

Appendix 5-1

Santa Rosa Plain Subbasin 2022 Well Installation Technical Memorandum

Well Installation Report

Monitoring Network Enhancement Project

November 2022



Prepared for:
Santa Rosa Plain Groundwater Sustainability Agency

Monitoring Network Enhancement Program - Well Installation Report, Santa Rosa Plain Groundwater Subbasin

Prepared for:

Santa Rosa Plain Groundwater Sustainability Agency
2235 Mercury Way, Suite 105
Santa Rosa, CA 95407

Submitted by:

GEI Consultants, Inc.
2868 Prospect Park Drive, Suite 400
Rancho Cordova, CA 95670
916-631-4500

November 18, 2022
Project # 2100757

Prepared by _____

Trevor Kent



Reviewed by _____

Chris Petersen, PG 6189. CHg 463



Table of Contents

1.	Introduction	5
1.1	Background and Objective	5
1.2	Report Organization	6
2.	Well Sites	7
3.	Methods and Procedures	9
3.1	Pre-Field Activities	9
3.2	Drilling and Lithologic Logging	10
3.2.1	SRPDMW-1	11
3.2.2	SRPDMW-2	12
3.2.3	SRPDMW-3	12
3.3	Electrical Logging (E-Log), Caliper Survey, and Well Design	12
3.4	Well Construction	13
3.4.1	Installation of Well Casing and Screen	14
3.4.2	Installation of Filter Pack and Borehole Seals	17
3.4.3	Well Survey	17
3.5	Well Development	17
4.	Groundwater Quality Sampling and Results	19
4.1	SRPDMW-1	21
4.2	SRPDMW-2	21
4.3	SRPDMW-3	22

Tables

Table 1: Geologic Formations, Descriptions, and Field Identifiers.....	11
Table 2: Well Construction Details.....	16
Table 3: Water Quality Results.....	20

Figures

Figure 1: Santa Rosa Plain Groundwater Subbasin Constructed Monitoring Well Locations.	8
--	---

Attachments

Attachment A: Permits and CEQA

Attachment B: Field Lithologic Logs

Attachment C: DWR Well Completion Reports

Attachment D: Geophysical Logs

Attachment E: Well As-Built

Attachment F: Sampling and Analysis Plan

Attachment G: Well Development Logs

Attachment H: Laboratory Results

Abbreviations and Acronyms

bgs	below ground surface
CEQA	California Environmental Quality Act
DWR	California Department of Water Resources
GEI	GEI Consultants, Inc.
GSP	Groundwater Sustainability Plan
MCL	Maximum Contaminant Limit
mg/L	milligrams per liter
MNEP	Monitoring Network Enhancement Program
MW	monitoring well
NTU	Nephelometric Turbidity Unit
PVC	polyvinyl chloride
Roadrunner	Roadrunner Drilling and Pump Company, Inc.
SAP	Sampling and Analysis Plan
SGMA	Sustainable Groundwater Management Act
Stewart	Stewart Well Logging Services
SRP Basin	Santa Rosa Plain Groundwater Subbasin
SRPDMW	Santa Rosa Plain Deep Monitoring Well
SRPGSA	Santa Rosa Plain Groundwater Sustainability Agency
SW	Sonoma Water, Sonoma County Water Agency
TDS	total dissolved solids

1. Introduction

GEI Consultants, Inc. (GEI) prepared this *Monitoring Well Installation Report* for the Santa Rosa Plain Groundwater Sustainability Agency (SRPGSA) to document the drilling, lithologic logging, and construction of three multilevel groundwater monitoring wells (MW) in the Santa Rosa Plain Groundwater Subbasin (SRP Subbasin). These wells were constructed as part of the Monitoring Network Enhancement Project (MNEP), intended to expand the groundwater monitoring networks of the SRP Subbasin, the Petaluma Valley Groundwater Basin, and the Sonoma Valley Groundwater Subbasin for the purposes of groundwater monitoring under the Sustainable Groundwater Management Act (SGMA). The new MWs will be integrated with the existing groundwater monitoring network detailed in the SRP Subbasin's Groundwater Sustainability Plan (GSP) for SGMA monitoring and compliance.

1.1 Background and Objective

In compliance with SGMA, the SRPGSA submitted a GSP for the SRP Subbasin to the California Department of Water Resources (DWR) in January 2022. The purpose of the GSP is to detail groundwater conditions in the subbasin, define sustainable criteria for the management of groundwater in the subbasin, and outline efforts to maintain or achieve sustainable groundwater management by 2040. Sustainable groundwater management, while defined by the stakeholders of each basin/subbasin, is avoidance of undesirable results for six sustainability indicators:



The GSP established a monitoring network to track groundwater conditions over time, with respect to the sustainability indicators listed above and monitor if groundwater conditions in the subbasin are sustainable. The objectives of the monitoring program (SRPGSA 2022) are to:

- 1) Demonstrate progress toward achieving measurable objectives described in the GSP,
- 2) Monitor impacts on the beneficial uses and users of groundwater,

- 3) Monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds
- 4) Quantify annual changes in water-budget components.

The SRP Subbasin groundwater-level monitoring network consists of existing monitoring, private supply, and municipal wells. Wells were selected for inclusion in the monitoring network based on accuracy of available well data, accessibility, and ability to accurately monitor groundwater conditions in relation to the sustainability indicators. However, existing wells were not sufficient to meet the monitoring needs of the subbasin, which resulted in the identification of data gaps. MWs constructed as part of this project serve to help fill these data gaps with respect to groundwater level and interconnected surface water with groundwater. Each well will be outfitted with a transducer in the future to continuously monitor groundwater levels.

This project, and construction of the MWs, was funded through the DWR's Proposition 68 grant funding, which is managed from the Sustainable Groundwater Management Grant Program. This funding was intended to address data gaps, including upgrades to the groundwater monitoring networks, evaluations of hydrogeologic conditions, and work, to facilitate completion and implementation of the GSPs throughout the state. Sonoma Water (SW) managed the MW construction on behalf of the SRPGSA.

1.2 Report Organization

This report is organized as follows:

- **Well Sites:** Identifies sites selected as part of the MNEP.
- **Methods and Procedures:** Documents each phase of borehole drilling and MW construction, including data collected during each phase:
 - Pre-Field Activities
 - Drilling and Lithologic Logging
 - Geophysical Logging and Well Design
 - Well Construction
 - Well Development
 - Site Cleanup
- **Water Quality Sampling and Results:** Documents water quality sampling procedures and results following well construction.

2. Well Sites

Figure 1 shows the locations of MWs constructed as part of the MNEP. Site locations were driven by the monitoring network data gaps assessment done in the SRP Subbasin GSP (SRPGSA 2022). This assessment identified locations throughout the SRP Subbasin where additional MWs would serve to improve monitoring of the shallow and deep aquifers as well as monitoring of surface water-groundwater interaction. Initial siting of MWs was completed as part of the SRP Subbasin GSP.

Sites were selected by SW with GEI support following an extensive pre-project site screening to select the most favorable locations. Factors included:

- Existing geologic reports and cross-sections
- Data gap assessments from the Santa Rosa Plain Subbasin GSP
- Nearby Well Completion Reports and drilling logs
- Construction details of nearby known domestic and agricultural production wells
- Surrounding land use type and surface water features
- Site access and feasibility of construction activities

Based on the criteria above, sites were selected to best supplement the existing groundwater monitoring network and address data gaps, as identified in the GSP, via a desktop study. Once the list of sites was refined, SW and GEI performed site visits of the most favorable locations to identify the most suitable locations. SW finalized well sites that met the requirements of the GSP, had the greatest probability of favorable geologic conditions, and were accessible.

Per the Prop 68 funding, selected well locations facilitate the implementation of the GSP by addressing the data gaps identified in the GSP. All well sites serve to address shallow and deep aquifer monitoring network data gaps. The shallow well at Santa Rosa Plain Deep Monitoring Well (SRPDMW)-2 and SRPDMW-3 also address respective surface water monitoring data gaps identified for Colgan Creek near Santa Rosa and Windsor Creek near Windsor.

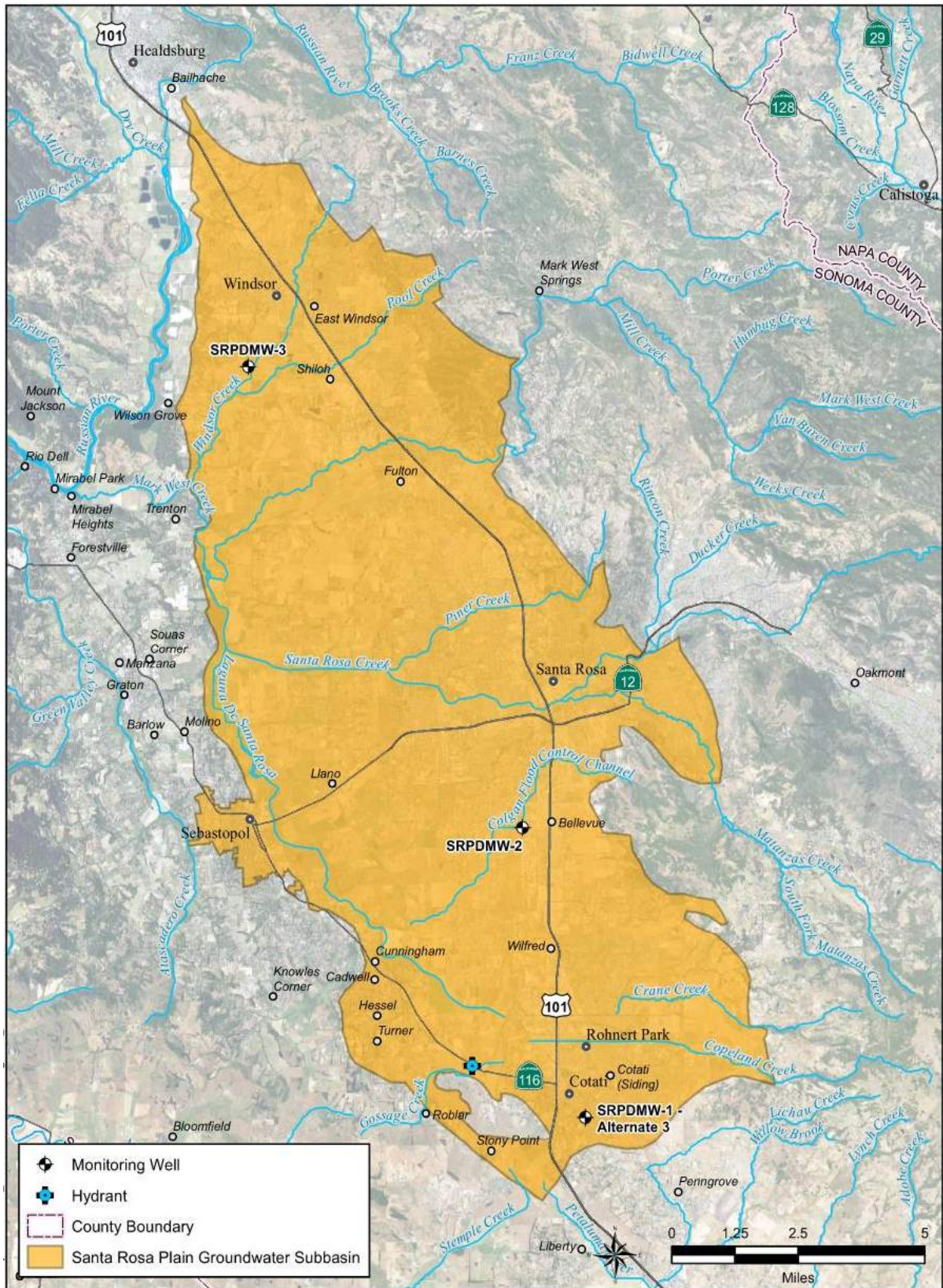


Figure 1: Santa Rosa Plain Groundwater Subbasin Constructed Monitoring Well Locations

3. Methods and Procedures

3.1 Pre-Field Activities

At commencement of the project, a number of Pre-Field activities were conducted to facilitate drilling and well construction:

- Access agreements for identified well sites with land owners
- Project bidding and contracting with the selected bidder
- Environmental review and permitting for sites
- Well drilling and construction planning

Once well sites were identified, SW worked on obtaining access agreements from the property owners. This included temporary construction easements and access easements. During drilling and construction, all work was contained in these construction easements. Site maps are included in the well permits found in **Attachment A**.

On August 24, 2021, SW released a Bid Package for borehole drilling, well construction, and well development as part of the MNEP. The Bid Package addressed drilling and construction of MWs in the Santa Rosa Plain Groundwater Subbasin, the Petaluma Valley Groundwater Basin, and the Sonoma Valley Groundwater Subbasin and included 4 MW locations per subbasin, for a total of 12 sites. Response to the bid was limited and included qualified bids and bids that exceeded available funding. Therefore, a new Bid Package for the MNEP was released on October 7, 2021. The revised Bid Package included a reduction in the number of wells from four per subbasin to two, with the option for a third, bringing the well total to nine. Three sites were included in the SRP Subbasin. The project, including the optional alternate sites was awarded on January 25, 2022, to Roadrunner Drilling and Pump Company, Inc. (Roadrunner), Woodland, California, a C-57 licensed water well contractor, as the lowest qualified bid.

A pre-project meeting was held on February 15, 2022, and attended by SW, GEI, and Roadrunner staff. This meeting addressed the project objectives and logistics, health and safety measures, project schedule, contractor requests for information, and grant requirements. Following the pre-project meeting, both GEI and Roadrunner developed Health and Safety Plans (HASPs) for drilling and well construction and GEI developed a Sampling and Analysis Plan (SAP), included in **Attachment F**. The SAP directed soil logging during borehole drilling and water quality sampling following well development. Well drilling permits (**Attachment A**) were obtained by Roadrunner from Permit Sonoma prior to the start of drilling. SW staff conducted biological and cultural resource review activities and filed a California Environmental Quality Act (CEQA) Notice of Exemption for

the project. Archeological field training was conducted by Tom Origer and Associates prior to breaking ground, for all Roadrunner, SW, and GEI field staff.

3.2 Drilling and Lithologic Logging

Drilling in the SRP Subbasin began on May 16, 2022 and finished July 26, 2022. Pilot boreholes were drilled using the direct mud rotary drilling method. Roadrunner utilized a modified Failing CF-15 mud rotary truck-mounted rig. Each borehole was drilled with an 8¾ -inch-diameter bit and bentonite-based drilling fluid. Fluid properties were measured by Roadrunner to ensure conformance with specifications, and these fluid logs were submitted by Roadrunner to SW for review throughout the project. Cutting samples were collected following separation from drilling mud via a Tulsa Rig Iron shaker table. Potable water used during drilling and construction (for drilling fluid, filter pack placement, and grouting) was obtained from SW fire hydrants and trucked onsite. Hydrants were equipped with backflow prevention devices and meters.

Pilot boreholes were drilled to depths of 520 feet, 488 feet, and 273 feet. SRPDMW-3 was terminated short of the target depth due the presence of hard rock, identified as the Franciscan Complex, which represents the bottom of the groundwater subbasin. At the other two locations, final pilot borehole depth at each location was determined by SW and GEI staff based on the depth of nearby domestic and agricultural supply wells, GSP monitoring network, and lithologic log.

Drill cutting samples were obtained every 10 feet and the lithology was logged by GEI staff, under the direction of a Professional Geologist/Certified Hydrogeologist licensed in the state of California. One set of drill cutting samples was preserved in resealable plastic bags while another set was preserved in a plastic partitioned archive box (i.e., tackle box). Samples were clearly labeled with sample depth and retained by SW.

Lithologic logs generated by GEI are included in **Attachment B**. Data collected on lithologic logs include:

- Unified Soil Classification System descriptions
- Munsell color classification
- Percent gravel, sands, and fines
- Angularity
- Mineralogy and geologic formation where identifiable
- Drill bit penetration rate
- Other pertinent observations by the field geologist or driller

Geologic formations and principal aquifers were identified when possible. These identifications were based on formation and aquifer descriptions in the SRP GSP and the *Three-Dimensional Geologic Modeling of the Santa Rosa Plain, California* report by Sweetkind et. al (2010) (see **Table 1**) and are briefly described below. Geologic formations anticipated to be encountered include the Quaternary Alluvium, the Glen Ellen Formation, the Petaluma Formation, the Wilson Grove Formation, and the Franciscan Complex bedrock. Well Completion Reports were submitted by Roadrunner to DWR following construction of the wells. These reports are included in **Attachment C**.

Table 1: Geologic Formations, Descriptions, and Field Identifiers

Geologic Formation	Formation Description*	Field Identifiers
Quaternary Alluvium	<u>Depositional Environment:</u> Continental - Fluvial <u>Characteristics:</u> Stream channel and stream terrace deposits along with alluvial fan deposits. Sedimentary material composed of volcanic and metamorphic rock eroded from surrounding hillside. Poorly to well sorted sand, silt, clay, gravel, cobbles, and boulders.	Fluvial deposits of mixed clasts, volcanic and metamorphic. Shallow depths, loose sand and gravel with silt and clay.
Glen Ellen Formation	<u>Depositional Environment:</u> Continental - Fluvial <u>Characteristics:</u> Alluvial fan and floodplains deposits. Clay rich, with poorly sorted sand, silt and gravel units that vary from very coarse to fine grained. May have tuffaceous clays and mud, potential for obsidian clasts.	More clay rich than the Quaternary Alluvium. Sediment from the erosion of Sonoma volcanics, andesitic and basaltic in composition. Obsidian and tuffaceous clay are indicators.
Wilson Grove Formation	<u>Depositional Environment:</u> Marginal marine - Continental shelf, shallow marine, and transitional <u>Characteristics:</u> Can be broken into two units: continental sandstone, clay, and gravel or blue marine sandstones with shells. Two layers may be separated by lava flows and volcanic ash or pumaceous tuff. Interfingers with the Petaluma Formation	Change in primary composition of coarse material to sandstone. Presence of shells and fine blue sands.
Petaluma Formation	<u>Depositional Environment:</u> Marine - Transitional, Continental - Estuarine, lacustrine, fluvial <u>Characteristics:</u> Thick to massive clay layers with lenses of poorly sorted sandstone and conglomerate. Shale, siltstone and clay with limestone, conglomerate, and tuff. Finer grained than the Wilson Grove Formation.	Massive clay layers and very fine grained material. Shale and siltstone.
Franciscan Complex	Hard bedrock of metamorphic origin. Predominantly comprised of serpentine material.	Presence of hard rock drilling with serpentine and metamorphic material.

Notes: Lithologic descriptions from the SRP Subbasin GSP and the "Three-dimensional Geologic Modeling of the Santa Rosa Plain by Sweetkind et. Al.

3.2.1 SRPDMW-1

The geologic units encountered at SRPDMW-1 are interpreted as the Quaternary Alluvium/Glen Ellen Formation (undifferentiated) and the Petaluma Formation. The Quaternary Alluvium/Glen Ellen Formation extends from the ground surface to approximately 250 feet bgs and is characterized at this location by its overall heterogeneity with relatively thin beds of clay, silt, sand, and gravel. The Petaluma Formation extends from approximately 250 feet bgs to the bottom of the borehole (520 feet bgs) and is characterized at this location by thick sequences of clay with relatively thin layers of silty gravel. The upper monitoring well completion at SRPDMW-1 is screened within sandy clay of the Quaternary Alluvium/Glen Ellen Formation, the middle completion is screened within well-graded sand of the Quaternary Alluvium/Glen Ellen Formation, and the deep completion is screened within silty gravel of the Petaluma Formation. The lithologic log and e-log indicate

that a thick clay aquitard is present at the SRPDMW-1 location from approximately 250 feet bgs to 420 feet bgs.

3.2.2 SRPDMW-2

The geologic units encountered at SRPDMW-2 are interpreted as the Quaternary Alluvium/Glen Ellen Formation (undifferentiated) and the Petaluma Formation. The Quaternary Alluvium/Glen Ellen Formation extends from the ground surface to approximately 175 feet bgs at this location. Similar to SRPDMW-1, the Quaternary Alluvium/Glen Ellen Formation encountered at SRPDMW-2 is heterogeneous and consists of beds of clay and poorly sorted sand and gravel. The Petaluma Formation extends from approximately 175 feet bgs to the bottom of the borehole (530 feet bgs). The Petaluma Formation at this location is generally coarser-grained and less homogeneous than that observed at SRPDMW-1 and contains beds of clay interspersed with relatively thin beds of sand and gravel. The upper monitoring well completion at SRPDMW-2 is screened within gravelly clay and poorly graded sand of the Quaternary Alluvium/Glen Ellen Formation, the middle completion is screened within clayey gravel and silty sand of the Petaluma Formation, and the deep completion is screened within silty sand of the Petaluma Formation.

3.2.3 SRPDMW-3

The geologic units encountered at SRPDMW-3 are interpreted as the Quaternary Alluvium/Glen Ellen Formation (undifferentiated), Petaluma Formation, and Franciscan Complex basement rock. The Quaternary Alluvium/Glen Ellen Formation extends from the ground surface to approximately 85 feet bgs and is characterized at this location by its relative coarseness with thin beds of sand, gravel, clayey sand, and clayey gravel. The Petaluma Formation extends from approximately 85 feet bgs to 260 feet bgs and is characterized at this location by thick sequences of clay with a relatively thin bed of sandy silt. Franciscan Complex basement rock was encountered at 260 feet bgs. The borehole was terminated after drilling approximately 13 feet in the basement rock. The upper monitoring well completion at SRPDMW-3 is screened within poorly graded gravel of the Quaternary Alluvium/Glen Ellen Formation, the middle completion is screened within sand with silt and gravel with silt of the Quaternary Alluvium/Glen Ellen Formation, and the deep completion is screened within sandy silt of the Petaluma Formation. The lithologic log and e-log indicate that confining layers are present at the SRPDMW-3 location from approximately 135 feet bgs to 190 feet bgs and 210 feet bgs to 250 feet bgs.

3.3 Electrical Logging (E-Log), Caliper Survey, and Well Design

Following the completion of pilot borehole drilling, Stewart Well Logging Services (Stewart) performed down-hole electrical logging (e-log), which included borehole depth, temperature, spontaneous potential, natural gamma radiation, and various resistivities, including drilling fluid, lateral and single point, short normal (16-inch) and long normal (64-inch). Electronic

copies of the e-logs were delivered to SW and GEI and printed copies are included in **Attachment D** and on the As-Built diagrams in **Attachment E**.

E-logs were used in conjunction with lithologic logs, groundwater levels, presence of surface water bodies, and nearby domestic and agricultural well construction details to produce a final design for each MW location. Final well design was chosen to target aquifer material in regions with high domestic and agricultural well density and to capture groundwater surface water interactions. Final designs were developed by GEI and SW.

Following completion of the final design, the pilot boreholes were reamed to the diameters and depths specified in the design. After reaming, Stewart conducted a caliper survey to confirmed reamed depths and to calculate the volume of the borehole. This volume calculation was used to determine the amount of filter pack and sealant needed for the final well construction. Caliper logs are included in **Attachment D**.

3.4 Well Construction

Wells were constructed following the completion of the e-logs, approval of the final well design by SW, and completion of the caliper survey. After approval of the final design, boreholes were reamed to 12- and 16-inch-diameters based on the number of multilevel completions in the borehole. Following reaming, a cleanout pass was made using the 8¾-inch bit to the total designed depth. Drilling fluid was then thinned, per specifications, prior to placement of material. Bentonite chips were placed from the bottom of the borehole to the bottom of the deepest filter pack interval to seal off the unused portion of the borehole. Wells were then constructed per the final design. Construction details for each MW are provided in **Table 2** and as-built diagrams can be found in **Attachment E**.

Triple-completion MWs were constructed with 2.5-inch-diameter, schedule 80, polyvinyl chloride (PVC) blank and slotted pipe at all three locations. SRPDMW-1 is in the parking lot of the Cotati Veterans Memorial Building and was completed with an 18-inch-diameter, flush-grade, EMCO Wheaton-brand, steel well vault. The shallow well completion was screened between 75 and 90 feet below ground surface (bgs), the middle completion between 170 and 185 feet bgs, and the deep completion between 430 and 445 feet bgs. Bentonite chips were placed in the remaining 35 feet of the borehole, from 455 to 490 feet bgs. Screen intervals were selected to target depths and aquifer material where the majority of domestic and agricultural wells draw water supply. With no surface water bodies in the immediate vicinity, the shallow well is not anticipated to monitor interconnected surface water. All wells at this location were constructed with a 5-foot long PVC well sump to allow space for well development and reduce impact on well screens due to accumulated sediment.

SRPDMW-2 is located off of Bellevue Avenue near Colgan Creek and was completed with an 18-inch-diameter, flush-grade, EMCO Wheaton-brand, steel well vault. The shallow well completion was constructed with a screen interval between 72 and 82 feet bgs, the middle

completion was constructed with two screen intervals from 251 to 261 feet bgs and 266 and 276 feet bgs while the deep completion was constructed with a screen interval between 456 and 466 feet bgs. The shallow well was constructed with a cap rather than a 5-foot sump due to the thin layer of aquifer material being targeted in this zone. A double screen interval was selected for the middle completion due to the presence of interbedded fine-grained aquifer material. The blank section between the screens facilitated the development of the well by reducing the amount of energy transferred to the thin clay/low permeability zone between the higher permeability zones that were targeted by the screen intervals. At this location, the shallow well is planned to monitor interconnected surface water and the groundwater produced by shallow domestic wells. The middle and deep wells serve to monitor deeper zones of domestic and agricultural well production.

SRPDMW-3 is located off of Starr Road near Windsor creek and was completed with a 16-inch-diameter, above-ground, steel stovepipe well protector. The well vault was placed in a 4- by 4-foot concrete pad with 6-foot-long bollards, filled with concrete, cemented approximately two feet into the ground, outside the pad. The shallow well completion was constructed with a screen interval between 30 feet and 45 feet bgs and is planned to monitor shallow domestic pumping and interconnected surface water in Windsor Creek. The middle completion was constructed with a screen interval between 66 and 81 feet bgs to monitor domestic and agricultural pumping in the shallow zone. The deep completion was constructed with a screen interval between 195 and 205 feet bgs to monitor domestic and agricultural pumping in the deeper zone. A bentonite seal was placed below the deep zone to seal off the unused portion of the borehole. This well was constructed shallower than the preliminary design due to the presence of Franciscan Complex bedrock encountered at 260 feet bgs.

Following the final completion, and well development, SW conducted a visual assessment of the surface completion at each location and approved the final well details.

3.4.1 Installation of Well Casing and Screen

Well casing and screen were placed following the reaming of the borehole to the designed depths (**Table 2** and **Attachment E**). All casing material was new 2.5-inch-diameter, Schedule 80, PVC material with factory slotted well screen and threaded joints. GEI staff inspected the casing and screen for signs of damage or warping prior to placement. Screen slot size was spot checked in the field and measured approximately 0.032-inch in size. Casing and screen segments were measured by Roadrunner prior to placement to ensure the screen intervals were placed at the correct depths. Depths were verified by GEI during placement.

Tremie pipe was placed just above the bottom of the borehole prior to casing installation to maintain circulation of water during the installation. Well casing and screens were lowered into the borehole individually to the designed depth, starting with the deep completion and ending with the shallow well. Wells strings were coupled using threaded joints without the

use of glue. Stainless steel centralizers were placed above and below each screen interval and every 60 feet afterwards to keep the casing centered within the borehole. During placement and when arriving at the design depth, each well was visually observed to ensure as much as possible that each well was hanging freely in the borehole and that the well casings were not pinching or infringing on each other. Once the well completions were installed and secured, and placement of the annular backfill commenced via the tremie pipe.

Table 2: Well Construction Details

Site Name	Monitoring Well Name	Latitude	Longitude	Reference Point Elevation (NAVD88)	Start Date	Completion Date	Total Borehole Depth (bgs)	Total Well Depth (bgs)	Casing and Screen Type	Screen Slot Size	Screen Interval (bgs)	Filter Pack Interval (bgs)
SRPDMW-1	Shallow	38.322130	-122.702300	119.17'	7/13/2022	8/2/2022	520'	95'	2.5" Dia. SCH 80 PVC	0.032"	75' - 90'	69' - 95'
	Middle			119.09'				190'	2.5" Dia. SCH 80 PVC	0.032"	170' - 185'	165' - 195'
	Deep			119.00'				450'	2.5" Dia. SCH 80 PVC	0.032"	430' - 445'	425' - 455'
SRPDMW-2	Shallow	38.402170	-122.725920	113.81'	5/23/2022	6/24/2022	488'	82'	2.5" Dia. SCH 80 PVC	0.032"	72' - 82'	67' - 84'
	Middle			113.60'				281'	2.5" Dia. SCH 80 PVC	0.032"	251' - 261' 266' - 276'	246' - 281'
	Deep			113.46'				471'	2.5" Dia. SCH 80 PVC	0.032"	456' - 466'	445' - 480'
SRPDMW-3	Shallow	38.528978	-122.827271	80.39'	5/16/2022	5/31/2022	273'	50'	2.5" Dia. SCH 80 PVC	0.032"	30' - 45'	20' - 49'
	Middle			80.31'				86'	2.5" Dia. SCH 80 PVC	0.032"	66' - 81'	60' - 90'
	Deep			80.21'				210'	2.5" Dia. SCH 80 PVC	0.032"	195' - 205'	190' - 213'

Notes:
bgs = below ground surface
NAVD88:North American Vertical Datum, 1988

3.4.2 Installation of Filter Pack and Borehole Seals

Filter pack and bentonite seals were placed via the tremie pipe to the designed depths (*refer to Table 2*) and as shown on the As-Builts (**Attachment E**). Filter pack material was Silica Resource filter pack material #8 (8x16 gradation). Puregold medium bentonite chips were used for the annular seal between filter pack intervals and to seal off unused portions of the borehole. Both filter pack material and bentonite chips were placed via hopper and tremie pipe. A sand-cement sanitary seal was placed from 20 feet bgs to ground surface. The sand-cement grout was delivered by Shamrock Material Inc. and placed in a single pour using a pump. The grout was a 10.3 sack mixture and GEI staff verified in the field that the appropriate mix of sand, cement, and water were used. Where applicable, additional water was added on-site to ensure the cement mix conformed to specifications. Once the sanitary seal was placed, all work on the well ceased for a 24-hour period to allow the cement to cure.

3.4.3 Well Survey

Following construction of all multilevel MWs, a survey was conducted to measure the latitude and longitude of each well site and establish a reference point elevation for each well completion. Reference points were identified by marking the top of the PVC well casing. Location and elevation data was collected using GPS instrumentation and traditional survey methods to an accuracy of approximately 0.1 feet. Reference point locations surveyed using the North American Vertical Datum of 1988 will establish a common point for depth to water measurements in the future and allow for consistent water surface elevation calculations. All water surface elevation values shown in this report are derived from the surveyed reference point. Survey activities were conducted under the supervision of a California Professional Land Surveyor.

3.5 Well Development

Following placement of the sanitary seal and the 24-hour curing period, development began on the MWs to remove drilling mud and fine sediments from the well, filter pack, and aquifer matrix. Development began with airlifting to remove the settled material at the bottom of the well. Following initial airlifting, development continued through a cycle of mechanical swabbing followed by airlifting to remove any residual drilling fluid and sediment that could restrict flow to the well and impair water quality results. Development consisted of swabbing of each well for 10 full strokes across the entire well casing and then airlifting for a couple hours. This process was repeated until the clarity of the groundwater was well below 100 Nephelometric Turbidity Units (NTUs), generally less than 10 NTUs. Thereafter, pumping for water quality sampling was completed.

Each well was developed using a line swab with a rubber packer assembly of diameter 1/8-inch less than the well diameter (2.5"). Swabbing occurred for a minimum of 1 hour per well. For airlifting, the airline was run down into the bottom of the well sump to agitate and evacuate the entire water column. Where a well didn't have a sump, the airline was set just

above the well screen. Water produced during airlifting was contained and stored in waste bins for transportation off-site to a disposal facility. Turbidity was monitored from a sample port off the airlift assembly to track development progress. When turbidity approached 100 NTUs, Aquaclear PFD, a polymer dispersant, was swabbed into the well and allowed to sit in the well overnight facilitate the removal of the drilling fluid residual. The wells were then airlifted until all the Aquaclear was removed and turbidity was less than 10 NTUs. At eight of the nine sites (deep well SRPDMW-3 was the exception), turbidity was less than 5 NTUs prior to water quality sampling. Each well was pumped for water quality sampling following development. Purge logs are included in Attachment G.

4. Groundwater Quality Sampling and Results

Groundwater quality samples were collected at all wells following development. A submersible groundwater pump was used to purge each completion prior to sampling. Purging was considered complete once three well volumes were removed, and field parameters stabilized. Purge volumes were calculated based on the total depth of the well minus the depth to water. Turbidity below 5 NTUs, the secondary drinking water maximum contaminant level (MCL), was desired, but due to time and budget restrictions with development, not always achieved. Roadrunner furnished a 2-inch-diameter Grundfos Redi Flow 2 submersible pump to purge each well. During pumping, water quality parameters were monitored by GEI including:

- Water level (static and pumped)
- Pumping rate and purge volume
- Temperature
- pH
- Electrical Conductivity
- Turbidity

Field purge logs were completed and retained by GEI and are included in **Attachment F**. Because of the low production rates (1-2 gallons per minute), purge water was discharged directly to the land surface to percolate on-site. Field parameters were measured using a Horiba U-82 multiparameter water quality sonde. A flow-through cell connected to the pump discharge tubing was used during measurement of field parameters. Use of a flow-through cell reduced contact of the pumped groundwater with the atmosphere that could impact field parameter results. Turbidity was measured using a Hach 2100Q turbidimeter which was calibrated and maintained by GEI. Field parameters at the end of pumping, prior to sample collection, are shown in **Table 3**. Groundwater level measurements were collected at all MW locations on October 19, 2022, at the conclusion of the project. This allowed time for water levels to reach equilibrium after development and measurements to be similar in time.

Groundwater quality samples were collected at each MW after purge pumping. All samples were analyzed for total dissolved solids (TDS) and chloride. In all instances, samples were collected following purging of three well volumes and parameter stabilization. If turbidity values below 5 NTU were not achieved, samples were collected at the discretion of SW. Samples were collected by GEI staff, stored in a cooler with wet ice, and transported under chain-of-custody to Eurofins TestAmerica (Eurofins) in Monrovia, CA. Eurofins is an accredited under the state of California Environment Laboratory Accreditation Program. Complete laboratory results can be found in **Attachment H**.

Table 3: Water Quality Results

			Laboratory Analysis		Field Parameters						
Well Site	Well ID	Sample Date	Chloride (mg/L)	TDS (mg/L)	Depth to Water (btoc)	Water Surface Elevation (NAVD88)	Temp (°C)	pH	Turbidity (NTUs)	EC (umhos/cm)	
			MCL: 250	MCL: 500					MCL: 5 NTU		
SRPDMW-1	Shallow	8/2/2022	25	240	40.65'	78.52'	20.9	5.7	56	280	Turbidity values indicate incomplete development
	Middle	8/2/2022	22	260	30.80'	88.29'	22.2	7.2	2.5	348	
	Deep	8/2/2022	210	690	52.98'	66.02'	24.6	8.3	0.6	1200	
SRPDMW-2	Shallow	6/24/2022	34	240	14.90'	98.91'	19.1	7.3	1.8	355	
	Middle	6/24/2022	22	280	25.63'	87.97'	21.4	7.1	0.7	379	
	Deep	6/24/2022	43	430	42.01'	71.45'	23.0	7.8	2.9	651	
SRPDMW-3	Shallow	6/1/2022	130	510	10.53'	69.86'	19.1	6.7	1.6	534	
	Middle	6/1/2022	100	440	10.40'	69.91'	17.3	7.4	3.8	705	
	Deep	6/1/2022	17	360	16.54'	63.67'	21.0	8.5	OVER RANGE	423	Little flow to well, could not clean up. Turbidity continued to exceed range of meter (>1,000 NTUs) indicating incomplete development

Notes:
Indicates MCL exceedance or turbidity above limit allowed in specifications
MCL: Maximum Contaminant Level, secondary
mg/L: milligrams per liter
btoc : below top of casing
umhos: micro-mhos
cm: centimeter
NAVD88:North American Vertical Datum, 1988

4.1 SRPDMW-1

Laboratory results for SRPDMW-1 show similar water quality in the shallow and middle completions. Chloride results were 25 milligrams per liter (mg/L) and 22 mg/L, respectively, well below the secondary MCL of 250 mg/L. TDS concentrations were 240 and 260 mg/L for the shallow and middle screens respectively, also below its secondary MCL of 500 mg/L. These wells were screened in the shallow aquifer, identified in the field as the Glen Ellen Formation, above 200 feet.

Field parameters differed between the shallow and middle wells, specifically with respect to turbidity and pH. SRPDMW-1 had difficulty cleaning up during development and the field turbidity reading indicates development was incomplete. Turbidity values were below the secondary MCL of 5 NTU in the middle well and indicate completed development. The pH was lower in the shallow well (5.78) in comparison to the middle well (7.23). EC values were more variable than the TDS values, which suggests groundwater in the shallow and middle well could contain a higher sulfate concentration. Because of the incomplete development at the SRPDMW-1 shallow completion, it is recommended that further well development be conducted in the future.

The deep completion at SRPDMW-1 showed a noticeable change in water chemistry. Laboratory results showed higher values for both chloride and TDS, at 210 and 690 mg/L respectively. Chloride levels were just below the secondary MCL while TDS levels were above the secondary MCL. Field turbidity readings were well below the secondary MCL of 5 NTU, indicating successful development. This well is screened notably deeper than the other two wells at 430 to 445 feet bgs and likely in the Petaluma formation.

Water level measurements were collected from the reference point for each completion and used to calculate water surface elevations (WSEs) and groundwater vertical gradients. The shallow and middle completions showed a WSE of 78.5 feet and 88.3 feet. An upward vertical gradient of 0.1 was calculated. This vertical gradient could be a sign of a confining layer between the two zones allowing the pressure head to build in the middle completion. It could also be a product of insufficient development in the shallow screen completion impacting groundwater flow to the well. A WSE of 66 feet was calculated for the deep completion. A downward vertical gradient of .08 was calculated between the deep and middle completion.

4.2 SRPDMW-2

Laboratory results for SRPDMW-2 showed similar water quality in the shallow and middle completions. Chloride results were 34 mg/L for the shallow and 22 mg/L for the middle, both well below the secondary MCL. TDS values were 240 mg/L for the shallow and 280 mg/L for the well, well below the secondary MCL. For both well completions turbidity was below the secondary MCL of 5 NTUs, indicating completed development. pH values were typical at 7.3 and 7.1 for the shallow and middle completions respectively. The shallow completion was

screened in the Quaternary Alluvium/Glen Ellen formation while the middle completion was screened in the upper portion of the Petaluma Formation.

The deep completion showed a change in water chemistry with a chloride result of 43 mg/L and a TDS result of 430 mg/L. Both were below the secondary MCL. Turbidity was below the secondary MCL of 5 NTU, indicating successful development. The deep completion was constructed in what was identified in the field as the Petaluma Formation. The pH value of 7.8 was higher than the shallow and middle completions but within expectations for groundwater.

Water level measurements were collected from the reference point for each completion and used to calculate WSEs and groundwater vertical gradients. The shallow and middle completions showed a WSE of 98.9 feet and 88.0 feet respectively. A downward vertical gradient of .06 was calculated. A WSE of 71.5 feet was calculated for the deep completion. A downward vertical gradient of 0.08 was calculated between the deep and middle completion.

4.3 SRPDMW-3

Laboratory results showed chloride levels were below the secondary MCL (250 mg/L) at all three completions but showed a decreasing trend with depth. The highest concentration occurred in the shallow completion with a result of 130 mg/L. TDS also showed a decreasing trend with depth. TDS for the shallow completion (510 mg/L) slightly exceed the secondary MCL (500 mg/L) while the TDS values for the middle (440 mg/L) and deep (360 mg/L) completions were lower than the secondary MCL. The shallow and middle completions were constructed in what was identified as the Quaternary Alluvium/Glen Ellen Formation while the deep completion was constructed in what was identified as the Petaluma Formation. Groundwater samples for SRPDMW-3 were analyzed one day outside of hold time for TDS. However, the limited time beyond the hold time (+14%) does not appear to have affected the analytical results. Therefore, resampling did not occur for these well completions.

Field parameter measurements showed respective pH values of 6.71, 7.43, and 8.48 for the shallow, middle, and deep wells. Turbidity values for the shallow and middle completion were below 5 NTU, indicating successful development. The deep completion did not clean up and turbidity values exceeded the capacity of the turbidity meter (>1,000 NTU). This completion produced little flow and development using the airlift method was not successful. Further consideration should be given to developing this well and alternate methods for development. A water quality sample was collected from the deep completion at the request of SW.

Water level measurements were collected from the reference point for each completion and used to calculate WSEs and groundwater vertical gradients. The shallow and middle completions had a similar WSE of 69.9 feet and a small upward gradient of 0.002 was calculated. The deep completion had a WSE of 63.67 feet and a downward vertical gradient of 0.05 feet was calculated between the deep and middle completions.

References

- Santa Rosa Plain Groundwater Sustainability Agency (SRPGSA). 2022. *Groundwater Sustainability Plan, Santa Rosa Plain Groundwater Subbasin*. January 2022.
- Sweetkind, Donald; Taylor, Emily; Langenheim, Vicki; McCabe, Craig. 2010. *Three-dimensional geologic modeling of the Santa Rosa Plain, California*. June 2010.

Attachment A: Well Permits and CEQA

Well Permit Application

WLS-031

SRPDMW-1

WEL22-0060

8505 Park Ave.

Site Address	Permit Number
Cotati CA 94931	144-410-032
City/Town	Assessor's Parcel Number
County of Sonoma - Department of General Services	Roadrunner Drilling and Pump Company
Owner Name	Well Driller Name
2300 County Center Drive, Suite A200	80 Bee Jay Way
Mailing Address	Mailing Address
Santa Rosa CA 95403	Woodland CA 95776
City/Town	City/Town
510-207-8975	803909
Phone	License Number
Mitch Buttress - Project Contact	530-406-8559
Contact Person	Phone
	Email
	patsy@rdpumpcoinc.com

The validity of this permit depends upon the accuracy of the information provided by the applicant. A site plan must accompany this application. In addition to the information required on the Minimum Standard Site Plan (Form CSS-019), the site plan shall also include the proposed well location, existing well(s) location(s), GPS coordinates of proposed well, sewer mains and laterals, and other potential sources of contamination. If an inadequate site plan is provided and a second field visit is required, a charge at the current hourly rate will be assessed. The precise site location of the proposed well must be staked with the driller's name.

INDICATE TYPE AND NUMBER OF PROPOSED WELLS/BORINGS:

Indicate use: ☐ Residential ☐ Community ☐ Irrigation ☐ Industrial

Reason for new well: Monitoring Well

☐ Destruct ☒ Class I Well ☐ Class II Well ☐ Reconstruction Reason for Class II: _____

Number of Geotechnical Borings: _____ Number of Geoexchange: _____ Number of monitoring: 1 Number of Cathodic: _____

Number of Performance Wells: _____ Number of Piezometers: _____ Number of Inclometers: _____ Number of Other: _____

Total number of wells on property: 0 Number in use: _____ Number inactive: _____ Number abandoned: _____

Well located within an existing public water system boundary: Yes ☒ No ☐ Name of System: City of Cotati

CONSTRUCTION PROPOSED: 3 well casings ending at different depths to monitor groundwater = clustered casings in one bore

Casing: Diameter: 2.5-inch Gauge: Sch. 80 Material: PVC Gravel Pack ☒ Conductor: Yes ☐ No ☒ hole.

Sand Pack ☐

Annular Space: Size: 16-inch Borehole Depth of Seal: 20 feet Seal Material: Sand-Cement Grout

Method of Disinfection: NA Method of Sealing Access Opening: Locking Expansion Plug Type of Joint: Threaded PVC

DESTRUCTION PROPOSED: Well Diameter: _____ Well Depth: _____ Well Casing: _____

Method of Destruction: _____

WORKER'S COMPENSATION DECLARATION

I hereby affirm under penalty of perjury one of the following declarations:

☐ I have and will maintain a certificate of consent to self-insure for worker's compensation, as provided for by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued.

☒ I have and will maintain worker's compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My worker's compensation insurance carrier and policy number are:

Carrier: Williamsburg National Insurance Company

Policy No. IIRDWC0952231

(This section need not be completed if the permit is for one hundred dollars (\$100) or less).

I hereby agree to comply with all laws and regulations of the County of Sonoma

and State of California pertaining to water well construction. I will notify Permit Sonoma Well & Septic Division 24 hours prior to commencing this work. I will furnish Permit Sonoma and the owner a copy of the State Well Completion Report

Within thirty (30) days in order to obtain final approval on this well as required by SONOMA COUNTY CODE, CHAPTER 25B. I acknowledge that the application will become a permit only after the site approval and payment of fee.

I understand that this permit is not transferrable and expires one year from the date of issuance.

Patsy L. Brookshire

Digitally signed by Patsy L. Brookshire
DN: cn=Patsy L. Brookshire, o=Sonoma County, ou=Permit Sonoma, email=patsy@rdpumpcoinc.com, c=US

02.07.2022

Signature of Well Driller

Date

WARNING: FAILURE TO SECURE WORKER'S COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS (\$100,000), IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.

***** DO NOT WRITE BELOW THIS LINE - To Be Completed by Permit Sonoma Staff *****

Application

Site Approved by: Becky Ver Meer Date: 4/4/2022 Seal Inspection Date: _____ EHS _____

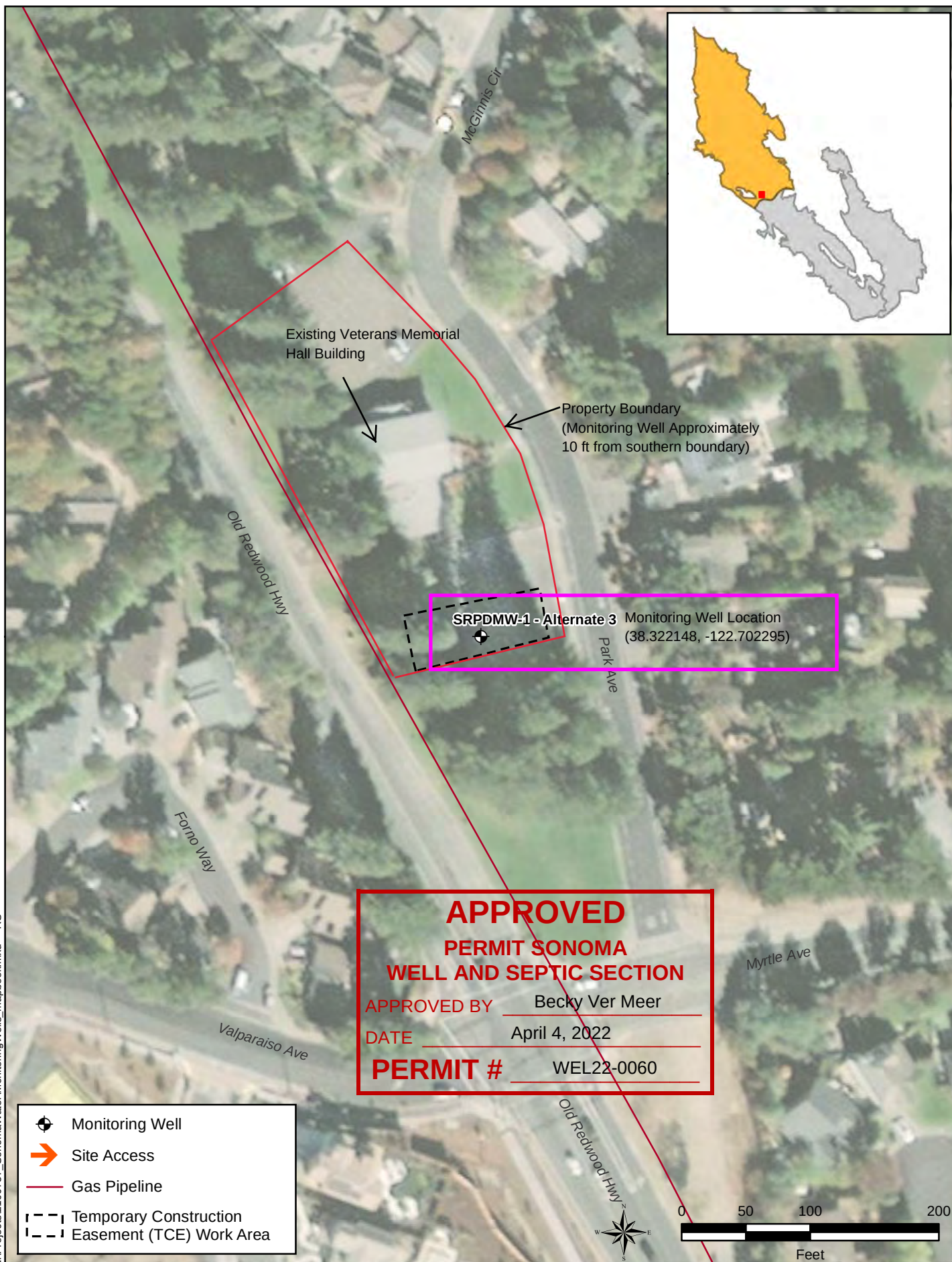
Finalized by: _____ Date: _____ GW Zone: 1 ☐ 2 ☐ 3 ☐ 4 ☐

Comments: In house directive to not impose the setbacks to Known Contaminated Sites on monitoring wells.

Sonoma County Permit and Resource Management Department

2550 Ventura Avenue ❖ Santa Rosa, CA ❖ 95403-2829 ❖ (707) 565-1900 ❖ Fax (707) 565-1399

04-Oct-2021 Z:\Projects\2100757_SonomaWater\MonitoringWells_mapbook.mxd RS

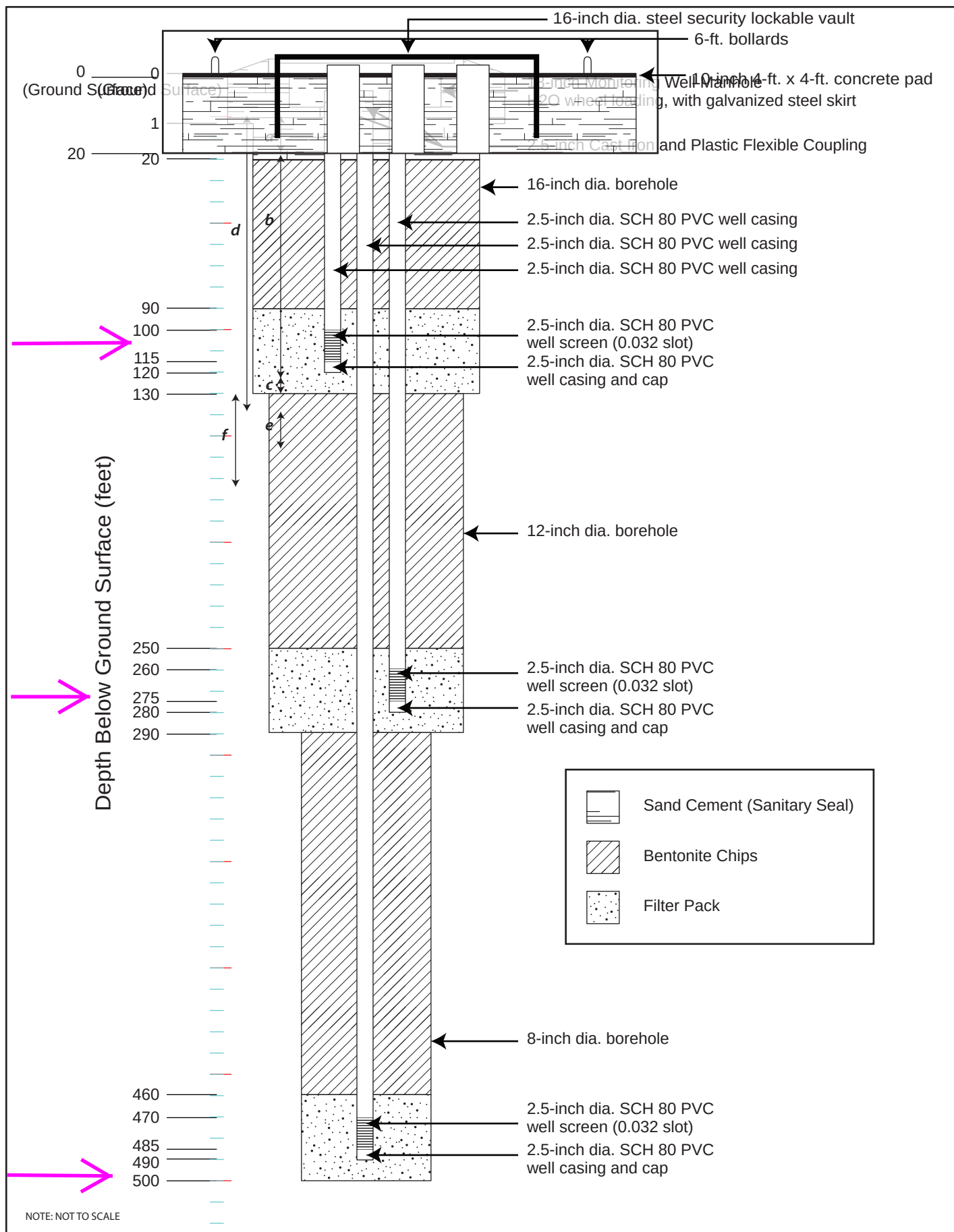


Deep Multi-Level Monitoring Wells
Santa Rosa Plain Groundwater Subbasin

Sonoma County Water Agency



Monitoring Well Site Plan
SRPDMW-1



Typical Monitoring Well Design
Santa Rosa Plain Groundwater Subbasin

Sonoma County Water Agency



Nested Monitoring Well Details
SRPDMW-1

October 2021

Figure 19

Well Permit Application

WLS-031

SRPDMW-2

WEL22-0047

0 Monument Dr

Site Address

Santa Rosa

CA

95407

City/Town

State

Zip

Sonoma County Water Agency

Owner Name

404 Aviation Blvd

Mailing Address

Santa Rosa

CA

95403

City/Town

State

Zip

510-207-8975

Phone

Mitch Buttress - Project Contact

Contact Person

Permit Number

042-122-015

Assessor's Parcel Number

Roadrunner Drilling and Pump Company

Well Driller Name

80 Bee Jay Way

Mailing Address

Woodland

CA

95776

City/Town

State

Zip

803909

License Number

530-406-8559

patsy@rdpumpcoinc.com

Phone

Email

The validity of this permit depends upon the accuracy of the information provided by the applicant. A site plan must accompany this application. In addition to the information required on the Minimum Standard Site Plan (Form CSS-019), the site plan shall also include the proposed well location, existing well(s) location(s), GPS coordinates of proposed well, sewer mains and laterals, and other potential sources of contamination. If an inadequate site plan is provided and a second field visit is required, a charge at the current hourly rate will be assessed. The precise site location of the proposed well must be staked with the driller's name.

INDICATE TYPE AND NUMBER OF PROPOSED WELLS/BORINGS:

Indicate use: ☐ Residential ☐ Community ☐ Irrigation ☐ Industrial

Reason for new well: Monitoring Well

☐ Destruct ☒ Class I Well ☐ Class II Well ☐ Reconstruction Reason for Class II: _____

Number of Geotechnical Borings: _____ Number of Geoexchange: _____ Number of monitoring: 1 Number of Cathodic: _____

Number of Performance Wells: _____ Number of Piezometers: _____ Number of Inclometers: _____ Number of Other: _____

Total number of wells on property: 1 Number in use: 1 Number inactive: _____ Number abandoned: _____

Well located within an existing public water system boundary: Yes ☒ No ☐ Name of System: City of Santa Rosa

CONSTRUCTION PROPOSED:

Casing: Diameter: 2.5-inch Gauge: Sch. 80 Material: PVC Gravel Pack ☒ Conductor: Yes ☐ No ☒

Sand Pack ☐

Annular Space: Size: 16-inch Borehole Depth of Seal: 20 feet Seal Material: Sand-Cement Grout

Method of Disinfection: NA Method of Sealing Access Opening: Locking Expansion Plug Type of Joint: Threaded PVC

DESTRUCTION PROPOSED: Well Diameter: _____ Well Depth: _____ Well Casing: _____

Method of Destruction: _____

WORKER'S COMPENSATION DECLARATION

I hereby affirm under penalty of perjury one of the following declarations:

☐ I have and will maintain a certificate of consent to self-insure for worker's compensation, as provided for by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued.

☒ I have and will maintain worker's compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My worker's compensation insurance carrier and policy number are:

Carrier Williamsburg National Insurance Company

Policy No. IIRDWC0952231

(This section need not be completed if the permit is for one hundred dollars (\$100) or less).

I hereby agree to comply with all laws and regulations of the County of Sonoma

and State of California pertaining to water well construction. I will notify Permit Sonoma Well & Septic Division 24 hours prior to commencing this work. I will furnish Permit Sonoma and the owner a copy of the State Well Completion Report

Within thirty (30) days in order to obtain final approval on this well as required by SONOMA COUNTY CODE, CHAPTER 25B. I acknowledge that the application will become a permit only after the site approval and payment of fee.

I understand that this permit is not transferrable and expires one year from the date of issuance.

Patsy L. Brookshire

Digitally signed by Patsy L. Brookshire
DN: cn=Patsy L. Brookshire, o=rdpumpcoinc.com, c=US
Date: 2022.07.07 12:13:22 -0800

02.07.2022

Signature of Well Driller

Date

WARNING: FAILURE TO SECURE WORKER'S COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS (\$100,000). IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.

Application

***** DO NOT WRITE BELOW THIS LINE - To Be Completed by Permit Sonoma Staff *****

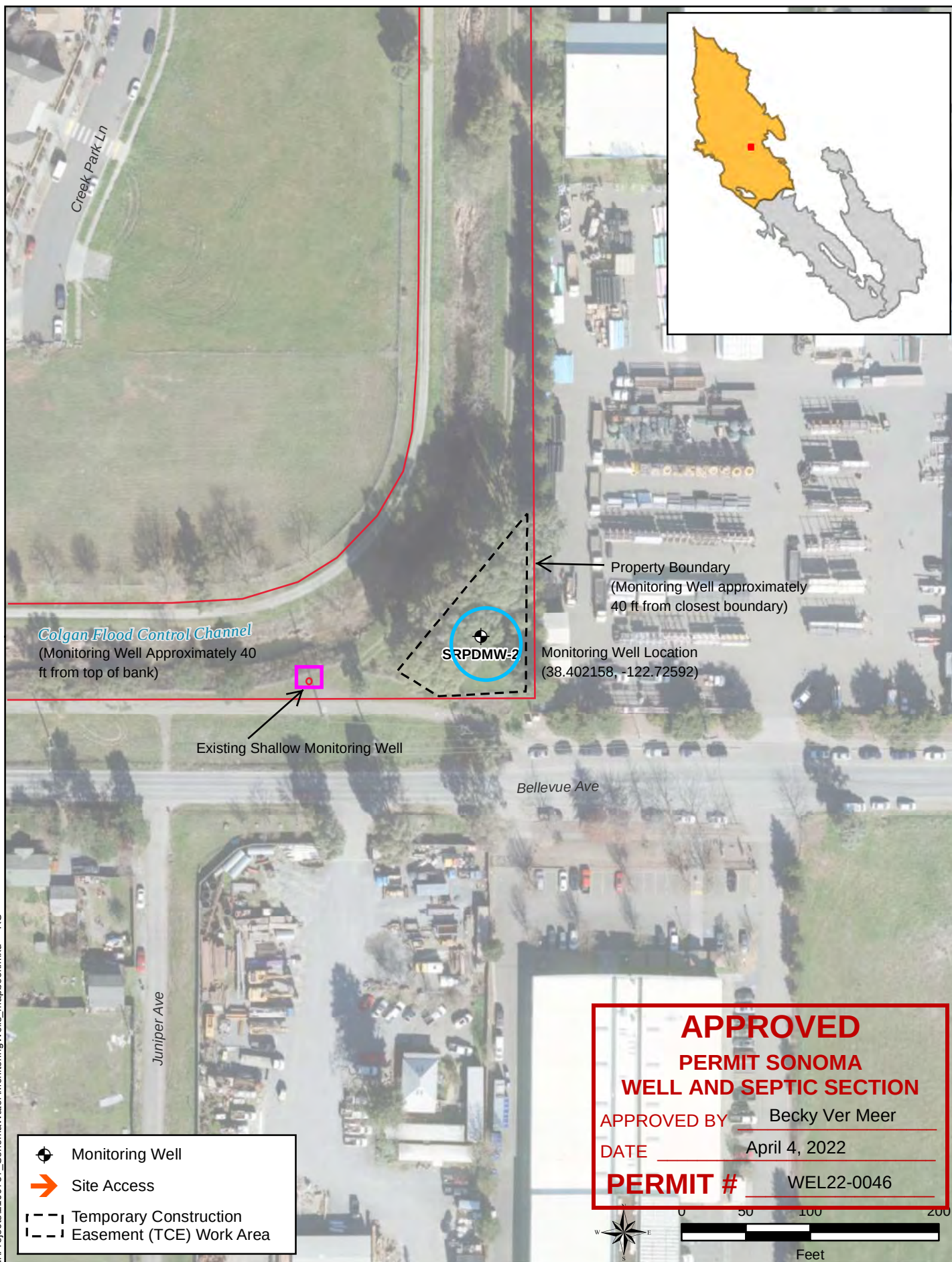
Site Approved by: Becky Ver Meer Date: 4/4/2022 Seal Inspection Date: _____ EHS _____

Finalized by: _____ Date: _____ GW Zone: ☒ 1 ☐ 2 ☐ 3 ☐ 4

Comments: In-house directive to not impose the setbacks to Known Contaminated Sites on monitoring wells.

Sonoma County Permit and Resource Management Department

2550 Ventura Avenue ❖ Santa Rosa, CA ❖ 95403-2829 ❖ (707) 565-1900 ❖ Fax (707) 565-1399

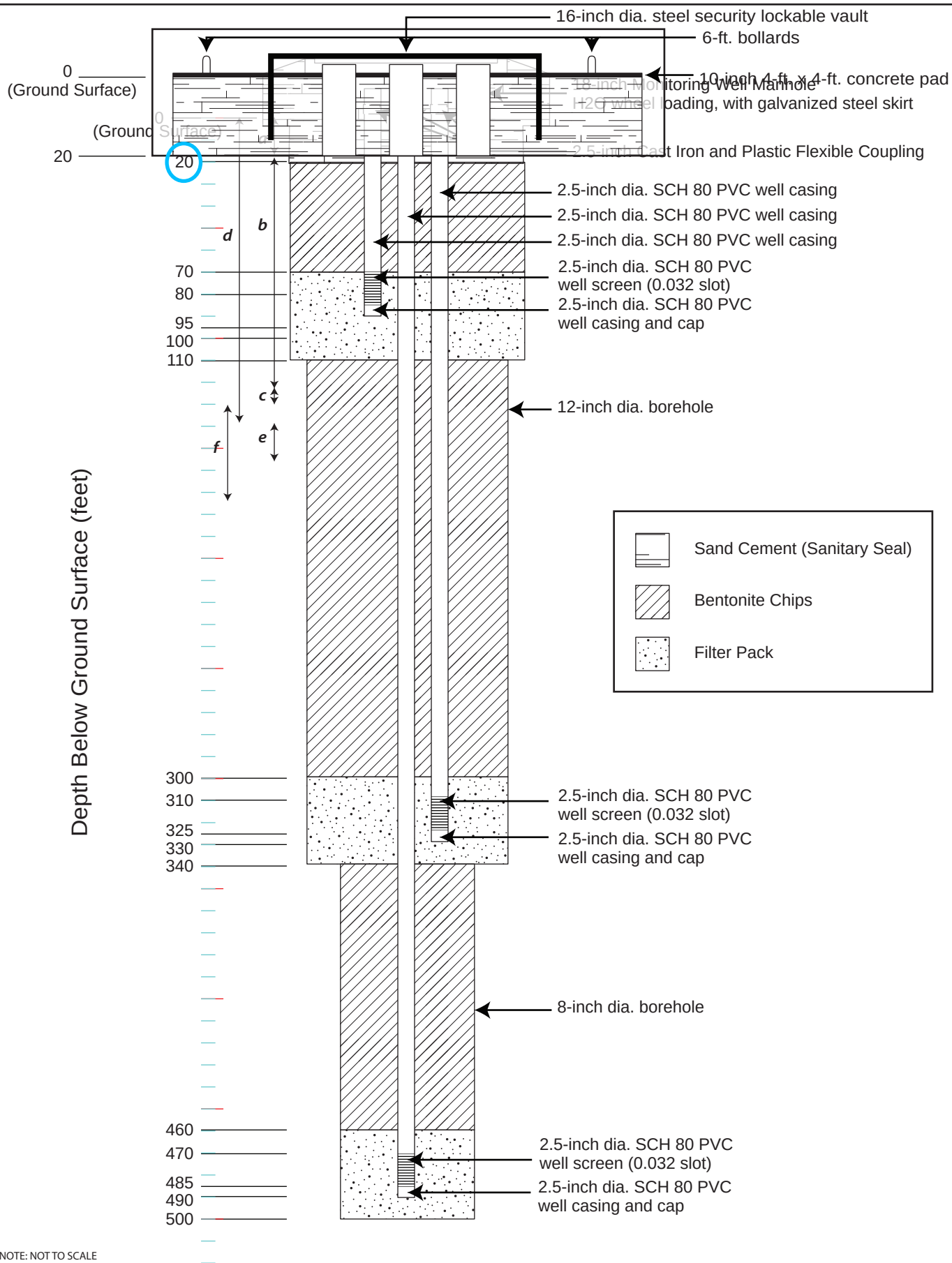


Deep Multi-Level Monitoring Wells
Santa Rosa Plain Groundwater Subbasin

Sonoma County Water Agency



Monitoring Well Site Plan
SRPDMW-2



Typical Monitoring Well Design
Santa Rosa Plain

Sonoma Water



Nested Monitoring Well Details
SRPDMW-2

October 2021

Figure 20

Well Permit Application

WLS-031

WEL22-0052

7800 Starr Rd

Site Address

Windsor CA 95492

City/Town State Zip

Windsor Water District

Owner Name

PO Box 100

Mailing Address

Windsor CA 95492

City/Town State Zip

510-207-8975

Phone

Mitch Buttress - Project Contact

Contact Person

Permit Number

066-220-038

Assessor's Parcel Number

Roadrunner Drilling and Pump Company

Well Driller Name

80 Bee Jay Way

Mailing Address

Woodland CA 95776

City/Town State Zip

803909

License Number

530-406-8559

Phone

patsy@rdpumpcoinc.com

Email

The validity of this permit depends upon the accuracy of the information provided by the applicant. A site plan must accompany this application. In addition to the information required on the Minimum Standard Site Plan (Form CSS-019), the site plan shall also include the proposed well location, existing well(s) location(s), GPS coordinates of proposed well, sewer mains and laterals, and other potential sources of contamination. If an inadequate site plan is provided and a second field visit is required, a charge at the current hourly rate will be assessed. The precise site location of the proposed well must be staked with the driller's name.

INDICATE TYPE AND NUMBER OF PROPOSED WELLS/BORINGS:

Indicate use: ☐ Residential ☐ Community ☐ Irrigation ☐ Industrial

Reason for new well: Monitoring Well

☐ Destruct ☒ Class I Well ☐ Class II Well ☐ Reconstruction Reason for Class II: _____

Number of Geotechnical Borings: _____ Number of Geoexchange: _____ Number of monitoring: 1 Number of Cathodic: _____

Number of Performance Wells: _____ Number of Piezometers: _____ Number of Inclometers: _____ Number of Other: _____

Total number of wells on property: 1 Number in use: 1 Number inactive: _____ Number abandoned: _____

Well located within an existing public water system boundary: Yes ☐ No ☒ Name of System: _____

CONSTRUCTION PROPOSED:

Casing: Diameter: 2.5-inch Gauge: Sch. 80 Material: PVC Gravel Pack ☒ Conductor: Yes ☐ No ☒

Annular Space: Size: 16-inch Borehole Depth of Seal: 20 feet Sand Pack ☐

Seal Material: Sand-Cement Grout

Method of Disinfection: NA Method of Sealing Access Opening: Locking Expansion Plug Type of Joint: Threaded PVC

DESTRUCTION PROPOSED: Well Diameter: _____ Well Depth: _____ Well Casing: _____

Method of Destruction: _____

WORKER'S COMPENSATION DECLARATION

I hereby affirm under penalty of perjury one of the following declarations:

☐ I have and will maintain a certificate of consent to self-insure for worker's compensation, as provided for by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued.

☒ I have and will maintain worker's compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My worker's compensation insurance carrier and policy number are:

Carrier: Williamsburg National Insurance Company

Policy No. 1IRDWC0952231

(This section need not be completed if the permit is for one hundred dollars (\$100) or less).

I hereby agree to comply with all laws and regulations of the County of Sonoma

and State of California pertaining to water well construction. I will notify Permit Sonoma Well & Septic Division 24 hours prior to commencing this work. **I will furnish Permit Sonoma and the owner a copy of the State Well Completion Report**

Within thirty (30) days in order to obtain final approval on this well as required by SONOMA COUNTY CODE, CHAPTER 25B. I acknowledge that the application will become a permit only after the site approval and payment of fee.

I understand that this permit is not transferrable and expires one year from the date of issuance.

Patsy L. Brookshire Digitally signed by Patsy L. Brookshire
DN: cn=Patsy L. Brookshire, c=us, email=patsy@rdpumpcoinc.com, o=RD
Pump Company, ou=RD Pump Company 02.07.2022

Signature of Well Driller Date

WARNING: FAILURE TO SECURE WORKER'S COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS (\$100,000), IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.

Application

***** DO NOT WRITE BELOW THIS LINE - To Be Completed by Permit Sonoma Staff *****

Site Approved by: Becky Ver Meer Date: 03/08/2022 Seal Inspection Date: _____ EHS _____

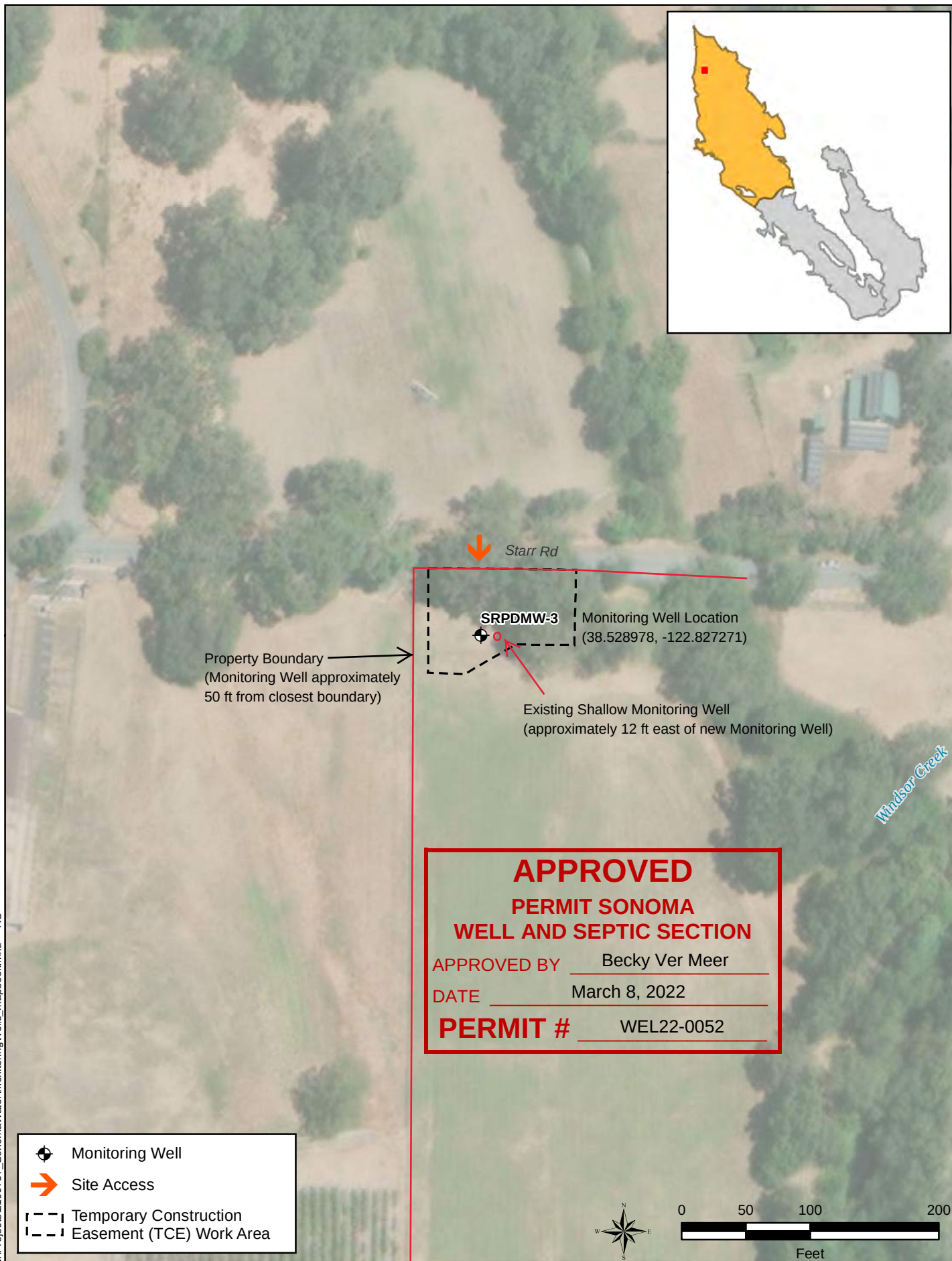
Finalized by: _____ Date: _____ GW Zone: 1 ☐ 2 ☐ 3 ☐ 4 ☐

Comments: _____

Sonoma County Permit and Resource Management Department

2550 Ventura Avenue ❖ Santa Rosa, CA ❖ 95403-2829 ❖ (707) 565-1900 ❖ Fax (707) 565-1399

04-Oct-2021 Z:\Projects\2100757_SonomaWater\MonitoringWells_mapbook.mxd RS

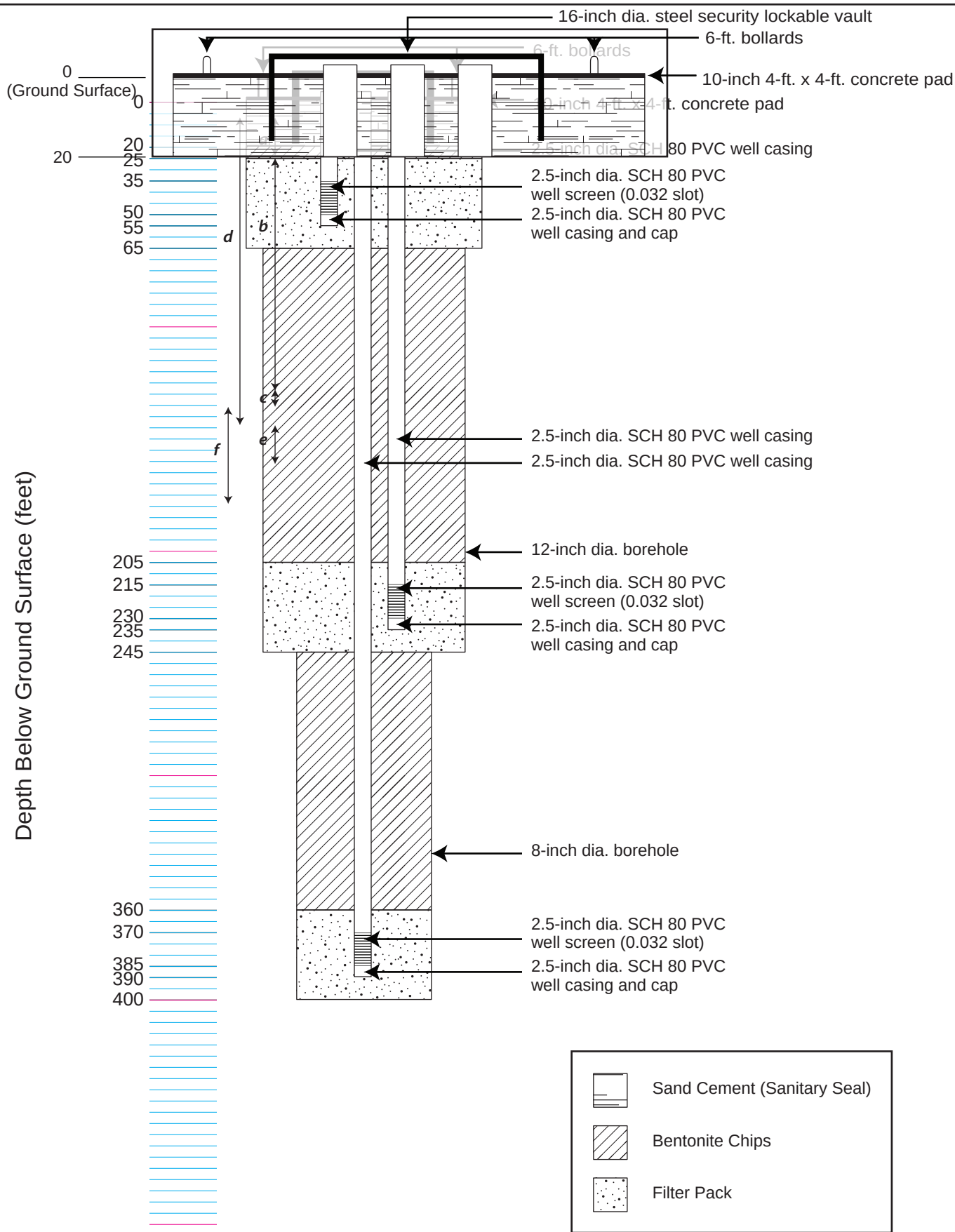


Deep Multi-Level Monitoring Wells
Santa Rosa Plain Groundwater Subbasin



Monitoring Well Site Plan
SRPDMW-3

Sonoma County Water Agency



Typical Monitoring Well Design
Santa Rosa Plain Groundwater Subbasin

Sonoma County Water Agency



Nested Monitoring Well Details
SRPDMW-3

October 2021

Figure 21

NOTICE OF EXEMPTION

TO: ☒ Office of Planning and Research
State Clearinghouse
1400 Tenth Street
Sacramento, CA 95814

FROM: Santa Rosa Plain Groundwater Sustainability
Agency
C/O West Yost
2235 Mercury Way Suite 105
Santa Rosa, CA 95407

☒ County Clerk
County of Sonoma
585 Fiscal Drive, Room 103
Santa Rosa, CA 95403

Project Title: Santa Rosa Plain Groundwater Sustainability Agency's Multi-Level Deep Monitoring Well Project

Project Location- Specific: Four locations within the Santa Rosa Plain located at 8505 Park Ave, Cotati, 372 Bellvue Ave, Santa Rosa, 7800 Starr Rd, Windsor, and 10011 Los Amigos Rd, Windsor, Sonoma County, CA (Figure 1).

Project Location – City: Santa Rosa and the Town of Windsor

Project Location – County: Sonoma

Description of Nature, Purpose and Beneficiaries of Project: In 2014, the State of California adopted the Sustainable Groundwater Management Act (SGMA) to help manage its groundwater. According to SGMA, local Groundwater Sustainability Agencies (GSAs) must be formed for all high and medium priority groundwater basins in the state. These GSAs must develop and implement Groundwater Sustainability Plans (GSPs) for managing and using groundwater. A major component of each GSP is the development of adequate groundwater monitoring networks to set a baseline for current groundwater levels and determine the sustainable yield of the basin, as well as track the effectiveness of sustainable management criteria as developed by the GSAs to meet the groundwater sustainability management goals in the GSPs.

The Santa Rosa Plain GSA received a \$1 million grant from California's Department of Water Resources through the California Drought, Water, Parks, Climate, Coastal Protection, and Outdoor Access for All Act of 2018 (Proposition 68). One of the grant components is the planning, design, and installation of up to four, multi-level groundwater monitoring wells drilled to depths of up to 500 feet within the GSP area. The specific focus is to provide monitoring data in areas identified as groundwater data gaps with important features such as fault zones, groundwater basin boundaries, baylands, or proximity to areas of substantial groundwater pumping.

The Proposed Project would improve the Santa Rosa Plain's GSA's monitoring networks through the installation of up to four, multi-level monitoring wells within the Santa Rosa Plain Groundwater Basin. These wells would range from approximately 200 to 500 feet in depth and each well casing would have a diameter of 2.5 inches. The wells would be installed within boreholes with a maximum diameter of 16 inches. The duration of construction for the entire Proposed Project is anticipated to be six to eight months. The monitoring wells will provide groundwater information to support and implement long-term sustainable groundwater planning and management, and inform projects to help the GSP meet the sustainable groundwater management goals of the Basin.

Name of Public Agency Approving Project: Santa Rosa Plain Groundwater Sustainability Agency

Name of Person or Agency Carrying Out Project: Santa Rosa Plain Groundwater Sustainability Agency

Exempt Status (check one):

- ☐ Ministerial (Sec. 21080(b)(1); 15268);
- ☐ Declared Emergency (Sec. 21080(b)(3); 15269(a));

Deva Marie Proto, County Clerk
BY: 
Nancy Escobar, Deputy Clerk

- ☐ Emergency Project (Sec.21080 (b)(4); 15269(b)(c));
☒ Categorical Exemption. State type and section number: CEQA Guidelines 15306: Information Collection
☐ Statutory Exemptions. State Code number:

Reasons why project is exempt: The installation of multi-level deep monitoring wells would not result in any change in existing environmental conditions. The project consists of data collection, research, and resource evaluation activities that do not result in a serious or major disturbance to an environmental, historical, or scenic resource. The project is part of a study that may result in a future project, which has not yet been approved, funded, or adopted.

Lead Agency Contact Person:

Area Code/Telephone/Extension:



GSA Administrator

09/30/2021

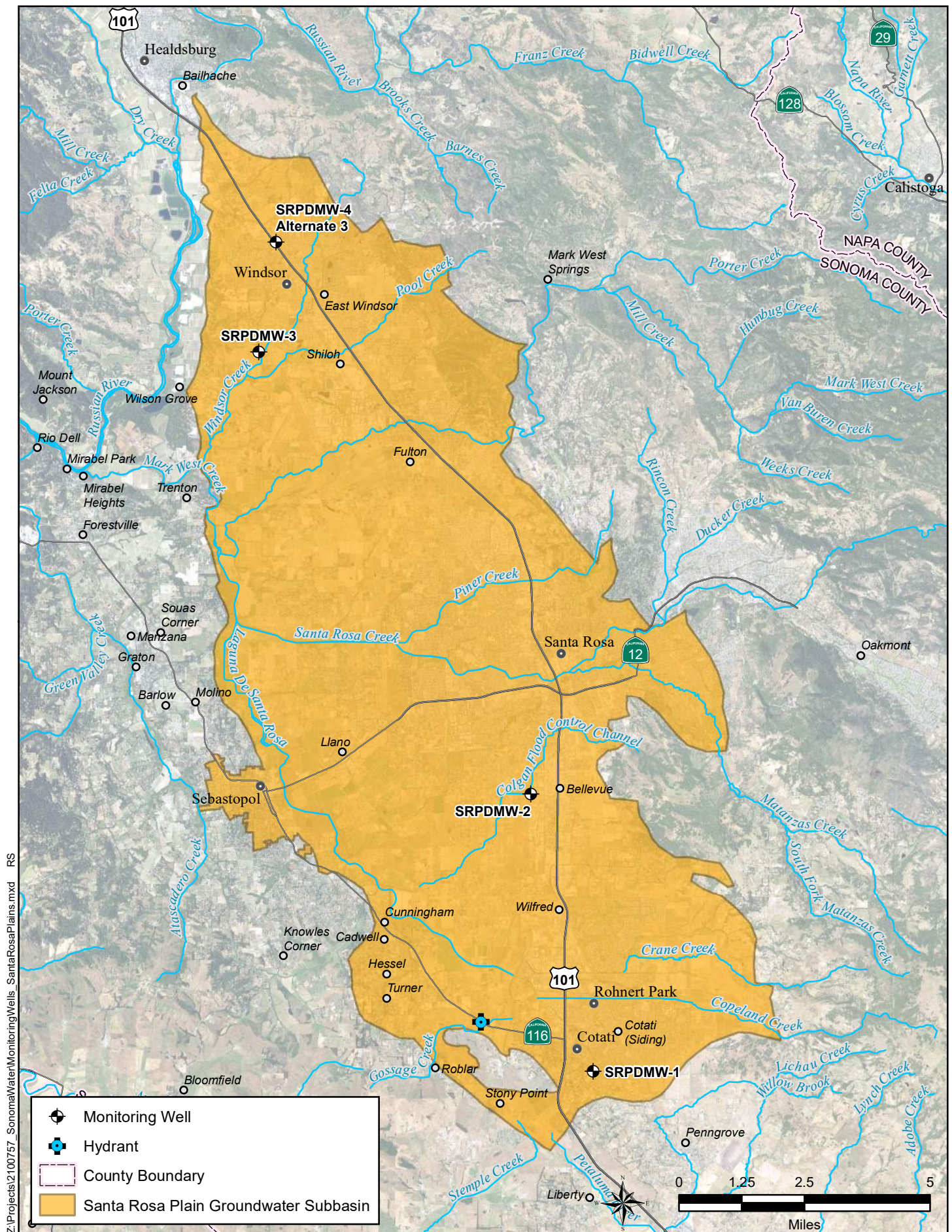
Signature

Title

Date

- ☐ Signed by Lead Agency
☐ Signed by Applicant

Date received for filing at OPR: _____



20-Aug-2021 Z:\Projects\2100757_SonomaWater\MonitoringWells_SantaRosaPlains.mxd RS

Deep Multi-Level Monitoring Wells
Santa Rosa Plain Groundwater Subbasin

Sonoma County Water Agency



Monitoring Well Locations
Santa Rosa Plain GSA

AUGUST 2021

FIGURE 11

Attachment B: Field Lithologic Logs

DATE STARTED 7/13/22	DATE COMPLETED 7/14/22	GROUND ELEVATION 124 ft	ELEVATION DATUM NAVD 88	TOTAL DEPTH OF BORING 520.0 ft
DRILLING CONTRACTOR Roadrunner Drilling & Pump Co. Inc	DRILLER'S NAME Jim Brookshire	HELPER'S NAME Justin Pate	TOTAL DEPTH OF FILL 5 ft	
DRILLING METHOD Mud Rotary	DRILL RIG MAKE AND MODEL Failing CF-15			CONSULTANT COMPANY GEI Consultants, Inc.
DRILL BIT SIZE AND TYPE (HOLE DIAMETER) 8-inch Drag and Button Bit	DRILLING ROD TYPE AND DIAMETER Steel 4.5-inch			FIELD LOGGER S. Storey
☒ VERTICAL ☐ INCLINED	CASING TYPE, DIAMETER, INSTALLATION DEPTH PVC, 2.5-inch diameter			FIELD LOG REVIEWER T. Kent; C. Petersen
SAMPLER TYPE(S) Grab	HAMMER TYPE, MAKE/MODEL, WEIGHT/DROP N/A			HAMMER EFFICIENCY N/A%
BOREHOLE BACKFILL OR COMPLETION Monitoring Well Completion - Triple Completion		GROUNDWATER READING: DURING DRILLING Not measured		
		AFTER DRILLING (DATE-TIME)		

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
	0			
	1			
	2			
	3			
	4			
	5			Top 5-feet were hand augered.
	6		LEAN CLAY (CL); light yellowish brown (10YR 6/4); moist; 95% fines; 5% sand; low plasticity.	
	7			
	8			
	9			
	10			
	11			
	12			
	13			
	14			
	15			
	16			
	17			
	18			
	19			
	20		SANDY LEAN CLAY (CL); pale yellow (2.5Y 7/3); wet; 70% fines; 30% sand; low plasticity, mixed sands, coarsening with depth.	
	21			
	22			
	23			
	24			
	25			
	26			
	27			
	28			
	29			
	30		20% sand; 5% gravel; black volcanic gravels, subrounded.	
	31			
	32			
	33			
	34			
	35			
	36			
	37			
	38			
	39			
	40			

Final Report Version 11/10/2022

Borehole Location: <u>Myrtle Ave and Old Redwood Hwy</u> County: <u>Sonoma</u> Coordinates: Northing: _____ Easting: _____ Latitude: <u>38.32215</u> Longitude: <u>-122.70230</u> Survey Method: <u>Estimated From Map</u> Coord. System: _____ Channel / River Name / Feature: <u>Cotati Veterans Memorial</u>		LOG OF BORING SRPDMW-1 Sheet 1 of 11	
		Sonoma County Water Agency	

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
40	41			
42	43			
80	44			
45	46			
47	48			
75	49			
50	51		SILTY SAND (SM); light olive brown (2.5Y 5/3); 80% sand; 15% fines; 5% gravel; low plasticity fines, very fine to coarse sands, black volcanic gravels, subangular, approximately 1-cm in size, fining with depth.	
52	53			
70	54			
55	55			
65	56			
59	57			
60	58			
61	59			
62	60			
63	61			
60	62			
64	63			
65	64			
66	65			
67	66			
68	67			
55	68			
69	69			
70	70		SILTY CLAY (CL); light yellowish brown (2.5Y 6/4); 90% fines; 10% sand; low plasticity fines, fine to medium-grained sand.	
71	71			
72	72			
73	73			
50	74			
75	75			
76	76			
77	77			
78	78			
45	79			
80	80			
81	81			
82	82			
83	83			
40	84			
85	85			
86	86			
87	87			
88	88			
35	89			
90	90			

Final Report Version 11/10/2022



Borehole Location: Myrtle Ave and Old Redwood Hwy **County:** Sonoma
Coordinates: **Northing:** _____ **Easting:** _____
Latitude: 38.32215 **Longitude:** -122.70230
Survey Method: Estimated From Map **Coord. System:** _____
Channel / River Name / Feature: Cotati Veterans Memorial

**LOG OF BORING
SRPDMW-1**

Sheet 2 of 11

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
90	91		SANDY LEAN CLAY (CL); light yellowish brown (2.5Y 6/3); 60% fines; 40% sand; low plasticity fines, coarse sand, black volcanics, subrounded, maximum 0.6-inch.	
30	92			
	93			
	94			
	95			
	96			
	97			
	98			
25	99			
	100		LEAN CLAY (CL); greenish gray (GLEY 1 5/1); 95% fines; 5% sand; low plasticity fines, very fine sand, black volcanics.	
	101			
	102			
	103			
20	104			
	105			
	106			
	107			
	108			
15	109			
	110			
	111			
	112			
	113			
10	114			
	115			
	116			
	117			
	118			
5	119			
	120		CLAYEY SAND (SC); dark greenish gray (GLEY 1 4/1); 80% sand; 20% fines; low plasticity fines, fine to coarse sand, rounded to subangular, volcanics with quartz.	
	121			
	122			
	123			
0	124			
	125			
	126			
	127			
	128			
-5	129			
	130		SILTY CLAY (CL); dark greenish gray (GLEY 1 4/1); 95% fines; 5% coarse sand; low plasticity fines, trace sands, volcanic.	
	131			
	132			
	133			
-10	134			
	135			
	136			
	137			
	138			
-15	139			
	140			

Final Report Version 11/10/2022



Borehole Location: Myrtle Ave and Old Redwood Hwy **County:** Sonoma
Coordinates: **Northing:** _____ **Easting:** _____
Latitude: 38.32215 **Longitude:** -122.70230
Survey Method: Estimated From Map **Coord. System:** _____
Channel / River Name / Feature: Cotati Veterans Memorial

**LOG OF BORING
SRPDMW-1**

Sheet 3 of 11

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
140	141			
142	143			
-20	144			
145	146			Possible cave-in occurred.
147	148			
-25	149			
150	151		SILTY SAND (SM); dark greenish gray (GLEY 1 4/1); 85% sand; 15% fines; low to no plasticity fines, medium to coarse-grained sand, rounded to subangular, volcanics with quartz; coarsening with depth.	
152	153			
-30	154			
155	156			
157	158			
-35	159			
160	161			
162	163			
-40	164			
165	166			
167	168			
-45	169			
170	171			
172	173			
-50	174			
175	176			
177	178			
-55	179			
180	181		Well-Graded SAND (SW); dark greenish gray (GLEY 1 4/1); 90% sand; 10% fines; no plasticity, fine to coarse-grained sands, rounded to subangular, quartz.	
182	183			
-60	184			
185	186			
187	188			
-65	189			
190				

Final Report Version 11/10/2022



Borehole Location: Myrtle Ave and Old Redwood Hwy County: Sonoma
 Coordinates: Northing: _____ Easting: _____
 Latitude: 38.32215 Longitude: -122.70230
 Survey Method: Estimated From Map Coord. System: _____
 Channel / River Name / Feature: Cotati Veterans Memorial

**LOG OF BORING
SRPDMW-1**

Sheet 4 of 11

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
190				
191				
192				
193				
-70	194			
	195			
	196			
	197			
	198			
-75	199			
	200		Well-Graded GRAVEL (GW); dark greenish gray (GLEY 1 4/1); 80% gravel; 10% sand; 10% fines; fine to coarse sand, rounded to subangular, volcanics; subangular gravel, volcanics with quartz, max 1.2-inch; blue quartz crystals, rusty trace fines.	
	201			
	202			
	203			
-80	204			
	205			
	206			
	207			
	208			
-85	209			
	210			
	211			
	212			
	213			
-90	214			
	215			
	216			
	217			
	218			
-95	219			
	220		CLAYEY SAND (SC); greenish gray (GLEY 1 6/1); 75% sand; 25% fines; low plasticity fines, fine to coarse sand, volcanics, max 1.2-inch gravels; fining with depth.	
	221			
	222			
	223			
-100	224			
	225			
	226			
	227			
	228			
-105	229			
	230		LEAN CLAY (CL); greenish gray (GLEY 2 5/1); 75% fines; 25% sand; low plasticity fines, fine to coarse sand.	
	231			
	232			
	233			
-110	234			
	235		CLAYEY GRAVEL (GC); greenish gray (GLEY 2 5/1); 85% sand; 15% fines; low plasticity fines, medium to coarse sand, subangular, mixed volcanics, quartz.	
	236			
	237			
	238			
-115	239			
	240			

Final Report Version 11/10/2022



Borehole Location: Myrtle Ave and Old Redwood Hwy County: Sonoma
 Coordinates: Northing: _____ Easting: _____
 Latitude: 38.32215 Longitude: -122.70230
 Survey Method: Estimated From Map Coord. System: _____
 Channel / River Name / Feature: Cotati Veterans Memorial

**LOG OF BORING
SRPDMW-1**

Sheet 5 of 11

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
240	241			
242	243			
-120	244			
245	246		Poorly Graded SAND (SP); very dark greenish gray (GLEY 1 3/5G); 90% sand; 10% fines; fine to coarse sand, subangular to subrounded, mixed volcanic gravel, maximum approximately 0.3-inch.	
247	248			
-125	249			
250	251			
252	253			
-130	254			
255	256			
257	258			
-135	259			
260	261		LEAN CLAY (CL); greenish gray (GLEY 1 5/10GY); 80% fines; 20% gravel; medium plasticity fines, mixed volcanic gravel.	
262	263			
-140	264			
265	266			
267	268			
-145	269			
270	271		FAT CLAY (CH); greenish gray (GLEY 1 5/10GY); 95% fines; 5% sand; high plasticity fines.	
272	273			
-150	274			
275	276			
277	278			
-155	279			
280	281			
282	283			
-160	284			
285	286			
287	288			
-165	289			
290				

Final Report Version 11/10/2022



Borehole Location: Myrtle Ave and Old Redwood Hwy County: Sonoma
 Coordinates: Northing: _____ Easting: _____
 Latitude: 38.32215 Longitude: -122.70230
 Survey Method: Estimated From Map Coord. System: _____
 Channel / River Name / Feature: Cotati Veterans Memorial

**LOG OF BORING
SRPDMW-1**

Sheet 6 of 11

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
290	291		LEAN CLAY (CL); greenish gray (GLE 1 7/5G); 100% medium plasticity fines.	
292	293			
-170	294			
	295			
	296			
	297			
	298			
-175	299			
	300		Hard clay stringers.	
	301			
	302			
	303			
-180	304			
	305			
	306			
	307			
	308			
-185	309			
	310		LEAN CLAY (CL); light olive gray (5Y 6/2); 95% fines; 5% sand; low to medium plasticity fines, stratified, intermittent hard clay stringers, trace silts.	
	311			
	312			
	313			
-190	314			
	315			
	316			
	317			
	318			
-195	319			
	320		Black hard clay fragments.	
	321			
	322			
	323			
-200	324			
	325			
	326			
	327			
	328			
-205	329			
	330			
	331			
	332			
	333			
-210	334			
	335			
	336			
	337			
	338			
-215	339			
	340			

Final Report Version 11/10/2022



Borehole Location: Myrtle Ave and Old Redwood Hwy **County:** Sonoma
Coordinates: **Northing:** _____ **Easting:** _____
Latitude: 38.32215 **Longitude:** -122.70230
Survey Method: Estimated From Map **Coord. System:** _____
Channel / River Name / Feature: Cotati Veterans Memorial

**LOG OF BORING
SRPDMW-1**

Sheet 7 of 11

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
340				
341				
342				
343				
-220	344			
	345			
	346			
	347			
	348			
-225	349			
	350			
	351			
	352			
	353			
-230	354			
	355			
	356			
	357			
	358			
-235	359			
	360			
	361			
	362			
	363			
-240	364			
	365			
	366			
	367			
	368			
-245	369			
	370			
	371			
	372			
	373			
-250	374			
	375			
	376			
	377			
	378			
-255	379			
	380		LEAN CLAY (CL); (GLEY 2 3/10BG); 95% fines; 5% sand; low plasticity, stratified, hard black clay stringers; trace oxidized (red) clay.	
	381			
	382			
	383			
-260	384			
	385			
	386			
	387			
	388			
-265	389			
	390			

Final Report Version 11/10/2022



Borehole Location: Myrtle Ave and Old Redwood Hwy **County:** Sonoma
Coordinates: **Northing:** _____ **Easting:** _____
Latitude: 38.32215 **Longitude:** -122.70230
Survey Method: Estimated From Map **Coord. System:** _____
Channel / River Name / Feature: Cotati Veterans Memorial

**LOG OF BORING
SRPDMW-1**

Sheet 8 of 11

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
390				
391				
392				
393				
-270	394			
	395			
	396			
	397			
	398			
-275	399			
	400			
	401			
	402			
	403			
-280	404			
	405			
	406			
	407			
	408			
-285	409			
	410			
	411		SILTY GRAVEL (GM); very dark greenish gray (GLEY 2 3/5BG); 70% gravel; 20% fines; 10% sand; no plasticity.	
	412			
	413			
-290	414			
	415			
	416		LEAN CLAY (CL); dark greenish gray (GLEY 1 4/10GY); 90% fines; 10% sand; low plasticity fines, interbedded clay with siltstone, brittle; coarse zone.	
	417			
	418			
-295	419			
	420			
	421		SILTY GRAVEL (GM); dark greenish gray (GLEY 1 4/10GY); 70% gravel; 20% fines; 10% sand; fine to coarse gravel, rounded to subangular, silty gravel and siltstone conglomerate, nodules/pebbles of silt with interstitial clay; brittle, nodules up to 1-inch clasts.	
	422			
	423			
	424			
-300	425			
	426			
	427			
	428			
-305	429			
	430			
	431			
	432			
	433			
-310	434			
	435			
	436			
	437			
	438			
-315	439			
	440			

Final Report Version 11/10/2022



Borehole Location: Myrtle Ave and Old Redwood Hwy **County:** Sonoma
Coordinates: **Northing:** _____ **Easting:** _____
Latitude: 38.32215 **Longitude:** -122.70230
Survey Method: Estimated From Map **Coord. System:** _____
Channel / River Name / Feature: Cotati Veterans Memorial

**LOG OF BORING
SRPDMW-1**

Sheet 9 of 11

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
440				
441				
442				
443				
-320	444			
	445			
	446			
	447			
	448			
-325	449			
	450			
	451			
	452			
	453			
-330	454			
	455			
	456			
	457			
	458			
-335	459			
	460			
	461			
	462			
	463			
-340	464			
	465			
	466			
	467			
	468			
-345	469			
	470			
	471			
	472			
	473			
-350	474			
	475			
	476			
	477			
	478			
-355	479			
	480			
	481			
	482			
	483			
-360	484			
	485			
	486			
	487			
	488			
-365	489			
	490			

LEAN CLAY (CL); dark greenish gray (GLEI 1 4/10GY); 95% fines; 5% sand; no to low plasticity fines, siltstone with lean clay lenses laminated, brittle, contains oxidation stains, conchoidal fracturing when split, partial lithification up to 0.5-inch, siltstone chips into coarse sand sized clasts, appear rounded at times.

Final Report Version 11/10/2022



Borehole Location: Myrtle Ave and Old Redwood Hwy County: Sonoma
 Coordinates: Northing: _____ Easting: _____
 Latitude: 38.32215 Longitude: -122.70230
 Survey Method: Estimated From Map Coord. System: _____
 Channel / River Name / Feature: Cotati Veterans Memorial

**LOG OF BORING
SRPDMW-1**

Sheet 10 of 11

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
490	491			
492	493			
494	495			
496	497			
498	499			
500	501			
502	503			
504	505			
506	507			
508	509			
510	511			
512	513			
514	515			
516	517			
518	519			
520	521			
522	523			
524	525			
526	527			
528	529			
530	531			
532	533			
534	535			
536	537			
538	539			
540				

Final Report Version 11/10/2022



Borehole Location: Myrtle Ave and Old Redwood Hwy **County:** Sonoma
Coordinates: **Northing:** _____ **Easting:** _____
Latitude: 38.32215 **Longitude:** -122.70230
Survey Method: Estimated From Map **Coord. System:** _____
Channel / River Name / Feature: Cotati Veterans Memorial

**LOG OF BORING
SRPDMW-1**

Sheet 11 of 11

Sonoma County Water Agency

DATE STARTED 5/23/22	DATE COMPLETED 6/1/22	GROUND ELEVATION 96 ft	ELEVATION DATUM NAVD 88	TOTAL DEPTH OF BORING 530.0 ft
DRILLING CONTRACTOR Roadrunner Drilling & Pump Co. Inc	DRILLER'S NAME Jim Brookshire	HELPER'S NAME Justin Pate	TOTAL DEPTH OF FILL	
DRILLING METHOD Mud Rotary	DRILL RIG MAKE AND MODEL Failing CF-15			CONSULTANT COMPANY GEI Consultants, Inc.
DRILL BIT SIZE AND TYPE (HOLE DIAMETER) 8-inch Drag and Button Bit	DRILLING ROD TYPE AND DIAMETER Steel 4.5-inch			FIELD LOGGER N. Cholewinski
☒ VERTICAL ☐ INCLINED	CASING TYPE, DIAMETER, INSTALLATION DEPTH PVC, 2.5-inch diameter			FIELD LOG REVIEWER T. Kent; C. Petersen
SAMPLER TYPE(S) Grab	HAMMER TYPE, MAKE/MODEL, WEIGHT/DROP N/A			HAMMER EFFICIENCY N/A%
BOREHOLE BACKFILL OR COMPLETION Monitoring Well Completion - Triple Completion		GROUNDWATER READING: DURING DRILLING Not measured AFTER DRILLING (DATE-TIME)		

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
95	0		FAT CLAY (CH); very dark grayish brown (10YR 3/2) mottled with dark grayish brown (10YR 4/2); 90-95 fines; 5-10% sand; 5% gravel; subangular gravel, fine sand, medium to high plasticity fines, roots throughout.	
90	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
85	10			
	11			
	12			
	13			
	14			
80	15		Poorly Graded SAND (SP); dark yellowish brown (10YR 4/4); 60% sand; 30% gravel; 10% fines; low plasticity fines, fine to coarse sand, subrounded to subangular, fine gravel, subrounded to rounded, max 0.25-inch, clayey nodules throughout, mixed alluvium with variety of composition, gravel size 1/4 to 1/2-inch.	
	16			
	17			
	18			
	19			
75	20		GRAVELLY LEAN CLAY (CL); grayish brown (10YR 5/2); 65% fines; 20% gravel; 15% sand; low to medium plasticity fines, fine to medium sand, subangular, fine gravel, subrounded to angular, maximum 0.75-inch, sandstone, reworked volcanics (basalt, tuff), quartz and chert.	Driller indicated that sand and gravel keep sloughing into borehole, so they thickened the mud.
	21			
	22			
	23			
	24			
	25			
	26			
	27			
	28			
	29			
70	30			
	31		CLAYEY GRAVEL (GC); grayish brown (10YR 5/2); 40% gravel; 40% fines; 20% sand; low to medium plasticity fines, subrounded to angular sand, fine gravel, subrounded to angular, consists of reworked volcanics (tuff), sandstone, chert, and quartz.	
65	32			
	33			
	34			
	35			
60	36			
	37			
	38		SANDY SILT (ML); brown (10YR 5/3); 40-45% sand; 55% fines; 5% gravel; no to low plasticity fines, fine to medium sand, subrounded to subangular, fine gravel, subangular,	
	39			
40	40			

Final Report Version 11/10/2022

Borehole Location: <u>Bellevue Ave</u> County: <u>Sonoma</u> Coordinates: Northing: _____ Easting: _____ Latitude: <u>38.40216</u> Longitude: <u>-122.72592</u> Survey Method: <u>Estimated From Map</u> Coord. System: _____ Channel / River Name / Feature: <u>Colgan Creek</u>		LOG OF BORING SRPDMW-2 Sheet 1 of 11
		Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
55	40		consists of reworked volcanics, chert and sandstone, trace clayey nodules throughout.	
50	41			
	42			
	43			
	44			
	45			
	46		SILTY SAND (SM); brown (10YR 5/3); 70% sand; 30% fines; no to low plasticity fines, fine to medium sand, subrounded to subangular, trace coarse sand and fine gravel, consists of chert, reworked volcanics (basalt) and quartz.	
	47			
	48			
	49			
	50			
45	51			
	52			
	53			
	54			
	55			
40	56			
	57			
	58			
	59			
	60			
35	61			
	62			
	63		GRAVELLY LEAN CLAY (CL); grayish brown (10YR 5/2); 60% fines; 25% gravel; 15% sand; fine sand, fine gravel, subrounded to angular, maximum 0.25-inch, consists of reworked volcanics (basalt, tuff), sandstone, and chert.	
	64			
	65			
30	66			
	67			
	68			
	69			
	70			
25	71			
	72			
	73			
	74			
	75			
20	76			
	77			
	78		Poorly Graded SAND (SP); dark brown (10YR 3/3); 85% sand; 10% fines; 5% gravel; no plasticity fines, fine to coarse sand, rounded to subangular, fine gravel, subrounded to subangular, max 0.25-inch, trace clayey nodules, sand and gravels consist of chert, reworked volcanics (tuff and scoria), and sandstone.	
	79			
	80			
15	81		GRAVELLY LEAN CLAY (CL); grayish brown (10YR 5/2); 60% fines; 25% gravel; 20% sand; low to medium plasticity fines, fine to coarse, subrounded to angular sand, fine subrounded to angular maximum 0.25-inch gravel; gravel consists of reworked volcanics (tuff and scoria), chert, sandstone, clayey nodules throughout.	
	82			
	83			
	84			
	85			
10	86			
	87			
	88			
	89			
	90			

Final Report Version 11/10/2022



Borehole Location: Bellevue Ave County: Sonoma
 Coordinates: Northing: _____ Easting: _____
 Latitude: 38.40216 Longitude: -122.72592
 Survey Method: Estimated From Map Coord. System: _____
 Channel / River Name / Feature: Colgan Creek

**LOG OF BORING
SRPDMW-2**

Sheet 2 of 11

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
5	90			
	91			
	92			
	93			
	94			
0	95			
	96			
	97			
	98			
	99			
-5	100			
	101			
	102			
	103			
	104			
	105			
-10	106			
	107			
	108			
	109			
	110			
-15	111			
	112			
	113			
	114			
	115			
-20	116			
	117			
	118			
	119			
	120			
-25	121			
	122			
	123			
	124			
	125			
-30	126			
	127			
	128			
	129			
	130			
-35	131			
	132			
	133			
	134			
	135			
-40	136			
	137			
	138			
	139			
	140			

Final Report Version 11/10/2022



Borehole Location: Bellevue Ave County: Sonoma
 Coordinates: Northing: _____ Easting: _____
 Latitude: 38.40216 Longitude: -122.72592
 Survey Method: Estimated From Map Coord. System: _____
 Channel / River Name / Feature: Colgan Creek

**LOG OF BORING
SRPDMW-2**

Sheet 3 of 11

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
-45	140			
	141			
	142			
	143			
	144			
	145			
-50	146			
	147			
	148		CLAYEY GRAVEL (GC); grayish brown (10YR 5/2); 70% gravel; 20% fines; 10% sand; low plasticity fines, coarse sand, subrounded, fine gravel, subrounded, consists of predominantly sandstone, some volcanics (tuff, basalt) and chert.	
	149			
	150			
-55	151			
	152			
	153			
	154			
	155		Poorly Graded SAND (SP); grayish brown (10YR 5/2); 100% fine sand.	
-60	156			
	157			
	158		CLAYEY GRAVEL (GC); light brownish gray (10YR 6/2); 70% gravel; 25% fines; 5% sand; medium plasticity fines, fine to coarse sand, subrounded, fine gravel, subrounded, maximum 0.25-inch, consists of sandstone, basalt and chert, gravel size increasing with depth, clayey nodules throughout.	
	159			
	160			
-65	161			
	162			
	163			
	164			
	165			
-70	166			
	167			
	168			
	169			
	170			
-75	171			
	172			
	173			
	174			
	175			
-80	176			
	177			
	178			
	179			
	180			
-85	181			
	182			
	183			
	184		CLAYEY SAND (SC); light brownish gray (2.5Y 6/2); 70% sand; 30% fines; 5% gravel; no to low plasticity fines, fine to medium sand, fine gravel, subrounded.	
-90	185			
	186			
	187			
	188		GRAVELLY LEAN CLAY (CL); light brownish gray (10YR 6/2); 55% fines; 30% gravel; 15% sand; medium plasticity fines, fine to coarse sand, subrounded to subangular, fine gravel, subrounded, maximum 0.25-inch, consists of sandstone, mudstone, few volcanics and chert, fining with depth.	
	189			
	190			

Final Report Version 11/10/2022



Borehole Location: Bellevue Ave County: Sonoma
 Coordinates: Northing: _____ Easting: _____
 Latitude: 38.40216 Longitude: -122.72592
 Survey Method: Estimated From Map Coord. System: _____
 Channel / River Name / Feature: Colgan Creek

**LOG OF BORING
SRPDMW-2**

Sheet 4 of 11

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
-95	190			
	191			
	192			
	193			
	194			
	195			
-100	196			
	197			
	198			
	199			
	200			
-105	201			
	202			
	203			
	204			
	205			
-110	206			
	207			
	208			
	209			
	210			
-115	211			
	212			
	213			
	214			
	215			
-120	216			
	217			
	218			
	219			
	220			
-125	221			
	222			
	223			
	224			
	225			
-130	226			
	227			
	228			
	229			
	230			
-135	231			
	232			
	233			
	234			
	235			
-140	236			
	237			
	238			
	239			
	240			

Final Report Version 11/10/2022



Borehole Location: Bellevue Ave County: Sonoma
 Coordinates: Northing: _____ Easting: _____
 Latitude: 38.40216 Longitude: -122.72592
 Survey Method: Estimated From Map Coord. System: _____
 Channel / River Name / Feature: Colgan Creek

**LOG OF BORING
SRPDMW-2**

Sheet 5 of 11

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
-145	240			
	241			
	242			
	243			
	244			
	245			
-150	246			
	247			
	248			
	249			
	250			
-155	251		LEAN CLAY (CL); pale brown (10YR 6/3); 85% fines; 10% sand; 5% gravel; low to medium plasticity fines, fine sand, subrounded, fine gravel, subrounded to subangular, consist of sandstone, mudstone and chert.	
	252			
	253			
	254			
	255			
-160	256			
	257		CLAYEY GRAVEL (GC); light brownish gray (10YR 6/2); 50% gravel; 40% fines; 10% sand; low plasticity fines, fine to coarse sand, subrounded, fine gravel, subrounded, maximum 0.25-inch, consists of sandstone, mudstone, and chert.	
	258			
	259			
-165	260			
	261			
	262			
	263			
	264			
	265			
-170	266			
	267			
	268			
	269			
	270			
-175	271		SILTY SAND (SM); dark bluish gray (5B 4/1) slightly mottled with bluish gray (10B 6/1); 80% sand; 20% fines; 5% gravel; no plasticity fines, fine to medium sand, subangular to subrounded, fine gravel, subrounded, trace yellow and blue clayey nodules, sand contains bluish gray ash.	
	272			
	273			
	274			
	275			
-180	276			
	277			
	278		SANDY LEAN CLAY (CL); greenish gray (10GY 5/1) to bluish gray (5B 5/1); 65% fines; 20% sand; 15% gravel; medium plasticity fines, fine to coarse sand, subrounded, fine gravel, subrounded, maximum 0.25-inch, sand and gravel contain bluish-gray ash.	
	279			
-185	280			
	281			
	282			
	283			
	284			
	285			
-190	286			
	287			
	288			
	289			
	290			

Final Report Version 11/10/2022



Borehole Location: Bellevue Ave County: Sonoma
 Coordinates: Northing: _____ Easting: _____
 Latitude: 38.40216 Longitude: -122.72592
 Survey Method: Estimated From Map Coord. System: _____
 Channel / River Name / Feature: Colgan Creek

**LOG OF BORING
SRPDMW-2**

Sheet 6 of 11

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
-195	290			
	291			
	292			
	293			
	294			
	295			
-200	296			
	297			
	298			
	299			
	300			
-205	301			
	302			
	303			
	304			
	305			
-210	306			
	307			
	308			
	309			
	310			
-215	311			
	312			
	313			
	314			
	315			
-220	316			
	317			
	318			
	319			
	320			
-225	321			
	322			
	323			
	324			
	325			
-230	326			
	327			
	328			
	329			
-235	330			
	331			
	332			
	333			
	334			
-240	335			
	336			
	337			
	338			
	339			
	340			

Final Report Version 11/10/2022



Borehole Location: Bellevue Ave **County:** Sonoma
Coordinates: Northing: _____ **Easting:** _____
Latitude: 38.40216 **Longitude:** -122.72592
Survey Method: Estimated From Map **Coord. System:** _____
Channel / River Name / Feature: Colgan Creek

**LOG OF BORING
SRPDMW-2**

Sheet 7 of 11

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
-245	340			
	341			
	342			
	343			
	344			
	345			
-250	346			
	347			
	348			
	349			
	350			
-255	351		SILTY SAND (SM); dark bluish gray (5B 4/1); 80% sand; 20% fines; 5% gravel; no plasticity	
	352		fines, fine sand, subrounded, fine gravel, consists of green mudstone, basalt and some	
	353		serpentine.	
	354			
	355			
-260	356			
	357			
	358		GRAVELLY LEAN CLAY (CL); greenish gray (10BG 5/1); 60% fines; 35% gravel; 5% sand;	
	359		medium plasticity fines, fine to coarse sand, subrounded to subangular, fine gravel,	
	360		subrounded, maximum 0.25-inch, consists of green and tan mudstone, chert, and sandstone.	
-265	361			
	362			
	363			
	364			
	365			
-270	366			
	367			
	368			
	369			
	370			
-275	371			
	372			
	373			
	374		SILTY SAND (SM); dark bluish gray (5B 4/1); 70% sand; 20% fines; 10% gravel; no plasticity	
	375		fines, fine sand, subrounded, fine gravel, subrounded, maximum 0.25-inch, consists of green	
	376		mudstone and grey siltstone, trace clayey nodules.	
-280	377			
	378			
	379		GRAVELLY LEAN CLAY (CL); dark greenish gray (10G 4/1); 75% fines; 20% gravel; 5%	
	380		sand; medium plasticity fines, fine sand, fine gravel, subrounded to subangular, maximum	
	381		0.5-inch, consists of green mudstone matrix with reworked volcanic tuff and quartz.	
-285	382			
	383			
	384			
	385			
-290	386			
	387			
	388			
	389			
	390		Poorly Graded SAND bluish gray (5B 5/1); 100% fine sand.	

Final Report Version 11/10/2022



Borehole Location: Bellevue Ave County: Sonoma
 Coordinates: Northing: _____ Easting: _____
 Latitude: 38.40216 Longitude: -122.72592
 Survey Method: Estimated From Map Coord. System: _____
 Channel / River Name / Feature: Colgan Creek

**LOG OF BORING
SRPDMW-2**

Sheet 8 of 11

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
-295	390			
	391			
	392			
	393			
	394		SANDY LEAN CLAY (CL); dark greenish gray (10G 4/1); 60% fines; 35% sand; 5% gravel; low to medium plasticity fines, fine sand, subrounded, consists of mudstone and tuff, fine gravel, subrounded, abundant clayey nodules.	
	395			
-300	396			
	397			
	398			
	399			
	400			
-305	401		LEAN CLAY with Sand (CL); greenish gray (10G 5/1); 85% fines; 15% sand; 5% gravel; low plasticity fines, fine to coarse sand, subrounded, consists of green and light brown/tan mudstone, quartz, some serpentinite, fine gravel, subrounded, maximum 1/8-inch.	
	402			
	403			
	404			
	405			
-310	406			
	407			
	408			
	409			
	410			
-315	411			
	412			
	413			
	414			
	415			
-320	416			
	417			
	418			
	419			
	420			
-325	421			
	422			
	423			
	424			
	425			
-330	426			
	427			
	428			
	429			
	430			
-335	431			
	432			
	433			
	434			
	435			
-340	436			
	437			
	438			
	439			
	440			

Final Report Version 11/10/2022



Borehole Location: Bellevue Ave County: Sonoma
 Coordinates: Northing: _____ Easting: _____
 Latitude: 38.40216 Longitude: -122.72592
 Survey Method: Estimated From Map Coord. System: _____
 Channel / River Name / Feature: Colgan Creek

**LOG OF BORING
SRPDMW-2**

Sheet 9 of 11

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
-345	440			
	441			
	442			
	443			
	444			
	445			
-350	446			
	447			
	448			
	449			
	450			
-355	451			
	452			
	453			
	454			
	455			
-360	456		SANDY LEAN CLAY (CL); greenish gray (10G 5/1); 60% fines; 25% gravel; 15% sand; medium plasticity fines, fine to coarse sand, subrounded, fine gravel, subrounded, maximum 0.25-inch, consists of green and tan mudstone, basalt, quartz and trace chert and sandstone.	
	457			
	458			
	459			
	460			
-365	461		SILTY SAND (SM); bluish gray (5B 5/1); 60% sand; 40% fines; 5% gravel; no to low plasticity fines, fine to coarse sand, subrounded to subangular, consists of mudstone, basalt, serpentinite, quartz and abundant green clayey nodules, fine gravel, subrounded, maximum 1/8-inch.	
	462			
	463			
	464			
	465			
-370	466			
	467			
	468			
	469			
	470			
-375	471			
	472			
	473		CLAYEY SAND (SC); bluish gray (5B 5/1); 60% sand; 35% fines; 5% gravel; no to low plasticity fines, coarse sand, subrounded, fine gravel, consists of serpentinite, basalt, greenstone, quartz, mudstone, and trace green clayey nodules.	
	474			
	475			
-380	476			
	477			
	478			
	479			
-385	480			
	481			
	482			
	483			
	484			
	485			
-390	486		SILTY SAND (SM); bluish gray (5B 5/1) to greenish gray (10G 5/1); 65% sand; 35% fines; 5% gravel; no to low plasticity fines, fine to coarse sand, subrounded, fine gravel, subrounded to subangular.	
	487			
	488			
	489			
	490			

Final Report Version 11/10/2022



Borehole Location: Bellevue Ave **County:** Sonoma
Coordinates: **Northing:** _____ **Easting:** _____
Latitude: 38.40216 **Longitude:** -122.72592
Survey Method: Estimated From Map **Coord. System:** _____
Channel / River Name / Feature: Colgan Creek

**LOG OF BORING
SRPDMW-2**

Sheet 10 of 11

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
-395	490			
	491			
	492			
	493			
	494		SANDY LEAN CLAY (CL); greenish gray (10G 5/1); 60% fines; 40% gravel; low plasticity fines, fine gravel, subrounded, maximum 1/8-inch, consists of mudstone.	
	495			
-400	496			
	497			
	498			
	499			
	500			
-405	501			
	502			
	503			
	504			
	505			
-410	506			
	507		SANDY SILT (ML); greenish gray (10G 5/1); 70% fines; 30% sand; no to low plasticity fines, fine to medium sand, subrounded, consists of mudstone, quartz.	
	508			
	509			
	510			
-415	511			
	512			
	513			
	514			
	515			
-420	516			
	517			
	518			
	519			
	520		LEAN CLAY (CL); greenish gray (10G 5/1); 75% fines; 25% sand; low to medium plasticity fines, fine sand, subrounded, consists of mudstone and some quartz.	
-425	521			
	522			
	523			
	524			
	525			
-430	526			Driller indicates that they increased the total depth to 530-feet bgs so the geophysical survey can read fully to 520-feet bgs.
	527			
	528			
	529			
	530			
-435	531			
	532			
	533			
	534			
	535			
-440	536			
	537			
	538			
	539			
	540			

Final Report Version 11/10/2022



Borehole Location: Bellevue Ave **County:** Sonoma
Coordinates: **Northing:** _____ **Easting:** _____
Latitude: 38.40216 **Longitude:** -122.72592
Survey Method: Estimated From Map **Coord. System:** _____
Channel / River Name / Feature: Colgan Creek

**LOG OF BORING
SRPDMW-2**

Sheet 11 of 11

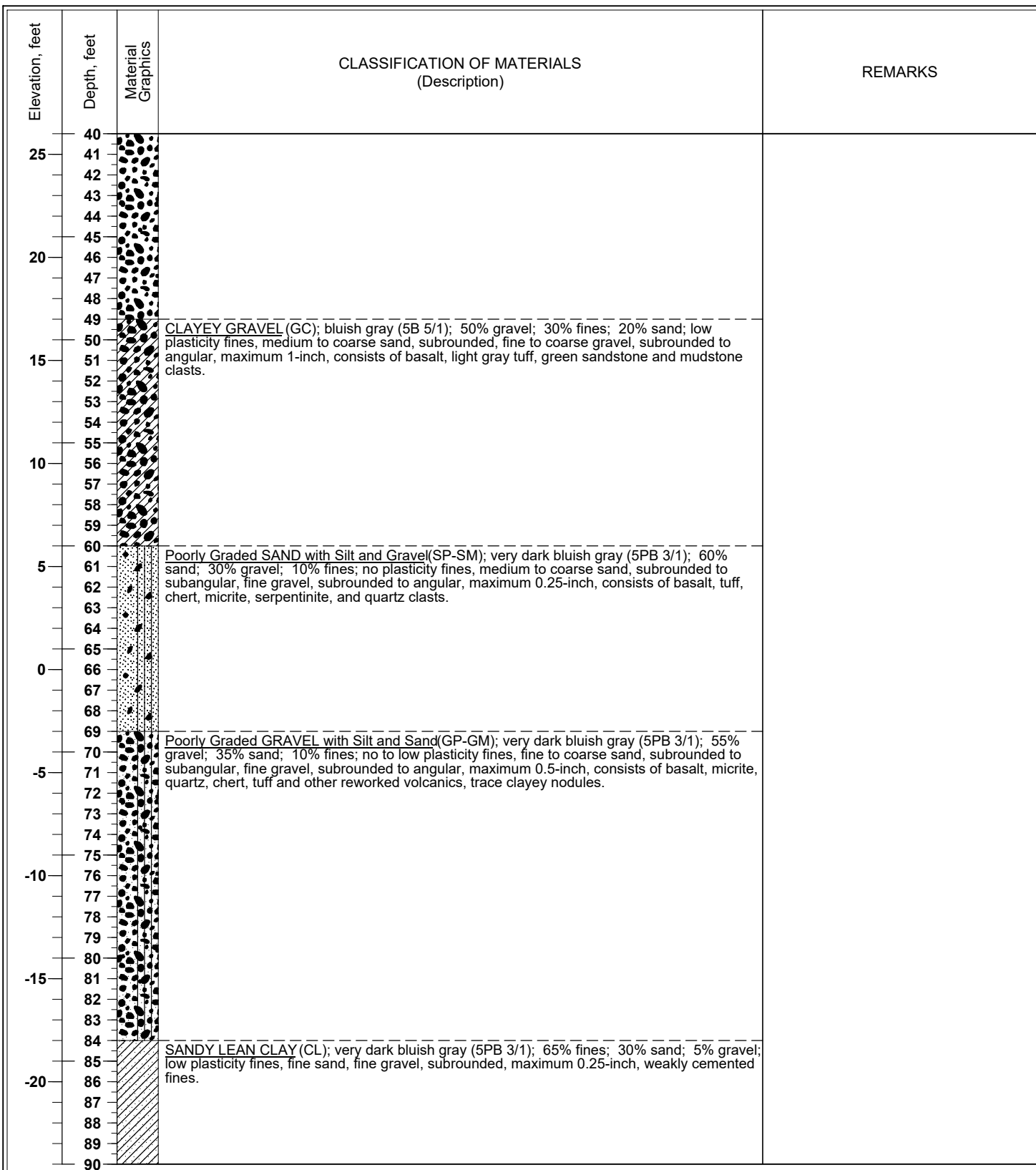
Sonoma County Water Agency

DATE STARTED 5/16/22	DATE COMPLETED 5/17/22	GROUND ELEVATION 66 ft	ELEVATION DATUM NAVD 88	TOTAL DEPTH OF BORING 273.2 ft
DRILLING CONTRACTOR Roadrunner Drilling & Pump Co. Inc	DRILLER'S NAME Jim Brookshire	HELPER'S NAME Justin Pate	TOTAL DEPTH OF FILL	
DRILLING METHOD Mud Rotary	DRILL RIG MAKE AND MODEL Failing CF-15		CONSULTANT COMPANY GEI Consultants, Inc.	
DRILL BIT SIZE AND TYPE (HOLE DIAMETER) 8-inch Drag and Button Bit	DRILLING ROD TYPE AND DIAMETER Steel 4.5-inch		FIELD LOGGER N. Cholewinski	
☒ VERTICAL ☐ INCLINED	CASING TYPE, DIAMETER, INSTALLATION DEPTH PVC, 2.5-inch diameter		FIELD LOG REVIEWER T. Kent; C. Petersen	
SAMPLER TYPE(S) Grab	HAMMER TYPE, MAKE/MODEL, WEIGHT/DROP N/A		HAMMER EFFICIENCY N/A%	
BOREHOLE BACKFILL OR COMPLETION Monitoring Well Completion - Triple Completion		GROUNDWATER READING: DURING DRILLING Not measured		AFTER DRILLING (DATE-TIME)

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
65	0		SANDY LEAN CLAY (CL); brown (7.5YR 5/2); 55% fines; 45% sand; 5% gravel; no to low plasticity, fine to coarse sand, subangular, fine gravel, subangular to subrounded, maximum 0.25-inch, consists of chert, quartz, sandstone and volcanics, roots present.	Hand auger 0 to 5-feet bgs.
60	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
55	10		CLAYEY SAND (SC); grayish brown (10YR 5/2); 45% sand; 30% fines; 25% gravel; no to low plasticity fines, fine to coarse sand, subangular to angular, fine gravel, subrounded to subangular, maximum 0.25-inch, consists of basalt, quart, chert, and mudstone, clayey nodules present.	
	11			
	12			
	13			
	14			
	15			
50	16			
	17			
	18			
	19			
45	20		Poorly Graded SAND with Gravel (SP); grayish brown (10YR 5/2); 60% sand; 35% gravel; 5% fines; no plasticity fines, medium to coarse sand, subangular, fine gravel, subrounded to subangular, maximum 0.25-inch, consists of basalt, quartz, chert, and obsidian.	
	21			
	22			
	23			
	24			
	25			
40	26			
	27			
	28			
	29			
35	30		Poorly Graded GRAVEL (GP); very dark bluish gray (5PB 3/1); 60% gravel; 35% sand; 5% fines; no plasticity fines, medium to coarse sand, subrounded, fine to coarse, subrounded to subangular gravel, maximum 1-inch, consists of basalt with reworked volcanics (tuff), quartz, chert, serpentinite clasts.	
	31			
	32			
	33			
	34			
	35			
30	36			
	37			
	38			
	39			
	40			

Final Report Version 11/10/2022

Borehole Location: <u>Starr Rd and Cooper Way</u> County: <u>Sonoma</u> Coordinates: Northing: _____ Easting: _____ Latitude: <u>38.52898</u> Longitude: <u>-122.82727</u> Survey Method: <u>Estimated From Map</u> Coord. System: _____ Channel / River Name / Feature: <u>Windsor Creek</u>		LOG OF BORING SRPDMW-3 Sheet 1 of 6	
		Sonoma County Water Agency	



Final Report Version 11/10/2022



Borehole Location: Starr Rd and Cooper Way **County:** Sonoma
Coordinates: **Northing:** _____ **Easting:** _____
Latitude: 38.52898 **Longitude:** -122.82727
Survey Method: Estimated From Map **Coord. System:** _____
Channel / River Name / Feature: Windsor Creek

**LOG OF BORING
SRPDMW-3**

Sheet 2 of 6

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
-25	90			
	91			
	92			
	93			
	94			
-30	95			
	96			
	97			
	98			
	99			
	100			
-35	101			
	102			
	103			
	104			
	105			
-40	106			
	107			
	108			
	109			
	110			
-45	111			
	112			
	113			
	114			
	115			
-50	116			
	117			
	118			
	119			
	120			
-55	121			
	122			
	123			
	124			
	125			
-60	126			
	127			
	128			
	129			
	130			
-65	131			
	132			
	133			
	134			
	135			
-70	136			
	137			
	138			
	139			
	140			

Final Report Version 11/10/2022



Borehole Location: Starr Rd and Cooper Way **County:** Sonoma
Coordinates: Northing: _____ **Easting:** _____
Latitude: 38.52898 **Longitude:** -122.82727
Survey Method: Estimated From Map **Coord. System:** _____
Channel / River Name / Feature: Windsor Creek

**LOG OF BORING
SRPDMW-3**

Sheet 3 of 6

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
-75	140			
	141			
	142			
	143			
	144			
-80	145			
	146			
	147			
	148			
	149			
-85	150		LEAN CLAY with Sand(CL); greenish gray (10G 5/1); 75% fines; 20% sand; 5% gravel; low plasticity fines, fine to coarse sand, subrounded, fine gravel, subrounded, consists of mudstone, chert, limestone, quartz and basalt.	
	151			
	152			
	153			
	154			
	155			
-90	156			
	157			
	158			
	159			
	160			
-95	161			
	162			
	163			
	164			
	165			
-100	166			
	167			
	168			
	169			
-105	170		SANDY LEAN CLAY (CL); greenish gray (10G 5/1); 55% fines; 30% sand; 5% gravel; low to medium plasticity fines, fine sand, fine gravel, subrounded, consists of chert, micrite and mudstone, fining with depth.	
	171			
	172			
	173			
	174			
	175			
-110	176			
	177			
	178			
	179			
	180			
-115	181			
	182			
	183		SANDY SILT (ML); dark greenish gray (10G 4/1); 65% fines; 30% sand; 5% gravel; no to low plasticity fines, weakly cemented, fine to coarse sand, subrounded, fine gravel, subrounded.	
	184			
	185			
-120	186			
	187			
	188			
	189			
	190			

Final Report Version 11/10/2022



Borehole Location: Starr Rd and Cooper Way **County:** Sonoma
Coordinates: **Northing:** _____ **Easting:** _____
Latitude: 38.52898 **Longitude:** -122.82727
Survey Method: Estimated From Map **Coord. System:** _____
Channel / River Name / Feature: Windsor Creek

**LOG OF BORING
SRPDMW-3**

Sheet 4 of 6

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
-125	190			
	191			
	192			
	193			
	194			
	195			
-130	196			
	197			
	198			
	199			
	200			
-135	201		SANDY LEAN CLAY (CL); dark greenish gray (10G 4/1); 65% fines; 25% sand; 10% gravel; low plasticity fines, weakly cemented, fine to coarse sand, subrounded, fine gravel, subrounded, maximum 0.25-inch, consists of mudstone, chert, limestone, basalt.	
	202			
	203			
	204			
	205			
-140	206			
	207			
	208			
	209			
	210			
-145	211			
	212			
	213			
	214			
	215			
-150	216			
	217			
	218			
	219			
	220			
-155	221			
	222			
	223			
	224			
	225			
-160	226			
	227			
	228			
	229			
	230			
-165	231			
	232			
	233			
	234			
	235			
-170	236			
	237			
	238			
	239			
	240			

Final Report Version 11/10/2022



Borehole Location: Starr Rd and Cooper Way **County:** Sonoma
Coordinates: **Northing:** _____ **Easting:** _____
Latitude: 38.52898 **Longitude:** -122.82727
Survey Method: Estimated From Map **Coord. System:** _____
Channel / River Name / Feature: Windsor Creek

**LOG OF BORING
SRPDMW-3**

Sheet 5 of 6

Sonoma County Water Agency

Elevation, feet	Depth, feet	Material Graphics	CLASSIFICATION OF MATERIALS (Description)	REMARKS
-175	240			
	241			
	242			
	243			
	244			
	245			
-180	246			
	247			
	248			
	249			
	250			
-185	251			
	252			
	253			
	254			
	255			
-190	256			
	257			
	258			
	259			
-195	260		Franciscan Complex, greenish black (10G 2.5/1), 20% fines, 80% sand, low plasticity fines, fine sand, subangular to subrounded, cuttings broken up to fine sand by drill.	
	261			
	262			
	263			
	264			
	265			Cuttings being broken up to fine sand by drill bit.
-200	266			Sample collected from drainage ditch, more coarse cuttings in ditch because driller is damming up ditch.
	267			
	268			
	269			
	270			
-205	271			
	272			
	273			
	274			
	275			
-210	276			
	277			
	278			
	279			
	280			
-215	281			
	282			
	283			
	284			
	285			
-220	286			
	287			
	288			
	289			
	290			

Final Report Version 11/10/2022



Borehole Location: Starr Rd and Cooper Way **County:** Sonoma
Coordinates: Northing: _____ **Easting:** _____
Latitude: 38.52898 **Longitude:** -122.82727
Survey Method: Estimated From Map **Coord. System:** _____
Channel / River Name / Feature: Windsor Creek

**LOG OF BORING
SRPDMW-3**

Sheet 6 of 6

Sonoma County Water Agency

Attachment C: DWR Well Completion Reports

State of California
Well Completion Report
 Form DWR 188 In Review 8/25/2022
 WCR2022-008614

Owner's Well Number SRPDMW-1 Date Work Began 07/13/2022 Date Work Ended 07/26/2022
 Local Permit Agency Sonoma County Permit & Resource Management Department
 Secondary Permit Agency _____ Permit Number WEL22-0060 Permit Date 04/04/2022

Well Owner (must remain confidential pursuant to Water Code 13752)	Planned Use and Activity
Name <u>SANTA ROSA PLAIN GROUNDWATER SUSTAINABILITY AGENCY C/O WEST YOST,</u>	Activity <u>New Well</u>
Mailing Address <u>2235 Mercury Way, Suite 105</u>	Planned Use <u>Monitoring</u>
City <u>SANTA ROSA</u> State <u>CA</u> Zip <u>95407</u>	

Well Location	
Address <u>8505 PARK AVE</u>	APN <u>144410032</u>
City <u>COTATI</u> Zip <u>94931</u> County <u>Sonoma</u>	Township <u>06 N</u>
Latitude <u>38</u> <u>19</u> <u>19.6535</u> <u>N</u> Longitude <u>-122</u> <u>42</u> <u>8.1835</u> <u>W</u>	Range <u>08 W</u>
Deg. Min. Sec. Deg. Min. Sec.	Section <u>36</u>
Dec. Lat. <u>38.322126</u> Dec. Long. <u>-122.7022732</u>	Baseline Meridian <u>Mount Diablo</u>
Vertical Datum _____ Horizontal Datum <u>WGS84</u>	Ground Surface Elevation _____
Location Accuracy _____ Location Determination Method _____	Elevation Accuracy _____
	Elevation Determination Method _____

Borehole Information	Water Level and Yield of Completed Well
Orientation <u>Vertical</u> Specify _____	Depth to first water _____ (Feet below surface)
Drilling Method <u>Direct Rotary</u> Drilling Fluid <u>Bentonite</u>	Depth to Static _____
Total Depth of Boring <u>520</u> Feet	Water Level <u>44.3</u> (Feet) Date Measured <u>07/27/2022</u>
Total Depth of Completed Well <u>450</u> Feet	Estimated Yield* _____ (GPM) Test Type _____
	Test Length _____ (Hours) Total Drawdown _____ (feet)
	*May not be representative of a well's long term yield.

Geologic Log - Free Form		
Depth from Surface	Feet to Feet	Description
0	6	Clay - Red
6	12	Sandy Clay - Tan
12	34	Sandy Clay - Grayish
34	41	Clay - Gray
41	47	Sand, Coarse - Yellow
47	95	Sandy Clay - Brown
95	96	Gravel, Small 1/8" +/-, with Sandy Clay - Brown
96	99	Sandy Clay - Brown
99	121	Clay - Blue
121	127	Clay, Soft - Blue, with Gravel, Small 1/8" +/-, & Shale
127	143	Clay, Soft - Blue, with Little Sand Layers
143	159	Sand, Fine - Blue, with Clay, Soft - Blue
159	181	Gravel, Small 1/8" +/-, with Sand, Fine, & Clay, Soft - Blue
181	207	Sand, Fine to Coarse; Little Gravel 1/4" +/-

207	222	Sand, Fine to Coarse, with Clay, Soft - Blue
222	257	Sand, Fine to Coarse; Gravel, Small 1/4" +/-, with Clay, Soft - Blue Hard @ 250'
257	302	Clay, Soft - Blue, with Layers of Hard Blue Clay, Hard @ 272'
302	435	Clay, Soft - Greenish & Blue, with Clay, Hard - Blue
435	496	Clay, Soft - Blue, with Streaks of Blue Dry Clay, with Sand, Fine - Trace
496	500	Clay, Soft - Blue, with Streaks of Hard Clay - Blue, Broken Rock, Trace - Small 1/8" +/-, & Sand, Little
500	520	Clay, Soft - Blue, with Streaks of Hard Blue Clay, & Blue Dry Clay

Casings										
Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specifications	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size If any (inches)	Description
1	0	75	Blank	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875			
1	75	90	Screen	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875	Milled Slots	0.032	
1	90	95	Blank	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875			Sump with End Cap
2	0	170	Blank	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875			
2	170	185	Screen	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875	Milled Slots	0.032	
2	185	190	Blank	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875			Sump with End Cap
3	0	430	Blank	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875			
3	430	445	Screen	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875	Milled Slots	0.032	
3	445	450	Blank	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875			Sump with End Cap

Annular Material					
Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	20	Cement	10.3 Sack Mix		
20	70	Bentonite	Non Hydrated Bentonite		
70	100	Filter Pack	Other Gravel Pack		SRI #8
100	165	Bentonite	Non Hydrated Bentonite		
165	195	Filter Pack	Other Gravel Pack		SRI #8
195	425	Bentonite	Non Hydrated Bentonite		
425	455	Filter Pack	Other Gravel Pack		SRI #8
455	475	Bentonite	Non Hydrated Bentonite		
475	520	Other Fill	See description.		Native Material

Other Observations:

Triple Completion

Borehole Specifications

Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	100	16
100	195	12
195	520	8.75

Attachments

1109-22 SRPDMW1_FinalDesign.pdf - Well Construction Diagram

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name ROADRUNNER DRILLING & PUMP COMPANY INC
Person, Firm or Corporation

80 BEE JAY WAY	WOODLAND	CA	95776
Address	City	State	Zip

Signed	<i>electronic signature received</i>	07/28/2022	803909
	C-57 Licensed Water Well Contractor	Date Signed	C-57 License Number

DWR Use Only

CSG #	State Well Number	Site Code	Local Well Number

			N					W
--	--	--	---	--	--	--	--	---

Latitude Deg/Min/Sec

Longitude Deg/Min/Sec

TRS:

APN:

State of California
Well Completion Report
 Form DWR 188 In Review 8/25/2022
 WCR2022-007187

Owner's Well Number SRPDMW-2 Date Work Began 06/01/2022 Date Work Ended 06/16/2022
 Local Permit Agency Sonoma County Permit & Resource Management Department
 Secondary Permit Agency _____ Permit Number WEL22-0047 Permit Date 04/04/2022

Well Owner (must remain confidential pursuant to Water Code 13752)	Planned Use and Activity
Name <u>SANTA ROSA PLAIN GROUNDWATER SUSTAINABILITY AGENCY C/O WEST YOST,</u>	Activity <u>New Well</u>
Mailing Address <u>2235 Mercury Way, Suite 105</u>	Planned Use <u>Monitoring</u>
City <u>Santa Rosa</u> State <u>CA</u> Zip <u>95407</u>	

Well Location	
Address <u>0 Monument DR</u>	APN <u>042122015</u>
City <u>Santa Rosa</u> Zip <u>95407</u> County <u>Sonoma</u>	Township <u>07 N</u>
Latitude <u>38</u> <u>24</u> <u>7.5358</u> <u>N</u> Longitude <u>-122</u> <u>43</u> <u>33.6277</u> <u>W</u>	Range <u>08 W</u>
Deg. Min. Sec. Deg. Min. Sec.	Section <u>34</u>
Dec. Lat. <u>38.4020933</u> Dec. Long. <u>-122.7260077</u>	Baseline Meridian <u>Mount Diablo</u>
Vertical Datum _____ Horizontal Datum <u>WGS84</u>	Ground Surface Elevation _____
Location Accuracy _____ Location Determination Method _____	Elevation Accuracy _____
	Elevation Determination Method _____

Borehole Information	Water Level and Yield of Completed Well
Orientation <u>Vertical</u> Specify _____	Depth to first water _____ (Feet below surface)
Drilling Method <u>Direct Rotary</u> Drilling Fluid <u>Bentonite</u>	Depth to Static _____
Total Depth of Boring <u>530</u> Feet	Water Level <u>16.33</u> (Feet) Date Measured <u>06/21/2022</u>
Total Depth of Completed Well <u>471</u> Feet	Estimated Yield* _____ (GPM) Test Type _____
	Test Length _____ (Hours) Total Drawdown _____ (feet)
	*May not be representative of a well's long term yield.

Geologic Log - Free Form		
Depth from Surface Feet to Feet		Description
0	5	Top Soil
5	11	Clay - Black
11	14	Clay - Black, with some White Clay
14	20	Sand/Gravel 1/8" - 1/4"
20	31	Clay - Green
31	38	Gravel/Sand
38	45	Clay - Brown, with little White Clay
45	62	Clay - Brown, with Sand, Fine
62	77	Clay - Brown, with Rock, Black
77	154	Sand, with Clay - Brown
154	157	Sand - Fine
157	165	Gravel - 1/8", with Clay - Brown
165	168	Sand/Gravel
168	183	Clay - Brown, with Gravel - 1/8" +/-

183	187	Sand - Fine
187	205	Clay - Brown, with Gravel - 1/8" +/-
205	213	Clay - Brown
213	224	Gravel - 1/8", with Clay - Brown
224	257	Clay - Brown, with Little Sand
257	271	Gravel - 1/8" +/-
271	278	Sand - Fine, Blue
278	280	Gravel - 1/8" +/-
280	291	Clay - Blue
291	297	Sand - Fine, Blue
297	317	Gravel, with Clay - Brown
317	322	Sand - Fine, Blue
322	330	Clay - Blue, with Gravel - 1/8" +/-
330	334	Sand - Fine, Blue
334	350	Clay - Blue, with Little Gravel
350	357	Sand - Fine, Blue
357	373	Clay - Blue, with Gravel - 1/8"
373	378	Sand - Fine, Blue
378	384	Clay - Blue, with Gravel
384	389	Clay - Blue
389	393	Sand - Fine, Blue
393	402	Clay - Blue, with Little Gravel
402	415	Clay - Blue
415	422	Clay - Blue, with Gravel - Little, Broken 1/2" +/-
422	460	Clay - Blue
460	472	Sand - Coarse, with Clay - Blue
472	477	Clay - Blue
477	485	Gravel - Small, with Clay - Blue
485	491	Clay - Blue
491	493	Sand/Gravel, with Clay - Blue
493	505	Gravel - 1/4" +/-
505	507	Clay - Blue
507	530	Clay - Sandy/Blue, with Hard Streaks of Blue Clay

Casings										
Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specifications	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	72	Blank	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875			
1	72	82	Screen	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875	Milled Slots	0.032	
2	0	251	Blank	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875			
2	251	261	Screen	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875	Milled Slots	0.032	
2	261	266	Blank	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875			
2	266	276	Screen	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875	Milled Slots	0.032	
2	276	281	Blank	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875			Sump with End Cap
3	0	456	Blank	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875			
3	456	466	Screen	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875	Milled Slots	0.032	
3	466	471	Blank	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875			Sump with End Cap

Annular Material					
Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	20	Cement	10.3 Sack Mix		
20	67	Bentonite	Non Hydrated Bentonite		
67	84	Filter Pack	Other Gravel Pack		SRI #8
84	246	Bentonite	Non Hydrated Bentonite		
246	284	Filter Pack	Other Gravel Pack		SRI #8
284	446	Bentonite	Non Hydrated Bentonite		
446	481	Filter Pack	Other Gravel Pack		SRI #8
481	488	Bentonite	Non Hydrated Bentonite		
488	530	Other Fill	See description.		Native Material

Other Observations:
Triple Completion

State of California
Well Completion Report
 Form DWR 188 Submitted 6/6/2022
 WCR2022-006281

Owner's Well Number SRPDMW-3 Date Work Began 05/17/2022 Date Work Ended 05/24/2022
 Local Permit Agency Sonoma County Permit & Resource Management Department
 Secondary Permit Agency _____ Permit Number WEL22-0052 Permit Date 03/08/2022

Well Owner (must remain confidential pursuant to Water Code 13752)		Planned Use and Activity
Name <u>SANTA ROSA PLAIN GROUNDWATER SUSTAINABILITY AGENCY C/O WEST YOST</u>	Activity <u>New Well</u>	
Mailing Address <u>2235 Mercury Way, Suite 105</u>	Planned Use <u>Monitoring</u>	
City <u>Santa Rosa</u> State <u>CA</u> Zip <u>95407</u>		

Well Location	
Address <u>7800 Starr RD</u>	APN <u>066220038</u>
City <u>Windsor</u> Zip <u>95492</u> County <u>Sonoma</u>	Township <u>08 N</u>
Latitude <u>38</u> <u>31</u> <u>44.1206</u> N Longitude <u>-122</u> <u>49</u> <u>38.2836</u> W	Range <u>09 W</u>
Deg. Min. Sec. Deg. Min. Sec.	Section <u>23</u>
Dec. Lat. <u>38.5289224</u> Dec. Long. <u>-122.827301</u>	Baseline Meridian <u>Mount Diablo</u>
Vertical Datum _____ Horizontal Datum <u>WGS84</u>	Ground Surface Elevation _____
Location Accuracy _____ Location Determination Method _____	Elevation Accuracy _____
	Elevation Determination Method _____

Borehole Information	Water Level and Yield of Completed Well
Orientation <u>Vertical</u> Specify _____	Depth to first water _____ (Feet below surface)
Drilling Method <u>Direct Rotary</u> Drilling Fluid <u>Bentonite</u>	Depth to Static _____
Total Depth of Boring <u>273</u> Feet	Water Level <u>8.31</u> (Feet) Date Measured <u>06/01/2022</u>
Total Depth of Completed Well <u>210</u> Feet	Estimated Yield* _____ (GPM) Test Type _____
	Test Length _____ (Hours) Total Drawdown _____ (feet)
	*May not be representative of a well's long term yield.

Geologic Log - Free Form		
Depth from Surface	Feet to Feet	Description
0	2	Top Soil
2	4	Clay - Brown, with Broken Rock, 3" +/-
4	9	Clay - Black, Silty
9	19	Sand - Coarse; Gravel, Small
19	49	Cemented Sand/Gravel - Broken Rock 1.5" +/-
49	69	Clay - Blue; Sand/Gravel 3/8" +/-
69	84	Hard Cemented Sand/Gravel, with Clay, Blue - Little
84	89	Clay - Blue, Silty, Soft
89	91	Sand/Gravel 1/4" +/-, with Clay - Blue, Soft
91	128	Clay - Blue, Soft
128	137	Clay - Blue, Soft, with Sand - Coarse
137	183	Clay - Blue, Soft
183	196	Sandy Clay - Soft, Blue, with Streaks of Hard Blue Clay
196	201	Clay - Blue, Soft; with Streaks of Hard Blue Clay

201	214	Clay - Blue, Soft; Clay - Hard, Blue; Sand/Gravel 1/4" +/-, Little
214	254	Clay - Blue, Soft, with Streaks of Hard Blue Clay
254	260	Hard Cemented Rock, with Hard Blue Clay and Shale
260	273	Hard Rock - Black Broken

Casings										
Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specifications	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	30	Blank	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875			
1	30	45	Screen	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875	Milled Slots	0.032	
1	45	50	Blank	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875			Sump with End Cap
2	0	65	Blank	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875			
2	65	80	Screen	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875	Milled Slots	0.032	
2	80	85	Blank	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875			Sump with End Cap
3	0	195	Blank	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875			
3	195	205	Screen	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875	Milled Slots	0.032	
3	205	210	Blank	PVC	OD: 2.875 in. SDR: SCH 80 Thickness: 0.276 in.	0.276	2.875			Sump with End Cap

Annular Material					
Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	20	Cement	10.3 Sack Mix		
20	25	Bentonite	Non Hydrated Bentonite		
25	49	Filter Pack	Other Gravel Pack		SRI #8
49	60	Bentonite	Non Hydrated Bentonite		
60	90	Filter Pack	Other Gravel Pack		SRI #8
90	190	Bentonite	Non Hydrated Bentonite		
190	213	Filter Pack	Other Gravel Pack		SRI #8
213	237	Bentonite	Non Hydrated Bentonite		
237	273	Other Fill	See description.		Native Material

Other Observations:
Triple Completion

Borehole Specifications		
Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	90	16
90	273	8.75

Certification Statement			
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief			
Name <u>ROADRUNNER DRILLING & PUMP COMPANY INC</u>			
Person, Firm or Corporation			
<u>80 BEE JAY WAY</u>	<u>WOODLAND</u>	<u>CA</u>	<u>95776</u>
Address	City	State	Zip
Signed <u>electronic signature received</u>	<u>08/24/2022</u>	<u>803909</u>	
C-57 Licensed Water Well Contractor	Date Signed	C-57 License Number	

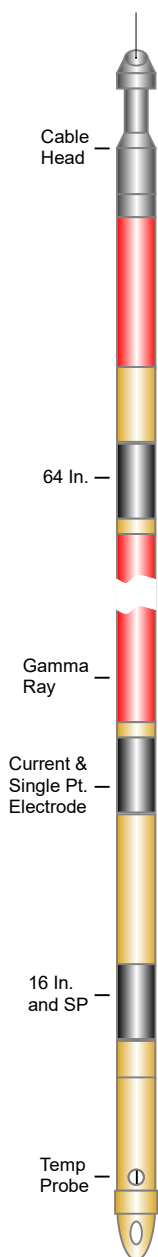
DWR Use Only										
CSG #	State Well Number			Site Code			Local Well Number			
						N				
Latitude Deg/Min/Sec						Longitude Deg/Min/Sec				
TRS:										
APN:										

Attachment D: E-Logs and Caliper Surveys

		ELECTRIC - GAMMA RAY-TEMPERATURE LOG	
Stewart Well Logging Service			
879 PURDUE DRIVE, WOODLAND CA 95695 · Phone: (530)908-6928 · Email: STEWARTWELLLOGGING@GMAIL.COM			
Filing No. 110922	COMPANY <u>Roadrunner Drilling & Pump Co. Inc.</u> WELL <u>SRPDMW-1</u> FIELD <u>Cotati</u> STATE <u>California</u> COUNTY <u>Sonoma</u> LOCATION: _____		
Job No. 0912	SEC: <u>36</u> TWP: <u>06N</u> RGE: <u>08W</u> LAT.: <u>38.3221260</u> LONG.: <u>-122.7022</u>		OTHER SERVICES: None
Permanent Datum: <u>Ground Level</u> Elev.: <u>124</u> Ft. Elevs.: K.B. _____ Ft. Log Measured From: <u>Ground Level</u> , <u>0</u> Ft. Above Perm. Datum D.F. _____ Ft. Drilling Measured From: <u>Ground Level</u> G.L. <u>124</u> Ft.			
Run	One		
Date	Jul 18, 2022		
Depth-Driller	520	Ft	Ft
Depth-Logger	519	Ft	Ft
Top Logged Interval	10.5	Ft	Ft
Btm Logged Interval	519	Ft	Ft
Casing-Driller	In @	Ft	In @ Ft
Casing - Logger In@Ft	In @	Ft	In @ Ft
Bit Size	8.75	In @ 520	Ft In @ Ft
Time On Bottom	1405		
Type Fluid in Hole	Bentonite		
Density	Viscosity		
pH	Fluid Loss		
Source of Sample	Lift Pump		
Rm @ Mea. Temp	6.6	@ 75 °F	@ °F
Rmf @ Mea. Temp	6.4	@ 75 °F	@ °F
Rmc @ Mea. Temp	4.8	@ °F	@ °F
Source Rmf	Rmc	Meas.	
Rm @ BHT	75	@ °F	@ °F
Time Since Circ.	1	Hr	Hr
Max. Rec. Temp.	75.5	°F	°F
Van No.	Location	SWLS-2 WOODLAND	
Recorded By	Stewart		
Witnessed By	J. Brookshire		

This Eagle Plot Heading Conforms To API RP 31A

ELECTRIC - GAMMA RAY-TEMPERATURE LOG TOOL



SPONTANEOUS POTENTIAL LOGS:

SP Logs record potentials or voltages developed between the borehole fluid and the surrounding formation and are representations of lithology and water quality. Recording of SP logs are limited to water-filled or mud-filled open holes.

NORMAL RESISTIVITY LOGS:

Normal Resistivity Logs record the electrical resistivity of the borehole environment with lower resistivities indicative of clays and higher resistivities being sands and gravels. Normal resistivity logs are affected by bed thickness, Borehole diameter and borehole fluid.

SINGLE POINT RESISTIVITY LOGS:

Single Point Resistivity Logs record the electrical resistance from points within the borehole to an electrical ground at land surface. Single-point resistance logs are useful in the determination of lithology, water quality, and location of fracture zones.

GAMMA RAY LOGS:

Gamma Ray Logs record the amount of natural gamma radiation emitted by the rocks surrounding the borehole. The most significant naturally occurring sources of gamma radiation are potassium 40 and daughter products of the uranium and thorium decay series. Clay and shale bearing rocks commonly emit relatively high gamma radiation because they include weathering products of potassium feldspar and mica and tend to concentrate uranium and thorium by ion absorption and exchange.

TEMPERATURE LOGS:

Temperature Logs record the water temperature in the borehole. Temperature logs are useful for delineating water-bearing zones and identifying vertical flow in the borehole between zones of differing hydraulic head penetrated by wells. Borehole flow between zones is indicated by temperature gradients that are less than the regional geothermal gradient.

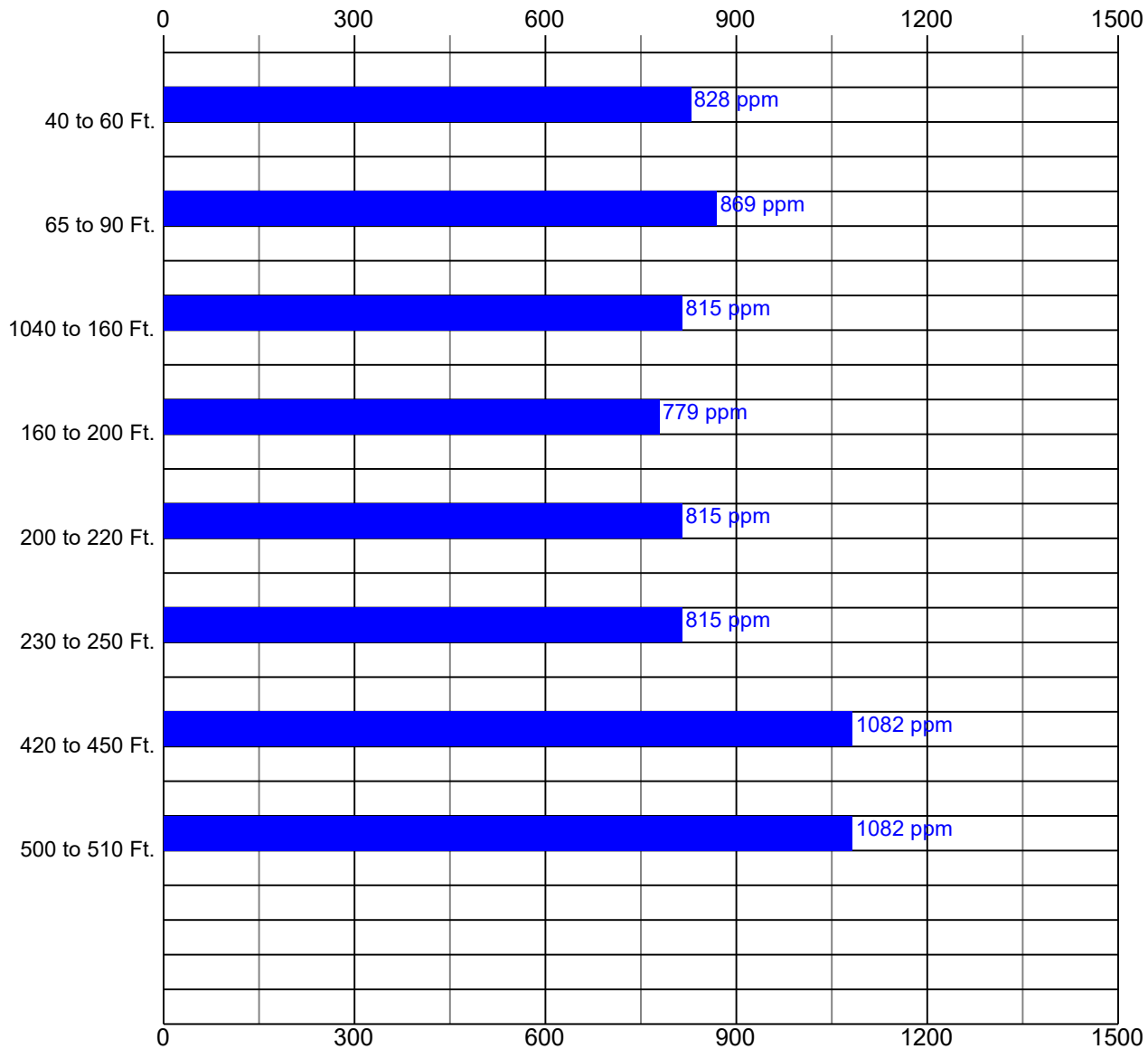
ELECTRIC LOG SPECIFICATIONS:

Diameter	1.73 Inches
Length	8.37 Feet
Weight	21.7 Lbs.
Max. Temp	158° F
Resist. Range	0 - 10,000 ohm-m
Gamma Ray	1.97 inches long x .98 inches diameter Scintillation crystal

TOTAL DISSOLVED SOLIDS

* NaCl 

Parts Per Million - ppm



TDS Classes

Class 1: Excellent to Good – Less than 700 ppm

Class 2: Good to Injurious – 700 to 2000 ppm

Class 3: Injurious to Poor – More than 2000 ppm

NaCl = Sodium Chloride

NOTICE

All interpretations are opinions based on inferences from electrical and other measurements and we do not guarantee the accuracy or correctness of any verbal or written interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by one of our officers, agents or employees. These interpretations are also subject to our General Terms and Conditions as set out in our current Price Schedule.

REMARKS

Roadrunner Drilling & Pump Co. Inc.
SRPDMW-1
Jul 18, 2022

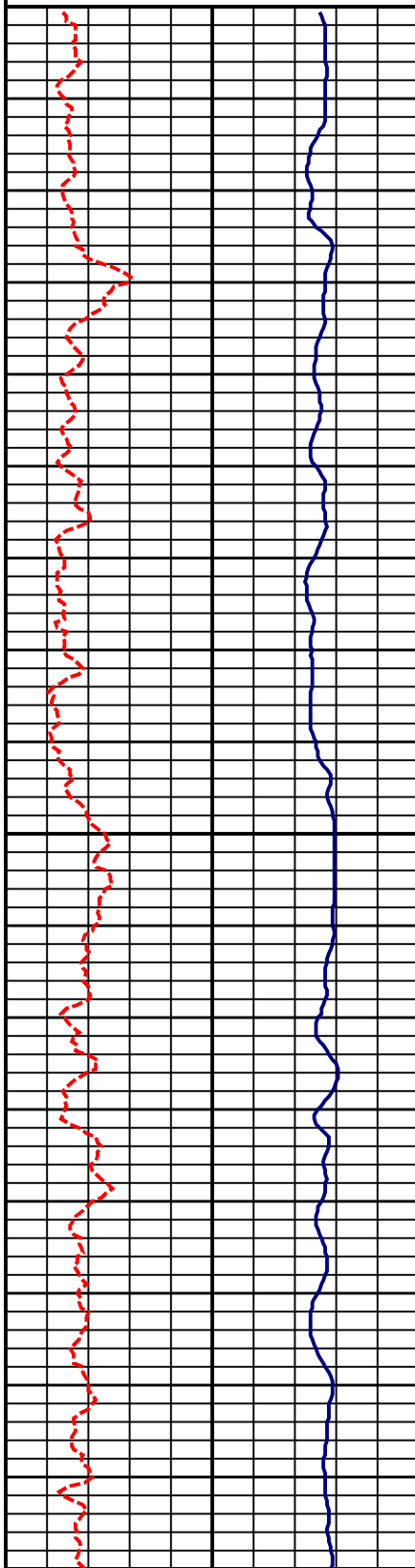
ELECTRIC - GAMMA RAY-TEMPERATURE LOG

Mult. Pages
5"/100'

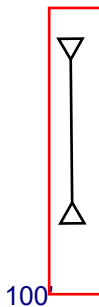
DEPTHS
(Feet)

0 Gamma Ray(api) 200
< - S.P. (10 mV/div) S.P. + >

100 64 Inch Normal (ohmm²/m) x10 1000
64 Inch Normal (ohmm²/m) 100
100 16 Inch Normal (ohmm²/m) x10 1000 70
16 Inch Normal (ohmm²/m) 100 0
Temperature (°F) 80
Single Point(ohms) 50



50'

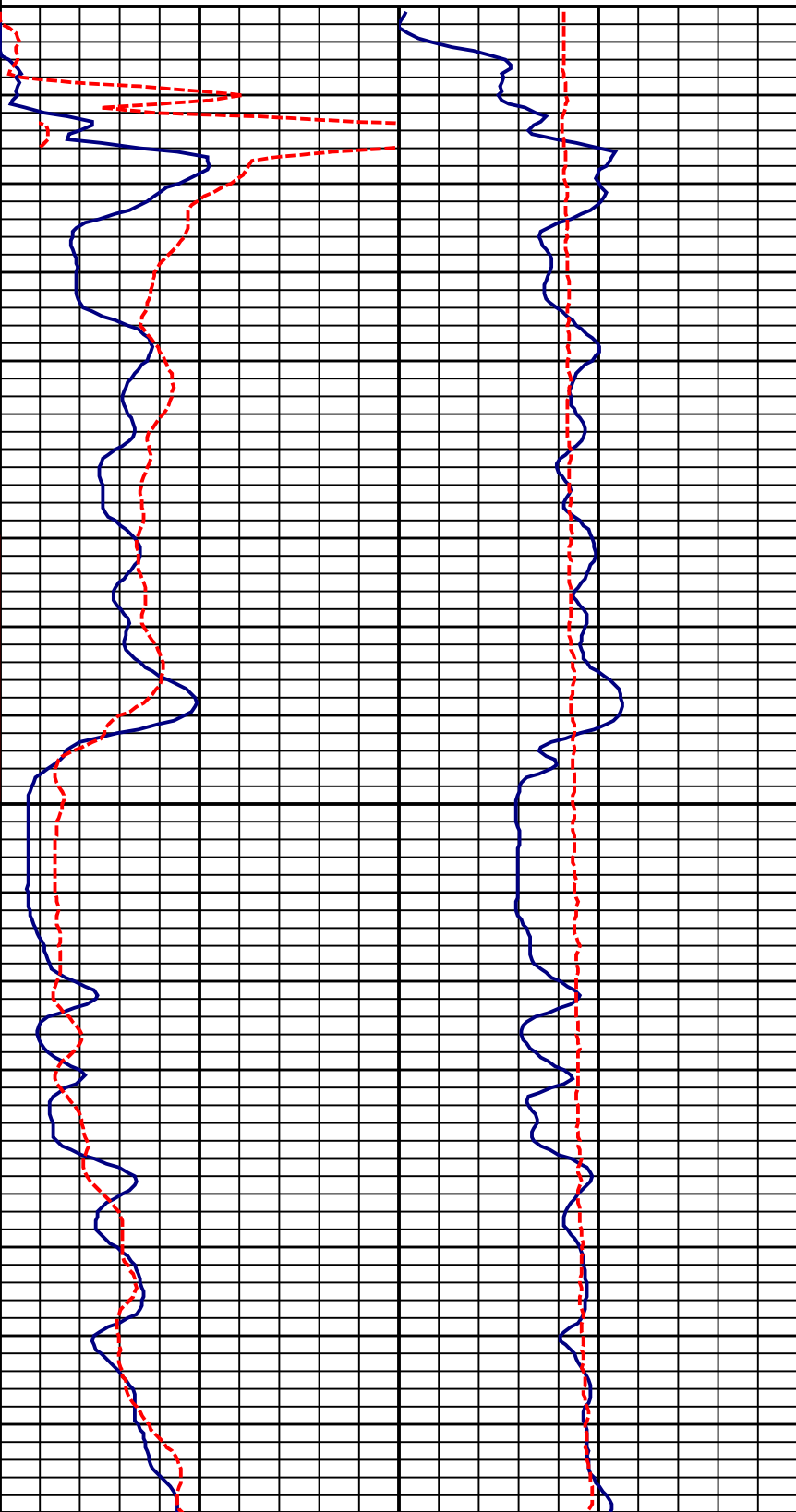


100'

150'



181'



Roadrunner Drilling & Pump Co. Inc.
SRPDMW-1
Jul 18, 2022

ELECTRIC - GAMMA RAY-TEMPERATURE LOG

Mult. Pages
5"/100'

DEPTHS
(Feet)

0 200
Gamma Ray(api)
< - S.P. (10 mV/div) S.P. + >

100 64 Inch Normal (ohmm²/m) x10 1000
64 Inch Normal (ohmm²/m) 100
100 16 Inch Normal (ohmm²/m) x10 1000 70
16 Inch Normal (ohmm²/m) 100 0
Temperature (°F) 80
Single Point(ohms) 50

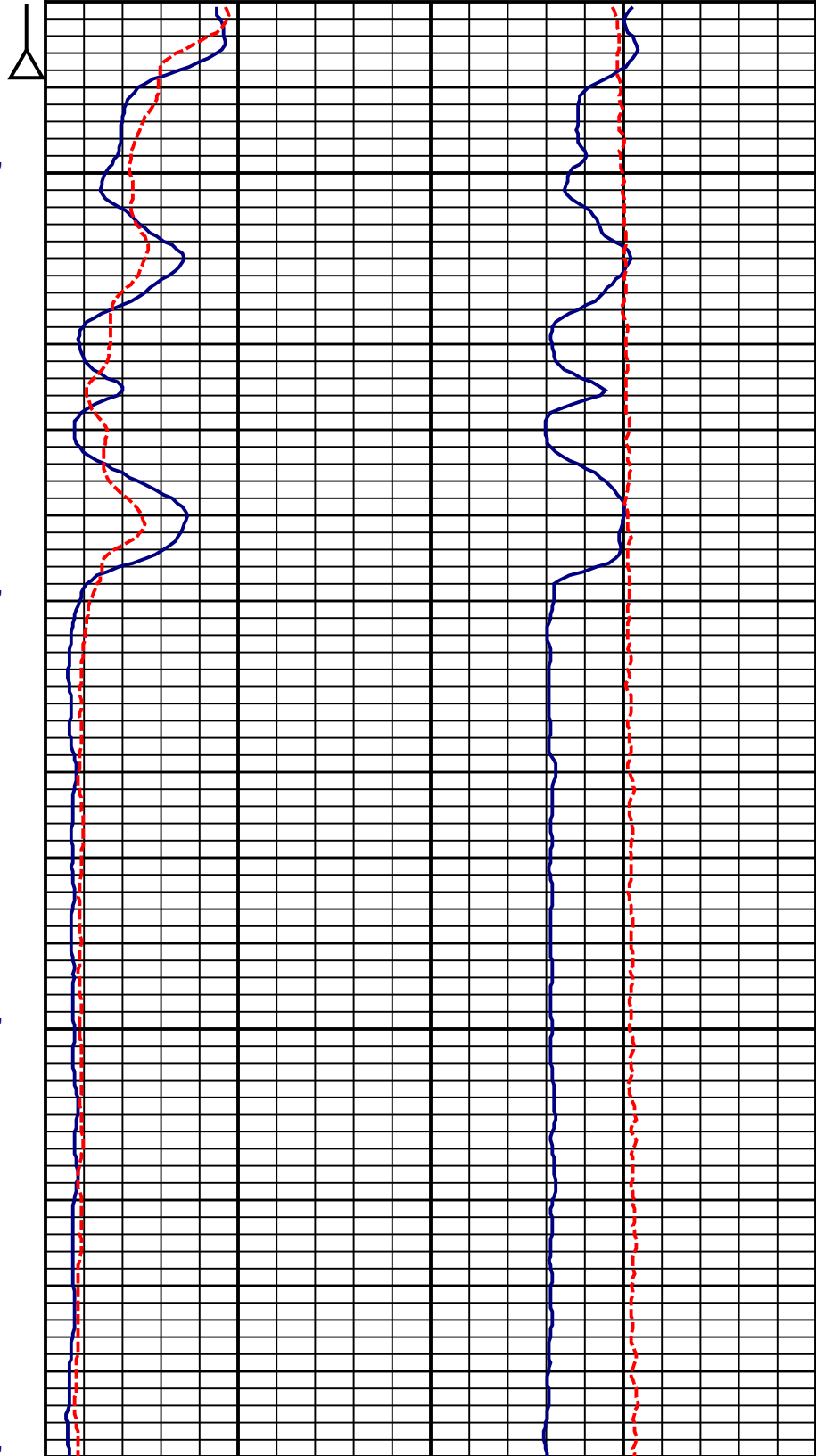
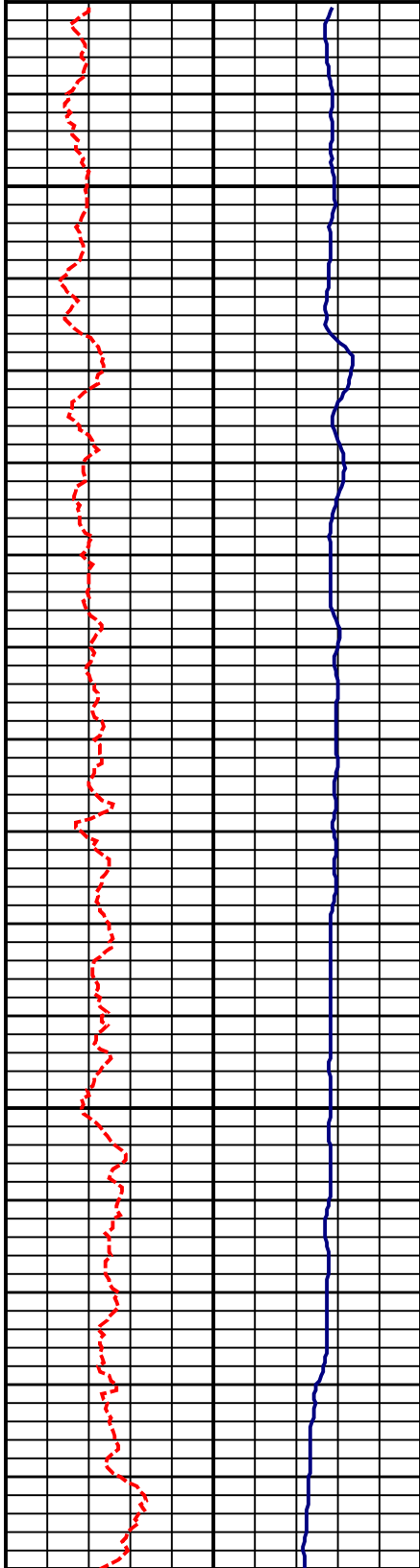
181'

200'

250'

300'

350'



Roadrunner Drilling & Pump Co. Inc.
SRPDMW-1
Jul 18, 2022

ELECTRIC - GAMMA RAY-TEMPERATURE LOG

Mult. Pages
5"/100'

DEPTHS
(Feet)

0 Gamma Ray(api) 200
< - S.P. (10 mV/div) S.P. + >

100 64 Inch Normal (ohmm²/m) x10 1000
64 Inch Normal (ohmm²/m) 100
100 16 Inch Normal (ohmm²/m) x10 1000 70
16 Inch Normal (ohmm²/m) 100 0
Temperature (°F) 80
Single Point(ohms) 50

351'

400'

450'

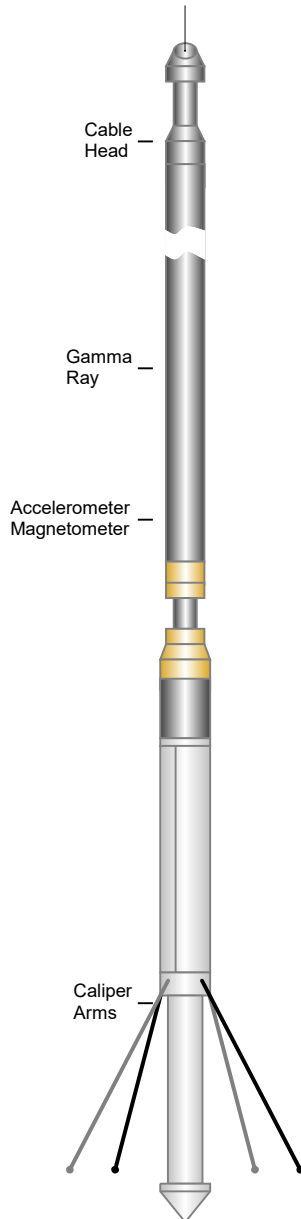
500'



Log Depth 518.5'

		4-ARM X-Y CALIPER LOG					
Stewart Well Logging Service							
879 PURDUE DRIVE, WOODLAND CA 95695 · Phone: (530)908-6928 · Email: STEWARTWELLLOGGING@GMAIL.COM							
Filing No.	COMPANY <u>Roadrunner Drilling & Pump Co. Inc.</u> WELL <u>SRPDMW-1</u> FIELD <u>Cotati</u> STATE <u>California</u> COUNTY <u>Sonoma</u> LOCATION: _____ OTHER SERVICES: None						
110922							
Job No. 0918							
SEC: <u>36</u> TWP: <u>06N</u> RGE: <u>08W</u> LAT.: <u>38.3221260</u> LONG.: <u>-122.7022732</u>							
Permanent Datum: <u>Ground Level</u> Elev.: <u>124</u> Ft. Elevs.: K.B. _____ Ft. Log Measured From: <u>Ground Level</u> , <u>0</u> Ft. Above Perm. Datum D.F. _____ Ft. Drilling Measured From: <u>Ground Level</u> G.L. <u>124</u> Ft.							
Date	Jul 20, 2022						
Type Log	Caliper						
Run	One						
Depth-Driller	489	Ft		Ft		Ft	Ft
Depth-Logger	489	Ft		Ft		Ft	Ft
Top Logged Interval	0	Ft		Ft		Ft	Ft
Btm Logged Interval	489	Ft		Ft		Ft	Ft
Type Fluid In Hole	Bentonite						
Fluid Level	GL	Ft		Ft		Ft	Ft
Max Temp	75.5	°F		°F		°F	°F
Operating Rig Time	1.5	°Hr		°Hr		°Hr	°Hr
Van No.	Location	SWLS-2 WOODLAND					
Recorded By	Stewart						
Witnessed By	J. Brookshire						
RUN	BOREHOLE RECORD				CASING RECORD		
NO.	BIT SIZE	FROM	TO	CASING SIZE	CASING TYPE	FROM	TO
1	16 In	0 Ft	100 Ft				
2	12 In	100 Ft	197 Ft				
3	8.75 In	197 Ft	489 Ft				

4-ARM X-Y CALIPER LOG TOOL



GAMMA RAY LOGS:

Gamma Ray Logs record the amount of natural gamma radiation emitted by the rocks surrounding the borehole. The most significant naturally occurring sources of gamma radiation are potassium 40 and daughter products of the uranium and thorium decay series. Clay and shale bearing rocks commonly emit relatively high gamma radiation because they include weathering products of potassium feldspar and mica and tend to concentrate uranium and thorium by ion absorption and exchange.

4 ARM CALIPER LOGS:

Caliper Logs provide a continuous measurement of the size and shape of a borehole along its depth and is commonly used to determine the annular hole volume of wells. The measurements that are recorded can be an important indicator of voids and swelling clay in the borehole. 4 Arm Caliper Logs measure the borehole on two perpendicular planes resulting in more accurate annular volumes when washouts occur during the drilling process.

MAGNETIC DEVIATION LOGS:

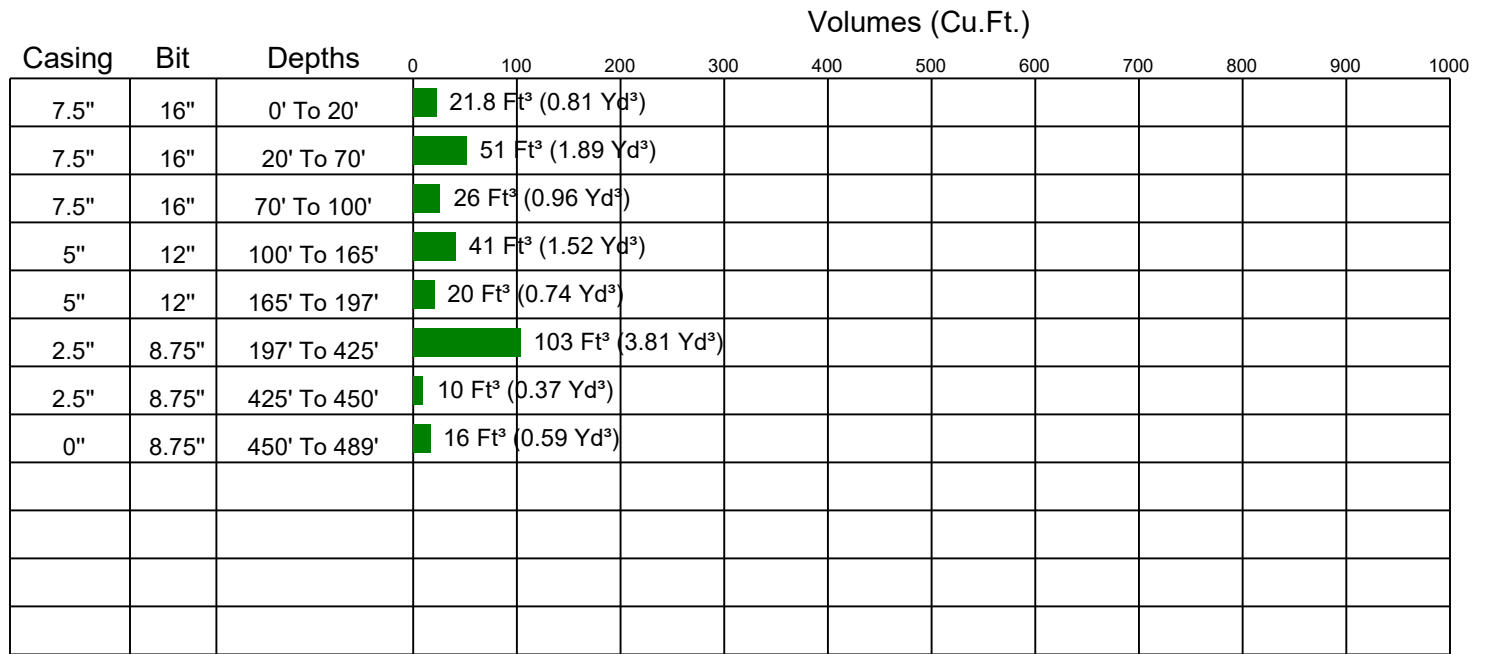
Magnetic logs are used to determine the inclination and direction of the well bore versus depth. With these three parameters, wellbore drift, bearing, and true vertical depth can be calculated based on any one of five API approved methodologies. The magnetic deviation will function in any non-magnetic wellbore with any type of wellbore fluid.

4 ARM CALIPER SPECIFICATIONS:

Diameter	2.36 Inches
Range	2.95 - 52 Inches
Length	11.5 Feet
Weight	88.18 Lbs.
Max. Temp	158° F
Inclination	0 to 180 Deg., +/- 0.5 Deg.
Azimuth	0 to 360 Deg., +/- 1.5 Deg.
Gamma Ray	1.97 inches long x .98 inches diameter Scintillation crystal

VOLUME CALCULATIONS

Annular Volumes Graph



Total Annular Volume: 288.8 Ft³ / 10.70 Yds³

Annular Volumes Table

Casing	Bit	Depths	Feet³	Yards³
7.5"	16"	0' To 20'	21.8 Ft³	0.81 Yds³
7.5"	16"	20' To 70'	51 Ft³	1.89 Yds³
7.5"	16"	70' To 100'	26 Ft³	0.96 Yds³
5"	12"	100' To 165'	41 Ft³	1.52 Yds³
5"	12"	165' To 197'	20 Ft³	0.74 Yds³
2.5"	8.75"	197' To 425'	103 Ft³	3.81 Yds³
2.5"	8.75"	425' To 450'	10 Ft³	0.37 Yds³
0"	8.75"	450' To 489'	16 Ft³	0.59 Yds³
Total Annular Volume			288.8 Ft³	10.70 Yds³

NOTICE

All interpretations are opinions based on inferences from electrical and other measurements and we do not guarantee the accuracy or correctness of any verbal or written interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by one of our officers, agents or employees. These interpretations are also subject to our General Terms and Conditions as set out in our current Price Schedule.

REMARKS

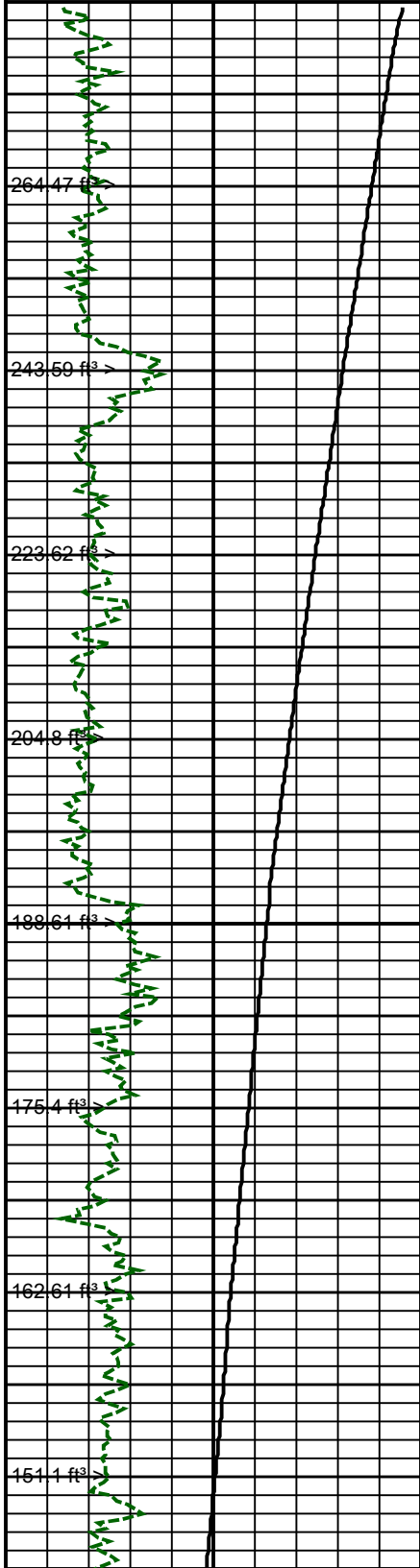
Roadrunner Drilling & Pump Co. Inc.
SRPDMW-1
Jul 20, 2022

4-ARM X-Y CALIPER LOG

Mult. Pages
5"/100'

DEPTHS
(Feet)

0 Annular Volume (ft³) 300
0 Gamma Ray(api) 150



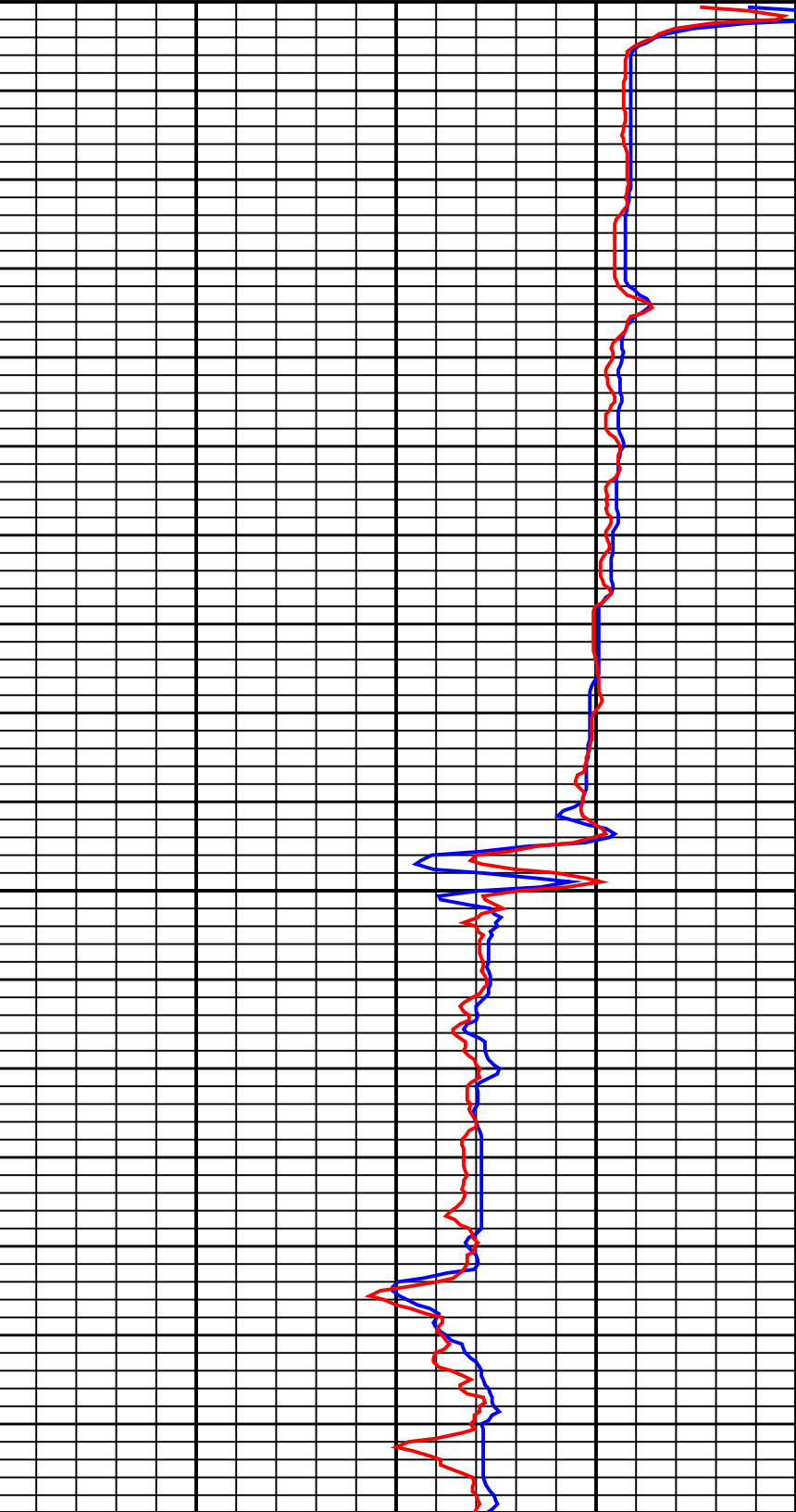
50'

100'

150'

171'

0 Y Axis Caliper(inches) 20
0 X Axis Caliper(inches) 20



Roadrunner Drilling & Pump Co. Inc.
SRPDMW-1
Jul 20, 2022

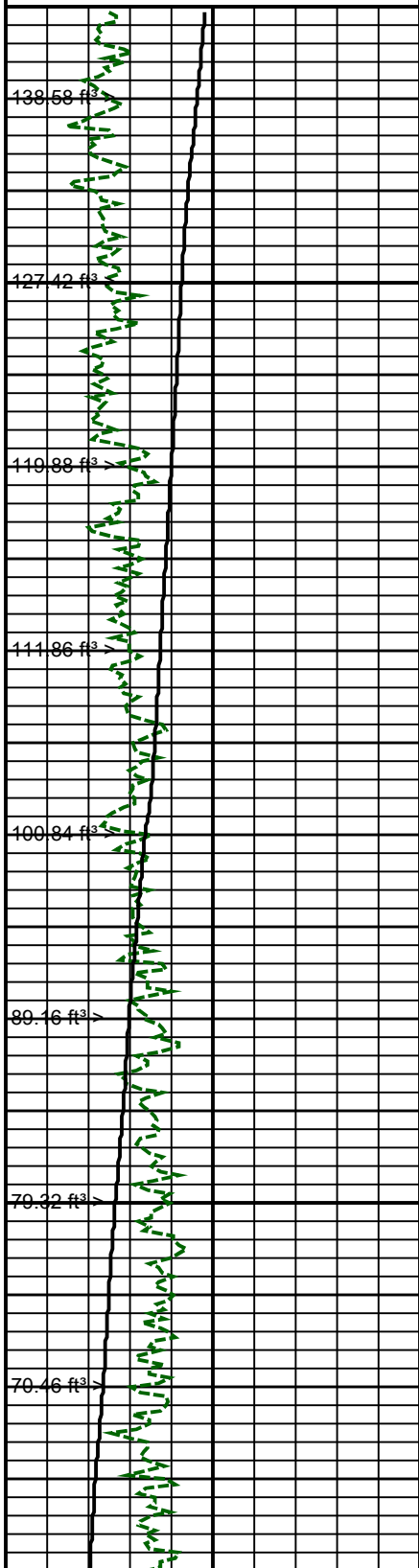
4-ARM X-Y CALIPER LOG

Mult. Pages
5"/100'

DEPTHS
(Feet)

0 Annular Volume (ft³) 300
0 Gamma Ray(api) 150

0 Y Axis Caliper(inches) 20
0 X Axis Caliper(inches) 20



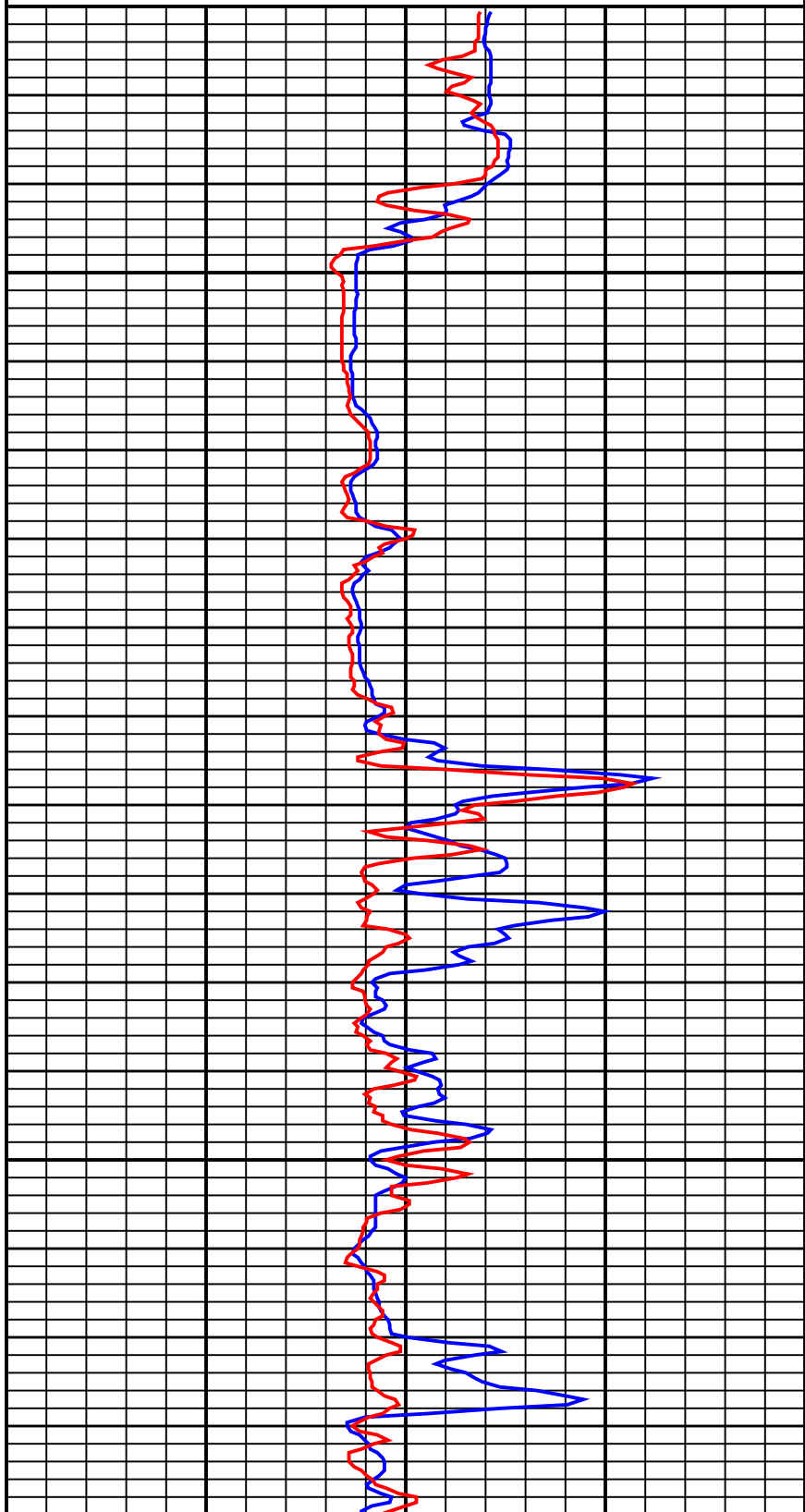
171'

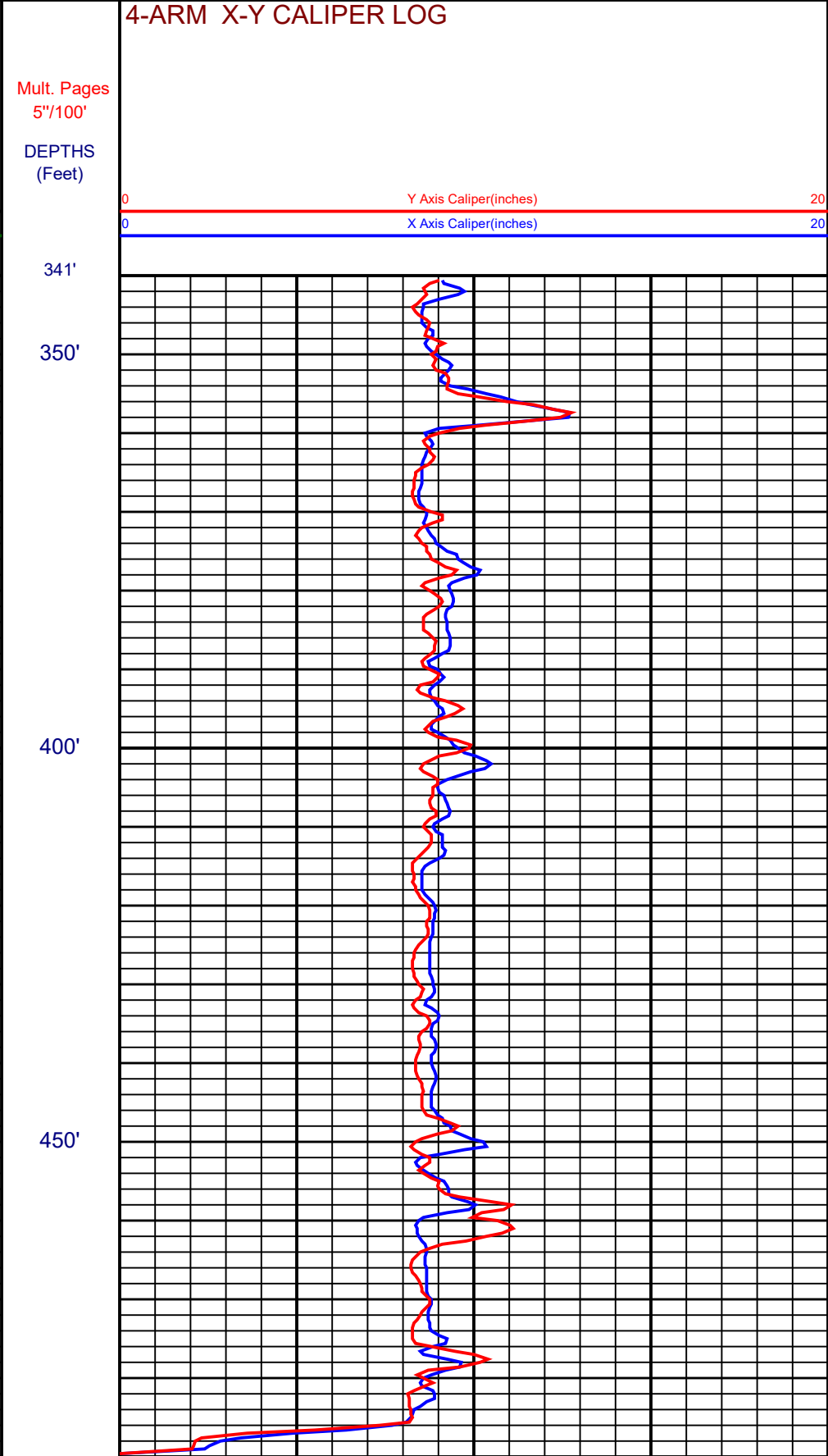
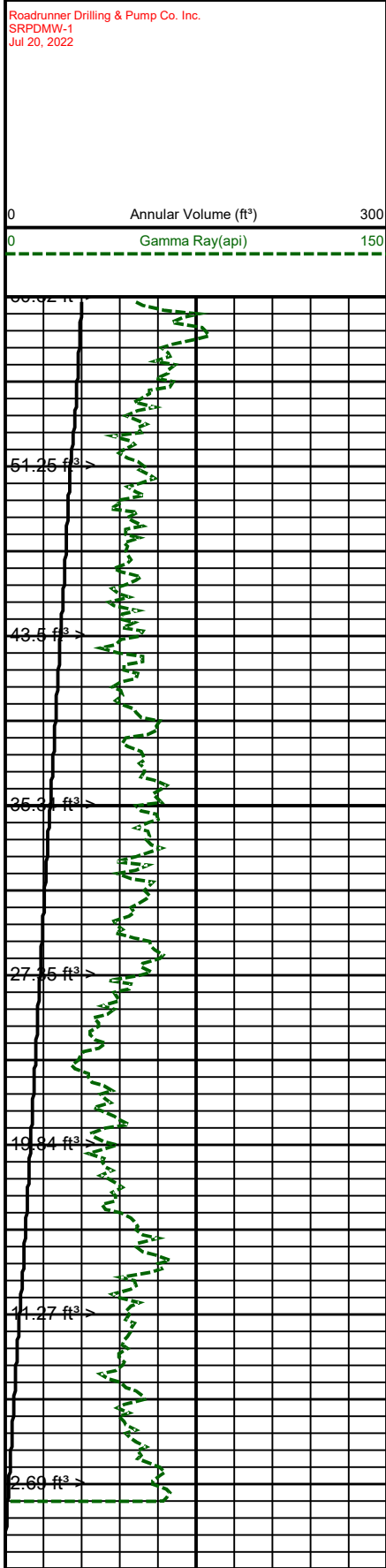
200'

250'

300'

341'



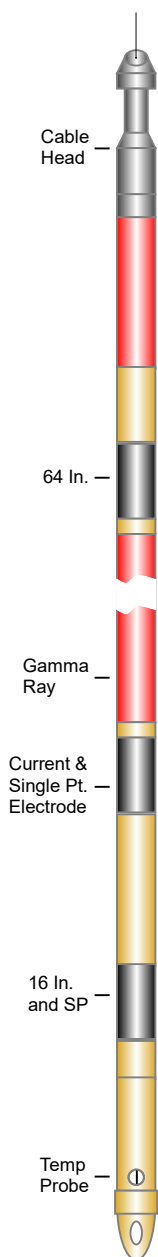


Log Depth 489'

		ELECTRIC - GAMMA RAY-TEMPERATURE LOG	
Stewart Well Logging Service			
Filing No.	COMPANY <u>Roadrunner Drilling & Pump Co. Inc.</u>		
	WELL <u>S.R.P.D.M.W. 2</u>		
	FIELD <u>Santa Rosa</u>		
	STATE <u>California</u> COUNTY <u>Solano</u>		
	LOCATION:		OTHER SERVICES: None
Job No. 0848	SEC: <u>34</u> TWP: <u>07N</u> RGE: <u>08W</u> LAT.: <u>38.4020933</u> LONG.: <u>-122.7260077</u>		
Permanent Datum: <u>Ground Level</u> Elev.: <u>117</u> Ft. Elevs.: K.B. <u> </u> Ft.			
Log Measured From: <u>Ground Level</u> , <u>0</u> Ft. Above Perm. Datum D.F. <u> </u> Ft.			
Drilling Measured From: <u>Ground Level</u> G.L. <u>117</u> Ft.			
Run	One		
Date	Jun 07, 2022		
Depth-Driller	530	Ft	Ft
Depth-Logger	527.65	Ft	Ft
Top Logged Interval	9	Ft	Ft
Btm Logged Interval	527.65	Ft	Ft
Casing-Driller	In @	Ft	In @ Ft
Casing - Logger In@Ft	In @	Ft	In @ Ft
Bit Size	8.75 In @ 530	Ft	In @ Ft
Time On Bottom	1714		
Type Fluid in Hole	Bentonite		
Density	Viscosity	8.9	33
pH	Fluid Loss		ml
Source of Sample	Lift Pump		
Rm @ Mea. Temp	6.5 @ 75	°F	@ °F
Rmf @ Mea. Temp	6.5 @ 75	°F	@ °F
Rmc @ Mea. Temp	@	°F	@ °F
Source Rmf	Meas		
Rm @ BHT	74 @	°F	@ °F
Time Since Circ.	1	Hr	Hr
Max. Rec. Temp.	74.5	°F	°F
Van No.	Location	SWLS-1 WOODLAND	
Recorded By	Stewart		
Witnessed By	J. Brookshire		

This Eagle Plot Heading Conforms To API RP 31A

ELECTRIC - GAMMA RAY-TEMPERATURE LOG TOOL



SPONTANEOUS POTENTIAL LOGS:

SP Logs record potentials or voltages developed between the borehole fluid and the surrounding formation and are representations of lithology and water quality. Recording of SP logs are limited to water-filled or mud-filled open holes.

NORMAL RESISTIVITY LOGS:

Normal Resistivity Logs record the electrical resistivity of the borehole environment with lower resistivities indicative of clays and higher resistivities being sands and gravels. Normal resistivity logs are affected by bed thickness, Borehole diameter and borehole fluid.

SINGLE POINT RESISTIVITY LOGS:

Single Point Resistivity Logs record the electrical resistance from points within the borehole to an electrical ground at land surface. Single-point resistance logs are useful in the determination of lithology, water quality, and location of fracture zones.

GAMMA RAY LOGS:

Gamma Ray Logs record the amount of natural gamma radiation emitted by the rocks surrounding the borehole. The most significant naturally occurring sources of gamma radiation are potassium 40 and daughter products of the uranium and thorium decay series. Clay and shale bearing rocks commonly emit relatively high gamma radiation because they include weathering products of potassium feldspar and mica and tend to concentrate uranium and thorium by ion absorption and exchange.

TEMPERATURE LOGS:

Temperature Logs record the water temperature in the borehole. Temperature logs are useful for delineating water-bearing zones and identifying vertical flow in the borehole between zones of differing hydraulic head penetrated by wells. Borehole flow between zones is indicated by temperature gradients that are less than the regional geothermal gradient.

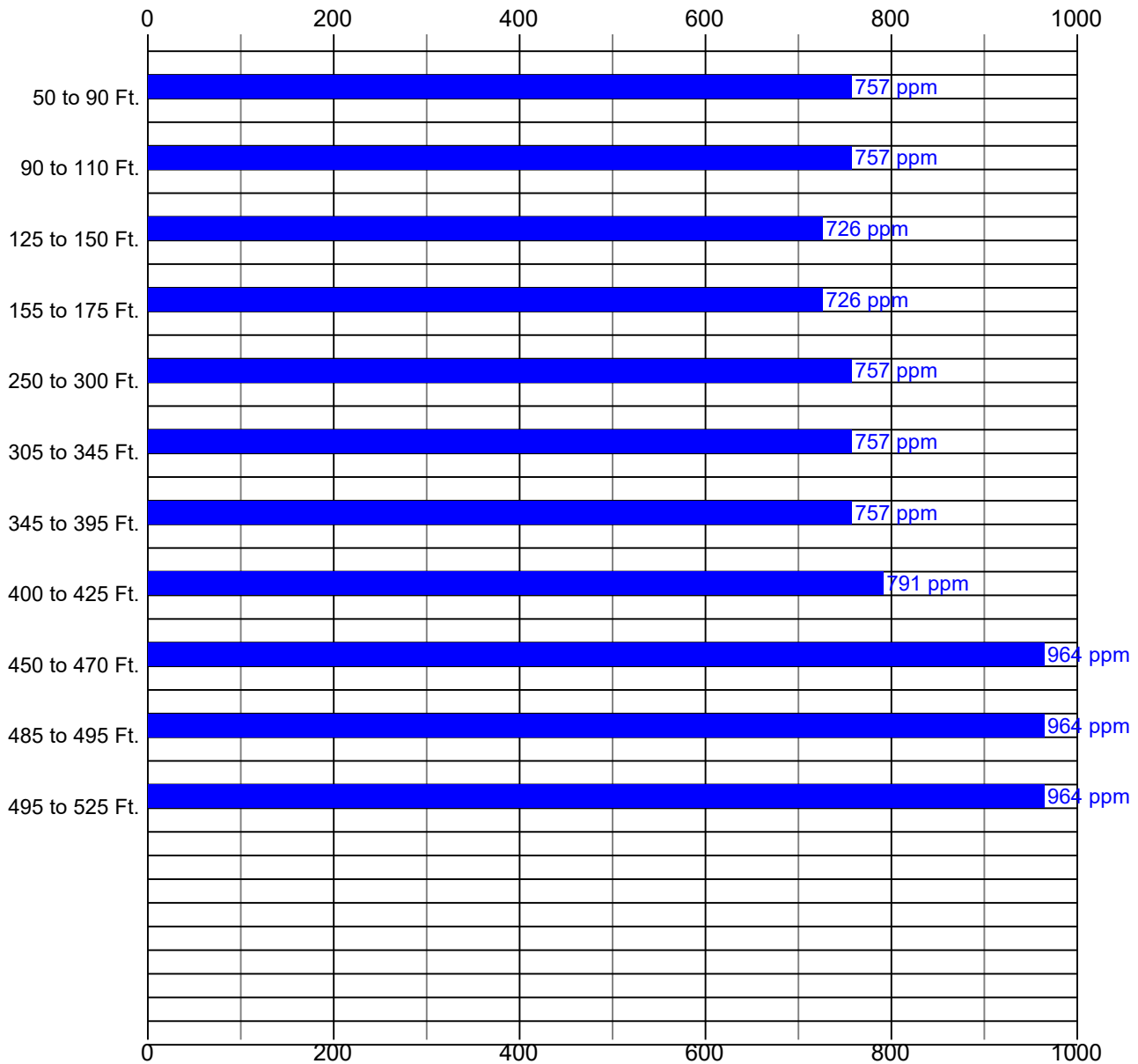
ELECTRIC LOG SPECIFICATIONS:

Diameter	1.73 Inches
Length	8.37 Feet
Weight	21.7 Lbs.
Max. Temp	158° F
Resist. Range	0 - 10,000 ohm-m
Gamma Ray	1.97 inches long x .98 inches diameter Scintillation crystal

TOTAL DISSOLVED SOLIDS

* NaCl 

Parts Per Million - ppm



TDS Classes

Class 1: Excellent to Good – Less than 700 ppm

Class 2: Good to Injurious – 700 to 2000 ppm

Class 3: Injurious to Poor – More than 2000 ppm

NaCl = Sodium Chloride

NOTICE

All interpretations are opinions based on inferences from electrical and other measurements and we do not guarantee the accuracy or correctness of any verbal or written interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by one of our officers, agents or employees. These interpretations are also subject to our General Terms and Conditions as set out in our current Price Schedule.

REMARKS

Roadrunner Drilling & Pump Co. Inc.
S.R.P.D.M.W. 2
Jun 07, 2022

ELECTRIC - GAMMA RAY-TEMPERATURE LOG

Single Page

DEPTHS
(Feet)

< - S.P. (20 mV/div) S.P. + >

Gamma Ray(api)

50 64 Inch Normal (ohmm²/m) x10 500

64 Inch Normal (ohmm²/m) 50

50 16 Inch Normal (ohmm²/m) x10 500

16 Inch Normal (ohmm²/m) 50

Single Point(ohms)

Temperature (°F)

50'

100'

150'

200'

250'

300'

350'

400'

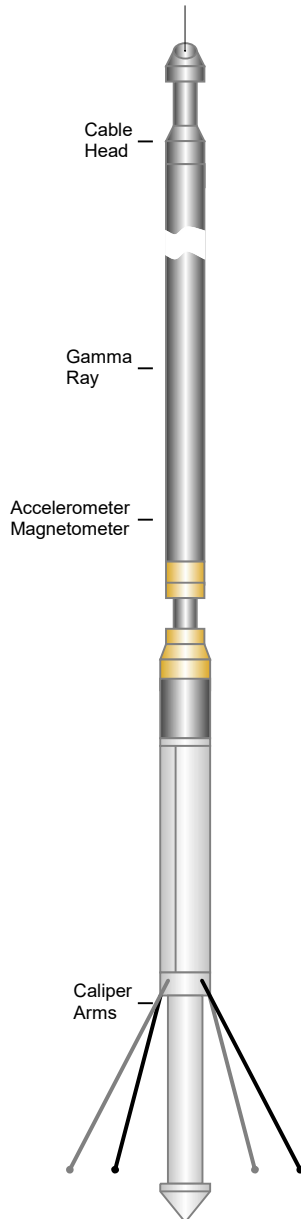
450'

500'

Log Depth 527.5'

				ELECTRIC - 4 ARM CALIPER LOG							
Stewart Well Logging Service											
879 PURDUE DRIVE, WOODLAND CA 95695 · Phone: (530)908-6928 · Email: STEWARTWELLLOGGING@GMAIL.COM											
Filing No.		COMPANY <u>Roadrunner Drilling & Pump Co. Inc.</u>									
		WELL <u>SRPDMW-2</u>									
		FIELD <u>Santa Rosa</u>									
		STATE <u>California</u> COUNTY <u>Sonoma</u>									
		LOCATION:							OTHER SERVICES: None		
		SEC: <u>34</u> TWP: <u>07N</u> RGE: <u>08W</u> LAT.: <u>38.4020933</u> LONG.: <u>-122.7260077</u>									
Job No. 0857											
Permanent Datum: <u>Ground Level</u> Elev.: <u>117</u> Ft. Elevs.: K.B. <u> </u> Ft. Log Measured From: <u>Ground Level</u> , <u>0</u> Ft. Above Perm. Datum D.F. <u> </u> Ft. Drilling Measured From: <u>Ground Level</u> G.L. <u>117</u> Ft.											
Date		Jun 13, 2022									
Type Log		Caliper									
Run		One									
Depth-Driller		488	Ft		Ft		Ft		Ft		Ft
Depth-Logger		488	Ft		Ft		Ft		Ft		Ft
Top Logged Interval		12	Ft		Ft		Ft		Ft		Ft
Btm Logged Interval		488	Ft		Ft		Ft		Ft		Ft
Type Fluid In Hole		Bentonite									
Fluid Level		GL	Ft		Ft		Ft		Ft		Ft
Max Temp			°F		°F		°F		°F		°F
Operating Rig Time		1.5	°Hr		°Hr		°Hr		°Hr		°Hr
Van No.	Location	SWLS-1 WOODLAND									
Recorded By		Stewart									
Witnessed By		Jim									
RUN	BOREHOLE RECORD					CASING RECORD					
NO.	BIT SIZE		FROM		TO	CASING SIZE	CASING TYPE		FROM		TO
1	16 In		0 Ft		90 Ft	2.5 In	PVC		0 Ft		82 Ft
2	12 In		90 Ft		284 Ft	2.5 In	PVC		0 Ft		281 Ft
3	8.75 In		284 Ft		481 Ft	2.5 In	PVC		0 Ft		471 Ft

ELECTRIC - 4 ARM CALIPER LOG TOOL



GAMMA RAY LOGS:

Gamma Ray Logs record the amount of natural gamma radiation emitted by the rocks surrounding the borehole. The most significant naturally occurring sources of gamma radiation are potassium 40 and daughter products of the uranium and thorium decay series. Clay and shale bearing rocks commonly emit relatively high gamma radiation because they include weathering products of potassium feldspar and mica and tend to concentrate uranium and thorium by ion absorption and exchange.

4 ARM CALIPER LOGS:

Caliper Logs provide a continuous measurement of the size and shape of a borehole along its depth and is commonly used to determine the annular hole volume of wells. The measurements that are recorded can be an important indicator of voids and swelling clay in the borehole. 4 Arm Caliper Logs measure the borehole on two perpendicular planes resulting in more accurate annular volumes when washouts occur during the drilling process.

MAGNETIC DEVIATION LOGS:

Magnetic logs are used to determine the inclination and direction of the well bore versus depth. With these three parameters, wellbore drift, bearing, and true vertical depth can be calculated based on any one of five API approved methodologies. The magnetic deviation will function in any non-magnetic wellbore with any type of wellbore fluid.

4 ARM CALIPER SPECIFICATIONS:

Diameter	2.36 Inches
Range	2.95 - 52 Inches
Length	11.5 Feet
Weight	88.18 Lbs.
Max. Temp	158° F
Inclination	0 to 180 Deg., +/- 0.5 Deg.
Azimuth	0 to 360 Deg., +/- 1.5 Deg.
Gamma Ray	1.97 inches long x .98 inches diameter Scintillation crystal

VOLUME CALCULATIONS

Annular Volumes Graph

Volumes (Cu.Ft.)

Casing	Bit	Depths	0	100	200	300	400	500	600	700	800	900	1000
9"	16"	-1' To 20'	29 Ft³ (1.07 Yd³)										
9"	12"	20' To 67'	53 Ft³ (1.96 Yd³)										
9"	12"	67' To 82'	16 Ft³ (0.59 Yd³)										
6"	12"	82' To 84'	3 Ft³ (0.11 Yd³)										
6"	12"	84' To 246'	128 Ft³ (4.74 Yd³)										
6"	12"	246' To 284'	22 Ft³ (0.81 Yd³)										
3"	8.75"	284' To 446'	65 Ft³ (2.41 Yd³)										
3"	8.75"	446' To 481'	13 Ft³ (0.48 Yd³)										

Total Annular Volume: 329 Ft³ / 12.19 Yds³

Annular Volumes Table

Casing	Bit	Depths	Feet³	Yards³
9"	16"	-1' To 20'	29 Ft³	1.07 Yds³
9"	12"	20' To 67'	53 Ft³	1.96 Yds³
9"	12"	67' To 82'	16 Ft³	0.59 Yds³
6"	12"	82' To 84'	3 Ft³	0.11 Yds³
6"	12"	84' To 246'	128 Ft³	4.74 Yds³
6"	12"	246' To 284'	22 Ft³	0.81 Yds³
3"	8.75"	284' To 446'	65 Ft³	2.41 Yds³
3"	8.75"	446' To 481'	13 Ft³	0.48 Yds³
Total Annular Volume			329 Ft³	12.19 Yds³

NOTICE

All interpretations are opinions based on inferences from electrical and other measurements and we do not guarantee the accuracy or correctness of any verbal or written interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by one of our officers, agents or employees. These interpretations are also subject to our General Terms and Conditions as set out in our current Price Schedule.

REMARKS

Consulting Company:

Roadrunner Drilling & Pump Co. Inc.
SRPDMW-2
Jun 13, 2022

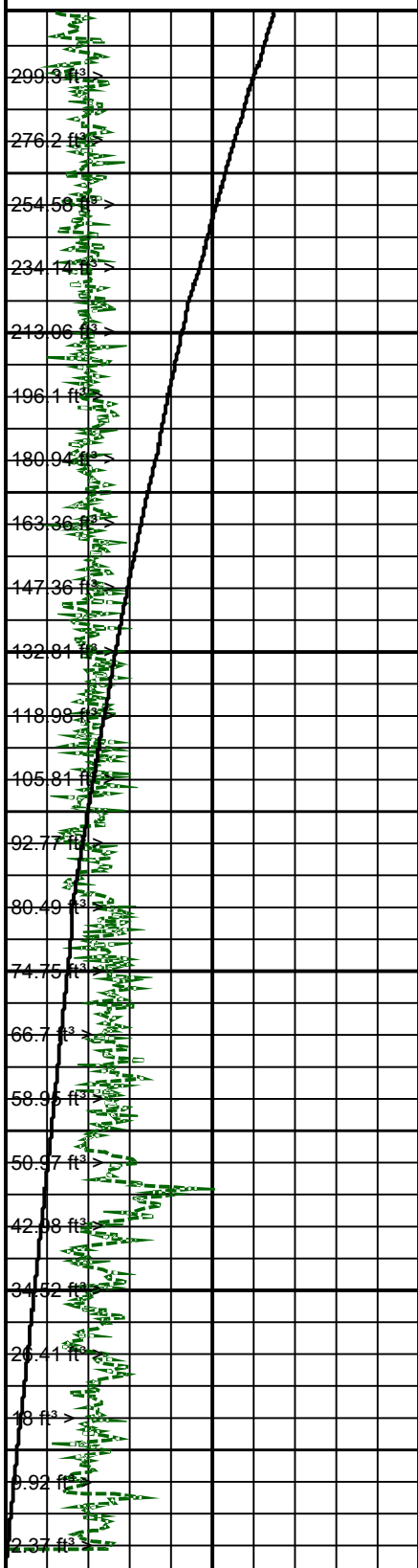
ELECTRIC - 4 ARM CALIPER LOG

Single Page

DEPTHS
(Feet)

0 Annular Volume (ft³) 500
0 Gamma Ray(api) 150

0 Y Axis Caliper(inches) 20
0 X Axis Caliper(inches) 20



50'

100'

150'

200'

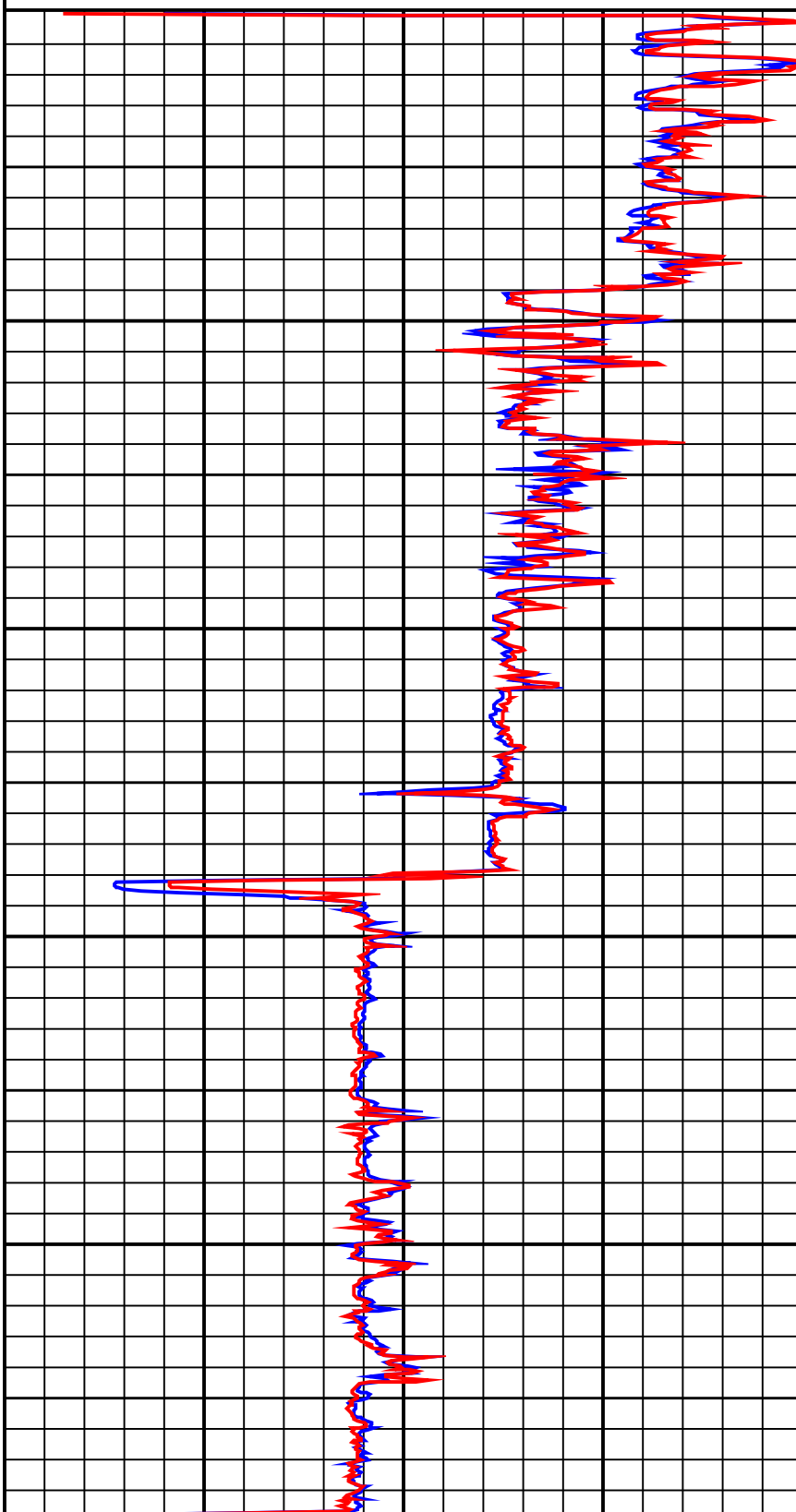
250'

300'

350'

400'

450'



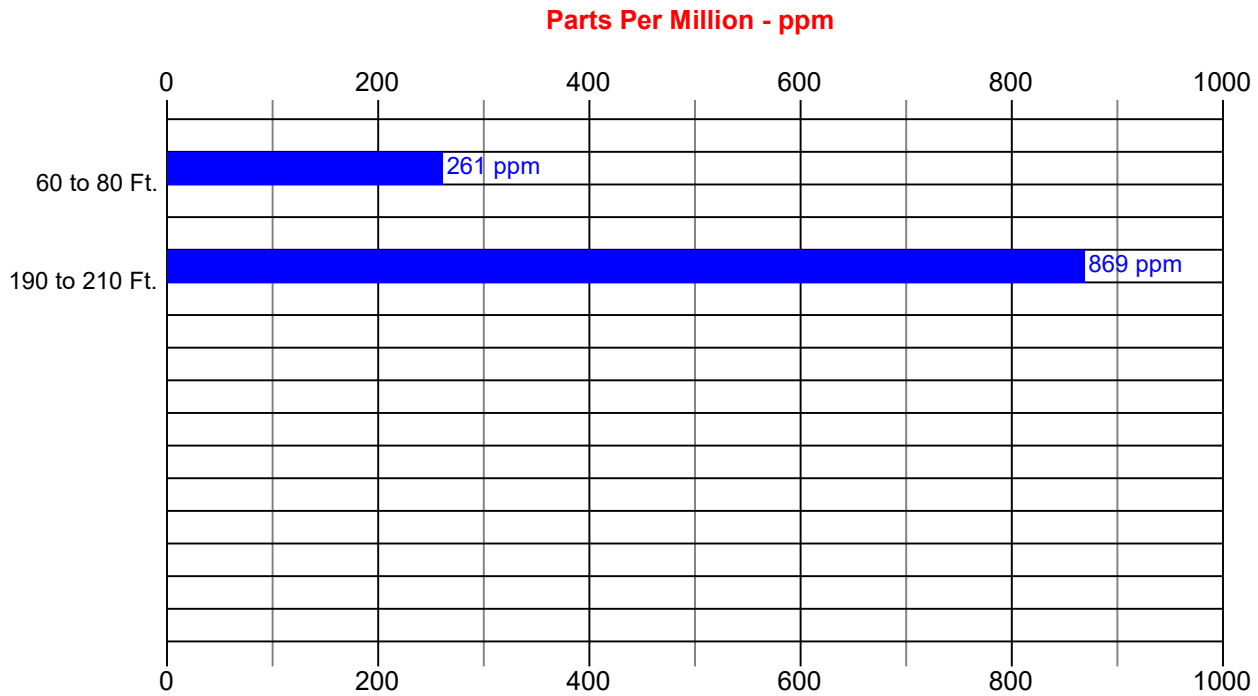
Log Depth 488'

		ELECTRIC - GAMMA RAY-TEMPERATURE LOG	
Stewart Well Logging Service			
Filing No.	COMPANY <u>Roadrunner Drilling & Pump Co. Inc.</u>		
	WELL <u>SRPBMW-3</u>		
	FIELD <u>Windsor</u>		
	STATE <u>California</u> COUNTY <u>Sonoma</u>		
	LOCATION:		OTHER SERVICES: None
Job No. 0826	SEC: <u>23</u> TWP: <u>08N</u> RGE: <u>09W</u> LAT.: <u>38.5289224</u> LONG.: <u>-122.8273010</u>		
Permanent Datum: <u>Ground Level</u> Elev.: <u>84</u> Ft. Elevs.: K.B. <u> </u> Ft. Log Measured From: <u>Ground Level</u> , <u>0</u> Ft. Above Perm. Datum D.F. <u> </u> Ft. Drilling Measured From: <u>Ground Level</u> G.L. <u>84</u> Ft.			
Run	One		
Date	May 19, 2022		
Depth-Driller	273	Ft	
Depth-Logger	273	Ft	
Top Logged Interval	9	Ft	
Btm Logged Interval	273	Ft	
Casing-Driller	In @	Ft	
Casing - Logger In@Ft	In @	Ft	
Bit Size	8-3/4 In @ 273	Ft	
Time On Bottom	826		
Type Fluid in Hole	Bentonite		
Density	Viscosity		
pH	Fluid Loss		
Source of Sample	Lift Pump		
Rm @ Mea. Temp	7.1 @ 75	°F	
Rmf @ Mea. Temp	7.1 @ 75	°F	
Rmc @ Mea. Temp	@	°F	
Source Rmf	Rmc	Meas	
Rm @ BHT	73 @	°F	
Time Since Circ.	2	Hr	
Max. Rec. Temp.	73	°F	
Van No.	Location	SWLS-1 WOODLAND	
Recorded By	Stewart		
Witnessed By	J. Brookshire		

This Eagle Plot Heading Conforms To API RP 31A

TOTAL DISSOLVED SOLIDS

* NaCl 



TDS Classes

Class 1: Excellent to Good – Less than 700 ppm

Class 2: Good to Injurious – 700 to 2000 ppm

Class 3: Injurious to Poor – More than 2000 ppm

NaCl = Sodium Chloride

NOTICE

All interpretations are opinions based on inferences from electrical and other measurements and we do not guarantee the accuracy or correctness of any verbal or written interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by one of our officers, agents or employees. These interpretations are also subject to our General Terms and Conditions as set out in our current Price Schedule.

REMARKS

Roadrunner Drilling & Pump Co. Inc.
SRPBMW-3
May 19, 2022

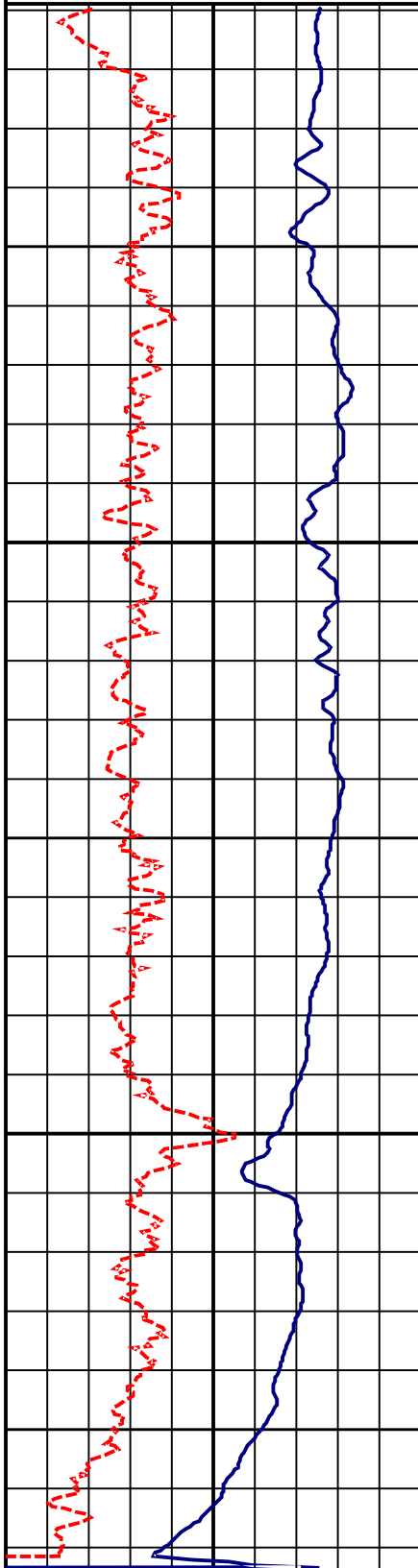
Single Page

DEPTHS
(Feet)

< - S.P. (20 mV/div) S.P. + >

Gamma Ray(api)

0 200



Log Depth 273'

ELECTRIC - GAMMA RAY-TEMPERATURE LOG

50 64 Inch Normal (ohmm²/m) x10 500

0 64 Inch Normal (ohmm²/m) 50

50 16 Inch Normal (ohmm²/m) x10 500

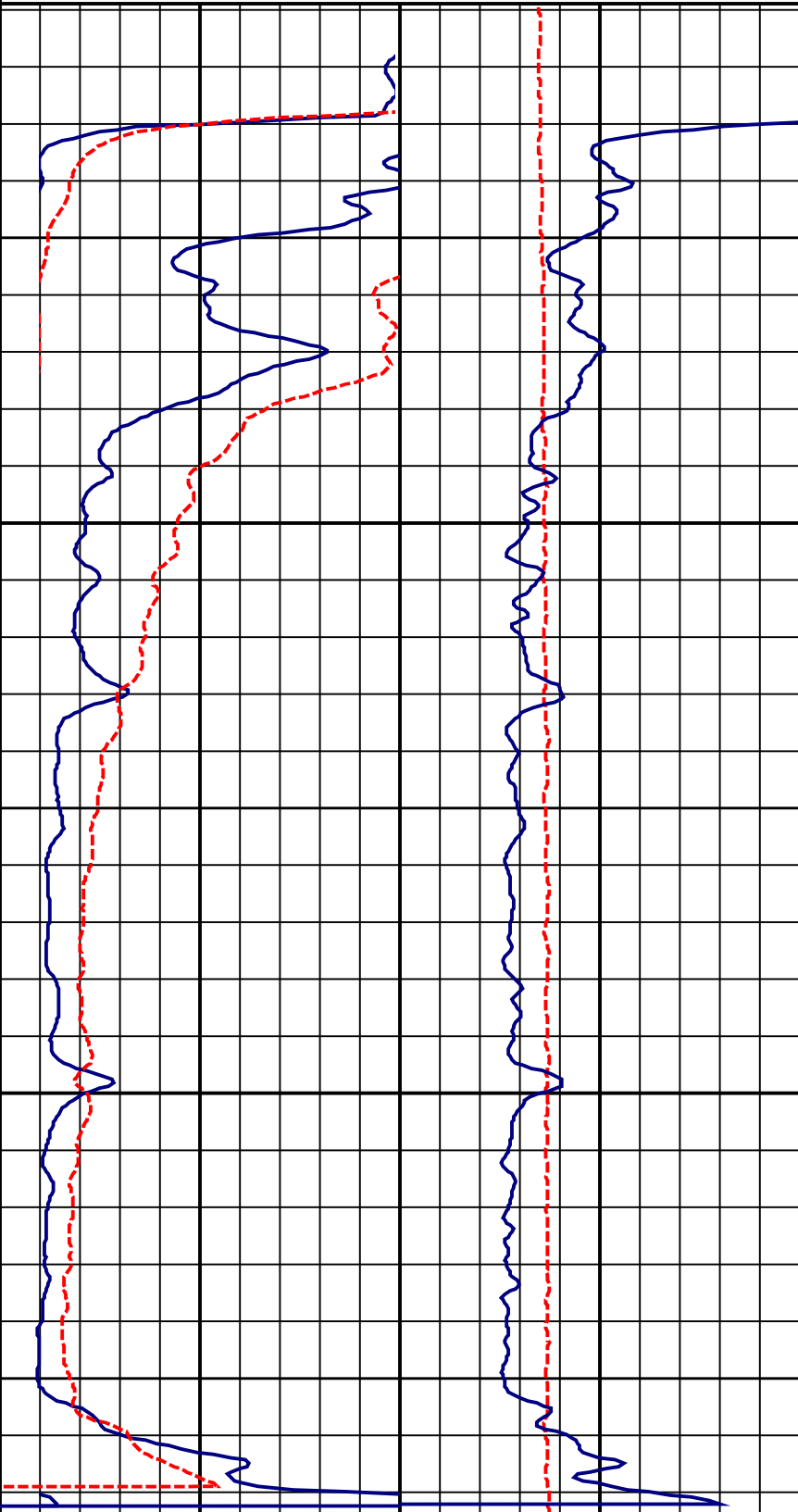
0 16 Inch Normal (ohmm²/m) 50

Single Point(ohms)

50

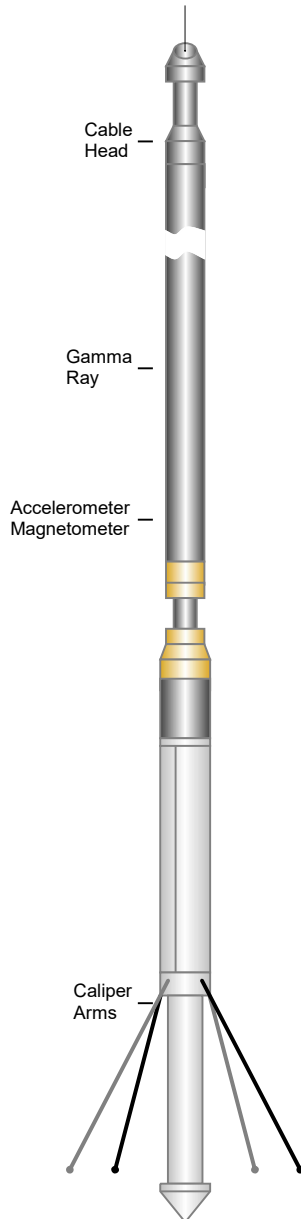
Temperature (°F)

80



		4-ARM X-Y CALIPER LOG					
Filing No.	COMPANY <u>Roadrunner Drilling & Pump Co. Inc.</u>						
	WELL <u>S.R.P.D.M.W.-3</u>						
	FIELD <u>Windsor</u>						
	STATE <u>California</u> COUNTY <u>Sonoma</u>						
	LOCATION:					OTHER SERVICES: None	
Job No. 0826	SEC: <u>23</u> TWP: <u>08N</u> RGE: <u>09W</u> LAT.: <u>38.5289224</u> LONG.: <u>-122.8273010</u>						
Permanent Datum: <u>Ground Level</u> Elev.: <u>84</u> Ft. Elevs.: K.B. <u> </u> Ft. Log Measured From: <u>Ground Level</u> , <u>0</u> Ft. Above Perm. Datum D.F. <u> </u> Ft. Drilling Measured From: <u>Ground Level</u> G.L. <u>84</u> Ft.							
Date	May 23, 2022						
Type Log	Caliper						
Run	One						
Depth-Driller	237	Ft		Ft		Ft	Ft
Depth-Logger	237	Ft		Ft		Ft	Ft
Top Logged Interval	0	Ft		Ft		Ft	Ft
Btm Logged Interval	237	Ft		Ft		Ft	Ft
Type Fluid In Hole	Bentonite						
Fluid Level	GL	Ft		Ft		Ft	Ft
Max Temp		°F		°F		°F	°F
Operating Rig Time	1	°Hr		°Hr		°Hr	°Hr
Van No.	Location	SWLS-1 WOODLAND					
Recorded By	Stewart						
Witnessed By	J. Brookshire						
RUN	BOREHOLE RECORD				CASING RECORD		
NO.	BIT SIZE	FROM	TO	CASING SIZE	CASING TYPE	FROM	TO
1	16 In	0 Ft	94 Ft			Ft	Ft
2	8.75 In	94 Ft	237 Ft			Ft	Ft
3						Ft	Ft

4-ARM X-Y CALIPER LOG TOOL



GAMMA RAY LOGS:

Gamma Ray Logs record the amount of natural gamma radiation emitted by the rocks surrounding the borehole. The most significant naturally occurring sources of gamma radiation are potassium 40 and daughter products of the uranium and thorium decay series. Clay and shale bearing rocks commonly emit relatively high gamma radiation because they include weathering products of potassium feldspar and mica and tend to concentrate uranium and thorium by ion absorption and exchange.

4 ARM CALIPER LOGS:

Caliper Logs provide a continuous measurement of the size and shape of a borehole along its depth and is commonly used to determine the annular hole volume of wells. The measurements that are recorded can be an important indicator of voids and swelling clay in the borehole. 4 Arm Caliper Logs measure the borehole on two perpendicular planes resulting in more accurate annular volumes when washouts occur during the drilling process.

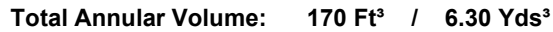
MAGNETIC DEVIATION LOGS:

Magnetic logs are used to determine the inclination and direction of the well bore versus depth. With these three parameters, wellbore drift, bearing, and true vertical depth can be calculated based on any one of five API approved methodologies. The magnetic deviation will function in any non-magnetic wellbore with any type of wellbore fluid.

4 ARM CALIPER SPECIFICATIONS:

Diameter	2.36 Inches
Range	2.95 - 52 Inches
Length	11.5 Feet
Weight	88.18 Lbs.
Max. Temp	158° F
Inclination	0 to 180 Deg., +/- 0.5 Deg.
Azimuth	0 to 360 Deg., +/- 1.5 Deg.
Gamma Ray	1.97 inches long x .98 inches diameter Scintillation crystal

Annular Volumes Graph



Casing	Bit	Depths	Feet ³	Yards ³
7.5"	16"	1' To 20'	28 Ft ³	1.04 Yds ³
7.5"	16"	20' To 94'	84 Ft ³	3.11 Yds ³
2.5"	8.75"	94' To 237'	58 Ft ³	2.15 Yds ³
Total Annular Volume			170 Ft³	6.30 Yds³

NOTICE

All interpretations are opinions based on inferences from electrical and other measurements and we do not guarantee the accuracy or correctness of any verbal or written interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by one of our officers, agents or employees. These interpretations are also subject to our General Terms and Conditions as set out in our current Price Schedule.

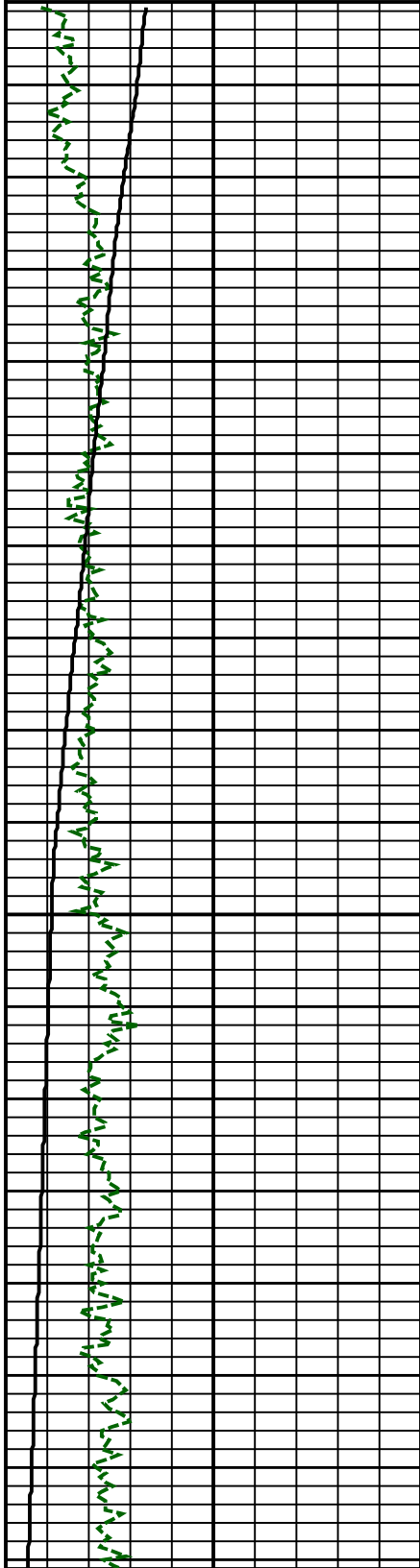
REMARKS

Roadrunner Drilling & Pump Co. Inc.
S.R.P.D.M.W.-3
May 23, 2022

Mult. Pages
5"/100'

DEPTHS
(Feet)

0	Annular Volume (ft³)	500
0	Gamma Ray(api)	200



50'

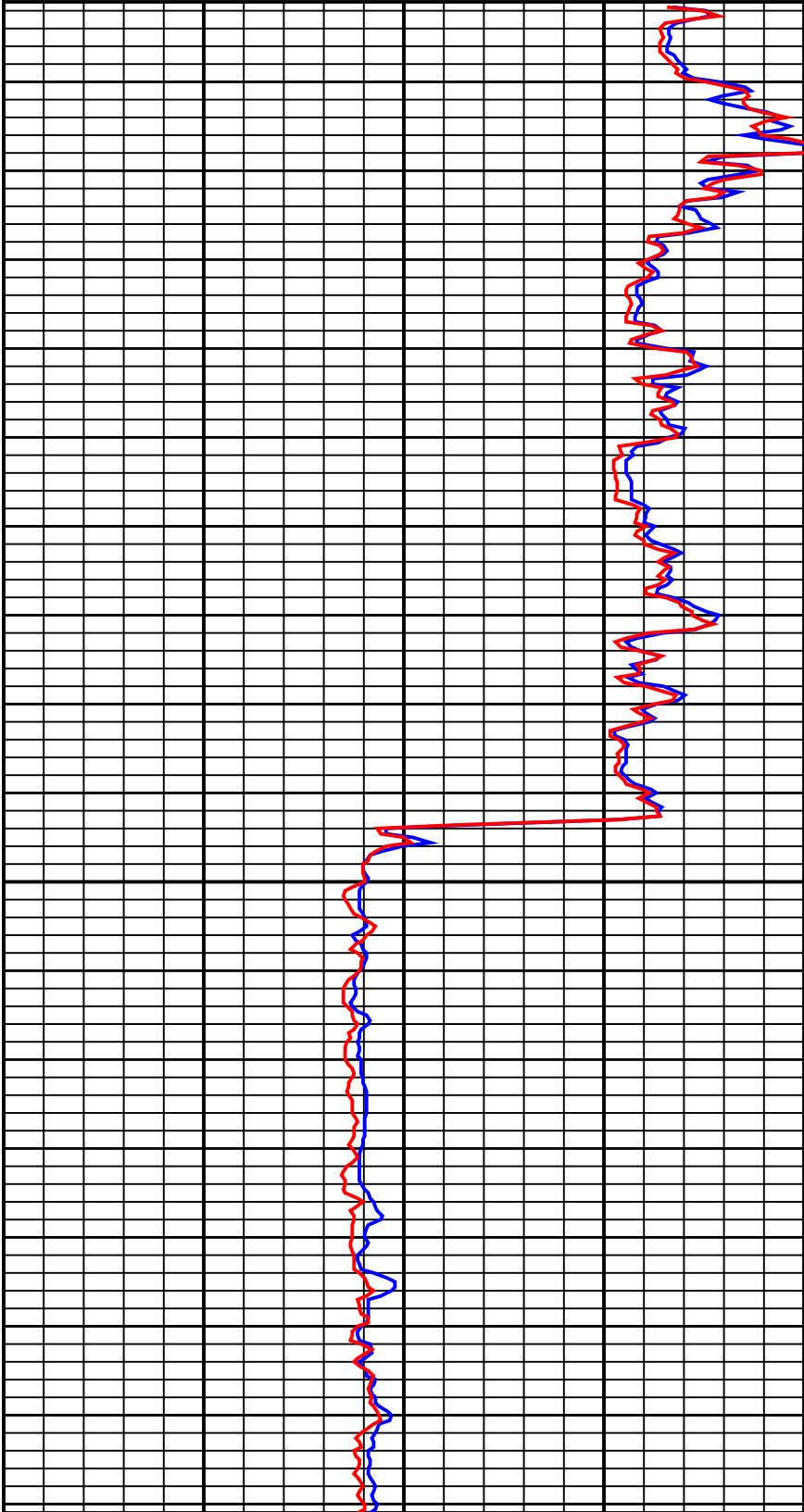
100'

150'

171'

4-ARM X-Y CALIPER LOG

0	Y Axis Caliper(inches)	20
0	X Axis Caliper(inches)	20



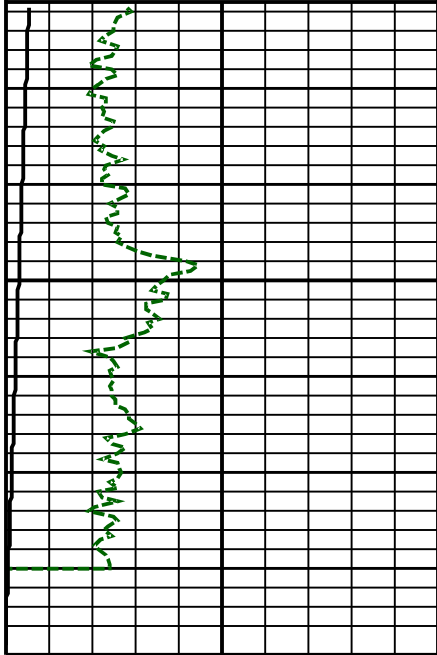
Roadrunner Drilling & Pump Co. Inc.
S.R.P.D.M.W.-3
May 23, 2022

Mult. Pages
5"/100'

4-ARM X-Y CALIPER LOG

0 Annular Volume (ft³) 500
0 Gamma Ray(api) 200

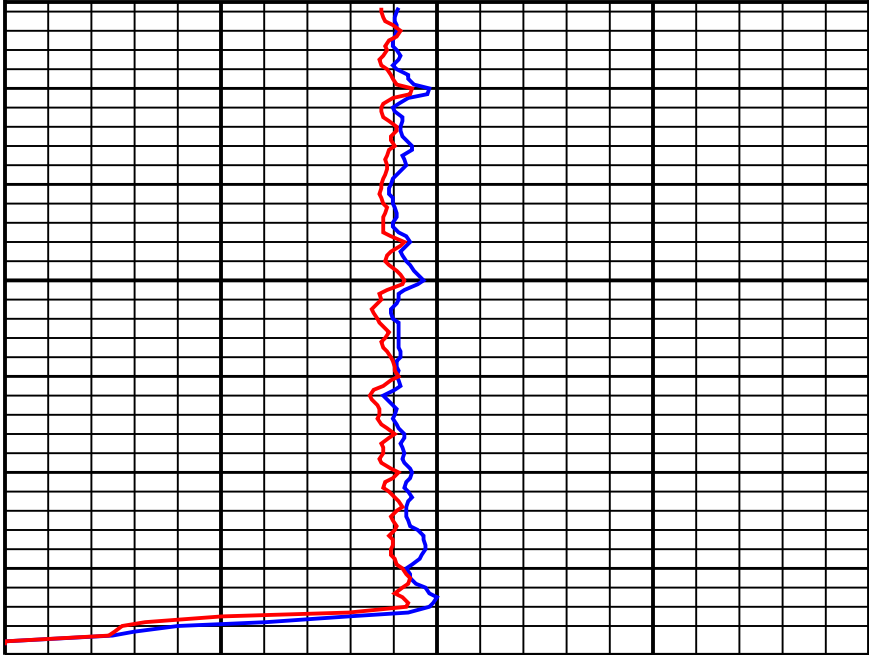
0 Y Axis Caliper(inches) 20
0 X Axis Caliper(inches) 20



171'

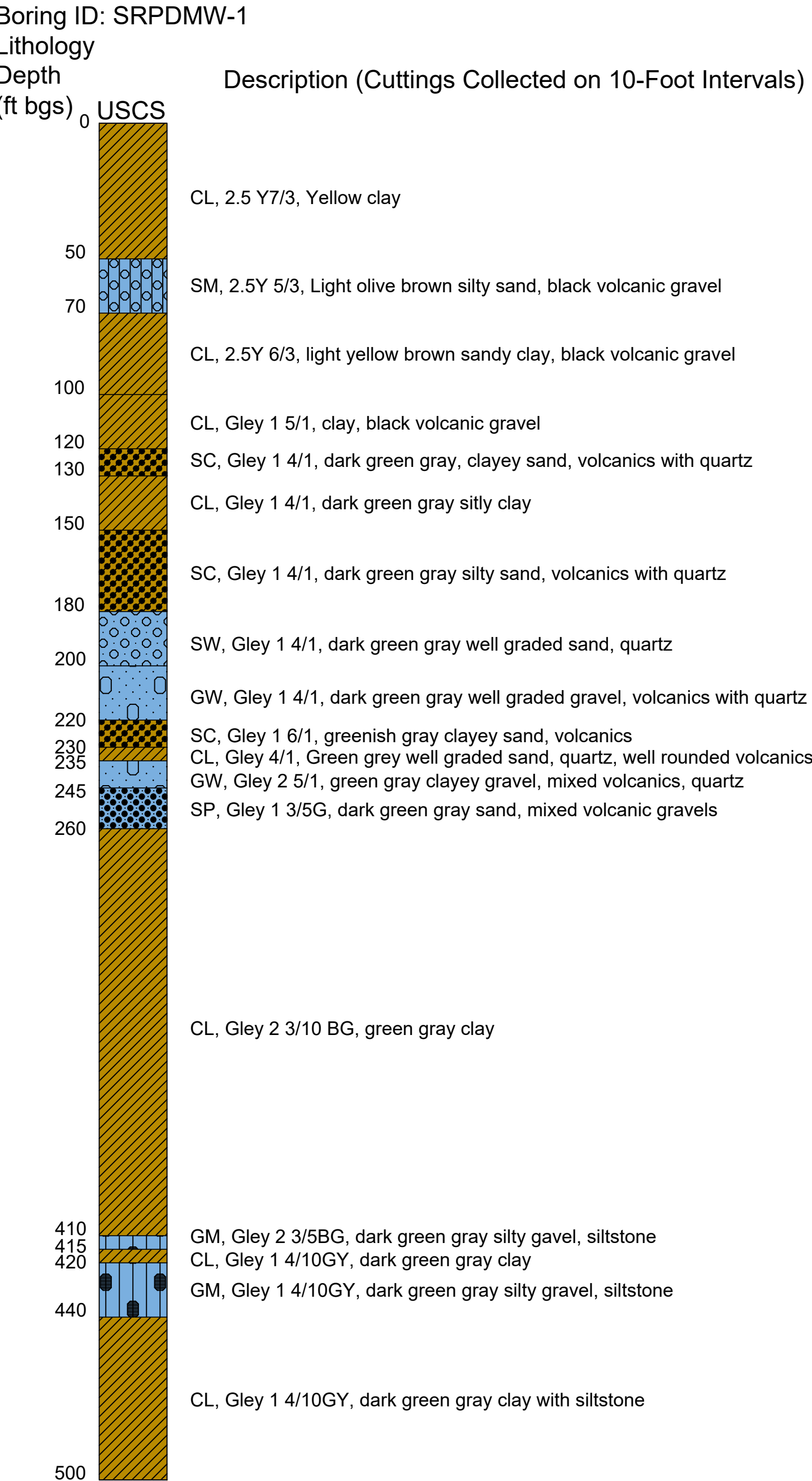
200'

Log Depth 237'

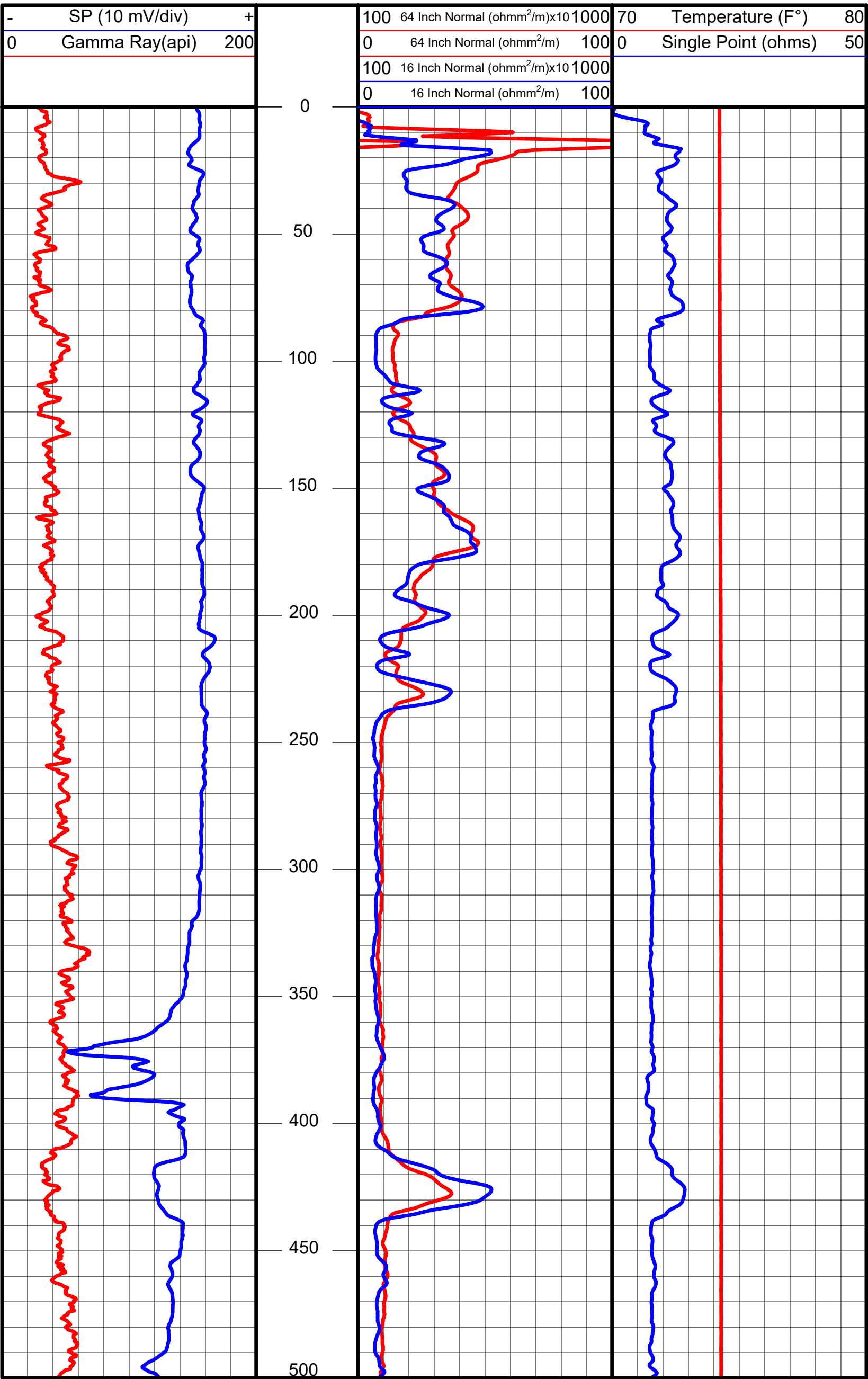


Attachment E: Well As-Builts

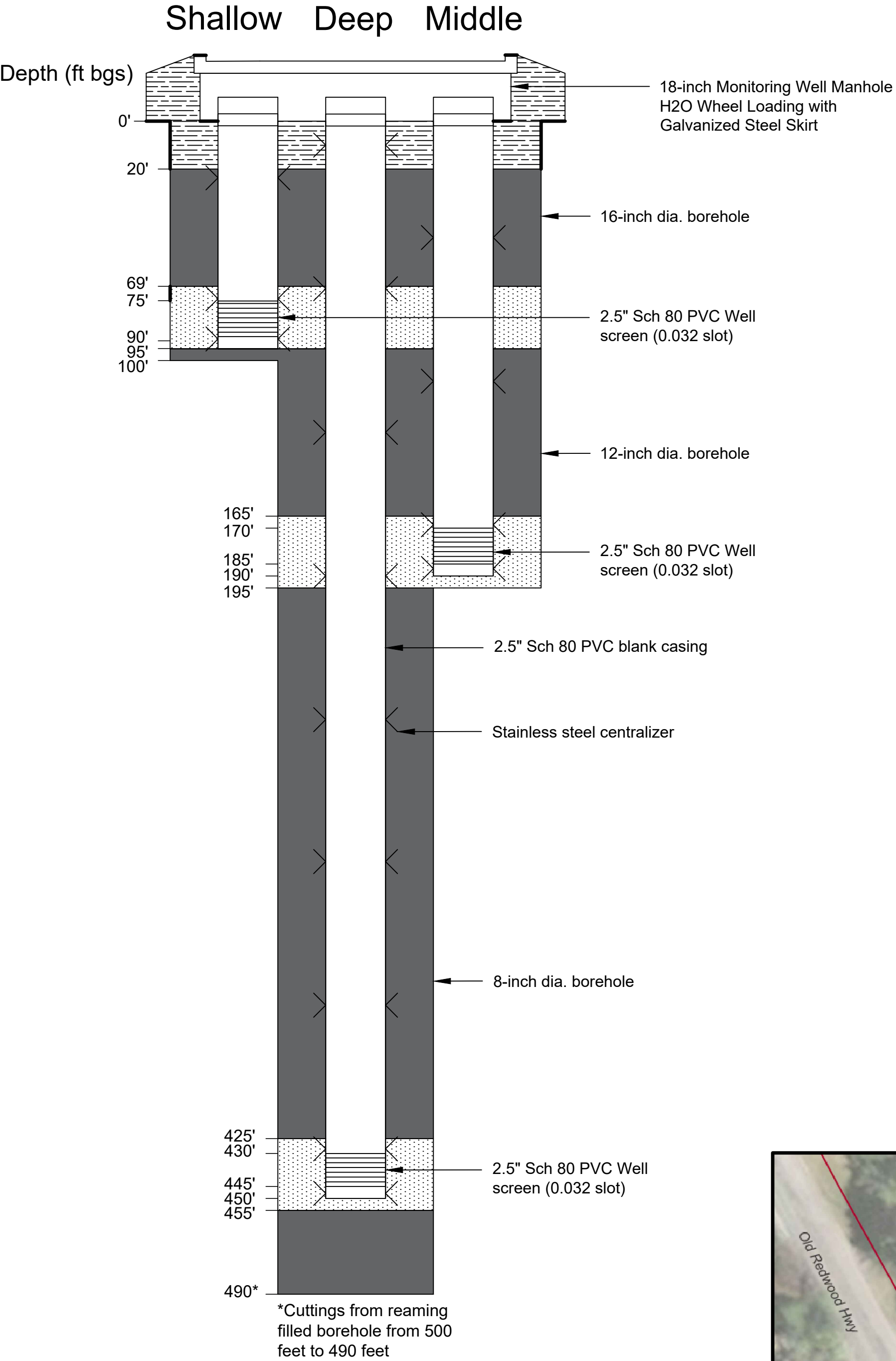
LITHOLOGIC LOGS



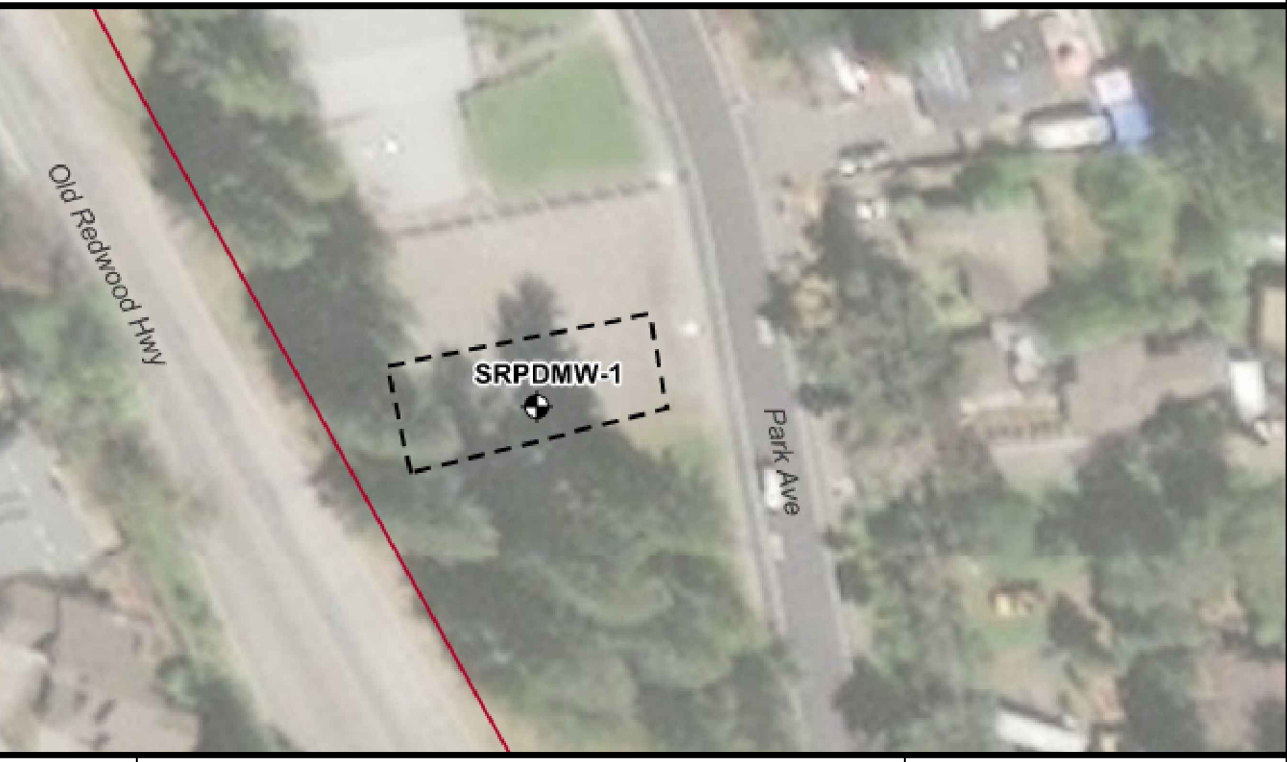
E-LOGS



SRPDMW-1



SITE MAP



- NOTES:
- CENTRALIZERS PLACED ABOVE AND BELOW EACH SCREEN INTERVAL AND APPROXIMATELY EVERY 60-FEET.
 - LITHOLOGIC DESCRIPTIONS ON THIS DIAGRAM ARE SIMPLIFIED FROM THE FIELD LITHOLOGIC LOGS. FOR MORE DETAILED DESCRIPTIONS, PLEASE REFER TO THE COMPLETE LITHOLOGIC LOGS CONTAINED IN THE WELL COMPLETION REPORT, ATTACHMENT B. FULL GEOPHYSICAL LOG PROVIDED IN ATTACHMENT D.
 - FILTER PACK IS SRI SUPREME FILTER PACK #8
 - CEMENT SEAL IS A 2:1 SAND-CEMENT MIX PROVIDED BY SHAMROCK MATERIALS AND APPROVED BY GEI ONSITE. CEMENT MIX CONFORMS TO THE SPECIFICATIONS AND STATE AND COUNTY WELL STANDARDS.

Attention: If this scale bar does not measure 1" then drawing is not original scale.	Construction Detail	Date Started	Date Completed		Designed: T. Kent	 GEI CONSULTANTS, INC. 2868 PROSPECT PARK DRIVE SUITE 400 RANCHO CORDOVA, CA 95670 (916)631-4500	Santa Rosa Plain GSA Deep Multi-Level Monitoring Well Construction	Santa Rosa Plain Deep Monitoring Well 1 (SRPDMW-1)	Drawing No. 1
	Pilot Boring	7/13/2022	7/18/2022		Checked: C. Petersen				
	Geophysical Log	7/18/2022	7/18/2022		Drawn: N. Cholewinski				
	Well Construction	7/20/2022	7/26/2022		Submitted By: C. Petersen				
	Well Development	7/27/2022	8/2/2022		P.G # 6189, C.H.G # 463				
GEI Project 2100757									

LITHOLOGIC LOGS

E-LOGS

SRPDMW-2

Cement Slurry

Bentonite Chips

Filter Pack

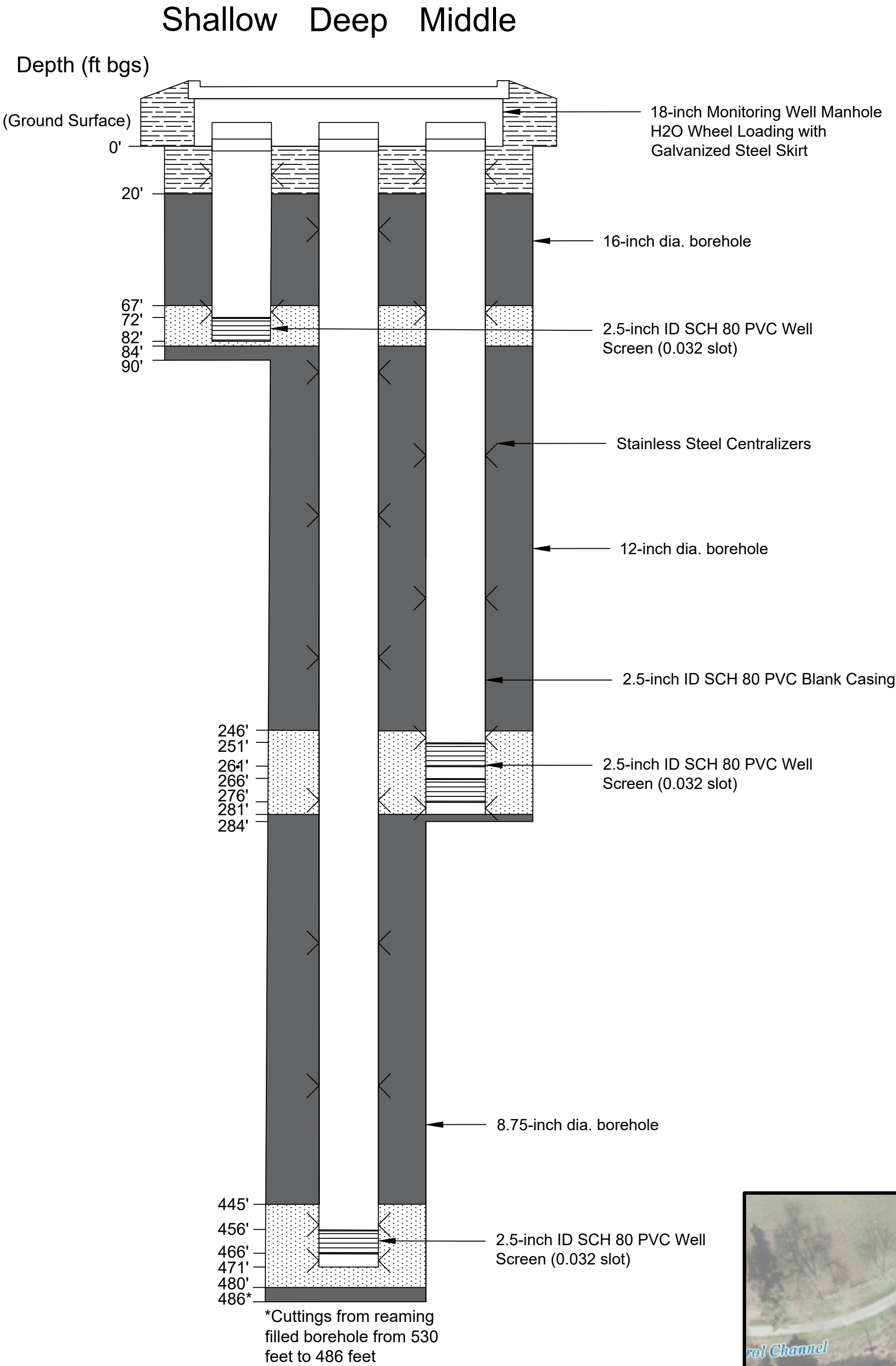
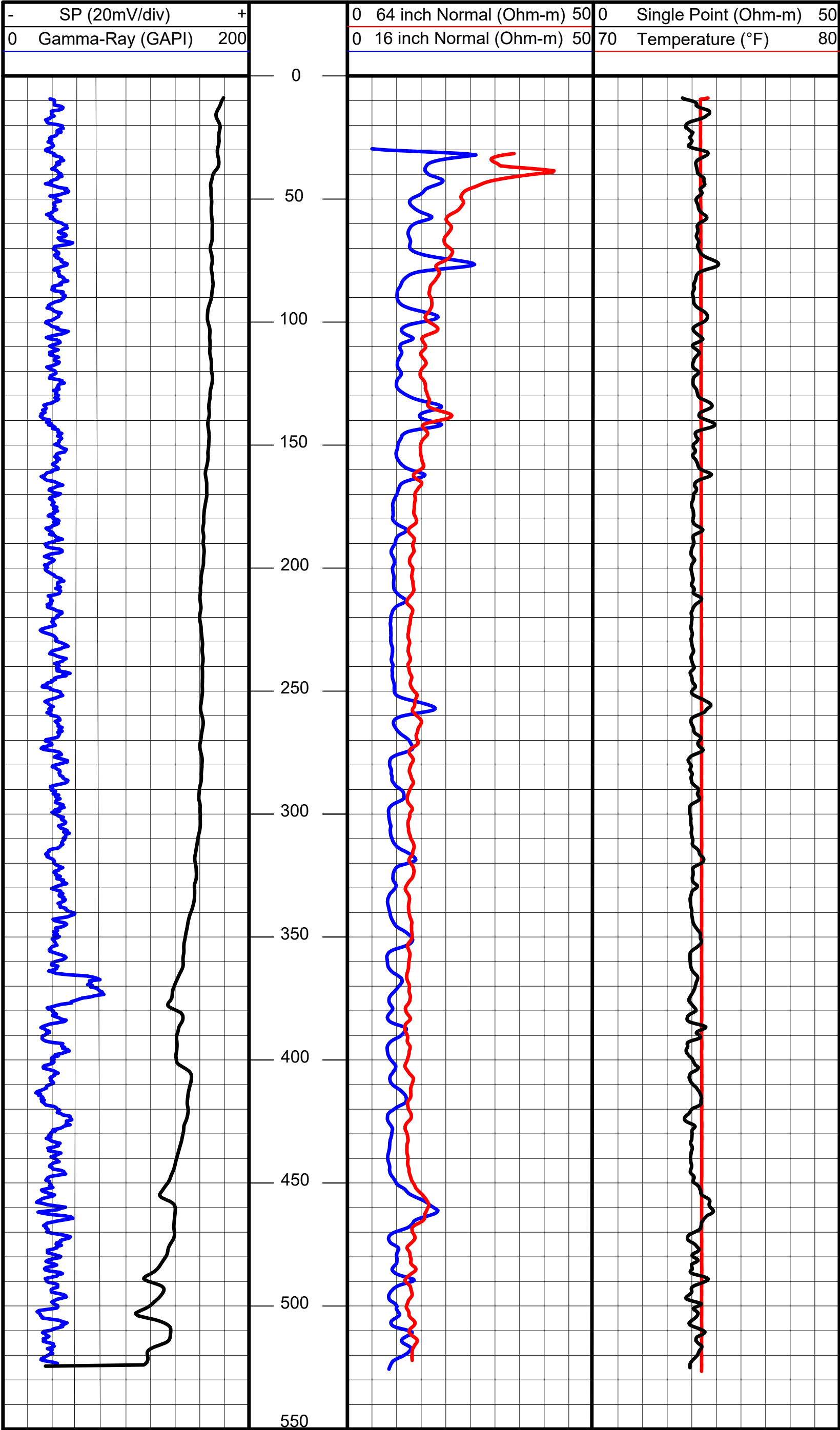
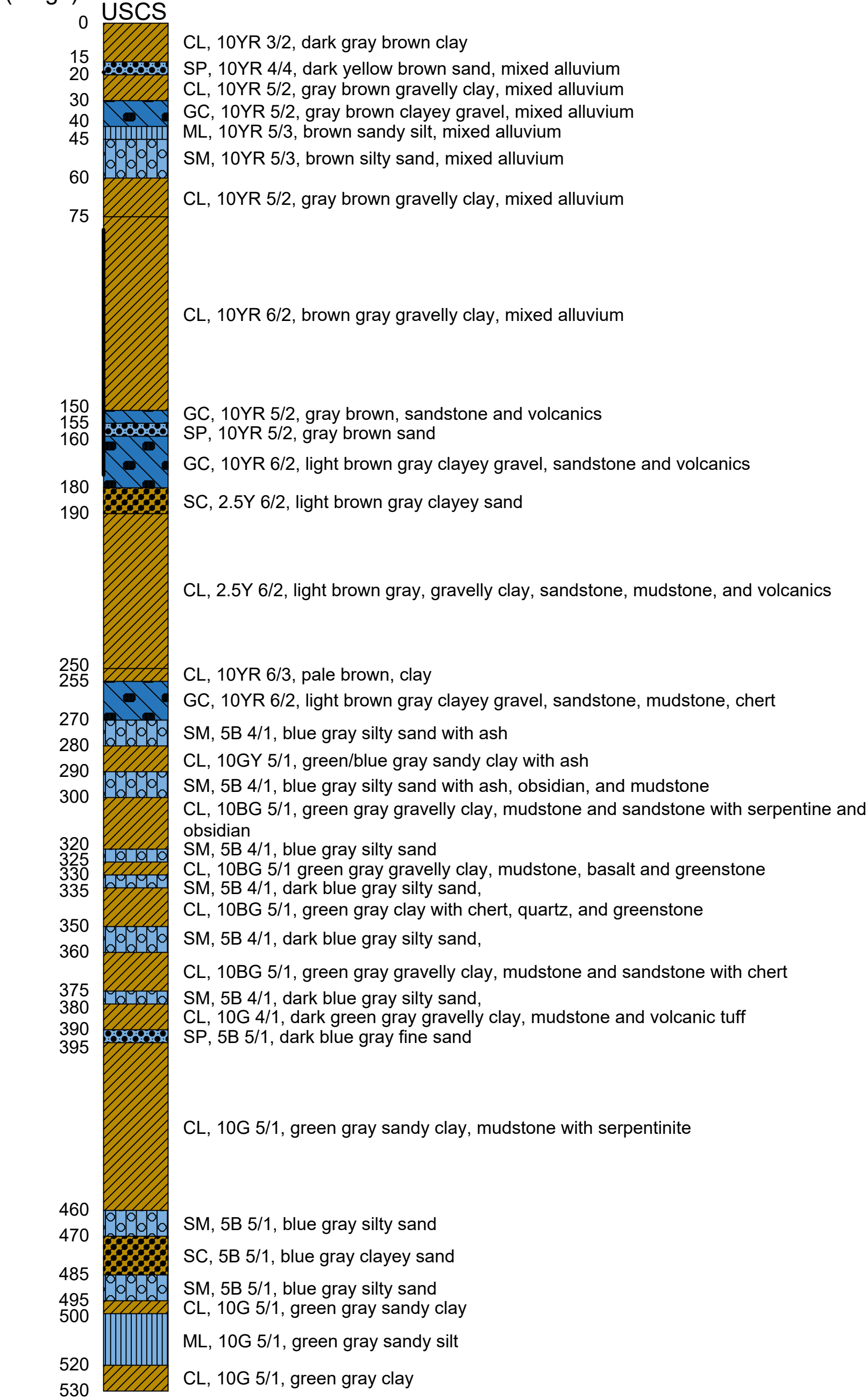
Boring ID: SRPDMW-2

Lithology

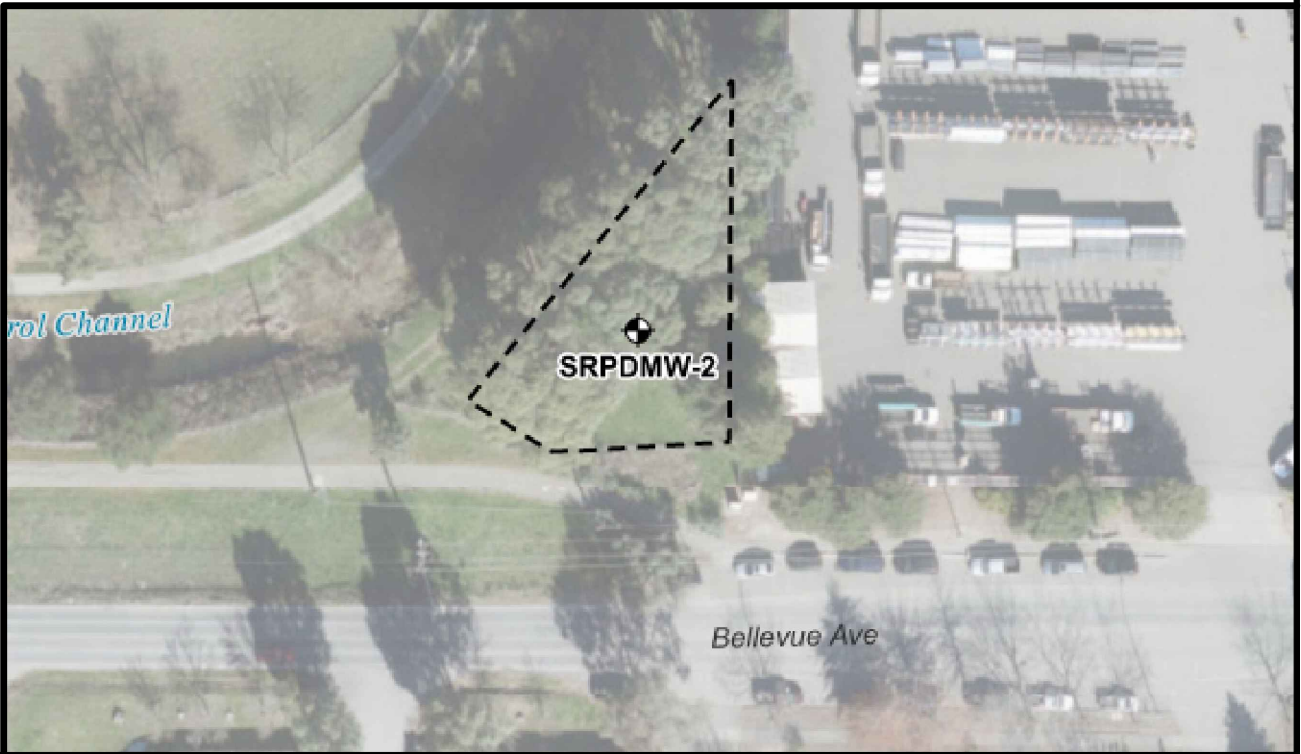
Depth

(ft bgs)

Description (Cuttings Collected at 10-Foot Intervals)



SITE MAP



NOTES:

1. CENTRALIZERS PLACED ABOVE AND BELOW EACH SCREEN INTERVAL AND APPROXIMATELY EVERY 60-FEET.
2. LITHOLOGIC DESCRIPTIONS ON THIS DIAGRAM ARE SIMPLIFIED FROM THE FIELD LITHOLOGIC LOGS. FOR MORE DETAILED DESCRIPTIONS, PLEASE REFER TO THE COMPLETE LITHOLOGIC LOGS CONTAINED IN THE WELL COMPLETION REPORT, ATTACHMENT B. FULL GEOPHYSICAL LOG PROVIDED IN ATTACHMENT D.
3. FILTER PACK IS SRI SUPREME FILTER PACK #8
4. CEMENT SEAL IS A 2:1 SAND-CEMENT MIX PROVIDED BY SHAMROCK MATERIALS AND APPROVED BY GEI ONSITE. CEMENT MIX CONFORMS TO THE SPECIFICATIONS AND STATE AND COUNTY WELL STANDARDS.

Attention:

0

1"

If this scale bar
does not measure
1" then drawing is
not original scale.

Construction Detail

Date Started

Date Completed

06/07/2022

06/07/2022

06/14/2022

06/15/2022

06/17/2022

06/24/2022

PROFESSIONAL GEOLOGIST
No. 6189
CERTIFIED
HYDROGEOLOGIST
STATE OF CALIFORNIA

Designed:

T. Kent

Checked:

C. Petersen

Drawn:

N. Cholewinski

Submitted By:

C. Petersen

P.G # 6189, C.H.G # 463

GEI

Consultants

GEI CONSULTANTS, INC.
2868 PROSPECT PARK DRIVE
SUITE 400
RANCHO CORDOVA, CA 95670
(916)631-4500

Santa Rosa Plain GSA Deep Multi-Level
Monitoring Well Construction

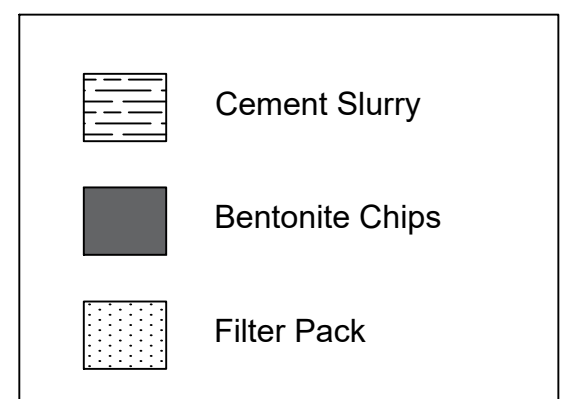
GEI Project 2100757

Santa Rosa Plain Deep Monitoring Well 2
(SRPDMW-2)

Sonoma County Water Agency

Drawing No.

2



LITHOLOGIC LOGS

E-LOGS

SRPDMW-3

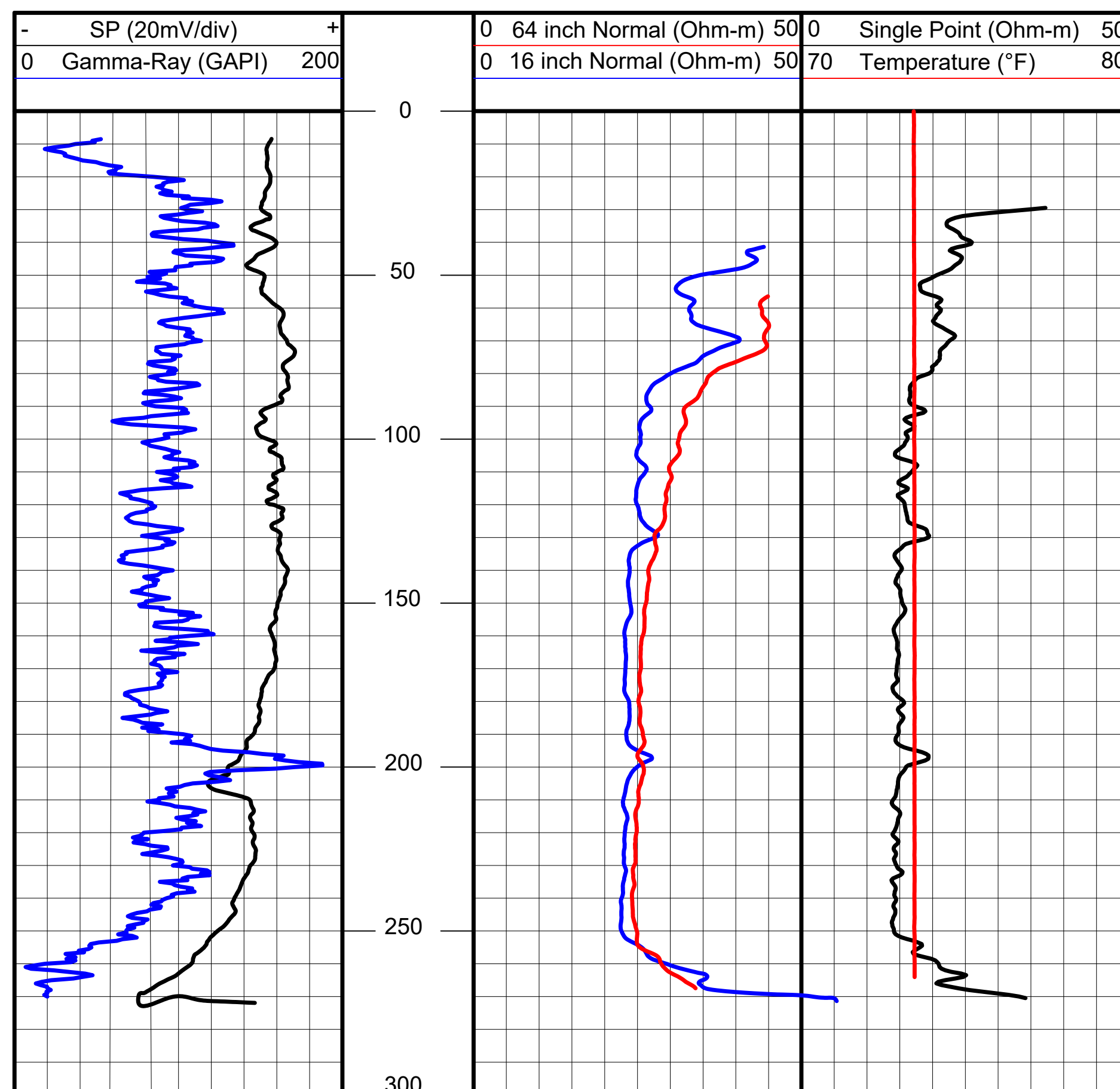
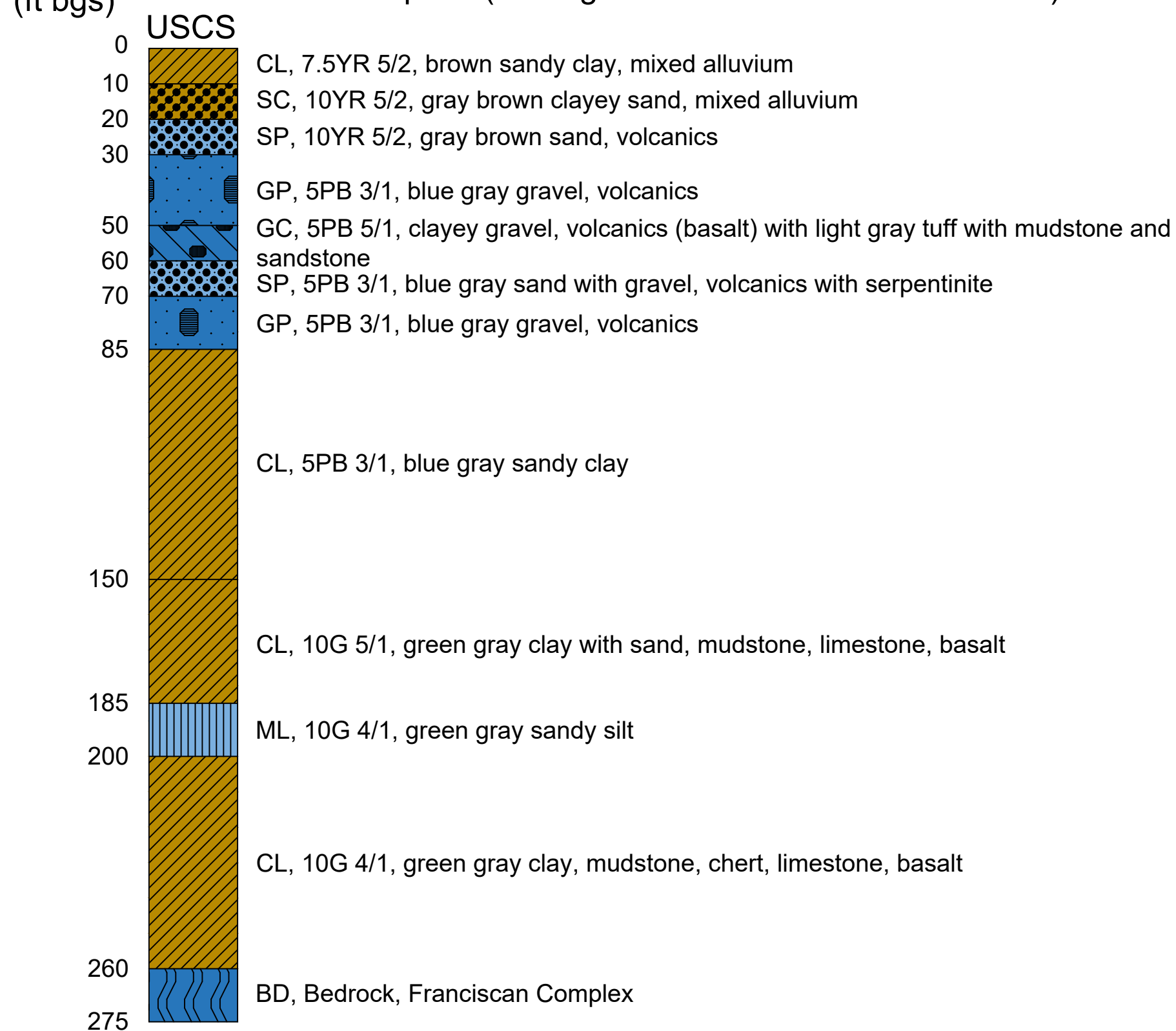
Boring ID: SRPDMW-3

Lithology

Depth

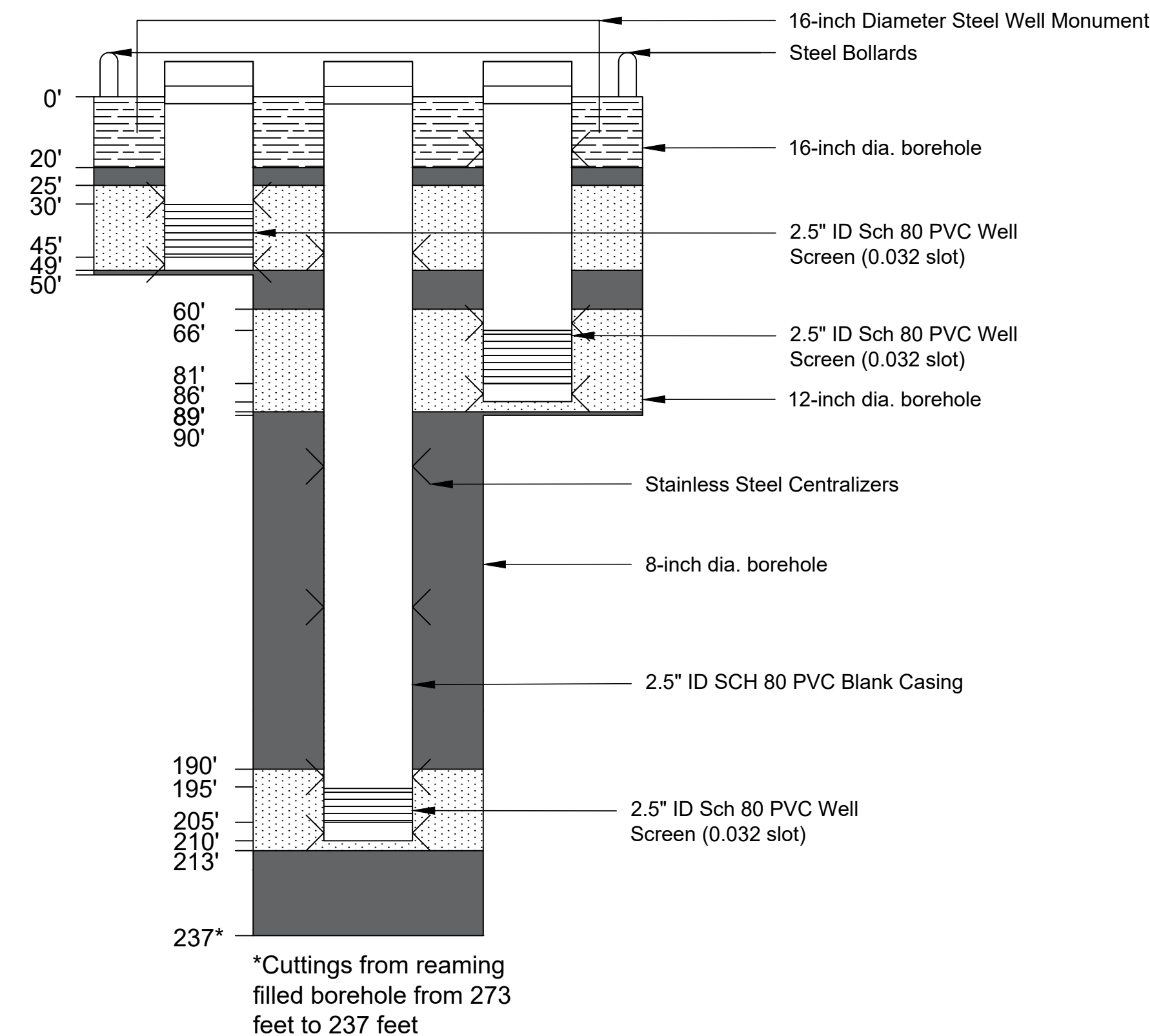
(ft bqs)

Description (Cuttings Collected at 10-Foot Intervals)



Depth (ft bgs)

Shallow Deep Middle

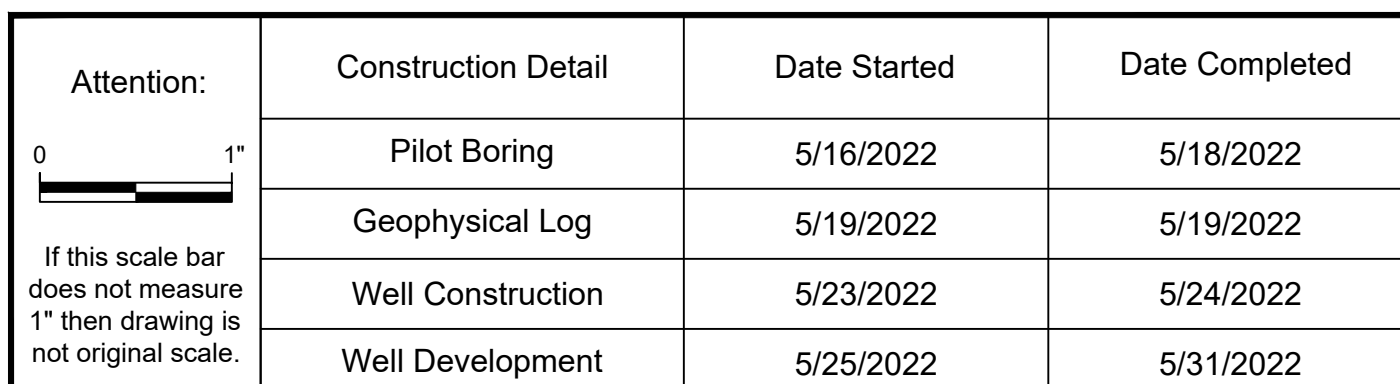


SITE MAP



NOTES:

1. CENTRALIZERS PLACED ABOVE AND BELOW EACH SCREEN INTERVAL AND APPROXIMATELY EVERY 60-FEET.
2. LITHOLOGIC DESCRIPTIONS ON THIS DIAGRAM ARE SIMPLIFIED FROM THE FIELD LITHOLOGIC LOGS. FOR MORE DETAILED DESCRIPTIONS, PLEASE REFER TO THE COMPLETE LITHOLOGIC LOGS CONTAINED IN THE WELL COMPLETION REPORT, ATTACHMENT B. FULL GEOPHYSICAL LOG PROVIDED IN ATTACHMENT D.
3. FILTER PACK IS SRI SUPREME FILTER PACK #8
4. CEMENT SEAL IS A 2:1 SAND-CEMENT MIX PROVIDED BY SHAMROCK MATERIALS AND APPROVED BY GEI ONSITE. CEMENT MIX CONFORMS TO THE SPECIFICATIONS AND STATE AND COUNTY WELL STANDARDS.



<i>Designed:</i>	T. Kent
<i>Checked:</i>	C. Petersen
<i>Drawn:</i>	N. Cholewinski
<i>Submitted By:</i>	C. Petersen
<i>P.G # 6189, C.H.G # 463</i>	



Santa Rosa Plain GSA Deep Multi-Level
Monitoring Well Construction

GEI Project 2100757

Santa Rosa Plain Deep Monitoring Well 3
(SRPDMW-3)

Sonoma County Water Agency

Drawing No.

3

Attachment F: Sampling and Analysis Plan

Sampling and Analysis Plan
Monitoring Network Enhancement
Program Sampling and Analysis Plan

Sonoma County, California

Submitted to:

Sonoma County Water Agency
404 Aviation Blvd
Santa Rosa, CA
95403

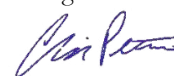
Submitted by:

GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781-721-4000

3/31/2022
Project 2100757



Trevor Kent
Geologist



Chris Petersen, PG, CHG,
Principal Hydrogeologist

Table of Contents

Abbreviations and Acronyms	ii
-----------------------------------	-----------

1. Project Overview	1
----------------------------	----------

2. Sampling and Analysis Plan	5
--------------------------------------	----------

2.1 Soil Cuttings	5
-------------------	---

2.2 Water Quality Sampling	6
----------------------------	---

Figures

1. Sonoma Valley Groundwater Subbasin Well Locations
2. Petaluma Valley Groundwater Basin Well Locations
3. Santa Rosa Plain Groundwater Subbasin Well Locations

Appendices

- A. Sampling and Data Collection Forms

Abbreviations and Acronyms

COC	Chain of Custody
ELAP	Environmental Laboratory Accreditation Program
GEI	GEI Consultants, Inc.
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
MNEP	Monitoring Network Enhancement Program
NTU	Nephelometric Turbidity Units
PVGB	Petaluma Valley Groundwater Basin
SAP	Sampling and Analysis Plan
SGMA	Sustainable Groundwater Management Act
SRPGB	Santa Rosa Plain Groundwater Subbasin
SVGB	Sonoma Valley Groundwater Subbasin
SW	Sonoma Water
USCS	Unified Soil Classification System

1. Project Overview

Sonoma County Water Agency, or Sonoma Water (SW), is overseeing the Monitoring Network Enhancement Program (MNEP) to expand groundwater monitoring networks for three groundwater basins in Sonoma County: the Sonoma Valley Groundwater Subbasin (SVGB), the Petaluma Valley Groundwater Basin (PVGB), and the Santa Rosa Plain Groundwater Subbasin (SRPGB). Management of these basins must comply with the Sustainable Groundwater Management Act (SGMA) by the Sonoma Valley Groundwater Sustainability Agency (SVGSA), the Petaluma Valley Groundwater Sustainability Agency (PVGSA), and the Santa Rosa Plain Groundwater Sustainability Agency (SRPGSA) respectively. Under SGMA, groundwater basins must be managed to sustainability criteria agreed upon by the groundwater stakeholders within the basin. Each of the GSA's listed above have established sustainability goals, minimum thresholds and measurable objectives for relevant sustainability indicators within the basin, including groundwater levels and groundwater quality.

As part of the MNEP, three nested groundwater monitoring wells shall be constructed in each basin for a total of nine wells to fill data gaps identified in the Groundwater Sustainability Plans (GSPs). Well locations are shown on Figure 1 through Figure 3. Each well will be constructed of 2.5" PVC casing and screen intervals selected to monitor the principal aquifers, as described in each basin's GSP, encountered at each location. In the future, these wells will become part of the representative monitoring networks, provide groundwater level and groundwater quality data in support of GSP implementation and further characterize basin conditions to ensure sustainability indicators are met.

This Sampling and Analysis Plan (SAP) describes the methods and procedures for collection of soil cuttings during pilot borehole drilling and water quality samples during final well development. All samples will be collected by qualified on-site personnel and handled in accordance with the guidelines of the SAP.

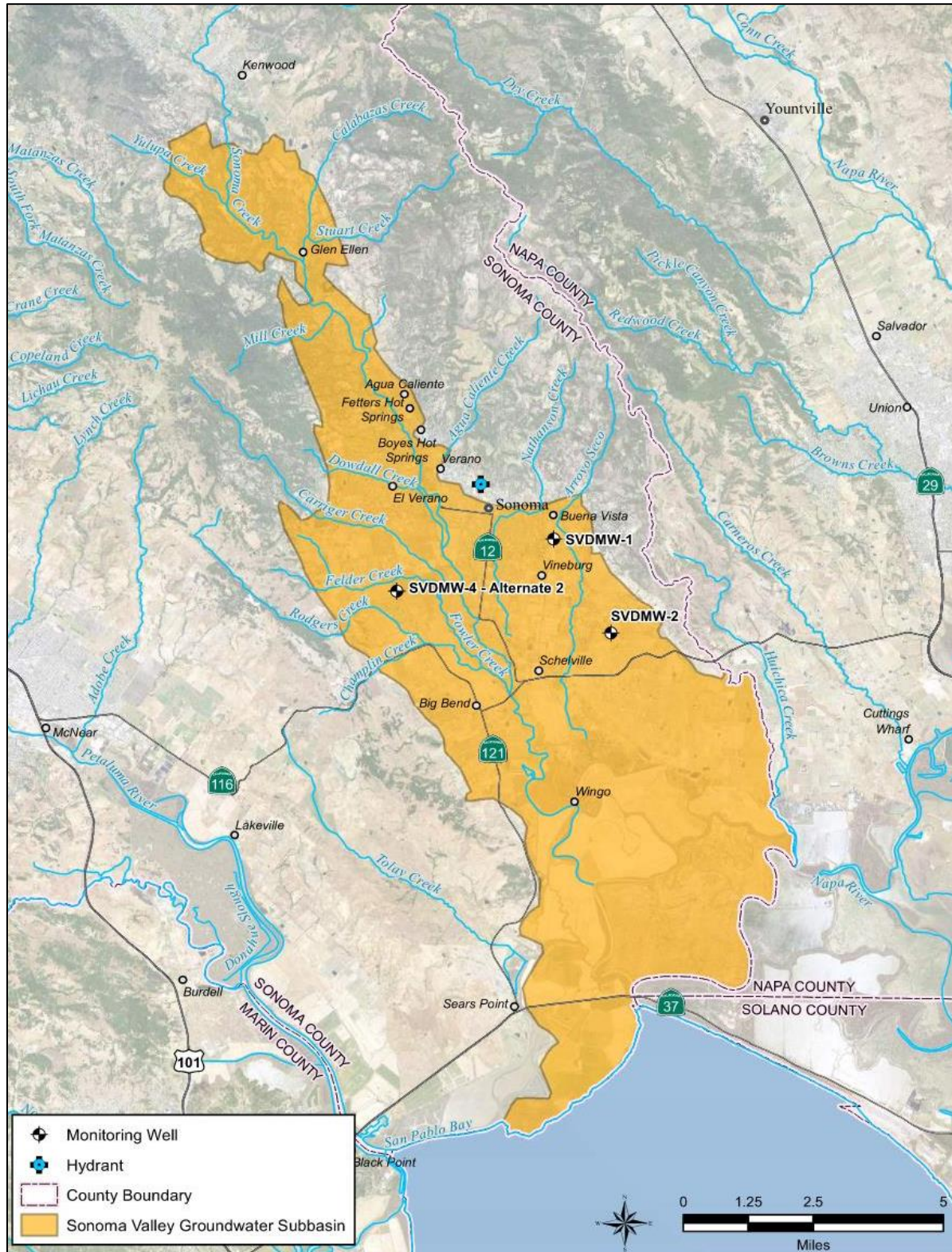


Figure 1: Sonoma Valley Groundwater Subbasin Well Locations

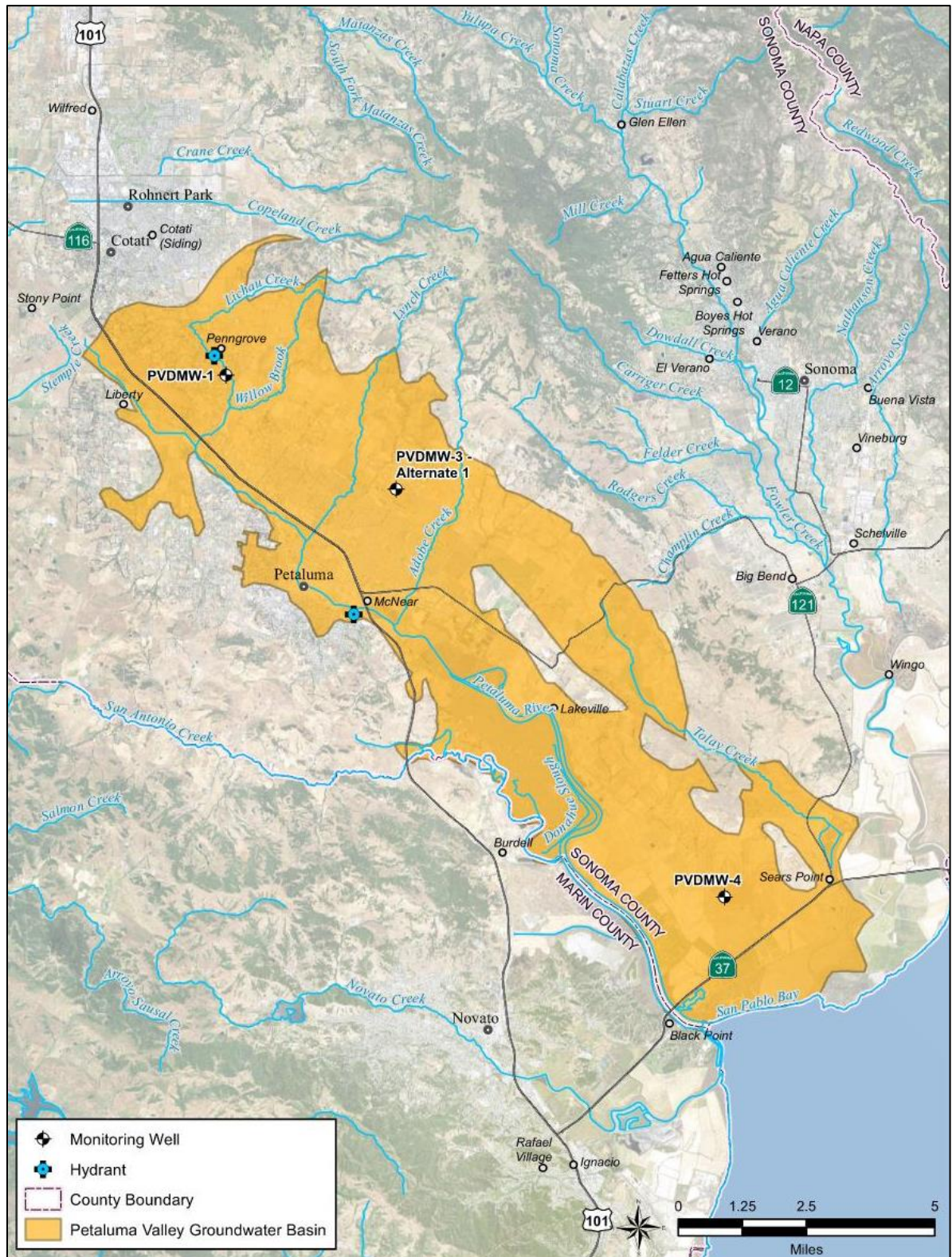


Figure 2: Petaluma Valley Groundwater Basin Well Locations

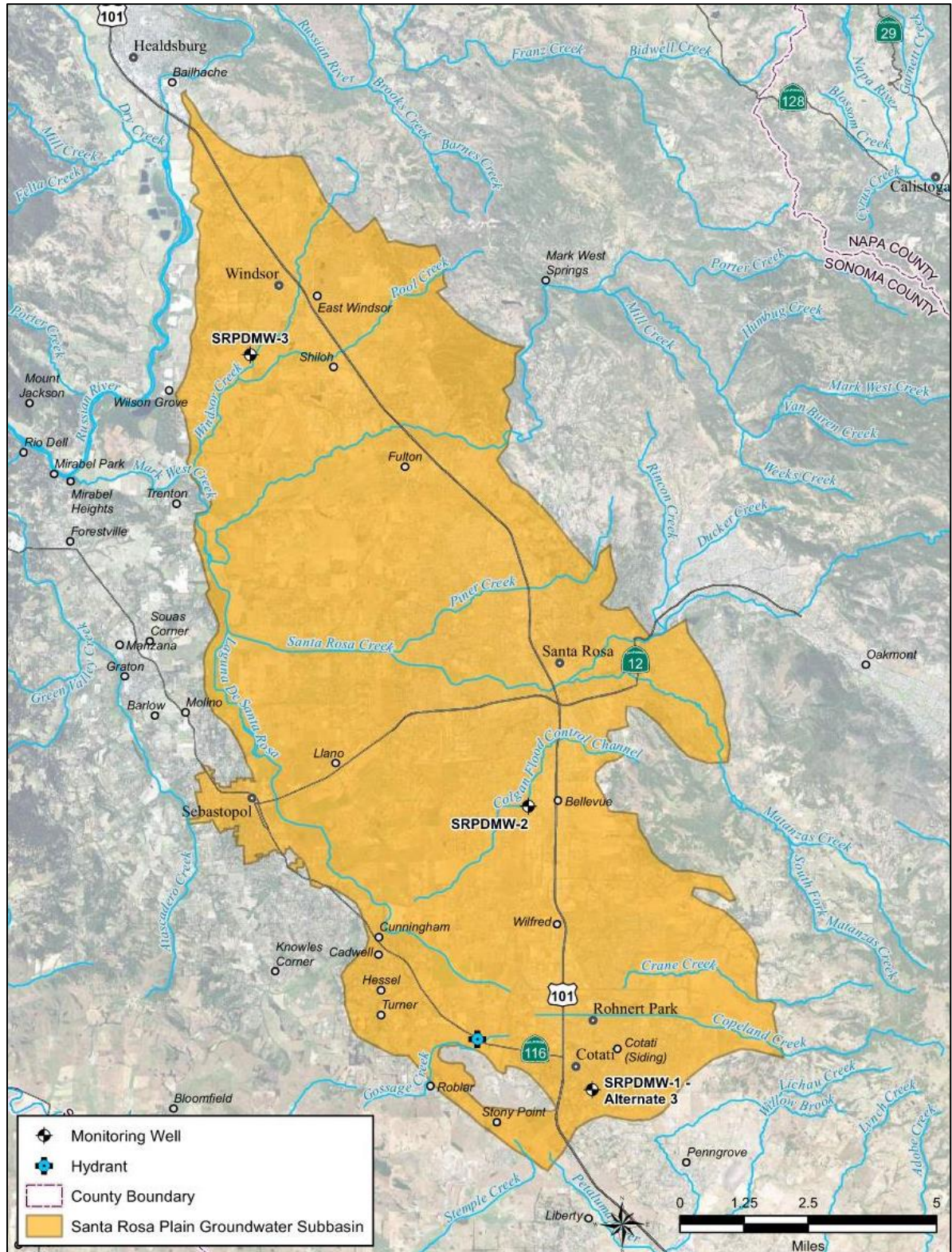


Figure 3: Santa Rosa Plain Groundwater Subbasin Well Locations

2. Sampling and Analysis Plan

The SAP describes sampling and data collection as part of the MNE project. This includes soil cuttings logged during drilling borehole drilling and water quality sampling following well construction and development. Both soil cuttings and water quality samples will be collected at each of the well locations shown in Figure 1 through Figure 3. The following sections cover sampling protocols for sample collection, equipment, and analysis being performed.

2.1 Soil Cuttings

Soil cutting samples will be collected during the pilot borehole drilling phase of the MNEP. Borehole drilling will be completed using a mud rotary drill rig. Representative formation samples will be collected over ten-foot intervals or when a change in formation is observed. Cuttings will be collected from the shaker table after the pass through a splitter, allowing the drilling fluids to be separated from the representative formation samples. Drilling equipment will be cleaned and rinsed between each well site.

Sample collection and analysis will be performed by GEI staff under the direction of a California licensed Professional Geologist/Certified Hydrogeologist. Each sample will be logged using the Lithologic Log forms found in Attachment A. A small volume of each sampled interval shall be archived for future reference if needed. A minimum of the following data will be collected during sampling:

- USCS Soil Classification
- Munsell Color
- % Gravel, Sand, Silt, and Clay
- Angularity
- Formation description (mineralogy, etc.)
- Geologic formation (if identifiable)

This geologic data will be used to develop the final design of the wells, including screen interval, and identify which principal aquifers, if any, are present.

2.2 Water Quality Sampling

Water quality samples shall be collected at each well site following well development. After construction of a well, development will take place in two phases: initial development and final pumped development. Initial development consists of mechanical swabbing and airlifting to remove any heavy material that settled at the bottom of the well in addition to drilling muds/fines that may still be in the gravel pack and formation. Once initial development is complete, final pumped development will be conducted using a submersible pump provided by the drilling contractor. The following parameters will be monitored in the field during final development:

- Water level (static and pumped) and drawdown in the well
- Pumping rate and purge volume
- Temperature
- pH
- Electrical Conductivity
- Dissolved Oxygen
- Turbidity

Water levels will be measured using an electronic water level sounder capable of reading measurements to the hundredth of a foot. Pumping rate will be measured intermittently by recording the time it takes for produced water to fill a specific volume, with purge volume calculated from the production rate and total pumping time. Water quality parameters measured in the field will be recorded using a water quality sonde (i.e., YSI sonde) with a flow through cell and a turbidimeter. Equipment calibration will be verified prior to sampling. All equipment will be properly cleaned and rinsed between each well site.

Each well will be pumped until 4 well volumes are purged, turbidity is less than 5 nephelometric turbidity units (NTUs), and field monitored water quality parameters have stabilized. Water quality samples will be collected directly following completion of final pump development. Field data collected during final pumped development along with time of sample collection for each well will be recorded using the Well Purge Logs included in Attachment A.

Water quality samples for laboratory analysis will be collected by GEI personnel. Water quality samples will be collected directly from the discharge port of the submersible pump and into clean, unused, laboratory provided containers. All wells will be sampled for total dissolved solids and chlorides. Samples shall be placed on ice following collection and transported directly to the analytical laboratory under Chain-of-Custody (COC). The

analytical laboratory shall be Environmental Laboratory Accreditation Program (ELAP)
Certified.

Appendix A: Sampling and Data Collection Forms



LITHOLOGIC LOG

Page No. ____ of ____

Project No. _____

Well ID _____

Date _____

Contractor _____

Logged by _____

Depth (Feet)	Time (military)	Penetration Rate (feet/hr)				Graphic Log	Field Classification of Materials USCS; Munsell color; moisture; %cobbles or boulders; % gravel, sand or fines; particle size range, angularity, shape, toughness ; HCL reaction; cementation; descrip. cobbles and boulder, other
		10	20	30	40		
10							
20							
30							
40							
50							



PURGE LOG

Page No. of

Proj. Name_____

Proj. No. _____

Date _____

Task No.

Weather	Contractor
1	1
1	2
1	3
1	4
1	5
1	6
1	7
1	8
1	9
1	10
1	11
1	12
1	13
1	14
1	15
1	16
1	17
1	18
1	19
1	20
1	21
1	22
1	23
1	24
1	25
1	26
1	27
1	28
1	29
1	30
1	31
1	32
1	33
1	34
1	35
1	36
1	37
1	38
1	39
1	40
1	41
1	42
1	43
1	44
1	45
1	46
1	47
1	48
1	49
1	50
1	51
1	52
1	53
1	54
1	55
1	56
1	57
1	58
1	59
1	60
1	61
1	62
1	63
1	64
1	65
1	66
1	67
1	68
1	69
1	70
1	71
1	72
1	73
1	74
1	75
1	76
1	77
1	78
1	79
1	80
1	81
1	82
1	83
1	84
1	85
1	86
1	87
1	88
1	89
1	90
1	91
1	92
1	93
1	94
1	95
1	96
1	97
1	98
1	99
1	100
1	101
1	102
1	103
1	104
1	105
1	106
1	107
1	108
1	109
1	110
1	111
1	112
1	113
1	114
1	115
1	116
1	117
1	118
1	119
1	120
1	121
1	122
1	123
1	124
1	125
1	126
1	127
1	128
1	129
1	130
1	131
1	132
1	133
1	134
1	135
1	136
1	137
1	138
1	139
1	140
1	141
1	142
1	143
1	144
1	145
1	146
1	147
1	148
1	149
1	150
1	151
1	152
1	153
1	154
1	155
1	156
1	157
1	158
1	159
1	160
1	161
1	162
1	163
1	164
1	165
1	166
1	167
1	168
1	169
1	170
1	171
1	172
1	173
1	174
1	175
1	176
1	177
1	178
1	179
1	180
1	181

Well ID _____

DTW (ft btoc) _____

T.D. (ft btoc) _____

Water Column (ft)

I.D. (in) Casing Vol. (gal) x3 = gal

[illegible]

Calibration:

By _____

Attachment G: Well Development Records



PURGE LOG

Page No. 1 of 1Proj. Name SonomaProj. No. 2100757Date: 08-02-2022Task No. 4.2

Weather: Clear, Sunny

Contractor: Roadrunner Drilling

Well ID: SRPDMW-1 ShallowDTW (ft btoc): 50T.D. (ft btoc) 95Water Column (ft) 45I.D. (in) 2.5

Casing Vol. (gal) 11.47 x3 = 34.4 gal

[illegible]

Calibration:

By Devin McDonald



PURGE LOG

Page No. 1 of 1Proj. Name SonomaProj. No. 2100757

Date 08-02-2022

Task No. 4.2

Weather Clear, Sunny

Contractor Roadrunner Drilling

Well ID SRPDMW-1 Middle

DTW (ft btoc) 31

T.D. (ft btoc) 190

Water Column (ft) 159I.D. (in) 2.5

Casing Vol. (gal) 40 x3 = 120 gal

[illegible]

Calibration:

By Devin McDonald



PURGE LOG

Page No. 1 of 1

Proj. Name Sonoma

Proj. No. 2100757

Date 08-02-2022

Task No. 4.2

Weather Clear, Sunny

Contractor: Roadrunner Drilling

Well ID SRPDMW-1 Deep

DTW (ft btoc) 99.45

T.D. (ft btoc) 450

Water Column (ft) 350

I.D. (in) 2.5

Casing Vol. (gal) 110 x3 = 332 gal

Time	Purge Vol. Gallons	Flow Rate GPM	DTW ft btoc	Temp. °C	pH	Turb. NTUs	Cond. uhmos/cm	Remarks
8:50		1.37	104.30	22.15	6.02	9.15	1,310	
8:55		1.22	105.00	22.78	6.72	7.18	1,250	
9:00		1.22	105.00	23.89	7.40	4.18	1,230	
9:15		1.22	105.80	24.86	6.99	2.83	1,210	
9:30		1.22	106.20	24.48	7.73	1.82	1,190	
9:45		1.22	106.20	24.41	7.54	1.67	1,210	
10:00		1.14	107.00	24.70	7.34	1.25	1,180	
10:15		1.14	107.00	26.91	7.08	2.06	1,000	
10:30	157	1.03	108.35	27.71	6.26	1.24	1,090	
10:45		1.03	108.35	26.70	7.21	0.97	1,100	
11:00		1.07	109.45	26.40	8.09	0.78	1,160	
11:15		1.07	109.45	26.56	8.22	0.62	1,160	
11:30	245	1.06	110.40	26.22	7.13	0.62	1,160	
11:45		1.06	110.40	24.51	8.28	0.56	1,220	
12:00	273	1.00	111.30	23.74	8.38	0.63	1,230	
12:15	288	1.00	111.30	25.09	8.27	0.52	1,200	
12:30	302	0.96	112.20	23.91	8.87	0.62	1,230	
12:45	316	0.96	112.20	24.59	8.78	1.11	1,220	
13:00	330	0.93	113.10	24.58	8.29	0.57	1,200	
Samples collected at 1300, end pumping								

Notes

Arrived onsite, pumping ongoing since 8 AM prior to arrival onsite, approved by SW.

Purge value calculated using Roadrunner records

By Devin McDonald



PURGE LOG

Page No. 1 of 1Proj. Name SonomaProj. No. 2100757Date 6/24/22Task No. 4.2

Weather Clear, Sunny

Contractor Roadrunner DrillingWell ID SRPDMW-2 ShallowDTW (ft btoc) 14.27T.D. (ft btoc) 82.2Water Column (ft) 67.93

I.D. (in) 2.5

Casing Vol. (gal) 17 x3 = 52 gal

[illegible]

Calibration:

By Nicole Cholewinski



PURGE LOG

Page No. 1 of 1Proj. Name SonomaProj. No. 2100757Date 6/24/22Task No. 4.2

Weather Clear, Sunny

Contractor Roadrunner DrillingWell ID SRPDMW-2 MiddleDTW (ft btoc) 23.55T.D. (ft btoc) 281.4Water Column (ft) 257.85

I.D. (in) 2.5

Casing Vol. (gal) 65.8 x3 = 197.4 gal

[illegible]

Calibration:

By Nicole Cholewinski



PURGE LOG

Page No. 1 of 1

Proj. Name Sonoma

Proj. No. 2100757

Date 6/24/22

Task No. 4.2

Weather Clear, Sunny

Contractor Roadrunner Drilling

Well ID SRPDMW-2 Deep

DTW (ft btoc) 41.13

T.D. (ft btoc) 471.44

Water Column (ft) 430.31

I.D. (in) 2.5

Casing Vol. (gal) 109.81 x3 = 329.42 gal

Time	Purge Vol. Gallons	Flow Rate GPM	DTW ft btoc	Temp. °C	pH	Turb. NTUs	Cond. uhmos/cm	Remarks
11:25	Pump Start		41.13					
11:30	8	1.0	47.91	22.19	7.51	9.86	650	
11:35	18	1.0		20.69	7.76		658	
Pump lowered due to excessive drawdown								
11:40	28	1.0	49.33	21.69	7.79	25.2	653	
11:50	46	1.0	48.18	21.79	7.67	7.89	664	
12:00	65	1.0	49.06	21.79	7.57	11.4	659	
12:10	85	1.0	49.18	21.95	7.57	28.0	649	
12:20	102	1.0	49.37	22.12	7.57	71.3	648	
12:30	117	1.2	47.93	22.71	7.71	326	654	
12:40	128	1.2	47.68	23.06	7.77	353	654	
12:50	139	1.2	48.00	23.02	7.81	372	648	
13:00	150	1.0	47.38	23.18	7.82	310	649	
13:10	160	1.0	47.37	23.28	7.84	254	646	
13:20	182	1.2	47.41	23.32	7.89	99.2	655	
13:30	194	1.2	47.45	23.25	7.89	60.4	658	
13:40	206	1.2	47.56	23.33	7.92	32.6	655	
13:50	218	1.2	47.56	23.39	7.88	23.5	651	
14:00	229	1.2		23.31	7.93	17.6	650	
14:10	241	1.2	47.60	23.21	7.81	13.5	653	
14:20	253	1.2		23.16	7.80	13.6	655	
14:30	266	1.2	47.73	22.95	7.86	12.6	653	
14:40	277	1.1	48.16	22.93	7.81	5.83	652	
14:50	288	1.1	8.05	22.91	7.81	5.33	649	
15:00	299	1.1	47.73	23.04	7.82	4.12	656	
15:10	311	1.1	47.72	22.88	7.75	6.00	660	
15:20	322	1.1	47.73	22.93	7.73	3.21	656	
15:30	334	1.1	47.73	22.99	7.76	2.91	651	
Samples collected at 15:30, pumping ended								

Notes: _____

By Nicole Cholewinski



PURGE LOG

Page No. 1 of 1Proj. Name SonomaProj. No. 2100757

Date 6/1/2022

Task No. 4.2

Weather Clear, Sunny

Contractor Roadrunner Drilling

Well ID SRPDMW-3 Shallow

DTW (ft btoc) 9.8T.D. (ft btoc) 86.2Water Column (ft) 76.4I.D. (in) 2.5

Casing Vol. (gal) 11.16 x3 = 33.48 gal

[illegible]

Notes

Pumping began 40 minutes prior to GEI onsite, with approval from SW. Was continued for 20 minutes to collect field parameters, reach purge volume, and show stabilization

By Devin McDonald



PURGE LOG

Page No. 1 of 1Proj. Name SonomaProj. No. 2100757

Date 6/1/2022

Task No. 4.2

Weather Clear, Sunny

Contractor Roadrunner Drilling

Well ID SRPDMW-3 Middle

DTW (ft btoc) 9.8T.D. (ft btoc) 86.2Water Column (ft) 78.15I.D. (in) 2.5

Casing Vol. (gal) 19.94 x3 = 59.82 gal

[illegible]

Notes

By Devin McDonald



PURGE LOG

Page No. 1 of 1Proj. Name SonomaProj. No. 2100757

Date 6/1/2022

Task No. 4.2

Weather Clear, Sunny

Contractor Roadrunner Drilling

Well ID SRPDMW-3 Deep

DTW (ft btoc) 16.12T.D. (ft btoc) 210.2Water Column (ft) 194.08I.D. (in) 2.5

Casing Vol. (gal) 49.97 x3 = 149.92 gal

[illegible]

Notes

Pumping was ended early due to highly turbid water causing potential damage to pump.

Pump was turned back on to collect samples at the request of Sonoma water

By Devin McDonald

Attachment H: Laboratory Water Quality Results

ANALYTICAL REPORT

Eurofins Eaton Monrovia
750 Royal Oaks Drive
Suite 100
Monrovia, CA 91016
Tel: (626)386-1100

Laboratory Job ID: 380-14208-1

Client Project/Site: Sonoma MW-TA Sac

For:

GEI Consultants, Inc.
2868 Prospect Park Drive
Suite 400
Rancho Cordova, California 95670

Attn: Trevor Kent



Authorized for release by:

9/25/2022 11:29:29 PM

Monica Van Natta, Project Manager
(559)326-4396

Monica.VanNatta@et.eurofinsus.com

LINKS

Review your project
results through



Have a Question?



Visit us at:

www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

1. Laboratory is accredited in accordance with TNI 2016 Standards and ISO/IEC 17025:2017.
2. Laboratory certifies that the test results meet all TNI 2016 and ISO/IEC 17025:2017 requirements unless noted under the individual analysis
3. Test results relate only to the sample(s) tested.
4. This report shall not be reproduced except in full, without the written approval of the laboratory.
5. Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below. (DW,Water matrices)



Monica Van Natta
Project Manager
9/25/2022 11:29:29 PM

Table of Contents

Cover Page	1
Table of Contents	3
Definitions/Glossary	4
Case Narrative	5
Detection Summary	6
Client Sample Results	7
QC Sample Results	8
QC Association Summary	10
Lab Chronicle	11
Certification Summary	12
Method Summary	14
Sample Summary	15
Chain of Custody	16
Receipt Checklists	19



Definitions/Glossary

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-14208-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-14208-1

Job ID: 380-14208-1

Laboratory: Eurofins Eaton Monrovia

Narrative

Job Narrative
380-14208-1

Comments

No additional comments.

Receipt

The samples were received on 8/3/2022 10:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.5° C.

HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-14208-1

Client Sample ID: SRPDMW-1-DEEP

Lab Sample ID: 380-14208-1

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	210		2.5	0.074 mg/L	5		300.0	Total/NA
Total Dissolved Solids	690		20	8.4 mg/L	1		SM 2540C	Total/NA

Client Sample ID: SRPDMW-1-MIDDLE

Lab Sample ID: 380-14208-2

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	22		0.50	0.015 mg/L	1		300.0	Total/NA
Total Dissolved Solids	260		20	8.4 mg/L	1		SM 2540C	Total/NA

Client Sample ID: SRPDMW-1-SHALLOW

Lab Sample ID: 380-14208-3

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	25		0.50	0.015 mg/L	1		300.0	Total/NA
Total Dissolved Solids	240		20	8.4 mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Eaton Monrovia

Client Sample Results

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-14208-1

Client Sample ID: SRPDMW-1-DEEP

Lab Sample ID: 380-14208-1

Date Collected: 08/02/22 13:00

Matrix: Water

Date Received: 08/03/22 10:30

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	210		2.5	0.074 mg/L			08/04/22 03:23	5

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	690		20	8.4 mg/L			08/06/22 16:57	1

Client Sample ID: SRPDMW-1-MIDDLE

Lab Sample ID: 380-14208-2

Date Collected: 08/02/22 14:45

Matrix: Water

Date Received: 08/03/22 10:30

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	22		0.50	0.015 mg/L			08/04/22 02:58	1

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	260		20	8.4 mg/L			08/09/22 22:18	1

Client Sample ID: SRPDMW-1-SHALLOW

Lab Sample ID: 380-14208-3

Date Collected: 08/02/22 16:00

Matrix: Water

Date Received: 08/03/22 10:30

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	25		0.50	0.015 mg/L			08/04/22 03:11	1

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	240		20	8.4 mg/L			08/06/22 16:57	1

QC Sample Results

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-14208-1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 380-15277/41

Matrix: Water

Analysis Batch: 15277

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.0285		0.50	0.015 mg/L			08/03/22 23:44	1

Lab Sample ID: LCS 380-15277/44

Matrix: Water

Analysis Batch: 15277

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	25.0	25.8		mg/L		103	90 - 110

Lab Sample ID: LCSD 380-15277/45

Matrix: Water

Analysis Batch: 15277

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	25.0	26.0		mg/L		104	90 - 110	1	20

Lab Sample ID: MRL 380-15277/42

Matrix: Water

Analysis Batch: 15277

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	0.125	0.142		mg/L		114	50 - 150

Lab Sample ID: MRL 380-15277/43

Matrix: Water

Analysis Batch: 15277

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	0.500	0.461		mg/L		92	50 - 150

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 380-12010/1

Matrix: Water

Analysis Batch: 12010

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	4.2 mg/L			08/06/22 16:57	1

Lab Sample ID: HLCS 380-12010/5

Matrix: Water

Analysis Batch: 12010

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	HLCS Result	HLCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	700	708		mg/L		101	80 - 114

Eurofins Eaton Monrovia

QC Sample Results

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-14208-1

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: LCS 380-12010/4
Matrix: Water
Analysis Batch: 12010

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	175	176		mg/L		101	80 - 114

Lab Sample ID: MRL 380-12010/3
Matrix: Water
Analysis Batch: 12010

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	10.0	8.00	J	mg/L		80	50 - 150

Lab Sample ID: MB 380-12469/1
Matrix: Water
Analysis Batch: 12469

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	4.2 mg/L			08/09/22 22:18	1

Lab Sample ID: HLCS 380-12469/5
Matrix: Water
Analysis Batch: 12469

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	HLCS Result	HLCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	700	690		mg/L		99	80 - 114

Lab Sample ID: LCS 380-12469/4
Matrix: Water
Analysis Batch: 12469

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	175	176		mg/L		101	80 - 114

Lab Sample ID: MRL 380-12469/3
Matrix: Water
Analysis Batch: 12469

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	10.0	10.0		mg/L		100	50 - 150

QC Association Summary

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-14208-1

HPLC/IC

Analysis Batch: 15277

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-14208-1	SRPDMW-1-DEEP	Total/NA	Water	300.0	
380-14208-2	SRPDMW-1-MIDDLE	Total/NA	Water	300.0	
380-14208-3	SRPDMW-1-SHALLOW	Total/NA	Water	300.0	
MB 380-15277/41	Method Blank	Total/NA	Water	300.0	
LCS 380-15277/44	Lab Control Sample	Total/NA	Water	300.0	
LCSD 380-15277/45	Lab Control Sample Dup	Total/NA	Water	300.0	
MRL 380-15277/42	Lab Control Sample	Total/NA	Water	300.0	
MRL 380-15277/43	Lab Control Sample	Total/NA	Water	300.0	

General Chemistry

Analysis Batch: 12010

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-14208-1	SRPDMW-1-DEEP	Total/NA	Water	SM 2540C	
380-14208-3	SRPDMW-1-SHALLOW	Total/NA	Water	SM 2540C	
MB 380-12010/1	Method Blank	Total/NA	Water	SM 2540C	
HLCS 380-12010/5	Lab Control Sample	Total/NA	Water	SM 2540C	
LCS 380-12010/4	Lab Control Sample	Total/NA	Water	SM 2540C	
MRL 380-12010/3	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 12469

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-14208-2	SRPDMW-1-MIDDLE	Total/NA	Water	SM 2540C	
MB 380-12469/1	Method Blank	Total/NA	Water	SM 2540C	
HLCS 380-12469/5	Lab Control Sample	Total/NA	Water	SM 2540C	
LCS 380-12469/4	Lab Control Sample	Total/NA	Water	SM 2540C	
MRL 380-12469/3	Lab Control Sample	Total/NA	Water	SM 2540C	

Lab Chronicle

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-14208-1

Client Sample ID: SRPDMW-1-DEEP

Lab Sample ID: 380-14208-1

Date Collected: 08/02/22 13:00

Matrix: Water

Date Received: 08/03/22 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	300.0		5	15277	P6LW	EA MON	08/04/22 03:23
Total/NA	Analysis	SM 2540C		1	12010	XLG4	EA MON	08/06/22 16:57

Client Sample ID: SRPDMW-1-MIDDLE

Lab Sample ID: 380-14208-2

Date Collected: 08/02/22 14:45

Matrix: Water

Date Received: 08/03/22 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	300.0		1	15277	P6LW	EA MON	08/04/22 02:58
Total/NA	Analysis	SM 2540C		1	12469	XLG4	EA MON	08/09/22 22:18

Client Sample ID: SRPDMW-1-SHALLOW

Lab Sample ID: 380-14208-3

Date Collected: 08/02/22 16:00

Matrix: Water

Date Received: 08/03/22 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	300.0		1	15277	P6LW	EA MON	08/04/22 03:11
Total/NA	Analysis	SM 2540C		1	12010	XLG4	EA MON	08/06/22 16:57

Laboratory References:

EA MON = Eurofins Eaton Monrovia, 750 Royal Oaks Drive, Suite 100, Monrovia, CA 91016, TEL (626)386-1100

Accreditation/Certification Summary

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-14208-1

Laboratory: Eurofins Eaton Monrovia

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	ISO/IEC 17025	5890.01 & 5890.02	06-30-23
Alabama	State	41060	01-31-23
Arizona	State	AZ0778	12-15-22
Arkansas (DW)	State	CA00006	01-31-23
California	State	2813	02-01-23
Colorado	State	CA00006	01-31-23
Connecticut	State	PH-0107	03-31-22 *
Delaware (DW)	State	CA00006	02-01-23
Florida	NELAP	E871024	06-30-23
Georgia (DW)	State	947	01-31-23
Guam	State	22-004R	04-21-23
Hawaii	State	CA00006	01-31-23
Hawaii (Micro)	State	CA00006	02-01-23
Idaho (DW)	State	CA00006	01-31-23
Idaho (Micro)	State	CA00006	03-31-23
Illinois	NELAP	200033	03-17-23
Indiana	State	C-CA-01	01-31-23
Iowa	State	413	07-01-23
Kansas	NELAP	E-10268	04-30-23
Kentucky (DW)	State	KY90107	12-31-22
Louisiana (DW)	State	LA008	12-31-22
Maine	State	CA00006	03-09-23
Maryland	State	224	12-31-22
Massachusetts	State	M-CA006	06-30-23
MI - RadChem Recognition	State	9906	02-01-23
Michigan	State	9906	02-01-23
Mississippi	State	CA2813	02-01-23
Montana (DW)	State	CERT0035	01-01-23
Nebraska	State	NE-OS-21-13	02-01-23
Nevada	State	CA00006	07-31-23
New Hampshire	NELAP	2959	03-29-23
New Jersey	NELAP	CA008	06-30-23
New Mexico	State	CA00006	01-31-23
New York	NELAP	11320	04-01-23
North Carolina (DW)	State	NC06701	07-31-23
North Dakota	State	R-009	01-31-23
Northern Mariana Islands (DW)	State	CA00006	01-31-23
Ohio	State	87786	01-31-23
Oregon	NELAP	4034	01-29-23
Pennsylvania	NELAP	68-00565	11-30-22
Puerto Rico	State	CA00006	11-10-22
Rhode Island	State	LAO00326	12-30-22
South Carolina	State	87016001	02-01-23
South Dakota (DW)	State	CA11320	02-01-23
Tennessee	State	TN02839	01-31-23
Texas	NELAP	T104704230-21-19	09-30-22
USEPA UCMR 3	US Federal Programs	CA00006	12-31-22
USEPA UCMR 4	US Federal Programs	CA00006	12-31-22
USEPA UCMR 5	US Federal Programs	CA00006	12-31-25
Utah	NELAP	CA00006	01-31-23

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins Eaton Monrovia

Accreditation/Certification Summary

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-14208-1

Laboratory: Eurofins Eaton Monrovia (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Vermont	State	VT-0114	12-28-22
Virginia	NELAP	460260	06-14-23
Washington	State	C838	03-14-23
Wyoming	State	8-TMS-L	11-30-22

Method Summary

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-14208-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	EPA	EA MON
SM 2540C	Solids, Total Dissolved (TDS)	SM	EA MON

Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

EA MON = Eurofins Eaton Monrovia, 750 Royal Oaks Drive, Suite 100, Monrovia, CA 91016, TEL (626)386-1100

Sample Summary

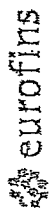
Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-14208-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
380-14208-1	SRPDMW-1-DEEP	Water	08/02/22 13:00	08/03/22 10:30
380-14208-2	SRPDMW-1-MIDDLE	Water	08/02/22 14:45	08/03/22 10:30
380-14208-3	SRPDMW-1-SHALLOW	Water	08/02/22 16:00	08/03/22 10:30

TAL-8210

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14



Eaton Analytical

INTERNAL CHAIN OF CUSTODY RECORD

SAMPLE TEMP RECEIVED:
Note: If samples are out of temperature range, let the ASMs know, ASMs will determine whether to proceed with analysis or not.
SAMPLES REC'D DAY OF COLLECTION? Yes / No

IR Gun ID = 401 (Observation = 1.6 °C) (Corr. Factor = 0.1 °C) (Final = 1.5 °C)

TYPE OF ICE: Real ☒ Synthetic ☐ No Ice ☐ CONDITION OF ICE: Frozen ☐ Partially Frozen ☒ Thawed ☐ N/A

METHOD OF SHIPMENT: Pick-Up / Walk-In / FedEx / UPS / DHL / Area Fast / Top Line / Other: _____

Compliance Acceptance Criteria:

- 1) Chemistry: >0, ≤6°C, not frozen (NELAP) (If received after 24 hrs of sample collection)
- 2) Microbiology, Distribution: < 10°C, not frozen (can be ≥10°C if received on ice the same day as sample collection, within 8 hours)
- 3) Microbiology, Surface Water: < 10°C (If received after 2 hours of sample collection)

If out of temperature range for both Chemistry and Microbiology samples and temperature does not confirm, then measure the temperature of each quadrant and record each temperature of the quadrants

1 = (Observation = °C) (Corr. Factor = °C) (Final = °C)	2 = (Observation = °C) (Corr. Factor = °C) (Final = °C)
3 = (Observation = °C) (Corr. Factor = °C) (Final = °C)	4 = (Observation = °C) (Corr. Factor = °C) (Final = °C)

4) Dioxin (1813 or 2,3,7,8 TCDD): must be between 0-4 °C, not frozen (If received after 24 hrs of sample collection)

5) pH Check. Manufacturer: _____ Lot Number: _____ pH strip type: 0 - 14 or _____ Expiration Date: _____ Results: _____

6) Chlorine check. Manufacturer: Sansafe. Lot No.: _____ Expiration Date: _____ Results: _____

7) Headspace: _____ No Samples with Headspace: _____ Samples with Headspace (see below): _____

Headspace Documentation (use additional VOA and Radon Internal COPC for additional bottles)

Exempt from headspace concerns: Methods 816.4, HAA(8251,852), 505, 8PME, @CH, 552LOMS, 856, 838, Anatoxin, LCMS methods using 40 ml Vials, International clients:

Samp ID	Bottle #	None/≤8	>8mm	Test	Samp ID	Bottle #	None/≤8	>8mm	Test

Note Sample IDs which have dissimilar headspace (i.e. potential sampling errors): _____

RECEIVED BY:	SIGNATURE	PRINT NAME	COMPANY/TITLE	DATE	TIME
	<i>Chris Brook</i>	Chris Brook	Eurofins Eaton Analytical	8-3-22	1030
SAMPLES CHECKED AGAINST COC BY:	SIGNATURE	PRINT NAME	COMPANY/TITLE	DATE	TIME
	<i>Andrew Wilson</i>	Andrew Wilson	Eurofins Eaton Analytical	8-3-22	1603

ORIGIN ID:MHRA (916) 596-0789
TREVOR KENT
GEI
2868 PROSPECT PARK DRIVE
SUITE 400
RANCHO CORDOVA, CA 95670
UNITED STATES US

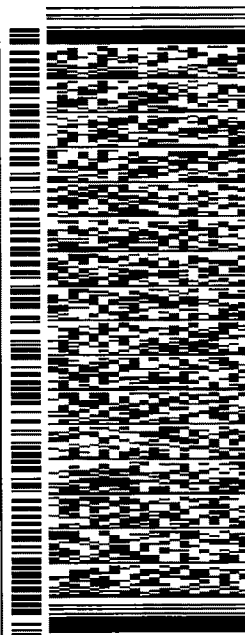
SHIP DATE: 25JUL22
ACTWGT: 10.00 LB
CAD: 106700140/NET4490
DIMMS: 15x9x14 IN
BILL SENDER

TO **JOE SANCHEZ**
EUROFINS EATON ANALYTICAL
750 ROYAL OAKS, STE 100

MONROVIA CA 91016

(626) 386-1100 REF OTHER

DEPT



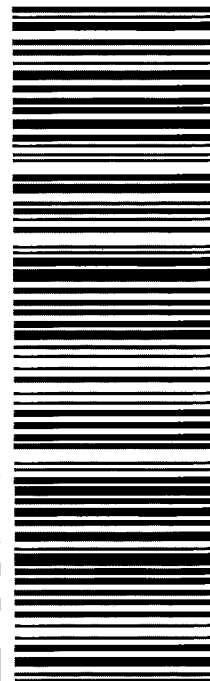
4220202041201UP

TUE - 26 JUL 10:30A
PRIORITY OVERNIGHT

TRK# **7774 4978 1200**

0201

92 WHPA
91016
BUR
CA-US



After printing this label:

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Login Sample Receipt Checklist

Client: GEI Consultants, Inc.

Job Number: 380-14208-1

Login Number: 14208

List Source: Eurofins Eaton Monrovia

List Number: 1

Creator: Carpenter, Kelly

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

ANALYTICAL REPORT

Eurofins Eaton Monrovia
750 Royal Oaks Drive
Suite 100
Monrovia, CA 91016
Tel: (626)386-1100

Laboratory Job ID: 380-10729-1

Client Project/Site: Sonoma Monitoring Wells

For:

GEI Consultants, Inc.
2868 Prospect Park Drive
Suite 400
Rancho Cordova, California 95670

Attn: Trevor Kent



Authorized for release by:

10/10/2022 3:18:52 PM

Lori Thompson, Project Manager I
(657)212-3035

Lori.Thompson@et.eurofinsus.com

Designee for

Monica Van Natta, Project Manager
(559)326-4396

Monica.VanNatta@et.eurofinsus.com

LINKS

Review your project
results through



Have a Question?



Visit us at:

www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

1. Laboratory is accredited in accordance with TNI 2016 Standards and ISO/IEC 17025:2017.
2. Laboratory certifies that the test results meet all TNI 2016 and ISO/IEC 17025:2017 requirements unless noted under the individual analysis
3. Test results relate only to the sample(s) tested.
4. This report shall not be reproduced except in full, without the written approval of the laboratory.
5. Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below. (DW,Water matrices)



Lori Thompson
Project Manager I
10/10/2022 3:18:52 PM

Table of Contents

Cover Page 1

Table of Contents 3

Definitions/Glossary 4

Case Narrative 5

Detection Summary 6

Client Sample Results 7

QC Sample Results 8

QC Association Summary 10

Lab Chronicle 11

Certification Summary 12

Method Summary 13

Sample Summary 14

Chain of Custody 15

Receipt Checklists 18



Definitions/Glossary

Client: GEI Consultants, Inc.
Project/Site: Sonoma Monitoring Wells

Job ID: 380-10729-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: GEI Consultants, Inc.
Project/Site: Sonoma Monitoring Wells

Job ID: 380-10729-1

Job ID: 380-10729-1

Laboratory: Eurofins Eaton Monrovia

Narrative

Job Narrative 380-10729-1

Comments

No additional comments.

Receipt

The samples were received on 6/25/2022 1:23 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.4° C.

HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: GEI Consultants, Inc.
Project/Site: Sonoma Monitoring Wells

Job ID: 380-10729-1

Client Sample ID: SRPDMW-2, Shallow

Lab Sample ID: 380-10729-1

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	34		0.50	0.015 mg/L	1		300.0	Total/NA
Total Dissolved Solids	240		20	8.4 mg/L	1		SM 2540C	Total/NA

Client Sample ID: SRPDMW-2, Middle

Lab Sample ID: 380-10729-2

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	22		0.50	0.015 mg/L	1		300.0	Total/NA
Total Dissolved Solids	280		20	8.4 mg/L	1		SM 2540C	Total/NA

Client Sample ID: SRPDMW-2, Deep

Lab Sample ID: 380-10729-3

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	43		1.0	0.029 mg/L	2		300.0	Total/NA
Total Dissolved Solids	430		20	8.4 mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Eaton Monrovia

Client Sample Results

Client: GEI Consultants, Inc.
Project/Site: Sonoma Monitoring Wells

Job ID: 380-10729-1

Client Sample ID: SRPDMW-2, Shallow

Lab Sample ID: 380-10729-1

Date Collected: 06/24/22 09:05

Matrix: Water

Date Received: 06/25/22 13:23

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	34		0.50	0.015 mg/L			06/28/22 21:14	1

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	240		20	8.4 mg/L			06/28/22 21:21	1

Client Sample ID: SRPDMW-2, Middle

Lab Sample ID: 380-10729-2

Date Collected: 06/24/22 11:15

Matrix: Water

Date Received: 06/25/22 13:23

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	22		0.50	0.015 mg/L			06/28/22 21:01	1

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	280		20	8.4 mg/L			06/28/22 21:21	1

Client Sample ID: SRPDMW-2, Deep

Lab Sample ID: 380-10729-3

Date Collected: 06/24/22 15:30

Matrix: Water

Date Received: 06/25/22 13:23

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	43		1.0	0.029 mg/L			06/28/22 21:27	2

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	430		20	8.4 mg/L			06/28/22 21:21	1

QC Sample Results

Client: GEI Consultants, Inc.
Project/Site: Sonoma Monitoring Wells

Job ID: 380-10729-1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 380-8600/4

Matrix: Water

Analysis Batch: 8600

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.015 mg/L			06/28/22 08:37	1

Lab Sample ID: MB 380-8600/40

Matrix: Water

Analysis Batch: 8600

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.50	0.015 mg/L			06/28/22 22:32	1

Lab Sample ID: LCS 380-8600/43

Matrix: Water

Analysis Batch: 8600

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	25.0	26.9		mg/L		107	90 - 110

Lab Sample ID: LCS 380-8600/7

Matrix: Water

Analysis Batch: 8600

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	25.0	26.3		mg/L		105	90 - 110

Lab Sample ID: LCSD 380-8600/44

Matrix: Water

Analysis Batch: 8600

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	25.0	27.2		mg/L		109	90 - 110	1	20

Lab Sample ID: LCSD 380-8600/8

Matrix: Water

Analysis Batch: 8600

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	25.0	26.6		mg/L		107	90 - 110	1	20

Lab Sample ID: MRL 380-8600/41

Matrix: Water

Analysis Batch: 8600

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	0.125	0.148	J	mg/L		119	50 - 150

Lab Sample ID: MRL 380-8600/5

Matrix: Water

Analysis Batch: 8600

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	0.125	0.140	J	mg/L		112	50 - 150

Eurofins Eaton Monrovia

QC Sample Results

Client: GEI Consultants, Inc.
Project/Site: Sonoma Monitoring Wells

Job ID: 380-10729-1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MRL 380-8600/6

Matrix: Water

Analysis Batch: 8600

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	0.500	0.473	J	mg/L		95	50 - 150

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 380-7182/1

Matrix: Water

Analysis Batch: 7182

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	4.2 mg/L			06/28/22 21:21	1

Lab Sample ID: HLCS 380-7182/5

Matrix: Water

Analysis Batch: 7182

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	HLCS Result	HLCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	700	712		mg/L		102	80 - 114

Lab Sample ID: LCS 380-7182/4

Matrix: Water

Analysis Batch: 7182

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	175	188		mg/L		107	80 - 114

Lab Sample ID: MRL 380-7182/3

Matrix: Water

Analysis Batch: 7182

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	10.0	13.0		mg/L		130	50 - 150

QC Association Summary

Client: GEI Consultants, Inc.
Project/Site: Sonoma Monitoring Wells

Job ID: 380-10729-1

HPLC/IC

Analysis Batch: 8600

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-10729-1	SRPDMW-2, Shallow	Total/NA	Water	300.0	
380-10729-2	SRPDMW-2, Middle	Total/NA	Water	300.0	
380-10729-3	SRPDMW-2, Deep	Total/NA	Water	300.0	
MB 380-8600/4	Method Blank	Total/NA	Water	300.0	
MB 380-8600/40	Method Blank	Total/NA	Water	300.0	
LCS 380-8600/43	Lab Control Sample	Total/NA	Water	300.0	
LCS 380-8600/7	Lab Control Sample	Total/NA	Water	300.0	
LCSD 380-8600/44	Lab Control Sample Dup	Total/NA	Water	300.0	
LCSD 380-8600/8	Lab Control Sample Dup	Total/NA	Water	300.0	
MRL 380-8600/41	Lab Control Sample	Total/NA	Water	300.0	
MRL 380-8600/5	Lab Control Sample	Total/NA	Water	300.0	
MRL 380-8600/6	Lab Control Sample	Total/NA	Water	300.0	

General Chemistry

Analysis Batch: 7182

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-10729-1	SRPDMW-2, Shallow	Total/NA	Water	SM 2540C	
380-10729-2	SRPDMW-2, Middle	Total/NA	Water	SM 2540C	
380-10729-3	SRPDMW-2, Deep	Total/NA	Water	SM 2540C	
MB 380-7182/1	Method Blank	Total/NA	Water	SM 2540C	
HLCS 380-7182/5	Lab Control Sample	Total/NA	Water	SM 2540C	
LCS 380-7182/4	Lab Control Sample	Total/NA	Water	SM 2540C	
MRL 380-7182/3	Lab Control Sample	Total/NA	Water	SM 2540C	

Lab Chronicle

Client: GEI Consultants, Inc.
Project/Site: Sonoma Monitoring Wells

Job ID: 380-10729-1

Client Sample ID: SRPDMW-2, Shallow

Lab Sample ID: 380-10729-1

Date Collected: 06/24/22 09:05

Matrix: Water

Date Received: 06/25/22 13:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	300.0		1	8600	P6LW	EA MON	06/28/22 21:14
Total/NA	Analysis	SM 2540C		1	7182	XLG4	EA MON	06/28/22 21:21

Client Sample ID: SRPDMW-2, Middle

Lab Sample ID: 380-10729-2

Date Collected: 06/24/22 11:15

Matrix: Water

Date Received: 06/25/22 13:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	300.0		1	8600	P6LW	EA MON	06/28/22 21:01
Total/NA	Analysis	SM 2540C		1	7182	XLG4	EA MON	06/28/22 21:21

Client Sample ID: SRPDMW-2, Deep

Lab Sample ID: 380-10729-3

Date Collected: 06/24/22 15:30

Matrix: Water

Date Received: 06/25/22 13:23

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	300.0		2	8600	P6LW	EA MON	06/28/22 21:27
Total/NA	Analysis	SM 2540C		1	7182	XLG4	EA MON	06/28/22 21:21

Laboratory References:

EA MON = Eurofins Eaton Monrovia, 750 Royal Oaks Drive, Suite 100, Monrovia, CA 91016, TEL (626)386-1100

Accreditation/Certification Summary

Client: GEI Consultants, Inc.
Project/Site: Sonoma Monitoring Wells

Job ID: 380-10729-1

Laboratory: Eurofins Eaton Monrovia

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2813	02-01-23

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Method Summary

Client: GEI Consultants, Inc.
Project/Site: Sonoma Monitoring Wells

Job ID: 380-10729-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	EPA	EA MON
SM 2540C	Solids, Total Dissolved (TDS)	SM	EA MON

Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

EA MON = Eurofins Eaton Monrovia, 750 Royal Oaks Drive, Suite 100, Monrovia, CA 91016, TEL (626)386-1100

Sample Summary

Client: GEI Consultants, Inc.
Project/Site: Sonoma Monitoring Wells

Job ID: 380-10729-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
380-10729-1	SRPDMW-2, Shallow	Water	06/24/22 09:05	06/25/22 13:23
380-10729-2	SRPDMW-2, Middle	Water	06/24/22 11:15	06/25/22 13:23
380-10729-3	SRPDMW-2, Deep	Water	06/24/22 15:30	06/25/22 13:23

1

2

3

4

5

6

7

8

9

10

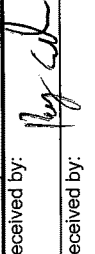
11

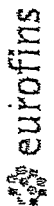
12

13

14

Address:

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:		Project Manager: Trevor Kent Tel/Email: TREVOR@CONSULTANTS.COM		Site Contact: Monica Lombardi Lab Contact: Monica Lombardi Date: 6/24/2022 Carrier: FedEx		COC No.: _____ of _____ COCs Sampler: M. Chokewindski For Lab Use Only: Walk-in Client: _____ Lab Sampling: _____ Job / SDG No.: _____	
Client Contact Company Name: GFI Consultants, Inc. Address: 2868 Prospect Park Dr, Suite 40 City/State/Zip: Rancho Cordova CA, 95670 Phone: (916) 596-0789 Fax: _____ Project Name: Sonoma Monitoring Wells Site: SRPDMW-2 P O # _____		Analysis Turnaround Time ☐ CALENDAR DAYS ☒ WORKING DAYS TAT if different from Below _____ ☐ 2 weeks ☒ 1 week ☐ 2 days ☐ 1 day		Filtered Sample (Y/N) Perform MS / MSD (Y/N)		Sample Specific Notes:	
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sample Specific Notes:
SRPDMW-2, Shallow		6/24	0905	G	GW	2	
SRPDMW-2, Middle		6/24	1115	G	GW	2	
SRPDMW-2, Deep		6/24	1530	G	GW	2	
 380-10729 COC							
Preservation Used: (1=Ice, 2=HCl, 3=H2SO4, 4=HNO3, 5=NaOH, 6=Other) _____							
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.							
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown							
Special Instructions/QC Requirements & Comments:							
Custody Seals Intact: ☐ Yes ☐ No		Custody Seal No.: _____		Cooler Temp. (°C): Obs'd: _____ Cor'd: _____		Therm ID No.: _____	
Relinquished by: 		Company: GFI Consultants		Received by: 		Company: GFI	
Relinquished by: _____		Company: _____		Received by: _____		Company: _____	
Relinquished by: _____		Company: _____		Received by: _____		Company: _____	



INTERNAL CHAIN OF CUSTODY RECORD

SAMPLE TEMP RECEIVED:

Note: If samples are out of temperature range, let the ASMs know, ASMs will determine whether to proceed with analysis or not.

SAMPLES REC'D DAY OF COLLECTION?		Yes / No
1	2	
3	4	
5	6	
7	8	
9	10	
11	12	
13	14	
15	16	
17	18	
19	20	
21	22	
23	24	
25	26	
27	28	
29	30	
31	32	
33	34	
35	36	
37	38	
39	40	
41	42	
43	44	
45	46	
47	48	
49	50	
51	52	
53	54	
55	56	
57	58	
59	60	
61	62	
63	64	
65	66	
67	68	
69	70	
71	72	
73	74	
75	76	
77	78	
79	80	
81	82	
83	84	
85	86	
87	88	
89	90	
91	92	
93	94	
95	96	
97	98	
99	100	

636A
 IR Gun ID = 2.6 °C (Corr. Factor = 0.2 °C) (Final = 2.4 °C)

TYPE OF ICE: Real ☒ Synthetic ☐ No Ice ☒ CONDITION OF ICE: Frozen ☒ Partially Frozen ☐ Thawed ☐ N/A ☐

METHOD OF SHIPMENT: Pick-Up / Walk-In / ☒ FedEx / ☒ UPS / DHL / Area Fast / Top Line / Other: _____

Compliance Acceptance Criteria:

- 1) Chemistry: >0, ≤ 6°C, not frozen (NELAP) (If received after 24 hrs of sample collection)
- 2) Microbiology, Distribution: < 10°C, not frozen (can be ≥ 10°C if received on ice the same day as sample collection, within 8 hours)
- 3) Microbiology, Surface Water: < 10°C (If received after 2 hours of sample collection)

If out of temperature range for both Chemistry and Microbiology samples and temperature does not confirm, then measure the temperature of each quadrant and record each temperature of the quadrants

1 = (Observations_____ '0) (Corr.Factor_____ '0) (Final =_____ '0)	2 = (Observations_____ '0) (Corr.Factor_____ '0) (Final =_____ '0)
3 = (Observations_____ '0) (Corr.Factor_____ '0) (Final =_____ '0)	4 = (Observations_____ '0) (Corr.Factor_____ '0) (Final =_____ '0)

- 4 Dioxin (1613 or 2,3,7,8 TCDD): must be between 0-4 °C, not frozen (if received after 24 hrs of sample collection)
- 5) pH Check. Manufacturer: _____ Lot Number: _____ pH strip type: 0 - 14 or _____ Expiration Date: _____ Results: _____
- 6) Chlorine check. Manufacturer: Sansafe. Lot No.: _____ Expiration Date: _____ Results: _____

VOA and Radon

No Samples with Headspace:

Samples with Headspace (see below):

1. Concentration (use additional VOC and Radon Internal COFC for additional bottles)

HeadSpace Documentation (use additional Vials and NaOH solution for additional vials, international clients: 505 SPME, 532 LCMS, 536, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290

Samp ID	Bottle #	None/<8 mm	>8mm mm	Teal
1	1			
2	2			
3	3			
4	4			
5	5			
6	6			
7	7			
8	8			
9	9			
10	10			
11	11			
12	12			
13	13			
14	14			
15	15			
16	16			
17	17			
18	18			
19	19			
20	20			
21	21			
22	22			
23	23			
24	24			
25	25			
26	26			
27	27			
28	28			
29	29			
30	30			
31	31			
32	32			
33	33			
34	34			
35	35			
36	36			
37	37			
38	38			
39	39			
40	40			
41	41			
42	42			
43	43			
44	44			
45	45			
46	46			
47	47			
48	48			
49	49			
50	50			
51	51			
52	52			
53	53			
54	54			
55	55			
56	56			
57	57			
58	58			
59	59			
60	60			
61	61			
62	62			
63	63			
64	64			
65	65			
66	66			
67	67			
68	68			
69	69			
70	70			
71	71			
72	72			
73	73			
74	74			
75	75			
76	76			
77	77			
78	78			
79	79			
80	80			
81	81			
82	82			
83	83			
84	84			
85	85			
86	86			
87	87			
88	88			
89	89			
90	90			
91	91			
92	92			
93	93			
94	94			
95	95			
96	96			
97	97			
98	98			
99	99			
100	100			

[illegible]

Do which have dissimilar headspace (i.e. potential sampling errors):

SIGNATURE

PRINT NAME

CONFIDENTIAL

2

1

9157411BF

PRINT NAME

COMPANY/TITLE

DATE _____

STAFF

ORIGIN ID: MHRA (916) 596-0789
TREVOR KENT
GEI
2668 PROSPECT PARK DRIVE
SUITE 400
RANCHO CORDOVA, CA 95670
UNITED STATES US

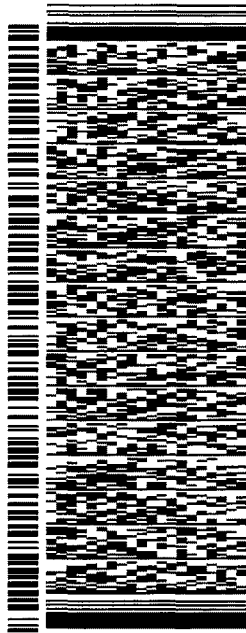
SHIP DATE: 24JUN22
ACTWGT: 20.00 LB
CAD: 106700140MINET4490
DIMS: 15x9x14 IN
BILL SENDER

TO **JOE SANCHEZ**
EUROFINS EATON ANALYTICAL
750 ROYAL OAKS, STE 100

MONROVIA CA 91016
(626) 366-1100
INV
PO

REF OTHER

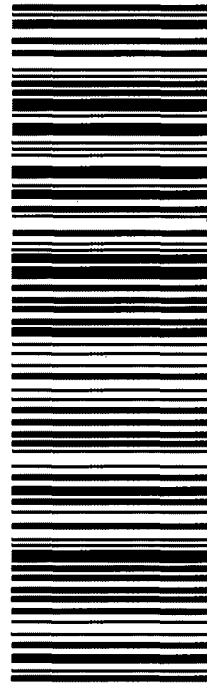
DEPT



SATURDAY 12:00P
PRIORITY OVERNIGHT

TRK# 7772 2262 8591
0201

W0 WHPA
91016
BUR
CA-US



After printing this label:

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$1,000, e.g., jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Login Sample Receipt Checklist

Client: GEI Consultants, Inc.

Job Number: 380-10729-1

Login Number: 10729

List Number: 2

Creator: Sullivan, Taylor

List Source: Eurofins Eaton Monrovia

Question	Answer	Comment
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Samples do not require splitting or compositing.	True	
Container provided by EEA	True	

ANALYTICAL REPORT

Eurofins Eaton Monrovia
750 Royal Oaks Drive
Suite 100
Monrovia, CA 91016
Tel: (626)386-1100

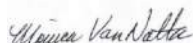
Laboratory Job ID: 380-3238-1

Client Project/Site: Sonoma MW-TA Sac

For:

GEI Consultants, Inc.
2868 Prospect Park Drive
Suite 400
Rancho Cordova, California 95670

Attn: Trevor Kent



Authorized for release by:

6/21/2022 5:51:36 PM

Monica Van Natta, Project Manager
(559)326-4396

Monica.VanNatta@et.eurofinsus.com

LINKS

Review your project
results through



Have a Question?



Visit us at:

www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

1. Laboratory is accredited in accordance with TNI 2016 Standards and ISO/IEC 17025:2017.
2. Laboratory certifies that the test results meet all TNI 2016 and ISO/IEC 17025:2017 requirements unless noted under the individual analysis
3. Test results relate only to the sample(s) tested.
4. This report shall not be reproduced except in full, without the written approval of the laboratory.
5. Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below. (DW,Water matrices)



Monica Van Natta
Project Manager
6/21/2022 5:51:36 PM

Table of Contents

Cover Page	1
Table of Contents	3
Definitions/Glossary	4
Case Narrative	5
Detection Summary	6
Client Sample Results	7
QC Sample Results	8
QC Association Summary	9
Lab Chronicle	10
Certification Summary	11
Method Summary	12
Sample Summary	13
Chain of Custody	14
Field Data Sheets	15
Receipt Checklists	16



Definitions/Glossary

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-3238-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-3238-1

Job ID: 380-3238-1

Laboratory: Eurofins Eaton Monrovia

Narrative

Job Narrative 380-3238-1

Comments

No additional comments.

Receipt

The samples were received on 6/8/2022 9:38 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.2° C.

Receipt Exceptions

The container label for the following sample(s) did not match the information listed on the Chain-of-Custody (COC):
Sample 1, both containers have ID as shallow, SRPDMW-3 but COC has the ID as SRPDMW-3, shallow.

SRPDMW-3, Shallow (380-3238-1).

General Chemistry

Method SM 2540C: The following samples in analytical batch 320-594540 were diluted due to the nature of the sample matrix: SRPDMW-3, Deep (380-3238-3). Elevated reporting limits (RLs) are provided.

Method SM 2540C: The following samples in analytical batch 320-594540 were analyzed outside of analytical holding time with client's approval. SRPDMW-3, Shallow (380-3238-1), SRPDMW-3, Middle (380-3238-2) and SRPDMW-3, Deep (380-3238-3). Total Dissolved Solids was being requested on the last day of the holding time. As such, the laboratory had insufficient time to perform the analysis within holding time.

Method 300.0: The following samples in analytical batch 320-595920 were diluted due to the nature of the sample matrix: SRPDMW-3, Shallow (380-3238-1), SRPDMW-3, Middle (380-3238-2) and SRPDMW-3, Deep (380-3238-3). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-3238-1

Client Sample ID: SRPDMW-3, Shallow

Lab Sample ID: 380-3238-1

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	130		10	3.7 mg/L	10		300.0	Total/NA
Total Dissolved Solids	510	H	10	5.4 mg/L	1		SM 2540C	Total/NA

Client Sample ID: SRPDMW-3, Middle

Lab Sample ID: 380-3238-2

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	100		10	3.7 mg/L	10		300.0	Total/NA
Total Dissolved Solids	440	H	10	5.4 mg/L	1		SM 2540C	Total/NA

Client Sample ID: SRPDMW-3, Deep

Lab Sample ID: 380-3238-3

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	17		10	3.7 mg/L	10		300.0	Total/NA
Total Dissolved Solids	360	H	40	22 mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Eaton Monrovia

Client Sample Results

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-3238-1

Client Sample ID: SRPDMW-3, Shallow

Lab Sample ID: 380-3238-1

Date Collected: 06/01/22 08:20

Matrix: Water

Date Received: 06/08/22 09:38

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	130		10	3.7 mg/L			06/16/22 16:21	10

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	510	H	10	5.4 mg/L			06/10/22 13:54	1

Client Sample ID: SRPDMW-3, Middle

Lab Sample ID: 380-3238-2

Date Collected: 06/01/22 09:23

Matrix: Water

Date Received: 06/08/22 09:38

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	100		10	3.7 mg/L			06/16/22 16:40	10

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	440	H	10	5.4 mg/L			06/10/22 13:54	1

Client Sample ID: SRPDMW-3, Deep

Lab Sample ID: 380-3238-3

Date Collected: 06/01/22 10:14

Matrix: Water

Date Received: 06/08/22 09:38

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	17		10	3.7 mg/L			06/16/22 17:00	10

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	360	H	40	22 mg/L			06/10/22 13:54	1

QC Sample Results

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-3238-1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 320-595920/3

Matrix: Water

Analysis Batch: 595920

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.37 mg/L			06/16/22 12:26	1

Lab Sample ID: LCS 320-595920/4

Matrix: Water

Analysis Batch: 595920

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	7.50	7.54		mg/L		101	90 - 110

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 320-594540/1

Matrix: Water

Analysis Batch: 594540

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	5.4 mg/L			06/10/22 13:54	1

Lab Sample ID: LCS 320-594540/2

Matrix: Water

Analysis Batch: 594540

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	415	366		mg/L		88	80 - 120

QC Association Summary

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-3238-1

HPLC/IC

Analysis Batch: 595920

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-3238-1	SRPDMW-3, Shallow	Total/NA	Water	300.0	
380-3238-2	SRPDMW-3, Middle	Total/NA	Water	300.0	
380-3238-3	SRPDMW-3, Deep	Total/NA	Water	300.0	
MB 320-595920/3	Method Blank	Total/NA	Water	300.0	
LCS 320-595920/4	Lab Control Sample	Total/NA	Water	300.0	

General Chemistry

Analysis Batch: 594540

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-3238-1	SRPDMW-3, Shallow	Total/NA	Water	SM 2540C	
380-3238-2	SRPDMW-3, Middle	Total/NA	Water	SM 2540C	
380-3238-3	SRPDMW-3, Deep	Total/NA	Water	SM 2540C	
MB 320-594540/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 320-594540/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Lab Chronicle

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-3238-1

Client Sample ID: SRPDMW-3, Shallow

Lab Sample ID: 380-3238-1

Date Collected: 06/01/22 08:20

Matrix: Water

Date Received: 06/08/22 09:38

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10	595920	06/16/22 16:21	Y1S	TAL SAC
Total/NA	Analysis	SM 2540C		1	594540	06/10/22 13:54	KMW	TAL SAC

Client Sample ID: SRPDMW-3, Middle

Lab Sample ID: 380-3238-2

Date Collected: 06/01/22 09:23

Matrix: Water

Date Received: 06/08/22 09:38

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10	595920	06/16/22 16:40	Y1S	TAL SAC
Total/NA	Analysis	SM 2540C		1	594540	06/10/22 13:54	KMW	TAL SAC

Client Sample ID: SRPDMW-3, Deep

Lab Sample ID: 380-3238-3

Date Collected: 06/01/22 10:14

Matrix: Water

Date Received: 06/08/22 09:38

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10	595920	06/16/22 17:00	Y1S	TAL SAC
Total/NA	Analysis	SM 2540C		1	594540	06/10/22 13:54	KMW	TAL SAC

Laboratory References:

TAL SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-3238-1

Laboratory: Eurofins Sacramento

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2897	01-31-23

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Method Summary

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-3238-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL SAC
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL SAC

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

TAL SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: GEI Consultants, Inc.
Project/Site: Sonoma MW-TA Sac

Job ID: 380-3238-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
380-3238-1	SRPDMW-3, Shallow	Water	06/01/22 08:20	06/08/22 09:38
380-3238-2	SRPDMW-3, Middle	Water	06/01/22 09:23	06/08/22 09:38
380-3238-3	SRPDMW-3, Deep	Water	06/01/22 10:14	06/08/22 09:38

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15



Environment Testing
TestAmerica

Sacramento
Sample Receiving Notes



380-3238 Field Sheet

Tracking #: _____

Job: _____

SO / PO / FO / SAT / 2-Day / Ground / UPS / CDO / Courier

GSO / OnTrac / Goldstreak / USPS / Other _____

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations.
File in the job folder with the COC.

Therm. ID: L-09 Corr. Factor: (+/-) 0 °C

Ice ☒ Wet ☒ Gel _____ Other _____

Cooler Custody Seal: _____

Cooler ID: _____

Temp Observed: 1.2 °C Corrected: 1.2 °C

From: Temp Blank ☐ Sample ☒

Opening/Processing The Shipment

Cooler compromised/tampered with? Yes ☐ No ☒ NA ☐

Cooler Temperature is acceptable? ☒ Yes ☐ No ☐ NA ☐

Frozen samples show signs of thaw? ☐ Yes ☐ No ☒ NA ☐

Initials: NC Date: 6-2-22

Unpacking/Labeling The Samples

COC is complete w/o discrepancies? ☒ Yes ☐ No ☐ NA ☐

Samples compromised/tampered with? ☐ Yes ☒ No ☐ NA ☐

Containers are not broken or leaking? ☒ Yes ☐ No ☐ NA ☐

Sample custody seal? ☐ Yes ☐ No ☒ NA ☐

Sample containers have legible labels? ☒ Yes ☐ No ☐ NA ☐

Sample date/times are provided? ☒ Yes ☐ No ☐ NA ☐

Appropriate containers are used? ☒ Yes ☐ No ☐ NA ☐

Sample bottles are completely filled? ☒ Yes ☐ No ☐ NA ☐

Sample preservatives verified? ☐ Yes ☐ No ☒ NA ☐

Is the Field Sampler's name on COC? ☐ Yes ☒ No ☐ NA ☐

Samples require splitting/compositing? ☐ Yes ☐ No ☒ NA ☐

Samples w/o discrepancies? ☐ Yes ☒ No ☐ NA ☐

Zero headspace?* ☐ Yes ☐ No ☒ NA ☐

Alkalinity has no headspace? ☐ Yes ☐ No ☒ NA ☐

Perchlorate has headspace? ☐ Yes ☐ No ☒ NA ☐

(Methods 314, 331, 6850)

Multiphasic samples are not present? ☒ Yes ☐ No ☐ NA ☐

*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

Initials: SO Date: 6-9-22

Notes: _____

Trizma Lot #(s): _____

Login Completion

Receipt Temperature on COC? Yes ☒ No ☐ NA ☐

Samples received within hold time? ☒ Yes ☐ No ☐ NA ☐

NCM Filed? ☒ Yes ☐ No ☐ NA ☐

Log Release checked in TALS? ☐ Yes ☐ No ☒ NA ☐

Initials: SO Date: 6-9-22

Login Sample Receipt Checklist

Client: GEI Consultants, Inc.

Job Number: 380-3238-1

Login Number: 3238

List Source: Eurofins Eaton Monrovia

List Number: 1

Creator: Sanchez, Joseph G

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ ($1/4''$).	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: GEI Consultants, Inc.

Job Number: 380-3238-1

Login Number: 3238

List Number: 2

Creator: Oropeza, Salvador

List Source: Eurofins Sacramento

List Creation: 06/09/22 01:06 PM

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ ($1/4''$).	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	