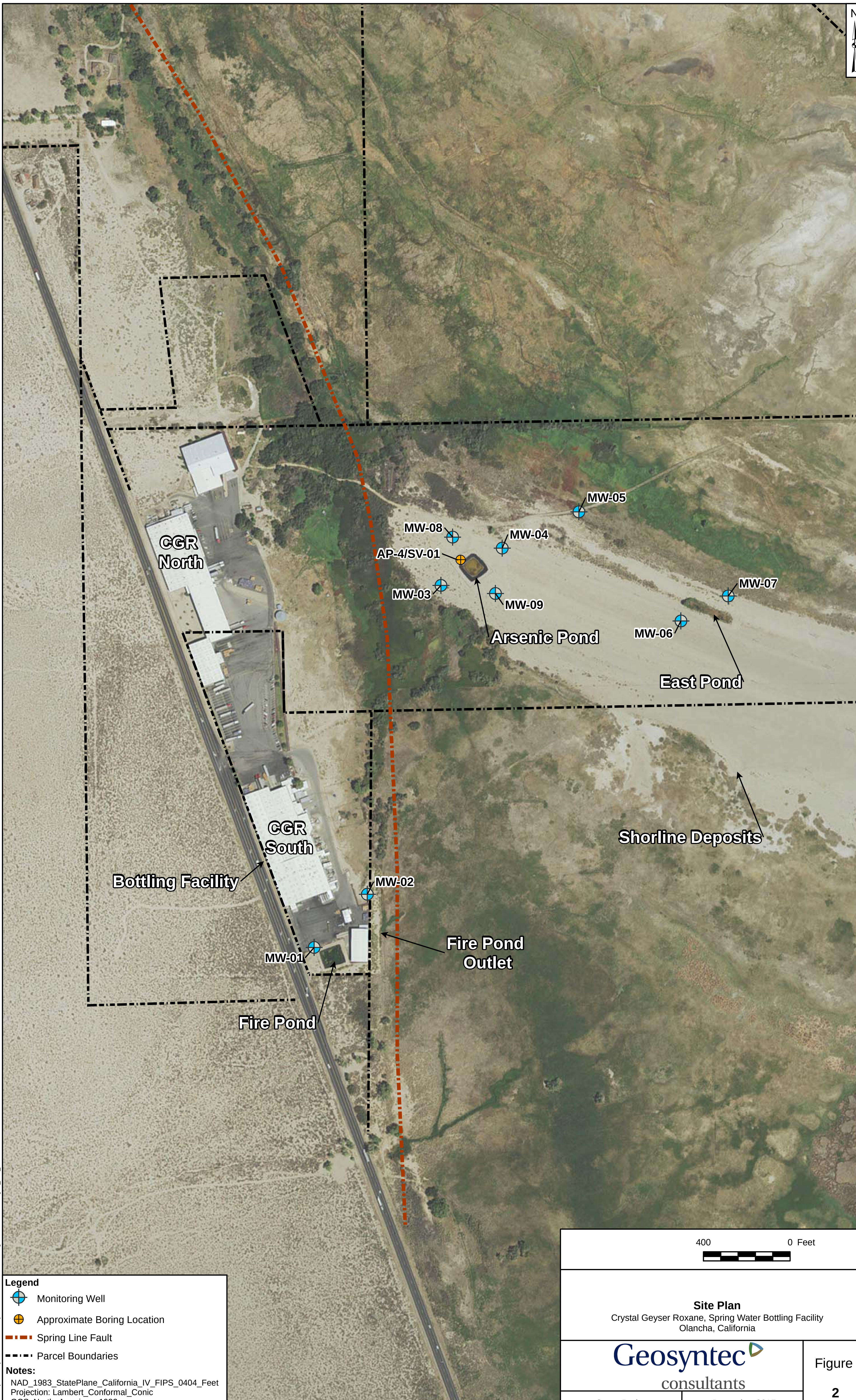

Site Plan

Crystal Geyser Roxane, Spring Water Bottling Facility
Olancha, California

Geosyntec consultants

Santa Barbara | December 2015

Figure 2

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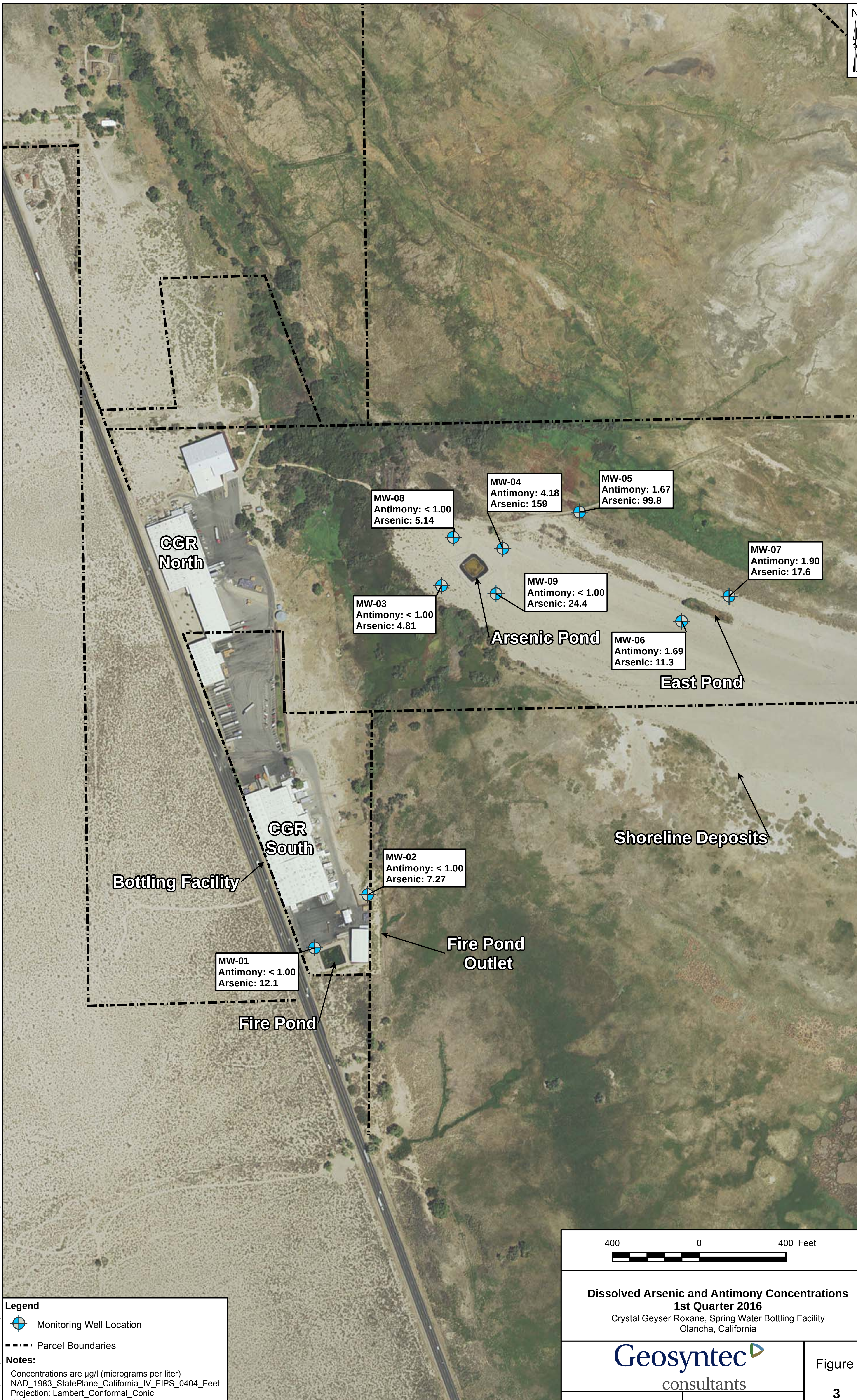

Dissolved Arsenic and Antimony Concentrations
1st Quarter 2016
Crystal Geyser Roxane, Spring Water Bottling Facility
Olancha, California

Geosyntec consultants

Santa Barbara | May 2016

Figure 3

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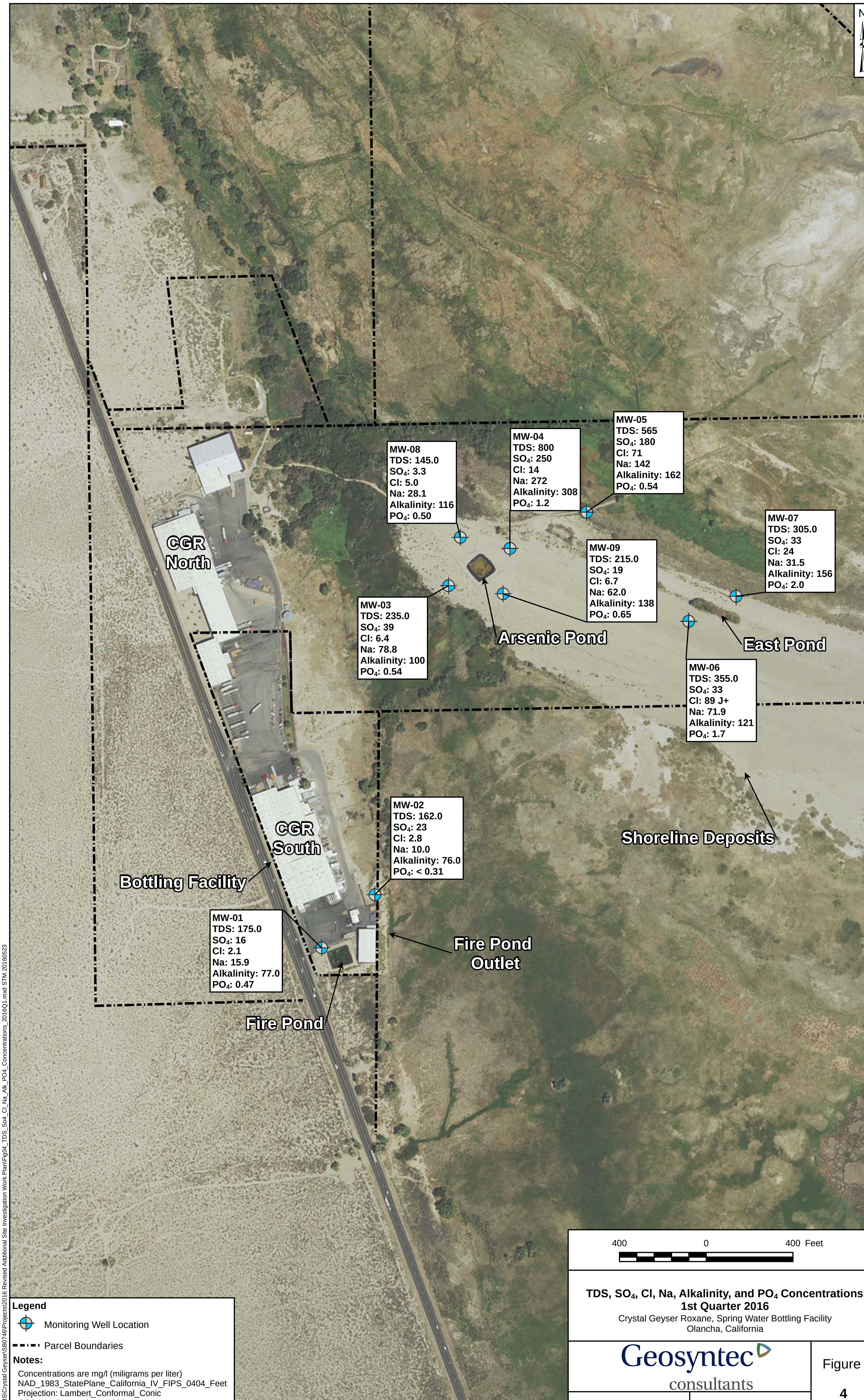
N
MW-08
TDS: 145.0
SO_4: 3.3
Cl: 5.0
Na: 28.1
Alkalinity: 116
PO_4: 0.50
MW-04
TDS: 800
SO_4: 250
Cl: 14
Na: 272
Alkalinity: 308
PO_4: 1.2
MW-05
TDS: 565
SO_4: 180
Cl: 71
Na: 142
Alkalinity: 162
PO_4: 0.54
MW-07
TDS: 305.0
SO_4: 33
Cl: 24
Na: 31.5
Alkalinity: 156
PO_4: 2.0
MW-09
TDS: 215.0
SO_4: 19
Cl: 6.7
Na: 62.0
Alkalinity: 138
PO_4: 0.65
MW-03
TDS: 235.0
SO_4: 39
Cl: 6.4
Na: 78.8
Alkalinity: 100
PO_4: 0.54
MW-06
TDS: 355.0
SO_4: 33
Cl: 89 J+
Na: 71.9
Alkalinity: 121
PO_4: 1.7
MW-02
TDS: 162.0
SO_4: 23
Cl: 2.8
Na: 10.0
Alkalinity: 76.0
PO_4: < 0.31
MW-01
TDS: 175.0
SO_4: 16
Cl: 2.1
Na: 15.9
Alkalinity: 77.0
PO_4: 0.47
CGR North
CGR South
Arsenic Pond
East Pond
Shoreline Deposits
Bottling Facility
Fire Pond Outlet
Fire Pond
400 0 400 Feet
Legend
Monitoring Well Location
Parcel Boundaries
Notes:
Concentrations are mg/l (miligrams per liter)
NAD_1983_StatePlane_California_IV_FIPS_0404_Feet
Projection: Lambert_Conformal_Conic
GCS_North_American_1983
TDS, SO_4, Cl, Na, Alkalinity, and PO_4 Concentrations
1st Quarter 2016
Crystal Geyser Roxane, Spring Water Bottling Facility
Olancha, California
Geosyntec consultants
Figure
4
Santa Barbara
May 2016
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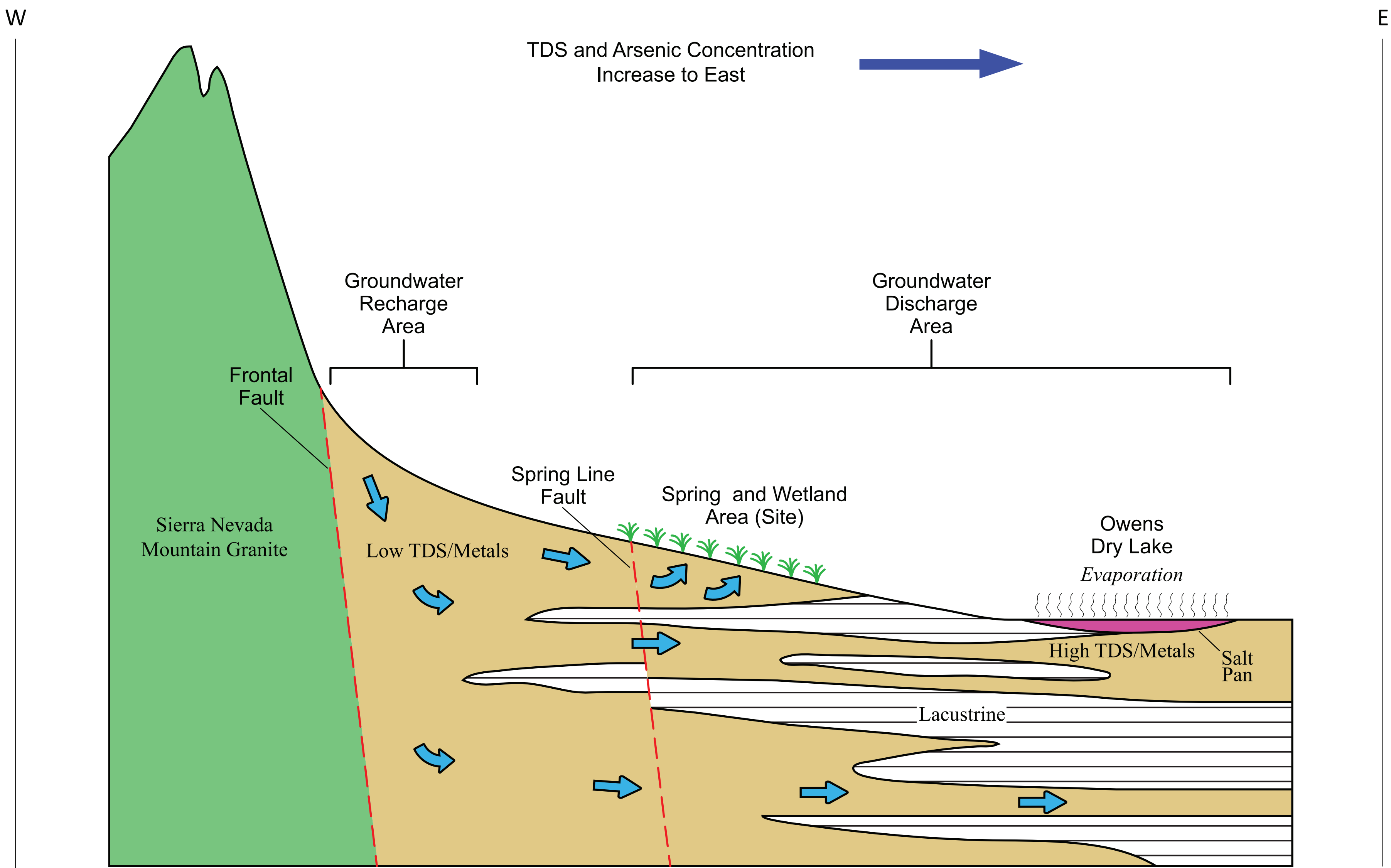

NOT TO SCALE

Hydrogeological Conceptual Model Illustration

Crystal Geyser Roxane, Spring Water Bottling Facility,
Olancha, California

Geosyntec consultants

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Figure 5

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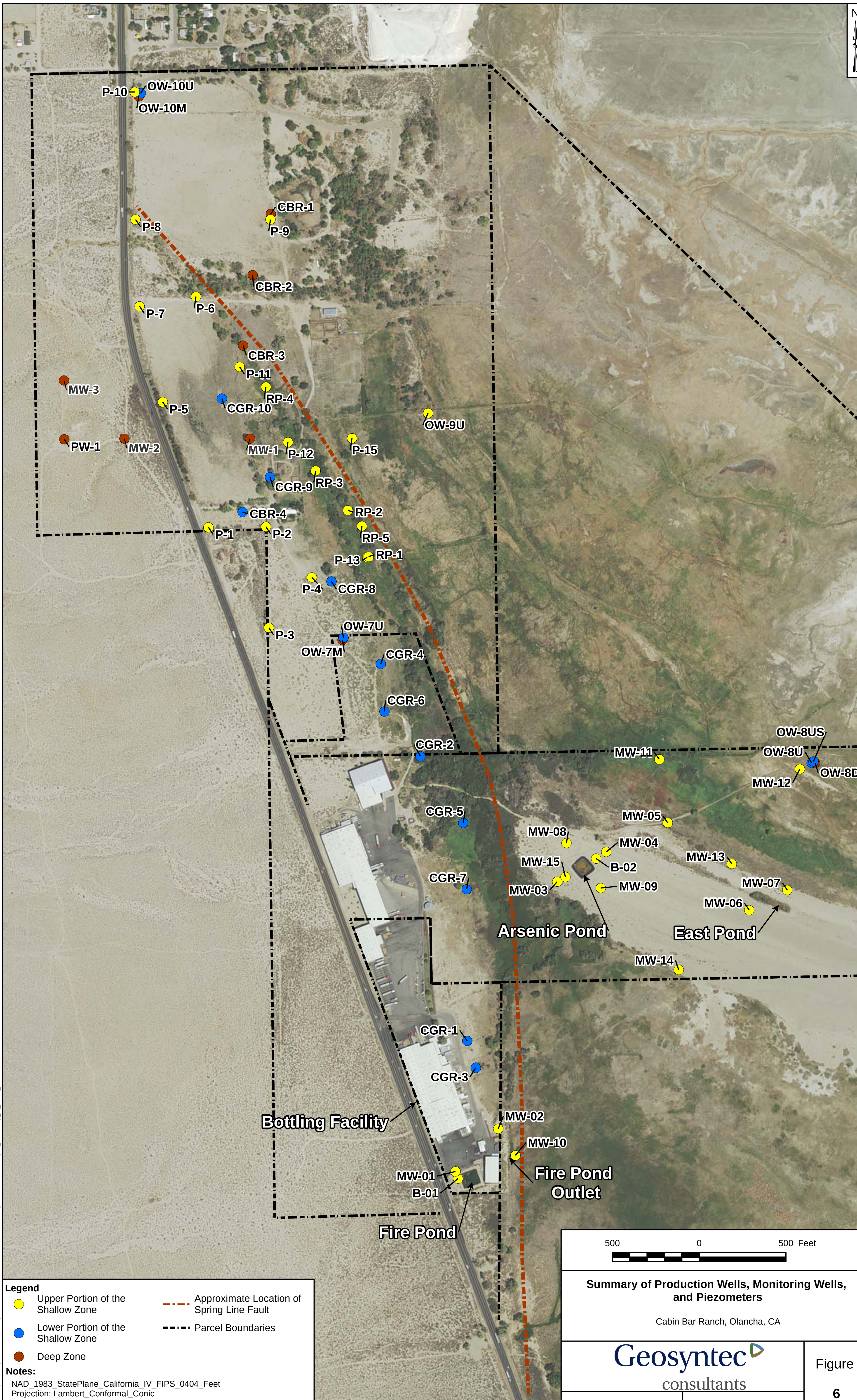

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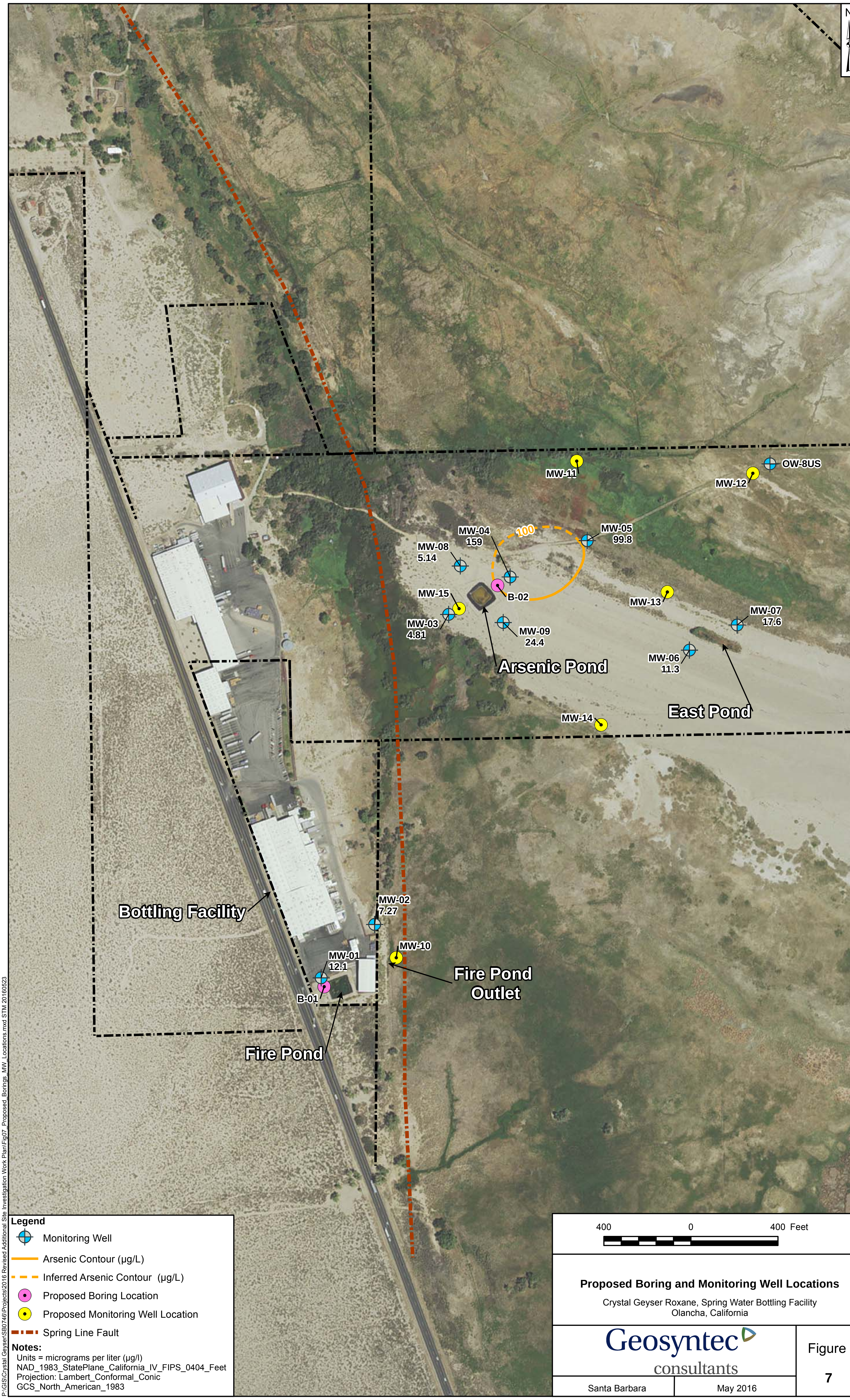

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TABLE

Table 1
Summary of Monitoring Wells for GMMRP
Crystal Geyser Roxane
Olancha CA

Monitoring Area	Well #	Monitored Zone	Depth of Well Screen Interval (ft bgs)	Water Level Monitoring	Quarterly and Semi- Annual Groundwater Quality Monitoring	Purpose or Rationale
Northern	P-10	Shallow	33 - 48	X		Monitor area north of production wells and provide sentinel monitoring to Cartago Area.
	OW-10U	Shallow	65 – 85	X	X	
	OW-10M	Deep	115 – 150	X	X	
Western	P-5	Shallow	23 - 28	X	X	Monitor area hydraulically upgradient of production wells.
	MW-3	Deep	200 – 420	X	X	
Southern	OW-7U	Shallow	54 - 74	X	X	Monitor area south of production wells.
	OW-7M	Deep	212 – 252	X	X	
Eastern	OW-8US	Shallow	55 – 75	X	X	Provide sentinel monitoring to potential brine intrusion from the east.
	OW-9U	Shallow	55 – 75	X	X	
Off-Site	CMW-2	Deep	115 - 150	X	X	Monitor Cartago area.
	PAT-1	Deep	50 – 155	X	X	
Vegetation Monitoring	P-15	Shallow	4-9	X		Monitor wetland area east of production wells.
	SSW-1	Shallow	~4-6	X		

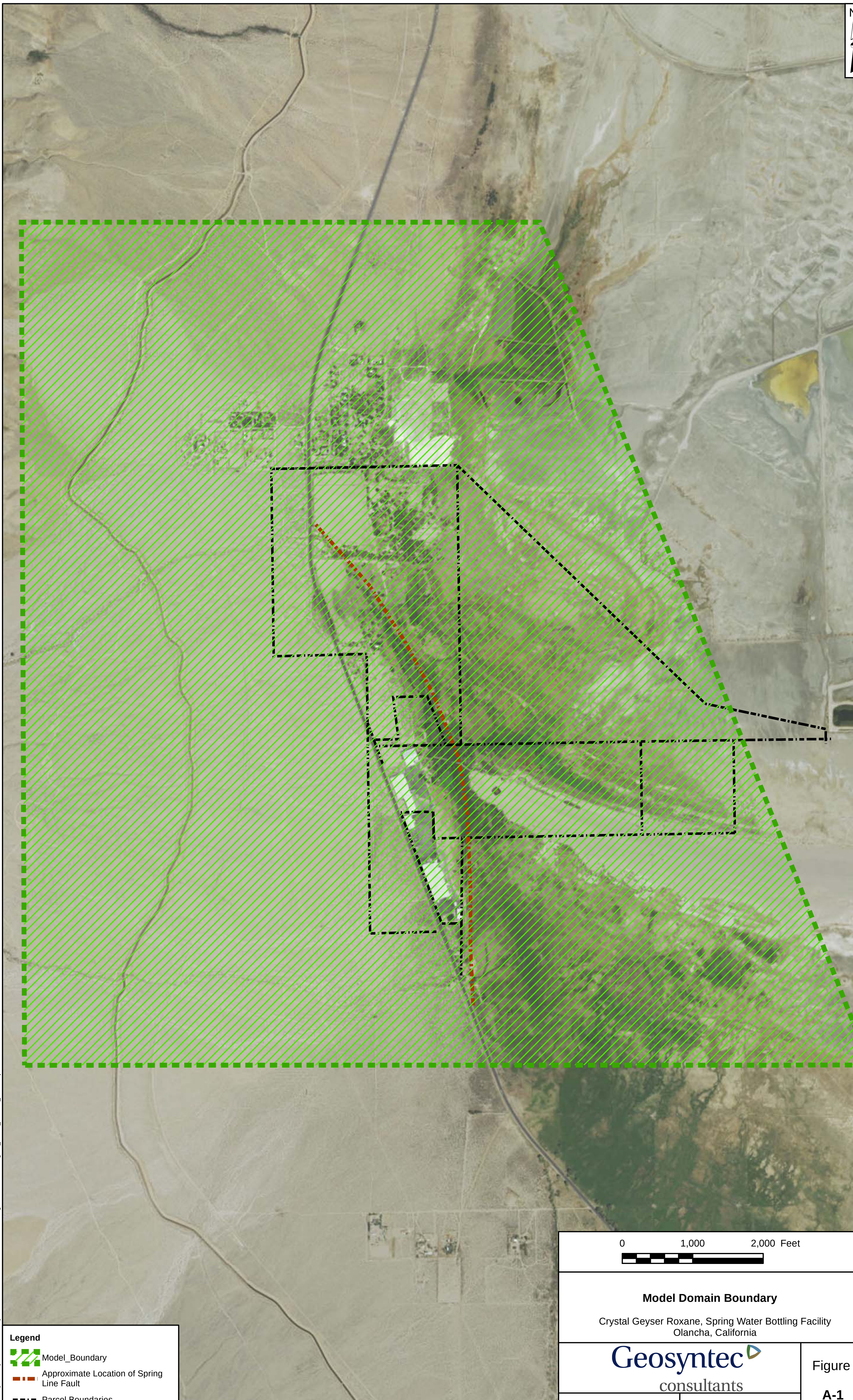
Explanation:

ft bgs: feet below ground surface

X: Designated for monitoring

~: Approximate

APPENDIX A



Model Domain Boundary

Crystal Geyser Roxane, Spring Water Bottling Facility
Olancha, California

Geosyntec consultants

Figure **A-1**

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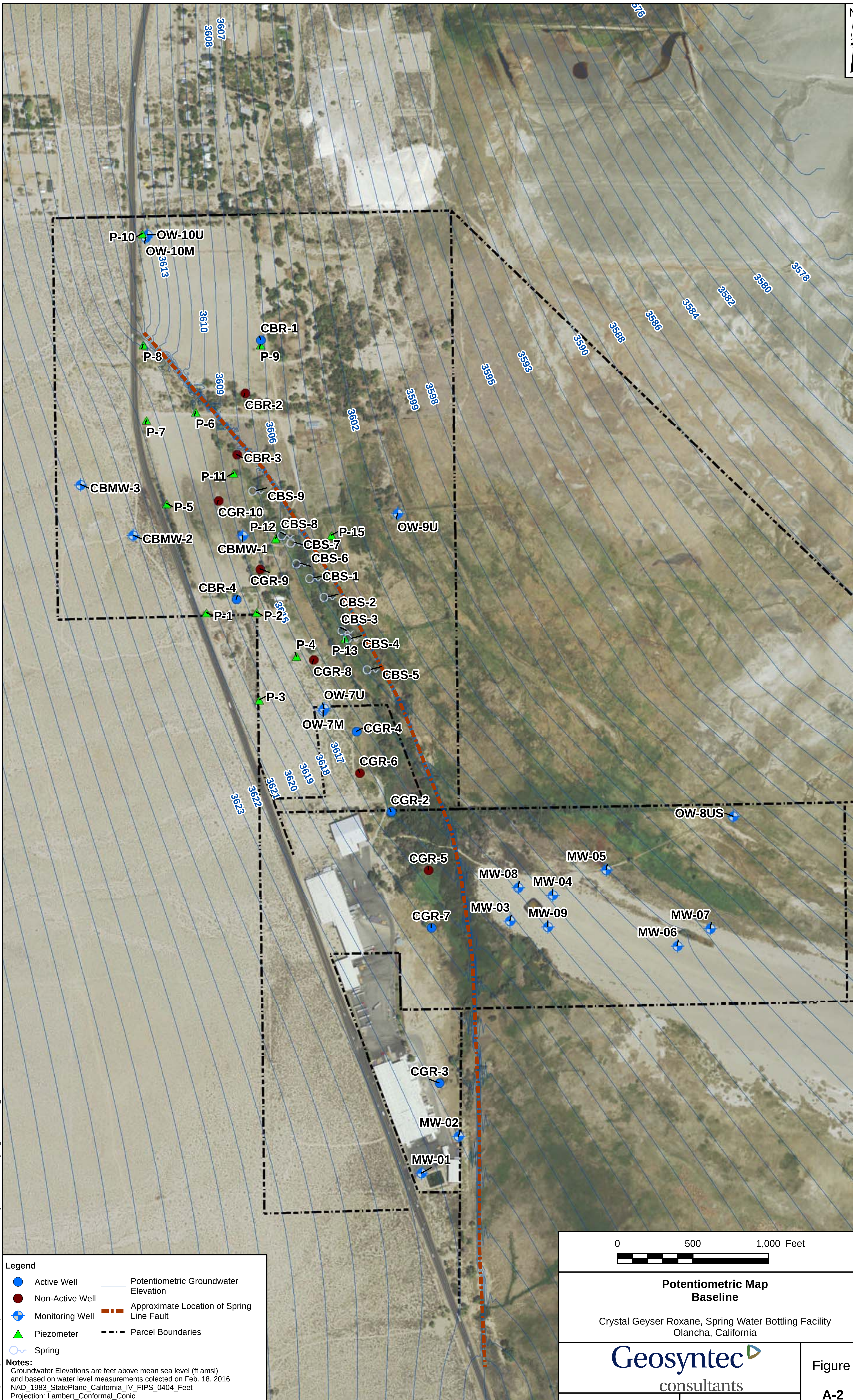

Legend

- Active Well
- Non-Active Well
- Monitoring Well
- Piezometer
- Spring
- Potentiometric Groundwater Elevation
- Approximate Location of Spring Line Fault
- Parcel Boundaries

Notes:
Groundwater Elevations are feet above mean sea level (ft amsl) and based on water level measurements colected on Feb. 18, 2016
NAD_1983_StatePlane_California_IV_FIPS_0404_Feet
Projection: Lambert_Conformal_Conic
GCS_North_American_1983

Potentiometric Map
Baseline

Crystal Geyser Roxane, Spring Water Bottling Facility
Olancha, California

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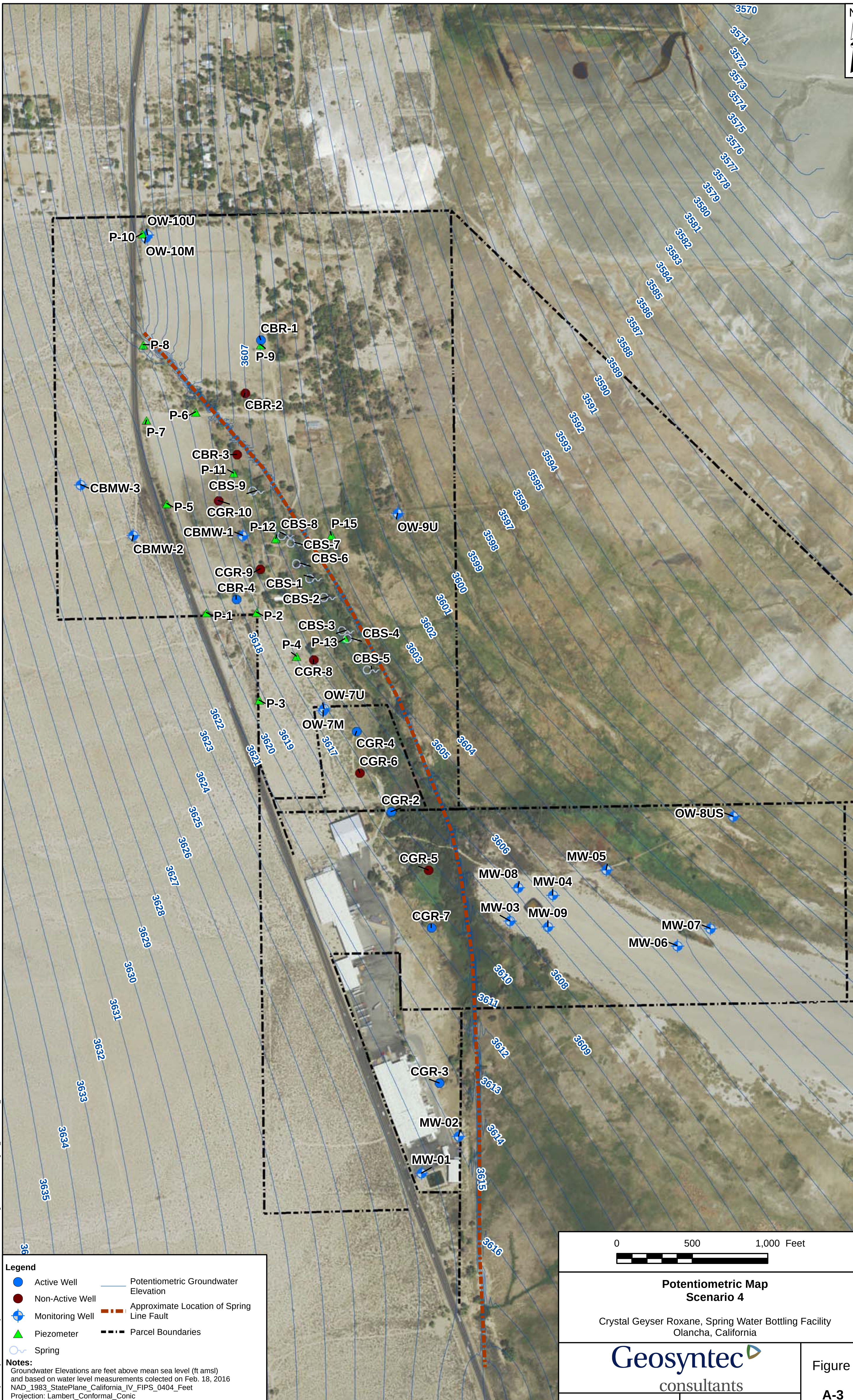
Figure **A-2**

P:\GIS\Crystal Geyser\SB0746\Projects\2016 Revised Additional Site Investigation Work Plan\FigA-2_Potentiometric_Baseline.mxd TCB 20160523



Potentiometric Map
Scenario 4

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Olancha, California

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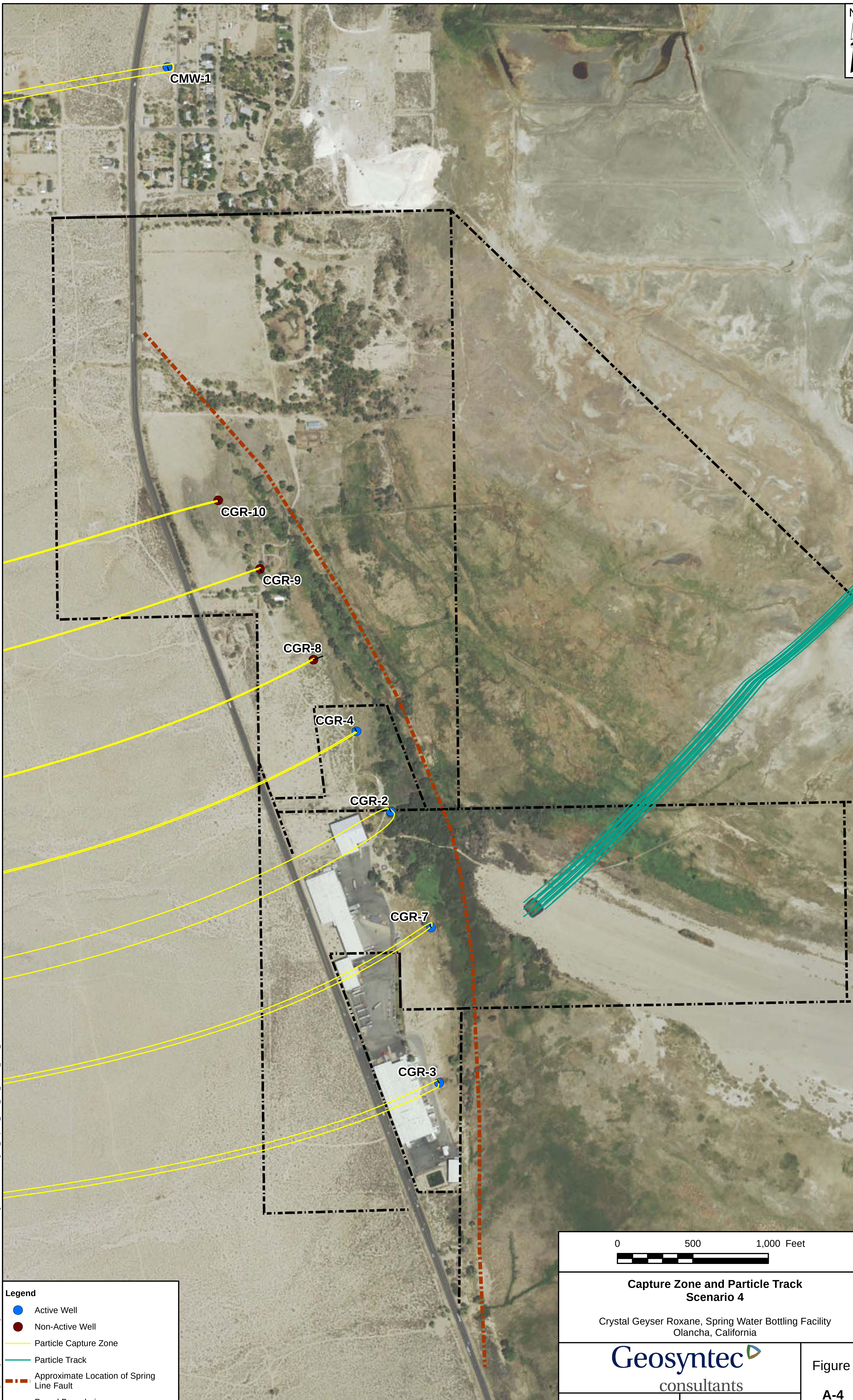
Figure **A-3**



Capture Zone and Particle Track Scenario 4

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Olancha, California

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Figure **A-4**

P:\GIS\Crystal Geyser\SB0746\Projects\2016 Revised Additional Site Investigation Work Plan\FigA-4_Capture_Zone_and_Particle_Track_Scenario4.mxd TCB 20160523