

BRANNIN CREEK DRY WELL RECHARGE CORNING SUBBASIN

PREPARED FOR

TEHAMA COUNTY FCWCD
AND CORNING SUBBASIN GSA

PREPARED BY



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LIST OF ACRONYMS AND ABBREVIATIONS

Acronym	Meaning
AF	Acre-feet
ft	Feet

1. INTRODUCTION

This document summarizes two feasibility studies and water quality testing completed for Brannin Creek. **Appendix A** contains the feasibility study related to a 10-day pilot test on the creek. This pilot test was conducted to determine percolation rates in the creek. **Appendix B** contains engineering plans and feasibility study related to drilling dry wells within the creek to facilitate groundwater recharge. These studies are summarized in **Sections 2 and 3**.

1.1. Location

Brannin Creek runs west to east, flowing into Burch Creek and ultimately into the Sacramento river. The portion of Brannin Creek examined for this feasibility study is located in the southern portion of the Corning Water District, within the Corning Subbasin. This area of Brannin Creek is adjacent to the Rolling Hills Casino and runs parallel to Interstate-5. The Corning canal also terminates at Brannin Creek, although no water from the canal is currently conveyed into the creek.

1.2. Community Partnerships

Due to the study area's location adjacent to the Rolling Hills Casino, the Paskenta Tribe of Nomlaki Indians was approached as potential partners for this recharge project. Discussions with the Tribe are ongoing regarding collaboration on this project. During the feasibility assessment of this project, the Tribe was consulted regarding their plans for a multi-benefit water feature within Brannin Creek and the possibility of linking a recharge project to their plans.

2. PILOT PROJECT

2.1. Methodology

In order to assess the capacity of Brannin Creek for recharge, a 10-day (October 29, 2024, to November 8, 2024) field test was conducted, utilizing water from the Corning Canal. A temporary pipeline was used to convey water from the Corning Canal in Brannin Creek. Water was allowed to flow through a pipeline into the creek and an initial survey of the wetted perimeter was conducted. Following the initial survey, periodic surveys of the wetted perimeter were conducted during the 10-day test. Flow and volume of water was also measured during these periodic surveys. Appendix A details the methodology of the field test.

Soil samples were also taken at three different locations to examine the level of soil saturation and to search for the presence of any confining layers. A confining layer was observed at 1.5 ft below ground surface. Standing water was also observed at all three test holes at this depth.

2.2. Results

The amount of water recharged was calculated using a water balance equation:

$$\text{Recharged Water} = \text{Inflows} - \text{Outflows} - \text{Storage}$$

Where:

Inflows = rainfall and water from the Corning Canal

Outflows = Evaporation

Storage = Pond storage + Soil storage

Appendix A discusses in detail, the calculations of the components of this equation. The values are summarized below:

Rainfall = 0.15 AF

Corning Canal = 9.76 AF

Evaporation = 0.25 AF

Pond Storage = 2.01 AF

Soil Storage = 3.13 AF

Thus, the total amount of water recharged to the subsurface was 4.53 AF. This volume translates to a percolation rate of 4.1 inches per day.

2.3. Conclusions

The percolation rate observed at this test site was 4.1 inches per day. This percolation rate suggests that this site is not an ideal site for recharge without any surface modifications. Without the aid of dry wells, this site would not be viable for a long-term recharge project. However, due to the Rolling Hills Casino Project, which will bring water into this canal, the possibility of a recharge project still exists with inclusion of dry wells. The feasibility of this project with wells is discussed in the next section (**Section 4.**)

3. ENGINEERING

3.1. Dry Wells

An exploratory well was drilled near the site in 2022. The well log from this site was used to confirm the existence of a clay layer at 40-50 ft below ground surface, impeding recharge through the creek into the aquifer system. The well log also showed a gravel layer located 90-105 ft below ground surface. This gravel layer would be the target layer for recharge. **Appendix B** contains this well log.

A total of four dry wells with a diameter of 30 inches is proposed for this site. These wells would be located within the creek. **Appendix B** details well designs along with other infrastructure required to convey water from the Corning Canal to the wells. The design also includes a weir structure at the eastern end of the project site, required to maintain water levels and hydraulic head for the dry wells.

3.2. Recharge Amounts

An estimated 3,000-5,000 AF of water is available for purchase from the Corning Water District. Corning Water District conveys water during the months of April through November. Thus, an eight-month period would be available for recharge.

Appendix B calculated the potential for recharge through all four dry wells as 467 AF per month. If this amount of water can be purchased, it would result in a total recharge amount of 3,736 AF per year.

3.3. Cost Estimate

Preliminary estimates for dry well construction were obtained in 2025. These estimates place the cost of construction of the dry wells at \$70,000 per well or \$280,000 for all four wells.

4. WATER QUALITY EVALUATION

4.1. Methodology

During discussions with the Paskenta Tribe of Nomlaki Indians, an additional source of water for the recharge project was discussed. A lake located on tribal lands could be used for additional water for the project. However, a water quality comparison between the water in the lake and the canal was requested by the Tribe to determine whether the water quality was comparable.

In order to fulfill this request, a water sampling campaign was conducted in conjunction with the 10-day pilot test. Samples from the canal were taken on day one of the 10-day pilot test. Samples were taken at the 10 minutes, one-hour, and two-hour mark. Subsequently, three samples were taken from the lake on the same day. The chain of custody and field papers along with the results from the lab are included in **Appendix C**.

4.2. Results

Cation and anion data converted to milliequivalents per liter (meq/L) show that both canal and lake samples fall within similar sodium-bicarbonate facies, as visualized on the Piper diagram. The canal samples (orange circle, blue star, purple X) exhibit calcium concentrations of 0.60–0.65 meq/L, magnesium concentrations of 0.41–0.49 meq/L, and sodium concentrations of ~0.26 meq/L. The lake samples (green triangle, open circle, red cross) display slightly higher calcium (0.89 meq/L) and magnesium (1.32–1.40 meq/L), with sodium levels ranging from 1.17–1.22 meq/L.

Bicarbonate is the dominant anion in both sources, with concentrations of ~1.15 meq/L in the canal and ~3.28 meq/L in the lake samples. Chloride and sulfate remain low throughout, with SO_4^{2-} at ~0.06–0.07 meq/L and Cl^- at ~0.06–0.14 meq/L. Levels of Total Dissolved Solids (TDS) are slightly higher in lake samples (200–210 mg/L) compared to the canal (90–100 mg/L), but all remain within the range of fresh water.

The Sodium Adsorption Ratio (SAR) is low across all samples. SAR values are 0.4 in all canal samples and 1.1–1.2 in lake samples. These values are well below thresholds of concern, indicating minimal risk of sodium-related infiltration problems.

Additional constituents support these findings. Nitrate levels were reported as non-detect (ND) in all but one sample (0.4 mg/L in the Canal 1 Hour Sample), well below drinking water limits and unlikely to pose environmental concern. Field pH values ranged from 6.5–7.5, suggesting slightly acidic to neutral water

chemistry typical of unpolluted surface waters. Specific conductance in lake samples ($\sim 320 \mu\text{S}/\text{cm}$) was higher than in canal samples ($\sim 130 \mu\text{S}/\text{cm}$), consistent with the slightly higher TDS observed.

Metals analysis indicated trace detections of iron, copper, and antimony in both sources, with no exceedances of regulatory benchmarks and no detection of hazardous elements such as lead, mercury, or cadmium. Additionally, zinc was found only in trace concentrations or not detected in most of the samples.

The Piper diagram (**Figures 1**) confirms these interpretations, as all samples cluster within the same general region, showing no significant chemical divergence between the canal and lake sources.

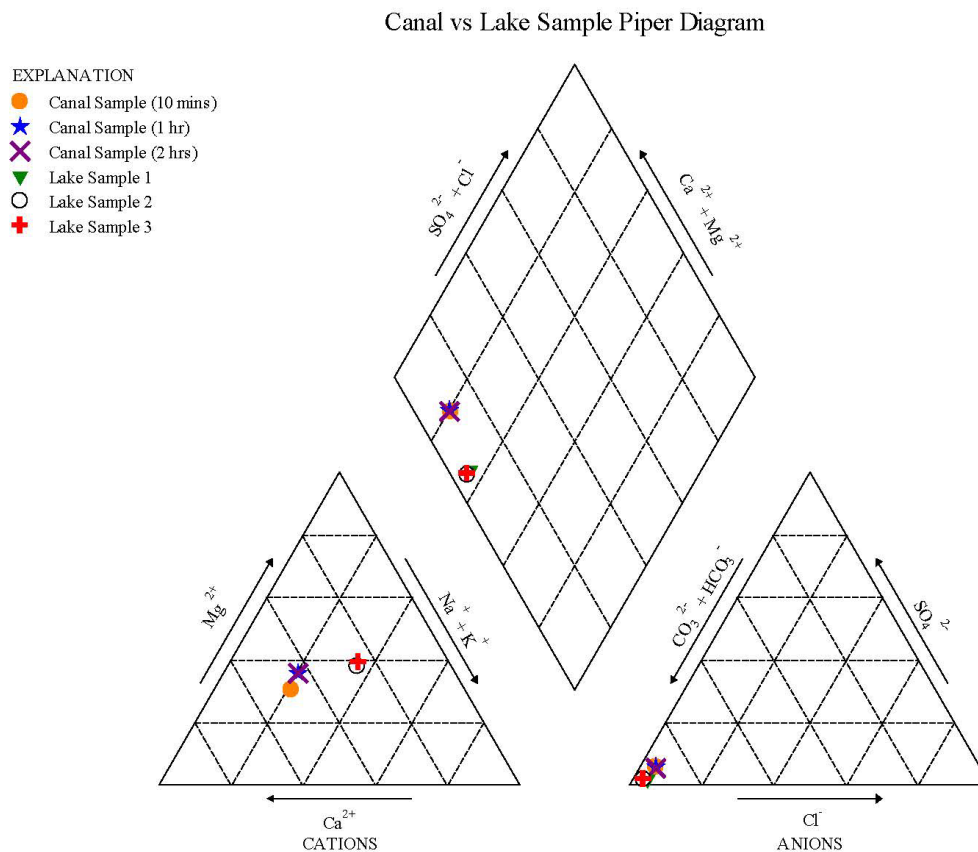


Figure 1-1: Canal vs Lake Sample Piper Diagram

4.3. Conclusions

Results from surface water chemistry analysis of canal and lake samples indicate that the two sources exhibit highly similar geochemical signatures and SAR values, suggesting that canal water is chemically suitable for use in managed aquifer recharge alongside lake water.

5. WATER

5.1. Sources

Water would be purchased from the Corning Water District when available. Excess water available during time of flood events within Brannin Creek could also be utilized. Another potential water source could be discharges from the Corning Canal ahead of storm events.

5.2. Cost Estimate

Water costs are an estimate based on water pricing observed during 2025. Purchased water from Corning Water District was priced at \$80 per AF. If water is purchased at this price, the resulting water cost for a single year of recharge would be \$298,880. However, maximizing water purchases when Section 215 water is available (priced at \$20 per AF) could help reduce overall water costs. Flood water or water that is discharged from the Corning Canal in preparation of a flood event would have no associated cost. Funding sources for the purchase of this water have not yet been established. However, different options are currently being explored including community partnerships and GSA funding.

6. RECOMMENDATIONS

1. The measured percolation rate of 4.1 inches per day combined with the information obtained from the exploratory well log confirms the presence of a confining layer preventing large scale aquifer recharge. Thus, dry wells are recommended to optimize recharge efforts.
2. The project has a multi-benefit use component. In addition to recharge through dry wells, the project ties into a larger project being proposed by the Paskenta Tribe of Nomlaki Indians. The larger project involves creating a multi-use recreational and habitat water feature within Brannin Creek. Thus, collaboration with the larger project would yield a multi-benefit recharge project.
3. Due to the opportunity for collaboration, the potential for a multi-benefit site, and substantial amounts of annual recharge, this project is recommended for implementation under the multi-benefit recharge task under the grant.
4. Continued communication with the Tribe and Corning Water District is recommended to implement this project.

Appendix A

TECHNICAL MEMORANDUM

To: Luhdorff & Scalmanini Consulting Engineers
From: Davids Engineering, Inc.
Date: June 06, 2025
Subject: **Brannin Creek Instream Recharge Feasibility Study**

1 Summary

The Corning Subbasin needs to achieve groundwater sustainability per the Sustainable Groundwater Management Act (SGMA) and as described in its Groundwater Sustainability Plan (GSP). Increasing groundwater recharge is one of the multiple projects and management actions (PMAs) described in the GSP to achieve groundwater sustainability. Davids Engineering (DE) was tasked with evaluating the feasibility of Corning Water District (CWD) conducting instream recharge within Brannin Creek, which is a small seasonal tributary that runs west to east through the southern portion of CWD and then flows into Burch Creek and to the Sacramento River, see **Figure 1**. Utilizing existing infrastructure and natural waterways to facilitate increased groundwater recharge is typically simpler and more cost-effective than design and construction of new recharge facilities. DE evaluated the feasibility of instream recharge within Brannin Creek through a 10-day field test, as described below.

Water flows to evaluate groundwater recharge potential were routed from CWD Lateral C (a buried pipeline) through a temporary above-ground pipeline retrofitted to an existing Lateral C air vent located near the Brannin Creek streambed. Flows were directed into Brannin Creek over a span of 10 days (from October 29th, 2024 to November 8th, 2024). A water budget was completed to calculate the volume that infiltrated and percolated through the streambed (presumably downwards back into the groundwater aquifer), and the streambed geology was evaluated. The water budget directly measured, estimated, or calculated all inflows, outflows, and change in storage (**Figure 2**). The inflows consisted of water redirected from CWD Lateral C into Brannin Creek, which was measured using a flowmeter, and precipitation, which was based on a nearby precipitation gauge. The outflows consisted of evaporation, which was calculated based on wetted area and evaporative demand, and percolation, which was calculated as the closure term based on the conservation of mass. No other surface outflows were observed during data collection over the course of the 10-day field test. The change in storage was estimated through measurements of ponding extent and depth and the saturation depth of the streambed. The overall objective of this effort was to evaluate the recharge potential of Brannin Creek and the feasibility of increasing groundwater recharge in the Corning Subbasin by wetting the creek during times it is dry to allow for water to infiltrate and percolate into the groundwater aquifer.

The feasibility study showed that Brannin Creek was favorable for groundwater recharge due to the close proximity of existing surface water conveyance infrastructure (CWD Lateral C), but unfavorable due to the presence of a confining layer that resulted in the ponded area continually expanding downstream over the course of the 10-day field test. Although there is large uncertainty about whether this value is representative of long term percolation rates in Brannin Creek, the calculated percolation rate from the study is equal to 0.34 feet (or 4.1 inches) per day. Additional investigation and testing would be required to more comprehensively evaluate the long term recharge potential of Brannin Creek and ultimate fate of surface water conveyed to Brannin Creek for recharge.

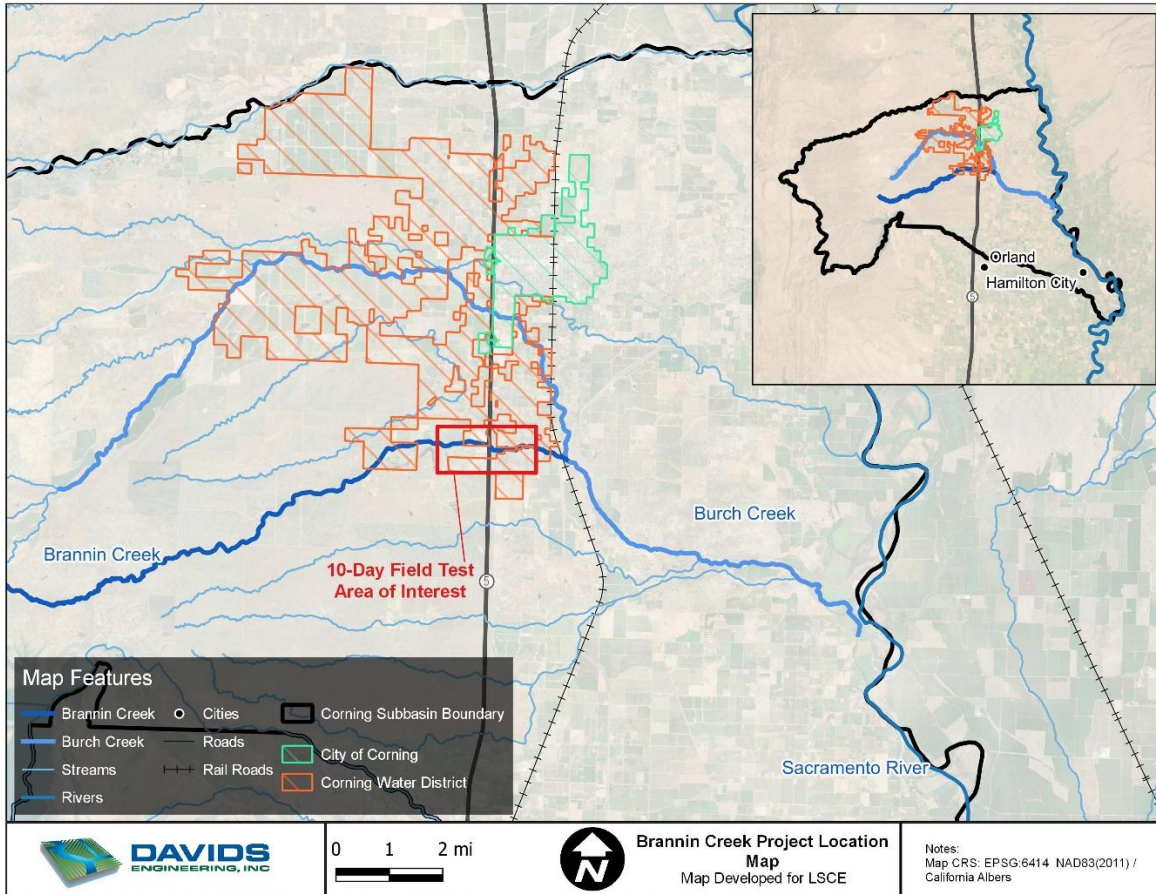


Figure 1. Study location map of Brannin Creek and 10-Day Field Test within the Corning Subbasin.

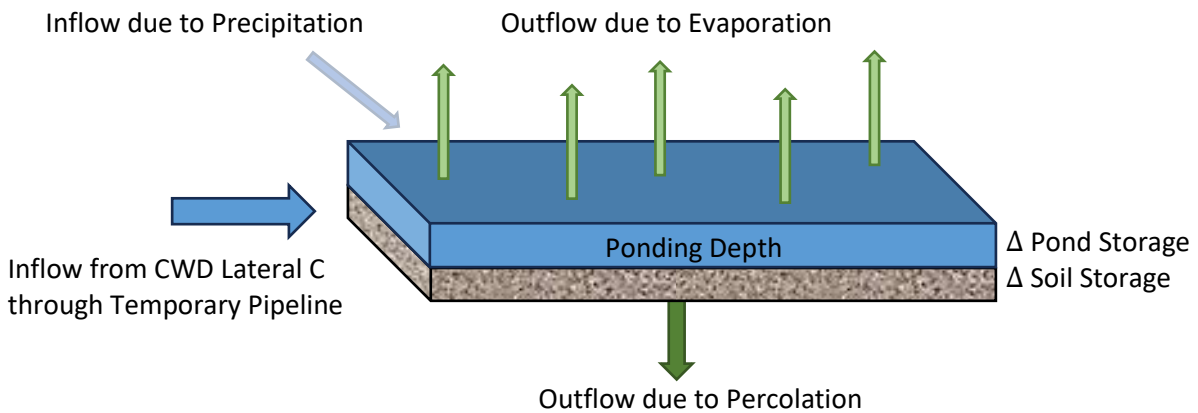


Figure 2. Schematic of instream-recharge water budget. Outflow due to percolation was calculated as the closure term of the water budget; all other inflows, outflows, and change in storage terms were independently measured or estimated.

2 Methods

The following methods and procedures were undertaken to complete the 10-day field test and associated feasibility study.

2.1 Temporary Pipeline Construction

A preliminary site visit was conducted to estimate pipe length and layout, and other associated materials, required to construct a temporary pipeline to convey water from CWD Lateral C to the Brannin Creek streambed. Materials were then procured as outlined in **Appendix B – List of Materials for Temporary Pipeline Construction**. The existing 2" ball air vent at the end of Lateral C was removed, and the temporary pipeline was connected and constructed from the vent location across and into the Brannin Creek streambed, as shown in **Figure 3** through **Figure 5**. A Seametrics 6" AG3000 flanged electromagnetic flowmeter was installed in accordance with the procedures detailed in **Appendix C**, including a raised discharge location to ensure full-pipe conditions at the flowmeter, to measure flows from CWD Lateral C to Brannin Creek. After construction of the temporary pipeline, flow was initiated, and the 10-day field test began. Upon completion of the 10-day field test, the water was shut off and flow stopped, the temporary pipeline was deconstructed, and the site was restored to its original condition.

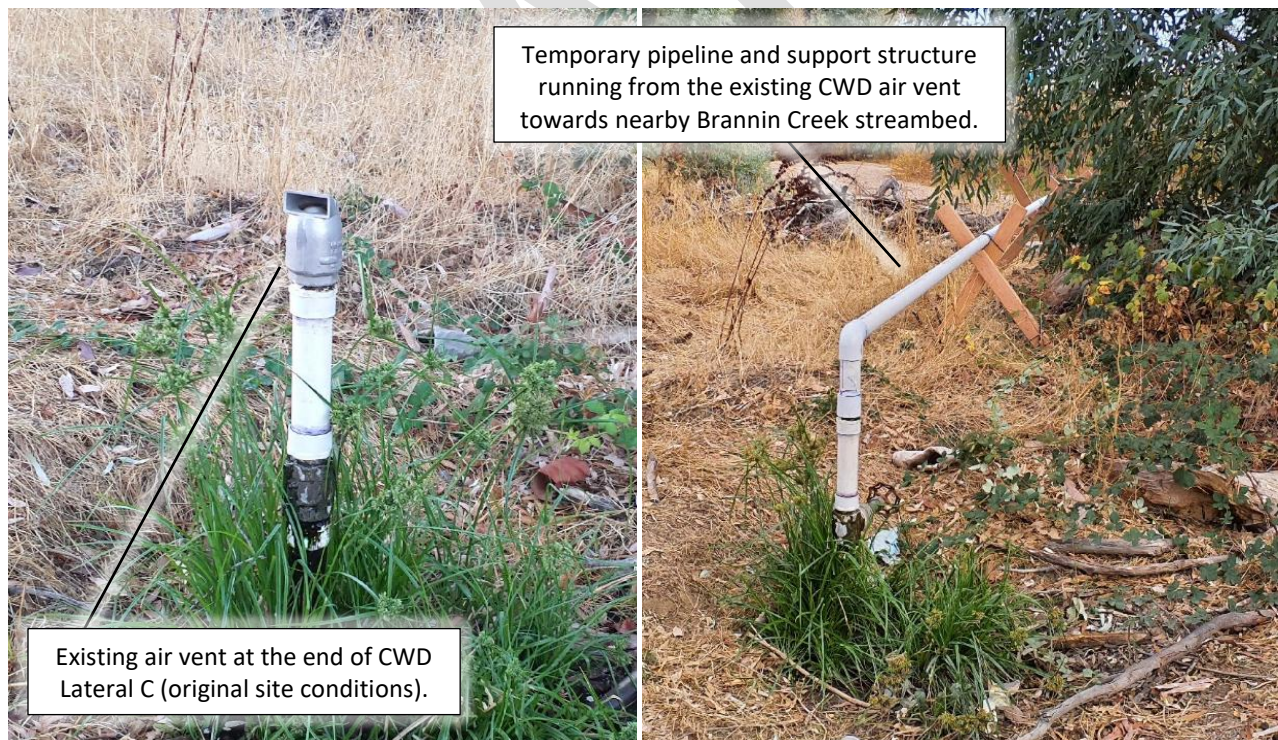


Figure 3. Source of water for Brannin Creek Instream Recharge Feasibility Study, consisting of a temporary pipeline retrofitted to connect to existing infrastructure (an air vent located at the end of CWD Lateral C).



Figure 4. Temporary pipeline and support structure spanning the distance between the CWD Lateral C air vent and Brannin Creek streambed (approximately 60 feet (FT) of 2" PVC pipe).

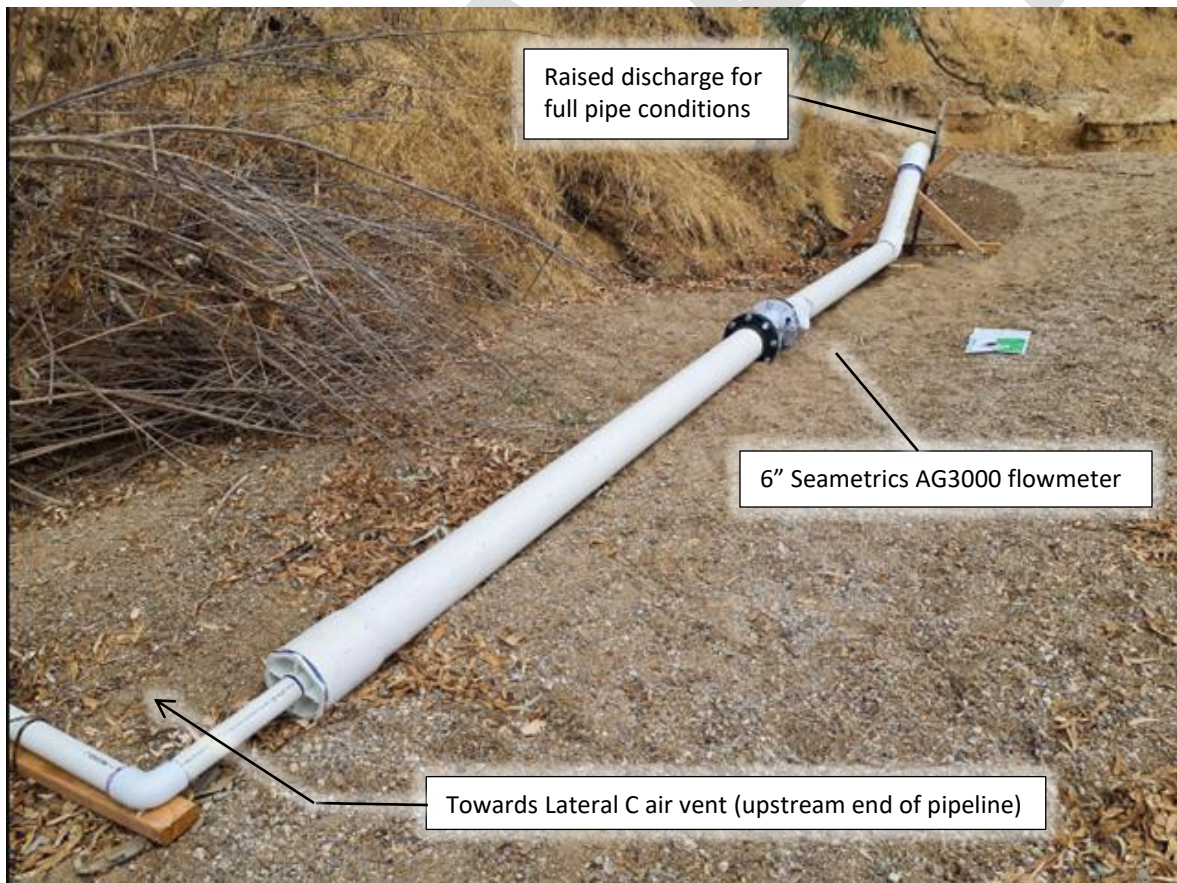


Figure 5. Temporary pipeline in Brannin Creek streambed. Pipeline transitions from 2" PVC to 6" PVC to allow for measurement through 6" Seametrics AG3000 flanged flowmeter. The discharge end of the pipeline is raised in elevation to ensure the pipe remains full for accurate flowmeter measurement.

2.2 10-Day Field Test

At the onset of the 10-day field test, flow was allowed through the temporary pipeline, as shown in **Figure 6**, and an initial survey of the wetted area was conducted on day one. After that, periodic surveys of the wetted area were conducted, along with observations noted on ponding depths, streambed saturation, evidence of percolation, and any potential surface outflows. Wetted perimeter surveys were conducted using a RTK network and rover to collect points along the pooled water edges, and later post-processed in a GIS application. After completing the final survey on day ten, the water inflow from CWD Lateral C was shut off. Data collection also included readings of the flow and volume measured by the Seametrics flowmeter on the days of periodic surveys. Following completion of the 10-day field test, the survey data were then processed and compiled into daily results (including maps of wetted extent, see **Appendix A – Surveys**) for use in the water budget analysis.



Figure 6. Surface water flow redirected from CWD Lateral C into the Brannin Creek streambed for Instream Recharge Feasibility Study.

2.3 Soils Analysis

During the daily surveys described previously, three test holes were excavated in different locations along the streambed to measure the depth of streambed saturation and investigate the presence of any potential confining layers within the subsurface. One of these holes is depicted in **Figure 7**. During the excavations, general observations regarding soil composition were made, along with measuring the depth of streambed saturation or depth to a confining layer. Additionally, a hand auger was also used to collect a soil sample to evaluate soil composition. A desktop soils analysis was also conducted utilizing Natural Resources Conservation Service's (NCRS) Soil Survey Geographic Database (SSURGO) data for the Brannin Creek streambed and surrounding area for comparison to in-field observations.



Figure 7. One of three holes excavated to investigate the existence and depth of a potential confining layer beneath the Brannin Creek streambed. Standing water at a depth of 1.5 FT below the surface was observed at this and the other two test holes.

2.4 Water Budget Analysis

All data collected in the field were processed for water budget analysis calculations. Periodic readings from the Seametrics flowmeter were reviewed and utilized to calculate daily surface water inflow volumes. Survey data for wetted areas were imported into a GIS application to determine the surface area of ponded water. Additional data collection and review related to streambed width, streambed saturation depth, and the soils analysis were completed to estimate soil properties and the subsurface wetted area and extent to calculate a subsurface storage volume; this process included an assessment of the presence of a confining layer.

Precipitation and evaporative demand data were obtained from the nearest California Irrigation Management Information System (CIMIS) station, which was Station #222 in South Gerber (roughly 12

miles to the north of the Study site)¹, for use in water budget analysis. The values obtained from CIMIS in inches per day (in/day) were multiplied by the relevant area to calculate a total volume.

A water budget was then calculated for the 10-day testing period on a daily timestep, as shown below in **Equation 1**. Based on the principle of the conservation of mass, all inflows and outflows must be equal to one another, while accounting for change in storage within the area of interest (both ponded and subsurface storage). As observed in the field during the 10-day field test, no surface outflows occurred apart from evaporation. Each inflow and outflow was quantified as described previously, with percolation being calculated as the closure term of the water budget. The closure term inherently includes any uncertainty and error in measurement or estimation of the other flow paths, and it should also be noted that for purposes of this water budget analysis, the percolation is assumed to represent vertical flow downwards towards the aquifer, but it may also include lateral movement of water within the subsurface (either continuing to flow downstream through the Brannin Creek streambed, or flowing to the north and south away from Brannin Creek).

$$\text{Percolation} = (\text{Inflows}) - \text{Outflows} - \Delta \text{Storage (eqn. 1)}$$

Inflows = Applied water + Precipitation

Outflows = Evaporation

Δ Storage = Change in pond storage + Change in soil water storage

3 Results and Discussion

The SSURGO soils analysis revealed the presence of a confining layer at an average depth of 17.0 IN (or 1.4 FT). During the excavation of the three test holes, beneath a gravel and sandy layer, a hard layer was encountered that could not be easily penetrated with a shovel. The depth to this confining layer from the surface of the sandy soil was recorded, with an average depth of 1.5 FT (a 0.1 FT difference from depth identified in the SSURGO data). A soil sample was also collected using a hand auger, with soils taken from above and from within the confining layer; the soils can be seen in **Figure 8**. The SSURGO soils analysis also provided additional soils information for the Brannin Creek area of interest such as available water holding capacity (AWHC), clay, sand, silt, and rock fragment percentages. **Table 1** depicts these results, in addition to the depth to confining layer. The SSURGO results aligned well with observations in the field, especially regarding the existence of and depth to a confining layer.

Table 1. NCRS SSURGO Soils Analysis Results.

Parameter	Value
AWHC (in)	6.5
Clay (%)	18.0
Rock Fragments (%)	10.7
Sand (%)	41.6
Silt (%)	40.4
Depth to confining layer (in)	17.0

¹ More information above CIMIS (including data access) is available at: <https://cimis.water.ca.gov/>



Figure 8. Soil samples retrieved from Brannin Creek Streambed, showing the soil above the confining layer comprised of sands and gravels (left), and soil within the confining layer (right) comprised of smaller particles that bind together into a hardened material.

To calculate the volume of percolation past the streambed² and potentially back into the groundwater aquifer, a water budget was conducted using the known inflows, outflows, and change in storage (see **Equation 1** previously, and **Table 2** below). Inflows consisted of surface water through CWD Lateral C (and measured by the Seametrics flowmeter), as well as minor precipitation. Outflows consisted of surface evaporation and percolation. Change in storage included ponded water above the streambed in Brannin Creek and subsurface storage in the soils within the Brannin Creek streambed. Over the course of the 10-day field test, the surface water applied from CWD Lateral C created a pond that continually expanded to further downstream reaches on Brannin Creek. The pond surface area and extent was monitored over the 10-day period and is shown in **Table 3, Figure 9, and Appendix A – Surveys**.

² As noted above, this analysis was unable to determine whether this subsurface movement of water was vertical towards the groundwater aquifer or lateral away from or down Brannin Creek.

The depth of ponding varied, but based on in-field observations and measurements of ponded depth, a depth of 1.5 FT was determined to be an overall representative depth for the ponded area (although some ponded depths were shallower and other deeper than this). This depth was multiplied by the ponded area to determine the ponded volume (i.e., surface storage). To calculate soil storage (i.e., subsurface storage), the saturated wetted area was estimated as the length of ponded area along Brannin Creek streambed, multiplied by the streambed width of Brannin Creek (measured over distinct reaches). The extent of subsurface wetted area was reviewed in the field through excavation of test holes, which all were wetted in the subsurface. The resulting wetted area was multiplied by the AWHC from the SSURGO data to estimate subsurface storage.

Table 2. Flow paths and change in storage terms for inflows, outflows, and storage included in the water budget.

Inflows	Storage	Outflows
CWD Surface Water	Pond (i.e., Surface)	Evaporation
Precipitation	Soil (i.e., Subsurface)	Percolation

Table 3. Summary of surveyed surface area data by date for ponding and subsurface soil storage results, including calculation of volumes using the procedure and values described previously. By the end of the 10-day field test there was a pond volume of 2.06 AF on the surface of the streambed and a soil storage volume of 3.13 AF beneath the surface of the streambed (i.e., subsurface).

Storage	Survey Date	Surface Area (sqft)	Surface Area (Acres)	Volume (AF)
Pond	10/29/2024	800	0.02	0.03
Pond	10/30/2024	16,500	0.38	0.58
Pond	11/01/2024	20,700	0.47	0.73
Pond	11/04/2024	22,700	0.52	0.80
Pond	11/08/2024	58,200	1.34	2.06
Soil	11/08/2024	236,800	5.44	3.13

Based on all data assembled, water budget volumes were calculated and summed for the entirety of the 10-day field test. These are described below and shown in **Figure 10**.

1. The surface inflow volume through CWD Lateral C was 9.76 AF (an average flow rate of 221 gallons per minute (gpm) over the 10-day field test³) and precipitation inflow volume was 0.15 AF. The combined inflow volume of these two flow paths was 9.91 AF.
2. The outflow volume due to evaporation was 0.25 AF.
3. Change in storage volume includes pond and soil storage. The ponding depth volume was 2.01 AF, determined using the measured surface area of the ponded extend after 10-days and an average ponding depth of 1.5 FT. The subsurface storage volume was 3.13 AF, based on AHWG (determined in the SSURGO soils analysis), measured streambed area, and the assumed saturated condition.
4. Using equation 1, the values presented above calculate the water budget outflow due to percolation (closure term) equal to 4.53 AF.

³ Six observations of the instantaneous flow rate through the Seametrics flowmeter were also recorded during fields visits. These ranged from 212 to 220 gpm with an average of 217 gpm, slightly lower than the average flow rate calculated based on total volume measured by the flowmeter over the course of the 10-day field test.

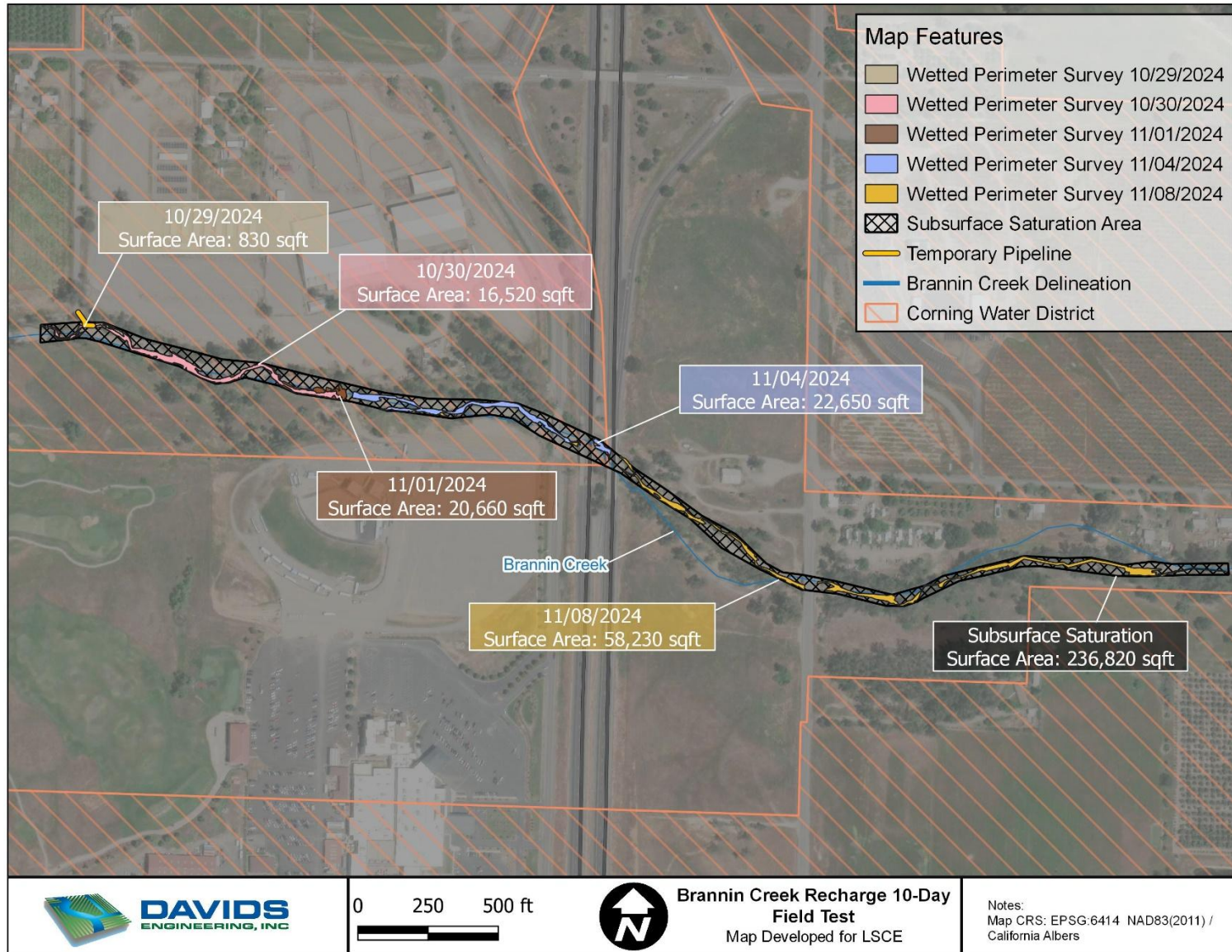


Figure 9. Map of surveyed ponded areas and estimated subsurface saturation.

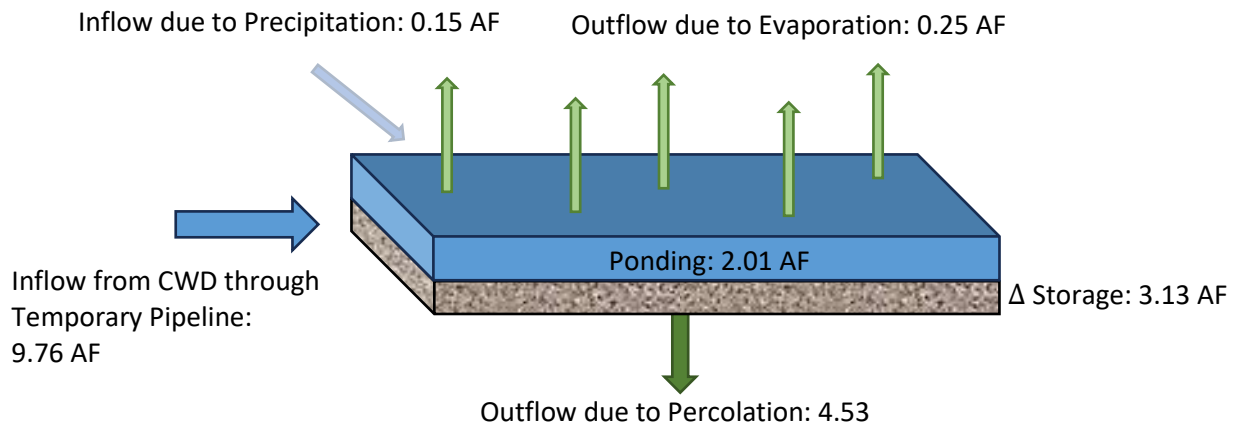


Figure 10. Water budget schematic including total cumulative volumes (AF) from the 10-day field test.

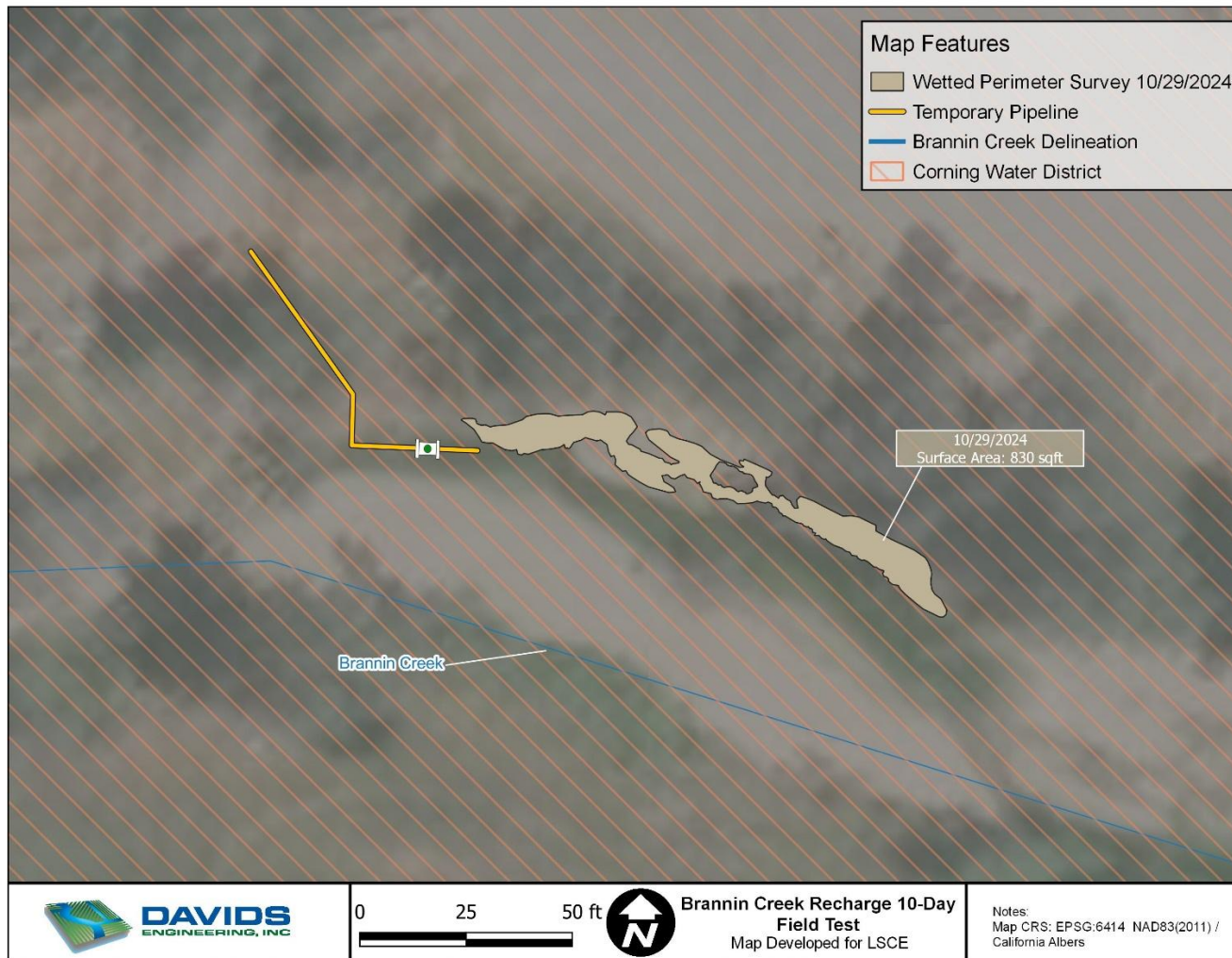
4 Conclusion

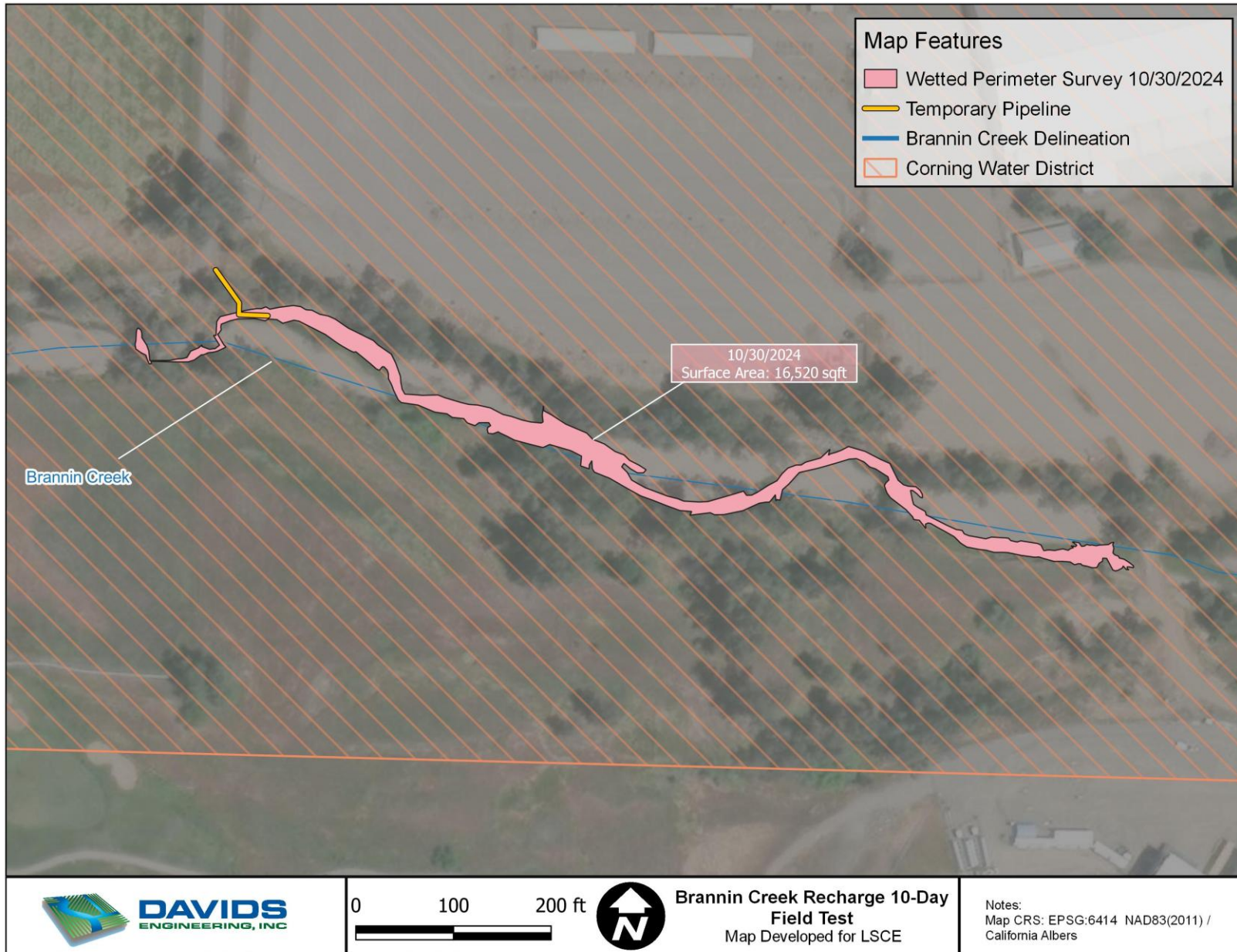
The purpose of this study was to determine the feasibility of CWD using Brannin Creek as an instream recharge location to support increasing groundwater recharge and PMA implementation under the GSP. Brannin Creek's streambed location is favorable due to its close proximity to existing water conveyance infrastructure (CWD lateral C) and would only require relatively simple modifications to deliver surface water to the streambed for potential recharge. However, the presence of a confining layer within the streambed (identified from SSURGO data and confirmed in the field) is unfavorable for recharge; this limits the rate at which water leaves surface and soil storage and resulted in ponded water extent continually expanding downstream over the course of the 10-day field test. Assuming evaporative demands remain low, the majority of the water in surface and soil storage is ultimately expected to result in percolation, although the time required for this percolation to occur is currently unknown, and the final destination of percolation is unknown (i.e., vertical or lateral movement of water in the subsurface). The results of the 10-day field test provide initial information regarding the feasibility of Brannin Creek for groundwater recharge, which can be evaluated relative to other alternatives for increasing groundwater recharge by CWD and others in the Corning Subbasin. Additional investigation and testing would be required to more comprehensively evaluate the long term recharge potential of Brannin Creek and ultimate fate of surface water conveyed to Brannin Creek for recharge.

Although a long term steady state percolation (or recharge) rate cannot be calculated from the data available from this study, a percolation rate can be calculated based on available information. The total percolation of 4.53 AF at the end of the 10-day field test (a volume) divided by the total ponded area of 58,230 square feet (or 1.34 acres) at the end of the 10-day field test (an area) produces a representative percolation depth over this area and time. The resulting value is 3.39 FT (or 40.7 inches) over 10 days, or 0.34 FT (or 4.1 inches) per day. There is uncertainty as to whether this calculated percolation rate is representative of long term steady state conditions for percolation in Brannin Creek (the actual percolation rate may be substantially lower or higher), but this is the percolation rate over the 10-day field test calculated from study results.

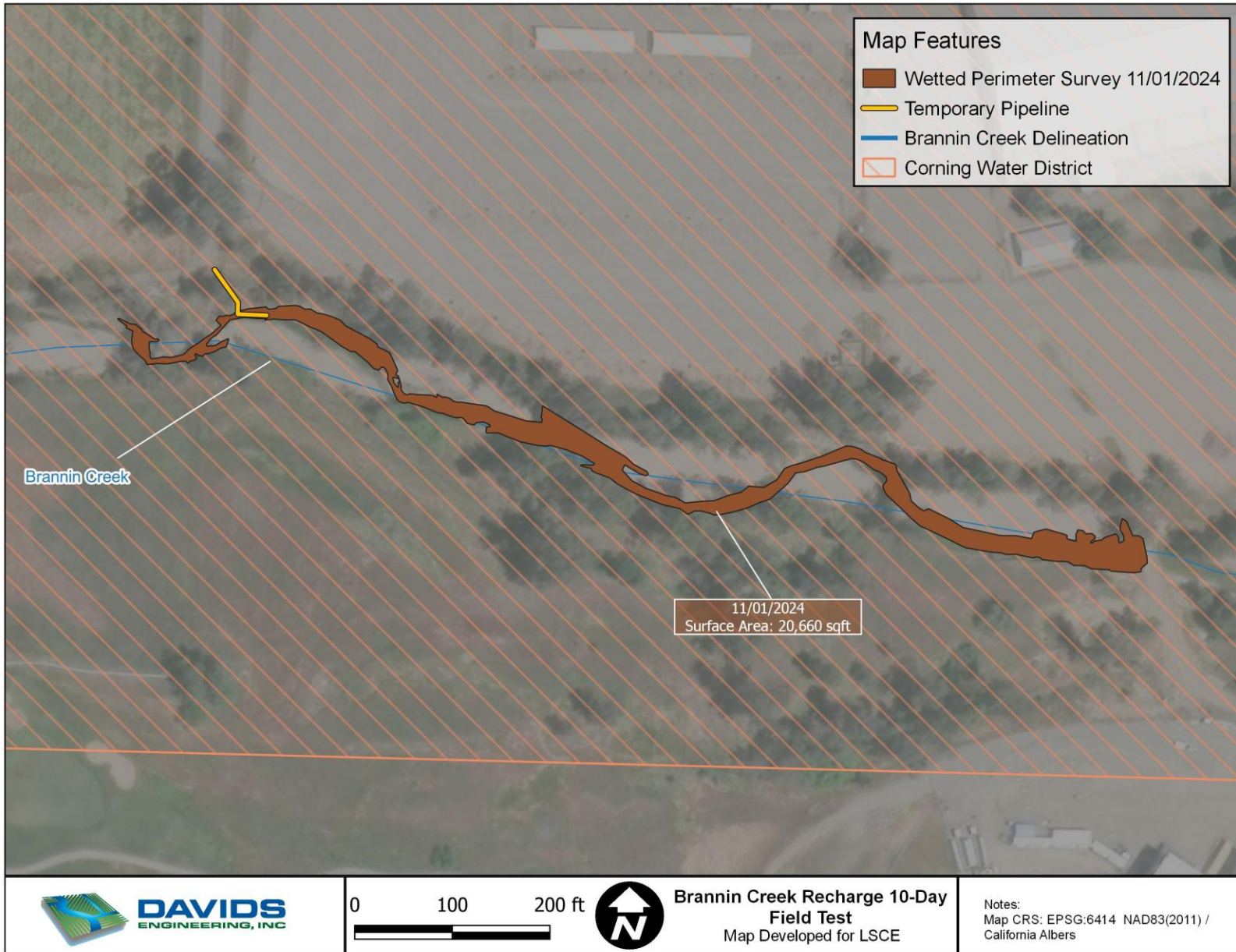
Appendix A – Surveys

The following maps depict results of the RTK surveys conducted periodically throughout the 10-day field test and show the wetted perimeter of the ponded water in the streambed above the surface. It can be seen over the course of the surveys the ponded water expanded downstream substantially.

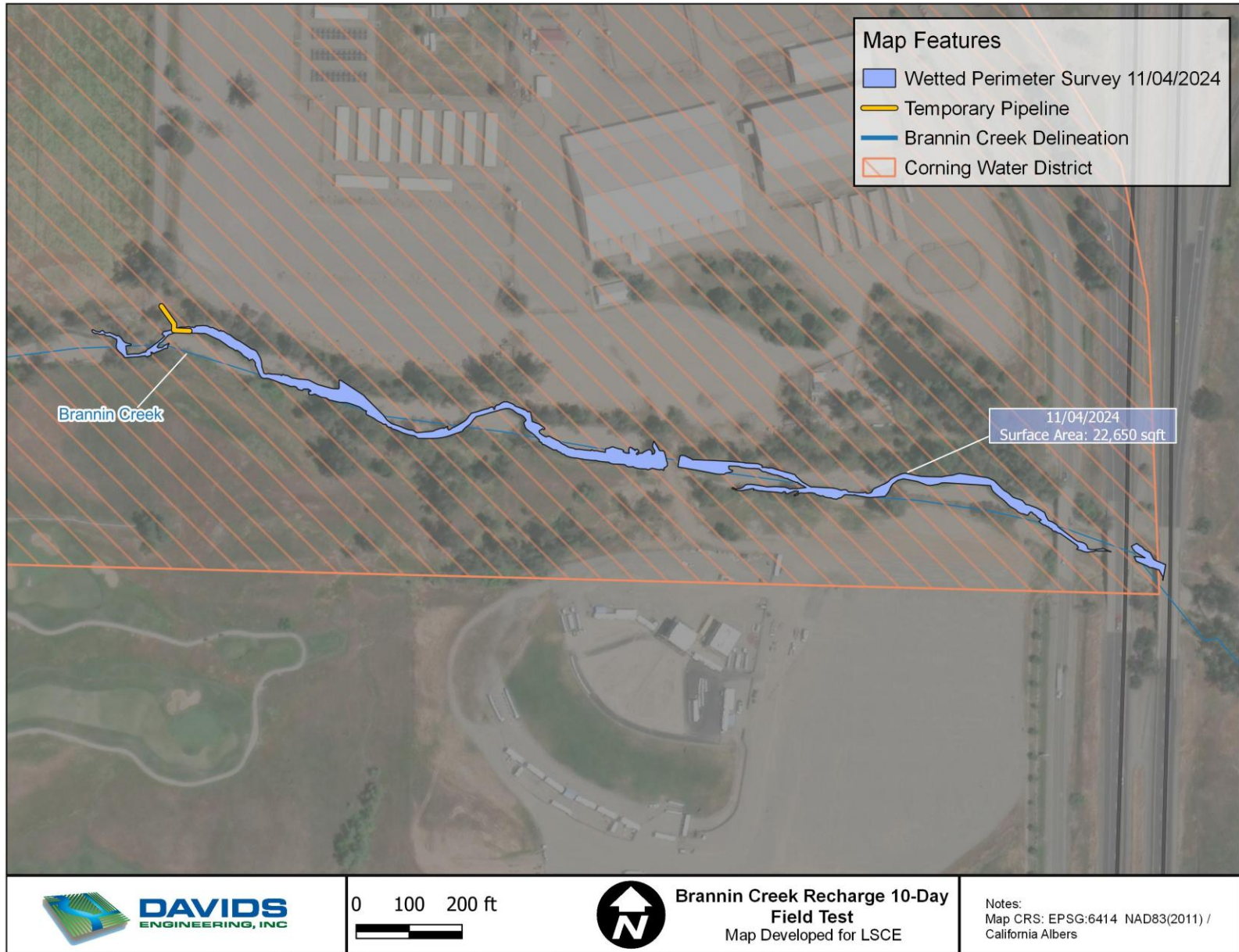


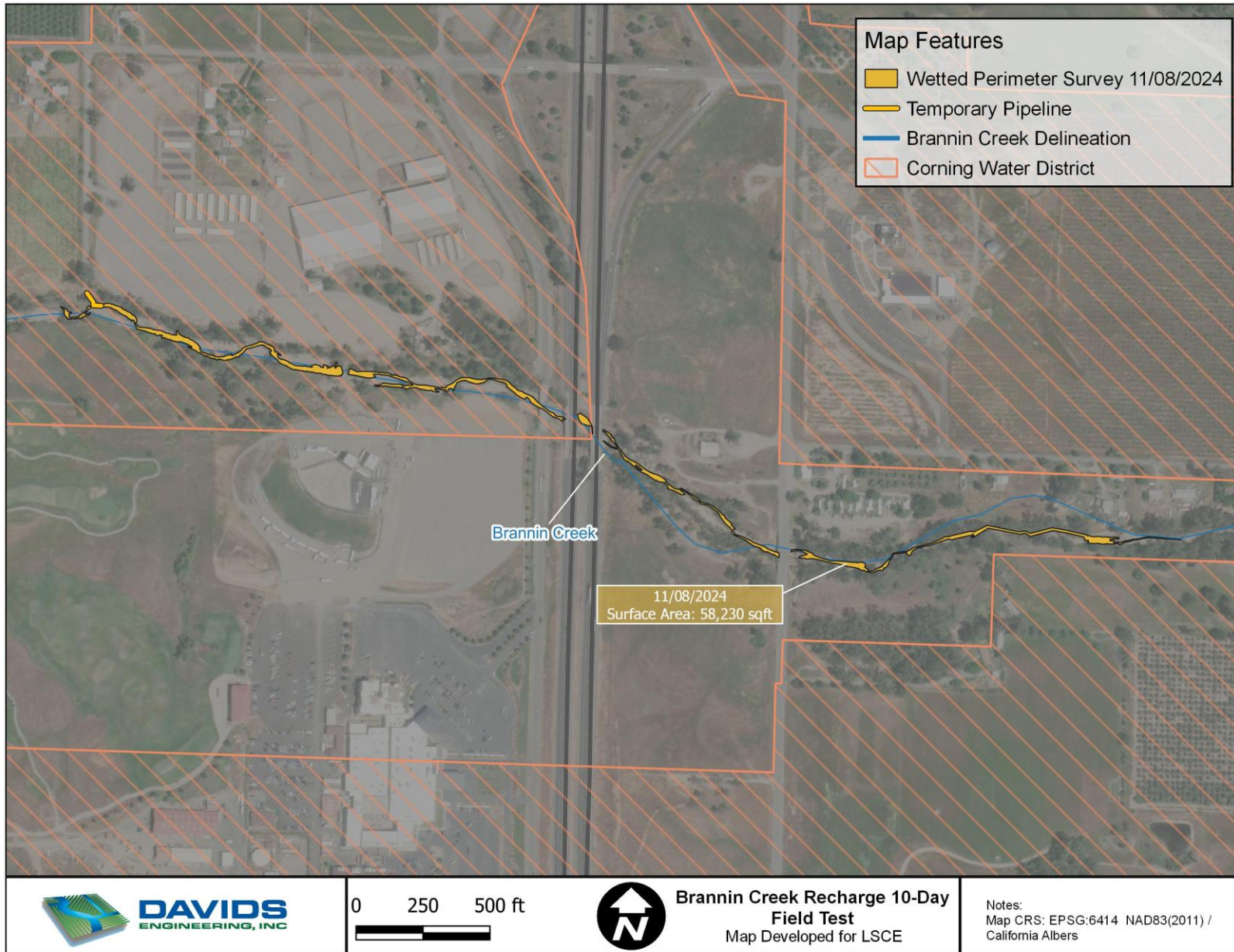


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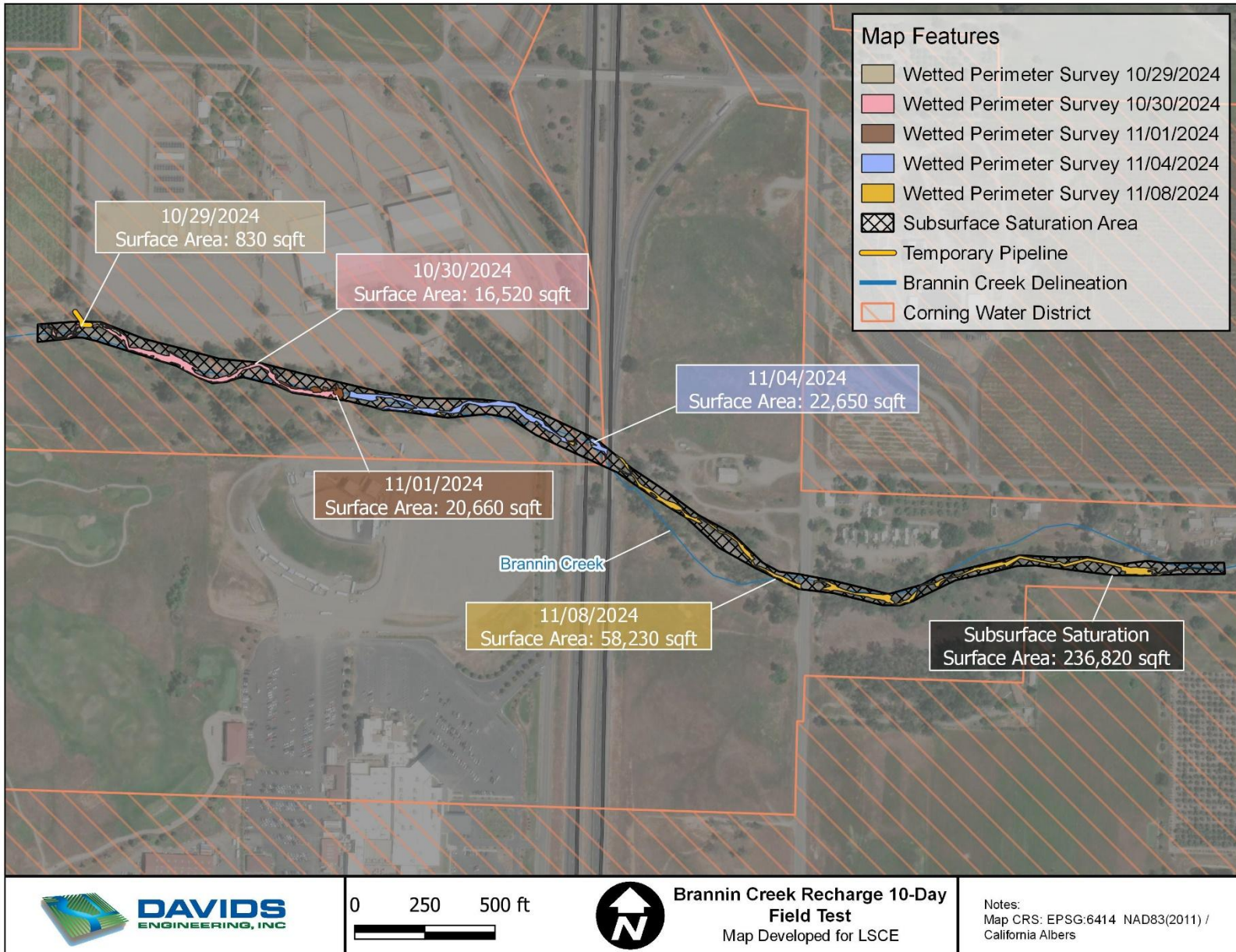


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Appendix B – List of Materials for Temporary Pipeline Construction

Item	Amount
6" Seametrics AG3000 Bolt-on magnetic flowmeter	1
6" Diameter SCH 40 PVC Pipe	20 FT
2" Diameter SCH 40 PVC Pipe	60 FT
6" to 2" pipe reducer fitting	1
2" Fittings and elbows	Various
6" Fittings and elbows	Various
Pipe Primer and Cement	2
2x4x8 Boards for Supporting Structure	8
Miscellaneous required hardware and fasteners	Misc

Appendix C – Seametrics AG3000 Documentation

GENERAL INFORMATION

The **AG3000 Series** is a spool-type electromagnetic flowmeter for use in irrigation applications in 3" to 12" pipe. With no moving parts, these meters provide unobstructed flow and are resistant to wear from debris found in ground or surface water. Little maintenance is required because there are no bearings to wear out or propellers to stop turning. Minimal straight pipe requirements allow AG3000 meters to be used in piping configurations where there is little space between the meter and an elbow.

The standard AG3000 is battery powered with an available pulse output. Both rate and total indication show on the meter mounted display. Bidirectional flow reading is standard with totals available in forward, reverse, net flow, batch forward flow, and batch reverse flow. Batch totals can be reset. Built-in data logging is available as an option

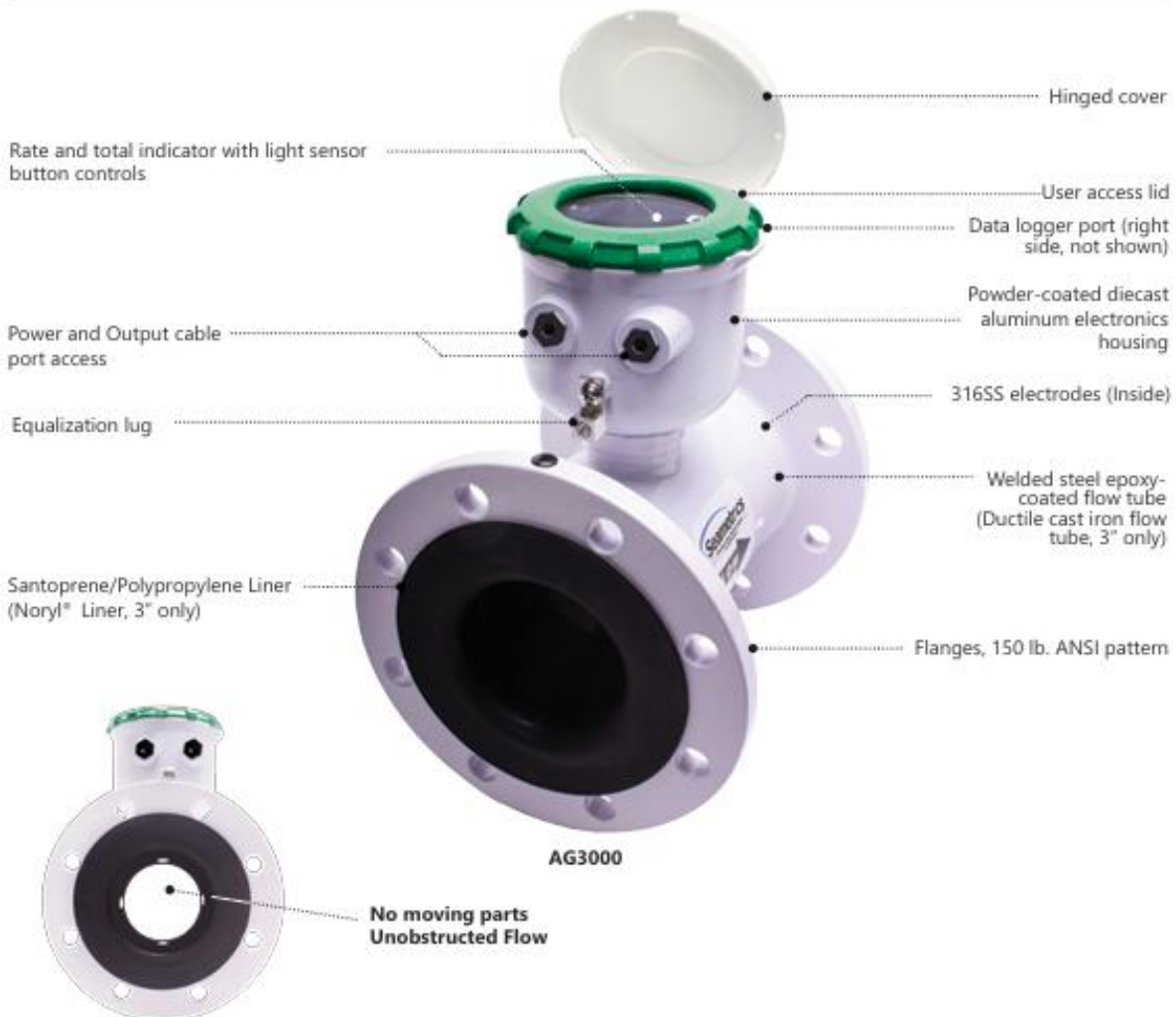
for secure flow logging.

The AG3000 is also available with external DC power. With an externally powered AG3000 an additional output can be added, such as 4-20mA, HART, Modbus®, or high speed digital.

The AG3000 Series is CE certified and IP68 for burial, or applications where the meter may be under water for prolonged periods of time. All meters are provided with a security seal to protect against unauthorized access. The seal can be broken by an authorized agent to replace the battery pack or field install a power/output cable. The cable is field installed where external power is available and/or an output is needed.

AG3000 INSTRUCTIONS

Features



GENERAL INFORMATION

AG3000 INSTRUCTIONS

Specifications*

Pipe Sizes	3", 4", 6", 8", 10", 12"						
Flanges	150 lb. ANSI Pattern						
Pressure	150 psi (10.3 bar) line pressure						
Temperature	Operating	10° to 140° F (-12° to 60° C)					
	Storage	-40° to 158° F (-40° to 70° C)					
Accuracy	±0.75% of reading on AG3000p and AG3000r (±1.0% AG3000), ±0.025% of full-scale flow from low flow cutoff to maximum flow rate of 10 m/sec						
Low Flow Cutoff	0.5% of maximum flow rate						
Material	Body (3" only)	Ductile cast iron, powder coated					
	Body (4"-12")	Welded steel, epoxy-coated					
	Liner (3" only)	Noryl®					
	Liner (4"-12")	Santoprene flange/Polypropylene liner body					
	Electronics Housing	Powder-coated diecast aluminum					
	Electrodes	316 stainless steel					
	O-ring (3" only)	EPDM					
Display	Type	128x64 dot-matrix LCD					
	Digits	5 Digit Rate			8 Digit Total		
	Units	Rate Volume Units		Rate Time Units	Total Volume Units		
	Please Note: All AG3000 meters are factory set for gallons per minute (GPM) rate and acre feet total. If other units are required, they can be set in the field.	Gallons	Million Gallons ²	Second	Gallons	Barrels (42 gal)	Acre Feet
		Liters	Mega Liters ²	Minute	Gallons x 10	Cubic Meters	Acre Inches
		Barrels(42 gal)	Imperial Gallons	Hour	Gallons x 100	Cubic Meters	Imperial Gallons
		Cubic Feet	Million Imperial Gallons ²	Day	Gallons x 1000	x 1000	Imperial Gallons x 1000
		Cubic Meters			Million Gallons	Cubic Feet	
				Liters	Cubic Feet x 1000	Million Imperial Gallons	
				Kilo Liters	Second Foot Day	Gallons	
			Mega Liters	Million Cubic Feet	Fluid Ounces		
	Bidirectional ¹	Forward Total, Reverse Total, Net Total, Batch Forward Total, Batch Reverse Total (Batch totals can be reset)					
Power	DC Power	9-36 Vdc @ 250 mA max, 30 mA average					
	Battery Backup (Not for use as primary power)	DC powered units: Two lithium 3.6V 'D' batteries, replaceable. AC powered units: One 9V alkaline battery, replaceable.					
	AC Power (AG3000r and AG3000p only)	85-264Vac, 50/60Hz, 0.12A					
	Battery (AG3000 only)	One lithium 7.2V 'D' size battery pack, replaceable.					
Scaled Pulse Output	Signal	Current sinking pulse, isolated, 36 Vdc at 10 mA max					
	Pulse Rates	User-scalable from 0.1 to 99,999.9 volume units/pulse. Pulse width is one-half of pulse period with minimum pulse width of 2.5 ms, 200 pulses/sec max. For battery option meters, pulse width varies with frequency, 150 pulses/sec max.					
Options	4-20mA Current Loop	Isolated, passive, 24Vdc, 650 Ω maximum current loop					
	HART/4-20mA	HART protocol over 4-20mA line					
	High Speed Digital Output (AG3000 & AG3000p only)	Isolated, open collector, 24 Vdc					
	Serial Communications	Isolated, asynchronous serial RS485 (Reconfigurable for RS232 or 3.3V CMOS), Modbus® RTU protocol (factory selectable)					
Cable	Power/Output Cable	20ft (6m) standard length polyurethane jacketed cable—for power and outputs (lengths up to 200' available).					
	Remote Display Cable (AG3000r)	20ft (6m) standard length polyurethane jacketed cable—for connection between meter and remote display (lengths up to 200' available).					
Conductivity	> 20 microSiemens/cm						
Empty Pipe Detection	Hardware/software, conductivity-based						
Regulatory	CE (EN 61326)						
Environmental	NEMA 6P, IP68 (10ft (3m) depth, continuously)						

Modbus is a registered trademark of Schneider Electric.

* Specifications subject to change. Please consult our website for the most current data (www.seametrics.com).

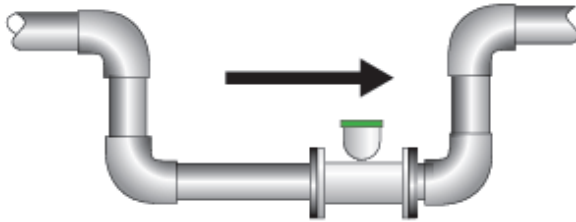
¹ If forward and reverse flow data needs to be sent to another device, either the Digital or Modbus output is required.

² Rate Time Unit is available in Day only.

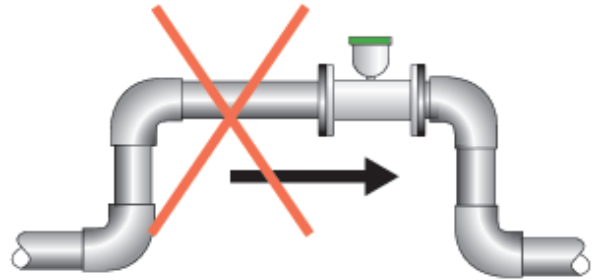
INSTALLATION

AG3000 INSTRUCTIONS

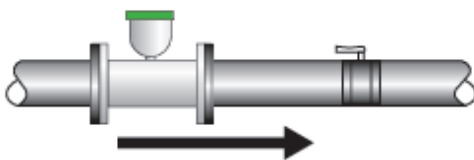
Full Pipe Recommendations



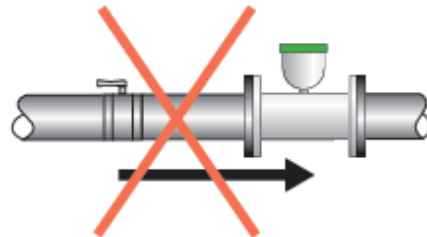
Recommended:
Keep pipe full at meter for accuracy



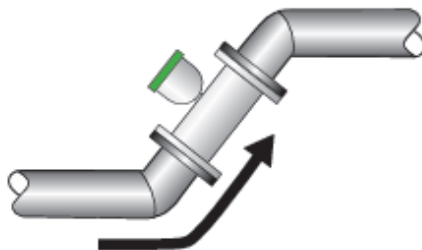
Not Ideal:
Allows air pockets to form at meter



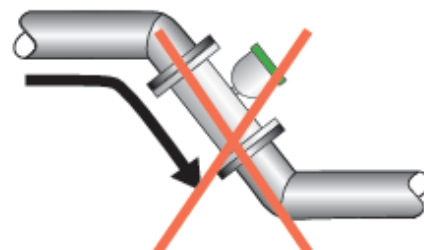
Recommended:
Keeps pipe full at meter for accuracy



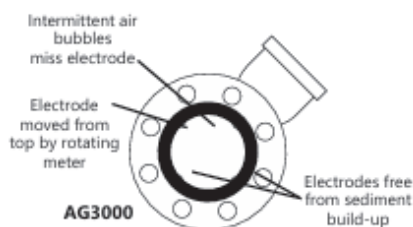
Not Ideal:
Post-valve cavitation can create air pocket



Recommended:
Allows air to bleed off



Not Ideal:
Air can be trapped



Best:
Improved accuracy results from unimpeded electrodes



Not Ideal:
If pipe contains air bubbles or sediment (may affect accuracy)

INSTALLATION

AG3000 INSTRUCTIONS

Tightening Flange Bolts

NOTE: Mating pipe flanges must be ANSI 150# full face (FF) and/or raised face (RT).

1. Tighten flange bolts in an alternating pattern.
 - Tighten left flange bolt-1 to 20% recommended torque.
 - Tighten right flange bolt-1 to 20% of recommended torque.
 - Repeat steps a and b for each bolt in an alternating order, such as shown at right, tightening to 40%, then 60%, then 80%, and then 100%.
2. Test for leaks.
3. If needed, tighten further in 10% increments until leaking stops. **DO NOT over-tighten. Over-tightening can cause serious damage to the flow meter.**
4. Recheck after 24 hours, adjusting if needed.



Suggested Tightening Sequence



Caution: Improper tightening sequence can cause serious damage to the flow meter.

- Do not tighten one side at a time.
- Do not tighten each bolt completely at one time.

SUGGESTED FLANGE BOLT TORQUE

Pipe Size	Liner	
	ft-lb	Nm
3"	25	34
4"	20	27
6"	42	57
8"	65	88
10"	73	99
12"	97	132

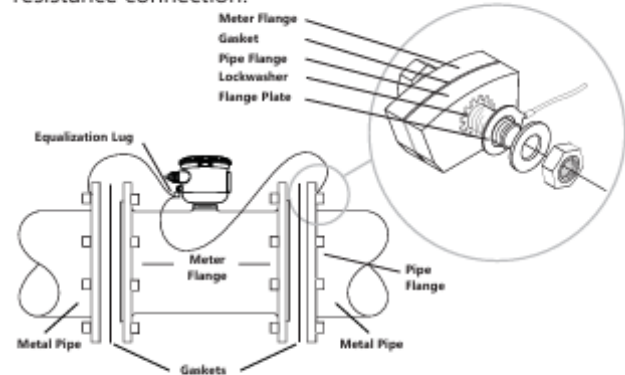
Equalization and Grounding



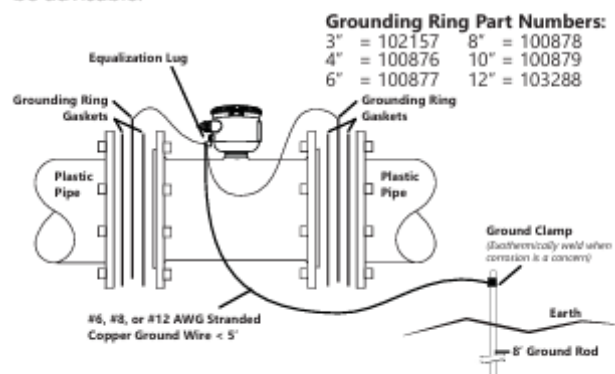
WARNING: ELECTRICAL SHOCK HAZARD

When the AG3000 is installed in a plastic piping system, or when externally powered, the piping system must be grounded to meet national and local electrical safety codes. Failure to do so can result in electrocution.

Metal Pipe Installations. To equalize the electrical potential of the fluid, the AG3000 meter, and the surrounding pipe, secure the flange plates (factory-installed on the equalization wire) to both pipe flanges at one of the bolt holes, as shown below. Be sure the lock washer fits between the pipe flange and the flange plate. For the best electrical bonding, remove rust and paint to expose clean, bare metal where the equalization flange plate lock washer contacts the pipe flange. Connection must be inspected periodically for corrosion to maintain the necessary low resistance connection.



Plastic Pipe and Electronically Noisy Installations. When the AG3000 is installed in plastic pipe or in an electrically noisy system (near a VFD etc.), grounding rings are recommended. As shown in the diagram below, the equalization wires should be solidly connected to the grounding ring tabs instead of the flange bolts as in metal piping installations. Where lightning is a threat, or in severe electrical environments, an optional connection to a nearby equipment ground or ground rod may be advisable.



Appendix B

FEASIBILITY REPORT AND PRELIMINARY DESIGN

BRANNIN CREEK RECHARGE PROJECT



Prepared For:
Tehama County Flood Control
and Water Conservation District

Prepared by:



Haling & Associates
Civil-Environmental Engineers

2540 Zanella Way, Suite 40
Chico, CA 95928
(530) 342-6958

30 JULY 2024

**BRANNIN CREEK RECHARGE PROJECT
FEASIBILITY REPORT
AND PRELIMINARY DESIGN**

**Brannin Creek
Rolling Hills Casino
Corning, CA**

TABLE OF CONTENTS

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1.1	Location.....	1
1.2	Hydrogeologic Setting.....	1
2.0	BASIS OF DESIGN	1
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2.3	Water Conveyance	2
2.3.1	Bulk Head	3
2.3.2	Discharge Structure.....	3
2.3.3	Gravity Turnouts.....	3
2.3.4	Weir Structure.....	3
3.0	CONCLUSION	3

APPENDIXES

Appendix A	Exploration Well Log
Appendix B	Preliminary Design Calculations
Appendix C	Preliminary Design Drawings

1.0 INTRODUCTION

Luhdorff & Scalmanini, Consulting Engineers (LSCE) has been hired by the Tehama County Flood Control and Water Conservation District (Tehama County FCWCD) for the purpose of providing Professional Services for Groundwater Sustainability Plan (GSP) Annual Reports, DWR GSP Review Response to Comments, and Implementation Activities for the Bowman, Red Bluff, Antelope, Los Molinos, and Corning Subbasins. Haling & Associates (H&A) has been hired as a subconsultant to LSCE to assist in the implementation of groundwater recharge activities in the Red Bluff, Los Molinos, and Corning Subbasins. This Feasibility Report is for a proposed project to take place under Task 4.4, regarding recharge through unlined canals and drainages in the Corning Sub-basin.

In consultation with the Paskenta Band of Nomlaki Indians (Paskenta), it is proposed to utilize a section of Brannin Creek to recharge the groundwater aquifer. Due to known impermeable soil layers in the area, dry wells will be utilized to assist in groundwater recharge. Water delivered through the Corning Canal will be utilized for groundwater recharge.

1.1 Location

The proposed project site is an approximately 1700-foot stretch of Brannin Creek, located directly west of Interstate-5. The creek is located directly north of the Rolling Hills Casino, and south of the Liberal Avenue exit. The creek flows east under Interstate-5. The project site stretches between Orchard Avenue and Everett Freeman Way. A map of the project site is included in the preliminary design drawings (Appendix C).

The Corning Canal flows south and ends at Brannin Creek, approximately 7,000 feet west of the proposed project site. A bulk head is located where the canal crosses Liberal Avenue. The 1,600-foot section of canal between Liberal Ave. and Brannin Creek is currently dry.

1.2 Hydrogeologic Setting

An exploration well was drilled near the project site in 2022 (See Appendix A for well log). The area beneath the project site consists of several aquifers at varying depths, separated by layers of high clay soils (70% to 100% clay). The first aquifer/gravel layer occurs at approximately 40 to 50 feet below ground surface. Water has not been observed at this depth. The second aquifer is located between 90 and 105 feet below ground surface. This second aquifer is made up of relatively small gravel with less than 10% clay content and water has been observed at this elevation. Additional gravel layers are present beyond 150 feet, but the second aquifer is the shallowest depth to intercept an effective recharge zone.

2.0 BASIS OF DESIGN

Soil within the project site is known to be very high in clay and relatively impermeable. This includes the soils beneath the creek bed of Brannin Creek. Because of this, dry wells are proposed to allow infiltration of surface water to deeper aquifers.

2.1 Water Supply

Surplus irrigation water from the Corning Water District is proposed to be utilized for this project. The Corning Water District has rights to 15,000 acre-ft per year. Currently, much of this water goes unused and flows back into the Sacramento River. It is proposed to request 3,000 to 5,000 acre-ft per year of water for groundwater recharge.

The Water District does not deliver water between December and March. This leaves 8 months to perform groundwater recharge with the irrigation water supplied from the district. This averages out to about 500 acre-ft per month of recharge flow for design of the dry wells.

Paskenta has proposed utilizing water from their surface water reservoir located west of the Rolling Hills Casino to maintain water elevation within the creek and provide hydraulic head.

This recharge project is not contingent upon, nor utilizes, existing surface water flows from the creek. Regular (seasonal) flows from Brannin Creek would be allowed to flow over the weir and not be captured for recharge.

2.2 Dry Wells

Soil within the project site is known to be very high in clay and relatively impermeable. This includes the soils beneath the creek bed of Brannin Creek. Because of this, dry wells are proposed to be utilized to allow infiltration of surface water to deeper aquifers.

An exploration well was drilled near the project site in 2022 (See Appendix A for well log). This exploratory drilling discovered a gravel layer located between 90 and 105 feet below ground surface. The soil in this layer was described as gravel, clay/silt; small rounded pebbles; gravel (small) with <10% clay. For this soil type, saturated hydraulic conductivity can be estimated to be between 1.64E-03 and 1.64E-01 ft/s.

An estimated 117 acre-ft per month could be accepted by each 30-inch diameter dry well, assuming 1.64E-02 ft/s hydraulic conductivity and depending on actual soil condition at the dry well location.

Four (4) dry wells of this size could accept up to 467 acre-ft per month of water for groundwater recharge purposes. Calculations are presented in Appendix B.

2.3 Water Conveyance

Several structures will be required in order to convey water from the Corning Canal to the project site for groundwater recharge purposes. This will include the following:

- Bulk head at the intersection of Corning Canal and Liberal Ave may require modification
- Discharge structure from Corning Canal to Brannin Creek
- Gravity turnout structure/gate for each dry well
- Weir structure at east end of project site to maintain water level and hydraulic head for dry wells

2.3.1 Bulk Head

A bulk head is present at the intersection of Liberal Ave. and the Corning Canal. The canal south of Liberal Ave is kept dry. Modification of this bulk head may be necessary to allow flow to reach the end of the canal at Brannin Creek. Additional investigation is necessary.

2.3.2 Discharge Structure

Additional investigation at the south end of the Corning Canal is required to determine the condition of the canal; what infrastructure already exists there, if any; and what additional structures will be necessary.

At a minimum, discharge from the Corning Canal will require:

- A method to measure and control the amount of water released, e.g. an adjustable weir
- A method of transporting water to Brannin Creek, e.g. a culvert or channel

The discharge structure will be designed for a flow of 500 acre-ft per month.

2.3.3 Gravity Turnouts

Four (4) gravity turnouts (one per dry well) will be necessary to convey water from the creek to each dry well. The dry wells will be constructed along the bank of the project site at even intervals. The turnout will consist of a concrete box with a sloped trash rack, constructed into the bank of the project site. A gate valve will allow the dry well to be closed off as necessary. A 10-inch pipe will convey water from the turnout to the dry well. A stilling well will be installed between the turnout and dry well in order to calculate flow into each dry well.

Preliminary design drawings for the gravity turnouts are provided in Appendix C.

2.3.4 Weir Structure

A broad-crested weir will need to be constructed across Brannin Creek in order to maintain a constant water elevation across the project site. Several options exist for this structure and will need to be considered. A topographic survey of the creek bed and banks will be necessary to determine weir height, weir length, and an adequate location. An adjustable weir may be necessary to allow for lowering of the weir during winter storms.

3.0 CONCLUSION

This report has been prepared on behalf of the Tehama County FCWCD and The Paskenta Band of the Nomlaki Indians. Following review of this report, additional information, permitting, and design will be required for construction of this recharge project. This report and the design drawings herein are for preliminary and conceptual purposes, not for construction.

APPENDIX A

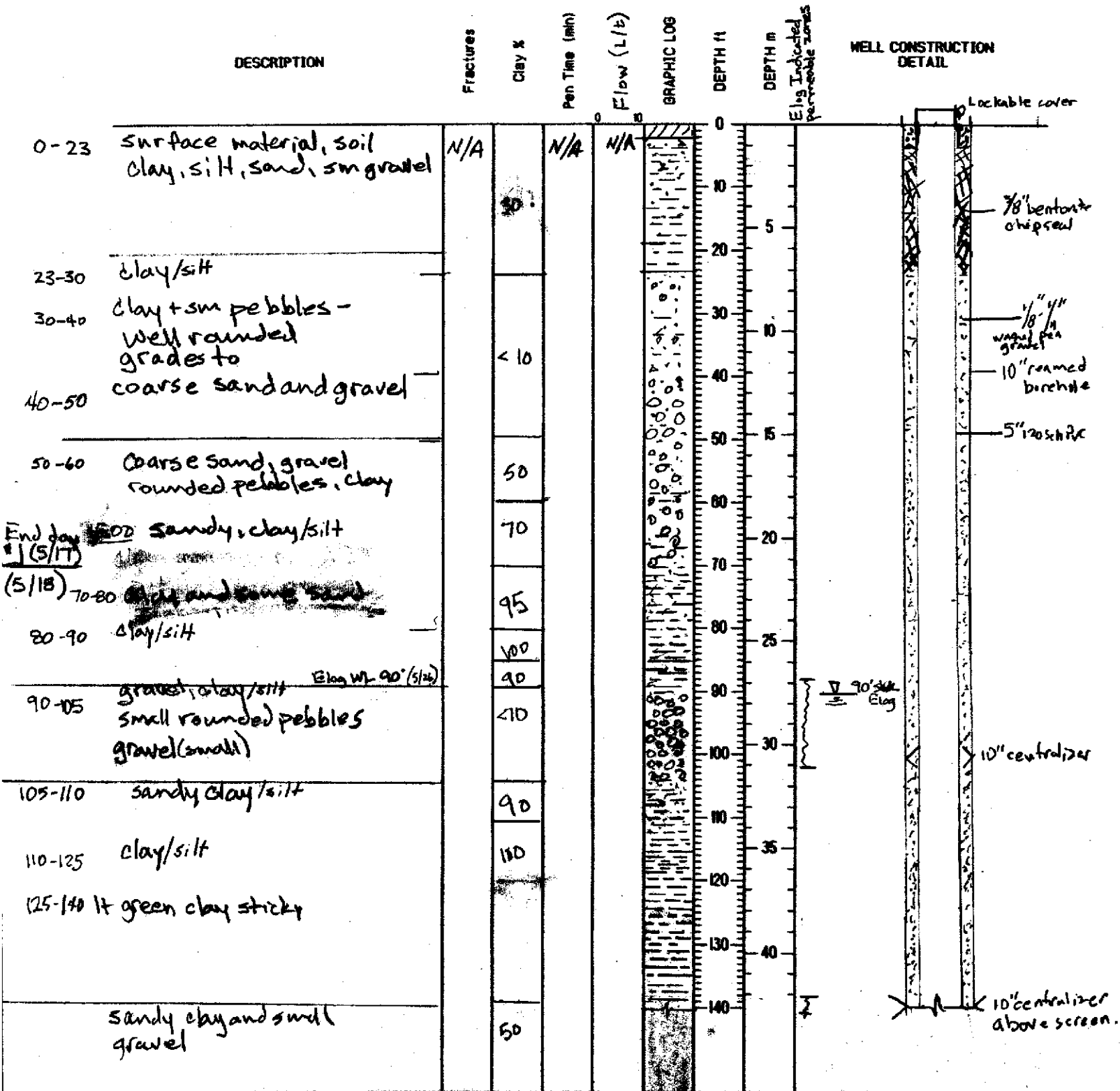
EXPLORATION WELL LOG



PROJECT: Paskenta 2022
 DRILLING CO: Maggiora Bros.
 WATER DEPTH: 90-140
 NORTHING:

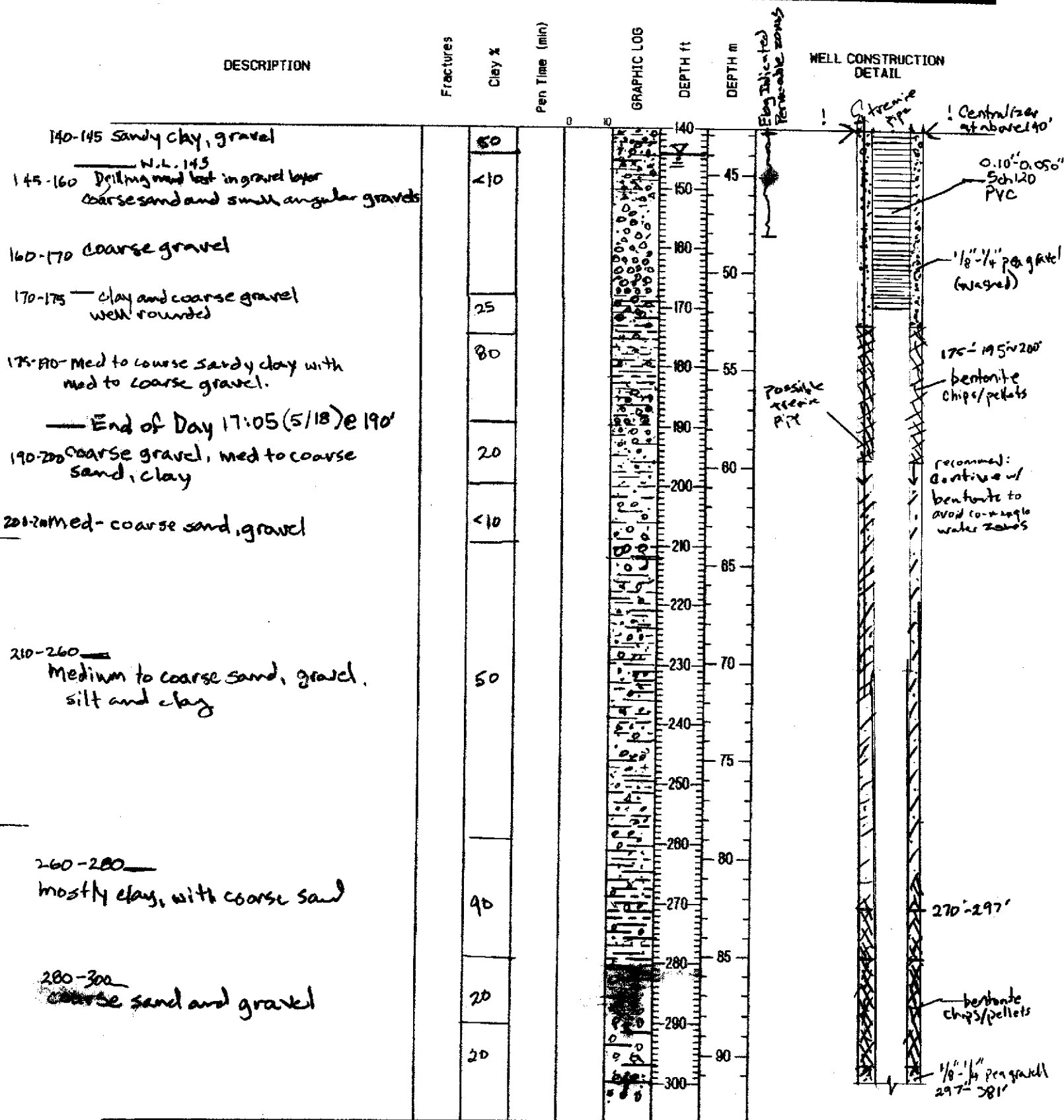
DATE CMPLD:
 RIG TYPE: Direct Rotary
 HOLE DIA: 8 3/4"
 EASTING:

LOGGED BY: T. HEWITT, PG
 TOTAL DEPTH: 710'
 COMPLETED DEPTH: 710'
 ELEV. 290 ft AMSL



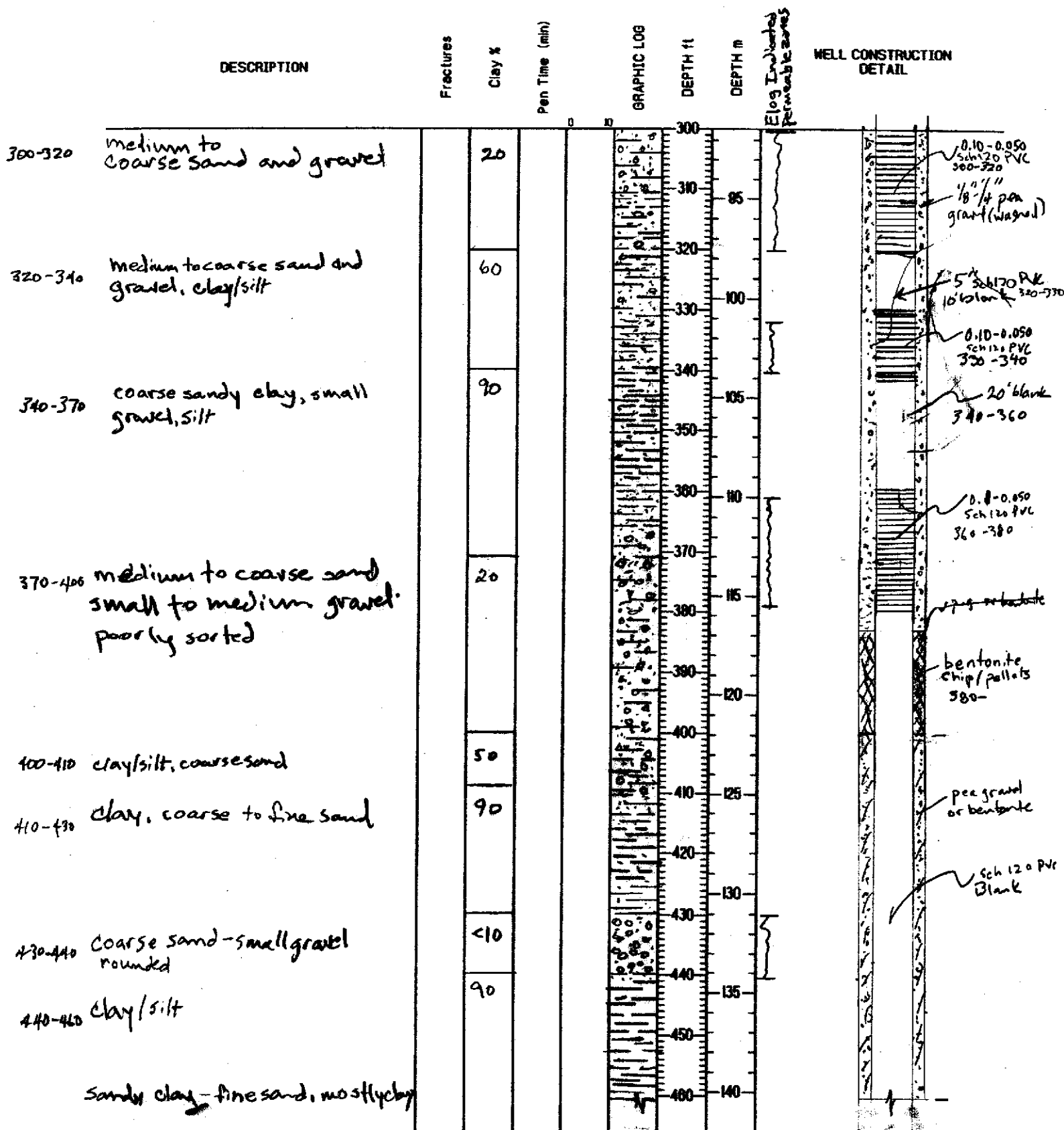
Log of Paskenta Exploration Well 2022

Page 2 of 5



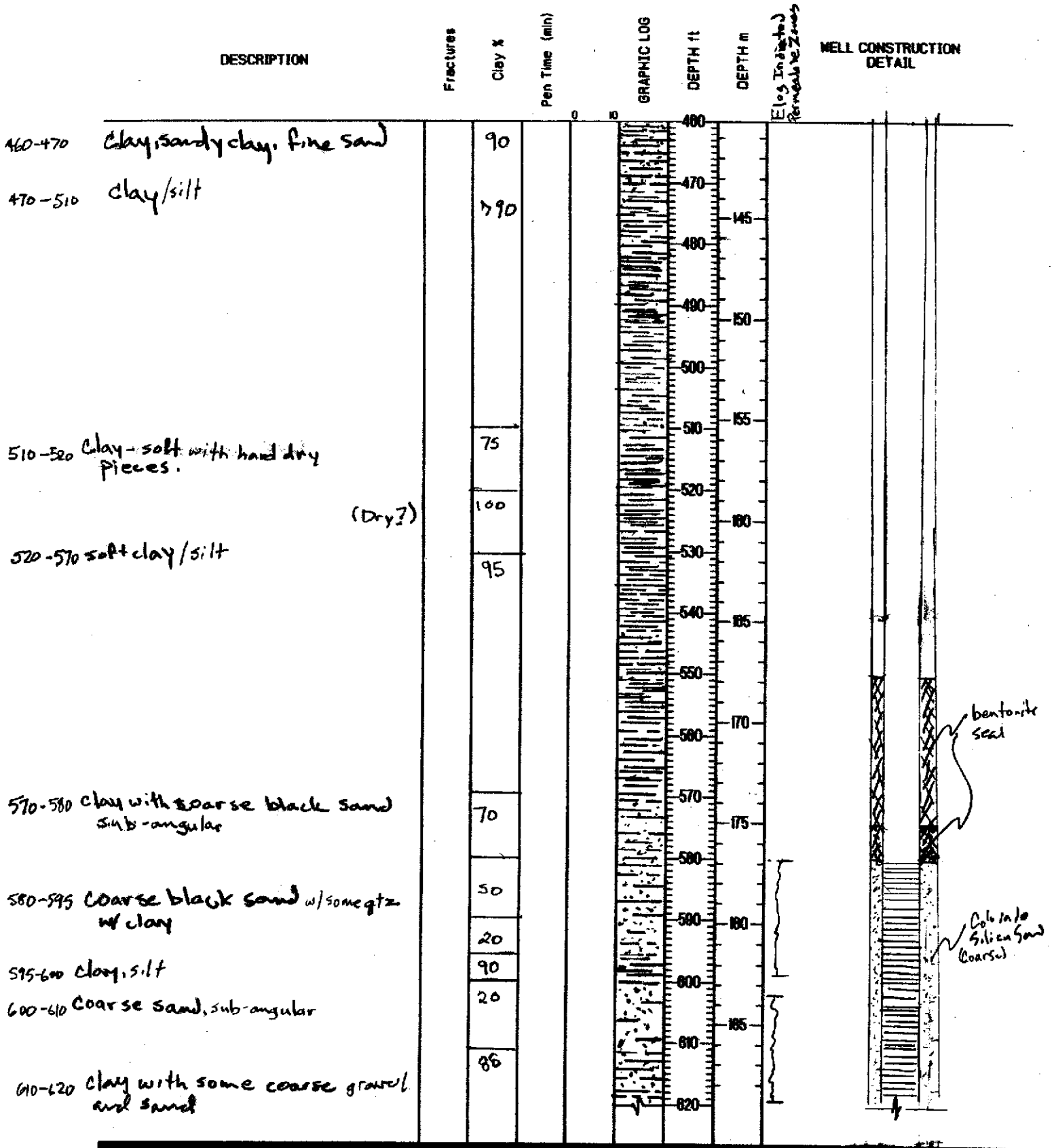
Log of Paskenta Exploration Well 2022

Page 3 of 5



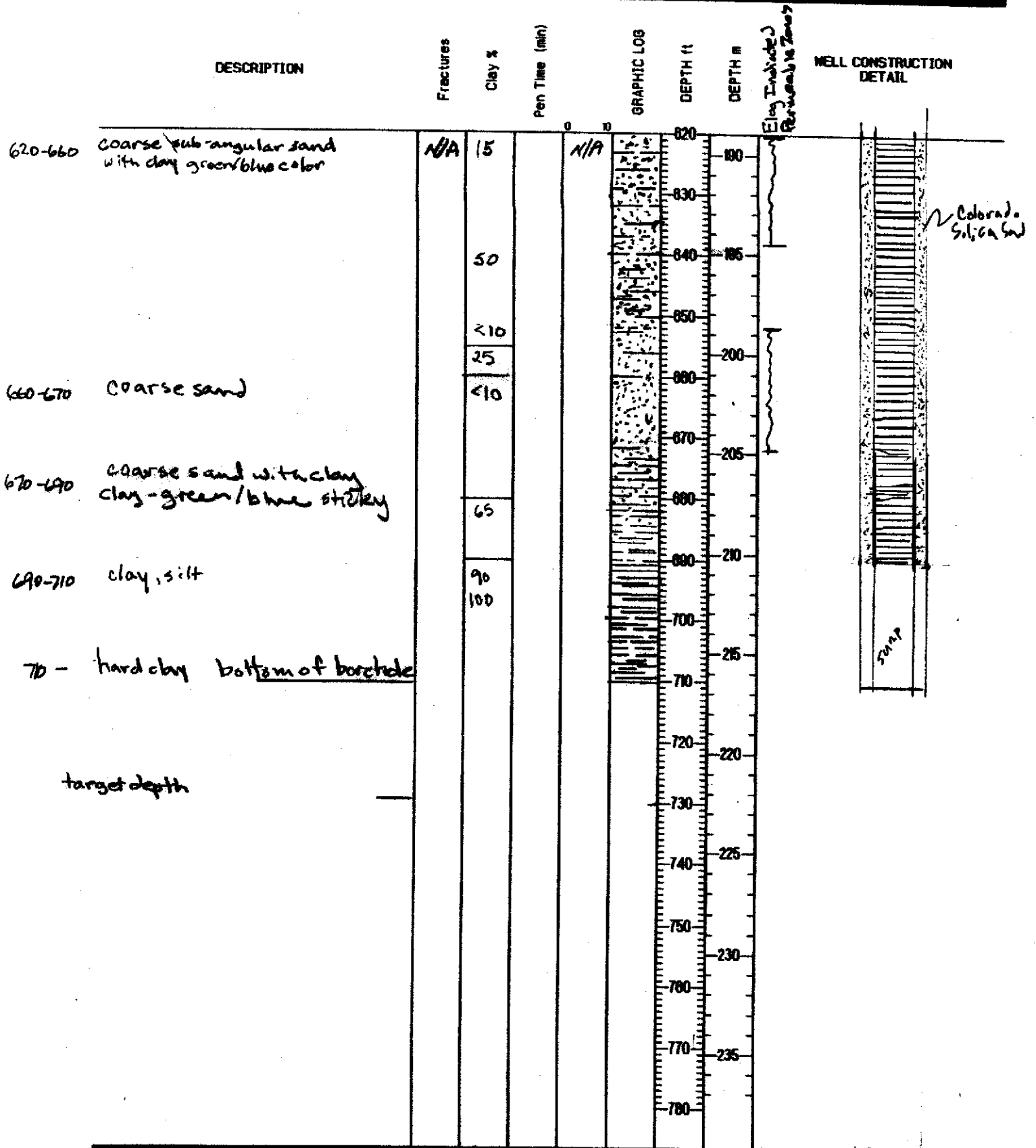
Log of Paskenta Exploration Well 2022

Page 4 of 5



Log of Paskenta Exploration Well, 2022

Page 5 of 5



APPENDIX B

PRELIMINARY DESIGN CALCULATIONS

Appendix B
Preliminary Design Calculations

Brannin Creek Recharge Project
Feasibility Report

<i>Dry Well Diameter</i>	2.5	ft
<i>Dry Well Circumference</i>	7.9	ft
<i>Gravel Layer Thickness</i>	× 15	ft
<i>Application Area</i>	118	sq-ft
<i>Application Area</i>	118	sq-ft
<i>Estimated Hydraulic Conductivity</i>	× 0.0164	ft/s
<i>Flow Rate per Dry Well</i>	1.93	cfs
<i>Flow Rate per Dry Well</i>	1,248,703	gpd
<i>Flow Rate per Dry Well</i>	117	acre-ft/month
<i>Flow Rate per Dry Well</i>	117	acre-ft/month
<i>4 Dry Wells</i>	× 4	
<i>Total Flow for 4 Wells</i>	467	acre-ft/month

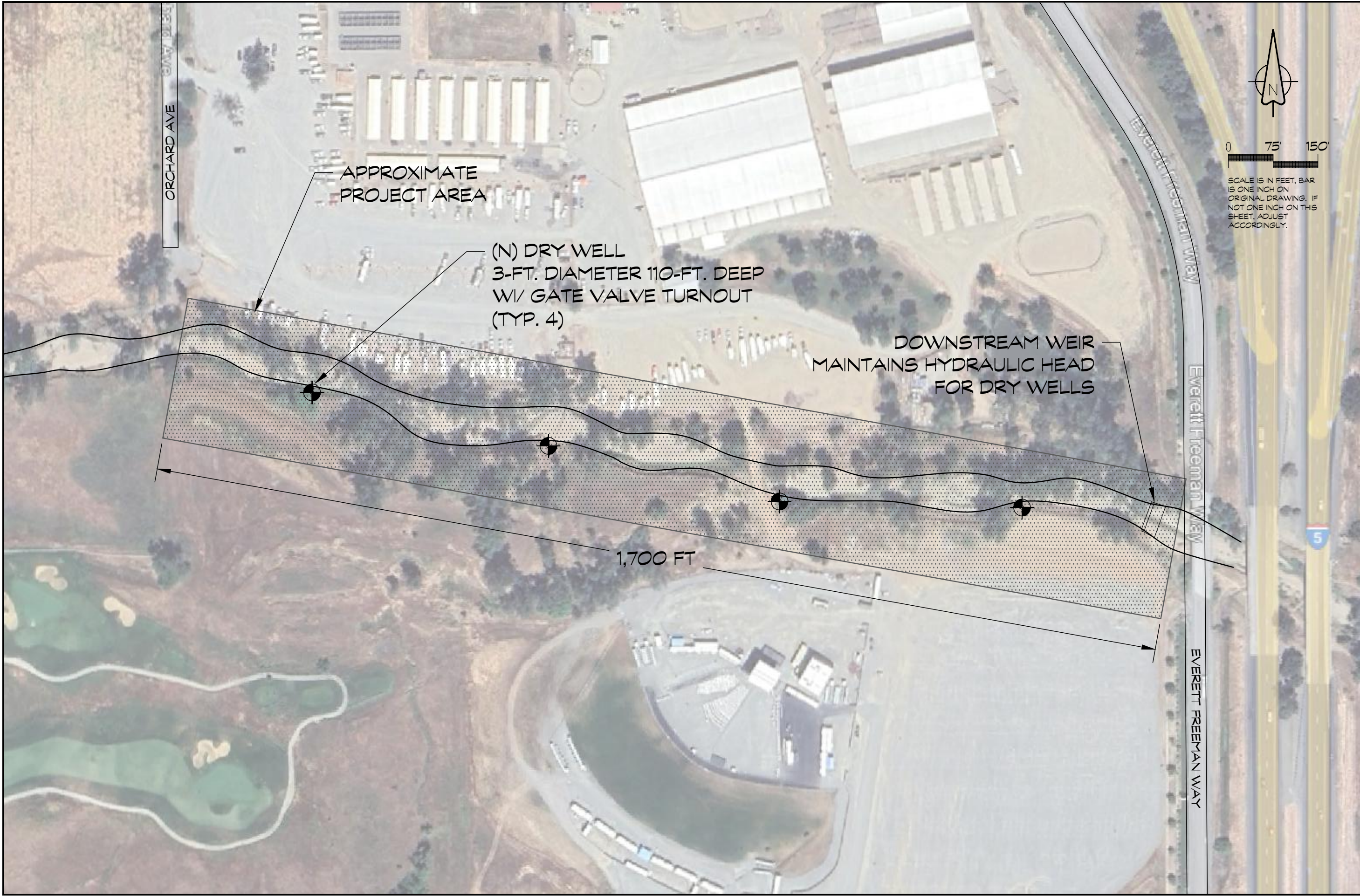
APPENDIX C


PRELIMINARY DESIGN DRAWINGS

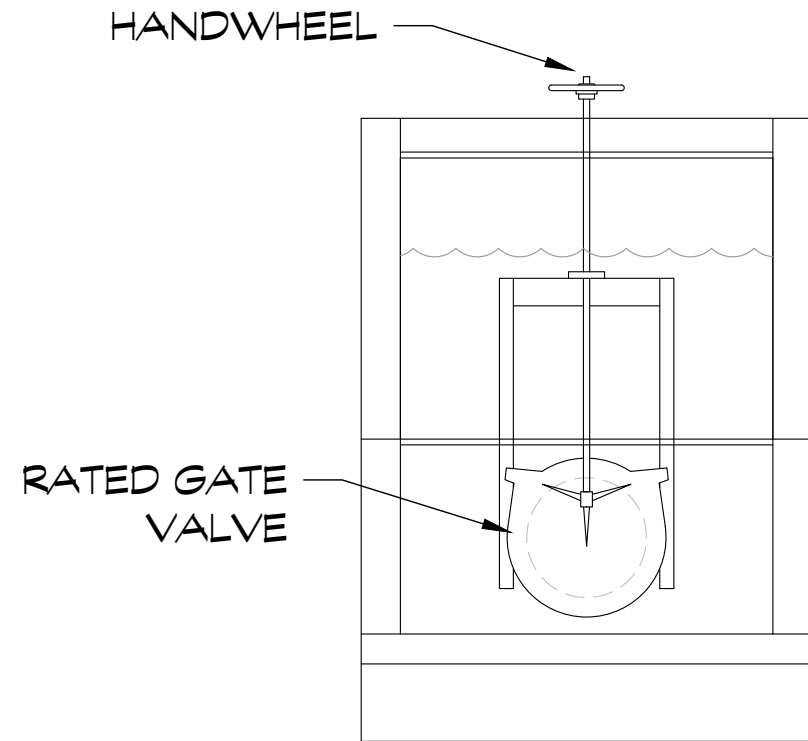
Sheet 01	Site Vicinity Map
Sheet 02	Site Map
Sheet 03	Turnout Details
Sheet 04	Dry Well Details



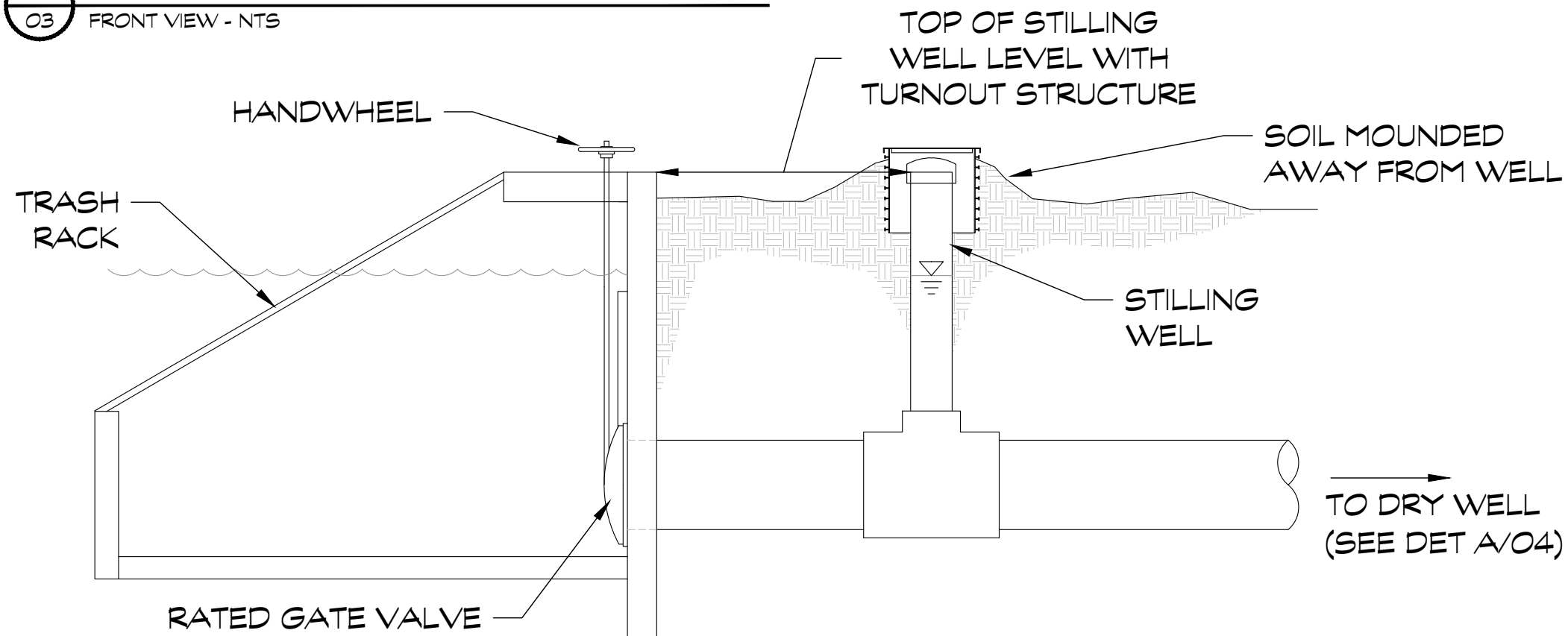
H&A Haling & Associates 2540 Zamella Ste. 40 Chico, CA 95928 Phone: (530) 342-6958		SITE VICINITY MAP	
PROJECT BRANNIN CREEK RECHARGE PRELIMINARY DRAWINGS		SHEET TITLE	
JOB NO: 1284		SHEET 01 OF 04	
DATE: MAY 2024			



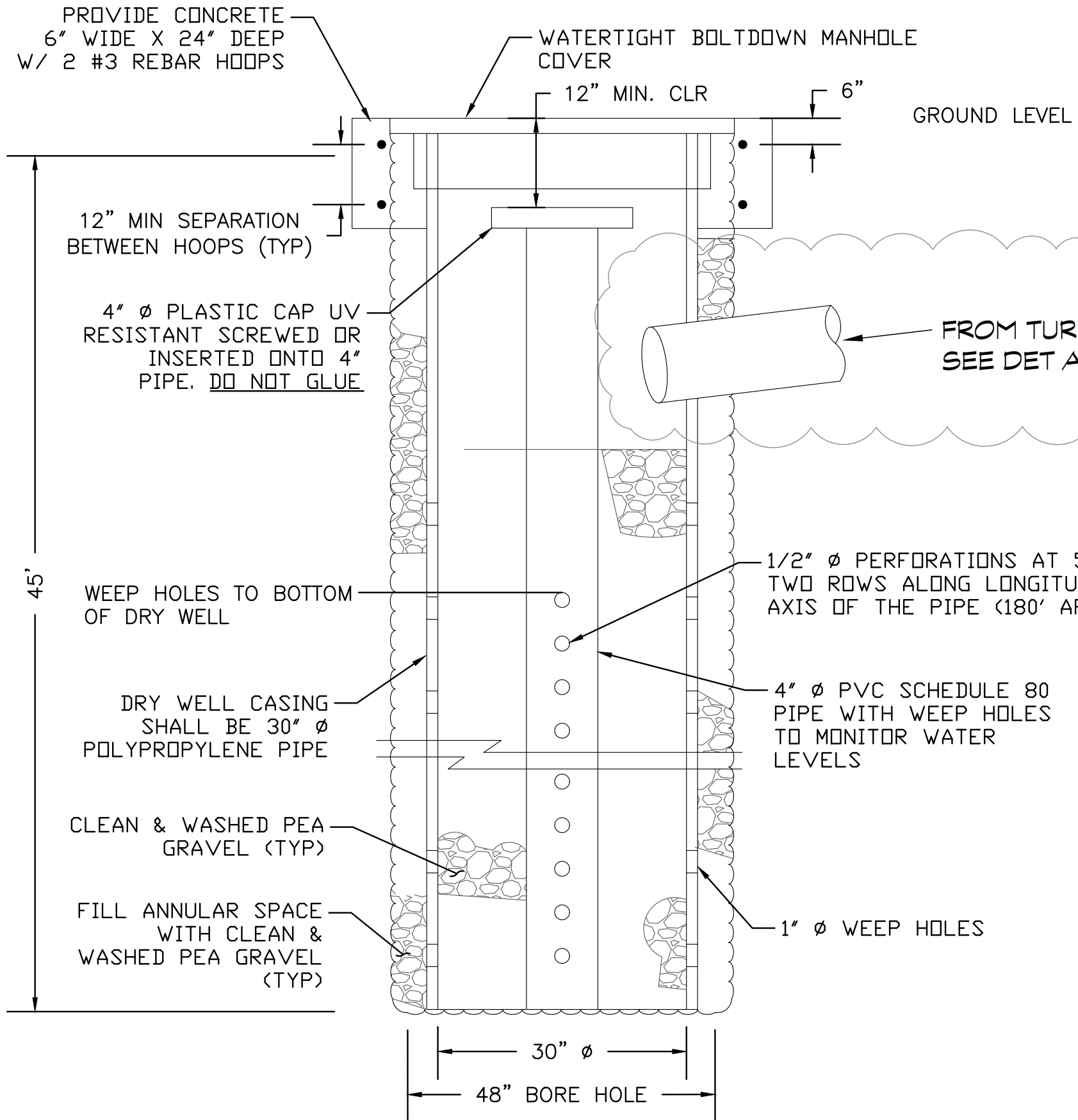
PROJECT		SHEET TITLE	 Haling & Associates 2540 Zamella Ste. 40 Chico, CA 95928 Phone: (530) 342-6958
BRANNIN CREEK RECHARGE			
PRELIMINARY DRAWINGS			
JOB NO: 1284			
SHEET 02 OF 04			
DATE: MAY 2024			



A ADJUSTABLE GATE VALVE TURNOUT
03 FRONT VIEW - NTS

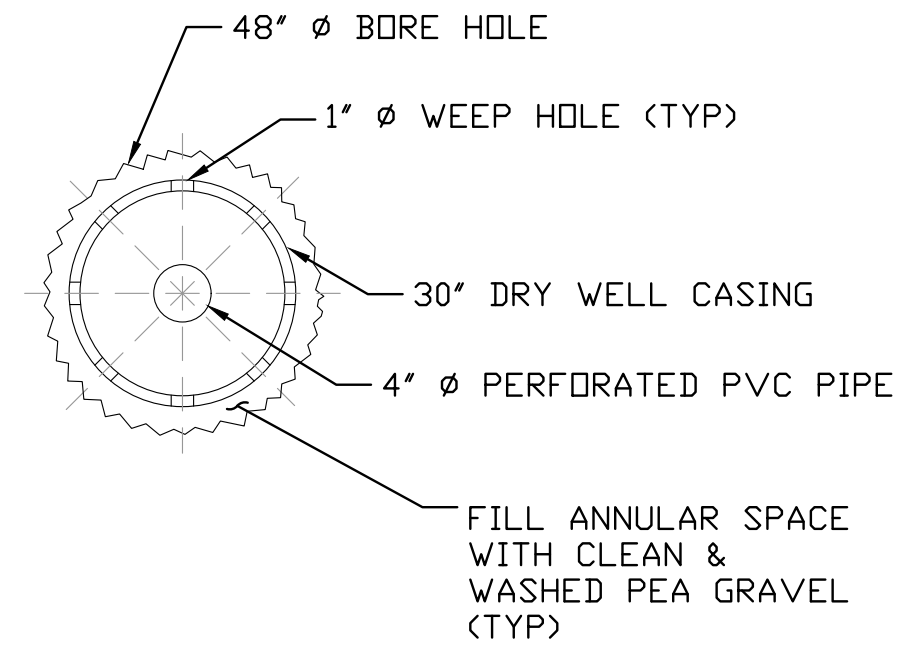


B ADJUSTABLE GATE VALVE TURNOUT
03 SIDE VIEW - NTS



ORIGINAL DRY WELL DETAIL DRAWINGS PREPARED BY LUHDORFF & SCALMANINI CONSULTING ENGINEERS (LSCE).

MODIFICATIONS HAVE BEEN MADE TO THIS DRAWING BY HALING & ASSOCIATES (H&A) AND HAVE BEEN NOTED WITH REVISION CLOUDS.



A DRY WELL
04 PROFILE VIEW - NTS

B DRY WELL
04 PLAN VIEW - NTS

Appendix C



DISCHARGE MONITORING

Well Name:

Client:

Tehama County

Project Name:

Training Next 24 hr Available Personnel:

Leah Schultz, Leah Jackson

Project No.:

231099-4.4.1

Location:

Rolling Hills Casino / Braun in week

Discharge Description:


[illegible]



Client: Tehama County
Project Name: Branin Creek Reserve
Project No.: 2310A9-4A1
Contractor: Davids Engineering
Item(s) of Work:

Date: 10/29/24 Tues
Location: Branin Creek
Day: Monday
Weather: Sunny, chilly, breezy
Time: Arrived: 8:30am Left: 11:00am

Page 1 of 1

				75857:10/07/2024				TEST DESCRIPTION - See Reverse side for Container, Preservative and Sampling information																			
Client: Luhdorff & Scalmanini Consulting Address: Attn: Eddy Teasdale 550 Salem Street, Suite 3 Chico, CA 95928 Phone: (530)661-0109 Fax: Contact Person: Eddy Teasdale Project Name: Surface & Canal Water Purchase Order Number: Quote Number: CH 20241016-01				Method of Sampling: Composite(C) Grab(G) Type of Sample **SEE REVERSE SIDE** Potable(P) Non-Potable(NP) Ag Water(AgW) Bacti Type: Other(O) System(SYS) Source(SR) Waste(W) Bacti Reason: Routine(ROUT) Repeat(RPT) Replace(RPL) Other(O) Special(SPL)				General Mineral 16oz(P) Wet Chemistry-Turbidity, Odor, Color **Analyzed in Chico** 500 ml(AGT) Field Test-Field pH !pH = 15 MINUTE HOLD TIME!! Field - pH Date Field - pH Time Metals, Total-Sb,As,Be,Cd,Cr,Cu,Pb,Hg,Ni,Se,Ag,Tl,V,Zn,3010Prep 250ml(P)-HNO3																			
Sampler(s) <i>Cecilia Schultz; Leah Jackson</i> Sampling Fee: _____ Pickup Fee: _____ Compositor Setup Date: ____/____/____ Time: ____/____				Lab Number: CH 7-10503																							
Samp Num	Location Description	Date Sampled	Time Sampled	Method of Sampling	Type of Sample	Potable(P)	Non-Potable(NP)	Ag Water(AgW)	Bacti Type	Bacti Reason	Other(O)	Special(SPL)	General Mineral 16oz(P)	Wet Chemistry-Turbidity, Odor, Color	**Analyzed in Chico** 500 ml(AGT)	Field Test-Field pH !pH = 15 MINUTE HOLD TIME!!	Field - pH Date	Field - pH Time	Metals, Total-Sb,As,Be,Cd,Cr,Cu,Pb,Hg,Ni,Se,Ag,Tl,V,Zn,3010Prep 250ml(P)-HNO3								
1	Canal 10 Min Sample	10/29/24	8:50am	G	SW								1	1					1								
2	Canal 1 Hour Sample		9:55am	G	SW								1	1					1								
3	Canal 2 Hour Sample		10:15am	G	SW								1	1					1								
4	Lake Sample 1		9:18am	G	SW								1	1					1								
5	Lake Sample 2		9:30am	G	SW								1	1					1								
6	Lake Sample 3		9:58am	G	SW								1	1					1								
Remarks:				Relinquished				Date: 10/29/24				Time: 1:40				Relinquished				Date: _____				Time: _____			
ROI 2.10				Received By: KSH				Date: 10/29/24				Time: 1:40				Received By: _____				Date: _____				Time: _____			

Corporate Offices & Laboratory

853 Corporation Street
 Santa Paula, CA 93060
 Phone: (805) 392-2000
 Env Fax: (805) 525-4172 / Ag Fax: (805) 392-2063

Office & Laboratory

2500 Stagecoach Road
 Stockton, CA 95215
 Phone: (209) 942-0182
 Fax: (209) 942-0423

Office & Laboratory

563 E. Lindo
 Chico, CA 95926
 Phone: (530) 343-5818
 Fax: (530) 343-3807

Office & Laboratory

3442 Empresa Drive, Suite D
 San Luis Obispo, CA 93401
 Phone: (805) 783-2940
 Fax: (805) 783-2912

Office & Laboratory

9411 W. Goshen Avenue
 Visalia, CA 93291
 Phone: (559) 734-9473
 Fax: (559) 734-8435



Invoice # 490089A

Remit To:
FGL Environmental
853 Corporation St
Santa Paula, CA 93060

INVOICE



Luhdorff & Scalmanini Consulting
500 First Street
Woodland, CA 95695

Account # 7010503	
Date Billed 11/25/2024	Amount Due \$2201.00
Date Due 12/25/2024	Amount Paid

To ensure that your account is properly credited, please return top portion with payment

Keep bottom portion for your records.

INVOICE



Customer Luhdorff & Scalmanini Consulting	Account # 7010503	Date Sampled 10/29/2024	Lab Number CH 2490089
Project Surface & Canal Water	Invoice # 490089A	Date Billed 11/25/2024	Amount Due \$2201.00
PO# / Check Number	Date Paid	Date Due 12/25/2024	Amount Paid

Description of Work	Quantity	Rate	Extended
Inorganic Analysis			
General Mineral	6	162.00	972.00
Wet Chemistry-Turbidity, Odor, Color	6	41.00	246.00
Metals, Total-Sb, As, Be, Cd, Cr, Cu, Pb, Hg, Ni, Se, Ag, Tl, V, Zn, 3010 Prep	6	163.00	978.00
Misc. Analysis			
Materials/Disposal	1	5.00	5.00
For More Information http://fglinc.com/md.php			
Total			\$2201.00

(SMH-L4) **For Questions about this Invoice - contact Stephanie Herron at 805-392-2021**

November 25, 2024

Lab No. : CH 2490089

Customer No. : 7010503

Luhdorff & Scalmanini Consulting

Attn: Eddy Teasdale
550 Salem Street, Suite 3
Chico, CA 95928

Laboratory Report

Introduction: This report package contains a total of 28 pages divided into 3 sections:

Case Narrative	(2 pages)	: An overview of the work performed at FGL.
Sample Results	(18 pages)	: Results for each sample submitted.
Quality Control	(8 pages)	: Supporting Quality Control (QC) results.

Case Narrative

This Case Narrative pertains to the following samples:

Sample Description	Date Sampled	Date Received	FGL Lab No.	Matrix
Canal 10 Min Sample	10/29/2024	10/29/2024	CH 2490089-001	SW
Canal 1 Hour Sample	10/29/2024	10/29/2024	CH 2490089-002	SW
Canal 2 Hour Sample	10/29/2024	10/29/2024	CH 2490089-003	SW
Lake Sample 1	10/29/2024	10/29/2024	CH 2490089-004	SW
Lake Sample 2	10/29/2024	10/29/2024	CH 2490089-005	SW
Lake Sample 3	10/29/2024	10/29/2024	CH 2490089-006	SW

Sampling and Receipt Information:

All samples were received in acceptable condition and within temperature requirements, unless noted on the Condition Upon Receipt (CUR) form. All samples were received, prepared and analyzed within the method specified holding times except those as listed in the table below. All samples arrived on ice. All samples were checked for pH if acid or base preservation is required (except for VOAs). For details of sample receipt information, please see the associated Chain of Custody and Condition Upon Receipt Form.

Samples Over Hold Time

Lab No	Analyte Method	Maximum Hold Time	Actual Hold Time
CH 2490089-002	Nitrate + Nitrite as N	48 hours	556.6 hours
CH 2490089-002	Nitrate as NO3	48 hours	556.6 hours
CH 2490089-002	Nitrate Nitrogen	48 hours	556.6 hours
CH 2490089-002	Nitrite as N	48 hours	556.6 hours
CH 2490089-003	Nitrate + Nitrite as N	48 hours	56.5 hours
CH 2490089-003	Nitrate as NO3	48 hours	56.5 hours
CH 2490089-003	Nitrate Nitrogen	48 hours	56.5 hours
CH 2490089-003	Nitrite as N	48 hours	56.5 hours
CH 2490089-004	Nitrate + Nitrite as N	48 hours	557.6 hours
CH 2490089-004	Nitrate as NO3	48 hours	557.6 hours
CH 2490089-004	Nitrate Nitrogen	48 hours	557.6 hours
CH 2490089-004	Nitrite as N	48 hours	557.6 hours
CH 2490089-004	pH	15 minutes	0.0 minutes

CH 2490089-006	Nitrate + Nitrite as N	48 hours	60.2 hours
CH 2490089-006	Nitrate as NO3	48 hours	60.2 hours
CH 2490089-006	Nitrate Nitrogen	48 hours	60.2 hours
CH 2490089-006	Nitrite as N	48 hours	60.2 hours


Quality Control: All samples were prepared and analyzed according to established quality control criteria. Any exceptions are noted in the Quality Control Section of this report.

Test Summary	
EPA 200.7	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
EPA 200.8	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
EPA 245.1	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
EPA 300.0	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
SM 2120 B	Preparation and analysis performed by FGL-Chico (FGL-CH ELAP# 2670)
SM 2130 B	Preparation and analysis performed by FGL-Chico (FGL-CH ELAP# 2670)
SM 2150 B	Preparation and analysis performed by FGL-Chico (FGL-CH ELAP# 2670)
SM 2540 C	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
SM 4500-H+B	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)
SM 5540 C	Preparation and analysis performed by FGL-Santa Paula (FGL-SP ELAP# 1573)

Certification: I certify that this data package is in compliance with ELAP standards, both technically and for completeness, except for any conditions listed above and in the QC Section. Release of the data contained in this data package is authorized by the Laboratory Director or his designee, as verified by the following electronic signature. This report shall not be reproduced except in full, without the written approval of the laboratory.

KD: SVH

Approved By **Kelly A. Dunnahoo, B.S.**



Digitally signed by Kelly A. Dunnahoo, B.S.
Title: Laboratory Director
Date: 2024-11-25

November 25, 2024

Luhdorff & Scalmanini Consulting

Attn: Eddy Teasdale
550 Salem Street, Suite 3
Chico, CA 95928

Description : Canal 10 Min Sample
Project : Surface & Canal Water

Lab No. : CH 2490089-001

Customer No. : 7010503

Sampled On : October 29, 2024 at 08:50

Sampled By : Leeah Schultz; Leah

Received On : October 29, 2024 at 14:01

Matrix : Surface Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
General Mineral							Date	Time	Who	Method	Date	Time	Who
Total Hardness as CaCO ₃	53.0	2.5	mg/L		1		10/31/2024	10:00	ac	2340B	10/31/2024	12:55	ac
Calcium	13	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	12:55	ac
Magnesium	5	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	12:55	ac
Potassium	1	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	12:55	ac
Sodium	6	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	12:55	ac
Total Cations	1.3	---	meq/L				10/31/2024	10:00	ac	Calc.	10/31/2024	12:55	ac
Boron	ND	0.1	mg/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	12:55	ac
Copper	30	10	ug/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	12:55	ac
Iron	60	30	ug/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	12:55	ac
Manganese	ND	10	ug/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	12:55	ac
Zinc	ND	20	ug/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	12:55	ac
SAR	0.4	0.1	--		1		10/31/2024	10:00	ac	Calc.	10/31/2024	12:55	ac
Total Alkalinity (as CaCO ₃)	60	10	mg/L		1		10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	20:51	amm
Hydroxide as OH	ND	10	mg/L		1	U	10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	20:51	amm
Carbonate as CO ₃	ND	10	mg/L		1	U	10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	20:51	amm
Bicarbonate as HCO ₃	70	10	mg/L		1		10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	20:51	amm
Sulfate	3.4	0.5	mg/L		1		10/30/2024	16:50	ldm	EPA 300.0	10/30/2024	21:26	ldm
Chloride	2	1	mg/L		1		10/30/2024	16:50	ldm	EPA 300.0	10/30/2024	21:26	ldm
Nitrate as NO ₃	ND	0.4	mg/L		1	U	10/30/2024	16:50	ldm	EPA 300.0	10/30/2024	21:26	ldm
Nitrite as N	ND	0.1	mg/L		1	U	10/30/2024	16:50	ldm	EPA 300.0	10/30/2024	21:26	ldm
Nitrate + Nitrite as N	ND	0.1	mg/L		1	J	10/30/2024	16:50	ldm	EPA 300.0	10/30/2024	21:26	ldm
Fluoride	ND	0.1	mg/L		1	U	10/30/2024	16:50	ldm	EPA 300.0	10/30/2024	21:26	ldm
Total Anions	1.3	---	meq/L		1		10/30/2024	18:32	amm	Calc.	10/30/2024	20:51	amm
pH	7.3	---	units		1		10/29/2024	08:50	lsl	SM 4500-H+B	10/29/2024	08:50	lsl
Specific Conductance	131	1	umhos/cm		1		10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	20:51	amm
Total Dissolved Solids	100	20	mg/L		1		10/30/2024	16:00	ctl	SM 2540 C	10/31/2024	10:50	ctl
MBAS, Calc. as LAS, MW 320	ND	0.1	mg/L		1	U	10/30/2024	17:06	krh	SM 5540 C	10/30/2024	21:35	krh
Aggressiveness Index	10.6	1	--		1		10/29/2024	08:50	lsl	Calc.	10/29/2024	08:50	lsl
Langlier Index (20°C)	-1.2	1	--		1		10/29/2024	08:50	lsl	Calc.	10/29/2024	08:50	lsl
Nitrate Nitrogen	ND	0.1	mg/L		1	U	10/30/2024	16:50	ldm	EPA 300.0	10/30/2024	21:26	ldm
Metals, Total													
Antimony	0.0010	0.0005	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:26	ac
Arsenic	ND	0.002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:26	ac
Beryllium	ND	0.0005	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:26	ac
Cadmium	ND	0.0002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:26	ac
Chromium	0.0015	0.0005	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:26	ac
Copper	0.0275	0.0005	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:26	ac
Lead	ND	0.0005	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:26	ac
Mercury	ND	0.00002	mg/L		1	U	11/11/2024	08:00	ejc	EPA 245.1	11/13/2024	13:17	ejc
Nickel	0.001	0.001	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:26	ac
Selenium	ND	0.002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:26	ac

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
Silver	ND	0.00025	mg/L		1	UI	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:26	ac
Thallium	ND	0.001	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:26	ac
Vanadium	0.004	0.002	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:26	ac
Zinc	0.02	0.01	mg/L		1	l	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:26	ac
Wet Chemistry													
Color, Apparent	13	13*	units		3		10/29/2024	14:55	kx1	SM 2120 B	10/29/2024	14:13	kx1
Odor	ND	1	TON		1		10/29/2024	14:51	kx1	SM 2150 B	10/29/2024	15:52	kx1
Turbidity	1.5	0.1	NTU		1	I	10/30/2024	09:08	kx1	SM 2130 B	10/30/2024	09:26	kx1

DQF Flags Definition:
 U Constituent results were non-detect.
 J Reported value is estimated; detected at a concentration below the RL and above the laboratory MDL.
 l The MS/MSD did not meet QC criteria.
 I The RPD for the laboratory duplicate exceeded laboratory criteria.

ND=Non-Detected, RL=Reporting Level * RL adjusted for dilution, Dil.=Dilution

November 25, 2024

Luhdorff & Scalmanini Consulting

Attn: Eddy Teasdale
 550 Salem Street, Suite 3
 Chico, CA 95928

Description : Canal 10 Min Sample
 Project : Surface & Canal Water

Lab No. : CH 2490089-001

Customer No. : 7010503

Sampled On : October 29, 2024 at 08:50

Sampled By : Leeah Schultz; Leah

Received On : October 29, 2024 at 14:01

Matrix : Surface Water

Sample Results - Field Test

Constituent	Result	RL	Units	Note	Sample Preparation	Sample Analysis	
Field Test					Date	Method	Date
pH (Field)	7.31		units		10/29/2024 08:50	4500HB	10/29/2024 08:50

ND=Non-Detected, RL=Reporting Level. * RL adjusted for dilution

November 25, 2024

Luhdorff & Scalmanini Consulting

Attn: Eddy Teasdale
550 Salem Street, Suite 3
Chico, CA 95928

Description : Canal 1 Hour Sample
Project : Surface & Canal Water

Lab No. : CH 2490089-002
Customer No. : 7010503

Sampled On : October 29, 2024 at 09:55
Sampled By : Leeah Schultz; Leah
Received On : October 29, 2024 at 14:01
Matrix : Surface Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
General Mineral							Date	Time	Who	Method	Date	Time	Who
Total Hardness as CaCO ₃	54.6	2.5	mg/L		1		10/31/2024	10:00	ac	2340B	10/31/2024	13:20	ac
Calcium	12	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:20	ac
Magnesium	6	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:20	ac
Potassium	1	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:20	ac
Sodium	6	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:20	ac
Total Cations	1.4	---	meq/L				10/31/2024	10:00	ac	Calc.	10/31/2024	13:20	ac
Boron	ND	0.1	mg/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:20	ac
Copper	20	10	ug/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:20	ac
Iron	50	30	ug/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:20	ac
Manganese	ND	10	ug/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:20	ac
Zinc	ND	20	ug/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:20	ac
SAR	0.4	0.1	--		1		10/31/2024	10:00	ac	Calc.	10/31/2024	13:20	ac
Total Alkalinity (as CaCO ₃)	60	10	mg/L		1		10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	21:19	amm
Hydroxide as OH	ND	10	mg/L		1	U	10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	21:19	amm
Carbonate as CO ₃	ND	10	mg/L		1	U	10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	21:19	amm
Bicarbonate as HCO ₃	70	10	mg/L		1		10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	21:19	amm
Sulfate	3.4	0.5	mg/L		1		11/21/2024	09:58	ldm	EPA 300.0	11/21/2024	14:33	ldm
Chloride	2	1	mg/L		1	b	11/21/2024	09:58	ldm	EPA 300.0	11/21/2024	14:33	ldm
Nitrate as NO ₃	0.4	0.4	mg/L		1	TI	11/21/2024	09:58	ldm	EPA 300.0	11/21/2024	14:33	ldm
Nitrite as N	ND	0.1	mg/L		1	UT	11/21/2024	09:58	ldm	EPA 300.0	11/21/2024	14:33	ldm
Nitrate + Nitrite as N	0.1	0.1	mg/L		1	TI	11/21/2024	09:58	ldm	EPA 300.0	11/21/2024	14:33	ldm
Fluoride	ND	0.1	mg/L		1	U	11/21/2024	09:58	ldm	EPA 300.0	11/21/2024	14:33	ldm
Total Anions	1.3	---	meq/L		1	bl	10/30/2024	18:32	amm	Calc.	10/30/2024	21:19	amm
pH	7.5	---	units		1		10/29/2024	09:55	lsl	SM 4500-H+B	10/29/2024	09:59	lsl
Specific Conductance	129	1	umhos/cm		1		10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	21:19	amm
Total Dissolved Solids	90	20	mg/L		1		10/30/2024	16:00	ctl	SM 2540 C	10/31/2024	10:50	ctl
MBAS, Calc. as LAS, MW 320	ND	0.1	mg/L		1	U	10/30/2024	17:06	krh	SM 5540 C	10/30/2024	21:35	krh
Aggressiveness Index	10.8	1	--		1		10/29/2024	09:55	lsl	Calc.	10/29/2024	09:59	lsl
Langlier Index (20°C)	-1.0	1	--		1		10/29/2024	09:55	lsl	Calc.	10/29/2024	09:59	lsl
Nitrate Nitrogen	ND	0.1	mg/L		1	JTI	11/21/2024	09:58	ldm	EPA 300.0	11/21/2024	14:33	ldm
Metals, Total													
Antimony	0.0005	0.0005	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:12	ac
Arsenic	ND	0.002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:12	ac
Beryllium	ND	0.0005	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:12	ac
Cadmium	ND	0.0002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:12	ac
Chromium	0.0010	0.0005	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:12	ac
Copper	0.0250	0.0005	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:12	ac
Lead	ND	0.0005	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:12	ac
Mercury	ND	0.00002	mg/L		1	U	11/11/2024	08:00	ejc	EPA 245.1	11/13/2024	13:38	ejc
Nickel	0.001	0.001	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:12	ac
Selenium	ND	0.002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:12	ac

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
Silver	ND	0.00025	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:12	ac
Thallium	ND	0.001	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:12	ac
Vanadium	ND	0.002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:12	ac
Zinc	0.03	0.01	mg/L		1	l	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:12	ac
Wet Chemistry													
Color, Apparent	14	5	units		1		10/29/2024	14:55	kx1	SM 2120 B	10/29/2024	14:13	kx1
Odor	ND	1	TON		1		10/29/2024	14:51	kx1	SM 2150 B	10/29/2024	15:52	kx1
Turbidity	0.90	0.1	NTU		1	I	10/30/2024	09:08	kx1	SM 2130 B	10/30/2024	09:26	kx1

DQF Flags Definition:
U Constituent results were non-detect.
b The Blank was positive for constituent but less than the PQL
T Exceeded method/regulatory-specific holding time.
l The MS/MSD did not meet QC criteria.
J Reported value is estimated; detected at a concentration below the RL and above the laboratory MDL.
I The RPD for the laboratory duplicate exceeded laboratory criteria.

ND=Non-Detected, RL=Reporting Level * RL adjusted for dilution, Dil.=Dilution

November 25, 2024

Luhdorff & Scalmanini Consulting

Attn: Eddy Teasdale
550 Salem Street, Suite 3
Chico, CA 95928

Description : Canal 1 Hour Sample
Project : Surface & Canal Water

Lab No. : CH 2490089-002

Customer No. : 7010503

Sampled On : October 29, 2024 at 09:55

Sampled By : Leeah Schultz; Leah

Received On : October 29, 2024 at 14:01

Matrix : Surface Water

Sample Results - Field Test

Constituent	Result	RL	Units	Note	Sample Preparation	Sample Analysis	
Field Test					Date	Method	Date
pH (Field)	7.48		units		10/29/2024 09:55	4500HB	10/29/2024 09:55

ND=Non-Detected, RL=Reporting Level. * RL adjusted for dilution

November 25, 2024

Luhdorff & Scalmanini Consulting

Attn: Eddy Teasdale
550 Salem Street, Suite 3
Chico, CA 95928

Description : Canal 2 Hour Sample
Project : Surface & Canal Water

Lab No. : CH 2490089-003
Customer No. : 7010503

Sampled On : October 29, 2024 at 10:43
Sampled By : Leeah Schultz; Leah
Received On : October 29, 2024 at 14:01
Matrix : Surface Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
General Mineral							Date	Time	Who	Method	Date	Time	Who
Total Hardness as CaCO ₃	54.6	2.5	mg/L		1		10/31/2024	10:00	ac	2340B	10/31/2024	13:26	ac
Calcium	12	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:26	ac
Magnesium	6	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:26	ac
Potassium	1	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:26	ac
Sodium	6	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:26	ac
Total Cations	1.4	---	meq/L				10/31/2024	10:00	ac	Calc.	10/31/2024	13:26	ac
Boron	ND	0.1	mg/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:26	ac
Copper	20	10	ug/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:26	ac
Iron	50	30	ug/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:26	ac
Manganese	ND	10	ug/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:26	ac
Zinc	ND	20	ug/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:26	ac
SAR	0.4	0.1	--		1		10/31/2024	10:00	ac	Calc.	10/31/2024	13:26	ac
Total Alkalinity (as CaCO ₃)	60	10	mg/L		1		10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	21:28	amm
Hydroxide as OH	ND	10	mg/L		1	U	10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	21:28	amm
Carbonate as CO ₃	ND	10	mg/L		1	U	10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	21:28	amm
Bicarbonate as HCO ₃	70	10	mg/L		1		10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	21:28	amm
Sulfate	3.2	0.5	mg/L		1		10/31/2024	17:14	ldm	EPA 300.0	10/31/2024	19:12	ldm
Chloride	2	1	mg/L		1		10/31/2024	17:14	ldm	EPA 300.0	10/31/2024	19:12	ldm
Nitrate as NO ₃	ND	0.4	mg/L		1	UT	10/31/2024	17:14	ldm	EPA 300.0	10/31/2024	19:12	ldm
Nitrite as N	ND	0.1	mg/L		1	UT	10/31/2024	17:14	ldm	EPA 300.0	10/31/2024	19:12	ldm
Nitrate + Nitrite as N	ND	0.1	mg/L		1	JT	10/31/2024	17:14	ldm	EPA 300.0	10/31/2024	19:12	ldm
Fluoride	ND	0.1	mg/L		1	U	10/31/2024	17:14	ldm	EPA 300.0	10/31/2024	19:12	ldm
Total Anions	1.3	---	meq/L		1		10/30/2024	18:32	amm	Calc.	10/30/2024	21:28	amm
pH	7.0	---	units		1		10/29/2024	10:43	lsl	SM 4500-H+B	10/29/2024	10:43	lsl
Specific Conductance	128	1	umhos/cm		1		10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	21:28	amm
Total Dissolved Solids	100	20	mg/L		1		10/30/2024	16:00	ctl	SM 2540 C	10/31/2024	10:50	ctl
MBAS, Calc. as LAS, MW 320	ND	0.1	mg/L		1	U	10/30/2024	17:06	krh	SM 5540 C	10/30/2024	21:35	krh
Aggressiveness Index	10.3	1	--		1		10/29/2024	10:43	lsl	Calc.	10/29/2024	10:43	lsl
Langlier Index (20°C)	-1.5	1	--		1		10/29/2024	10:43	lsl	Calc.	10/29/2024	10:43	lsl
Nitrate Nitrogen	ND	0.1	mg/L		1	UT	10/31/2024	17:14	ldm	EPA 300.0	10/31/2024	19:12	ldm
Metals, Total													
Antimony	0.0010	0.0005	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:06	ac
Arsenic	ND	0.002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:06	ac
Beryllium	ND	0.0005	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:06	ac
Cadmium	ND	0.0002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:06	ac
Chromium	0.0015	0.0005	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:06	ac
Copper	0.0240	0.0005	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:06	ac
Lead	ND	0.0005	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:06	ac
Mercury	ND	0.00002	mg/L		1	U	11/11/2024	08:00	ejc	EPA 245.1	11/13/2024	14:00	ejc
Nickel	0.002	0.001	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:06	ac
Selenium	ND	0.002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:06	ac

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
Silver	ND	0.00025	mg/L		1	UI	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:06	ac
Thallium	ND	0.001	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:06	ac
Vanadium	ND	0.002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:06	ac
Zinc	0.03	0.01	mg/L		1	l	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:06	ac
Wet Chemistry													
Color, Apparent	15	5	units		1		10/29/2024	14:55	kx1	SM 2120 B	10/29/2024	14:13	kx1
Odor	ND	1	TON		1		10/29/2024	14:51	kx1	SM 2150 B	10/29/2024	15:52	kx1
Turbidity	0.65	0.1	NTU		1	I	10/30/2024	09:08	kx1	SM 2130 B	10/30/2024	09:26	kx1

DQF Flags Definition:
U Constituent results were non-detect.
T Exceeded method/regulatory-specific holding time.
J Reported value is estimated; detected at a concentration below the RL and above the laboratory MDL.
l The MS/MSD did not meet QC criteria.
I The RPD for the laboratory duplicate exceeded laboratory criteria.

ND=Non-Detected, RL=Reporting Level * RL adjusted for dilution, Dil.=Dilution

November 25, 2024

Luhdorff & Scalmanini Consulting

Attn: Eddy Teasdale
550 Salem Street, Suite 3
Chico, CA 95928

Description : Canal 2 Hour Sample
Project : Surface & Canal Water

Lab No. : CH 2490089-003

Customer No. : 7010503

Sampled On : October 29, 2024 at 10:43

Sampled By : Leeah Schultz; Leah

Received On : October 29, 2024 at 14:01

Matrix : Surface Water

Sample Results - Field Test

Constituent	Result	RL	Units	Note	Sample Preparation	Sample Analysis	
Field Test					Date	Method	Date
pH (Field)	7.04		units		10/29/2024 10:43	4500HB	10/29/2024 10:43

ND=Non-Detected, RL=Reporting Level. * RL adjusted for dilution

November 25, 2024

Luhdorff & Scalmanini Consulting

Attn: Eddy Teasdale
550 Salem Street, Suite 3
Chico, CA 95928

Description : Lake Sample 1
Project : Surface & Canal Water

Lab No. : CH 2490089-004
Customer No. : 7010503

Sampled On : October 29, 2024 at 09:18
Sampled By : Leeah Schultz; Leah
Received On : October 29, 2024 at 14:01
Matrix : Surface Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
General Mineral							Date	Time	Who	Method	Date	Time	Who
Total Hardness as CaCO ₃	111	2.5	mg/L		1		10/31/2024	10:00	ac	2340B	10/31/2024	13:33	ac
Calcium	18	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:33	ac
Magnesium	16	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:33	ac
Potassium	2	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:33	ac
Sodium	27	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:33	ac
Total Cations	3.4	---	meq/L				10/31/2024	10:00	ac	Calc.	10/31/2024	13:33	ac
Boron	ND	0.1	mg/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:33	ac
Copper	ND	10	ug/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:33	ac
Iron	90	30	ug/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:33	ac
Manganese	ND	10	ug/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:33	ac
Zinc	ND	20	ug/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:33	ac
SAR	1.1	0.1	--		1		10/31/2024	10:00	ac	Calc.	10/31/2024	13:33	ac
Total Alkalinity (as CaCO ₃)	160	10	mg/L		1		10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	21:09	amm
Hydroxide as OH	ND	10	mg/L		1	U	10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	21:09	amm
Carbonate as CO ₃	ND	10	mg/L		1	U	10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	21:09	amm
Bicarbonate as HCO ₃	200	10	mg/L		1		10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	21:09	amm
Sulfate	2.9	0.5	mg/L		1		11/21/2024	09:58	ldm	EPA 300.0	11/21/2024	14:54	ldm
Chloride	5	1	mg/L		1	b	11/21/2024	09:58	ldm	EPA 300.0	11/21/2024	14:54	ldm
Nitrate as NO ₃	ND	0.4	mg/L		1	UTl	11/21/2024	09:58	ldm	EPA 300.0	11/21/2024	14:54	ldm
Nitrite as N	ND	0.1	mg/L		1	UT	11/21/2024	09:58	ldm	EPA 300.0	11/21/2024	14:54	ldm
Nitrate + Nitrite as N	ND	0.1	mg/L		1	UTl	11/21/2024	09:58	ldm	EPA 300.0	11/21/2024	14:54	ldm
Fluoride	0.2	0.1	mg/L		1		11/21/2024	09:58	ldm	EPA 300.0	11/21/2024	14:54	ldm
Total Anions	3.5	---	meq/L		1	bl	10/30/2024	18:32	amm	Calc.	10/30/2024	21:09	amm
pH	6.9	---	units		1	T	10/29/2024	09:18	lsl	SM 4500-H+B	10/29/2024	10:08	lsl
Specific Conductance	321	1	umhos/cm		1		10/30/2024	18:32	amm	SM 4500-H+B	10/30/2024	21:09	amm
Total Dissolved Solids	200	20	mg/L		1		10/30/2024	16:00	ctl	SM 2540 C	10/31/2024	10:50	ctl
MBAS, Calc. as LAS, MW 320	0.106	0.1	mg/L		1		10/30/2024	17:06	krh	SM 5540 C	10/30/2024	21:35	krh
Aggressiveness Index	10.8	1	--		1		10/29/2024	09:18	lsl	Calc.	10/29/2024	10:08	lsl
Langlier Index (20°C)	-1.1	1	--		1		10/29/2024	09:18	lsl	Calc.	10/29/2024	10:08	lsl
Nitrate Nitrogen	ND	0.1	mg/L		1	UTl	11/21/2024	09:58	ldm	EPA 300.0	11/21/2024	14:54	ldm
Metals, Total													
Antimony	0.0020	0.0005	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:33	ac
Arsenic	0.004	0.002	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:33	ac
Beryllium	ND	0.0005	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:33	ac
Cadmium	ND	0.0002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:33	ac
Chromium	0.0015	0.0005	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:33	ac
Copper	0.0010	0.0005	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:33	ac
Lead	ND	0.0005	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:33	ac
Mercury	ND	0.00002	mg/L		1	U	11/11/2024	08:00	ejc	EPA 245.1	11/13/2024	14:04	ejc
Nickel	ND	0.001	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:33	ac
Selenium	ND	0.002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:33	ac

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
Silver	ND	0.00025	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:33	ac
Thallium	ND	0.001	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:33	ac
Vanadium	ND	0.002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:33	ac
Zinc	0.02	0.01	mg/L		1	l	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	13:33	ac
Wet Chemistry													
Color, Apparent	33	13*	units		3		10/29/2024	14:55	kx1	SM 2120 B	10/29/2024	14:13	kx1
Odor	ND	1	TON		1		10/29/2024	15:59	kx1	SM 2150 B	10/29/2024	16:46	kx1
Turbidity	0.90	0.1	NTU		1	I	10/30/2024	09:08	kx1	SM 2130 B	10/30/2024	09:26	kx1

DQF Flags Definition:

- U Constituent results were non-detect.
- b The Blank was positive for constituent but less than the PQL
- T Exceeded method/regulatory-specific holding time.
- l The MS/MSD did not meet QC criteria.
- I The RPD for the laboratory duplicate exceeded laboratory criteria.

ND=Non-Detected, RL=Reporting Level * RL adjusted for dilution, Dil.=Dilution

November 25, 2024

Luhdorff & Scalmanini Consulting

Attn: Eddy Teasdale
 550 Salem Street, Suite 3
 Chico, CA 95928

Description : Lake Sample 1
 Project : Surface & Canal Water

Lab No. : CH 2490089-004

Customer No. : 7010503

Sampled On : October 29, 2024 at 09:18

Sampled By : Leeah Schultz; Leah

Received On : October 29, 2024 at 14:01

Matrix : Surface Water

Sample Results - Field Test

Constituent	Result	RL	Units	Note	Sample Preparation	Sample Analysis	
Field Test					Date	Method	Date
pH (Field)	6.86		units		10/29/2024 09:18	4500HB	10/29/2024 09:18

ND=Non-Detected, RL=Reporting Level. * RL adjusted for dilution

November 25, 2024

Luhdorff & Scalmanini Consulting

Attn: Eddy Teasdale
550 Salem Street, Suite 3
Chico, CA 95928

Description : Lake Sample 2
Project : Surface & Canal Water

Lab No. : CH 2490089-005

Customer No. : 7010503

Sampled On : October 29, 2024 at 09:30

Sampled By : Leeah Schultz; Leah

Received On : October 29, 2024 at 14:01

Matrix : Surface Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
General Mineral							Date	Time	Who	Method	Date	Time	Who
Total Hardness as CaCO ₃	111	2.5	mg/L		1		10/31/2024	10:00	ac	2340B	10/31/2024	13:52	ac
Calcium	18	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:52	ac
Magnesium	16	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:52	ac
Potassium	1	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:52	ac
Sodium	28	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:52	ac
Total Cations	3.5	---	meq/L				10/31/2024	10:00	ac	Calc.	10/31/2024	13:52	ac
Boron	ND	0.1	mg/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:52	ac
Copper	ND	10	ug/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:52	ac
Iron	90	30	ug/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:52	ac
Manganese	ND	10	ug/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:52	ac
Zinc	ND	20	ug/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:52	ac
SAR	1.2	0.1	--		1		10/31/2024	10:00	ac	Calc.	10/31/2024	13:52	ac
Total Alkalinity (as CaCO ₃)	170	10	mg/L		1		10/31/2024	18:37	amm	SM 4500-H+B	10/31/2024	22:43	amm
Hydroxide as OH	ND	10	mg/L		1	U	10/31/2024	18:37	amm	SM 4500-H+B	10/31/2024	22:43	amm
Carbonate as CO ₃	ND	10	mg/L		1	U	10/31/2024	18:37	amm	SM 4500-H+B	10/31/2024	22:43	amm
Bicarbonate as HCO ₃	200	10	mg/L		1		10/31/2024	18:37	amm	SM 4500-H+B	10/31/2024	22:43	amm
Sulfate	2.7	0.5	mg/L		1		10/30/2024	16:50	ldm	EPA 300.0	10/30/2024	21:46	ldm
Chloride	4	1	mg/L		1		10/30/2024	16:50	ldm	EPA 300.0	10/30/2024	21:46	ldm
Nitrate as NO ₃	ND	0.4	mg/L		1	U	10/30/2024	16:50	ldm	EPA 300.0	10/30/2024	21:46	ldm
Nitrite as N	ND	0.1	mg/L		1	U	10/30/2024	16:50	ldm	EPA 300.0	10/30/2024	21:46	ldm
Nitrate + Nitrite as N	ND	0.1	mg/L		1	J	10/30/2024	16:50	ldm	EPA 300.0	10/30/2024	21:46	ldm
Fluoride	0.2	0.1	mg/L		1		10/30/2024	16:50	ldm	EPA 300.0	10/30/2024	21:46	ldm
Total Anions	3.5	---	meq/L		1		10/31/2024	18:37	amm	Calc.	10/31/2024	22:43	amm
pH	6.5	---	units		1		10/29/2024	09:30	lsl	SM 4500-H+B	10/29/2024	09:35	lsl
Specific Conductance	319	1	umhos/cm		1		10/31/2024	18:37	amm	SM 4500-H+B	10/31/2024	22:43	amm
Total Dissolved Solids	210	20	mg/L		1		10/30/2024	16:00	ctl	SM 2540 C	10/31/2024	10:50	ctl
MBAS, Calc. as LAS, MW 320	ND	0.1	mg/L		1	U	10/30/2024	17:06	krh	SM 5540 C	10/30/2024	21:35	krh
Aggressiveness Index	10.4	1	--		1		10/29/2024	09:30	lsl	Calc.	10/29/2024	09:35	lsl
Langlier Index (20°C)	-1.4	1	--		1		10/29/2024	09:30	lsl	Calc.	10/29/2024	09:35	lsl
Nitrate Nitrogen	ND	0.1	mg/L		1	U	10/30/2024	16:50	ldm	EPA 300.0	10/30/2024	21:46	ldm
Metals, Total													
Antimony	0.0010	0.0005	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:46	ac
Arsenic	0.004	0.002	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:46	ac
Beryllium	ND	0.0005	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:46	ac
Cadmium	ND	0.0002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:46	ac
Chromium	0.0015	0.0005	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:46	ac
Copper	0.0015	0.0005	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:46	ac
Lead	ND	0.0005	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:46	ac
Mercury	ND	0.00002	mg/L		1	U	11/11/2024	08:00	ejc	EPA 245.1	11/13/2024	14:09	ejc
Nickel	0.002	0.001	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:46	ac
Selenium	ND	0.002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:46	ac

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
Silver	ND	0.00025	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:46	ac
Thallium	ND	0.001	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:46	ac
Vanadium	ND	0.002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:46	ac
Zinc	0.04	0.01	mg/L		1	l	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:46	ac
Wet Chemistry													
Color, Apparent	40	17*	units		3		10/29/2024	14:55	kx1	SM 2120 B	10/29/2024	14:13	kx1
Odor	ND	1	TON		1		10/29/2024	15:59	kx1	SM 2150 B	10/29/2024	16:46	kx1
Turbidity	1.5	0.1	NTU		1	I	10/30/2024	09:08	kx1	SM 2130 B	10/30/2024	09:26	kx1

DQF Flags Definition:
 U Constituent results were non-detect.
 J Reported value is estimated; detected at a concentration below the RL and above the laboratory MDL.
 l The MS/MSD did not meet QC criteria.
 I The RPD for the laboratory duplicate exceeded laboratory criteria.

ND=Non-Detected, RL=Reporting Level * RL adjusted for dilution, Dil.=Dilution

November 25, 2024

Luhdorff & Scalmanini Consulting

Attn: Eddy Teasdale
 550 Salem Street, Suite 3
 Chico, CA 95928

Description : Lake Sample 2
 Project : Surface & Canal Water

Lab No. : CH 2490089-005

Customer No. : 7010503

Sampled On : October 29, 2024 at 09:30

Sampled By : Leeah Schultz; Leah

Received On : October 29, 2024 at 14:01

Matrix : Surface Water

Sample Results - Field Test

Constituent	Result	RL	Units	Note	Sample Preparation	Sample Analysis	
Field Test					Date	Method	Date
pH (Field)	6.48		units		10/29/2024 09:30	4500HB	10/29/2024 09:30

ND=Non-Detected, RL=Reporting Level. * RL adjusted for dilution

November 25, 2024

Luhdorff & Scalmanini Consulting

Attn: Eddy Teasdale
550 Salem Street, Suite 3
Chico, CA 95928

Description : Lake Sample 3
Project : Surface & Canal Water

Lab No. : CH 2490089-006

Customer No. : 7010503

Sampled On : October 29, 2024 at 09:38

Sampled By : Leeah Schultz; Leah

Received On : October 29, 2024 at 14:01

Matrix : Surface Water

Sample Results - Inorganic

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
General Mineral							Date	Time	Who	Method	Date	Time	Who
Total Hardness as CaCO ₃	115	2.5	mg/L		1		10/31/2024	10:00	ac	2340B	10/31/2024	13:59	ac
Calcium	18	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:59	ac
Magnesium	17	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:59	ac
Potassium	2	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:59	ac
Sodium	28	1	mg/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:59	ac
Total Cations	3.6	---	meq/L				10/31/2024	10:00	ac	Calc.	10/31/2024	13:59	ac
Boron	ND	0.1	mg/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:59	ac
Copper	ND	10	ug/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:59	ac
Iron	90	30	ug/L		1		10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:59	ac
Manganese	ND	10	ug/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:59	ac
Zinc	ND	20	ug/L		1	U	10/31/2024	10:00	ac	EPA 200.7	10/31/2024	13:59	ac
SAR	1.1	0.1	--		1		10/31/2024	10:00	ac	Calc.	10/31/2024	13:59	ac
Total Alkalinity (as CaCO ₃)	170	10	mg/L		1		10/31/2024	18:37	amm	SM 4500-H+B	10/31/2024	20:23	amm
Hydroxide as OH	ND	10	mg/L		1	U	10/31/2024	18:37	amm	SM 4500-H+B	10/31/2024	20:23	amm
Carbonate as CO ₃	ND	10	mg/L		1	U	10/31/2024	18:37	amm	SM 4500-H+B	10/31/2024	20:23	amm
Bicarbonate as HCO ₃	200	10	mg/L		1		10/31/2024	18:37	amm	SM 4500-H+B	10/31/2024	20:23	amm
Sulfate	2.7	0.5	mg/L		1		10/31/2024	17:14	ldm	EPA 300.0	10/31/2024	21:51	ldm
Chloride	4	1	mg/L		1		10/31/2024	17:14	ldm	EPA 300.0	10/31/2024	21:51	ldm
Nitrate as NO ₃	ND	0.4	mg/L		1	UT	10/31/2024	17:14	ldm	EPA 300.0	10/31/2024	21:51	ldm
Nitrite as N	ND	0.1	mg/L		1	UT	10/31/2024	17:14	ldm	EPA 300.0	10/31/2024	21:51	ldm
Nitrate + Nitrite as N	ND	0.1	mg/L		1	UT	10/31/2024	17:14	ldm	EPA 300.0	10/31/2024	21:51	ldm
Fluoride	0.2	0.1	mg/L		1		10/31/2024	17:14	ldm	EPA 300.0	10/31/2024	21:51	ldm
Total Anions	3.5	---	meq/L		1		10/31/2024	18:37	amm	Calc.	10/31/2024	20:23	amm
pH	7.1	---	units		1		10/29/2024	09:38	lsl	SM 4500-H+B	10/29/2024	09:42	lsl
Specific Conductance	317	1	umhos/cm		1		10/31/2024	18:37	amm	SM 4500-H+B	10/31/2024	20:23	amm
Total Dissolved Solids	200	20	mg/L		1		10/30/2024	16:00	ctl	SM 2540 C	10/31/2024	10:50	ctl
MBAS, Calc. as LAS, MW 320	0.146	0.1	mg/L		1		10/30/2024	17:06	krh	SM 5540 C	10/30/2024	21:35	krh
Aggressiveness Index	11.0	1	--		1		10/29/2024	09:38	lsl	Calc.	10/29/2024	09:42	lsl
Langlier Index (20°C)	-0.8	1	--		1		10/29/2024	09:38	lsl	Calc.	10/29/2024	09:42	lsl
Nitrate Nitrogen	ND	0.1	mg/L		1	UT	10/31/2024	17:14	ldm	EPA 300.0	10/31/2024	21:51	ldm
Metals, Total													
Antimony	0.0010	0.0005	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:39	ac
Arsenic	0.004	0.002	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:39	ac
Beryllium	ND	0.0005	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:39	ac
Cadmium	ND	0.0002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:39	ac
Chromium	0.0015	0.0005	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:39	ac
Copper	0.0040	0.0005	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:39	ac
Lead	ND	0.0005	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:39	ac
Mercury	ND	0.00002	mg/L		1	U	11/11/2024	08:00	ejc	EPA 245.1	11/13/2024	14:13	ejc
Nickel	0.003	0.001	mg/L		1		11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:39	ac
Selenium	ND	0.002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:39	ac

Constituent	Result	RL	Units	Note	Dil.	DQF	Sample Preparation			Sample Analysis			
Silver	ND	0.00025	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:39	ac
Thallium	ND	0.001	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:39	ac
Vanadium	ND	0.002	mg/L		1	U	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:39	ac
Zinc	0.04	0.01	mg/L		1	l	11/05/2024	08:00	ejc	EPA 200.8	11/08/2024	12:39	ac
Wet Chemistry													
Color, Apparent	35	13*	units		3		10/29/2024	14:55	kx1	SM 2120 B	10/29/2024	14:13	kx1
Odor	ND	1	TON		1		10/29/2024	15:59	kx1	SM 2150 B	10/29/2024	16:46	kx1
Turbidity	1.0	0.1	NTU		1	I	10/30/2024	09:08	kx1	SM 2130 B	10/30/2024	09:26	kx1
DQF Flags Definition: U Constituent results were non-detect. T Exceeded method/regulatory-specific holding time. l The MS/MSD did not meet QC criteria. I The RPD for the laboratory duplicate exceeded laboratory criteria.													

ND=Non-Detected, RL=Reporting Level * RL adjusted for dilution, Dil.=Dilution

November 25, 2024

Luhdorff & Scalmanini Consulting

Attn: Eddy Teasdale
 550 Salem Street, Suite 3
 Chico, CA 95928

Description : Lake Sample 3
 Project : Surface & Canal Water

Lab No. : CH 2490089-006
 Customer No. : 7010503

Sampled On : October 29, 2024 at 09:38
 Sampled By : Leeah Schultz; Leah
 Received On : October 29, 2024 at 14:01
 Matrix : Surface Water

Sample Results - Field Test

Constituent	Result	RL	Units	Note	Sample Preparation	Sample Analysis	
Field Test					Date	Method	Date
pH (Field)	7.14		units		10/29/2024 09:38	4500HB	10/29/2024 09:38

ND=Non-Detected, RL=Reporting Level. * RL adjusted for dilution

November 25, 2024

Luhdorff & Scalmanini Consulting

Lab No. : CH 2490089

Customer No. : 7010503

Quality Control - Metals

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals Boron	200.7	10/31/2024:212318AC (SP 2417897-001)	MS	mg/L	4.000	93.9%	75-125	
			MSD	mg/L	4.000	93.0%	75-125	
			MSRPD	mg/L		0.9%	≤20.0	
		(CH 2490089-005)	MS	mg/L	4.000	89.9%	75-125	
			MSD	mg/L	4.000	91.1%	75-125	
			MSRPD	mg/L		1.3%	≤20.0	
Calcium	200.7	10/31/2024:212318AC (SP 2417897-001)	MS	mg/L	12.00	55.1%	<¼	406
			MSD	mg/L	12.00	61.0%	<1/4	
			MSRPD	mg/L		0.5%	≤20.0	
		(CH 2490089-005)	MS	mg/L	12.00	81.2%	75-125	
			MSD	mg/L	12.00	81.5%	75-125	
			MSRPD	mg/L		0.1%	≤20.0	
Copper	200.7	10/31/2024:212318AC (SP 2417897-001)	MS	ug/L	800.0	92.5%	75-125	
			MSD	ug/L	800.0	95.8%	75-125	
			MSRPD	ug/L		3.5%	≤20.0	
		(CH 2490089-005)	MS	ug/L	800.0	89.9%	75-125	
			MSD	ug/L	800.0	89.3%	75-125	
			MSRPD	ug/L		0.7%	≤20.0	
Iron	200.7	10/31/2024:212318AC (SP 2417897-001)	MS	ug/L	4000	93.0%	75-125	
			MSD	ug/L	4000	92.0%	75-125	
			MSRPD	ug/L		1.1%	≤20.0	
		(CH 2490089-005)	MS	ug/L	4000	90.7%	75-125	
			MSD	ug/L	4000	95.0%	75-125	
			MSRPD	ug/L		4.5%	≤20.0	
Magnesium	200.7	10/31/2024:212318AC (SP 2417897-001)	MS	mg/L	12.00	68.6%	<¼	406
			MSD	mg/L	12.00	71.5%	<1/4	
			MSRPD	mg/L		0.4%	≤20.0	
		(CH 2490089-005)	MS	mg/L	12.00	82.7%	75-125	
			MSD	mg/L	12.00	84.5%	75-125	
			MSRPD	mg/L		0.8%	≤20.0	
Manganese	200.7	10/31/2024:212318AC (SP 2417897-001)	MS	ug/L	800.0	91.3%	75-125	
			MSD	ug/L	800.0	92.8%	75-125	
			MSRPD	ug/L		1.5%	≤20.0	
		(CH 2490089-005)	MS	ug/L	800.0	90.6%	75-125	
			MSD	ug/L	800.0	90.6%	75-125	
			MSRPD	ug/L		0.0%	≤20.0	
Potassium	200.7	10/31/2024:212318AC (SP 2417897-001)	MS	mg/L	12.00	95.0%	75-125	
			MSD	mg/L	12.00	93.1%	75-125	
			MSRPD	mg/L		1.7%	≤20.0	
		(CH 2490089-005)	MS	mg/L	12.00	84.5%	75-125	
			MSD	mg/L	12.00	87.0%	75-125	
			MSRPD	mg/L		2.6%	≤20.0	
Sodium	200.7	10/31/2024:212318AC (SP 2417897-001)	MS	mg/L	12.00	18.1%	<¼	406
			MSD	mg/L	12.00	101%	75-125	
			MSRPD	mg/L		4.6%	≤20.0	
			MS	mg/L	12.00	81.7%	75-125	

November 25, 2024

Luhdorff & Scalmanini Consulting

Lab No. : CH 2490089

Customer No. : 7010503

Quality Control - Metals

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Zinc	200.7	(CH 2490089-005)	MSD	mg/L	12.00	77.6%	75-125	
			MSRPD	mg/L		1.3%	≤20.0	
		10/31/2024:212318AC	MS	ug/L	800.0	79.7%	75-125	
		(SP 2417897-001)	MSD	ug/L	800.0	81.9%	75-125	
			MSRPD	ug/L		2.7%	≤20.0	
			MS	ug/L	800.0	81.8%	75-125	
Antimony	200.8	(CH 2490089-005)	MSD	ug/L	800.0	80.0%	75-125	
			MSRPD	ug/L		2.2%	≤20.0	
		11/05/2024:212504EJC	Blank	ug/L		ND	<0.5	
			LCS	ug/L	50.00	95.3%	85-115	
			MS	ug/L	50.00	96.8%	75-125	
		(SP 2417968-001)	MSD	ug/L	50.00	101%	75-125	
Arsenic	200.8		MSRPD	ug/L		4.2%	≤20.0	
			MS	ug/L	50.00	97.2%	75-125	
		(SP 2417895-002)	MSD	ug/L	50.00	97.4%	75-125	
			MSRPD	ug/L		0.1%	≤20.0	
		11/05/2024:212504EJC	Blank	ug/L		ND	<2	
			LCS	ug/L	50.00	98.3%	85-115	
Beryllium	200.8		MS	ug/L	50.00	97.3%	75-125	
		(SP 2417968-001)	MSD	ug/L	50.00	103%	75-125	
			MSRPD	ug/L		5.7%	≤20	
			MS	ug/L	50.00	103%	75-125	
		(SP 2417895-002)	MSD	ug/L	50.00	106%	75-125	
			MSRPD	ug/L		3.3%	≤20	
Cadmium	200.8	11/05/2024:212504EJC	Blank	ug/L		ND	<0.5	
			LCS	ug/L	50.00	89.3%	85-115	
			MS	ug/L	50.00	91.5%	75-125	
		(SP 2417968-001)	MSD	ug/L	50.00	93.3%	75-125	
			MSRPD	ug/L		1.9%	≤20	
			MS	ug/L	50.00	91.0%	75-125	
Chromium	200.8	(SP 2417895-002)	MSD	ug/L	50.00	99.0%	75-125	
			MSRPD	ug/L		8.4%	≤20	
		11/05/2024:212504EJC	Blank	ug/L		ND	<0.5	
			LCS	ug/L	50.00	97.6%	85-115	
			MS	ug/L	50.00	96.6%	75-125	
		(SP 2417968-001)	MSD	ug/L	50.00	102%	75-125	
Copper	200.8		MSRPD	ug/L		4.7%	≤20.0	
			MS	ug/L	50.00	101%	75-125	
		(SP 2417895-002)	MSD	ug/L	50.00	103%	75-125	
			MSRPD	ug/L		1.8%	≤20.0	
		11/05/2024:212504EJC	Blank	ug/L		ND	<0.5	
			LCS	ug/L	50.00	96.1%	85-115	
			MS	ug/L	50.00	95.5%	75-125	

November 25, 2024

Luhdorff & Scalmanini Consulting

Lab No. : CH 2490089

Customer No. : 7010503

Quality Control - Metals

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note		
Lead	200.8	(SP 2417968-001)	MSD	ug/L	50.00	105%	75-125			
			MSRPD	ug/L		8.5%	≤20.0			
		(SP 2417895-002)	MS	ug/L	50.00	102%	75-125			
			MSD	ug/L	50.00	104%	75-125			
			MSRPD	ug/L		1.6%	≤20.0			
			Blank	ug/L		ND	<0.5			
		(SP 2417968-001)	LCS	ug/L	50.00	94.3%	85-115			
			MS	ug/L	50.00	95.8%	75-125			
		(SP 2417895-002)	MSD	ug/L	50.00	100%	75-125			
			MSRPD	ug/L		4.5%	≤20.0			
Nickel	200.8		MS	ug/L	50.00	98.9%	75-125			
			MSD	ug/L	50.00	102%	75-125			
		(SP 2417968-001)	MSRPD	ug/L		3.3%	≤20.0			
			Blank	ug/L		ND	<1			
		(SP 2417895-002)	LCS	ug/L	50.00	95.5%	85-115			
			MS	ug/L	50.00	95.2%	75-125			
			MSD	ug/L	50.00	101%	75-125			
			MSRPD	ug/L		6.1%	≤20			
		(SP 2417895-002)	MS	ug/L	50.00	99.3%	75-125			
			MSD	ug/L	50.00	104%	75-125			
Selenium	200.8		MSRPD	ug/L		4.6%	≤20			
			Blank	ug/L		ND	<2			
		(SP 2417968-001)	LCS	ug/L	50.00	102%	85-115			
			MS	ug/L	50.00	103%	75-125			
		(SP 2417895-002)	MSD	ug/L	50.00	108%	75-125			
			MSRPD	ug/L		4.8%	≤20.0			
			MS	ug/L	50.00	111%	75-125			
			MSD	ug/L	50.00	111%	75-125			
			MSRPD	ug/L		0.2%	≤20.0			
			Blank	ug/L		ND	<0.25			
Silver	200.8		LCS	ug/L	50.00	95.2%	85-115	435		
			MS	ug/L	50.00	13.7%	75-125			
		(SP 2417968-001)	MSD	ug/L	50.00	14.2%	75-125	435		
			MSRPD	ug/L		3.6%	≤20.0			
		(SP 2417895-002)	MS	ug/L	50.00	13.9%	75-125	435		
			MSD	ug/L	50.00	15.4%	75-125			
			MSRPD	ug/L		9.9%	≤20.0			
			Blank	ug/L		ND	<1			
		Thallium	200.8		LCS	ug/L	50.00	93.5%	85-115	
					MS	ug/L	50.00	95.4%	75-125	
(SP 2417968-001)	MSD			ug/L	50.00	98.6%	75-125			
	MSRPD			ug/L		3.3%	≤20			
(SP 2417895-002)	MS			ug/L	50.00	96.9%	75-125			
	MSD			ug/L	50.00	101%	75-125			
	MSRPD			ug/L		3.9%	≤20			
	Blank			ug/L		ND	<2			
Vanadium	200.8				LCS	ug/L	50.00	95.9%	85-115	
					MS	ug/L	50.00	96.3%	75-125	
		(SP 2417968-001)	MSD	ug/L	50.00	101%	75-125			
			MSRPD	ug/L		5.0%	≤20			
			MS	ug/L	50.00	101%	75-125			

November 25, 2024

Luhdorff & Scalmanini Consulting

Lab No. : CH 2490089

Customer No. : 7010503

Quality Control - Metals

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Zinc	200.8	(SP 2417895-002)	MSD	ug/L	50.00	102%	75-125	
			MSRPD	ug/L		0.9%	≤20	
		11/05/2024:212504EJC	Blank	ug/L		ND	<10	
			LCS	ug/L	50.00	109%	85-115	
			MS	ug/L	50.00	38.2%	75-125	435
		(SP 2417968-001)	MSD	ug/L	50.00	42.0%	75-125	435
			MSRPD	ug/L		2.4%	≤20	
			MS	ug/L	50.00	79.0%	75-125	
		(SP 2417895-002)	MSD	ug/L	50.00	88.6%	75-125	
			MSRPD	ug/L		5.8%	≤20	
Mercury	245.1	11/11/2024:212688EJC	Blank	ug/L		ND	<0.02	
			LCS	ug/L	0.2000	85.0%	85-115	
			MS	ug/L	0.2000	87.9%	75-125	
		(CH 2490089-001)	MSD	ug/L	0.2000	86.9%	75-125	
			MSRPD	ug/L		1.1%	≤20	

Definition

- Blank : Method Blank - Prepared to verify that the preparation process is not contributing contamination to the samples.
- DQO : Data Quality Objective - This is the criteria against which the quality control data is compared.
- LCS : Laboratory Control Standard/Sample - Prepared to verify that the preparation process is not affecting analyte recovery.
- MS : Matrix Spikes - A random sample is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
- MSD : Matrix Spike Duplicate of MS/MSD pair - A random sample duplicate is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
- MSRPD : MS/MSD Relative Percent Difference (RPD) - The MS relative percent difference is an indication of precision for the preparation and analysis.
- ND : Non-detect - Result was below the DQO listed for the analyte.

Explanation

- 406 : Matrix Spike (MS) not within the Acceptance Range (AR) because of high analyte concentration in the sample. Data was accepted based on the LCS or CCV recovery.
- 435 : Sample matrix may be affecting this analyte. Data was accepted based on the LCS or CCV recovery.

November 25, 2024

Luhdorff & Scalmanini Consulting

Lab No. : CH 2490089

Customer No. : 7010503

Quality Control - Wet Chem

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
Color	2120B	(CH 2490087-001)	Dup	units		0%	20	
Turbidity	2130B	(CH 2490087-001)	Dup	NTU		22.2%	20	440
Odor	2150B	(CH 2490087-001)	Dup	TON		0%	20	
Alkalinity (as CaCO ₃)	2320B	(CC 2484199-003)	Dup	mg/L		1.30%	10	
	2320B	(SP 2417945-003)	Dup	mg/L		1.57%	10	
Bicarbonate	2320B	(CC 2484199-003)	Dup	mg/L		1.24%	10	
	2320B	(SP 2417945-003)	Dup	mg/L		1.56%	10	
Carbonate	2320B	(CC 2484199-003)	Dup	mg/L		0%	10	
	2320B	(SP 2417945-003)	Dup	mg/L		0%	10	
E. C.	2320B	(CC 2484199-003)	Dup	umhos/cm		0.4%	5	
	2320B	(SP 2417945-003)	Dup	umhos/cm		0.4%	5	
Hydroxide	2320B	(CC 2484199-003)	Dup	mg/L		0%	10	
	2320B	(SP 2417945-003)	Dup	mg/L		0%	10	
Solids, Total Dissolved	2540CE	10/30/2024:212271CTL	Blank	mg/L		ND	<20	
		(VI 2448735-001)	LCS	mg/L	991.1	100%	90-110	
		(VI 2448735-001)	Dup	mg/L		0.3%	5	
			Dup	mg/L		0.06%	5	
Chloride	300.0	10/30/2024:212519LDM	Blank	mg/L		ND	<1	
			LCS	mg/L	25.00	98.3%	90-110	
			MS	mg/L	50.00	87.0%	67-117	
		(SP 2417840-001)	MSD	mg/L	50.00	87.5%	67-117	
			MSRPD	mg/L		0.3%	≤7	
	300.0	10/31/2024:212343LDM	Blank	mg/L		ND	<1	
			LCS	mg/L	25.00	97.2%	90-110	
			MS	mg/L	50.00	95.8%	67-117	
		(CH 2490089-003)	MSD	mg/L	50.00	96.0%	67-117	
			MSRPD	mg/L		0.2%	≤7	
			MS	mg/L	50.00	94.8%	67-117	
		(STK2455940-003)	MSD	mg/L	50.00	95.0%	67-117	
			MSRPD	mg/L		0.2%	≤7	
	300.0	11/21/2024:213208LDM	Blank	mg/L		ND	<1	
			LCS	mg/L	25.00	101%	90-110	
			MS	mg/L	50.00	97.3%	67-117	
		(STK2456087-001)	MSD	mg/L	50.00	96.8%	67-117	
			MSRPD	mg/L		0.4%	≤7	
			MS	mg/L	50.00	101%	67-117	
		(STK2456087-002)	MSD	mg/L	50.00	101%	67-117	
			MSRPD	mg/L		0.4%	≤7	
Fluoride	300.0	10/30/2024:212519LDM	Blank	mg/L		ND	<0.1	
			LCS	mg/L	2.500	97.8%	90-110	
			MS	mg/L	5.000	96.7%	89-111	
		(SP 2417840-001)	MSD	mg/L	5.000	95.1%	89-111	
			MSRPD	mg/L		1.5%	≤9	
	300.0	10/31/2024:212343LDM	Blank	mg/L		ND	<0.1	
			LCS	mg/L	2.500	97.5%	90-110	
			MS	mg/L	5.000	93.7%	89-111	
		(CH 2490089-003)	MSD	mg/L	5.000	94.3%	89-111	
			MSRPD	mg/L		0.5%	≤9	
			MS	mg/L	5.000	93.7%	89-111	
		(STK2455940-003)	MSD	mg/L	5.000	94.5%	89-111	

November 25, 2024

Luhdorff & Scalmanini Consulting

Lab No. : CH 2490089

Customer No. : 7010503

Quality Control - Wet Chem

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
			MSRPD	mg/L		0.9%	≤9	
	300.0	11/21/2024:213208LDM	Blank	mg/L		ND	<0.1	
			LCS	mg/L	2.500	101%	90-110	
			MS	mg/L	5.000	102%	89-111	
		(STK2456087-001)	MSD	mg/L	5.000	101%	89-111	
			MSRPD	mg/L		0.7%	≤9	
			MS	mg/L	5.000	105%	89-111	
		(STK2456087-002)	MSD	mg/L	5.000	105%	89-111	
			MSRPD	mg/L		0.5%	≤9	
Nitrate	300.0	10/30/2024:212519LDM	Blank	mg/L		ND	<0.4	
			LCS	mg/L	20.00	97.7%	90-110	
			MS	mg/L	40.00	97.5%	86-112	
		(SP 2417840-001)	MSD	mg/L	40.00	97.3%	86-112	
			MSRPD	mg/L		0.2%	≤7	
	300.0	10/31/2024:212343LDM	Blank	mg/L		ND	<0.4	
			LCS	mg/L	20.00	97.4%	90-110	
			MS	mg/L	40.00	97.5%	86-112	
		(CH 2490089-003)	MSD	mg/L	40.00	97.4%	86-112	
			MSRPD	mg/L		0.1%	≤7	
			MS	mg/L	40.00	93.9%	86-112	
		(STK2455940-003)	MSD	mg/L	40.00	93.8%	86-112	
			MSRPD	mg/L		0.1%	≤7	
	300.0	11/21/2024:213208LDM	Blank	mg/L		ND	<0.4	
			LCS	mg/L	20.00	100%	90-110	
			MS	mg/L	40.00	77.5%	86-112	435
		(STK2456087-001)	MSD	mg/L	40.00	77.1%	86-112	435
			MSRPD	mg/L		0.3%	≤7	
			MS	mg/L	40.00	79.6%	86-112	435
		(STK2456087-002)	MSD	mg/L	40.00	79.9%	86-112	435
			MSRPD	mg/L		0.3%	≤7	
Nitrate + Nitrite as N	300.0	10/30/2024:212519LDM	Blank	mg/L		ND	<0.4	
			LCS	mg/L	20.00	97.7%	90-110	
			MS	mg/L	40.00	97.5%	86-112	
		(SP 2417840-001)	MSD	mg/L	40.00	97.3%	86-112	
			MSRPD	mg/L		0.2%	≤7	
	300.0	10/31/2024:212343LDM	Blank	mg/L		ND	<0.4	
			LCS	mg/L	20.00	97.4%	90-110	
			MS	mg/L	40.00	97.5%	86-112	
		(CH 2490089-003)	MSD	mg/L	40.00	97.4%	86-112	
			MSRPD	mg/L		0.1%	≤7	
			MS	mg/L	40.00	93.9%	86-112	
		(STK2455940-003)	MSD	mg/L	40.00	93.8%	86-112	
			MSRPD	mg/L		0.1%	≤7	
	300.0	11/21/2024:213208LDM	Blank	mg/L		ND	<0.4	
			LCS	mg/L	20.00	100%	90-110	
			MS	mg/L	40.00	77.5%	86-112	435
		(STK2456087-001)	MSD	mg/L	40.00	77.1%	86-112	435
			MSRPD	mg/L		0.3%	≤7	
			MS	mg/L	40.00	79.6%	86-112	435
		(STK2456087-002)	MSD	mg/L	40.00	79.9%	86-112	435
			MSRPD	mg/L		0.3%	≤7	

November 25, 2024

Luhdorff & Scalmanini Consulting

Lab No. : CH 2490089

Customer No. : 7010503

Quality Control - Wet Chem

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Nitrate Nitrogen	300.0	10/30/2024:212519LDM (SP 2417840-001)	Blank	mg/L		ND	<0.1	
			LCS	mg/L	4.518	97.6%	90-110	
			MS	mg/L	9.036	97.5%	86-112	
			MSD	mg/L	9.036	97.2%	86-112	
			MSRPD	mg/L		0.2%	≤7	
	300.0	10/31/2024:212343LDM (CH 2490089-003)	Blank	mg/L		ND	<0.1	
			LCS	mg/L	4.518	97.3%	90-110	
			MS	mg/L	9.036	97.5%	86-112	
			MSD	mg/L	9.036	97.4%	86-112	
			MSRPD	mg/L		0.1%	≤7	
	300.0	11/21/2024:213208LDM (STK2455940-003)	MS	mg/L	9.036	93.8%	86-112	
			MSD	mg/L	9.036	93.7%	86-112	
			MSRPD	mg/L		0.1%	≤7	
	300.0	11/21/2024:213208LDM (STK2456087-001)	Blank	mg/L		ND	<0.1	
			LCS	mg/L	4.518	100%	90-110	
			MS	mg/L	9.036	77.4%	86-112	435
			MSD	mg/L	9.036	77.0%	86-112	435
			MSRPD	mg/L		0.3%	≤7	
	300.0	11/21/2024:213208LDM (STK2456087-002)	MS	mg/L	9.036	79.5%	86-112	435
			MSD	mg/L	9.036	79.8%	86-112	435
			MSRPD	mg/L		0.3%	≤7	
Nitrite as Nitrogen	300.0	10/30/2024:212519LDM (SP 2417840-001)	Blank	mg/L		ND	<0.1	
			LCS	mg/L	4.567	98.4%	90-110	
			MS	mg/L	9.134	95.3%	88-111	
			MSD	mg/L	9.134	96.2%	88-111	
			MSRPD	mg/L		0.9%	≤8	
	300.0	10/31/2024:212343LDM (CH 2490089-003)	Blank	mg/L		ND	<0.1	
			LCS	mg/L	4.567	94.3%	90-110	
			MS	mg/L	9.134	95.1%	88-111	
			MSD	mg/L	9.134	95.3%	88-111	
			MSRPD	mg/L		0.2%	≤8	
	300.0	11/21/2024:213208LDM (STK2455940-003)	MS	mg/L	9.134	96.0%	88-111	
			MSD	mg/L	9.134	96.2%	88-111	
			MSRPD	mg/L		0.3%	≤8	
	300.0	11/21/2024:213208LDM (STK2456087-001)	Blank	mg/L		ND	<0.1	
			LCS	mg/L	4.567	99.7%	90-110	
			MS	mg/L	9.134	100%	88-111	
			MSD	mg/L	9.134	100%	88-111	
			MSRPD	mg/L		0.3%	≤8	
	300.0	11/21/2024:213208LDM (STK2456087-002)	MS	mg/L	9.134	104%	88-111	
			MSD	mg/L	9.134	104%	88-111	
			MSRPD	mg/L		0.7%	≤8	
Sulfate	300.0	10/30/2024:212519LDM (SP 2417840-001)	Blank	mg/L		ND	<0.5	
			LCS	mg/L	50.00	98.7%	90-110	
			MS	mg/L	100.0	86.2%	18-165	
			MSD	mg/L	100.0	86.8%	18-165	
			MSRPD	mg/L		0.4%	≤7	
	300.0	10/31/2024:212343LDM (CH 2490089-003)	Blank	mg/L		ND	<0.5	
			LCS	mg/L	50.00	97.2%	90-110	
			MS	mg/L	100.0	95.9%	18-165	
			MSD	mg/L	100.0	96.1%	18-165	

November 25, 2024

Luhdorff & Scalmanini Consulting

Lab No. : CH 2490089

Customer No. : 7010503

Quality Control - Wet Chem

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
			MSRPD	mg/L		0.3%	≤7	
			MS	mg/L	100.0	95.9%	18-165	
		(STK2455940-003)	MSD	mg/L	100.0	96.1%	18-165	
			MSRPD	mg/L		0.2%	≤7	
	300.0	11/21/2024:213208LDM	Blank	mg/L		ND	<0.5	
			LCS	mg/L	50.00	101%	90-110	
			MS	mg/L	100.0	98.6%	18-165	
		(STK2456087-001)	MSD	mg/L	100.0	98.2%	18-165	
			MSRPD	mg/L		0.3%	≤7	
			MS	mg/L	100.0	102%	18-165	
		(STK2456087-002)	MSD	mg/L	100.0	102%	18-165	
			MSRPD	mg/L		0.4%	≤7	
MBAS	5540C	10/30/2024:212297KRH	Blank	mg/L		ND	<0.1	
			LCS	mg/L	0.5000	97.7%	86-114	
			BS	mg/L	0.5000	97.8%	86-114	
			BSD	mg/L	0.5000	99.2%	86-114	
			BSRPD	mg/L		1.4%	≤5	


Definition

- Blank : Method Blank - Prepared to verify that the preparation process is not contributing contamination to the samples.
- BS : Blank Spikes - A blank is spiked with a known amount of analyte. It is prepared to verify that the preparation process is not affecting analyte recovery.
- BSD : Blank Spike Duplicate of BS/BSD pair - A blank duplicate is spiked with a known amount of analyte. It is prepared to verify that the preparation process is not affecting analyte recovery.
- BSRPD : BS/BSD Relative Percent Difference (RPD) - The BS relative percent difference is an indication of precision for the preparation and analysis.
- Dup : Duplicate Sample - A random sample with each batch is prepared and analyzed in duplicate. The relative percent difference is an indication of precision for the preparation and analysis.
- LCS : Laboratory Control Standard/Sample - Prepared to verify that the preparation process is not affecting analyte recovery.
- MS : Matrix Spikes - A random sample is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
- MSD : Matrix Spike Duplicate of MS/MSD pair - A random sample duplicate is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
- MSRPD : MS/MSD Relative Percent Difference (RPD) - The MS relative percent difference is an indication of precision for the preparation and analysis.

Explanation

- 435 : Sample matrix may be affecting this analyte. Data was accepted based on the LCS or CCV recovery.
- 440 : Sample nonhomogeneity may be affecting this analyte. Data was accepted based on the LCS or CCV recovery.



				75857:10/07/2024				TEST DESCRIPTION - See Reverse side for Container, Preservative and Sampling information											
Client: Luhdorff & Scalmanini Consulting Address: Attn: Eddy Teasdale 550 Salem Street, Suite 3 Chico, CA 95928 Phone: (530)661-0109 Fax: Contact Person: Eddy Teasdale Project Name: Surface & Canal Water Purchase Order Number: Quote Number: CH 20241016-01				Method of Sampling: Composite(C) Grab(G) Type of Sample **SEE REVERSE SIDE** Potable(P) Non-Potable(NP) Ag Water(AgW) Bact Type: Other(O) System(SYS) Source(SR) Waste(W) Bact Reason: Routine(ROUT) Repeat(RPT) Replace(RPL) Other(O) Special(SPL) General Mineral 16oz(P) Wet Chemistry-Turbidity,Odor,Color **Analyzed in Chico** 500 ml(AGT) Field Test-Field pH !!pH = 15 MINUTE HOLD TIME!! Field - pH Date Field - pH Time Metals, Total-Sb,As,Be,Cd,Cr,Cu,Pb,Hg,Ni,Se,Ag,Tl,V,Zn,3010Prep 250ml(P)-HNO3															
Sampler(s) Leah Schultz; Leah Jackson																			
Sampling Fee: _____ Pickup Fee: _____ Compositor Setup Date: ____/____/____ Time: ____/____																			
Lab Number: CH 24190089 7-10503																			
Samp Num	Location Description	Date Sampled	Time Sampled																
1	Canal 10 Min Sample	10/29/24	850am	G	SW	NP				1	1	7.31	10/29	0850	1				
2	Canal 1 Hour Sample		955am	G	SW	NP				1	1	7.48	10/29	0959	1				
3	Canal 2 Hour Sample		1043am	G	SW	NP				1	1	7.04	10/29	1043	1				
4	Lake Sample 1		918am	G	SW	NP				1	1	6.86	10/29	1008	1				
5	Lake Sample 2		930am	G	SW	NP				1	1	6.48	10/29	9:35	1				
6	Lake Sample 3	Y	938am	G	SW	NP				1	1	7.14	10/29	942	1				
Remarks:				Relinquished: _____ Date: _____ Time: _____				Relinquished: _____ Date: _____ Time: _____				Relinquished: _____ Date: _____ Time: _____							
ROI 2.1c				Received By: _____ Date: _____ Time: _____				Received By: _____ Date: _____ Time: _____				Received By: _____ Date: _____ Time: _____							
				KSH 10/29 1401				KSH 10/29 1700				GCS 10/29 1700							
				10/29 1401				10/29 1700				10/30/24 1200							

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Inter-Laboratory Condition Upon Receipt (Attach to COC) Sample Receipt at:

CC CH STK VI

1. Number of ice chests/packages received: CH Shipping tracking #(s): _____

2. Temp IR Gun ID #: 1

3. Were samples received on ice? Yes No Temps: 2.1°C / _____ / _____ / _____ / _____

Surface water SWTR bact samples: A sample that has a temperature upon receipt of >10° C, whether iced or not, should be flagged unless the time since sample collection has been less than two hours.

4. Do the number of bottles received agree with the COC? Yes No N/A

5. Were samples received intact? (i.e. no broken bottles, leaks etc.) Yes No

6. VOAs checked for Headspace? Yes No N/A

7. Were all analyses within holding times at time of receipt? Yes No

8. Verify sample date, time and sampler name Yes No

Sign and date the COC, place in a ziplock and put in the same ice chest as the samples.

Sample Receipt Review completed by (initials): KSH

Sample Receipt at SP:

1. Number of ice chests/packages received: 1 Shipping tracking #(s): 562891140

2. Temp IR Gun ID #: 261

3. Were samples received on ice? Yes No Temps: 3 / _____ / _____ / _____ / _____

Acceptable is above freezing to 6°C. If many packages are received at one time check for tests/H.T.'s/rushes/

4. Do the number of bottles received agree with the COC? Yes No N/A

5. Were samples received intact? (i.e. no broken bottles, leaks etc.) Yes No

Sign and date the COC, obtain LIMS sample numbers, select methods/tests and print labels.

Sample Verification, Labeling and Distribution:

1. Were all requested analyses understood and acceptable? Yes No

2. Did bottle labels correspond with the client's ID's? Yes No

3. Were all bottles requiring sample preservation properly preserved? Yes No N/A FGL
[Exception: Oil & Grease, VOA and CrVI verified in lab]

4. VOAs checked for Headspace? Yes No N/A

5. Have rush or project due dates been checked and accepted? Yes No N/A

6. Were all analyses within holding times at time of receipt? Yes No

Attach labels to the containers and include a copy of the COC for lab delivery.

Sample Receipt, Login and Verification completed by (initials): [Signature]

Discrepancy Documentation:

Any items above which are "No" or do not meet specifications (i.e. temps) must be resolved.

1. Person Contacted: _____ Phone Number: _____

Initiated By: _____ Date: _____

Problem:

Resolution:

2. Person Contacted: _____

Initiated By: _____

Problem:

Resolution:

(7010503)
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