
Appendix G3

Lassen Groundwater Well Evaluation

April 16, 2024

12335_19_2

Arthur J. Wylene, General Counsel
Rural Country Representatives of California
1215 K Street, Suite 1650
Sacramento, CA 95814

Subject: Groundwater Well Assessment – 653-800 Washington Ave. Bieber, California 96009

REVISED April 22, 2024

Dear Arthur J. Wylene:

This letter report presents the results of a groundwater well assessment performed for an onsite well (Well 1) at 653-800 Washington Ave. Bieber, California 96009, on Accessor Parcel Number (APN) 001-270-80-11 (Site). The assessment was conducted to determine the feasibility of using Well 1 to serve as a source of groundwater for a proposed project on the Site. The assessment included a downhole video survey and a 24-hour constant rate pump test to estimate the capacity of Well 1 using the existing pump and to estimate the projected drawdown in the well. Drawdown projections were also calculated to estimate the long-term water level response to pumping and determine if the well can feasibly produce the proposed project's total annual water demand of 46.85 acre-feet per year.

Well 1 is located along the eastern border of the Site at latitude 41.0943703, longitude -121.1751618 (Figure 1). Well 1 is an operational well that services various industrial activities at the Site.

1 Hydrogeologic Conditions

The Site is located within the Big Valley Groundwater Basin (Basin), categorized by the Department of Water Resources (DWR) as Basin 5-004 (Figure 2). The principal aquifer in the Basin is characterized as consisting of gravels and sand up to 1,200 feet deep, although these materials may extend up to 7,000 feet in portions of the Basin (Lassen County and Modoc County 2021)¹. The aquifer also includes semi-consolidated layers of clay, silt, sand, gravel, and diatomite (Lassen County and Modoc County 2021). The thickness of water bearing material thins towards the edges of the Basin, which includes the area where the Site is located (Lassen County and Modoc County 2021). The surficial geology at the Site and in the immediate vicinity is mapped as Quaternary lake deposits (CDMG 1958)². Hard rock characterized as tertiary volcanics (basalt) is mapped approximately 1.5 miles west of the Site, is not considered water bearing material, and therefore is not included in the Basin.

¹ Lassen County and Modoc County, 2021. Big Valley Groundwater Sustainability Plan.

² CDMS, (California Division of Mines and Geology) 1958. Geologic Map of California: Alturas sheet. Gay, T.E, and Aune, Q.A. Geologic Atlas of California GAM-01, 1:250,000. https://ngmdb.usgs.gov/Prodesc/proddesc_282.htm

The lithology documented in well completion reports from wells drilled near the Site predominantly consists of sand, clay, sandstone, and volcanic material (Dudek 2023)³. Initial estimated yields from wells documented near the Site range from 5 gallons per minute (gpm) to 150 gpm, with the exception one well located approximately $\frac{3}{4}$ mile northeast of the site, which had a documented estimated yield of 1,500 gpm in the DWR report (Dudek 2023).

The Basin is considered a medium priority basin, as defined in the 2018 update to DWR Bulletin 118 and is subject to Sustainable Groundwater Management Act guidance. The Big Valley Groundwater Sustainability Agency (GSA) includes the County of Modoc GSA and County of Lassen GSA. The GSA prepared a Groundwater Sustainability Plan (GSP) in 2021. The Big Valley Groundwater Sustainability Plan is currently under revision by the GSA after it was deemed incomplete by DWR in October 2023.

There is one groundwater level monitoring well (Well 38N07E32A002M)⁴ located to the east of the Site (Figure 2). The period of record for groundwater level monitoring in this well is from 1959 to 2023. Groundwater levels in this well are relatively close to ground surface and fluctuate between ground surface and 12 feet below ground surface (bgs), with the lower groundwater levels recorded in the fall and higher groundwater levels recorded in the spring following winter precipitation (Figure 3).

Groundwater levels in Well 1 were recorded during groundwater investigative field work in September 2023 and March 2024. The lowest recorded groundwater level measurement of 63.93 feet bgs was recorded on September 28, 2023 (equivalent to a fall measurement), and the highest recorded groundwater level measurement of 46.8 feet bgs was recorded on March 25, 2024 (equivalent to a spring measurement). Based on the long-term record of groundwater level measurements in the nearby monitoring wells, it is reasonable to assume that groundwater levels on and near the Site likely follow a similar seasonal trend of higher groundwater levels in the spring, and a lower groundwater levels in the fall. Long-term groundwater level monitoring of Well 1 can provide additional information on groundwater level trends at the Site.

2 Previous Work

Dudek performed an initial site inspection and data review in September 2023. A Preliminary Groundwater Well Evaluation (Evaluation) was provided to the client on October 20, 2023, and is included as Attachment A. The Evaluation included the findings of the desktop study and site reconnaissance. The desktop study identified nine (9) well completion reports from the DWR database for wells located on and near the Site. The site reconnaissance identified one (1) groundwater well on the Site (Well 1). Information from well completion reports did not match surface construction characteristics for Well 1. The Evaluation recommended performing a video survey and production rate testing at Well 1. Personal communication with onsite personnel indicated that the Well 1 produces approximately 100 gpm to 167 gpm, that the well was onsite 20 years ago when the property was purchased, and that the only known repairs were to the pump, but the date of these repairs are unknown.

An offsite well was identified to the north of the Site during the initial site inspection. The Evaluation recommended using the offsite well as a monitoring well during production rate testing at Well 1. The well owner was contacted,

³ Dudek, 2023. Memorandum - Preliminary Groundwater Well Evaluation - 55100 Roosevelt Property. (Attachment A). *Note that address changed from 55100 Roosevelt to 653-800 Washington Ave.*

⁴ SGMA Data Viewer. <https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#gwlevels>. Accessed March 4, 2024. Site Code 410950N1211839W001.

and access was granted to monitor the offsite well, but there was no access port for monitoring water levels at the well head and therefore the offsite well was not used as a monitoring well.

3 Video Survey

Dudek's contractor, Your H2O Pro of Janesville, California, removed the existing pump in Well 1 on February 8, 2024. The equipment removed included 90 feet of 5-inch diameter column pipe, 84 feet of 4-inch diameter column pipe, a Berkely 6T15-250 pump (Serial number B64059 with date code 1989), and pump cable. The pump curve for the existing pump is included as Attachment B. The total depth of the well was recorded at 337 feet bgs and the pump was set at a depth of 175 feet bgs.

A downhole video survey was performed by Your H2O Pro on February 27, 2024, but visibility was poor due to poor water clarity and the quality of the equipment used. Dudek contracted Pacific Surveys of Upland, California, to perform a second video survey of the well on March 14, 2024. The video survey report provided by Pacific Surveys is included as Attachment C. On March 19, 2024, Your H2O Pro reinstalled the submersible pump in Well 1 to a depth of 175 feet bgs and installed a 1.5-inch sounding tube to the top of the pump (175 feet bgs) to allow for water level measurements during pump testing.

3.1 Video Survey Observations

Well 1 is constructed with 72.5 feet of 12-inch internal diameter steel casing from ground surface to 72.5 feet bgs, and 264.3 feet of approximately 10-inch steel casing from 72.5 feet to 336.8 feet bgs. The downhole video camera came to a stop on fill material encountered at 336.8 feet bgs (total observable depth). Casing perforations were not observed in the video survey until a depth of 334.2 feet bgs, approximately 3 feet from the observable bottom of the well. The casing perforations appear to be torch cut vertical slots. Scale was observed on the casing walls for the entire length of the well, and increased between a depth of approximately 180 feet bgs and the total depth of 336.8 feet bgs. Casing perforations may extend below 336.8 feet bgs, however that was not seen in the video survey due to the presence of fill material in the bottom of the well. Additionally, there is potential that perforations exist above a depth of 334.2 feet bgs, but were not visible in the video survey performed and were potentially obstructed due to scale on the casing.

The well casing shows signs of age and deterioration. Care should be taken while conducting downhole work in the well (removing and reinstalling pump equipment). Well rehabilitation may be an option to remove fill in the bottom of the well and to remove scale to open perforations and increase flow to the well. However, due to the casing deterioration observed during the video survey, there is a high likelihood that rehabilitation activities may damage the casing and render the well unusable.

A Dropbox link to the video survey is provided below:

<https://www.dropbox.com/scl/fo/hrhqo5ld0f1ag2089je0n/h?rlkey=sqzuhlrbqu7m3qq4pwocztzp&dl=0>

Well construction details observed during the video survey did not match information from DWR well completion reports for wells on or near the Site. Well 1 is located on a concrete pad, but the presence of a sanitary seal extending to a depth of 50 feet bgs (as required for drinking water wells) could not be confirmed.

4 Production Rate Testing

4.1 Testing Procedures

A 24-hour constant rate pump test was performed on Well 1 from March 27, 2024, to March 28, 2024. Your H2O Pro supplied a 6-inch totalizing flow meter, valve, 10 feet of discharge pipe and 30 feet of discharge hose for the test. Dudek hydrogeologist, Nicole Tucker, conducted onsite testing activities. An Insitu pressure transducer was installed in a 1.5-inch PVC sounding tube to a depth of 175 bgs and programmed to record water level measurements every 15 seconds. An Insitu barometric pressure transducer was placed at the wellhead to correct barometric variations recorded with the downhole pressure transducer. Power was supplied to the pump from an electrical meter near the well. The pump used during testing was the existing pump that was installed before work on the well began. The existing pump is a Berkely 6T15-250 pump that is set to 175 feet bgs on 5-inch and 4-inch column pipe. Groundwater was discharged to the adjacent field to the west of Well 1 during testing. An electric sounder was used to measure manual depth-to-water measurements during testing and to convert pressure readings from the pressure transducer to depth-to-water measurements.

Well 1 was pumped at an average rate of 180 gpm for 24 hours. Groundwater recovery was measured using the transducer for 24 hours after the pump was shut off.

4.2 Results and Analysis

Depth to water measurements for Well 1 were plotted against time and is presented in Figure 4. Static water level recorded in Well 1 before the constant rate test was measured at 47 feet bgs. Field staff attempted to maintain a constant flow rate using a gate valve on the discharge pipe. Although the flow rate was continuously modified to maintain a relatively constant rate, the rate fluctuated periodically between 200 gpm and 170 gpm. The average flow rate for the test was 180 gpm during the 24-hour pump test period. Depth to water in Well 1 after 24 hours of pumping was measured at 74.15 feet bgs (equivalent to 27.15 feet of drawdown). Approximately 24 hours after the pump was shut off, the recovered water level in Well 1 was measured at 48.3 feet bgs. There was 1.3 feet of residual drawdown and 95.2% recovery to the pre-test static water level 24 hours after shutdown (Figure 5).

Recovery was also plotted against time since pumping started (t) over time since pumping stopped (t'). A trend line passing through the late time drawdown measurements of t/t' is approximately equal to 1, indicating that recovery is nearly complete, and no major constant head boundary or residual drawdown was encountered over this testing and recovery period (Figure 6).

Drawdown data was plotted on a semi-log plot of depth to water vs elapsed time in minutes. A straight line was fit to the semi-log drawdown curve to project drawdown over time (Figure 4). The straight line was extended to 59 days and 1 year. The extension of the line to 59 days represents the number of days the well would need to be pumped continuously at the tested rate of 180 gpm to achieve the total annual water demand of 46.85 acre-feet per year. The straight-line drawdown projection estimates that the depth to water would drop to approximately 76.2 feet bgs (approximate drawdown of 29.2 feet) after 59 days of continuous pumping at 180 gpm and approximately 77 feet bgs (approximate drawdown of 30 feet) after 1 year of continuous pumping at 180 gpm. These projections are estimates only and the assumptions listed in Section 4.2.1 are made for long-term planning purposes.

4.2.1 Assumptions

The assumptions for the analysis of the Well 1 pump test are included below:

- Static non-pumping water levels are similar to water levels measured when the 24-hour test occurred.
- No barriers to flow (i.e. faults, other boundary conditions) will be encountered during long-term pumping.
- Drawdown as a result of pumping at a constant rate for 24 hours is representative of long-term pumping.
- Water level recovery observed during testing will remain consistent in the future.
- Pumping at offsite wells does not affect groundwater production at Well 1.
- There will not be year over year net decline in water levels during long-term pumping to meet project demand.

It should also be noted that pump testing at Well 1 occurred during the wet season. Surface water was observed in low lying areas on the Site. Groundwater extraction during the wet season may not be representative of pumping and water level response during the dry season.

5 Summary and Conclusions

Well 1 was pumped for approximately 24 hours at an average rate of 180 gpm. Approximately 27.15 feet of drawdown was observed during pumping. Groundwater levels recovered to approximately 1.3 feet below the static water level measurement recorded before pumping began, indicating approximately 95.2% recovery within 24 hours since the pump was turned off. Groundwater level projections using the 24-hour constant rate data show that there is available groundwater production from Well 1 to meet the annual water demand of 46.85 acre-feet per year for the proposed project (provided assumptions in Section 4.2.1 are met).

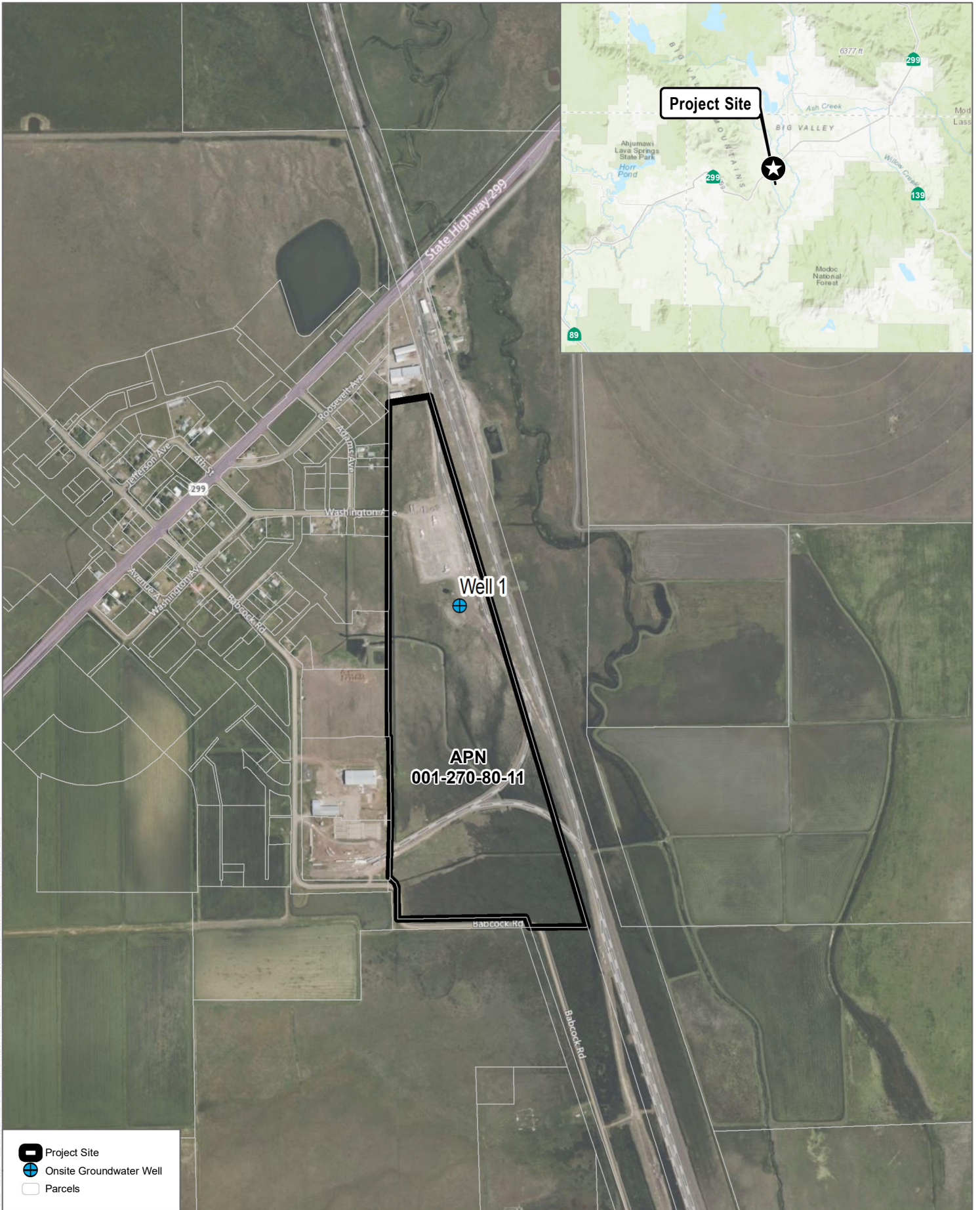
Sincerely,



Hugh McManus, PG, CHG
Senior Hydrogeologist

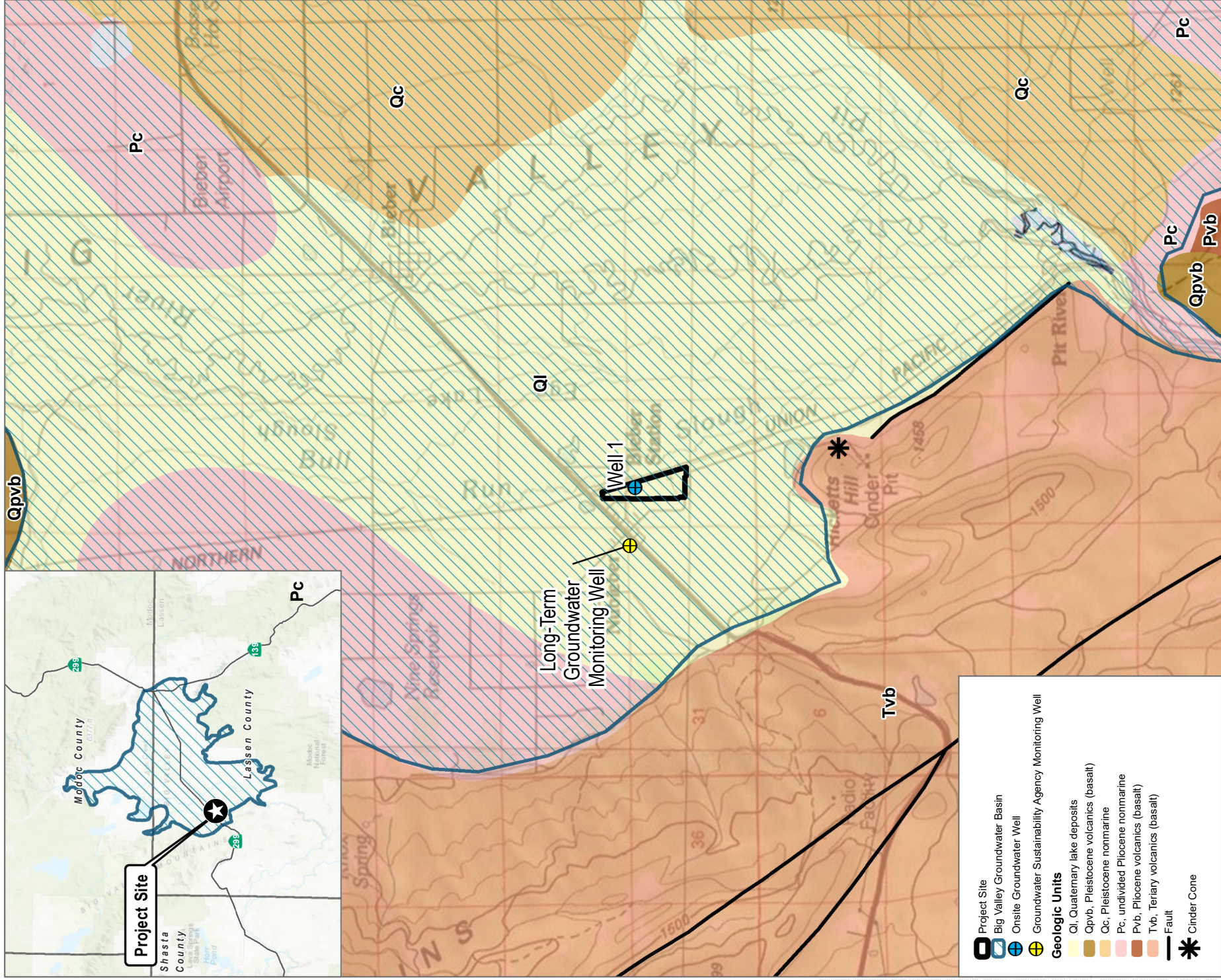
Att.: *Figure 1 - Project Site*
Figure 2 - Geologic Map
Figure 3 - Depth to Water Hydrograph - Well 1
Figure 4 - Constant Rate Test - Depth to Water - Well 1
Figure 5 - Constant Rate Recovery - Well 1
Figure 6 - Residual Drawdown - Well 1
Attachment A - Preliminary Groundwater Well Evaluation
Attachment B - Pump Curve
Attachment C - Pacific Survey Video Inspection Report
cc: *Brian Grattidge, Dudek*

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SOURCE: Bing Maps

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SOURCE: California Geological Survey, © 2013 National Geographic Society

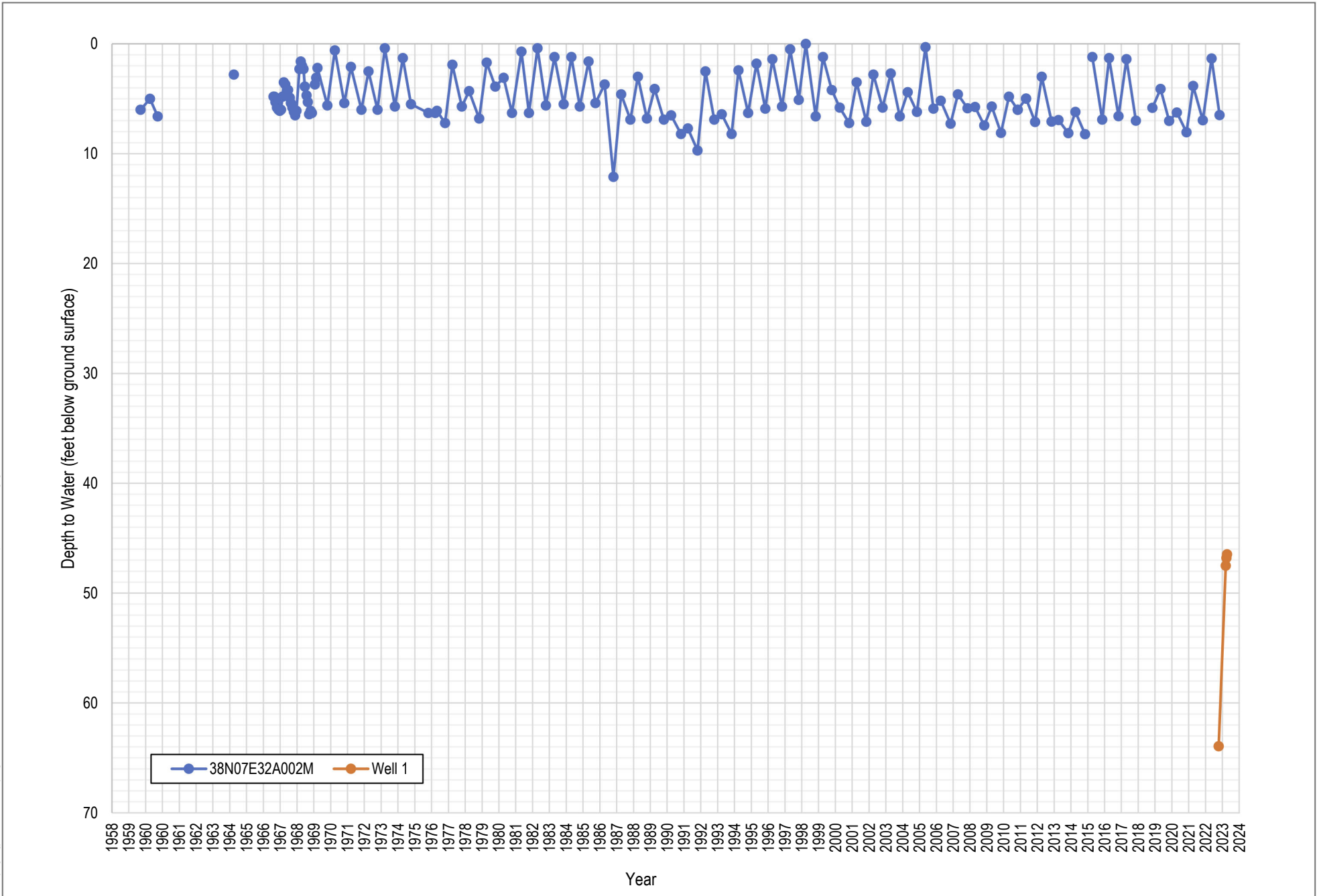


FIGURE 2

Geologic Map

Groundwater Well Assessment - 653-800 Washington Avenue, Bieber, CA 96009

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SOURCE: SGM data view (<https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#gwlevels>), Dudek

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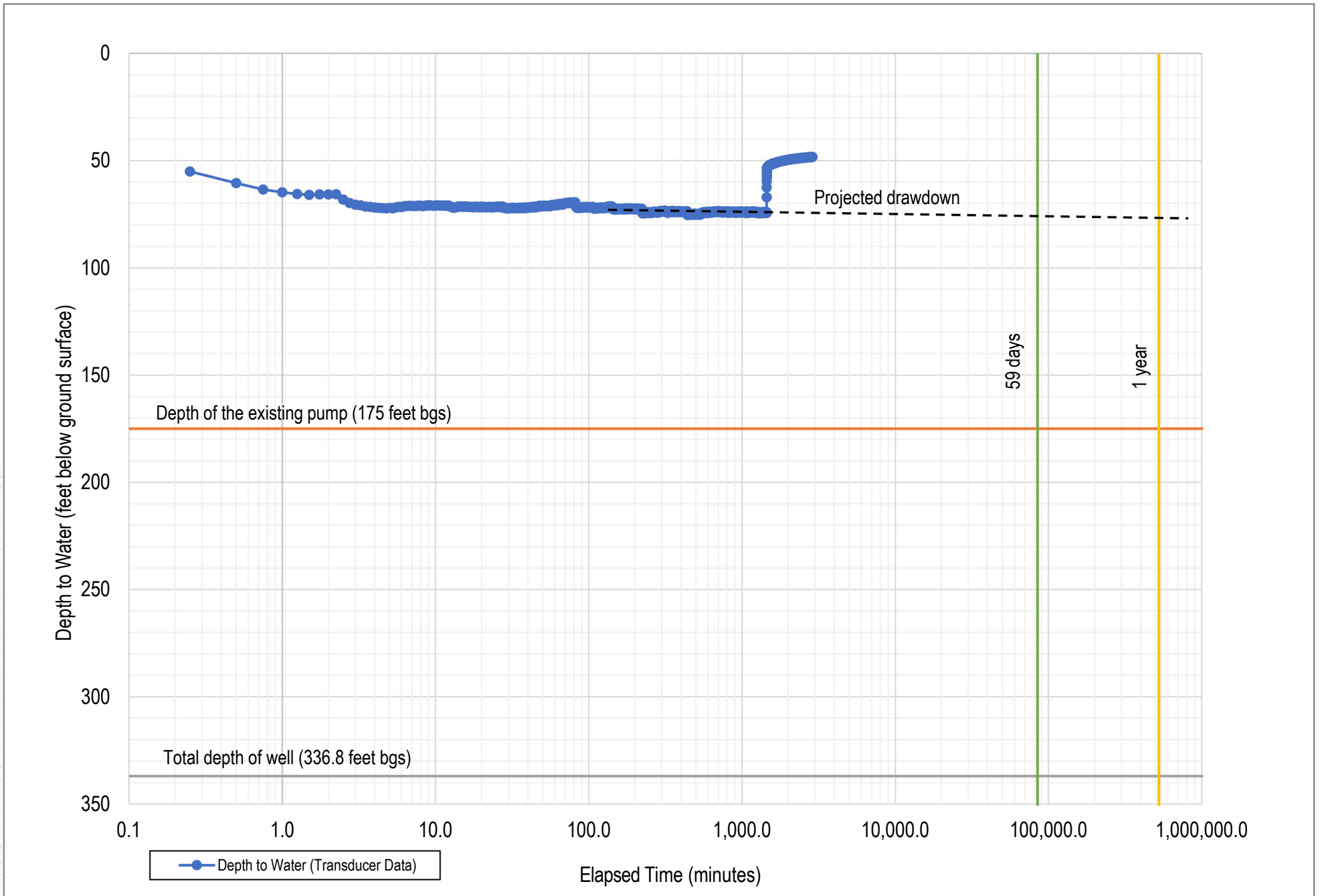


FIGURE 4

Constant Rate Test - Depth to Water - Well 1

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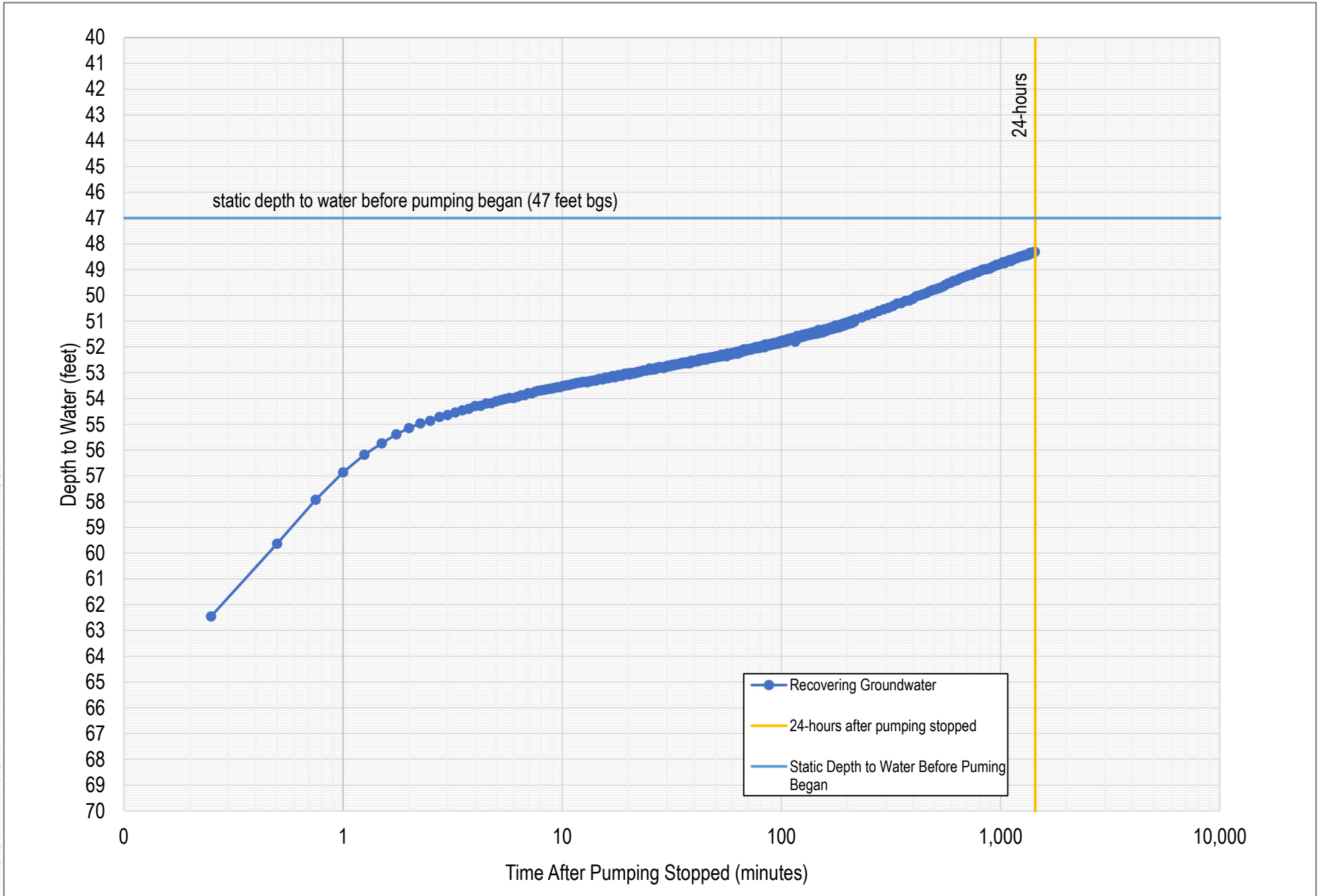


FIGURE 5

Constant Test Recovery - Well 1

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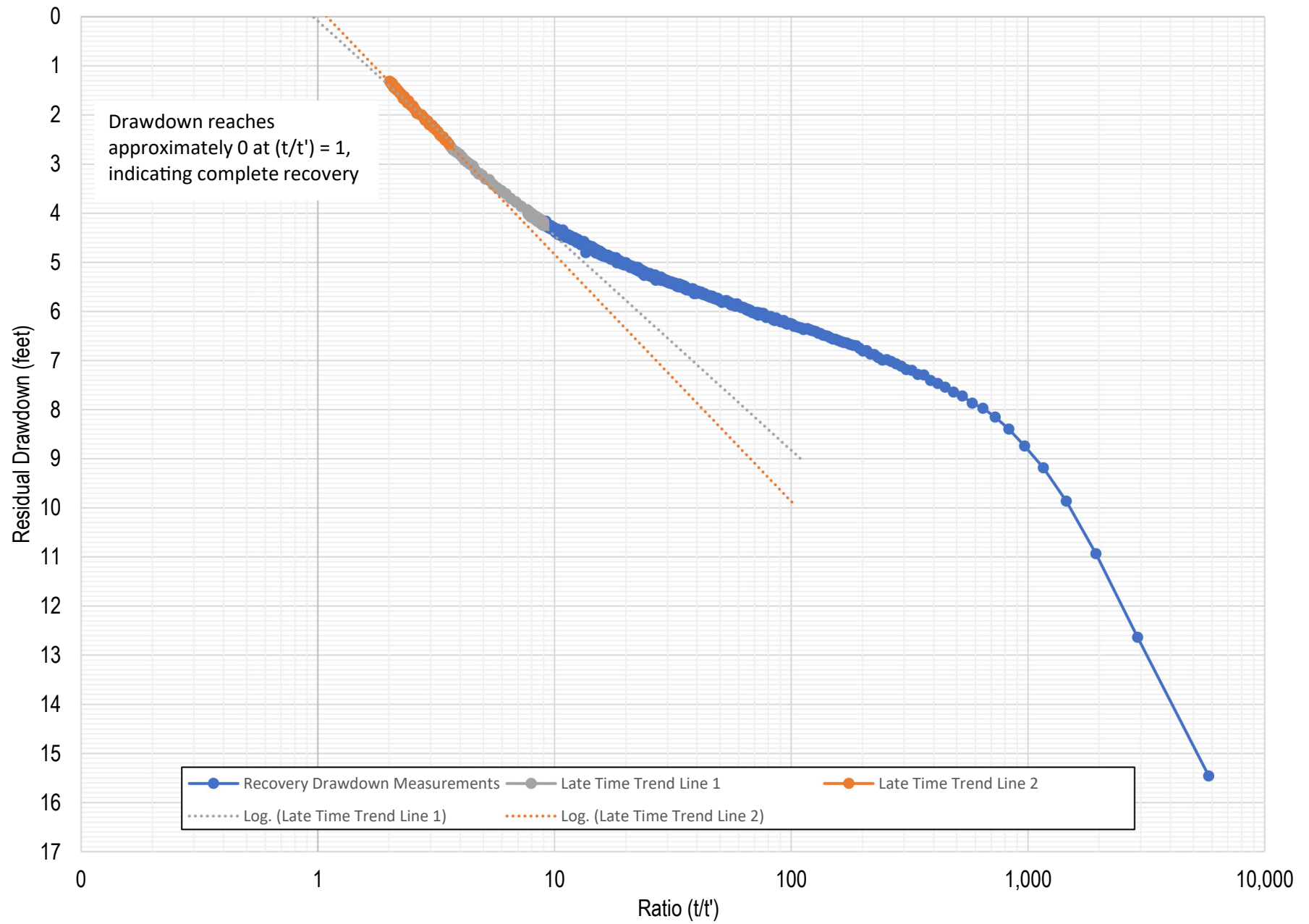


FIGURE 6

Residual Drawdown - Well 1

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Attachment A

Preliminary Groundwater Well Evaluation

MEMORANDUM

To: Arthur J. Wylene, Rural County Representatives of California
From: Hugh McManus (Dudek), Nicole Tucker (Dudek)
Subject: Preliminary Groundwater Well Evaluation – 55100 Roosevelt Property
Date: October 20, 2023
cc: Brian Grattidge (Dudek), Kayvan Ilkhanipour (Dudek)
Attachment(s): Figure 1 – Project Site
Appendix A – Well Completion Reports
Appendix B – Photographic Log

This memorandum provides a summary of groundwater well information collected from a desktop study and site reconnaissance at the property located at 55100 Roosevelt Ave. Nubieber, California 96068 (Project Site). The desktop study includes a review of available information from the California Department of Water Resources (DWR) database. The site reconnaissance included an onsite inspection of existing groundwater wells. The purpose of this work is to document existing groundwater wells on and near the Project Site. The data collected is intended to provide preliminary information to the Golden State Natural Resources (Client) on existing groundwater well conditions at the Project Site, and to recommend future groundwater well work to fulfill groundwater requirements as they pertain to the California Environmental Quality Act (CEQA).

The proposed project includes the development of a pellet processing facility (Project). The Project anticipates using approximately 46.85 acre-feet of groundwater per year (AFY). Groundwater is expected to be supplied from an onsite groundwater well. To meet the facilities anticipated groundwater demand, the onsite well will need to produce approximately 30 gallons per minute (gpm) continuously per year. The maximum anticipated flow rate is estimated to be 360 gpm.

The Project is subject to CEQA and there are two relevant CEQA environmental thresholds related to the use of groundwater at the Project Site. The thresholds are:

- 1) Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?***

And,

- 2) Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?***

The overlying goal of this memorandum is to provide preliminary groundwater well information to inform future work for the Project to satisfy CEQA requirements.

1 Desktop Study

Well Completion Report Information

Dudek reviewed available well completion reports from the DWR well completion report database. DWR well completion reports provide details on well construction, lithology, groundwater depth encountered while drilling, and an estimate of production rate. Well completion reports are categorized within the DWR database by meridian, township, range, and section (MTRS) of the public land survey system (PLSS). Well coordinates (latitude and longitude) are not always available on well completion reports. Dudek searched PLSS MTRS number M38N07E33, M38N07E29, M38N07E28 (Figure 1).

Nine (9) well completion reports were available near the Project Site and reviewed for well information. None of the well completion reports provided sufficient information to correlate the reports with the onsite well. The completion reports do provide information on well construction and estimated yield for wells completed near the Project Site. Well completion reports are included in Appendix A. Table 1 presents a summary of information obtained from the well completion reports. Figure 1 includes estimated locations of the wells based on descriptions reviewed in the well completion reports. These estimated locations are based on limited data and may not represent the actual locations of the wells.

Table 1. Well Completion Report Information

Well Completion Report Number	Legacy Log Number	MTRS	Year Drilled	Total Depth (feet)	Screen Interval (feet)	Depth to Water (feet)	Casing Material	Casing Diameter (inches)	Estimated Yield (gpm)
WCR1968-001028	49867	M38N07E33	1968	261	Unknown	72	Steel	8	20
WCR1986-009048	16596	M38N07E33	1986	360	Unknown	50	Unknown	6	150
WCR1992-013485	379964	M38N07E29	1992	120	60 - 120	15	Unknown	6.625	5
WCR1998-007860	502639	M38N07E28	1998	380	300 - 380	25	Steel	6.25	100
WCR1982-004122	090214	M38N07E33	1982	160	Unknown	18	Steel	6	80
WCR1966-001455	5315	M38N07E33	1966	136	Unknown	12	Steel	8	45
WCR1992-013497	484619	M38N07E28	1992	615	140 - 220	18	Steel	12.25	1,500
WCR1967-001018	2842	M38N07E28	1967	155	Unknown	10	Steel	8	30
WCR1995-008495	454582	M38N07E28	1995	150	Unknown	20	Steel	6	100

Note: MTRS = Meridian, Township, Range, and Section; gpm = gallons per minute.

Well completion reports for wells near the Project Site indicate that these wells were drilled between 1966 and 1998 to depths ranging from 120 feet to 615 feet. Depth to water measurements ranged from 12 feet below ground surface to 72 feet below ground surface. Initial estimated yields reported ranged from 5 gpm to 150 gpm, with the exception of the well drilled to the northeast of the Project Site with an estimated yield of 1,500 gpm. Based on the

available well data, it appears that wells drilled past a depth of 300 feet produced higher initial estimated yields compared to wells drilled shallower than 300 feet below ground surface. It should be noted that estimated well yields from well completion reports are generally estimated for a short period of time and are not a representative long term sustainable production rate. In addition, the initial estimated yield during well construction is conducted when the well is new and performing at its highest efficiency. Well efficiency, and subsequently well yield, tend to degrade over time due to accumulations on the well screen and/or in the filter pack.

Data reviewed from well completion reports show estimated yield from groundwater wells drilled near the Project site to depths beyond 300 feet generally have a higher production rate than shallower wells. Well completion information was not sufficient to correlate the available well completion information to the onsite groundwater well.

Sustainable Groundwater Management

The Project Site is located within the Big Valley Groundwater Basin (Basin 5-004), which is considered a medium priority basin, as defined in the 2018 update to DWR Bulletin 118. The Big Valley Groundwater Sustainability Agency (GSA) includes the County of Modoc GSA and County of Lassen GSA. The GSA prepared a Groundwater Sustainability Plan (GSP) in 2021. The plan is currently under review by DWR.

2 Site Reconnaissance

Dudek hydrogeologist, Nicole Tucker, performed a site reconnaissance at the Project Site on September 28, 2023. The reconnaissance included walking the property, making general observations, documenting the well location, and interviewing the previous landowner, Delbert Gould, about the history of the onsite groundwater well. One (1) groundwater well was observed on the Project Site and one (1) groundwater well was observed on the adjoining property to the north. Groundwater well locations documented during the site reconnaissance are included in Figure 1. Information gathered during the site reconnaissance is included in Table 2. Photographs collected during the site reconnaissance are included in Appendix B.

Table 2. Groundwater Well Information

Well Name	Use Type	Casing Diameter (inches)	Casing Material Type	Depth (feet)	Screen Interval (feet)	Production Rate (gallons per minute)	Pump Size (Horsepower)	Depth to Water (feet) ^b	Status
Onsite Groundwater Well									
Onsite Well	Industrial	Unknown	Unknown	Unknown	Unknown	100 to 167 ^a	Unknown	63.93	Active
Offsite Groundwater Well									
Offsite Well	Domestic	6	Steel	Unknown	Unknown	Unknown	Unknown	Not Measured	Active

Notes: Unknown data was either unable to be observed during the site visit or well records could not be found or confirmed.

^a. Onsite staff estimate that a 500-gallon water truck fills in approximately three to five minutes; equivalent to approximately 100 gallons per minute to 167 gallons per minute.

^b. Feet below the stop of the metal well cover.

Onsite Groundwater Well

The onsite groundwater well is an active well and is located along the eastern boundary of the Project Site (Figure 1, Photograph 1). A submersible pump is installed in the well. The pump is supplied power from a control box and power pole located near the well (Photograph 2). Wellhead discharge piping includes a 6-inch diameter elbow that extends from a roughly 2-foot by 2-foot steel plate that lies directly on a cement well pad (Photograph 3). The 6-inch diameter elbow is connected to a flange that is reduced to a 3-inch diameter steel pipe. A plastic threaded connector is installed at the 3-inch pipe. A 3-inch diameter hose connects with a cam lock to the plastic connector (Photograph 4). The hose is connected to a J-stand water fill station near the well (Photograph 5). The J-stand is used by Sierra Pacific Industries to fill water trucks for dust suppression. An access port is located on the steel plate, but it is unknown if a PVC sounding tube is connected to the access port for collection of groundwater level measurements (Photograph 6). A gravel feed tube exits the cement pad at roughly a 45-degree angle and appeared to be damaged (Photograph 7). The casing type and diameter and condition was not observed because the steel plate was covering the well casing. The steel plate could not be moved without heavy equipment.

The previous site owner stated that the property was purchased 20 years ago, and the well was onsite prior to his purchase of the property. The well was previously used to fill a water tower located on the Project Site (Photograph 8). The water tower is no longer in use. The previous owner stated that the only well maintenance performed on the well was a pump repair by Copp’s Irrigation. The previous owner did not have well construction information available. Sierra Pacific Industries staff, who currently uses the site, stated that when the well is in use to fill water trucks, it can fill a 500-gallon truck in three to five minutes, equivalent to approximately 167 gpm to 100 gpm.

A static depth to water measurement was collected during the site visit. The depth to water was measured at 63.93 feet below the top of the metal well plate. The pump was turned on during the site visit to confirm that the well is operational. Discharge water was observed at the J-stand and appeared clear with no visible sediment or debris. The discharge flow rate was estimated visually at approximately 100 gpm (Photograph 5).

Offsite Groundwater Well

One (1) offsite groundwater well is located on the adjacent property to the north of the Project Site (Figure 1). The offsite groundwater well is an active domestic well. The casing observed during the site visit is 6-inch diameter steel. The well is equipped with a submersible pump and 1-inch drop pipe at the well head (Photograph 9). The wellhead is sealed and there is no visible access for water level measurements. The well is on a cement pad within a wooden wellhouse. Discharge piping enters the cement pad and services buildings located on the parcel. Additional wellhead equipment includes a pressure tank, a water spigot, valves, a backflow device, and a pressure gauge. Power is supplied to the well from a power line. During the site visit, no water level measurement was collected, and the well was not turned on to confirm flow.

3 Summary and Recommendations

There is one (1) active groundwater well on the Project Site. The well is currently used by Sierra Pacific Industries to fill water trucks for dust suppression. Based on visual observations and communication with Sierra Pacific Industries staff during the site reconnaissance, the flow rate of the well is estimated to be 100 gpm¹. Depth to static water was measured during the site reconnaissance on September 28, 2023, at 63.93 feet below the top of the steel plate at the wellhead. No well completion information was obtained for the on-site well. Well construction details, casing condition, as well as pump size and placement depth, are not known. The age and long-term yield of the well are also unknown. The previous property owner stated that the well has produced water for the Project Site and the only historical maintenance performed on the well was a pump repair (the pump was not replaced). The well has supplied power and has a working pump and discharge assembly.

To assess the impacts on regional groundwater as it applies to sustainable groundwater management, the GSA should be contacted and the plans for groundwater use by the Project should be discussed. The GSA may have criteria and requirements for new groundwater use in the Basin.

To assess whether the onsite groundwater well is suitable for use and is suitable to supply the Project with a long-term water supply to meet the demand, Dudek recommends that production rate testing is performed on the onsite groundwater well. Production rate testing would include a step drawdown test to determine an ideal pumping rate for a constant rate pumping test. The constant rate test should be conducted for a period of at least 24 hours. The results of the constant rate test should be used to record the water level response (drawdown) to pumping and recovery after pumping has ceased. These projections could estimate if the groundwater well is suitable for sustainable groundwater production to meet the demands for the Project.

Dudek recommends the following steps to further evaluate the onsite groundwater well:

- Perform downhole video survey at onsite well.
 - Temporarily remove pump and motor.
 - Allow well to sit idle with no downhole equipment for at least 24-hours.
 - Perform video survey.

¹ This is a visual and antidotal estimate only. No flow meter was connected to the wellhead to confirm flow rate. It is unknown if the well can sustain this estimated flow rate for the life of the Project.

- Install PVC sounding tube (at least 1-inch in diameter) to the depth of the pump to record depth to water measurements when pump and motor is installed.

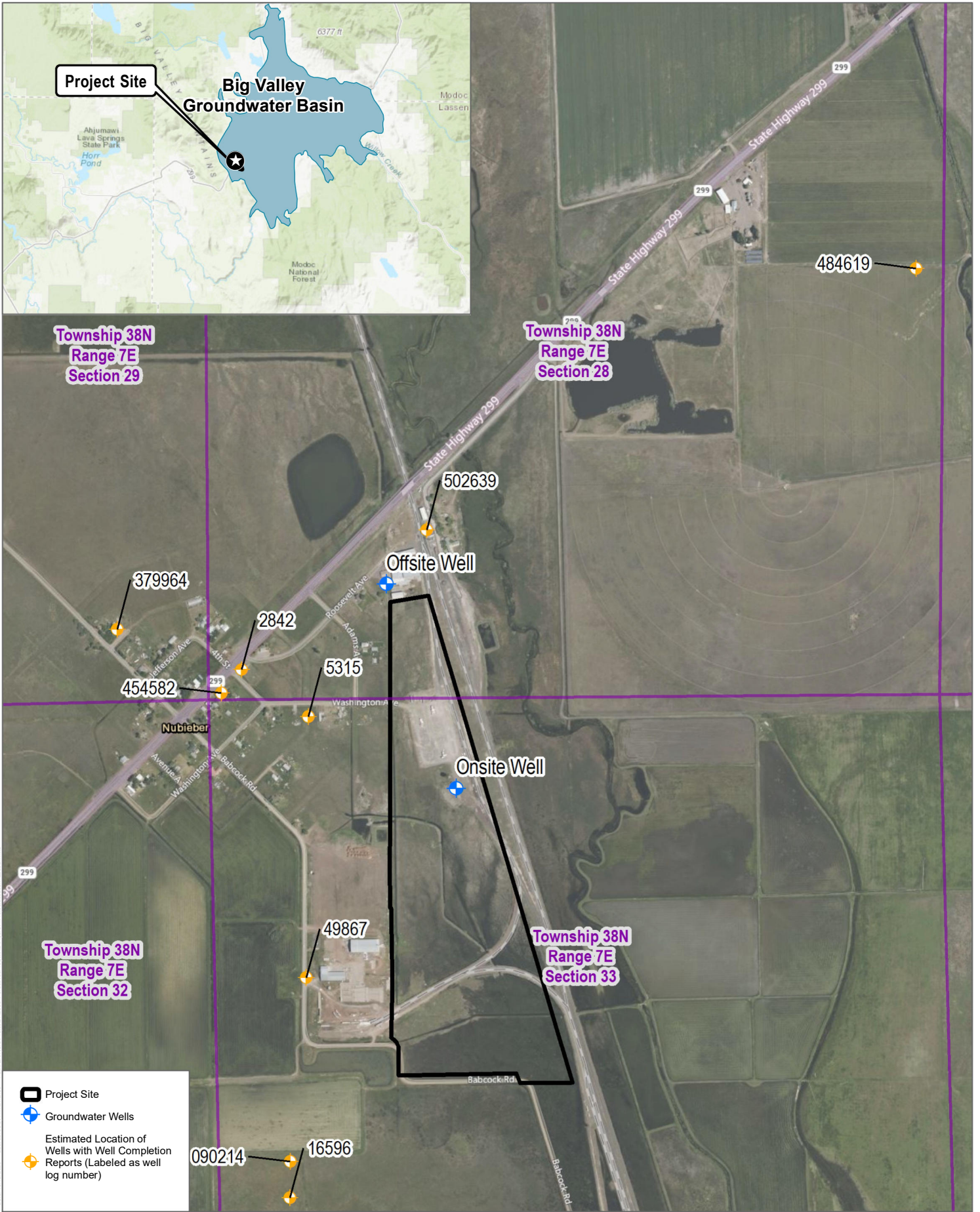
The video survey should be reviewed by a professional geologist or hydrogeologist to assess the condition of the well and the construction details.

- Step drawdown testing
 - Install temporary test pump and discharge equipment (including flow meter).
 - Set recording water level transducers to monitor water levels.
 - Run the pump for at least three (3) different flow rates.
 - Project drawdown data at each step to determine a flow rate for a constant rate test.

The step drawdown test should be conducted and analyzed by a professional geologist or hydrogeologist.

- Constant rate test
 - Pump well at a constant rate for at least 24-hours.
 - Download data from transducers during and after test to monitor drawdown and recovery, respectively.

The constant rate test should be conducted and analyzed by a professional geologist or hydrogeologist. The results of the constant rate test can provide an estimate of long-term drawdown associated with pumping the onsite well at the desired flow rate as well as an estimate of the long-term sustainable production from the on-site well.



SOURCE: (c) 2009 Microsoft Corporation and its data suppliers
 Note: Well locations with well completion reports are estimated based on limited location data available.



FIGURE 1
 Project Site

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Appendix A

Well Completion Reports

WATER WELL DRILLERS REPORT

(Sections 7079, 7080, 7081, 7082, Water Code)

THE RESOURCES AGENCY OF CALIFORNIA DEPARTMENT OF WATER RESOURCES

Do Not Fill In

No. **49867**

State Well No. **38N/7E 33E1**

CONFIDENTIAL LOG
Water Code Sec. 13752

<p>(1) OWNER:</p> <p>Name _____ Address _____</p>	<p>(11) WELL LOG:</p> <p>Total depth <u>261</u> ft. Depth of completed well <u>261</u> ft. Formation: Describe by color, character, size of material, and structure _____ ft. to _____ ft.</p>
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<p>(2) LOCATION OF WELL:</p> <p>County <u>Lassen</u> Owner's number, if any _____ Township, Range, and Section <u>T 38N R 7E Sec. 33</u> Distance from cities, roads, railroads, etc. <u>SW$\frac{1}{4}$ of NW$\frac{1}{4}$</u></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 15%;">0-4</td><td>Top soil</td></tr> <tr><td>4-10</td><td>Soil & boulders</td></tr> <tr><td>10-32</td><td>Light sandy clay</td></tr> <tr><td>32-65</td><td>Light brown sandstone</td></tr> <tr><td>65-100</td><td>Blue clay</td></tr> <tr><td>100-180</td><td>Brown sandstone</td></tr> <tr><td>180-204</td><td>White pumic and clay</td></tr> <tr><td>204-259</td><td>Brown sandstone</td></tr> <tr><td>259-261</td><td>Lava rock</td></tr> </table>	0-4	Top soil	4-10	Soil & boulders	10-32	Light sandy clay	32-65	Light brown sandstone	65-100	Blue clay	100-180	Brown sandstone	180-204	White pumic and clay	204-259	Brown sandstone	259-261	Lava rock
0-4	Top soil																		
4-10	Soil & boulders																		
10-32	Light sandy clay																		
32-65	Light brown sandstone																		
65-100	Blue clay																		
100-180	Brown sandstone																		
180-204	White pumic and clay																		
204-259	Brown sandstone																		
259-261	Lava rock																		

<p>(3) TYPE OF WORK (check):</p> <p>New Well <input checked="" type="checkbox"/> Deepening <input type="checkbox"/> Reconditioning <input type="checkbox"/> Destroying <input type="checkbox"/> If destruction, describe material and procedure in Item 11.</p>	<p>(5) EQUIPMENT:</p> <p>Rotary <input type="checkbox"/> Cable <input checked="" type="checkbox"/> Other <input type="checkbox"/></p>
---	---

<p>(4) PROPOSED USE (check):</p> <p>Domestic <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Municipal <input type="checkbox"/> Irrigation <input type="checkbox"/> Test Well <input type="checkbox"/> Other <input type="checkbox"/></p>	<p>(6) CASING INSTALLED:</p> <p>STEEL: Yes OTHER: _____ SINGLE <input checked="" type="checkbox"/> DOUBLE <input type="checkbox"/></p> <p style="text-align: center;">If gravel packed</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>From ft.</th> <th>To ft.</th> <th>Diam.</th> <th>Gage or Wall</th> <th>Diameter of Bore</th> <th>From ft.</th> <th>To ft.</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>70</td> <td>8"</td> <td>3/16</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Size of shoe or well ring: <u>3/16x3x8</u> Size of gravel: _____ Describe joint <u>Welded</u></p>	From ft.	To ft.	Diam.	Gage or Wall	Diameter of Bore	From ft.	To ft.	0	70	8"	3/16			
From ft.	To ft.	Diam.	Gage or Wall	Diameter of Bore	From ft.	To ft.									
0	70	8"	3/16												

<p>(7) PERFORATIONS OR SCREEN:</p> <p>Type of perforation or name of screen _____</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>From ft.</th> <th>To ft.</th> <th>Perf. per row</th> <th>Rows per ft.</th> <th>Size in. x in.</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	From ft.	To ft.	Perf. per row	Rows per ft.	Size in. x in.																					<p>(8) CONSTRUCTION:</p> <p>Was a surface sanitary seal provided? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> To what depth <u>70</u> ft. Were any strata sealed against pollution? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, note depth of strata _____ From <u>8</u> ft. to <u>70</u> ft. From _____ ft. to _____ ft. Method of sealing <u>Cement</u></p>
From ft.	To ft.	Perf. per row	Rows per ft.	Size in. x in.																						

<p>(9) WATER LEVELS:</p> <p>Depth at which water was first found, if known <u>8</u> ft. Standing level before perforating, if known _____ ft. Standing level after perforating and developing <u>72</u> ft.</p>	<p>Work started <u>6/11</u> 19<u>68</u>, Completed <u>6/7</u> 19<u>68</u></p> <p>WELL DRILLER'S STATEMENT: <i>This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.</i></p> <p>NAME <u>Conners Well Drilling, Inc.</u> (Person, firm, or corporation) (Typed or printed)</p> <p>Address <u>Box 362 Bieber, California</u></p>
---	---

<p>(10) WELL TESTS:</p> <p>Pump test made? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, by whom? _____ <u>20</u> gal./min. with <u>180</u> ft. drawdown after <u>2</u> hrs. Temperature of water <u>Cool</u> Was a chemical analysis made? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Was electric log made of well? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, attach copy _____</p>	<p>[SIGNED] <u>Roy O. Conners</u> (Well Driller)</p> <p>Dated <u>July 5</u>, 19<u>68</u></p>
--	--

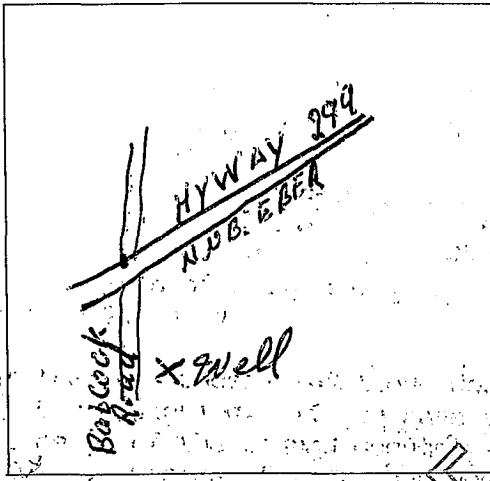
SKETCH LOCATION OF WELL ON REVERSE SIDE

Notice of Permit No. _____
Local Permit No. or Date _____

State Well No. _____
Other Well No. _____

(1) LOCATION OF WELL (See instructions):
County Folsom Owner's Well Number _____
Well address if different from above _____
Township 38 N Range 7 E Section 33
Distance from cities, roads, railroads, fences, etc. _____

(12) WELL LOG: Total depth 360 ft. Depth of completed well 360 ft.
from ft. to ft. Formation (Describe by color, character, size or material)
0 - 3 Top Soil
3 - 10 Brown Clay
10 - 50 coarse sand & gravel
50 - 150 Black Sandy Clay
150 - 160 Black Sand & Gravel
160 - 335 grey clay
335 - 350 white sandstone pumice
350 - 360 grey sandstone



(3) TYPE OF WORK:
New Well Deepening
Reconstruction
Reconditioning
Horizontal Well
Destruction (Describe destruction materials and procedures in Item 12)
(4) PROPOSED USE:
Domestic
Irrigation
Industrial
Test Well
Stock
Municipal
Other

(5) EQUIPMENT:
Rotary Reverse
Cable Air
Other Bucket

(6) GRAVEL PACK:
Yes No Size _____
Diameter of bore _____
Packed from _____ to _____

(7) CASING INSTALLED:
Steel Plastic Concrete
Type of perforation or size of screen

From ft.	To ft.	Dia. in.	Gage or Wall
0	190	6 3/4	250

(8) PERFORATIONS:
Type of perforation or size of screen
NONE

(9) WELL SEAL:
Was surface sanitary seal provided? Yes No If yes, to depth 190 ft.
Were strata sealed against pollution? Yes No Interval 10-160 ft.
Method of sealing _____

(10) WATER LEVELS:
Depth of first water, if known 10 ft.
Standing level after well completion 50 ft.

(11) WELL TESTS:
Was well test made? Yes No If yes, by whom? Drillers
Type of test Pump Baller Air lift
Depth to water at start of test _____ ft. At end of test _____ ft.
Discharge 150 gal/min after 4 hours Water temperature _____
Chemical analysis made? Yes No If yes, by whom? _____
Was electric log made? Yes No If yes, attach copy to this report

WATER CODE SEC. 13750
MAR 05 1988
Work started aug 1986 Completed aug 1986

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. 00466
SIGNED John Conners (Well Driller)
NAME CONNERS WELL DRILLING INC
(Person, firm, or corporation) (Typed or printed)
Address PO Box 92
City ALHAMBRA CALIF Zip 96101
License No. 250398 Date of this report Sept 1, 1986

OCT 13 1992

38N/07E-33M

ORIGINAL File with DWR

RECEIVED D.W.R.

STATE OF CALIFORNIA THE RESOURCES AGENCY

Do not fill in

DEPARTMENT OF WATER RESOURCES WATER WELL DRILLERS REPORT

No. 379964

Notice of Intent No. Local Permit No. or Date 0344-92

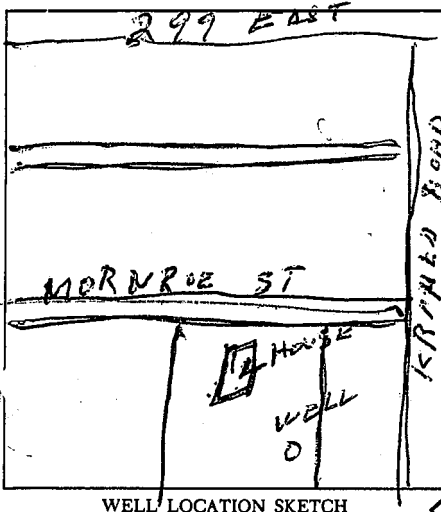
State Well No. Other Well No.

(1) C Address: City

(12) WELL LOG: Total depth 120 ft. Completed depth 120 ft. from ft to ft Formation (Describe by color, character, size or material)

Well log table with columns for depth (ft) and formation description. Entries include: 0-3 TOP SOIL CLAY, 3-15 SAND, 15-25 GREEN CLAY, 25-60 SAND & CLAY, 60-81 CLAY, 81-98 SAND & GRAVEL, 98-101 LAVA ROCK, 101-120 BLUE CLAY.

(2) LOCATION OF WELL (See instructions): County LASSEN Owner's Well Number Well address if different from above Township T38N Range R7E Section 33 Distance from cities, roads, railroads, fences, etc.



(3) TYPE OF WORK: New Well [X] Deepening [] Reconstruction [] Reconditioning [] Horizontal Well [] Destruction [] (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE: Domestic [X] Irrigation [] Industrial [] Test Well [] Municipal [] Other [] (Describe)

(5) EQUIPMENT: Rotary [X] Reverse [] Cable [] Air [] Other [] Bucket []

(6) GRAVEL PACK: Yes [] No [X] Size Diameter of bore Packed from to ft.

(7) CASING INSTALLED: Steel [] Plastic [] Concrete []

(8) PERFORATIONS: Type of perforation or size of screen

Table for perforations with columns: From ft, To ft, Dia. in., Gauge or Wall, From ft, To ft, Slot size. Entry: 0 to 120 ft, 1.34 in. gauge, 60 to 120 ft, 1/8 inch slot size.

(9) WELL SEAL: Was surface sanitary seal provided? Yes [X] No [] If yes, to depth 22 ft. Were strata sealed against pollution? Yes [] No [] Interval Method of sealing CEMENT

Work started 8-10-92 Completed 8-30-92

(10) WATER LEVELS: Depth of first water, if known 31 ft. Standing level after well completion 15 ft.

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

(11) WELL TESTS: Was well test made? Yes [X] No [] If yes, by whom? DRILLED T f test Pump [] Bailer [] Air lift [X] L. to water at start of test 15 ft. At end of test 15 ft. Discharge 5 gal/min after 1/2 hours Water temperature Chemical analysis made? Yes [] No [] If yes, by whom? Was electric log made Yes [] No [] If yes, attach copy to this report

Signed Mayor B. King 1320 (Well Driller) NAME KING WELL DRILLERS (Person, firm, or corporation) (Typed or printed) Address P.O. BOX 207 City HEARTHUR ZIP 96056 License No. 339047 A-053 Date of this report 9-11-92

STATE OF CALIFORNIA
RECEIVED WELL COMPLETION REPORT
Refer to Instruction Pamphlet

DWR USE ONLY - DO NOT FILL IN
38N/07E-33M
STATE WELL NO./STATION NO.
LATITUDE _____ LONGITUDE _____
APN/TRS/OTHER _____

Page _____ of _____
Owner's Well No. # 1 APR 02 1998 No. **502639**
Date Work Began Jan 98, Ended Jan 98
Local Permit Agency Lassen
Permit No. WE-1997-138 Permit Date 11/24/97

GEOLOGIC LOG

ORIENTATION (∠) VERTICAL _____ HORIZONTAL _____ ANGLE _____ (SPECIFY)

DEPTH TO FIRST WATER 15' (Ft.) BELOW SURFACE

DEPTH FROM SURFACE		DESCRIPTION <i>Describe material, grain size, color, etc.</i>
Ft.	to Ft.	
0	2'	Gray Gravel
2'	10'	Sticky Brown Clay
10'	20'	Loose Gravel
20'	130'	Green Clay
130'	140'	Black Sandstone
140'	350'	Gray Clay
350'	370'	White Porphyry Sandstone
370'	380'	Black Sandstone

TOTAL DEPTH OF BORING 380' (Feet)
TOTAL DEPTH OF COMPLETED WELL 380' (Feet)

WELL LOCATION
CITY _____ STATE _____ ZIP _____
Address Hwy 299
City NUBIA
County Lassen
APN Book 001 Page 270 Parcel 51
Township 38N Range 07E Section 33
Latitude _____ North Longitude _____ West

LOCATION SKETCH
NORTH _____ SOUTH _____

ACTIVITY (∠) NEW WELL
MODIFICATION/REPAIR
— Deepen
— Other (Specify) _____
— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")
PLANNED USE(S) (∠)
— MONITORING
WATER SUPPLY
 Domestic
 Public
— Irrigation
— Industrial
— "TEST WELL"
— CATHODIC PROTECTION
— OTHER (Specify) _____

Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc.
PLEASE BE ACCURATE & COMPLETE.

DRILLING METHOD Rotary FLUID Air
WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH OF STATIC WATER LEVEL 25' (Ft.) & DATE MEASURED 1/20/98
ESTIMATED YIELD 100 (GPM) & TEST TYPE Air
TEST LENGTH 1 (Hrs.) TOTAL DRAWDOWN 60' (Ft.)
* May not be representative of a well's long-term yield.

DEPTH FROM SURFACE Ft. to Ft.	BORE-HOLE DIA. (Inches)	CASING(S)						ANNULAR MATERIAL					
		TYPE (∠)				MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)	TYPE			
		BLANK	SCREEN	CON-DOCTOR	FILL PIPE								
0	60'	10"	✓			Steel	6 1/4	188	None				Type II
60'	300'	8"	✓			Steel	6 1/4	188	None			✓	Clay Seal
300'	380'	6"	✓	✓		Steel	5"	188	1/2"				

APR 07 1998

ATTACHMENTS (∠)
 Geologic Log
 Well Construction Diagram
 Geophysical Log(s)
 Soil/Water Chemical Analyses
 Other _____
 ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

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

NAME Conner's Well Drilling
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
ADDRESS Po Box 92 CITY Alturas Ca STATE Ca ZIP 96101
Signed Duane Conner DATE SIGNED 2/5/98 C-57 LICENSE NUMBER 709-156
WELL DRILLER/AUTHORIZED REPRESENTATIVE

38N 07E 33M

ORIGINAL
File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
WATER WELL DRILLERS REPORT

Do not fill in

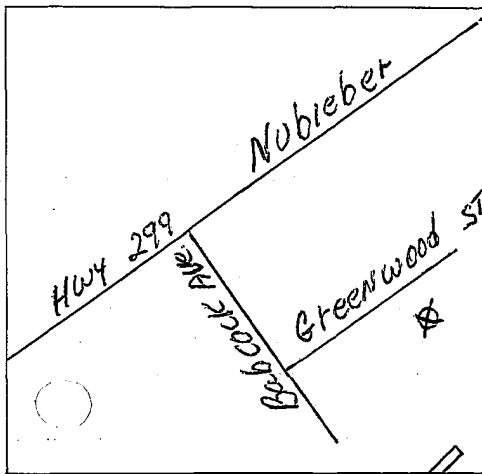
No. 090214

Intent No. _____
Local Permit No. or Date _____

State Well No. _____
Other Well No. _____

(1) Add _____
City _____
(2) LOCATION OF WELL (See instructions):
County Lassen Owner's Well Number 1
Well address if different from above _____
Township 38 N Range 7 E Section 33
Distance from cities, roads, railroads, fences, etc. 1/2 mile S/O
HWY 299 AT Nubieber

(12) WELL LOG: Total depth <u>160</u> ft. Depth of completed well <u>160</u> ft.	
from ft.	to ft. Formation (Describe by color, character, size or material)
0	1 TOP SOIL
2	6 LIGHT BKN CLAY
6	17 Blue Clay STICKEY
17	25 BKN Clay STICKEY
25	60 Heavy Gravel + Blue Clay
60	138 Blue Clay CAVING
138	160 Blue Clay + Gravel Main Water



(3) TYPE OF WORK:

- New Well Deepening
- Reconstruction
- Reconditioning
- Horizontal Well
- Destruction (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:

- Domestic
- Irrigation
- Industrial
- Test Well
- Stock
- Municipal
- Other

WELL LOCATION SKETCH

(5) EQUIPMENT:
Rotary Reverse
Cable Air
Other Bucket

(6) GRAVEL PACK:
Yes No Size _____
Diameter of bore _____
Packed from _____ to _____ ft.

(7) CASING INSTALLED:
Steel Plastic Concrete

(8) PERFORATIONS:
Type of perforation or size of screen _____

From ft.	To ft.	Dia. in.	Gage or Wall	From ft.	To ft.	Slot size
0	70	6	133			

(9) WELL SEAL:
Was surface sanitary seal provided? Yes No If yes, to depth 70 ft.
Were strata sealed against pollution? Yes No Interval _____ ft.
Method of sealing CASING + CEMENT

(10) WATER LEVELS:
Depth of first water, if known 25 ft.
Standing level after well completion 18 ft.

(11) WELL TESTS:
Was well test made? Yes No If yes, by whom? driller
Type of test Pump Bailer Air lift
Depth to water at start of test 18 ft. At end of test 35 ft.
Discharge 80 gal/min after 1 hours Water temperature 56
Chem analysis made? Yes No If yes, by whom? _____
Was electric log made? Yes No If yes, attach copy to this report

Modoc drill 25' to 70'
- EXTREME CAVING
Work started 5-18 1982 Completed 5-20 1982

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
SIGNED James J. Brown 00985
(Well Driller)
NAME Modoc DRILLING Co.
(Person, firm, or corporation) (Typed or printed)
Address PO Box 1048
City ALTITAS CALIF Zip 96101
License No. 336751 Date of this report 5-28-82

WATER WELL DRILLERS REPORT

(Sections 7079, 7080, 7081, 7082, Water Code)

Do Not Fill In

THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

CONFIDENTIAL
Water Code Sec. 13752

5315

State Well No. 30N7E-33F
Other Well No. _____

(1) ()

Name _____
Address _____

(11) WELL LOG:

Total depth 136 ft. Depth of completed well 136 ft.

Formation: Describe by color, character, size of material, and structure

0 - 4 ft. to soil ft.

4 - 16 yellow clay

16 - 20 gravel

20 - 58 blue clay

58 - 130 green clay

130 - 136 black sand

(2) LOCATION OF WELL:

County Fresno Owner's number, if any _____

Township, Range, and Section Tot 3 in Block 20

Distance from cities, roads, railroads, etc. of Bieber
City, Unit No 1

(3) TYPE OF WORK (check):

New Well Deepening Reconditioning Destroying

If destruction, describe material and procedure in Item 11.

(4) PROPOSED USE (check):

Domestic Industrial Municipal
Irrigation Test Well Other

(5) EQUIPMENT:

Rotary
Cable
Other

(6) CASING INSTALLED:

STEEL: OTHER:

SINGLE DOUBLE

If gravel packed

From ft.	To ft.	Diam.	Gage or Wall	Diameter of Bore	From ft.	To ft.
0	28	8"	3/16		_____	

Size of shoe or well ring: 3 1/2 in Band X 1/4

Describe joint Welded

(7) PERFORATIONS OR SCREEN:

Type of perforation or name of screen

From ft.	To ft.	Perf. per row	Rows per ft.	Size in. x in.

(8) CONSTRUCTION:

Was a surface sanitary seal provided? Yes No To what depth 28 ft.

Were any strata sealed against pollution? Yes No If yes, note depth of strata

From 6 ft. to 20 ft.

From _____ ft. to _____ ft.

Method of sealing Casing & Cement

(9) WATER LEVELS:

Depth at which water was first found, if known ft. 6

Standing level before perforating, if known ft. _____

Standing level after perforating and developing ft. 19

(10) WELL TESTS:

Was pump test made? Yes No If yes, by whom? Jack Conner

Rate: 45 gal./min. with 23 ft. drawdown after _____ hrs.

Temperature of water _____ Was a chemical analysis made? Yes No

Was electric log made of well? Yes No If yes, attach copy

Work started May 24, 66, Completed May 27, 19 66

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME JACK CONNER
(Person, firm, or corporation) (Typed or printed)

Address Bieber Calif

[SIGNED] Jack Conner
(Well Driller)

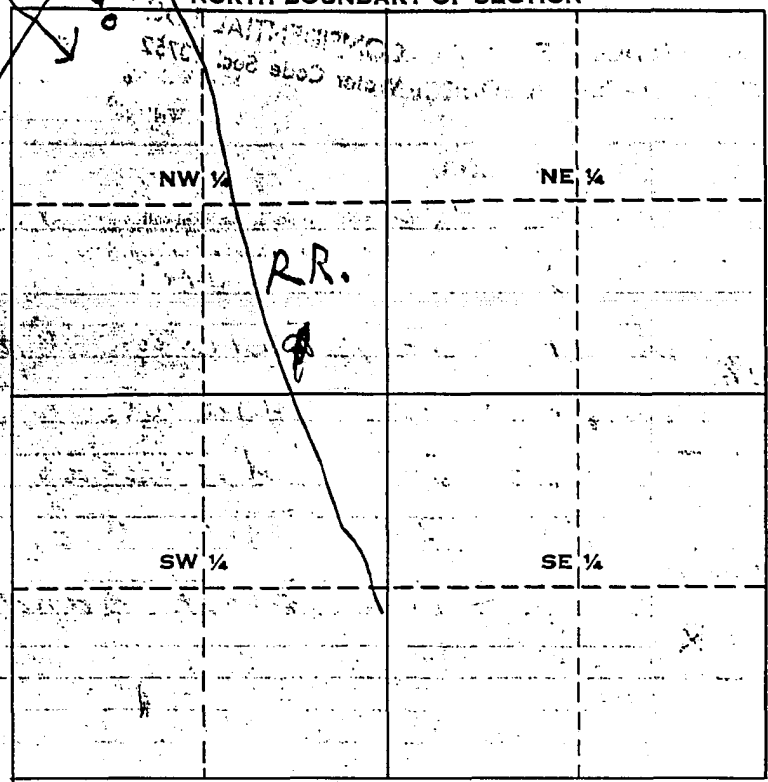
License No. 188934 Dated June 23, 19 66

CONFIDENTIAL LOG
Water Code Sec. 13752

SKETCH LOCATION OF WELL ON REVERSE SIDE

#5315

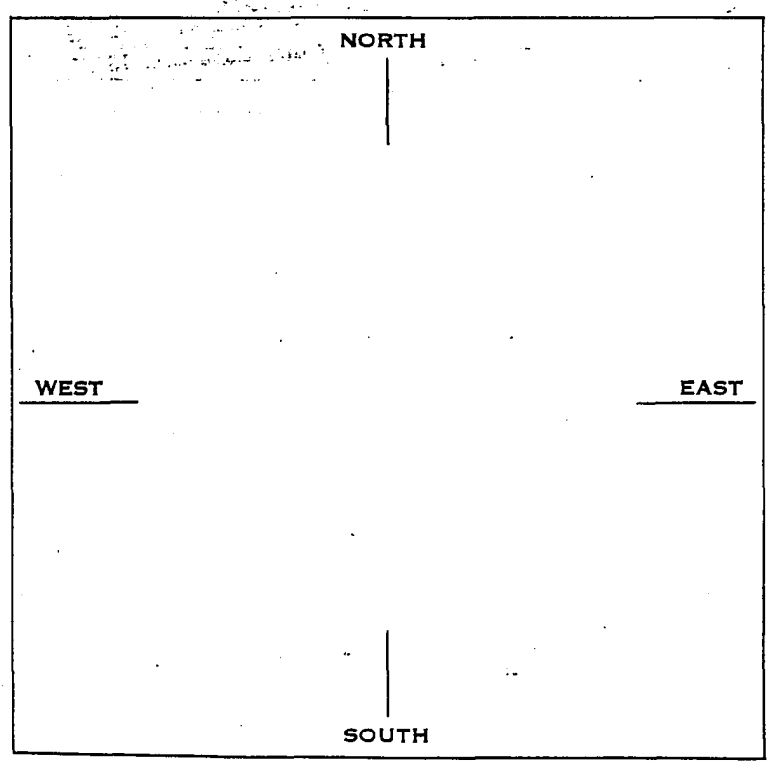
NORTH BOUNDARY OF SECTION



Township 38 N N/S
 Range 7 E E/W
 Section No. 33

NW 1/4 of NW 1/4

A. Location of well in sectionized areas.
 Sketch roads, railroads, streams, or other features as necessary.



B. Location of well in areas not sectionized.
 Sketch roads, railroads, streams, or other features as necessary.
 Indicate distances.



ORIGINAL
File with DWR

RECEIVED

STATE OF CALIFORNIA
WELL COMPLETION REPORT

Page ___ of ___

DEC 30 1993

Refer to Instruction Pamphlet

Owner's Well No. _____

No. 484619

Date Work Began _____

S.D.W.R. Ended Sept 92

Local Permit Agency LASSON

Permit No. _____

Permit Date 8/9/92

DWR USE ONLY - DO NOT FILL IN

38N/07E-28M

STATE WELL NO./STATION NO.

LATITUDE _____ LONGITUDE _____

APN/TRS/OTHER _____

GEOLOGIC LOG

ORIENTATION (✓) VERTICAL _____ HORIZONTAL _____ ANGLE _____ (SPECIFY) _____

DEPTH TO FIRST WATER 16' (Ft.) BELOW SURFACE

DEPTH FROM SURFACE

DESCRIPTION

Describe material, grain size, color, etc.

Ft.	to	Ft.	DESCRIPTION
0	10'		Black Clay
10'	35'		Loose Sand & Gravel
35'	116'		Green Clay
110'	125'		Black Green Sandstone
125'	138'		Hard (Green) Clay
138'	175'		Porosity Black & Green Sandstone
175'	180'		Loose Sand Gravel
180'	430'		Green & Gray Clay
430'	440'		White & Green Porosity
440'	480'		Green & Gray Sandstone
480'	510'		Red & White Porosity
510'	570'		Green Sandstone
570'	580'		Brown Sandstone
580'	595'		Porosity Green Sandstone
595'	615'		Sticky Green Clay

WELL LOCATION

Address Highway 249

City Bieber

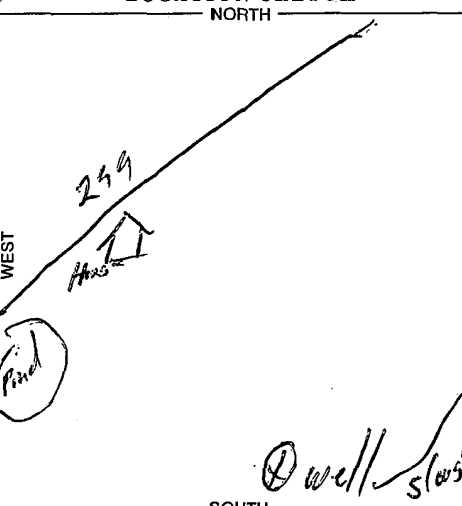
County LASSON

APN Book _____ Page _____ Parcel 001-270-0969

Township 38N Range 7E Section 28

Latitude _____ NORTH Longitude _____ WEST

LOCATION SKETCH



ACTIVITY (✓)

NEW WELL

MODIFICATION/REPAIR

Deepen _____

Other (Specify) _____

DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USE(S)

(✓) MONITORING

WATER SUPPLY

Domestic _____

Public _____

✓ Irrigation

Industrial _____

"TEST WELL" _____

CATHODIC PROTECTION _____

OTHER (Specify) _____

DRILLING METHOD Rotary FLUID Air

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL 18' (Ft.) & DATE MEASURED _____

ESTIMATED YIELD* 1500 (GPM) & TEST TYPE Air

TEST LENGTH 2 (Hrs.) TOTAL DRAWDOWN _____ (Ft.)

* May not be representative of a well's long-term yield.

TOTAL DEPTH OF BORING 615' (Feet)

TOTAL DEPTH OF COMPLETED WELL 615' (Feet)

DEPTH FROM SURFACE	BORE-HOLE DIA. (Inches)	CASING(S)					INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)	DEPTH FROM SURFACE	ANNULAR MATERIAL					
		TYPE (✓)									TYPE					
Ft.	to	Ft.	BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL/ GRADE			Ft.	to	Ft.	CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	40'	20"	X				Steel	15 1/2	250		0	40	✓			
40	140'	15.5"	X				Steel	12 1/4	188							
140	220'	15.5"	X				Steel	12 1/4	188	1/2 x 1/4						
220	615'	8"														

ATTACHMENTS (✓)

- Geologic Log
- Well Construction Diagram
- Geophysical Log(s)
- Soil/Water Chemical Analyses
- Other _____

ATTACH ADDITIONAL INFORMATION. IF IT EXISTS.

CERTIFICATION STATEMENT

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

NAME Conner's Well Drilling 466

ADDRESS Pi Box 92 CITY Alturas STATE CA ZIP 96101

Signed Duane Conner DATE SIGNED 9/23/92 C-57 LICENSE NUMBER 250-298

WATER WELL DRILLERS REPORT

(Sections 7079, 7080, 7081, 7082, Water Code)

CONFIDENTIAL LOG
Do Not Fill In
Water Code Sec. 13752

No 2842

State Well No. 38N/7E-28N

Other Well No. _____

THE RESOURCES AGENCY OF CALIFORNIA DEPARTMENT OF WATER RESOURCES

(1) OWNER: Name _____ Address _____				(11) WELL LOG: Total depth <u>155</u> ft. Depth of completed well <u>155</u> ft. Formation: Describe by color, character, size of material, and structure _____ _____ _____ _____ _____																															
(2) LOCATION OF WELL: County <u>Lassen</u> Owner's number, if any _____ Township, Range, and Section <u>T 38 N, R 27E, Sec. 28</u> Distance from cities, roads, railroads, etc. <u>SW¹/₄ of SW¹/₄</u>				0-4 Top soil 4-19 Hard brown clay 19-22 Loose gravel 22-140 Clay-green 140-145 Black sand 145-155 Green clay																															
(3) TYPE OF WORK (check): New Well <input checked="" type="checkbox"/> Deepening <input type="checkbox"/> Reconditioning <input type="checkbox"/> Destroying <input type="checkbox"/> If destruction, describe material and procedure in Item 11.				CONFIDENTIAL LOG Water Code Sec. 13752																															
(4) PROPOSED USE (check): Domestic <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Municipal <input type="checkbox"/> Irrigation <input type="checkbox"/> Test Well <input type="checkbox"/> Other <input type="checkbox"/>		(5) EQUIPMENT: Rotary <input type="checkbox"/> Cable <input checked="" type="checkbox"/> Other <input type="checkbox"/>																																	
(6) CASING INSTALLED: STEEL: Yes OTHER: _____ SINGLE <input checked="" type="checkbox"/> DOUBLE <input type="checkbox"/>				If gravel packed <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>From ft.</th> <th>To ft.</th> <th>Diam.</th> <th>Gage or Wall</th> <th>Diameter of Bore</th> <th>From ft.</th> <th>To ft.</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>36</td> <td>8"</td> <td>3/16</td> <td></td> <td></td> <td></td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>				From ft.	To ft.	Diam.	Gage or Wall	Diameter of Bore	From ft.	To ft.	0	36	8"	3/16																	
From ft.	To ft.	Diam.	Gage or Wall	Diameter of Bore	From ft.	To ft.																													
0	36	8"	3/16																																
Size of shoe or well ring: <u>4" x 1 1/2" x 8"</u> Size of gravel: _____ Describe joint <u>Welded</u>																																			
(7) PERFORATIONS OR SCREEN: Type of perforation or name of screen <u>None</u> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>From ft.</th> <th>To ft.</th> <th>Perf. per row</th> <th>Rows per ft.</th> <th>Size in. x in.</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>								From ft.	To ft.	Perf. per row	Rows per ft.	Size in. x in.																							
From ft.	To ft.	Perf. per row	Rows per ft.	Size in. x in.																															
(8) CONSTRUCTION: Was a surface sanitary seal provided? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> To what depth <u>34</u> ft. Were any strata sealed against pollution? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, note depth of strata _____ From <u>19</u> ft. to <u>22</u> ft. From _____ ft. to _____ ft. Method of sealing <u>Cement</u>				Work started <u>Oct. 30^o 67</u> Completed <u>Nov. 3^o 67</u> WELL DRILLER'S STATEMENT: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.																															
(9) WATER LEVELS: Depth at which water was first found, if known <u>19</u> ft. Standing level before perforating, if known <u>10</u> ft. Standing level after perforating and developing <u>10</u> ft.				NAME <u>Connors' Well Drilling, Inc.</u> (Person, firm, or corporation) (Typed or printed)																															
(10) WELL TESTS: Pump test made? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, by whom? _____ <u>30</u> gal./min. with <u>65</u> ft. drawdown after <u>2</u> hrs. Temperature of water _____ Was a chemical analysis made? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				Address <u>Box 362 Bieber, California 96009</u> [SIGNED] <u>Roy O. Connors</u> (Well Driller)																															
Was electric log made of well? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, attach copy _____				License No. <u>250298</u> Dated <u>Nov. 6</u> , 19 <u>67</u>																															

SKETCH LOCATION OF WELL ON REVERSE SIDE

ORIGINAL
File with DWR 1

STATE OF CALIFORNIA
WELL COMPLETION REPORT

DWR USE ONLY - DO NOT FILL IN
38N/07E+28
STATE WELL NO./STATION NO.
LATTITUDE _____ LONGITUDE _____
APN/TRS/OTHER _____

Page 1 of 1
Owner's Well No. FEB 1 1995
Date Work Began 10/05/95, Ended 10/06/95
Local Permit Agency LASSEN COUNTY HEALTH DEPT.
Permit No. _____ Permit Date / /
No. **454582**

GEOLOGIC LOG			WELL OWNER	
ORIENTATION (∠) <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> HORIZONTAL _____ ANGLE _____ (SPECIFY)			Address <u>4TH & WASHINGTON ST.</u>	
DEPTH TO FIRST WATER <u>14</u> (Ft.) BELOW SURFACE			City <u>NUBIEBER, CA</u>	
DESCRIPTION			County <u>LASSEN</u>	
Describe material, grain size, color, etc.			APN Book _____ Page _____ Parcel <u>001-363-03</u>	
DEPTH FROM SURFACE			Township <u>38N</u> Range <u>07E</u> Section <u>28</u>	
Ft. to Ft.			Latitude _____ NORTH Longitude _____ WEST	
<u>0</u> to <u>18</u>	<u>CLAY</u>		DEG. MIN. SEC. DEG. MIN. SEC.	
<u>18</u> to <u>22</u>	<u>FRACTURE GRAVEL</u>		LOCATION SKETCH	
<u>22</u> to <u>50</u>	<u>CLAY</u>		NORTH _____ WEST _____	
<u>50</u> to <u>140</u>	<u>CLAY</u>		SOUTH _____ EAST _____	
<u>140</u> to <u>150</u>	<u>GRAVEL FRACTURE</u>		ACTIVITY (∠)	
			<input checked="" type="checkbox"/> NEW WELL	
			MODIFICATION/REPAIR	
			— Deepen	
			— Other (Specify)	
			— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")	
			PLANNED USE(S)	
			(∠)	
			— MONITORING	
			WATER SUPPLY	
			<input checked="" type="checkbox"/> Domestic	
			— Public	
			— Irrigation	
			— Industrial	
			— "TEST WELL"	
			— CATHODIC PROTECTION	
			— OTHER (Specify)	
TOTAL DEPTH OF BORING <u>0</u> (Feet)			DRILLING METHOD <u>AIR ROTARY</u> FLUID <u>WATER</u>	
TOTAL DEPTH OF COMPLETED WELL <u>0</u> (Feet)			WATER LEVEL & YIELD OF COMPLETED WELL	
			DEPTH OF STATIC WATER LEVEL <u>20</u> (Ft.) & DATE MEASURED <u>10/06/95</u>	
			ESTIMATED YIELD* <u>100</u> (GPM) & TEST TYPE <u>AIR BLOW</u>	
			TEST LENGTH <u>4</u> (Hrs.) TOTAL DRAWDOWN <u>0</u> (Ft.)	
			* May not be representative of a well's long-term yield.	

DEPTH FROM SURFACE	BORE-HOLE DIA. (Inches)	CASING(S)						DEPTH FROM SURFACE	ANNULAR MATERIAL				
		TYPE (∠)				MATERIAL / GRADE	INTERNAL DIAMETER (Inches)		GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)	TYPE		
Ft. to Ft.		BLANK	SCREEN	CON. DUCTOR	FILL PIPE								
<u>0</u> to <u>25</u>	<u>10</u>						<u>0</u>	<u>25</u>	<u>Y</u>	<u>N</u>	<u>N</u>		
<u>0</u> to <u>120</u>	<u>0</u>	<u>Y</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>STEEL</u>	<u>6</u>	<u>250</u>					

- ATTACHMENTS (∠)
- Geologic Log
 - Well Construction Diagram
 - Geophysical Log(s)
 - Soil/Water Chemical Analyses
 - Other _____
- ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

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

NAME DIAMOND WELL DRILLING CO.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

ADDRESS 1660 OLD AIRPORT ROAD, AUBURN, CA, 95602 STATE _____ ZIP _____

Signed [Signature] DATE SIGNED 10/2/95 398306
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

Appendix B

Photographic Log

Photograph 3. Wellhead discharge piping includes 6-inch elbow, reducer pipe at a flange connection, plastic threaded connector, and 3-inch hose connected with a camlock. The well cover is a metal plate on a cement well pad.



Photograph 4. 3-inch hose connected at the wellhead.



Photograph 1. Active onsite groundwater well located along the eastern boundary of the Project Site.



Photograph 2. Power and well control box adjacent to the onsite groundwater well.





Photograph 5. Onsite groundwater well connected to J-stand for filling up water trucks. The onsite well was turned on during the site visit to confirm well operation and visually estimate flow rate.



Photograph 6. Access port on steel plate covering well. PVC sounding tube extending into the well casing was not observed.



Photograph 7. Gravel feed tube located to the right of the wellhead on the cement pad.



Photograph 8. According to the previous site owner, the onsite groundwater well was previously used to fill an onsite water tower.



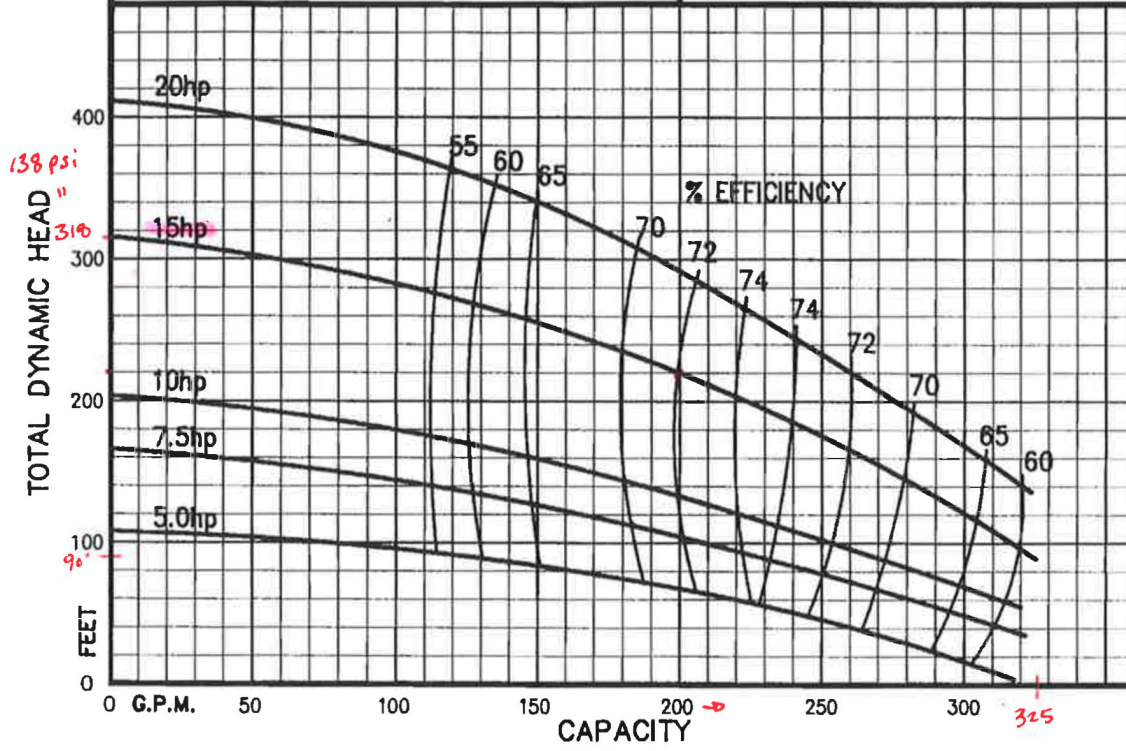
Photograph 9. Offsite active domestic well located on the adjacent property to the north.

Attachment B

Pump Curve

Submersible Turbine Model 6T-250

FAMILY CURVE SIZE: 6"
 DESIGN SERIES: 6T-250 HZ: 60
 SPEED: 3450 DATE: 5 DEC 89
 CURVE NO.: ST2350A



Specifications

CURVE No. ST2350A

LIQUID END WEIGHTS

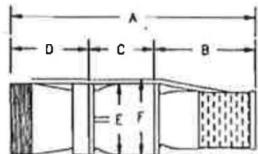
DESCRIPTION	WEIGHT LBS.	HP RATING	MOTOR FLANGE
ONE STAGE L.E.	55.8	5-20	6"
ONE STAGE L.E.			
ONE STAGE L.E.			
EACH ADDED STAGE	19.4	ALL	ALL

IMPELLER DATA

TYPE: ENCLOSED EYE AREA 5.76 Sq. In.
 THRUST CONSTANT K 2.11 Lbs./Ft of HEAD.

HP	IMPELLER No.	STAGES	IMPELLER Dia.
20	M04043	6	4.53" @ 34" (3.88")
15	S39546	5	4.38" @ 32" (3.72")
10	M04043	3	4.53" @ 34" (3.88")
7.5	S39545	3	4.19" @ 32" (3.50")
5.0	S39545	2	4.19" @ 32" (3.50")

OUTLINE DIMENSIONS



- A- ONE STAGE LIQUID END LENGTH
- B- SUCTION CONNECTION LENGTH!
- C- STAGE LENGTH
- D- DISCHARGE CONNECTION LENGTH
- E- BOWL DIAMETER
- F- DIAMETER ACROSS LEAD GUARD

BOWL DATA

BOWL No. M04461 PUMP SHAFT Dia. 1"
 TYPE: THREADED DISCHARGE SIZE 3" NPT (Female)
4" NPT (Male)

NOTE: For each additional stage add 'C'

A	B	C	D	E	F	HP RATING	MOTOR FLANGE
19.63	11.00	5.00	3.63	5.38	5.81	5-20	6"

REVISED 15 May 90

Attachment C

Pacific Surveys Video Inspection Report

