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December 11, 2023
Project No: 20-10008

Bryan Bondy, PG, CHG
Executive Director
Upper Ventura River Groundwater Agency
202 West El Roblar Drive
Ojai, California 93023
Via email: bbondy@uvrgroundwater.org

**Subject: Annual Data Deliverable Memorandum for Water Year 2023
Upper Ventura River Groundwater Agency, Ventura County, California**

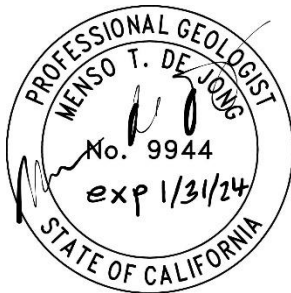
Dear Mr. Bondy:

Rincon Consultants, Inc. (Rincon) has prepared the attached Annual Data Deliverable Memorandum for the 2023 Water Year (October 1, 2022, through September 30, 2023) for groundwater elevation monitoring activities performed at nine monitoring wells located within the Upper Ventura River Groundwater Basin in Ventura County California. The memorandum was prepared for Upper Ventura River Groundwater Agency (UVRGA) under the supervision of a licensed California Professional Geologist and in accordance with UVRGA's *Monitoring and Data Collection Protocols and Data Quality Control Review Procedures*.

We are pleased to support UVRGA on this important project and look forward to discussing any questions you may have regarding the data presented in this report.

Sincerely,

Rincon Consultants, Inc.



Menso de Jong, PhD, PG
Watershed Scientist

A handwritten signature in black ink, appearing to read "K. Brtalik".

Kiernan Brtalik, CPSWQ, QSD/P
Director, Watershed Sciences



Annual Data Deliverable Memorandum Water Year 2023

Groundwater Level Monitoring
Ventura County, California

prepared for
Upper Ventura River Groundwater Sustainability Agency

prepared by
Rincon Consultants, Inc.

December 11, 2023

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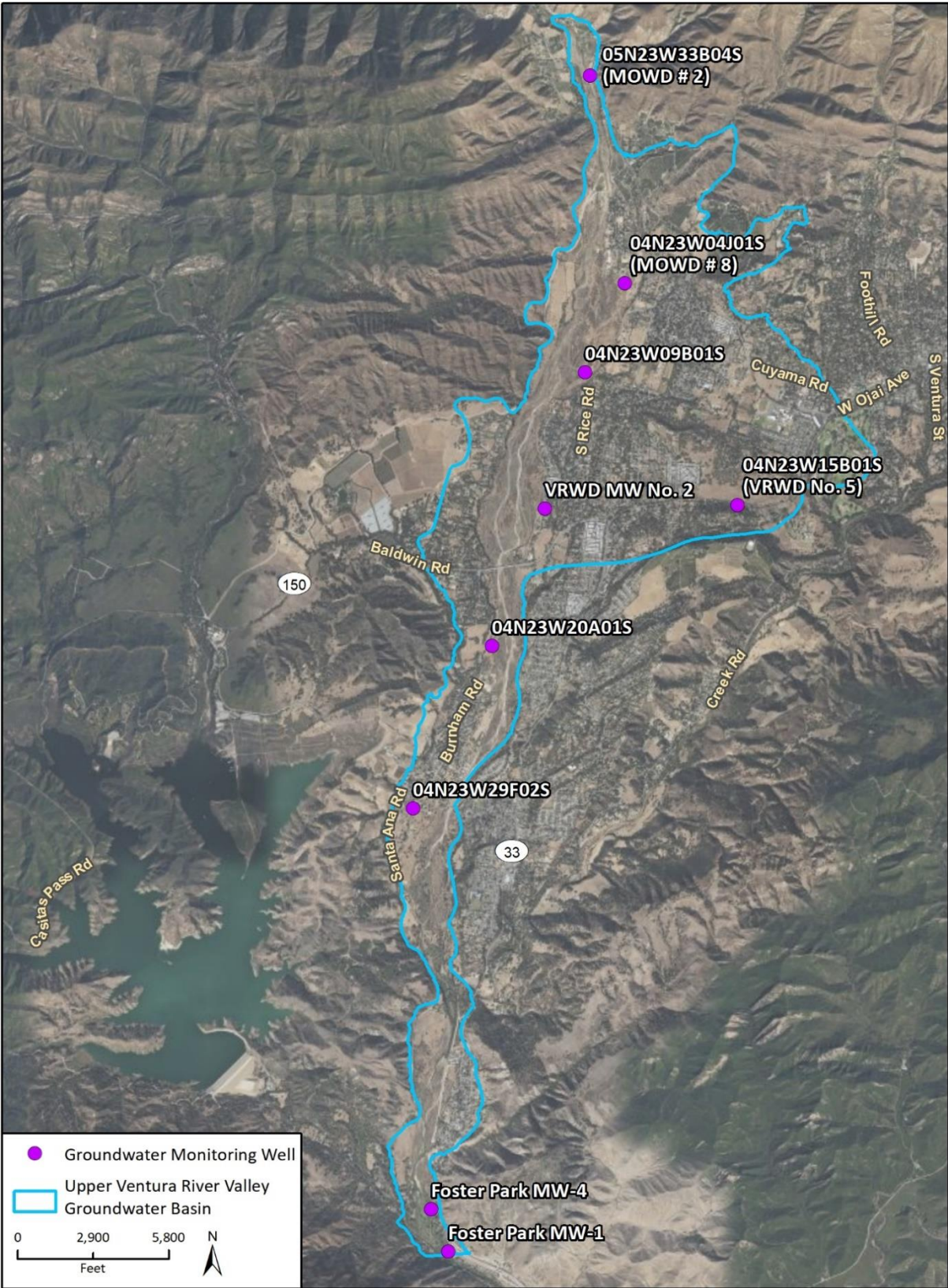
1 Introduction

The Annual Data Deliverable Memorandum for the 2023 Water Year presents data collected between October 1, 2022, and November 20, 2023, from a network of nine groundwater monitoring wells located within the Upper Ventura River Valley Groundwater Basin (Basin) in Ventura County California (Figure 1). This memorandum was prepared for Upper Ventura River Groundwater Agency (UVRGA) under the supervision of a licensed California Professional Geologist. Rincon Consultants, Inc. (Rincon) conducted monitoring activities and data collection, as well as preparation of this memorandum in accordance with the UVRGA's *Monitoring and Data Collection Protocols and Data Quality Control Review Procedures*.

The groundwater monitoring program provides groundwater level and elevation data necessary for the implementation of UVRGA's Groundwater Sustainability Plan (GSP). In early 2017, UVRGA established a monitoring network comprised of six groundwater monitoring wells located throughout the Basin. This monitoring network was expanded in November 2019 by installing two additional pressure transducers in groundwater monitoring wells located at Foster Park (MW 1 and MW 4). Additionally, in 2019, Meiners Oaks Water District (MOWD) and Ventura River Water District (VRWD) agreed to provide groundwater level data from pressure transducers maintained by the districts in their production wells MOWD # 2 (State Well 05N23W33B04S) and VRWD No. 5 (State Well 04N23W15B01S), respectively. As of August 16, 2021, VRWD has made VRWD No. 5 accessible to UVRGA and Rincon staff to collect depth-to-water measurements and to download pressure transducer data from the district-owned pressure transducer.

The following section presents a groundwater monitoring well location map (Figure 1) and well information table (Table 1), as well as figures presenting groundwater level as depth-to-water (Figure 2a and Figure 2b) and groundwater elevation as feet above mean sea level (ft. amsl) (Figure 3a and 3b). Appendices include field data sheets, raw pressure transducer data, and the processed pressure transducer data.

Figure 1 Groundwater Monitoring Well Locations



Imagery provided by Microsoft Bing, Esri, and their licensors © 2022.

W02 Fig 1 Monitoring Locations

Table 1 Groundwater Monitoring Well Information

State Well Number	Other Name	Owner	Use	Data Source	Reference Point Elevation (ft. amsl)	Coordinates (NAD 83)
05N23W33B04S	MOWD # 2	MOWD	Municipal	MOWD Pressure Transducer	816.54	34.4771809, -119.291636
04N23W04J01S	MOWD # 8	MOWD	Municipal	UVRGA Pressure Transducer	713.04	34.4552614, -119.2868565
04N23W09B01S	N/A	Private	Agricultural	Well Owner Pressure Transducer beginning April 2021	662.30	34.445844, -119.291794
N/A	VRWD MW No. 2	VRWD	Monitoring	UVRGA Pressure Transducer	565.11	34.431363, -119.296737
04N23W15B01S	VRWD No. 5	VRWD	Municipal (Inactive)	VRWD Pressure Transducer	686.27	34.4320185, -119.2721482
04N23W20A01S*	N/A	Private	Agricultural	UVRGA Pressure Transducer	488.89	34.4168, -119.303224
04N23W29F02S	N/A	Private	Domestic/ Agricultural	UVRGA Pressure Transducer	396.58	34.399551, -119.312975
N/A	Foster Park MW-1	City of Ventura	Municipal	UVRGA Pressure Transducer	226.01	34.3527778, -119.3077778
N/A	Foster Park MW-4	City of Ventura	Municipal	UVRGA Pressure Transducer	240.84	34.3572222, -119.310

MOWD – Meiners Oaks Water District

UVRGA – Upper Ventura River Groundwater Agency

VRWD – Ventura River Water District

N/A – Not Available

ft. amsl – Feet Above Mean Sea Level

NAD 83 – North American Datum of 1983

* On November 5, 2020, the pressure transducer at State Well 0423W20A01S was removed for servicing and when reinstallation was attempted on February 18, 2021, Rincon observed that the well was reconfigured by a new property owner. The transducer was not reinstalled due to the well reconfiguration.

2 Monitoring Data Summary

As part of the 2023 Water Year monitoring period, field monitoring activities were conducted on May 24, 2023, June 2, 2023, November 20, and November 21 by Rincon. During these events, manual depth-to-water measurements were collected, and pressure transducer data were downloaded.

Field data sheets are provided as Appendix A and raw pressure transducer data is provided as Appendix B. Processed data, including a compilation of raw pressure transducer level data are provided as Appendix C. The processed data (Appendix C) includes a metadata and Quality Assurance and Quality Control (QA/QC) worksheet to summarize the processed data file deliverable, raw data processing activities, and QA/QC considerations.

Pressure transducer data recorded by Solinst Levelloggers were exported to Microsoft Excel to process groundwater level and elevation. Groundwater level was calculated by subtracting raw pressure transducer level data from the effective logger depth for each pressure transducer.¹ Groundwater elevation was calculated by subtracting the groundwater level from the reference point elevation at the top of well casing, which was provided by UVRGA. Groundwater level data provides insight into how groundwater changes in relation to the land surface, whereas elevation data can provide insight into the direction of groundwater flow and gradient. Groundwater levels are presented in Figure 2a and Figure 2b, and groundwater elevations are presented in Figure 3a and 3b. For presentation purposes, these figures present monitoring wells located north and south of Baldwin Road.

2.1 Quality Assurance and Control Observations

The following provides a summary of specific QA/QC observations for the 2023 Water Year that were identified during the preparation of this data deliverable. A list of QA/QC comments is provided in the “MetaData and QAQC” tab of Appendix C.

Barometric Compensation

As summarized in previous reports and most recently in the 2023 Semi-Annual Data Deliverable (Rincon Consultants, 2023), Rincon understands that the effect of barometric fluctuations on groundwater levels may not be of significance in evaluation of long-term trends in these groundwater monitoring wells. Barometric pressure is measured continuously using Solinst Barologgers at two locations in the basin and these data are available for data compensation if determined necessary by UVRGA.

¹ This effective logger depth is developed using raw pressure transducer level data (including both water pressure and atmospheric pressure) and manual depth to water measurements.

The barometric pressure recorded at the sites between November 2022 and October 2023 ranged from 14.3 pounds per square inch (psi) to 14.8 psi, a range equivalent to approximately 1.2 feet of water depth. Groundwater level fluctuations during this period were on the order of five feet or more. As such, groundwater pressure transducer data were not barometrically compensated. This was similarly noted in the 2018 report (Kear Groundwater, 2018) and the processed data file included in the 2020 report (Kear Groundwater, 2020) which did not conduct data compensation. For purposes of consistency, Rincon followed previous data processing procedures and is not compensating for barometric fluctuations.

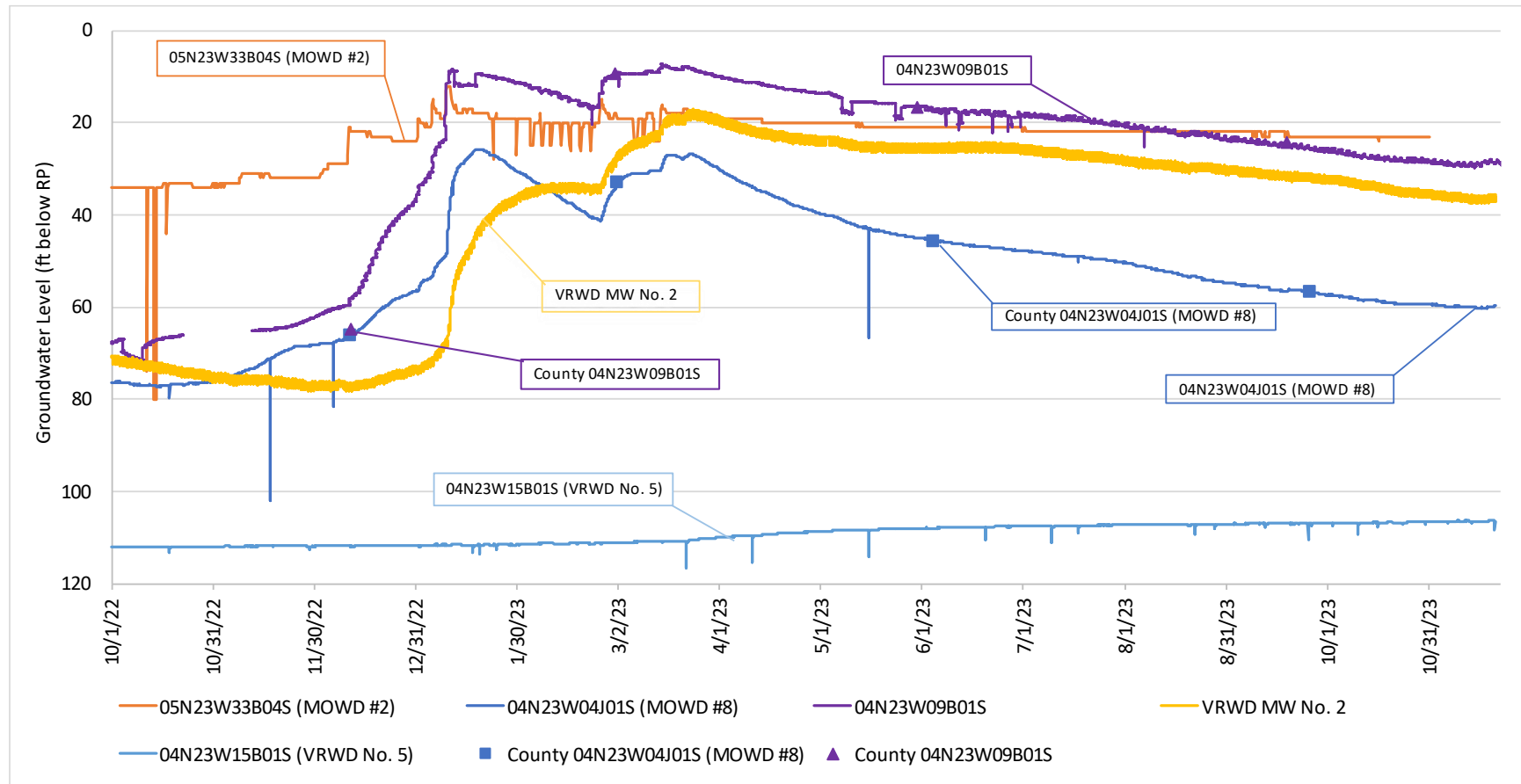
Data Calibration at State Well 04N23W29F02S, Foster Park MW-1, and Foster Park MW-4

Pressure transducer data at State Well 04N23W29F02S after the May 2023 download through the remainder of the reporting period were calibrated to the manual water level taken by Rincon on May 23, 2023, to account for a change of transducer depth upon redeployment. Pressure transducer data at Foster Park MW-1 and Foster Park MW-4 after the May 2023 download through the remainder of the reporting period were calibrated to the manual water levels taken by Rincon on November 20, 2023, to account for possible transducer drift since the original offset was calculated.

County of Ventura Manual Measurements

Manual depth to water measurement data collected by the County of Ventura (County) is included in a separate tab in the Processed Pressure Transducer Data file (Appendix C). These data are presented in the figures below to allow comparison between the County's manual measurements and continuous pressure transducer measurements. This comparison provides additional layer of QA/QC insight to reveal both similarities and discrepancies in the dataset.

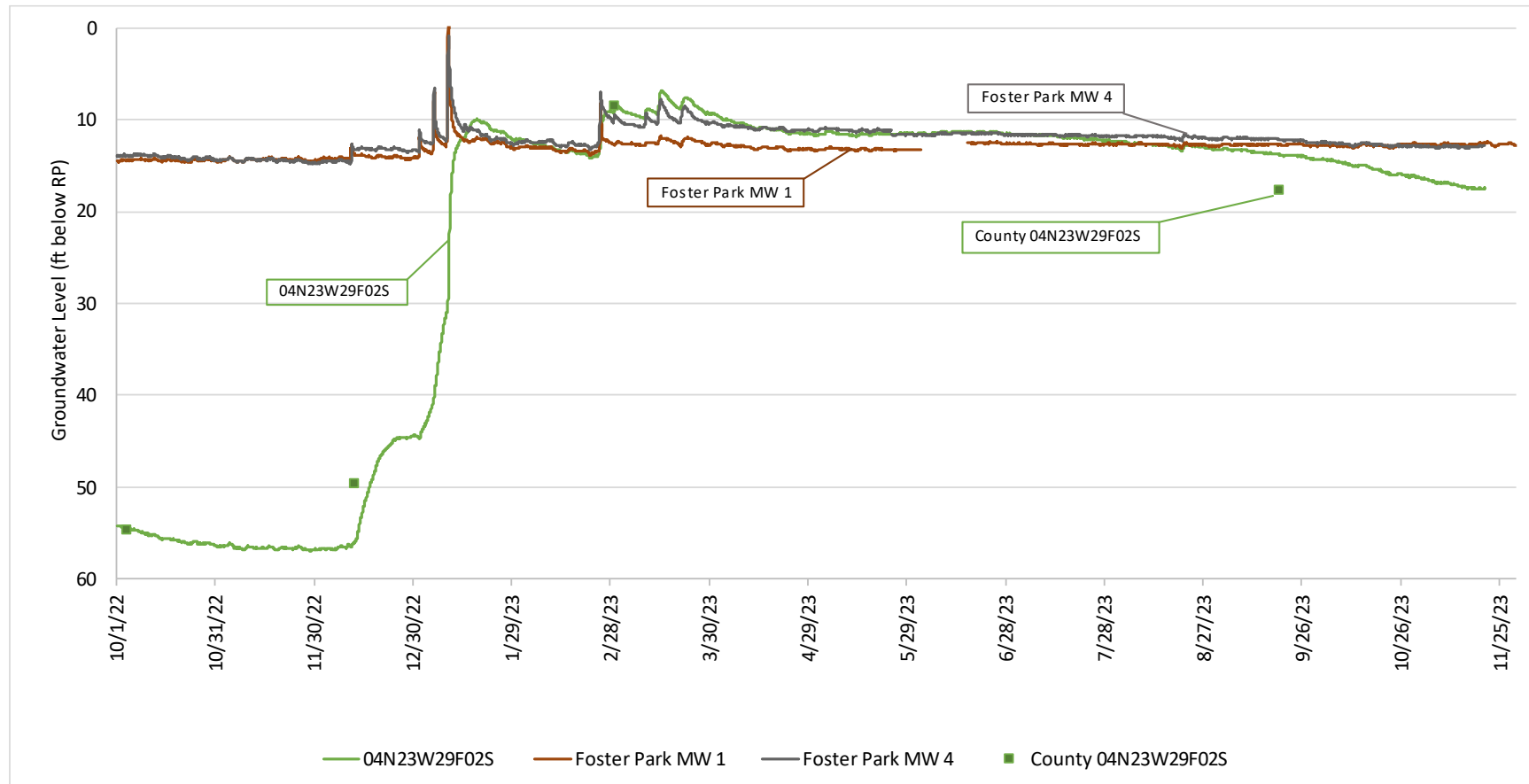
Figure 2a Groundwater Level Below Reference Points – Wells North of Baldwin Road



Notes:

To present depth to water relative to the monitoring well's reference point (RP) at ground surface, the y-axis is presented in reverse order.

County of Ventura manual depth to water measurements are presented on this chart for quality assurance purposes.

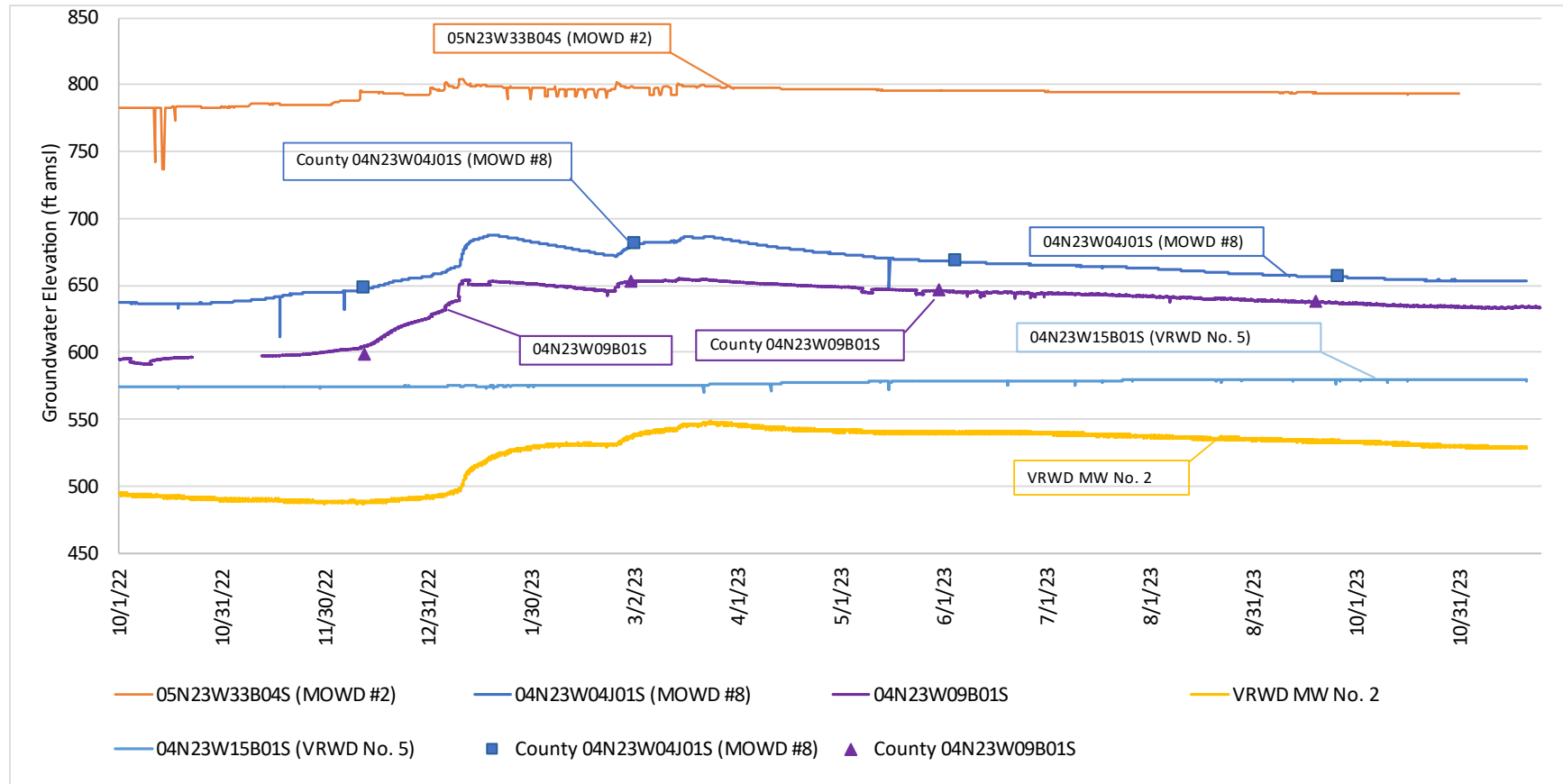
Figure 2b Groundwater Level Below Reference Points – Wells South of Baldwin Road**Notes:**

To present depth to water relative to the monitoring well's reference point (RP) at ground surface, the y-axis is presented in reverse order.

State Well 04N23W20A01S is currently not equipped for water level monitoring due to an ownership change.

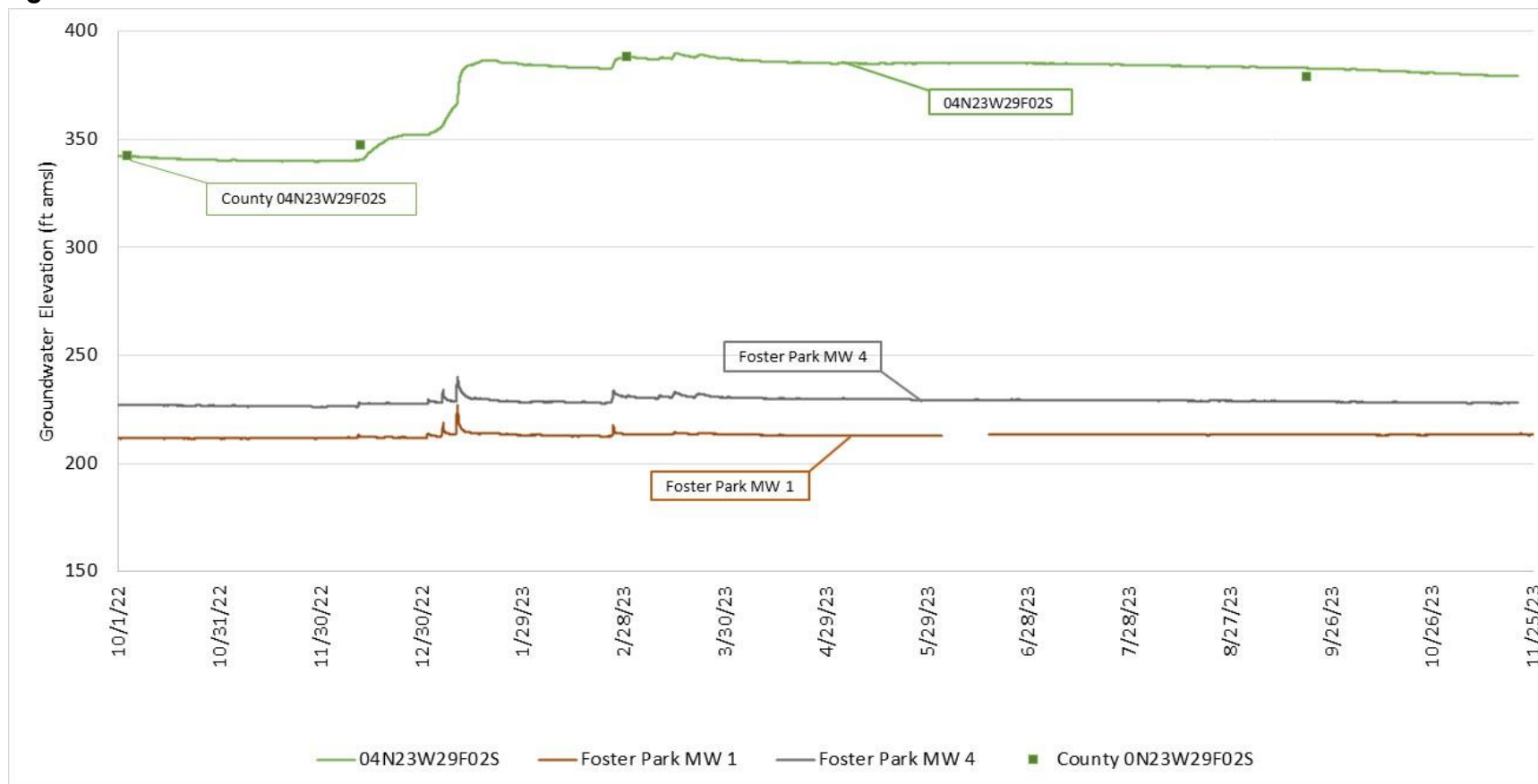
County of Ventura manual elevation measurements are presented on this chart for quality assurance purposes.

Figure 3a Groundwater Elevation – Wells North of Baldwin Road



Note:

County of Ventura manual elevation measurements are presented on this chart for quality assurance purposes.

Figure 3b Groundwater Elevation – Wells South of Baldwin Road**Notes:**

State Well 04N23W20A01S is currently not equipped for water level monitoring due to an ownership change.

County of Ventura manual elevation measurements are presented on this chart for quality assurance purposes.

3 References

Kear Groundwater, 2018. *Report of Groundwater Level and Temperature data, spring 2017 to summer 2018 Upper Ventura River Groundwater Basin Ventura County, California.* September 30, 2018.

_____. 2020, *Report of Groundwater Level and Temperature Data, Spring 2017 to September 2019, Upper Ventura River Groundwater Basin, Ventura County, California.* January 31, 2020.

Rincon Consultants, Inc. 2023. *Semi-Annual Data Deliverable Memorandum Water Year 2023.* June 13, 2023.

UVRGA Monitoring and Data Collection Protocols, Updated and Adopted November 13, 2018.

Appendix A

Field Data Sheets

Appendix A – Groundwater Level Field Form



GROUNDWATER LEVEL MEASUREMENT FIELD DATA SHEET

A	B	C	D	E	F	G	H
Well ID	DATE	TIME	RPE (ft amsl)	RPH (ft agl)	DTW (ft)	GWE (ft amsl)	Notes
<i>Researched</i>	<i>Record</i>	<i>Record</i>	<i>Researched</i>	<i>Measured</i>	<i>Measured</i>	<i>D-F</i>	
MOWD #8	5/24/2023	10:57	713.04	5.65	44.25	668.79	
04N23W09B01S	5/24/2023	-	662.3	-	-		Well data provided by owner
VRWD MW No. 2	5/24/2023	12:37	565.11	0.51	24.39	540.72	
04N23W20A01S	5/24/2023	-	-	-	-		Transducer removed by new owner.
04N23W29F02S	5/24/2023	12:32	396.58	2.18	11.51	385.07	Barologger data downloaded.
Foster Park MW-4	5/24/2023	10:00	240.84	2.2	11.62	229.22	Barologger stuck in the well; unable to download. Measured DTW from TOC.
Foster Park MW-1	6/16/2023	9:03	226.01	0.9	12.16	213.85	Unable to access well on 5/24 due to new city lock. Removed on 6/6 due to connection issues. Replaced on 6/16 after cleaning the optical sensor.
VRWD #5	5/24/2023	12:00	686.27	0.25	109.63	576.64	Access provided by VRWD. Measured DTW from ST.

Appendix A – Groundwater Level Field Form



GROUNDWATER LEVEL MEASUREMENT FIELD DATA SHEET

A	B	C	D	E	F	G	H
Well ID	DATE	TIME	RPE (ft amsl)	RPH (ft agl)	DTW (ft)	GWE (ft amsl)	Notes
<i>Researched</i>	<i>Record</i>	<i>Record</i>	<i>Researched</i>	<i>Measured</i>	<i>Measured</i>	<i>D-F</i>	
MOWD #8	11/20/2023	16:11	713.04	5.65	60.10	652.94	
04N23W09B01S	-	-	662.3	-	-	-	Well data provided by owner
VRWD MW No. 2	11/20/2023	15:05	565.11	0.51	37.22	527.89	Transducer clock about thirty minutes off. Stopped log to synchronize clock to PST. Future start at 16:00.
03N23W05B01S	11/21/2023	10:30	293.2	-	39.18	254.02	Installed transducer on 100 foot line.
04N23W29F02S	11/20/2023	14:34	396.58	2.18	17.65	378.93	Barologger data downloaded.
Foster Park MW-4	11/20/2023	13:40	240.84	2.2	12.81	228.03	Barologger data downloaded. Transducer clock about 4 minutes off.
Foster Park MW-1	11/20/2023	14:10	226.01	0.9	12.57	213.44	
VRWD #5	11/21/2023	11:16	686.27	0.25	108.41	577.86	Access provided by VRWD. Measured DTW from ST. Removed transducer for connection troubleshooting on 11/20, reinstalled 11/21.

Appendix B

Raw Pressure Transducer Data (Provided Electronically)

Appendix C

Processed Pressure Transducer Data (Provided Electronically)