EAST BAY
MUNICIPAL UTILITY DISTRICT

February 28, 2019

Ms. Alyx Karpowicz
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Re: East Bay Municipal Utility District Bayside Groundwater Project, 2018 Annual Report, Order No. R2-2007-0038

Dear Ms. Karpowicz:

In accordance with the Waste Discharge Requirements of Order No. R2-2007-0038, the East Bay Municipal Utility District (EBMUD) is submitting the enclosed 2018 annual self-monitoring report (SMR) for the Bayside Groundwater Project. There were no exceedances of the permit's water quality limits.

Table 1 includes construction details for the project's groundwater monitoring wells. Table 2 summarizes historical injected and recovered water volumes. Injection of treated drinking water in the Bayside Well occurred during October and November 2018 totaling approximately 8.34 million gallons; however no extraction events took place in 2018.

The Self-Monitoring and Reporting Program (SMP) of Order No. R2-2007-0038 requires EBMUD to implement a phased approach for groundwater quality monitoring. Table 3 of the SMP tabulates groundwater quality monitoring well groups for phased monitoring. There are a total of four groups. Group 3 monitoring, consisting of the Bayside Well, MW-2S, MW-2D[1], MW-4, MW-5D, MW-6, and MW-7, was implemented beginning in 2014.

Table 3 summarizes groundwater level elevations and depths; Table 4 presents the vertical hydraulic gradients at MW-5S, MW-5I, and MW-5D; and Tables 5 and 6 contain current and historical groundwater quality results. Figure 1 is a well location map; Figures 2 and 3 present the groundwater elevation contours on August 1, 2018 and December 1, 2018, respectively; and Figure 4 shows TDS concentration contours. Attachment B contains figures showing the monitoring wells' groundwater elevation trends in 2018.

There were no exceedances of the permit's limits for TTHMs and HAAs.

[1] EBMUD uses slightly different well names than those used in the Permit. For example, "MW-2I" is used instead of "MW-2D" and "MW-9D" instead of "MW-9." EBMUD's well naming convention is used in this Report.

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions, please contact me at (510) 287-0412 or David Behnken, Environmental Health and Safety Specialist II, at (510) 287-0327.

Sincerely,

for Chandra Johannesson
Manager of Environmental Compliance

WEST YOST ASSOCIATES

February 28, 2019

Project No.: 484-13-14-02.002
SENT VIA: EMAIL

Mr. David Behnken
Environmental Health & Safety Specialist II
East Bay Municipal Utility District
375 11th Street
Oakland, CA 94607

SUBJECT: EBMUD Bayside Groundwater Project, 2018 Annual Report, Waste Discharge Requirements Order No. R2-2007-0038

Dear Mr. Behnken:

West Yost Associates (West Yost) has prepared this 2018 Annual Report (Report) on behalf of the East Bay Municipal Utility District (EBMUD) for the Bayside Groundwater Project (Project) in Alameda County. West Yost has prepared this Report in accordance with the Self-Monitoring and Reporting Program (SMRP) of Waste Discharge Requirements (Permit) Order No. R2-2007-0038, which was adopted by the San Francisco Regional Water Quality Control Board (Regional Board) on May 9, 2007 (Regional Board, 2007).

The Project consists of the Bayside Well and a number of monitoring wells constructed near and in the vicinity of the Bayside Well. Depth to groundwater was monitored in the Bayside Well and associated monitoring wells during 2018. Groundwater samples were collected on December 5, 10, 11, 12, and 19, 2018, for analytical testing. Groundwater elevations and analytical results are provided in this Report, along with results from previous years, in accordance with the SMRP, for evaluation of long-term trends.

This Report addresses the following topics:

- Project Overview
- Regulatory Requirements
- Injection and Recovery Activities
- Monitoring and Sampling Activities
- Groundwater Elevations and Flow Directions
- Groundwater Quality Results
- Conclusions

PROJECT OVERVIEW

The Project site is located in a predominantly industrial area within unincorporated portions of the City of San Lorenzo and the City of San Leandro. The Bayside Well is located at 2600 Grant Avenue in San Lorenzo. The Project area is bounded by residential communities to the north and east, and the San Francisco Bay about a half-mile to the west.

The Bayside Well is an Aquifer Storage and Recovery (ASR) well designed, constructed, and operated for injection of treated drinking water from EBMUD's distribution system into the South East Bay Plain Groundwater Basin for aquifer storage during wet years and, later, for recovery as a source of supplemental drinking water supply for EBMUD during dry years. Injection of treated drinking water took place in October and November 2018. No extraction of water occurred during 2018.

The Bayside Well was constructed with 18-inch diameter stainless steel casing and is screened from 520 feet below ground surface (bgs) to 650 feet bgs. The monitoring well network consists of 17 monitoring wells constructed to various depths (Figure 1). Well construction details are summarized in Table 1. Additional background information on the Project is provided in the Permit.

REGULATORY REQUIREMENTS

The SMRP requires groundwater level monitoring in 13 of the 17 Project monitoring wells. The 13 Project wells monitored during this reporting period were MW-1, MW-2S, MW-2I, MW-3, MW-4, MW-5S, MW-5I, MW-5D, MW-6, MW-7, MW-9D, MW-10I, and MW-10D.[1] After the first year of monitoring in 2009, groundwater levels are required to be monitoring on an hourly basis in 11 of the 13 wells listed above. The exceptions to this monitoring frequency are MW-4 and MW-6, where groundwater level monitoring is required to be performed quarterly only.

To address the primary groundwater quality concern of introducing disinfection by-products (DBPs) into the groundwater basin, the SMRP requires EBMUD to implement a phased approach for sampling and monitoring groundwater quality in subsets of the Project monitoring wells. Each phase is successive and depends on certain SMRP triggers, generally related to the location of the injected water front (i.e. leading edge of the injected water). The SMRP specifies the following phased approach consisting of four groups of monitoring wells:

- Initial monitoring in Group 1 wells (Bayside Well, MW-2S, MW-2I, MW-4, and MW-10D[2]) is required to start three months prior to the start of Project operations and to continue on an annual basis until Group 2 monitoring is triggered.

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[1] EBMUD uses slightly different well names than those used in the Permit. For example, "MW-2I" is used instead of "MW-2D" and "MW-9D" instead of "MW-9." EBMUD's well naming convention is used in this Report.

[2] Group 1 monitoring included limited monitoring at MW-10D. Specifically, the SMRP requires monitoring of MW-10D only once in the beginning of the Group 1 monitoring phase.

- Monitoring of Group 2 wells (Group 1 wells plus MW-6, but excluding MW-10D) would begin once the injected water front reaches MW-4 and would continue on an annual basis until Group 3 monitoring is triggered.
- Monitoring of Group 3 wells (Group 2 wells plus MW-5D and MW-7) would begin once the injected water front reaches MW-6 and would continue on an annual basis until Group 4 monitoring is triggered.
- Monitoring of Group 4 wells (Group 3 wells plus MW-10D) would begin with the detection of injected water at MW-5D or MW-7, or 15 years after initiating Project operations, whichever is earlier.

Water quality parameters are required to be measured annually per the parameters and test methods listed in Table 4 of the SMRP. These parameters include general water quality parameters, standard minerals, and DBPs. The Permit specifies water quality limits for total trihalomethanes (TTHMs) at 80 micrograms per liter (µg/L), and haloacetic acids (HAAs) at 60 µg/L. The individual analytes are discussed below in the Groundwater Quality Results section.

The SMRP requires the submission of data from the Project's monitoring well network to the Regional Board in an annual report. Annual reports, due by March 1 of the following year, are required to include the following items, per Part A.4 of the SMRP:

- A table of water injection and recovery data, including the cumulative total volume injected and recovered since Project inception.
- Maps of well locations, groundwater elevation contours, extent of the injected water front, and extent of dissolved water quality parameters (isoconcentration maps).
- A table of location and construction details for the wells.
- A table of current groundwater depths, elevations, and horizontal and vertical gradients.
- A table of current and historical (past five years) water quality results for the wells.
- A discussion of field and laboratory results that includes conclusions, recommendations, and data anomalies.

INJECTION AND RECOVERY ACTIVITIES

Injection of treated drinking water in the Bayside Well took place over approximately one month, between October 9 and November 5, 2018. A total of 8.34 million gallons of treated drinking water was injected at a sustained rate of 320 gallons per minute. The 2018 injection flow rate was determined to be the highest injection rate possible without incurring backflow shut-off or spill risks. No extraction from the Bayside Well occurred in 2018. The injection rate was in compliance with the permitted maximum rate limits. The cumulative volumes of injected and recovered water since the Project inception in 2009 are shown in Table 2.

MONITORING AND SAMPLING ACTIVITIES

The SMRP requires groundwater level monitoring on an hourly basis in the applicable monitoring wells with the exception of MW-4 and MW-6, for which quarterly groundwater level monitoring is required. In early 2014, EBMUD installed new dedicated pressure transducers in the wells to collect hourly groundwater level data. Hourly groundwater level data were collected from January through December 2018.

The SMRP also requires groundwater quality monitoring following a phased approach. In 2013, EBMUD initiated monitoring of Group 2 wells, which added MW-6 to the annual monitoring well network. In 2015, EBMUD initiated monitoring of Group 3 wells, which added MW-5D and MW-7 to the annual monitoring well network, in response to the detection of chlorine residual and the HAA, dibromoacetic acid, at MW-6, as detailed in the 2013 Annual Report.

EBMUD collected the 2018 groundwater samples from the required monitoring wells. The required annual water quality sampling was performed on December 5, 10, 11, 12, and 19, 2018.

Submersible pumps fitted with new tubing were used to purge and sample groundwater monitoring wells MW-2S, MW-2I, MW-4, MW-5D, MW-6 and MW-7. The Bayside Well was purged using the dedicated downhole turbine pump with the sample collected from a spigot at the wellhead. Purge water was disposed of on permeable ground adjacent to monitoring wells. Purge water from the Bayside Well was pumped to an onsite holding tank and eventually discharged to Oro Loma Sanitary District under Sewer Permit No. 18-100-19. No surface water discharges occurred during the 2018 reporting period.

Groundwater monitoring and sampling were completed using the following procedures:

1. Measured static water level within each well and calculated three well casing volumes required for purging in accordance with United States Environmental Protection Agency (USEPA) groundwater sampling protocols.
2. Purged the well until three well casing volumes were removed.
3. Measured field water quality parameters (pH, specific conductance, and temperature) periodically during purging.
4. Collected samples in containers with appropriate preservatives in accordance with USEPA sampling protocols for individual constituents.
5. Measured residual chlorine immediately after sample collection.
6. Transported samples to EBMUD's state-certified laboratory in a cooler under chain of custody for analytical testing.

Attachment A provides well purge logs, including the static water level, purge volumes, and field parameter measurements.

GROUNDWATER ELEVATIONS AND FLOW DIRECTIONS

Static depth to groundwater levels measured prior to well purging and sampling in 2018 are summarized in Table 3, along with calculated groundwater elevations. The calculated

groundwater elevations are based on the reference elevations noted in Table 1. The historical static water levels and groundwater elevations are also provided in Table 3.

Groundwater elevations derived from the pressure transducers installed in May 2014 and corrected for barometric pressures are plotted by well for January through December 2018 (Attachment B).[3] These elevations were calculated by EBMUD staff. It should be noted that MW-7, which was damaged in prior years and unable to generate water quality samples, was repaired on December 6, 2018, and modified with a flush mount surface, resulting in a groundwater elevation shift of approximately -2.78 feet.

Groundwater elevation contour maps were generated using groundwater elevation data collected at specific times using the pressure transducers. Groundwater elevation contours for August 1, 2018, corresponding to a low tide in San Francisco Bay, are shown on Figure 2. Groundwater elevation contours for December 1, 2018, corresponding to a high tide in San Francisco Bay, are shown on Figure 3. As shown on Figures 2 and 3, the groundwater flow direction was primarily to the north-northwest at both low tide (Figure 2) and high tide (Figure 3). The horizontal hydraulic gradients were variable with lower gradients generally further from the bay and higher gradients closer to the bay.

Groundwater elevations during low tide ranged from -16.39 feet above mean sea level (amsl) to -11.04 feet amsl for the five wells shown on Figure 2. Groundwater elevations during high tide ranged from -15.94 feet amsl to -9.89 feet amsl at the same wells (Figure 3).

Vertical hydraulic gradients were calculated based on groundwater elevations and the distance to the center of the screened interval specified in Table 4 for the nested wells MW-5S, MW-5I, and MW-5D. Specifically, vertical gradients were calculated for a low tide using groundwater elevation data from around 9:00 AM on August 1, 2018, and for a high tide using groundwater elevation data from around 7:00 AM on December 1, 2018. The calculated vertical gradients for these dates, including supporting data for the calculations, are presented in Table 4. The overall vertical gradient under both conditions was downward at approximately 0.02 to 0.04 feet per foot. These results are consistent with the vertical gradients reported in the 2017 Annual Report.

GROUNDWATER QUALITY RESULTS

The 2018 analytical results are included in the following tables, along with historical water quality results for the previous five years (2013 through 2017):

- Table 5 includes data for general water quality parameters (e.g. pH, chlorine residual, total dissolved solids (TDS), ammonia, nitrate, chloride, manganese, and iron) and standard minerals (e.g. calcium, magnesium, potassium, sodium, sulfate, total alkalinity [including alkalinity series], and hardness).
- Table 6 includes data for DBPs (e.g. THMs and HAAs including their individual components).

[3] Groundwater levels gathered and provided by EBMUD between 1/1/18 and 1/17/18 were adjusted to account for offsets resulting from annual transducer recalibration.

Copies of the analytical laboratory reports for the 2018 water quality data are provided in Attachment C.[4] The laboratory report for the Bayside Well also includes data collected by EBMUD for additional constituents beyond those presented in Tables 5 and 6. These results are for "Title 22" parameters that would be of interest in a future water system permit application to the State.

For wells with pre-2018 data (Bayside Well, MW-2S, MW-2I, MW-4, MW-5D, MW-6 and MW-7), the 2018 water quality results summarized in Table 5 are generally consistent. A number of parameters detected in MW-2S have significantly higher concentrations than the same parameter detected in the other monitoring wells. Monitoring well MW-2S is a much shallower well and may be affected by seawater intrusion.

For the 2018 groundwater quality results summarized in Table 5, TDS has been used as a representative constituent to evaluate overall groundwater quality conditions. The isoconcentration contours shown on Figure 4 are based on TDS concentrations for deep monitoring wells, including the Bayside Well, MW-4, MW-5D, MW-6 and MW-7. The isoconcentration contours indicate the lowest concentration of 170 milligrams per liter (mg/L) occurs at the Bayside Well with increasing TDS concentrations in a northerly direction (i.e. further inland). The highest TDS concentration of 460 mg/L was detected at well MW-5D. TDS concentrations increase in a northeasterly direction away from the Bayside Well. The TDS concentration trend shown on Figure 4 is similar in shape to the northeasterly groundwater gradients (Figures 2 and 3). Comparison of Figures 2, 3 and 4 shows that TDS concentrations increase hydraulically downgradient from the Bayside Well.

The current DBPs data summarized in Table 6 are consistent with the historical groundwater monitoring results. A few analytes were above the method detection limits (MDLs) and the combined DBPs as HAA(5),[5] HAA(9),[6] and TTHMs are beyond the range of historical results in some wells, notably the Bayside Well. However, the data indicates there are no exceedances of the Permit's water quality limits for HAAs and TTHMs at 60 µg/L and 80 µg/L, respectively.

CONCLUSIONS

EBMUD conducted the 2018 groundwater monitoring for the Bayside Groundwater Project site in accordance with the Self-Monitoring and Reporting Program of Waste Discharge Requirements Order No. R2-2007-0038. EBMUD will continue to implement groundwater monitoring for the Group 3 wells during 2019. The 2019 Annual Report will be submitted to the Regional Board by March 1, 2020.

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[4] The laboratory reports in Attachment C include results for additional parameters beyond those required by the SMRP. EBMUD collected this information for reasons unrelated to the Permit and SMRP. These data are not discussed in this Report.

[5] HAA(5) includes the sum of dibromoacetic, dichloroacetic, monobromoacetic, monochloroacetic, and trichloroacetic acids.

[6] HAA(9) includes the sum of all nine haloacetic acids.

Please call Charles Hardy at 925-949-5814 or Ken Loy at 530-792-3276 with any questions or comments on this Report.

Sincerely,

WEST YOST ASSOCIATES

Charles E. Hardy, PE
Senior Engineer
RCE #C71015

Kenneth L. Loy
Principal Hydrogeologist
PG #7008, CEG #2214, CHG #720

List of Tables

List of Figures

List of Attachments

List of References

1. Regional Board, 2007, Order No. R2-2007-0038 *Waste Discharge Requirements for East Bay Municipal Utility District, Bayside Groundwater Project, San Lorenzo, Alameda County*, Adopted May 9, 2007.

Table 1. Groundwater Monitoring Well Construction Details

Well ID	Latitude	Longitude	Address	City	Completion Date	Drilled Depth, feet bgs[a]	Casing Depth, feet bgs	Depth to Top of Perforation, feet bgs	Depth to Bottom of Perforation, feet bgs	Casing Diameter, inches	Reference Elevation, feet amsl[b]	Reference Location on Well
MW-1	37° 40' 4.8"	122° 9' 25.2"	2600 Grant Avenue	San Lorenzo		665	650	520	640	2	8.71	Top of steel casing
MW-2S						210	60	40	60	2	9.90	Top of steel casing
MW-2I[c]						210	200	160	190	2		
MW-3	37° 40' 4.8"	122° 9' 28.8"				665	660	520	650	2	8.12	Top of steel casing
MW-4	37° 40' 11.6"	122° 9' 28.8"	2575 Grant Avenue			705	650	520	650	2	8.96	Top of steel rim
MW-5S	37° 40' 34.4"	122° 9' 06.6"	2006 Via Barrett		Sep. 2008	460	210	200	210	2	13.88	Seal of vault lid at easterly edge
MW-5I	37° 40' 34.4"	122° 9' 06.6"	2005 Via Barrett		Sep. 2008	460	325	315	325	2		
MW-5D	37° 40' 34.4"	122° 9' 06.6"	2007 Via Barrett		Feb. 2001	1,025	640	500	630	4	13.76	Top of casing at northerly edge
MW-6	37° 40' 07"	122° 9' 04.5"	15600 Worthley		Nov. 2000	1,000	655	480	650	4	9.46	Top of casing at easterly edge
MW-7	37° 39' 56.5"	122° 8' 44.2"	Western tip of San Lorenzo Park		Dec. 2018	972	680	510	630	4	4.64	Top of vault lid [e]
MW-8D	37° 43' 04"	122° 11' 50.3"	1970 Davis Street			910	490	420	480	2	14.76	Top of steel rim
MW-9S	37° 41' 11"	122° 6' 46"	589 E. Lewelling Avenue		Jan. 2008	460	120	110	120	2	54.39	Seal of vault lid at westerly edge
MW-9I					Jan. 2008	460	210	200	210	2		
MW-9D[d]					Jan. 2008	460	335	325	335	2		
MW-10S	37° 41' 19"	122° 9' 43"	15526 Wick Boulevard	San Leandro	Sep. 2008	680	120	100	120	2	11.76	Seal of vault lid at easterly edge
MW-10I					Sep. 2008	680	360	340	360	2		
MW-10D					Sep. 2008	680	610	590	610	2		

(a) bgs = below ground surface

(b) amsl = above Mean Sea Level

(c) Well MW-2I is referred to in the Permit as "MW-2D."

(d) Well MW-9D is referred to in the Permit as "MW-9."

(e) Well surface completion was modified to fix the monitoring well. The difference between the top of casing reference point and current flush mounted vault was measure to be 2.78 feet, which will be used until MW-7 is resurveyed.

Table 2. Historical Injected and Recovered Water Volumes		
Year	Injected Volume, gallons	Recovered Volume, gallons
2009	445,000	4,545,000
2010	0	113,000,000
2011	28,432,401	0
2012	0	0
2013	0	0
2014	0	0
2015	0	0
2016	0	0
2017	1,310,000	0
2018	8,340,000	0
Total	**38,527,401**	**117,545,000**

Table 3. Summary of Groundwater Elevation and Depth

Measurement Date	Groundwater Elevation, ft amsl								Depth to Groundwater, ft							
	Bayside	MW-1[a]	MW-2S	MW-2I	MW-4	MW-6	MW-5D	MW-7	Bayside	MW-1	MW-2S	MW-2I	MW-4	MW-6	MW-5D	MW-7
12/8/08			0.99		-4.07	[b]					8.78[c]		12.68[c]			
12/9/08		-5.06		1.09						13.74[c]		8.73[c]				
12/14/09					-3.75								12.71			
12/15/09			0.95	1.44							8.95	8.46				
12/8/10	-7.22		1.71	0.25	-7.45				15.6		8.19	9.65	16.41			
12/21/11		-4.16	1.12	3.59	-4.17					12.87	8.78	6.31	13.13			
1/5/12		-3.94	1.04	6.24	-3.97					12.65	8.86	3.66	12.93			
12/13/12		-4.49	2.38	1.72	-4.16	-4.52				13.20	7.52	8.18	13.12	13.98		
12/18/13		-4.06	1.59	0.37	-6.68	-6.46				12.77	8.31	9.53	15.64	15.92		
12/12-12/17/14		-6.54	2.75	0.18	-6.01	-5.99	-5.76	[d]		15.25	7.15	9.72	14.97	15.45	19.52	[d]
11/16-12/15/15		-5.48	2.90	0.32	-4.94	[d]	-5.87	[d]		14.19[f]	7.00	9.58	13.9	[e]	19.63	[d]
12/21-12/27/16		-2.00	2.90	2.88	-1.95	-1.96	-1.96	[d]		10.71	7.00	7.02	10.91	11.42	15.72	[d]
12/19-12/20/17		-5.05	1.86	-1.07	-1.42	-1.80	-1.47	[d]		13.76	8.04	10.97	10.38	11.26	15.23	[d]
12/5-12/19/18		-11.12	1.62	-2.17	-2.36	-2.11	-2.14	-4.30		19.83	8.28	12.07	11.32	11.57	15.90	8.94

[a] Groundwater elevation is averaged over the measurement date period from tranducer data, and used to calculate the depth to groundwater using the surveyed elevation.

[b] Gray shaded cells indicate that no monitoring was required for the well at that time period, reflecting the transition between monitoring groups.

[c] Applicable well reference elevations are different from those in Table 1.

[d] Well MW-7 was damaged in 2012, and accurate data collection was not feasible until 2016. In 2017, a sample wasn't collected because the pump EBMUD owns was found to be incompatible with the well.

[e] Well MW-6 was not monitored in late 2015 due to a pump equipment failure.

[f] Depth to Groundwater for MW-1 was incorrectly reported in the 2015 Annual Report as -13.56 ft.

Table 4. Calculated Vertical Hydraulic Gradients for Low Tide and High Tide in San Francisco Bay								
Nested Well	Measurement Date and Time	Screened Interval, ft	Center of Screened Intervals, ft bgs	Groundwater Elevation, ft amsl	Shallow to Intermediate Vertical Gradient, ft/ft	Intermediate to Deep Vertical Gradient, ft/ft	Shallow to Deep Vertical Gradient, ft/ft	Vertical Gradient Direction
Low Tide								
MW-5S	8/1/2018 @ 09:14	200 - 210	205	-3.85	0.016	--	0.034	downward
MW-5I	8/1/2018 @ 09:15	315 - 325	320	-5.68		0.042		
MW-5D	8/1/2018 @ 09:19	500 - 630	575	-16.39	--			
High Tide								
MW-5S	12/1/2018 @ 07:14	200 - 210	205	-3.19	0.030	--	0.034	downward
MW-5I	12/1/2018 @ 07:15	315 - 325	320	-6.62		0.037		
MW-5D	12/1/2018 @ 07:19	500 - 630	575	-15.94	--			

Table 5. Current and Historical Groundwater Quality Results for General Water Quality Parameters and Standard Minerals[(a)]

Sample Date	General Water Quality Parameters								Standard Minerals									
															Alkalinity (as CaCO3)			
	pH	Chlorine Residual, mg/L	TDS, mg/L	Ammonia, mg/L	Nitrate as N, mg/L	Chloride, mg/L	Manganese, µg/L	Iron, µg/L	Calcium, mg/L	Magnesium, mg/L	Potassium, mg/L	Sodium, mg/L	Sulfate, mg/L	Hardness, mg/L	Total, mg/L	Hydroxide, mg/L	Carbonate, mg/L	Bicarbonate, mg/L
Bayside Well																		
12/18/2013	7.87	ND	120	0.56	<0.003	13	22.8	580	14.0	3.77	1.05	22.5	15	50	65	<0.1	0.45	64
12/17/2014	8.19	ND	130	0.42	<0.009	15	23.0	52.3	14.7	3.88	1.07	28.0	15	70	69	<0.1	0.99	68
11/16/2015	7.68	0.10	75	<0.3	<0.009	15	22.3	215	13.5	3.64	1.01	23.3	16	48	70	<0.1	<0.1	70
12/7/2016	8.09	0.10	140	0.11	<0.009	17	16.2	70.2	16.4	4.15	1.13	27.1	18	55	68	<0.1	<0.1	68
12/5/2017	7.91	ND	150	0.25	<0.040	16	12.9	66.5	16.5	4.17	1.19	25.0	21	62	68	<0.1	<0.1	68
12/5/2018	7.93	<0.02	170	0.280	0.12	13	13.2	946	23.2	7.66	1.34	24.0	32	94	89	<0.10	<0.10	89
MW-2S																		
12/18/2013	6.67	0.08	85,000	0.70	<0.15	45,000	36,100	2,530	1,230	2,580	568	22,300	5,700	17,000	430	<0.1	0.19	420
12/13/2014	6.57	0.20	83,000	<0.3	23(b)	39,000	36,900	<31.2	1,230	2,680	462	22,000	6,100	17,000	380	<0.1	0.13	380
12/10/2015	6.85	ND	76,000	<0.3	27	41,000	21,900	76.8	1,250	3,040	401	20,500	5,200	16,000	390	<0.1	<0.1	390
12/27/2016	6.73	0.07	77,000	0.34	<0.65	42,000	38,100	<62.4	1,330	3,150	510	20,600	5,700	16,000	390	<0.1	<0.1	390
12/19/2017	6.27	ND	73,000	1.23	<11	41,000	33,200	<62.4	1,210	2,800	501	21,200	5,500	17,000	390	<0.1	<0.1	390
12/11/2018	6.66	1	74,000	0.952	<1	41,000	33,200	<52.0	1,150	3,090	439	23,400	5,500	16,000	400	<0.10	<0.10	400
MW-2I																		
12/18/2013	7.83	ND	500	<0.3	<0.003	75	115	606	14.8	13.4	6.76	153	32	89	310	<0.1	1.9	300
12/12/2014	7.90	ND	520	1.1	<0.009	81	98.7	213	14.6	12.6	5.33	153	31	94	310	<0.1	2.3	310
12/15/2015	7.75	ND	490	0.56	0.044	59	105	177	14.4	12.5	6.73	156	34	90	300	<0.1	<0.1	300
12/27/2016	8.10	0.02	540	0.28	0.18	84	111	98.0	15.2	13.2	6.16	148	30	94	320	<0.1	<0.1	320
12/19/2017	7.69	0.05	630	1.0	0.18	150	139	1,220	17.8	15.9	7.61	193	13	130	350	<0.1	<0.1	350
12/11/2018	7.83	<0.02	620	0.280	<0.019	120	124	1,260	15.8	14.2	5.87	184	22	110	330	<0.10	<0.10	330
MW-4																		
12/18/2013	7.78	ND	430	<0.3	<0.003	59	237	31.2	32.2	13.0	3.05	113	42	130	260	<0.1	1.5	260
12/16/2014	8.22	0.10	450	<0.3	0.028	56	239	33.7	32.2	12.8	2.72	113	39	130	270	<0.1	4.2	270
12/8/2015	7.98	ND	420	<0.3	0.039	56	215	32.5	28.8	11.7	3.08	106	41	130	250	<0.1	<0.1	250
12/27/2016	8.14	ND	440	0.34	0.098	59	222	31.6	31.4	12.6	2.76	108	42	120	260	<0.1	<0.1	260
12/20/2017	7.55	ND	410	0.25	0.091	57	196	24.4	27.9	10.7	2.69	107	40	130	240	<0.1	<0.1	240
12/11/2018	7.73	<0.02	380	0.280	<0.019	48	192	39.1	24.6	9.01	2.12	102	37	100	220	<0.10	<0.10	220
MW-5D																		
12/16/2014	7.00	0.40	490	<0.3	<0.009	96	241	180	42.8	10.8	2.59	123	46	150	230	<0.1	0.22	230
11/18/2015	7.53	0.20	450	<0.3	<0.009	82	175	46.4	35.6	9.06	2.30	112	49	140	240	<0.1	<0.1	240
12/21/2016	7.68	0.02	470	<0.3	<0.013	84	195	34.6	39.0	9.74	2.34	130	49	130	230	<0.1	<0.1	230
12/19/2017	7.55	ND	410	<0.25	<0.091	57	196	24.4	27.9	10.70	2.69	107	40	130	240	<0.1	<0.1	240
12/10/2018	7.57	<0.02	460	0.280	0.19	79	197	270	35.6	9.13	1.96	112	46	130	230	<0.10	<0.10	230

Table 5. Current and Historical Groundwater Quality Results for General Water Quality Parameters and Standard Minerals[a]

Sample Date	General Water Quality Parameters								Standard Minerals									
															Alkalinity (as CaCO3)			
	pH	Chlorine Residual, mg/L	TDS, mg/L	Ammonia, mg/L	Nitrate as N, mg/L	Chloride, mg/L	Manganese, µg/L	Iron, µg/L	Calcium, mg/L	Magnesium, mg/L	Potassium, mg/L	Sodium, mg/L	Sulfate, mg/L	Hardness, mg/L	Total, mg/L	Hydroxide, mg/L	Carbonate, mg/L	Bicarbonate, mg/L
MW-6																		
12/18/2013	7.41	0.07	420	<0.3	0.017	120	223	60.4	32.4	8.58	2.14	110	95	110	230	<0.1	0.55	230
12/13/2014	7.92	0.10	430	<0.3	<0.009	58	209	25.4	34.1	8.89	2.39	110	56	120	230	<0.1	1.8	230
12/10/2015	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)
12/27/2016	7.72	ND	400	0.34	0.17	68	192	21.0	35.6	8.25	3.00	87.7	40	120	210	<0.1	<0.1	210
12/20/2017	7.37	0.01	450	<0.3	<0.19	83	164	130.0	34.2	8.56	2.39	99	49	150	230	<0.1	<0.1	230
12/12/2018	6.9	0.10	410	0.280	<0.019	54	234	43.4	30.5	7.10	3.56	97.2	46	110	230	<0.10	<0.10	230
MW-7																		
2016	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)
2017	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)
12/19/2018	8.32	0.30	470	0.280	<0.095	86	236	164	36.1	8.97	2.46	118	50	130	230	<0.10	<0.10	230

[a] Symbols and data qualifiers are described as follows:
"<" or "ND" indicates non-detect (ND) results, with the Method Detection Limit (MDL) shown as the value following "<".
"B" preceding a value indicates that the parameter was detected in the laboratory blank associated with the reported result.
"E" preceding a value indicates a detected results with a value reported as "estimated" between the MDL and the Reporting Limit.
"--" indicates that no result was reported for the analyte on the corresponding sample date.

[b] The analytical laboratory report notes that the analysis for nitrate exceeded the hold time for the MW-2S sample collected 12/13/2014.

[c] Well MW-6 was not sampled in 2015 due to pump equipment failure.

[d] Well MW-7 was not sampled in 2016 and 2017 because the pump EBMUD owns was found to be incompatible with the well.

Table 6. Current and Historical Groundwater Quality Results for Disinfection Byproducts[a]

Sample Date	Haloacetic Acids											Trihalomethanes				
	HAA(5),[b] µg/L	HAA(9),[c] µg/L	Bromochloro-acetic Acid, µg/L	Bromodichloro-acetic Acid, µg/L	Chlorodibromo-acetic Acid, µg/L	Dibromo-acetic Acid, µg/L	Dichloro-acetic Acid, µg/L	Monobromo-acetic Acid, µg/L	Monochloro-acetic Acid, µg/L	Tribromo-acetic Acid, µg/L	Trichloro-acetic Acid, µg/L	TTHMs,[d] µg/L	Chloroform, µg/L	Bromodichloro-methane, µg/L	Dibromochloro-methane, µg/L	Bromoform, µg/L
Bayside Well																
12/18/2013	0.35	<1.6	I 1.3	<0.16	<0.19	I 0.35	<0.23	<0.22	<0.68	<0.44	<0.21	<2.94	2.5	<0.079	<0.13	<0.23
12/17/2014	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.89	0.45	<0.079	<0.13	<0.23
11/16/2015	1.7	<3.2	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	0.36	<0.98	0.37	<0.145	<0.20	<0.27
12/7/2016	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<4.95	4.4	0.19	<0.13	<0.23
12/5/2017	1.6	<3.1	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	0.26	<15.56	14	1.2	<0.13	<0.23
12/5/2018	<10.4	<12.8	<0.15	1.2	<0.31	1.1	3.4	<0.29	<0.65	<0.72	5.0	<35.22	29.71	3.56	1.65	<0.3
MW-2S																
12/18/2013	ND	ND	<0.14	<0.16	<0.19	<0.11	<0.23	<0.22	<0.68	<0.44	<0.21	<0.609	<0.17	<0.079	<0.13	<0.23
12/13/2014	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/10/2015	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/27/2016	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/19/2017	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/11/2018	<1.5	<3.5	<0.15	0.75	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<1.50	<0.4	<0.4	<0.4	<0.3
MW-2I																
12/18/2013	0.34	<0.34	<0.14	<0.16	<0.19	I 0.34	<0.23	<0.22	<0.68	<0.44	<0.21	<0.609	<0.17	<0.079	<0.13	<0.23
12/12/2014	ND	3.4	0.50	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	J <0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/15/2015	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/27/2016	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/19/2017	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/11/2018	<1.6	<3.5	<0.15	0.73	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	E 0.22	<1.50	<0.4	<0.4	<0.4	<0.3
MW-4																
12/18/2013	0.36	4.0	I 3.6	<0.16	<0.19	0.36	<0.23	<0.22	<0.68	<0.44	<0.21	<0.609	<0.17	<0.079	<0.13	<0.23
12/16/2014	<1.6	<3.1	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	0.72	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/8/2015	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/27/2016	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/20/2017	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/11/2018	<1.6	<3.1	<0.15	<0.31	<0.31	E 0.27	<0.18	<0.29	<0.65	<0.72	E 0.21	<1.50	<0.4	<0.4	<0.4	<0.3
MW-5D																
12/16/2014	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
11/18/2015	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.170	<0.17	<0.079	<0.13	<0.23
12/21/2016	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/19/2017	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/10/2018	<1.5	<3.1	E 0.19	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<1.50	<0.4	<0.4	<0.4	<0.3

Table 6. Current and Historical Groundwater Quality Results for Disinfection Byproducts[a]

Sample Date	Haloacetic Acids											Trihalomethanes				
	HAA(5),[b] µg/L	HAA(9),[c] µg/L	Bromochloro-acetic Acid, µg/L	Bromodichloro-acetic Acid, µg/L	Chlorodibromo-acetic Acid, µg/L	Dibromo-acetic Acid, µg/L	Dichloro-acetic Acid, µg/L	Monobromo-acetic Acid, µg/L	Monochloro-acetic Acid, µg/L	Tribromo-acetic Acid, µg/L	Trichloro-acetic Acid, µg/L	TTHMs,[d] µg/L	Chloroform, µg/L	Bromodichloro-methane, µg/L	Dibromochloro-methane, µg/L	Bromoform, µg/L
MW-6																
12/18/2013	0.34	3.9	I, N 3.6	<0.16	<0.19	0.34	<0.23	<0.22	<0.68	<0.44	<0.21	<0.609	<0.17	<0.079	<0.13	<0.23
12/13/2014	[e]	[e]	[e]	[e]	[e]	[e]	[e]	[e]	[e]	[e]	[e]	<0.609	<0.17	<0.079	<0.13	<0.23
12/10/2015	[f]	[f]	[f]	[f]	[f]	[f]	[f]	[f]	[f]	[f]	[f]	[f]	[f]	[f]	[f]	[f]
12/27/2016	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/19/2017	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/12/2018	<1.6	<3.1	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	E 0.21	<1.50	<0.4	<0.4	<0.4	<0.3
MW-7																
2016	[g]	[g]	[g]	[g]	[g]	[g]	[g]	[g]	[g]	[g]	[g]	[g]	[g]	[g]	[g]	[g]
2017	[g]	[g]	[g]	[g]	[g]	[g]	[g]	[g]	[g]	[g]	[g]	[g]	[g]	[g]	[g]	[g]
12/19/2018	<1.5	<3.0	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<1.50	<0.4	<0.4	<0.4	<0.3

[a] Symbols and data qualifiers are described as follows:
"<" or "ND" indicates non-detect (ND) results, with the Method Detection Limit (MDL) shown as the value following "<", except for total haloacetic acids (HAA) and total trihalomethanes (TTHMs) as detailed below.
"I" preceding a value indicates a dual column quantitation difference greater than 40 percent Relative Percent Difference.
"J" preceding a value indicates that the quantitation of the result does not meet the laboratory's Standard Operating Procedure criteria.
"N" preceding a value indicates that the spike recovery for the result was outside the laboratory control limits.
"E" indicates that value is estimated, concentration is outside calibration range.
"--" indicates that no result was reported for the analyte on the corresponding sample date.

[b] HAA5 value is calculated by adding values for dibromoacetic, dichloroacetic, monobromoacetic, monochloroacetic, and trichloroacetic acids, with "<" indicating that the total includes ND data (MDLs used). If all results are ND, then the total is indicated as ND.

[c] HAA9 value is calculated by adding results for all individual haloacetic acids shown, with "<" indicating that the total includes ND data (MDLs used). If all results are ND, then the total is indicated as ND.

[d] TTHMs value is calculated by adding individual trihalomethane results (including MDLs for ND data). If ND data is included, "<" is indicated with the TTHMs result.

[e] Well MW-6 was not monitored for haloacetic acids in 2014.

[f] Well MW-6 was not monitored in 2015 due to pump equipment failure.

[g] Well MW-7 was not sampled in 2016 and 2017 because the pump EBMUD owns was found to be incompatible with the well.

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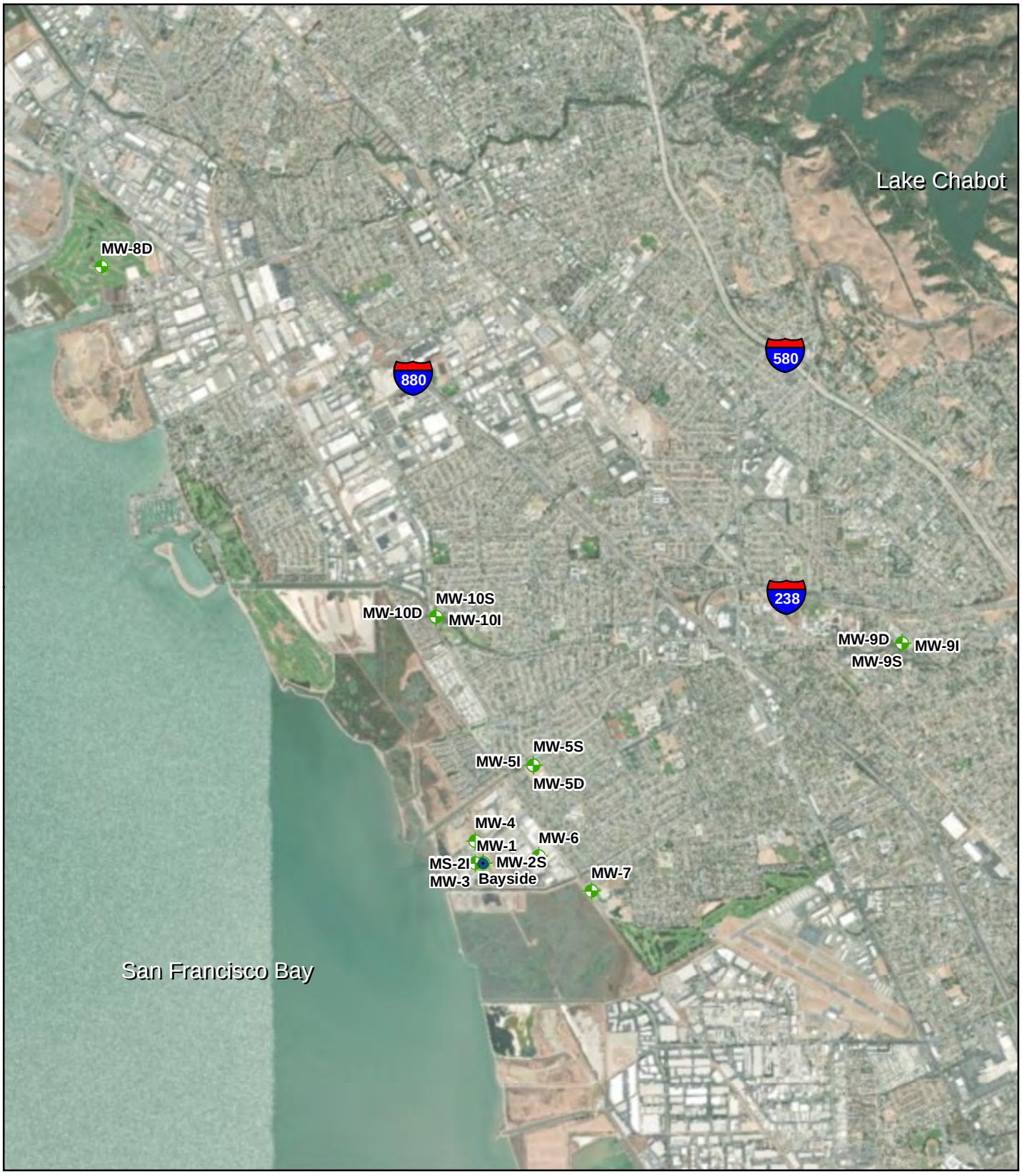


LEGEND

- Groundwater Monitoring Well
- Bayside Aquifer Storage and Recovery Well

N

0 0.5 1

Miles

FIGURE 1

East Bay Municipal Utility District
2018 Bayside Annual Report

Well Location Map

WEST YOST ASSOCIATES

LEGEND

- Groundwater monitoring well and elevation, feet above mean sea level (amsl)
- Groundwater elevation contour, feet amsl, dashed where approximate
- Approximate horizontal groundwater gradient direction and magnitude

N

0 250 500

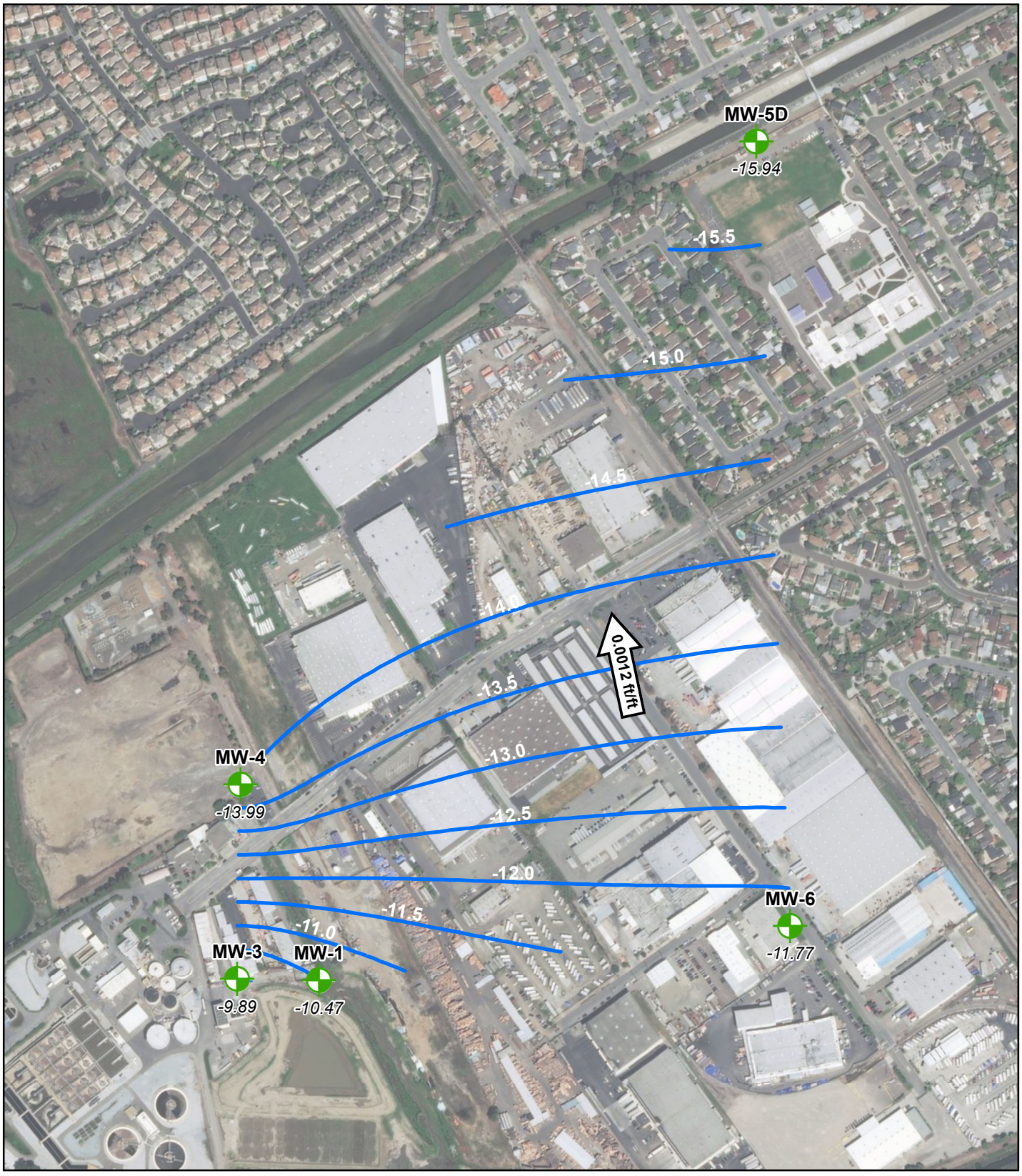
Scale in Feet

FIGURE 2

East Bay Municipal Utility District
2018 Bayside Annual Report

Groundwater Elevation Contours
Low Tide (August 1, 2018)

WEST YOST ASSOCIATES



LEGEND

- Groundwater monitoring well and elevation, feet above mean sea level (amsl)
- Groundwater elevation contour, feet amsl, dashed where approximate
- Approximate horizontal groundwater gradient direction and magnitude

N

0 250 500

Scale in Feet

FIGURE 3

East Bay Municipal Utility District
2018 Bayside Annual Report

Groundwater Elevation Contours
High Tide (December 1, 2018)

WEST YOST ASSOCIATES

LEGEND

Groundwater monitoring well and TDS concentration in mg/L.

TDS concentration contour.

N

0 250 500

Scale in Feet

FIGURE 4

East Bay Municipal Utility District
2018 Bayside Annual Report

Groundwater TDS Contours
December 2018

WEST YOST ASSOCIATES

ATTACHMENT A
Groundwater Purging Logs

GROUNDWATER PURGING LOG

SITE NAME: Bayside Well		
WELL NO: Bayside	INSPECTOR: NPK/GC	DATE: 12/5/18

PURGING DATA

WELL DIAMETER (inches): 18	TUBING DIAMETER (inches): NA	WELL SCREEN INTERVAL DEPTH: NA	INITIAL TOTALIZER READING (gal): 8404098	PURGE PUMP TYPE: O – dedicated well pump

WELL VOLUME PURGE: 30,000 gal

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): NA	PURGING INITIATED AT: 0958	PURGING ENDED AT: 1054	TOTAL VOLUME PURGED (gallons): 30,000	FINAL TOTALIZER READING (gal): 8434098

TIME	VOLUME PURGED (gallons)	TOTAL VOLUME PURGED (gallons)			pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm				
1014	10,000	10,000			8.42	18.0	274.5				
1035	10,000	20,000			7.99	17.4	301.7				
1054	10,000	30,000			7.96	17.5	250.4				

WELL CAPACITY (Gallons Per Foot): **2"** = 0.16; **4"** = 0.65

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

GROUNDWATER PURGING LOG

SITE NAME: **Bayside Wells**		
WELL NO: **2S**	INSPECTOR: NPK/GR/DW	DATE: 12/11/18

PURGING DATA

WELL DIAMETER (inches): **2**	TUBING DIAMETER (inches): **1/2**	WELL SCREEN INTERVAL DEPTH: **40** feet to **60** feet	STATIC DEPTH TO WATER (feet): 7.84 ft.*	PURGE PUMP TYPE: **ESP**

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

= (**60** feet – 7.84 feet) X **0.16** gallons/foot = 8.34 gallons 25.03

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 40'	PURGING INITIATED AT: 1338	PURGING ENDED AT: 1345	TOTAL VOLUME PURGED (gallons): 28	FINAL STATIC DEPTH TO WATER (feet): 7.80

4 gpm

TIME	VOLUME PURGED (gallons)	TOTAL VOLUME PURGED (gallons)	pH (standard units)	TEMP. (°C)	COND. (circle units) umhos/cm or µS/cm
1340	8	8	6.57	18.9	85.8
1342	8	16	6.59	18.5	82.9
1344	8	24	6.58	18.2	82.7

WELL CAPACITY (Gallons Per Foot): **2"** = 0.16; **4"** = 0.65

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other
(Specify)

* 8.28 ft. to top of Sticking

GROUNDWATER PURGING LOG

SITE NAME: **Bayside Wells**		
WELL NO: **2I**	INSPECTOR: DW/SR/NPK	DATE: 12/11/18

PURGING DATA

WELL DIAMETER (inches): **2**	TUBING DIAMETER (inches): **1/2**	WELL SCREEN INTERVAL DEPTH: **160** feet to **190** feet	STATIC DEPTH TO WATER (feet): 12.55 ft ~~12.63 ft~~ *	PURGE PUMP TYPE: **ESP**

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

= (**200** feet – 12.55 feet) X **0.16** gallons/foot = 30 x 3 = 90 gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 45'	PURGING INITIATED AT: 1205	PURGING ENDED AT: 1305	TOTAL VOLUME PURGED (gallons):	FINAL STATIC DEPTH TO WATER (feet): 29.25

2gpm

TIME	VOLUME PURGED (gallons)	TOTAL VOLUME PURGED (gallons)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm
1220	30	30	7.69	18.4	1096
1240	30	60	7.74	18.7	958
1305	30	90	7.81	18.5	886

WELL CAPACITY (Gallons Per Foot): **2"** = 0.16; **4"** = 0.65

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

* 12.87 ft to top of stickup

initial well 11.82 ft
depth to grade

GROUNDWATER PURGING LOG

SITE NAME: Bayside Wells		
WELL NO: 4	INSPECTOR: David W. John S.	DATE: 12/11/18

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 1/2	WELL SCREEN INTERVAL DEPTH: 520 feet to 650 feet	STATIC DEPTH TO WATER (feet): 11.32 ft.	PURGE PUMP TYPE: ESP

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY (x3 for total purge volume)
(only fill out if applicable)
= (650 feet – 11.32 feet) X 0.16 gallons/foot = 102 x3 gallons 306

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 25	PURGING INITIATED AT: 9:28 AM	PURGING ENDED AT: 1042	TOTAL VOLUME PURGED (gallons): 322	FINAL STATIC DEPTH TO WATER (feet): 11.15

TIME	VOLUME PURGED (gallons)	TOTAL VOLUME PURGED (gallons)			pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm				
9:28 AM	~~294~~	~~294~~			~~7.83~~ DW	~~18.3~~ DW					
10:00 am	(147x2)	(147x2)			7.83	18.3	536				
10:30 Am	(138x2)	(285x2)			7.77	18.8	548				
	276	570									

WELL CAPACITY (Gallons Per Foot): 2" = 0.16; 4" = 0.65

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

2gal / 13 sec. 60/13 9.2 DW gal/min ~~66.5~~ 33.26 DW min For ~~306~~ 612 g

GROUNDWATER PURGING LOG

SITE NAME: **Bayside Wells**		
WELL NO: **5D**	INSPECTOR: MPK/RV/DW	DATE: 12/10/18

PURGING DATA

WELL DIAMETER (inches): **4**	TUBING DIAMETER (inches): **1/2**	WELL SCREEN INTERVAL DEPTH: **500** feet to **630** feet	STATIC DEPTH TO WATER (feet): 15.9' 16.35'	PURGE PUMP TYPE: **ESP**

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

= (**640** feet – 15.9 feet) X **0.65** gallons/foot = 394 gallons 1200 gal

10 gpm

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 25'	PURGING INITIATED AT: 0920	PURGING ENDED AT: 1120	TOTAL VOLUME PURGED (gallons): 1200	FINAL STATIC DEPTH TO WATER (feet): 15.52'

TIME	VOLUME PURGED (gallons)	TOTAL VOLUME PURGED (gallons)			pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or (µS/cm)				
0950	300	300			6.73	19.4	767				
1020	300	600			7.46	20.7	715				
1050	300	900			7.60	21.3	734				
1120	300	1200			7.60	20.9	728				

WELL CAPACITY (Gallons Per Foot): **2"** = 0.16; **4"** = 0.65

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

GROUNDWATER PURGING LOG

SITE NAME: **Bayside Wells**		
WELL NO: **6**	INSPECTOR: NPK/JR/ZW	DATE: 12/12/18

PURGING DATA

WELL DIAMETER (inches): **4**	TUBING DIAMETER (inches): **1/2**	WELL SCREEN INTERVAL DEPTH: **480** feet to **650** feet	STATIC DEPTH TO WATER (feet): 12.35' 11.57'	PURGE PUMP TYPE: **ESP**

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

= (**655** feet – 11.57 feet) X **0.65** gallons/foot = 418 gallons 1254

10 gpm

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): **25**	PURGING INITIATED AT: 0920	PURGING ENDED AT: 1130	TOTAL VOLUME PURGED (gallons): 1300	FINAL STATIC DEPTH TO WATER (feet): 11.40

TIME	VOLUME PURGED (gallons)	TOTAL VOLUME PURGED (gallons)			pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or (µS/cm)				
1000	400	400			7.35	20.1	866				
1040	400	800			7.01	20.0	712				
1120	400	1200			7.19	19.7	616				
1130											

WELL CAPACITY (Gallons Per Foot): **2"** = 0.16; **4"** = 0.65

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

GROUNDWATER PURGING LOG

SITE NAME: **Bayside Wells**		
WELL NO: **7**	INSPECTOR: ZW DW	DATE: 12/19/2018

PURGING DATA

WELL DIAMETER (inches): **4**	TUBING DIAMETER (inches): **1/2**	WELL SCREEN INTERVAL DEPTH: **510** feet to **630** feet	STATIC DEPTH TO WATER (feet): 8.94	PURGE PUMP TYPE: **ESP**

WELL VOLUME PURGE: (680 ft – 8.94 ft) X **0.65** gal/ft = 436.69 gallons X 3 = 1308.57 total purge gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): **25**	PURGING INITIATED AT: 9:45	PURGING ENDED AT: 12:05	TOTAL VOLUME PURGED (gallons):	FINAL STATIC DEPTH TO WATER (feet): 8.81

TIME	VOLUME PURGED (gallons)	TOTAL VOLUME PURGED (gallons)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm
10:00	138	138	6.61	18.7	1124
10:30	276.27 414	414.27	7.32	20.1	855
11:00	276.27	690.54	7.38	20.6	848
11:30	276.27	966.81	7.04	20.2	940
12:00	276.27	1,243.08	7.43	21.8	813

10.15

2.5 tube length

2 gal 13.03 sec , 1 min / 60 sec

2 gal × 1 / 13.03 sec × 60 sec / 1 min = 9.209 gal/min

2 hours 20 min.

ATTACHMENT B

Groundwater Elevation Trends for Monitoring Wells

Figure B-1. 2018 MW-1 Groundwater Elevation Trend

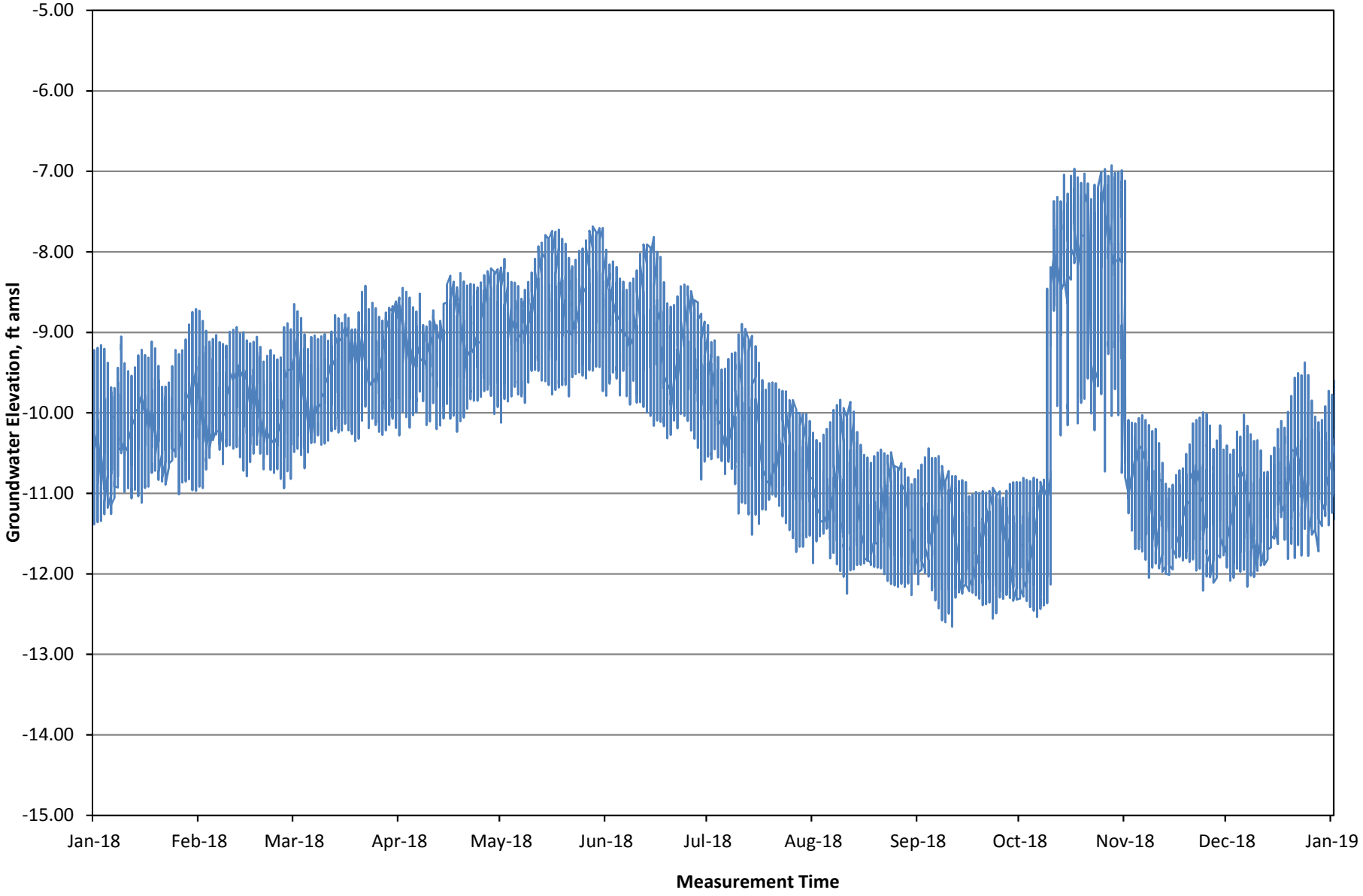


Figure B-2. 2018 MW-2S Groundwater Elevation Trend

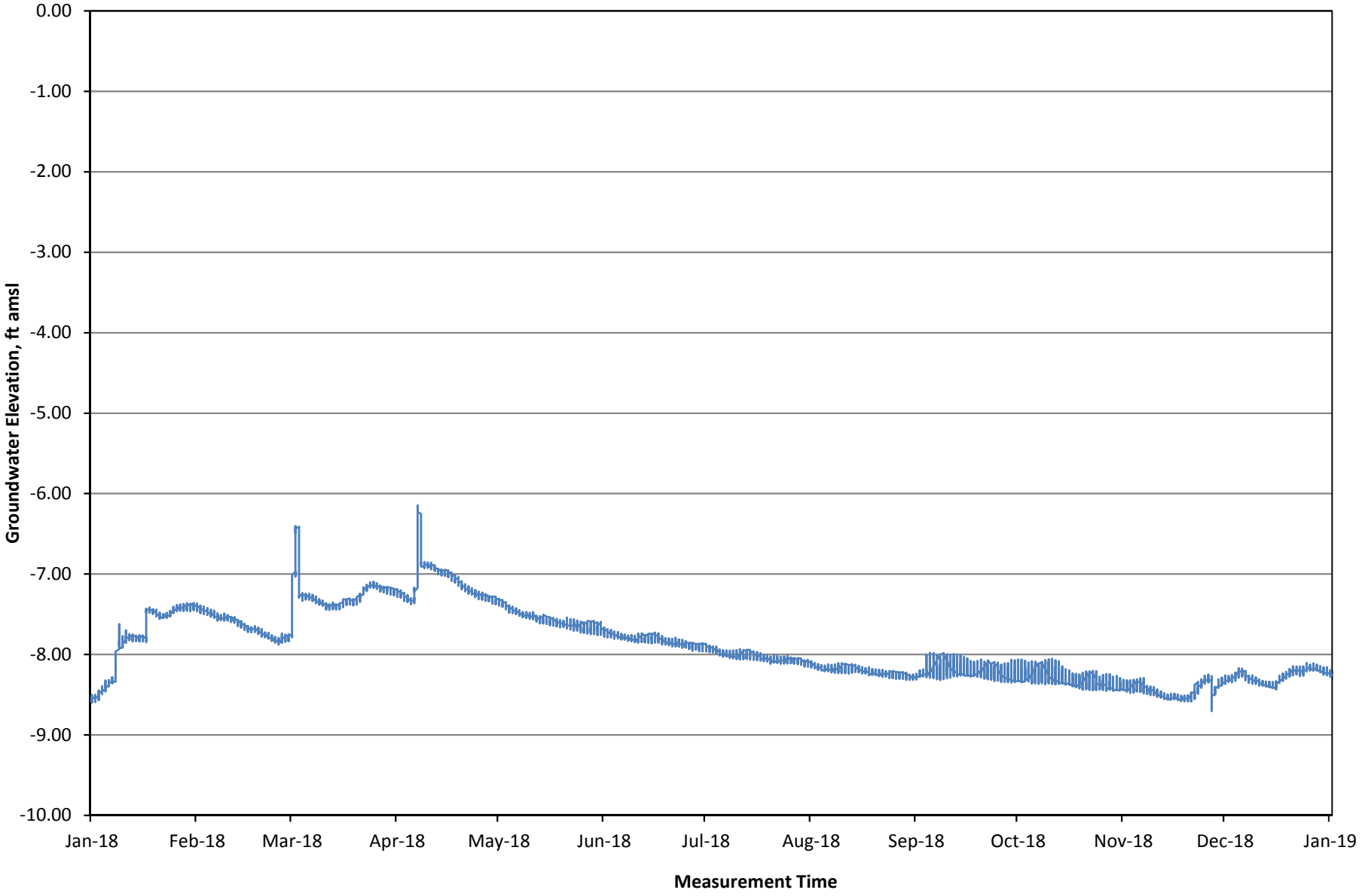


Figure B-3. 2018 MW-2I Groundwater Elevation Trend

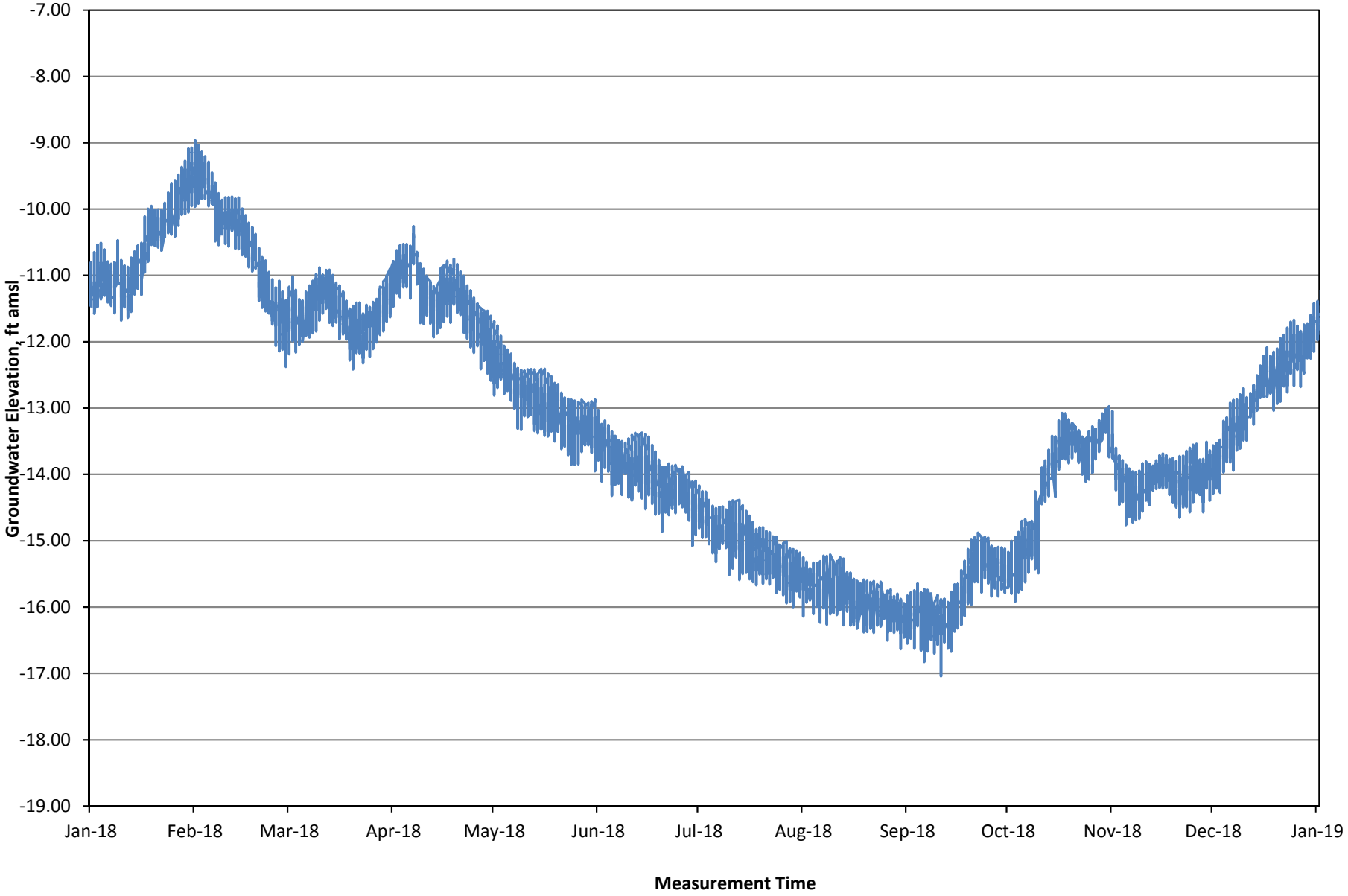


Figure B-4. 2018 MW-3 Groundwater Elevation Trend

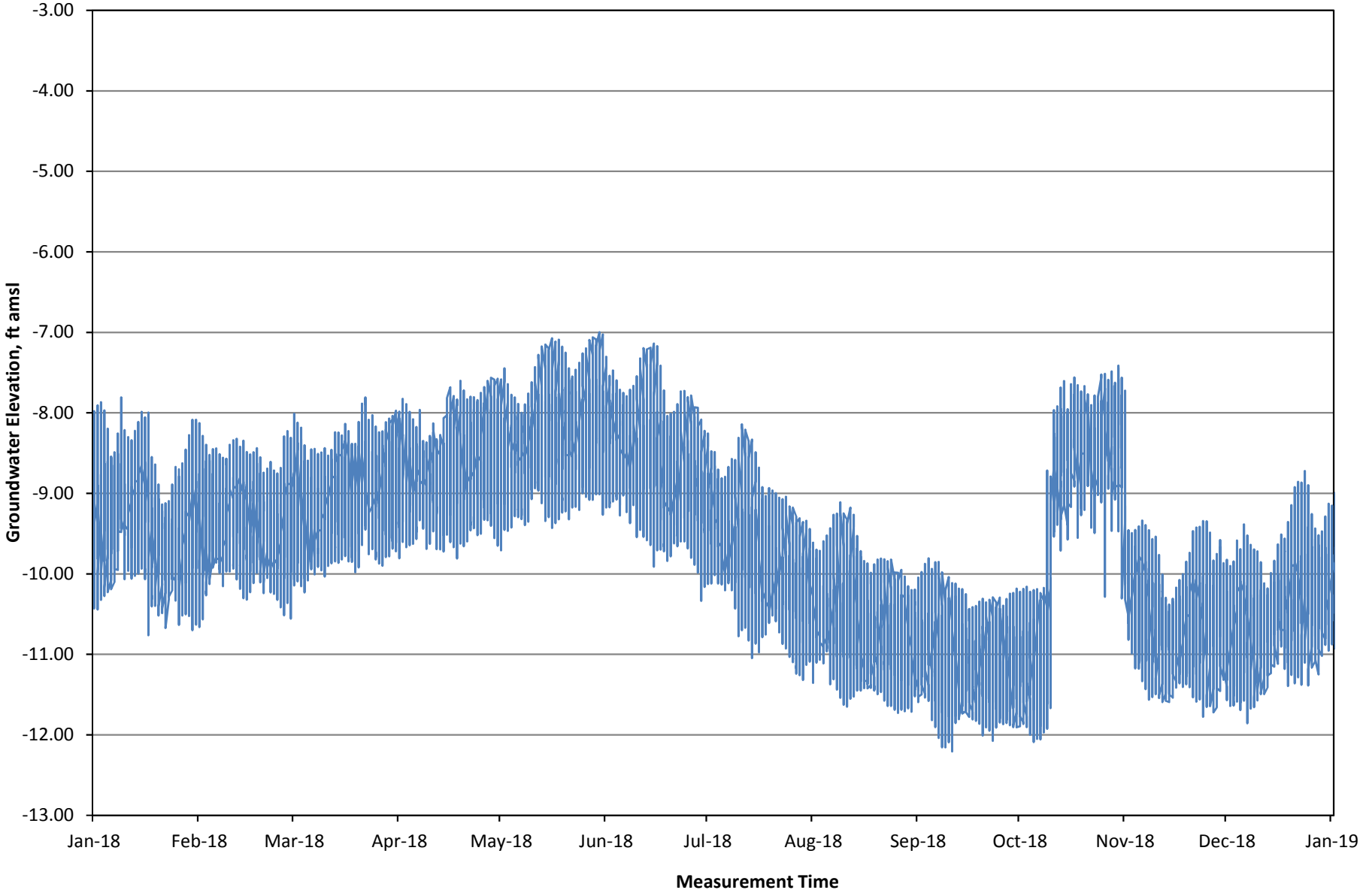


Figure B-5. 2018 MW-4 Groundwater Elevation Trend

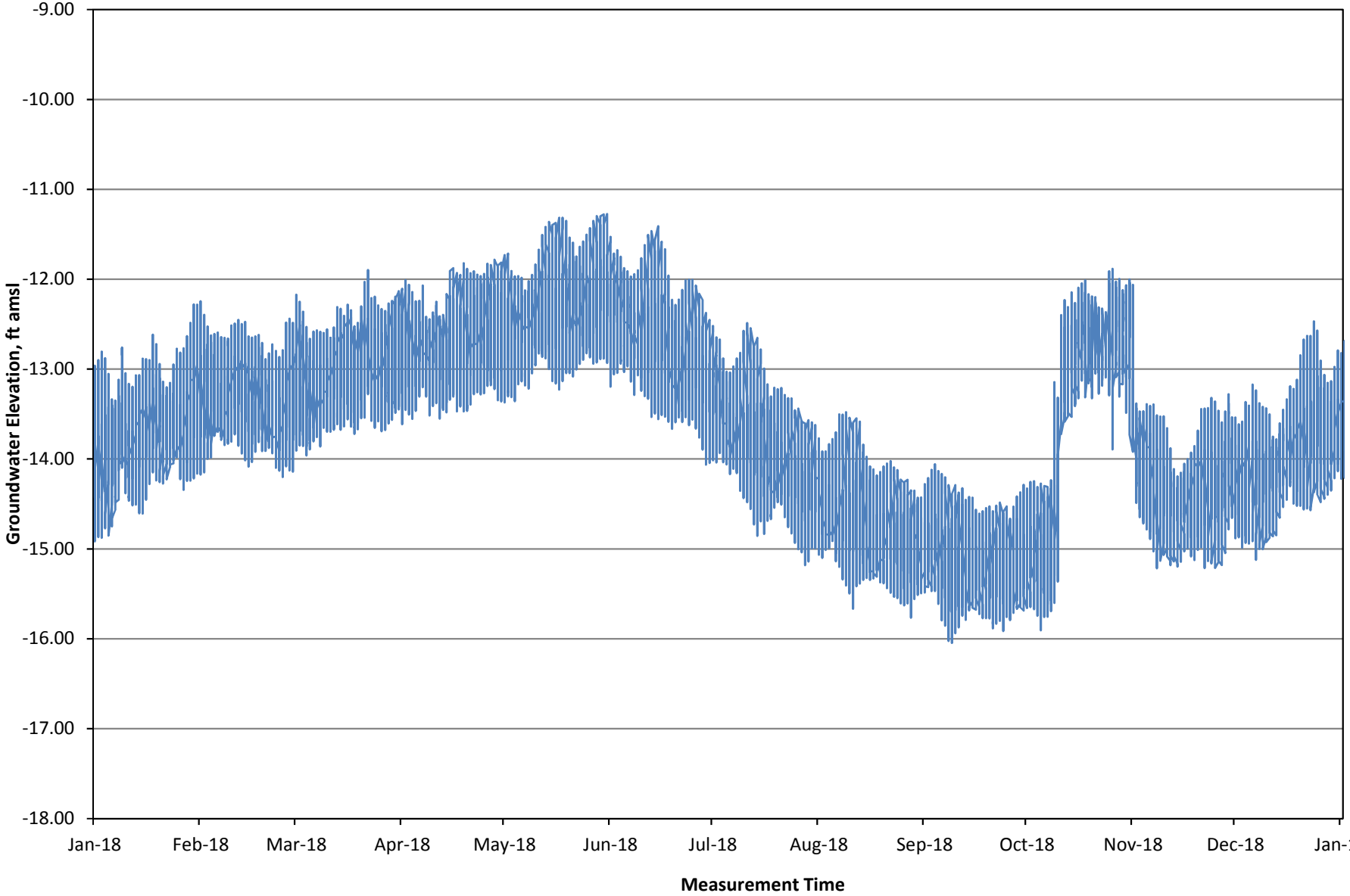


Figure B-6. 2018 MW-5S Groundwater Elevation Trend

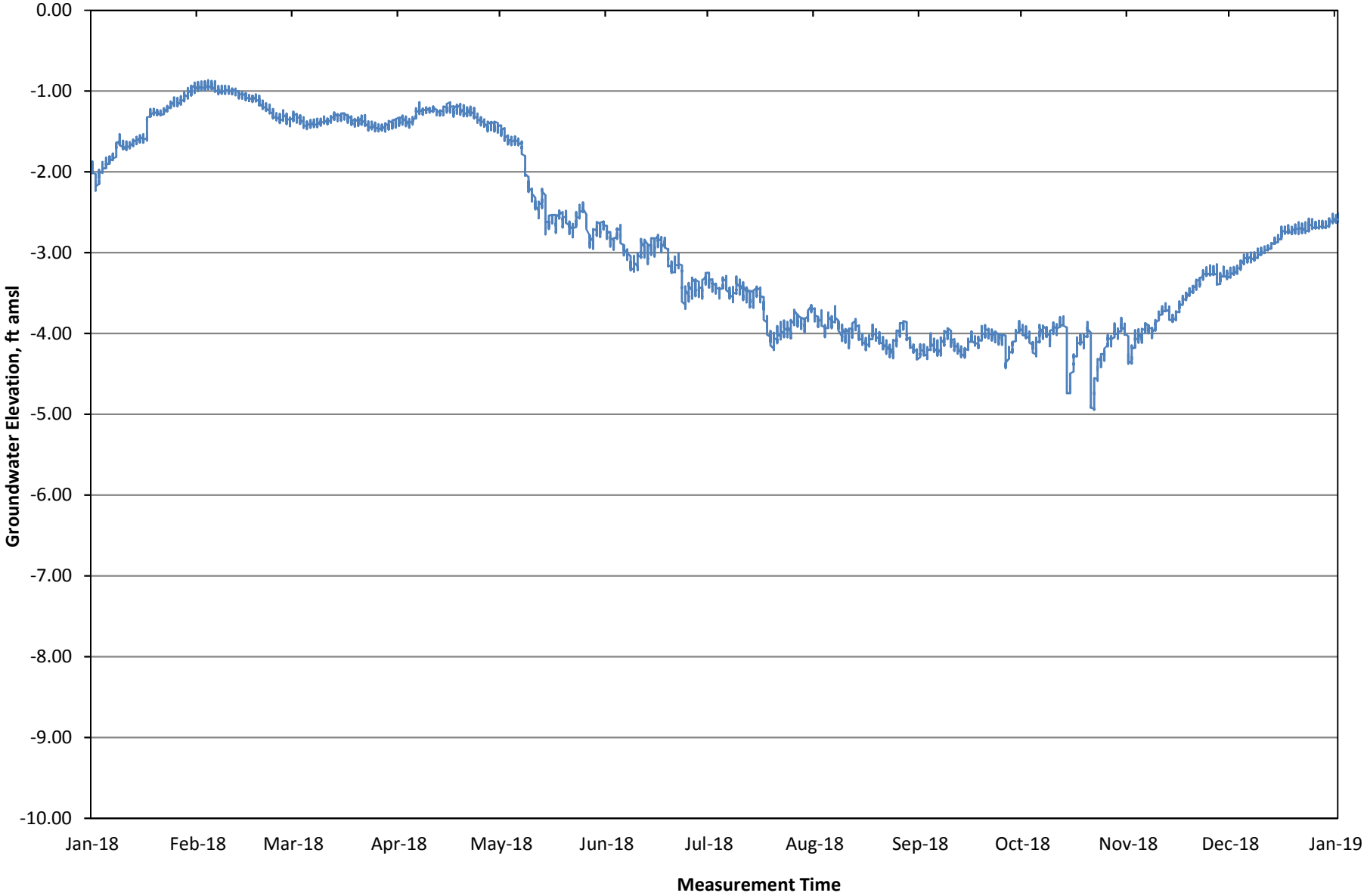


Figure B-7. 2018 MW-5I Groundwater Elevation Trend

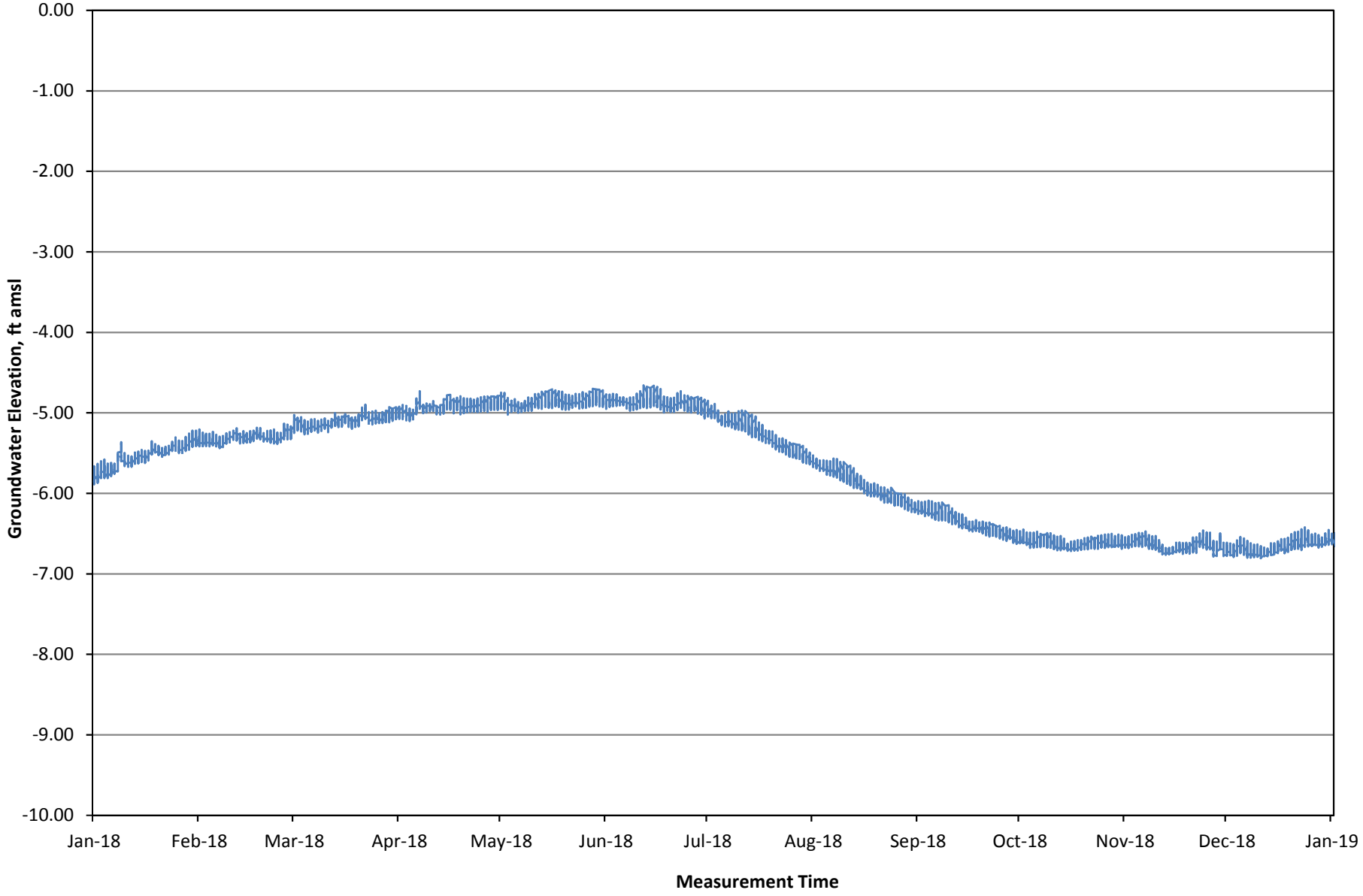


Figure B-8. 2018 MW-5D Groundwater Elevation Trend

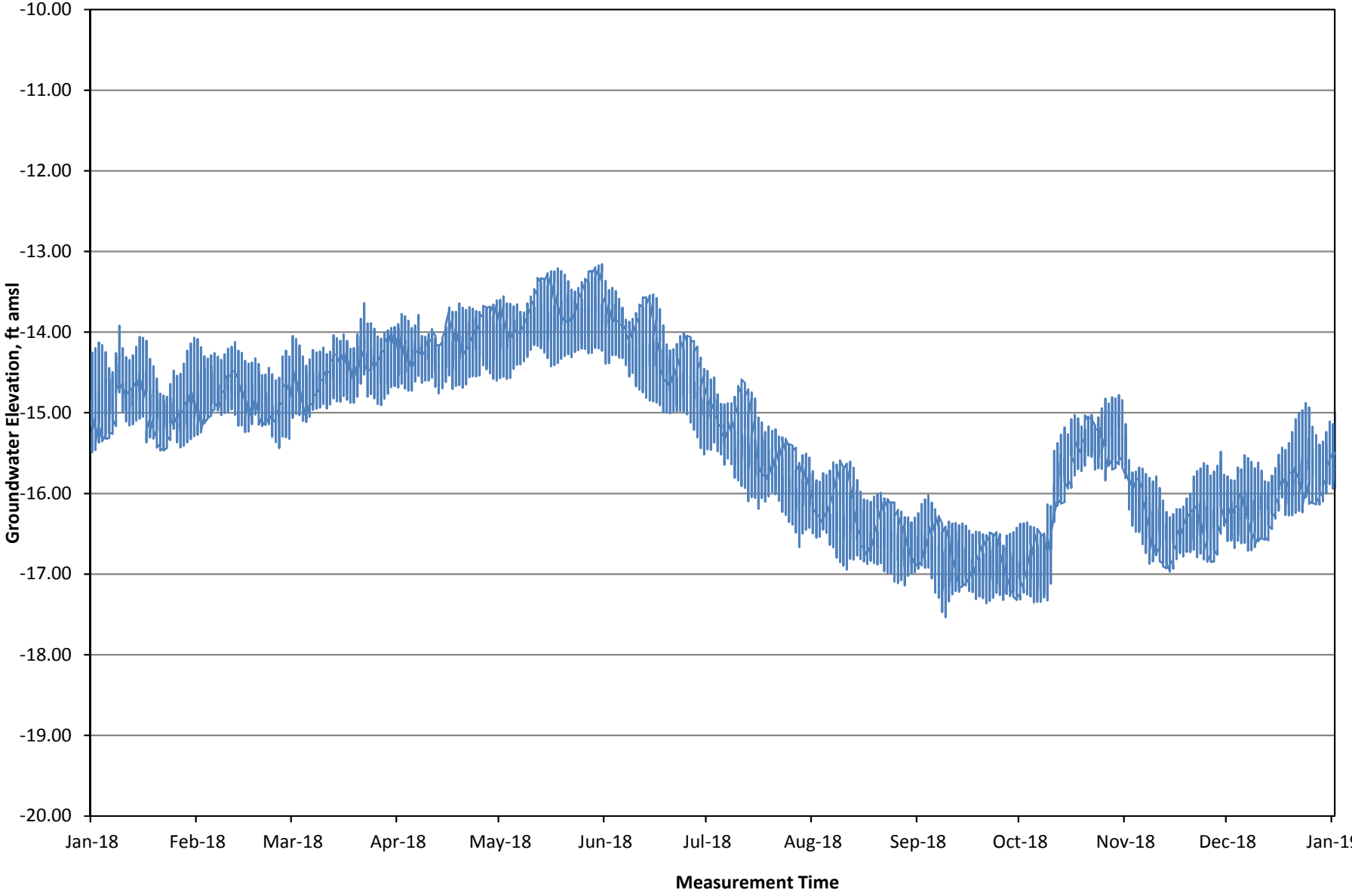


Figure B-9. 2018 MW-6 Groundwater Elevation Trend

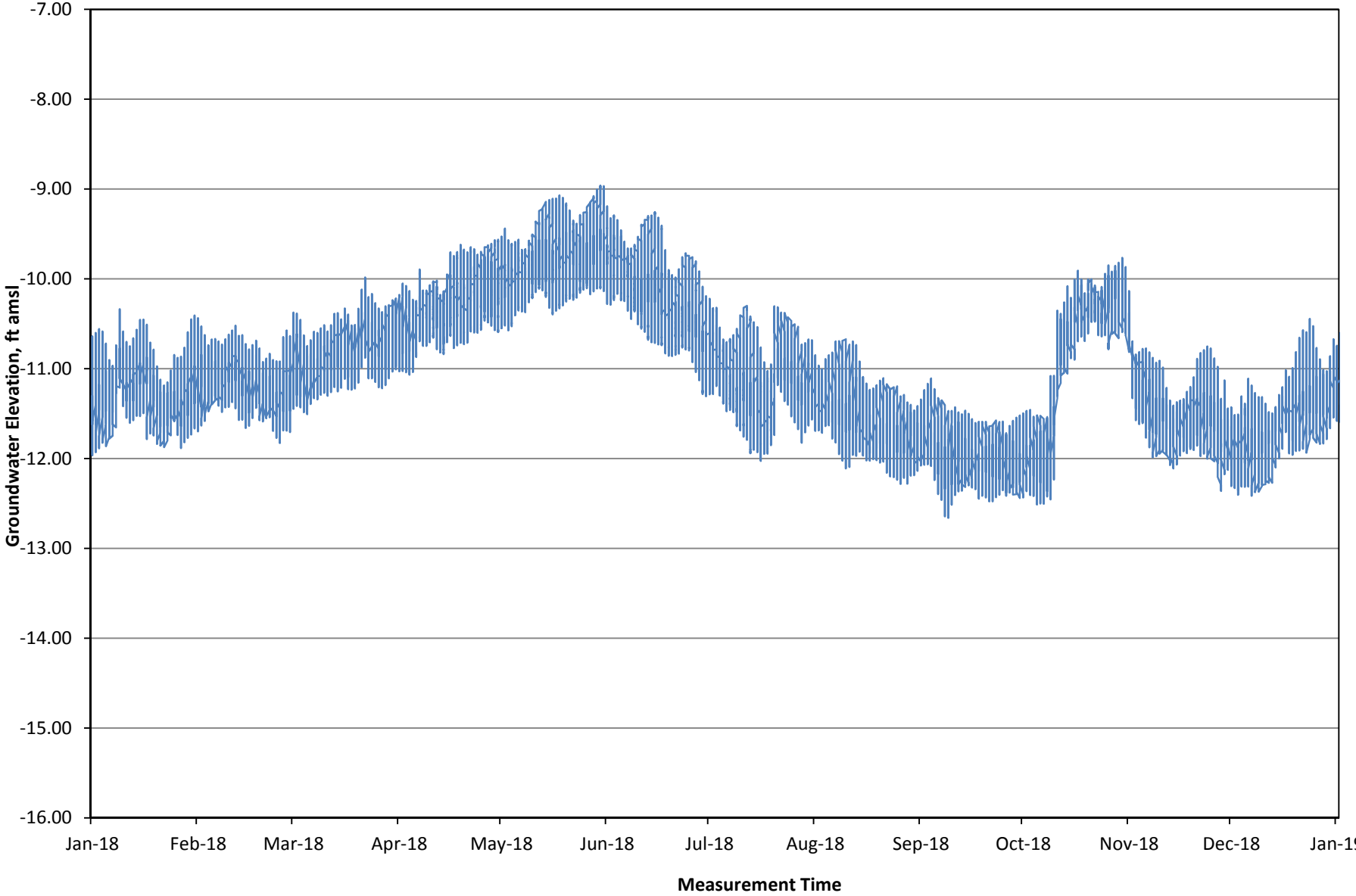


Figure B-10. 2018 MW-7 Groundwater Elevation Trend

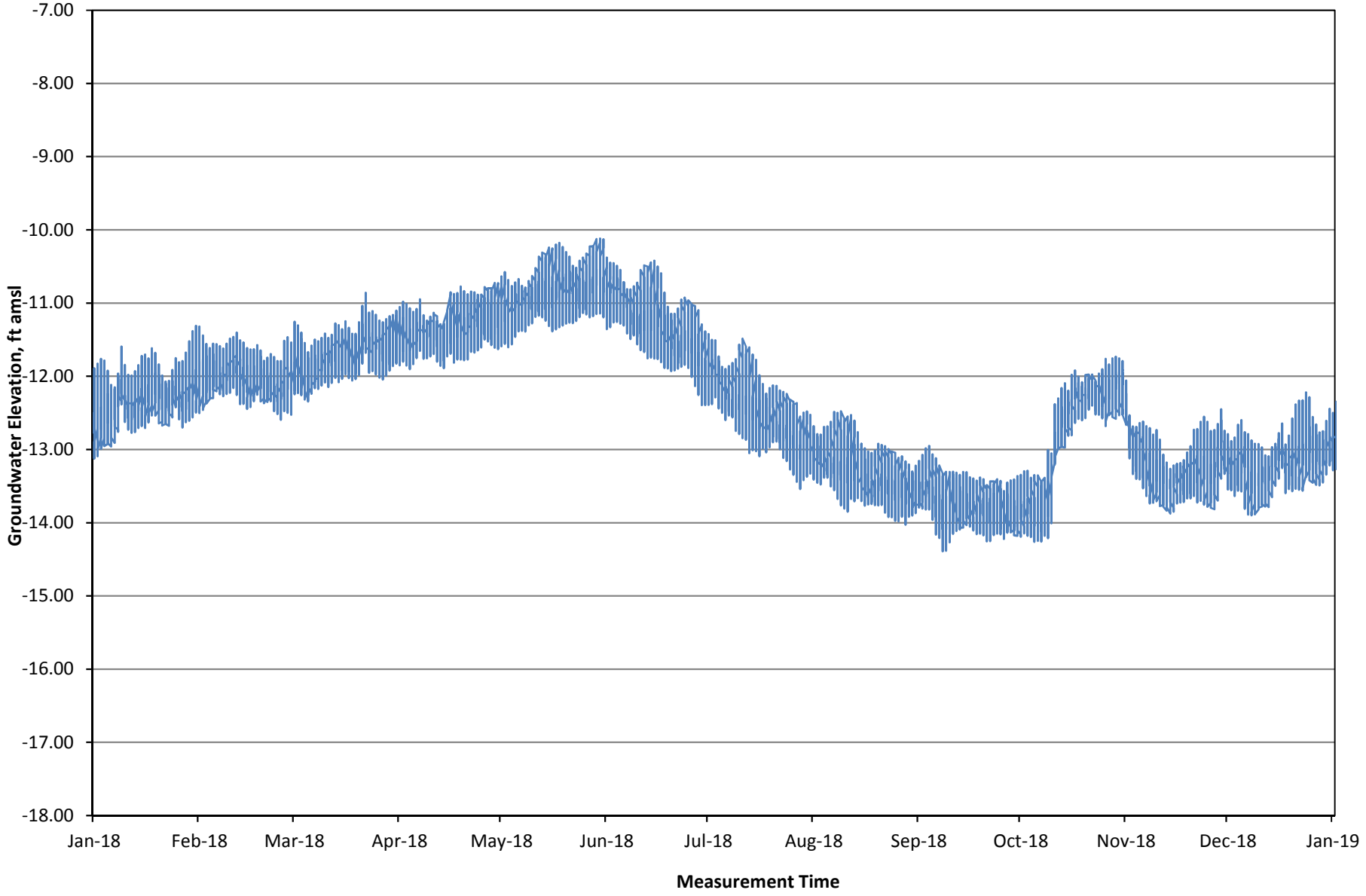


Figure B-11. 2018 MW-9D Groundwater Elevation Trend

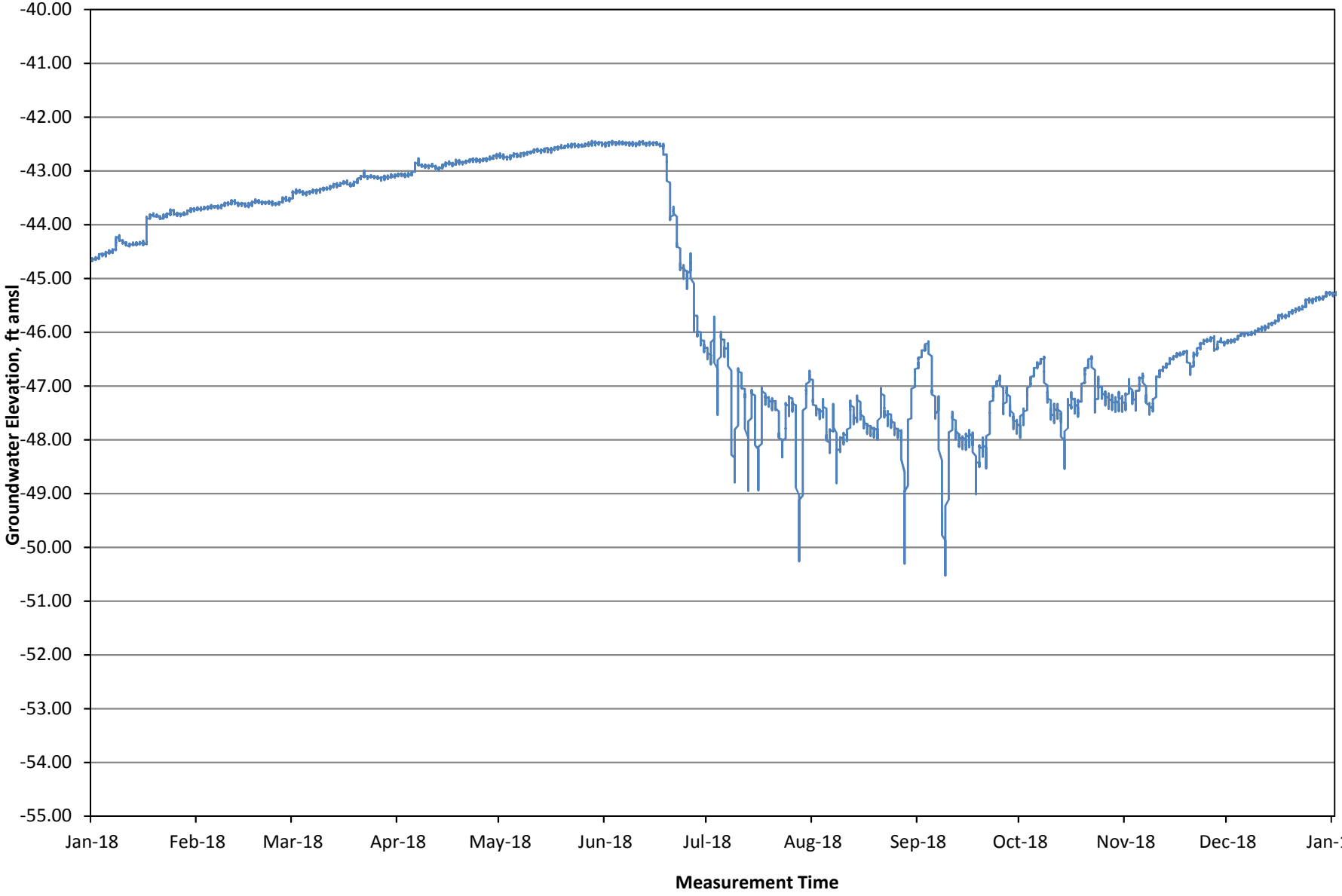


Figure B-12. 2018 MW-10I Groundwater Elevation Trend

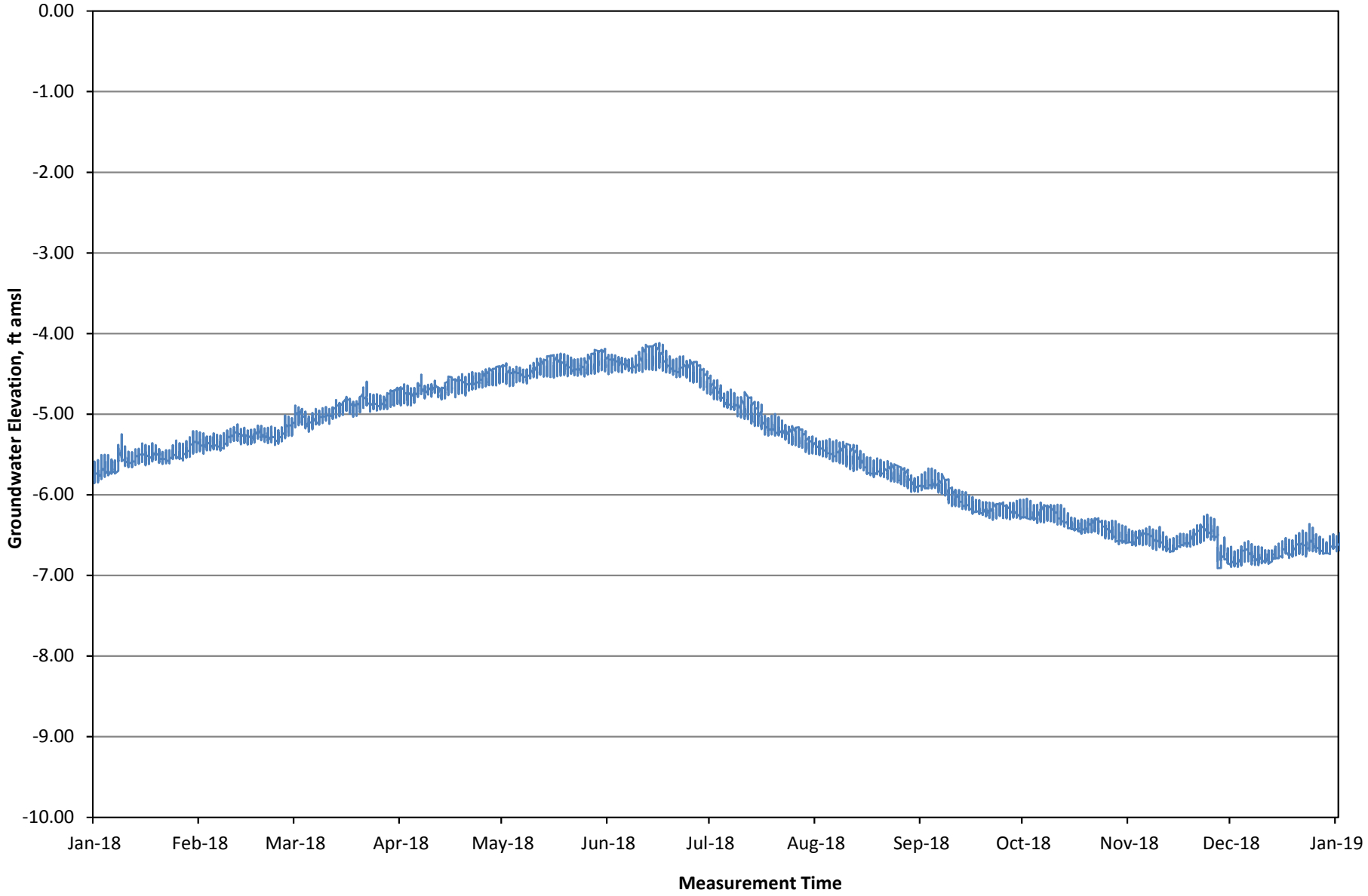
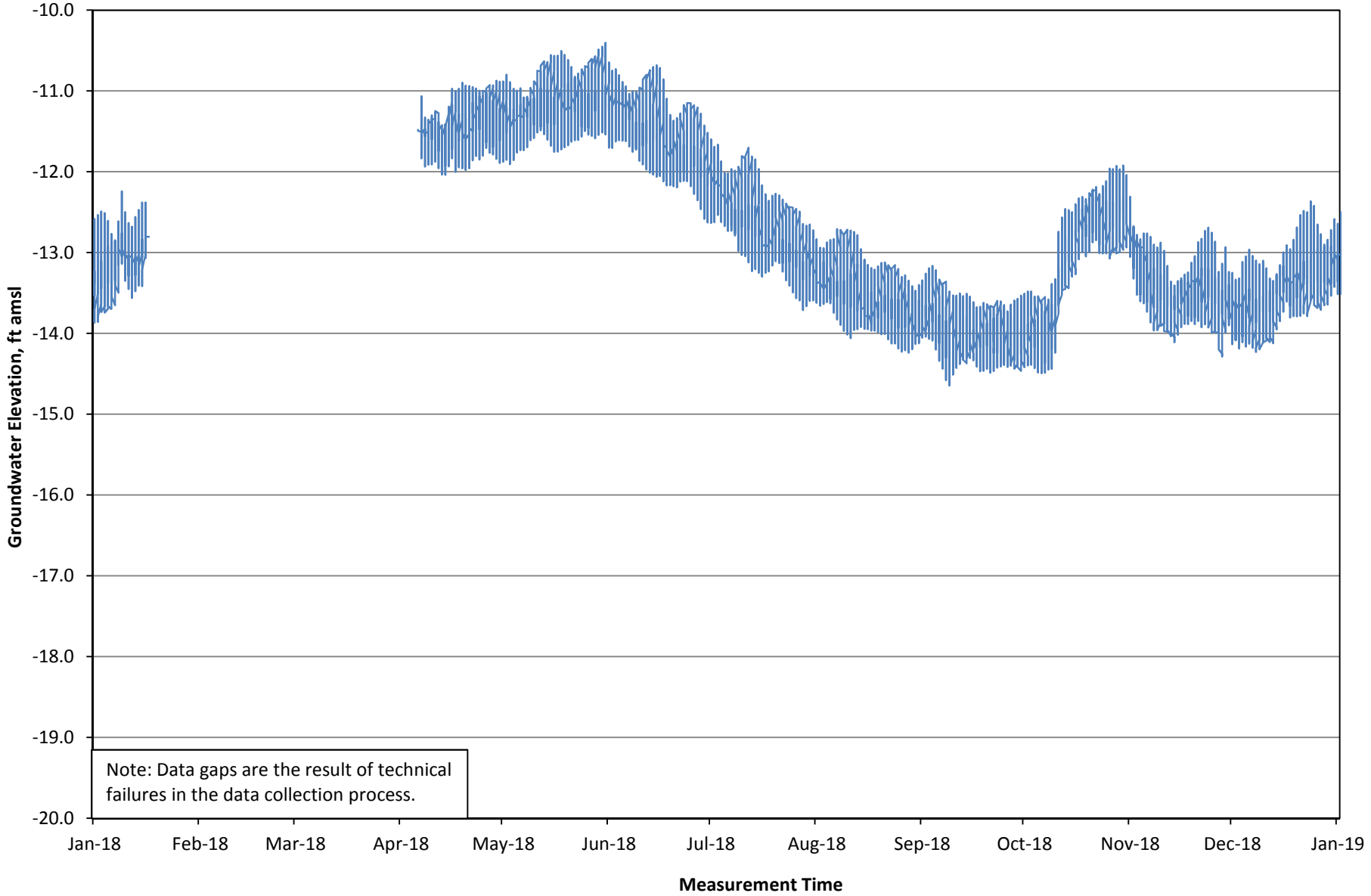


Figure B-13. 2018 MW-10D Groundwater Elevation Trend



ATTACHMENT C

Analytical Lab Reports for 2018 Water Quality Monitoring

EAST BAY MUNICIPAL UTILITY DISTRICT
Laboratory Services Division
Phone (510)287-1432 Fax (510)465-5462
PO Box 24055, MS 59, Oakland, CA 94623

Analytical Report Prepared for DAVID BEHNKEN

Report generated on: Jan 09, 2019 04:16 pm
Login No.: L225078

Reported by:

KRISTI LORENSON
Laboratory Program Manager

Approved by:

NIRMELA ARSEM
Laboratory Services Division Manager

LSR B455-0706-1
Project Title: BAYSIDE GROUND WATER PROJECT

Login Performance Summary
1 - Sample received by the lab on: Oct 24 2018, 03:35 pm
0 - Lost Analyses
0 - Hold Time Exceedences
Turn-around-time not met

Samples included in this report:

Sample	Type Collected	Site	Locator	ClientID
L225078-1	GRAB 24-Oct-2018 14:25	GW BAYSIDE	BAY1-MW4	Bayside Well

Legend to the laboratory qualifiers used in this report:
ND - Not detected at the Method Detection Limit
U - Analyte not detected
Qualifiers for subcontract work - See textvalue for description

EAST BAY MUNICIPAL UTILITY DISTRICT
Laboratory Services Division
PO Box 24055, MS 59, Oakland, CA 94623
Phone (510)287-1432 Fax (510)465-5462

Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW4 OW-1 the same parcel as the Bayside Well on Oro Loma Property; formerly BAY1-MW5
ClientID: Bayside Well
Lab ID: L225078-1 (P233860-2)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Oct 24 2018, 02:25pm Sample collector: N. Klumpp
Date Received: Oct 24 2018, 03:35pm Sample receiver: ANG
Sample Comments: 1st set Every 25 acre-ft (~6 weeks) +FLD DATA: pH = 7.62; ODOR ND.;
Labelled as RAW WATER for the program. T=19.8 degC, Cl2R=0.2mg/L

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal							GroundH2O	
Subcontract data								
Comment: Original report transmitted to client. Copy of report archived with data packet.								
SUBCONTRACT LAB DATA								
DATA TRANSMITTAL								
Run ID: R289992 / Work Group No.: WG226783								
Prep Date1: 31-DEC-18 Analyzed 31-Dec-18 00:00								
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal for oxygen 18							GroundH2O	
Subcontract data from Alpha Analytical Lab								
Comment: Refer to sublab data report attached								
SUBCONTRACT LAB DATA								
DATA TRANSMITTAL								
Run ID: R289994 / Work Group No.: WG226785								
Prep Date1: 26-NOV-18 Analyzed 26-Nov-18 00:00								
Method: SAMPLER PROVIDED FIELD MEASUREMENTS - DATA ENTRY LIST FOR FIELD DATA							GroundH2O	
FIELD ANALYSIS/OBSERVATION DATA PARAMETERS								
PH		**7.62**	pH units	1				
TEMPERATURE		**19.8**	deg C	1				
CHLORINE RESIDUAL: TOTAL		**0.2**	mg/L	1	0.08			
ODOR: QUALITATIVE - SEE COMMENTS	**ND**			1				
None.								
Run ID: R288515 / Work Group No.: WG225539								
Prep Date1: 24-OCT-18 Analyzed 24-Oct-18 14:25								
Method: EPA 524.4 - THMs, GC/MS							RawH2O	
TARGET ANALYTES								
CHLOROFORM	U	0.11	ug/L	1	0.11	1		
BROMODICHLOROMETHANE	U	0.090	ug/L	1	0.09	1		
DIBROMOCHLOROMETHANE	U	0.065	ug/L	1	0.065	1		
BROMOFORM	U	0.096	ug/L	1	0.096	1		
VALUE CALCULATED FROM OTHER RESULTS								
TRIHALOMETHANES	U	1.0	ug/L	1				
TTHM calculation uses a zero for any individual THM result less than the California DLR for that THM								
INTERNAL STANDARD								
1,4-DIFLUOROBENZENE		100	% recovery	1				
D5-CHLOROBENZENE		99.4	% recovery	1				
D4-1,4-DICHLOROBENZENE		101	% recovery	1				
SURROGATE								
D3-METHYL-T-BUTYL-ETHER		98.9	% recovery	1				
4-BROMOFLUOROBENZENE		101	% recovery	1				
D4-1,2-DICHLOROBENZENE		97.0	% recovery	1				
Run ID: R288692 / Work Group No.: WG225626								
Prep Date1: 31-OCT-18 Analyzed 31-Oct-18 11:45								

RL is either the client requested or regulatory mandated Reporting Limit. ML is the regulatory mandated Minimum Level

EAST BAY MUNICIPAL UTILITY DISTRICT
Laboratory Services Division
PO Box 24055, MS 59, Oakland, CA 94623
Phone (510)287-1432 Fax (510)465-5462

Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW4 OW-1 the same parcel as the Bayside Well on Oro Loma Property; formerly BAY1-MW5
ClientID: Bayside Well
Lab ID: L225078-1 (P233860-2)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Oct 24 2018, 02:25pm Sample collector: N. Klumpp
Date Received: Oct 24 2018, 03:35pm Sample receiver: ANG
Sample Comments: 1st set Every 25 acre-ft (~6 weeks) +FLD DATA: pH = 7.62; ODOR ND.;
Labelled as RAW WATER for the program. T=19.8 degC, Cl2R=0.2mg/L

Method Reference / Parameter	Qualifier	Result	Units	Dilution	MDL	Matrix RL/ML	Tag
Method: EPA 552.2 - Haloacetic Acids						GroundH2O	
TARGET ANALYTES							
BROMOCHLOROACETIC ACID	U	0.15	ug/L	1	0.15		
BROMODICHLOROACETIC ACID	U	0.31	ug/L	1	0.31		
CHLORODIBROMOACETIC ACID	U	0.31	ug/L	1	0.31		
DIBROMOACETIC ACID	U	0.25	ug/L	1	0.25	1	
DICHLOROACETIC ACID	U	0.18	ug/L	1	0.18	1	
MONOBROMOACETIC ACID	U	0.29	ug/L	1	0.29	1	
MONOCHLOROACETIC ACID	U	0.65	ug/L	1	0.65	2	
TRIBROMOACETIC ACID	U	0.72	ug/L	1	0.72		
TRICHLOROACETIC ACID	U	0.17	ug/L	1	0.17	1	
VALUE CALCULATED FROM OTHER RESULTS							
HAA(5)	U	1.0	ug/L				
HAA (5) calculation uses a zero for any individual HAA result less than the California DLR for that HAA							
HAA(9)	U	1.0	ug/L				
INTERNAL STANDARD							
1,2,3-TRICHLOROPROPANE		110	% recovery		1		
SURROGATE							
2,3-DIBROMOPROPIONIC ACID		110	% recovery		1		

Run ID: R288696 / Work Group No.: WG225669
Prep Date1: Analyzed 02-Nov-18 22:44

RL is either the client requested or regulatory mandated Reporting Limit. ML is the regulatory mandated Minimum Level

EAST BAY MUNICIPAL UTILITY DISTRICT
Laboratory Services Division
Phone (510)287-1432 Fax (510)465-5462
PO Box 24055, MS 59, Oakland, CA 94623

Analytical Report Prepared for DAVID BEHNKEN

Report generated on: Jan 28, 2019 02:59 pm
Login No.: L225857

Reported by:

KRISTI LORENSON
Laboratory Program Manager

Approved by:

NIRMELA ARSEM
Laboratory Services Division Manager

LSR B455-0706-1
Project Title: BAYSIDE GROUND WATER PROJECT

Login Performance Summary
3 - Samples received by the lab on: Dec 05 2018, 12:35 pm
0 - Lost Analyses
0 - Hold Time Exceedences
Turn-around-time not met

Samples included in this report:

Sample	Type	Collected	Site	Locator	ClientID
L225857-1	GRAB	05-Dec-2018 10:59	WTP BAYSIDE	BAY WELL HEAD	-
L225857-2	GRAB	05-Dec-2018 11:20	WTP BAYSIDE	BAY WELL HEAD	-
L225857-3	QCFB	05-Dec-2018 11:55	FIELD QC	COLLECTION QC	-

Legend to the laboratory qualifiers used in this report:
* - Duplicate value outside of control limits
< - Less than
E - Estimated value, concentration outside calibration range. For SIP, E=DNQ, Estimated Concentration.
J - Estimated value, quantitation does not meet SOP criteria
JB - Estimated value, method blank exceeds 10% of sample concentration
N - Spike recovery outside of control limits
U - Analyte not detected
Qualifiers for subcontract work - See textvalue for description

EAST BAY MUNICIPAL UTILITY DISTRICT
Laboratory Services Division
PO Box 24055, MS 59, Oakland, CA 94623
Phone (510)287-1432 Fax (510)465-5462

Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: WTP BAYSIDE Bayside GW Project Extraction Wells at 2540 Grant Avenue, San Lorenzo
Locator: BAY WELL HEAD Sample tap at the well, as shown in Drawing No. 2097-C-002
Lab ID: L225857-1 (P234698-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 05 2018, 10:59am Sample collector: GChow
Date Received: Dec 05 2018, 12:35pm Sample receiver: CSOOHOO
Sample Comments: Annual Bayside Sampling per DDW T22 and WDR; +FLD DATA: pH = 7.93 CL2R = <0.02 mg/L (MDL=0.02 mg/L)

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Tag
Method Reference						Matrix	
Method: SAMPLER PROVIDED FIELD MEASUREMENTS - DATA ENTRY LIST FOR FIELD DATA						RawH2O	
FIELD ANALYSIS/OBSERVATION DATA PARAMETERS							
PH		**7.93**	pH units	1			
CHLORINE RESIDUAL: TOTAL	U	0.02	mg/L	1	0.02		
Run ID: R289578 / Work Group No.: WG226406							
Prep Date1: 05-DEC-18 Analyzed 05-Dec-18 10:59							
Method: EPA 524.4 - Volatile Organics, GC/MS						RawH2O	
TARGET ANALYTES							
ALLYL CHLORIDE	U	0.36	ug/L	1	0.36		
TERT-AMYL METHYL ETHER	U	0.23	ug/L	1	0.23	3	
BENZENE	U	0.054	ug/L	1	0.054	0.5	
BROMOBENZENE	U	0.11	ug/L	1	0.11		
BROMOCHLOROMETHANE	**E**	**0.31**	ug/L	1	0.15		
BROMODICHLOROMETHANE		**4.3**	ug/L	1	0.09		
BROMOFORM	**E**	**0.46**	ug/L	1	0.096		
BROMOMETHANE	U	0.72	ug/L	1	0.72		
TERT-BUTYL ALCOHOL	U	0.57	ug/L	1	0.57	2	
N-BUTYLBENZENE	U	0.076	ug/L	1	0.076		
SEC-BUTYLBENZENE	U	0.069	ug/L	1	0.069		
TERT-BUTYLBENZENE	U	0.15	ug/L	1	0.15		
CARBON DISULFIDE	U	0.072	ug/L	1	0.072		
CARBON TETRACHLORIDE	U	0.14	ug/L	1	0.14	0.5	
CHLOROBENZENE	U	0.085	ug/L	1	0.085	0.5	
1-CHLOROBUTANE	U	0.076	ug/L	1	0.076		
CHLOROFORM		**31**	ug/L	1	0.11		
CHLOROMETHANE	U	0.30	ug/L	1	0.3		
O-CHLOROTOLUENE	U	0.17	ug/L	1	0.17		
P-CHLOROTOLUENE	U	0.15	ug/L	1	0.15		
DIBROMOCHLOROMETHANE		**1.6**	ug/L	1	0.065		
DIBROMOCHLOROPROPANE	U	0.11	ug/L	1	0.11		
DIBROMOMETHANE	U	0.088	ug/L	1	0.088		
1,2-DICHLOROBENZENE	U	0.082	ug/L	1	0.082	0.5	
1,3-DICHLOROBENZENE	U	0.071	ug/L	1	0.071		
1,4-DICHLOROBENZENE	U	0.070	ug/L	1	0.07	0.5	
DICHLORODIFLUOROMETHANE	U	0.23	ug/L	1	0.23	0.5	
1,1-DICHLOROETHANE	U	0.13	ug/L	1	0.13	0.5	
1,2-DICHLOROETHANE	U	0.11	ug/L	1	0.11	0.5	
1,1-DICHLOROETHENE	U	0.12	ug/L	1	0.12	0.5	
CIS-1,2-DICHLOROETHENE	U	0.14	ug/L	1	0.14	0.5	
TRANS-1,2-DICHLOROETHENE	U	0.10	ug/L	1	0.1	0.5	
1,2-DICHLOROPROPANE	U	0.070	ug/L	1	0.07	0.5	
1,3-DICHLOROPROPANE	U	0.064	ug/L	1	0.064		
1,1-DICHLOROPROPENE	U	0.14	ug/L	1	0.14		
CIS-1,3-DICHLOROPROPENE	U	0.099	ug/L	1	0.099	0.5	
TRANS-1,3-DICHLOROPROPENE	U	0.070	ug/L	1	0.07	0.5	
DIISOPROPYL ETHER	U	0.072	ug/L	1	0.072		
ETHYL BENZENE	U	0.053	ug/L	1	0.053	0.5	
ETHYL ETHER	U	0.11	ug/L	1	0.11		
ETHYLENE DIBROMIDE	U	0.060	ug/L	1	0.06		
ETHYLMETHACRYLATE	U	0.051	ug/L	1	0.051		
ETHYL-T-BUTYL ETHER	U	0.070	ug/L	1	0.07	3	
FLUOROTRICHLOROMETHANE	U	0.065	ug/L	1	0.065	5	

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: WTP BAYSIDE Bayside GW Project Extraction Wells at 2540 Grant Avenue, San Lorenzo
Locator: BAY WELL HEAD Sample tap at the well, as shown in Drawing No. 2097-C-002
Lab ID: L225857-1 (P234698-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 05 2018, 10:59am Sample collector: GChow
Date Received: Dec 05 2018, 12:35pm Sample receiver: CSOOHOO
Sample Comments: Annual Bayside Sampling per DDW T22 and WDR; +FLD DATA: pH = 7.93 CL2R = <0.02 mg/L (MDL=0.02 mg/L)

Method Reference — Matrix — Tag

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	U	0.12	ug/L	1	0.12	10
HEXACHLOROBUTADIENE	U	0.089	ug/L	1	0.089	
HEXACHLOROETHANE	U	0.18	ug/L	1	0.18	
IODOMETHANE	U	0.58	ug/L	1	0.58	
ISOPROPYLBENZENE	U	0.056	ug/L	1	0.056	
P-ISOPROPYLTOLUENE	U	0.062	ug/L	1	0.062	
METHYLENE CHLORIDE	**E**	**0.29**	ug/L	1	0.092	0.5
METHYL-T-BUTYL ETHER	U	0.067	ug/L	1	0.067	3
NAPHTHALENE	U	0.070	ug/L	1	0.07	
PENTACHLOROETHANE	U	0.38	ug/L	1	0.38	
N-PROPYLBENZENE	U	0.051	ug/L	1	0.051	
STYRENE	U	0.075	ug/L	1	0.075	0.5
1,1,1,2-TETRACHLOROETHANE	U	0.097	ug/L	1	0.097	
1,1,2,2-TETRACHLOROETHANE	U	0.13	ug/L	1	0.13	0.5
TETRACHLOROETHENE	U	0.10	ug/L	1	0.1	0.5
TETRAHYDROFURAN	U	0.37	ug/L	1	0.37	
TOLUENE	U	0.054	ug/L	1	0.054	0.5
1,2,3-TRICHLOROBENZENE	U	0.075	ug/L	1	0.075	
1,2,4-TRICHLOROBENZENE	U	0.096	ug/L	1	0.096	0.5
1,1,1-TRICHLOROETHANE	U	0.11	ug/L	1	0.11	0.5
1,1,2-TRICHLOROETHANE	U	0.079	ug/L	1	0.079	0.5
TRICHLOROETHENE	U	0.12	ug/L	1	0.12	0.5
1,2,3-TRICHLOROPROPANE	U	0.22	ug/L	1	0.22	
1,2,4-TRIMETHYLBENZENE	U	0.072	ug/L	1	0.072	
1,3,5-TRIMETHYLBENZENE	U	0.071	ug/L	1	0.071	
VINYL CHLORIDE	U	0.086	ug/L	1	0.086	0.5
O-XYLENE	U	0.079	ug/L	1	0.079	0.5
M+P XYLENES	U	0.14	ug/L	1	0.14	0.5
VALUE(S) USED TO CALCULATE OTHER VALUE(S)						
TOTAL 1,3-DICHLOROPROPENES	U	0.50	ug/L	1		0.5
TOTAL XYLENES	U	0.50	ug/L	1	0.22	0.5
INTERNAL STANDARD						
1,4-DIFLUOROBENZENE		101	% recovery	1		
D4-1,4-DICHLOROBENZENE		100	% recovery	1		
D5-CHLOROBENZENE		98.8	% recovery	1		
SURROGATE						
4-BROMOFLUOROBENZENE		103	% recovery	1		
D3-METHYL-T-BUTYL-ETHER		102	% recovery	1		
D4-1,2-DICHLOROBENZENE		103	% recovery	1		

Run ID: R289399 / Work Group No.: WG226338
Prep Date1: 06-DEC-18 Analyzed 06-Dec-18 14:02

Method: EPA 525.2 - Semivolatile Organics, GC/MS — RawH2O

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML
TARGET ANALYTES						
ACENAPHTHYLENE	U	0.036	ug/L	1	0.036	
ALACHLOR	U	0.021	ug/L	1	0.021	1
ALDRIN	U	0.011	ug/L	1	0.011	
ANTHRACENE	U,N,J	0.042	ug/L	1	0.042	
Low recoveries in spiked QC samples						
ATRAZINE	U	0.026	ug/L	1	0.026	0.5
BENZO(A)ANTHRACENE	U	0.017	ug/L	1	0.017	
BENZO(B)FLUORANTHENE	U	0.014	ug/L	1	0.014	
BENZO(K)FLUORANTHENE	U	0.013	ug/L	1	0.013	
BENZO(A)PYRENE	U,N,J	0.011	ug/L	1	0.011	0.1

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: WTP BAYSIDE Bayside GW Project Extraction Wells at 2540 Grant Avenue, San Lorenzo
Locator: BAY WELL HEAD Sample tap at the well, as shown in Drawing No. 2097-C-002
Lab ID: L225857-1 (P234698-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 05 2018, 10:59am Sample collector: GChow
Date Received: Dec 05 2018, 12:35pm Sample receiver: CSOOHOO
Sample Comments: Annual Bayside Sampling per DDW T22 and WDR; +FLD DATA: pH = 7.93 CL2R = <0.02 mg/L (MDL=0.02 mg/L)

Method Reference — Matrix — Tag

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML
Low recoveries in spiked QC samples						
BENZO(GHI)PERYLENE	U	0.016	ug/L	1	0.016	
BIS(2-ETHYLHEXYL)ADIPATE	U	0.029	ug/L	1	0.029	5
BIS(2-ETHYLHEXYL)PHTHALATE	**JB,***	**0.25**	ug/L	1	0.059	3
ALPHA BHC	U	0.012	ug/L	1	0.012	
BETA BHC	U	0.020	ug/L	1	0.02	
DELTA BHC	U	0.012	ug/L	1	0.012	
GAMMA BHC	U	0.017	ug/L	1	0.017	0.2
BROMACIL	U	0.018	ug/L	1	0.018	
BUTACHLOR	U	0.026	ug/L	1	0.026	
BUTYLBENZYL PHTHALATE	U	0.026	ug/L	1	0.026	
CHLORDANE	U	0.10	ug/L	1	0.1	0.1
CHLORDANE-ALPHA	U	0.018	ug/L	1	0.018	
CHLORDANE-GAMMA	U	0.018	ug/L	1	0.018	
CHLOROBENZILATE	U	0.047	ug/L	1	0.047	
CHLORONEB	U	0.052	ug/L	1	0.052	
CHLOROTHALONIL	U	0.032	ug/L	1	0.032	
CHRYSENE	U	0.012	ug/L	1	0.012	
DCPA	U	0.028	ug/L	1	0.028	
4,4'-DDD	U	0.022	ug/L	1	0.022	
4,4'-DDE	U	0.025	ug/L	1	0.025	
4,4'-DDT	U	0.023	ug/L	1	0.023	
DIBENZO(A,H)ANTHRACENE	U	0.014	ug/L	1	0.014	
DI-N-BUTYL PHTHALATE	U	0.028	ug/L	1	0.028	
DIELDRIN	U	0.023	ug/L	1	0.023	
DIETHYL PHTHALATE		**0.017**	ug/L	1	0.014	
DIMETHOATE	U	0.038	ug/L	1	0.038	
DIMETHYL PHTHALATE	U	0.010	ug/L	1	0.01	
2,4-DINITROTOLUENE	U	0.025	ug/L	1	0.025	
2,6-DINITROTOLUENE	U	0.019	ug/L	1	0.019	
ALPHA ENDOSULFAN	U	0.012	ug/L	1	0.012	
BETA ENDOSULFAN	U	0.019	ug/L	1	0.019	
ENDOSULFAN SULFATE	U	0.035	ug/L	1	0.035	
ENDRIN	U	0.031	ug/L	1	0.031	0.1
ENDRIN ALDEHYDE	U	0.029	ug/L	1	0.029	
EPTC	U	0.010	ug/L	1	0.01	
ETRIDIAZOLE	U	0.010	ug/L	1	0.01	
FLUORENE	U	0.022	ug/L	1	0.022	
HEPTACHLOR	U	0.0060	ug/L	1	0.006	0.01
HEPTACHLOR EPOXIDE	U	0.0060	ug/L	1	0.006	0.01
HEXACHLOROBENZENE	U	0.018	ug/L	1	0.018	0.5
HEXACHLOROCYCLOPENTADIENE	U	0.019	ug/L	1	0.019	1
HEXAZINONE	U	0.035	ug/L	1	0.035	
INDENO(1,2,3-CD)PYRENE	U	0.013	ug/L	1	0.013	
ISOPHORONE	U	0.011	ug/L	1	0.011	
METHOXYCHLOR	U	0.011	ug/L	1	0.011	10
METOLACHLOR	U	0.023	ug/L	1	0.023	
METRIBUZIN	U	0.025	ug/L	1	0.025	
MOLINATE	U	0.026	ug/L	1	0.026	2
AROCLOR 1016	U	0.50	ug/L	1	0.5	
AROCLOR 1221	U	0.50	ug/L	1	0.5	
AROCLOR 1232	U	0.50	ug/L	1	0.5	
AROCLOR 1242	U	0.50	ug/L	1	0.5	
AROCLOR 1248	U	0.50	ug/L	1	0.5	

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: WTP BAYSIDE Bayside GW Project Extraction Wells at 2540 Grant Avenue, San Lorenzo
Locator: BAY WELL HEAD Sample tap at the well, as shown in Drawing No. 2097-C-002
Lab ID: L225857-1 (P234698-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 05 2018, 10:59am Sample collector: GChow
Date Received: Dec 05 2018, 12:35pm Sample receiver: CSOOHOO
Sample Comments: Annual Bayside Sampling per DDW T22 and WDR; +FLD DATA: pH = 7.93 CL2R = <0.02 mg/L (MDL=0.02 mg/L)

Method Reference / Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
AROCLOR 1254	U	0.50	ug/L	1	0.5			
AROCLOR 1260	U	0.50	ug/L	1	0.5			
PENTACHLOROPHENOL	U	0.10	ug/L	1	0.1			
CIS-PERMETHRIN	U	0.047	ug/L	1	0.047			
TRANS-PERMETHRIN	U	0.020	ug/L	1	0.02			
PHENANTHRENE	U	0.015	ug/L	1	0.015			
PROMETRYN	U	0.022	ug/L	1	0.022			
PROPACHLOR	U	0.014	ug/L	1	0.014			
PYRENE	U	0.030	ug/L	1	0.03			
SIMAZINE	U	0.028	ug/L	1	0.028	1		
TERBACIL	U	0.032	ug/L	1	0.032			
THIOBENCARB	U	0.018	ug/L	1	0.018	1		
TOXAPHENE	U	0.50	ug/L	1	0.5	1		
TRIFLURALIN	U	0.010	ug/L	1	0.01			
INTERNAL STANDARD								
D10-ACENAPHTHENE		88.2	% recovery		1			
D10-PHENANTHRENE		97.0	% recovery		1			
D12-CHRYSENE		91.1	% recovery		1			
SURROGATE								
D12-PERYLENE		81	% recovery		1			
1,3-DIMETHYL-2-NITROBENZENE		95	% recovery		1			
TRIPHENYL PHOSPHATE		120	% recovery		1			
Run ID: R289728 / Work Group No.: WG226453								
Prep Date1: 11-DEC-18 Prep Date2: 12-DEC-18 Analyzed 13-Dec-18 14:11								
Method: EPA 548.1 - Endothall, GC/MS							RawH2O	
TARGET ANALYTES								
ENDOTHALL	U,N	1.1	ug/L	1	1.1	45		
INTERNAL STANDARD								
D10-ACENAPHTHENE		106	% recovery		1			
Run ID: R289658 / Work Group No.: WG226418								
Prep Date1: 10-DEC-18 Prep Date2: 11-DEC-18 Analyzed 12-Dec-18 12:52								
Method: SRL 524M-TCP - SIM for TCP, PT, GC/MS							RawH2O	
TARGET ANALYTES								
1,2,3-TRICHLOROPROPANE	U	0.94	ng/L	1	0.94			
INTERNAL STANDARD								
D5-1,2,3-TRICHLOROPROPANE		84.0	% recovery					
Run ID: R289757 / Work Group No.: WG226465								
Prep Date1: 13-DEC-18 Analyzed 13-Dec-18 15:46								
Method: EPA 300.1 - Ion Chromatography							RawH2O	
Instrument calibrated 04-SEP-18								
TARGET ANALYTES								
FLUORIDE		**0.59**	mg/L	4	0.035	0.1		
CHLORIDE		**13**	mg/L	4	0.14			
NITRITE AS N		**1.8**	mg/L	4	0.0092	0.4		
NITRATE AS N		**0.12**	mg/L	4	0.0076	0.4		
SULFATE		**32**	mg/L	4	0.2	0.5		
SURROGATE								
DICHLOROACETATE		98	% recovery	4				
Run ID: R289276 / Work Group No.: WG226297								
Prep Date1: 05-DEC-18 Analyzed 05-Dec-18 16:21								

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: WTP BAYSIDE Bayside GW Project Extraction Wells at 2540 Grant Avenue, San Lorenzo
Locator: BAY WELL HEAD Sample tap at the well, as shown in Drawing No. 2097-C-002
Lab ID: L225857-1 (P234698-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 05 2018, 10:59am Sample collector: GChow
Date Received: Dec 05 2018, 12:35pm Sample receiver: CSOOHOO
Sample Comments: Annual Bayside Sampling per DDW T22 and WDR; +FLD DATA: pH = 7.93 CL2R = <0.02 mg/L (MDL=0.02 mg/L)

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method: EPA 314.0 - Ion Chromatography							RawH2O	
Instrument calibrated 31-DEC-18								
TARGET ANALYTES								
PERCHLORATE	U,J	0.500	ug/L	1	0.5	4		
low recoveries in Spiked Blank and QCS								
Run ID: R290073 / Work Group No.: WG226437								
Prep Date1: 27-DEC-18 Analyzed 31-Dec-18 17:12								
Method: EPA 504.1 - EDB & DBCP, GC/ECD							RawH2O	
TARGET ANALYTES								
ETHYLENE DIBROMIDE	U	0.0030	ug/L	1	0.003	0.02		
DIBROMOCHLOROPROPANE	U	0.0060	ug/L	1	0.006	0.01		
Run ID: R289838 / Work Group No.: WG226554								
Prep Date1: 12-DEC-18 Prep Date2: 18-DEC-18 Analyzed 18-Dec-18 16:01								
Method: EPA 515.3 - Chlorinated Acids, GC/ECD							RawH2O	
TARGET ANALYTES								
ACIFLUORFEN	U	0.028	ug/L	1	0.028			
BENTAZON	U	0.14	ug/L	1	0.14	2		
CHLORAMBEN	U	0.012	ug/L	1	0.012			
(2,4-DICHLOROPHENOXY)ACETIC ACID	U	0.056	ug/L	1	0.056	10		
DALAPON	U	0.25	ug/L	1	0.25	10		
4-(2,4-DICHLOROPHENOXY)BUTANOIC ACID	U	0.26	ug/L	1	0.26			
DACTHAL (DCPA)	U,N,*	0.050	ug/L	1	0.05			
DICAMBA	U	0.036	ug/L	1	0.036	1.5		
3,5-DICHLOROBENZOIC ACID	U	0.025	ug/L	1	0.025			
DICHLORPROP	U	0.21	ug/L	1	0.21			
DINOSEB	U	0.057	ug/L	1	0.057	2		
4-NITROPHENOL	U	0.075	ug/L	1	0.075	5		
Qualitative result only. Diazomethane derivatization procedure does not provide accurate quantitation.								
PENTACHLOROPHENOL	U	0.014	ug/L	1	0.014	0.2		
PICLORAM	U	0.022	ug/L	1	0.022	1		
(2,4,5-TRICHLOROPHENOXY)ACETIC ACID	U	0.082	ug/L	1	0.082			
2-(2,4,5-TRICHLOROPHENOXY)PROPIONIC ACID	U	0.063	ug/L	1	0.063	1		
INTERNAL STANDARD								
4,4'-DIBROMOCTAFLUOROBENZENE		100	% recovery	1				
SURROGATE								
DICHLOROPHENYLACETIC ACID		100	% recovery	1				
Run ID: R289881 / Work Group No.: WG226550								
Prep Date1: 12-DEC-18 Prep Date2: 18-DEC-18 Analyzed 19-Dec-18 16:27								
Method: EPA 552.2 - Haloacetic Acids							RawH2O	
TARGET ANALYTES								
BROMOCHLOROACETIC ACID	U	0.15	ug/L	1	0.15			
BROMODICHLOROACETIC ACID		**1.2**	ug/L	1	0.31			
CHLORODIBROMOACETIC ACID	U	0.31	ug/L	1	0.31			
DIBROMOACETIC ACID		**1.1**	ug/L	1	0.25	1		
DICHLOROACETIC ACID		**3.4**	ug/L	1	0.18	1		
MONOBROMOACETIC ACID	U	0.29	ug/L	1	0.29	1		
MONOCHLOROACETIC ACID	U	0.65	ug/L	1	0.65	2		
TRIBROMOACETIC ACID	U	0.72	ug/L	1	0.72			
TRICHLOROACETIC ACID		**5.0**	ug/L	1	0.17	1		

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: WTP BAYSIDE Bayside GW Project Extraction Wells at 2540 Grant Avenue, San Lorenzo
Locator: BAY WELL HEAD Sample tap at the well, as shown in Drawing No. 2097-C-002
Lab ID: L225857-1 (P234698-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 05 2018, 10:59am Sample collector: GChow
Date Received: Dec 05 2018, 12:35pm Sample receiver: CSOOHOO
Sample Comments: Annual Bayside Sampling per DDW T22 and WDR; +FLD DATA: pH = 7.93 CL2R = <0.02 mg/L (MDL=0.02 mg/L)

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference								
VALUE CALCULATED FROM OTHER RESULTS								
HAA(5)		9.6	ug/L					
HAA (5) calculation uses a zero for any individual HAA result less than the California DLR for that HAA								
HAA(9)		11	ug/L					
INTERNAL STANDARD								
1,2,3-TRICHLOROPROPANE		93	% recovery		1			
SURROGATE								
2,3-DIBROMOPROPIONIC ACID		110	% recovery		1			
Run ID: R289906 / Work Group No.: WG226626								
Prep Date1: Analyzed 20-Dec-18 13:07								
Method: SM5310C - 5310 C. Heated-Persulfate Oxidation Method							RawH2O	
TARGET ANALYTES								
TOTAL ORGANIC CARBON		**2.2**	mg/L	1	0.096			
Run ID: R289701 / Work Group No.: WG226473								
Prep Date1: 13-DEC-18 Analyzed 14-Dec-18 00:11								
Method: SM2120B - 2001, Visual Comparison							RawH2O	
TARGET ANALYTES								
COLOR		**5.0**	color unit	1	1			
pH= 7.0								
Run ID: R289338 / Work Group No.: WG226348								
Prep Date1: 06-DEC-18 Analyzed 06-Dec-18 16:10								
Method: SM2130B - 2001, Nephelometric							RawH2O	
TARGET ANALYTES								
TURBIDITY		**3.2**	NTU	1	0.075			
Run ID: R289278 / Work Group No.: WG226323								
Prep Date1: 06-DEC-18 Analyzed 06-Dec-18 08:13								
Method: SM2320B - 1997, Titration							RawH2O	
TARGET ANALYTES								
ALKALINITY: TOTAL AS CACO3		**89**	mg/L	1	5			
Run ID: R289650 / Work Group No.: WG226445								
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 06:59								
Method: SM2320B-1997 - Calculation							RawH2O	
TARGET ANALYTES								
ALKALINITY: HYDROXIDE	U	0.10	mg/L	1	0.1			
Run ID: R289655 / Work Group No.: WG226447								
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 08:24								
Method: SM2320B-1997 - Calculation							RawH2O	
TARGET ANALYTES								
ALKALINITY: CARBONATE	U	0.10	mg/L	1	0.1			
Run ID: R289655 / Work Group No.: WG226447								
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 08:24								

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: WTP BAYSIDE Bayside GW Project Extraction Wells at 2540 Grant Avenue, San Lorenzo
Locator: BAY WELL HEAD Sample tap at the well, as shown in Drawing No. 2097-C-002
Lab ID: L225857-1 (P234698-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 05 2018, 10:59am Sample collector: GChow
Date Received: Dec 05 2018, 12:35pm Sample receiver: CSOOHOO
Sample Comments: Annual Bayside Sampling per DDW T22 and WDR; +FLD DATA: pH = 7.93 CL2R = <0.02 mg/L (MDL=0.02 mg/L)

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference								
Method: SM2320B-1997 - Calculation							RawH2O	
TARGET ANALYTES								
ALKALINITY: BICARBONATE		**89**	mg/L	1	5			
Run ID: R289655 / Work Group No.: WG226447								
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 08:24								
Method: SM2340C - 1997, Titration: EDTA							RawH2O	
TARGET ANALYTES								
HARDNESS: TOTAL AS CACO3		**94**	mg/L	1	3			
Run ID: R289652 / Work Group No.: WG226441								
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 10:13								
Method: SM2510B - 1997, Meter: Platinum Electrode							RawH2O	
TARGET ANALYTES								
CONDUCTIVITY		**281**	umhos/cm	1	0.55			
Run ID: R289662 / Work Group No.: WG226422								
Prep Date1: 17-DEC-18 Analyzed 17-Dec-18 15:25								
Method: SM2540C - 1997, Dried at 180C							RawH2O	
TARGET ANALYTES								
TOTAL DISSOLVED SOLIDS		**170**	mg/L	1	10			
Run ID: R289617 / Work Group No.: WG226354								
Prep Date1: 07-DEC-18 Analyzed 07-Dec-18 09:30								
Method: SM4500-CN C, E - 2011, Distillation & Colorimetric							RawH2O	
TARGET ANALYTES								
CYANIDE: TOTAL	U	0.0012	mg/L	1	0.0012			
Run ID: R289682 / Work Group No.: WG226434								
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 08:00								
Method: SM4500-NH3 B, C - 1997, Distillation & Titration							GroundH2O	
TARGET ANALYTES								
AMMONIA AS N	U	0.280	mg/L	1	0.28			
Run ID: R289836 / Work Group No.: WG226625								
Prep Date1: 20-DEC-18 Analyzed 20-Dec-18 11:45								
Method: EPA 200.7 - Rev. 4.4, ICP Scan							RawH2O	
TARGET ANALYTES								
ALUMINUM		**17.9**	ug/L	1.04	14	50		
CALCIUM		**23,200**	ug/L	1.04	22.4			
COPPER	U	4.06	ug/L	1.04	4.06	50		
IRON		**946**	ug/L	1.04	5.2	100		
POTASSIUM		**1,340**	ug/L	1.04	19.9			
MAGNESIUM		**7,660**	ug/L	1.04	5.72			
MANGANESE		**13.2**	ug/L	1.04	0.0832	20		
SODIUM		**24,000**	ug/L	1.04	5.62			
ZINC		**3.11**	ug/L	1.04	0.728	50		
Run ID: R289781 / Work Group No.: WG226562								
Prep Date1: 13-DEC-18 Prep Date2: 18-DEC-18 Analyzed 18-Dec-18 11:44								

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: WTP BAYSIDE Bayside GW Project Extraction Wells at 2540 Grant Avenue, San Lorenzo
Locator: BAY WELL HEAD Sample tap at the well, as shown in Drawing No. 2097-C-002
Lab ID: L225857-1 (P234698-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 05 2018, 10:59am Sample collector: GChow
Date Received: Dec 05 2018, 12:35pm Sample receiver: CSOOHOO
Sample Comments: Annual Bayside Sampling per DDW T22 and WDR; +FLD DATA: pH = 7.93 CL2R = <0.02 mg/L (MDL=0.02 mg/L)

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference								
Method: EPA 200.8 - Rev. 5.4, ICP-MS Scan							RawH2O	
TARGET ANALYTES								
SILVER		**0.014**	ug/L	1.02	0.0081	10		
ARSENIC		**0.74**	ug/L	1.02	0.23	2		
BARIUM		**40**	ug/L	1.02	0.024	100		
BERYLLIUM	U	0.010	ug/L	1.02	0.01	1		
CADMIUM	U	0.012	ug/L	1.02	0.012	1		
CHROMIUM		**0.18**	ug/L	1.02	0.11	10		
NICKEL		**0.33**	ug/L	1.02	0.025	10		
LEAD		**0.065**	ug/L	1.02	0.04	5		
ANTIMONY	U	0.15	ug/L	1.02	0.15	6		
SELENIUM	U	0.69	ug/L	1.02	0.69	5		
THALLIUM	U	0.010	ug/L	1.02	0.01	1		
INTERNAL STANDARD								
SCANDIUM		95.8	% response	1.02				
GERMANIUM		93.1	% response	1.02				
RHODIUM		88.8	% response	1.02				
INDIUM		96.7	% response	1.02				
TERBIUM		95.9	% response	1.02				
Run ID: R289889 / Work Group No.: WG226683								
Prep Date1: 20-DEC-18 Prep Date2: 24-DEC-18 Analyzed 24-Dec-18 10:38								
Method: EPA 245.1 - Cold Vapor AA							RawH2O	
TARGET ANALYTES								
MERCURY		**0.48**	ug/L	1	0.011			
Run ID: R289704 / Work Group No.: WG226471								
Prep Date1: 13-DEC-18 Analyzed 13-Dec-18 09:40								
Method: SM9221B - 2006, Multiple Tube Fermentation							RawH2O	
TARGET ANALYTES								
TOTAL COLIFORMS	<	1.8	MPN/100 mL		1.8			
Run ID: R289596 / Work Group No.: WG226313								
Prep Date1: 05-DEC-18 Analyzed 05-Dec-18 14:01								
Method: SM9221F - 2006, Multiple Tube Fermentation							RawH2O	
TARGET ANALYTES								
E. COLI	<	1.8	MPN/100 mL		1.8			
Run ID: R289596 / Work Group No.: WG226313								
Prep Date1: 05-DEC-18 Analyzed 05-Dec-18 14:01								

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: WTP BAYSIDE Bayside GW Project Extraction Wells at 2540 Grant Avenue, San Lorenzo
Locator: BAY WELL HEAD Sample tap at the well, as shown in Drawing No. 2097-C-002
Lab ID: L225857-2 (P234698-2)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 05 2018, 11:20am Sample collector: GChow
Date Received: Dec 05 2018, 12:35pm Sample receiver: CSOOHOO
Sample Comments: Annual Sampling per DDW T22 and WDR; SUBCONTRACT DATA; 1613 for 2,3,7,8-TCDD only

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method: EPA 100.1: EPA 100.2 - Asbestos by Electron Microscopy							RawH2O	
Subcontract data from Forensic Analytical								
Comment: SUB ND = None Detected								
SUBCONTRACT LAB DATA								
ASBESTOS	<	0.2	MFL	1	0.2			
Run ID: R289891 / Work Group No.: WG226693								
Prep Date1: 06-DEC-18 Analyzed 20-Dec-18 00:00								
Method: EPA 1613 - DIOXIN 1613A TCDD							RawH2O	
Subcontract data from Frontier Analytical Laboratory								
Comment: ND – Analyte Not Detected at Detection Limit Level of 0.654 pg/L.								
SUBCONTRACT LAB DATA								
2,3,7,8-TETRACHLORODIBENZO DIOXIN	**ND**	**0.235**	pg/L	1	0.235	5		
Run ID: R289797 / Work Group No.: WG226599								
Prep Date1: 12-DEC-18 Analyzed 13-Dec-18 00:00								
Method: EPA 218.6 - Hexavalent Chromium by IC							RawH2O	
Subcontract data from Alpha Analytical Lab								
Comment: U - ANALYTE INCLUDED IN ANALYSIS BUT NOT DETECTED AT OR ABOVE MDL								
SUBCONTRACT LAB DATA								
HEXAVALENT CHROMIUM	U	0.2	ug/L	1	0.2	1		
Run ID: R289894 / Work Group No.: WG226694								
Prep Date1: 18-DEC-18 Analyzed 18-Dec-18 21:39								
Method: EPA 508 - PCBS by 508							RawH2O	
Subcontract data from Alpha Analytical Lab								
Comment: U - ANALYTE INCLUDED IN ANALYSIS BUT NOT DETECTED AT OR ABOVE MDL								
SUBCONTRACT LAB DATA								
AROCLOR 1016	U	0.3	ug/L	1	0.3	0.5		
AROCLOR 1221	U	0.3	ug/L	1	0.3	0.5		
AROCLOR 1232	U	0.3	ug/L	1	0.3	0.5		
AROCLOR 1242	U	0.3	ug/L	1	0.3	0.5		
AROCLOR 1248	U	0.3	ug/L	1	0.3	0.5		
AROCLOR 1254	U	0.3	ug/L	1	0.3	0.5		
AROCLOR 1260	U	0.2	ug/L	1	0.2	0.5		
TOTAL PCB'S	U	0.3	ug/L	1	0.3	0.5		
Run ID: R289894 / Work Group No.: WG226694								
Prep Date1: 10-DEC-18 Analyzed 12-Dec-18 00:09								
Method: EPA 531.1 - Carbamates, HPLC							RawH2O	
Subcontract data from Alpha Analytical Lab								
Comment: U - ANALYTE INCLUDED IN ANALYSIS BUT NOT DETECTED AT OR ABOVE MDL								
SUBCONTRACT LAB DATA								
3-HYDROXYCARBOFURAN	U	0.4	ug/L	1	0.4	3		
ALDICARB	U	0.6	ug/L	1	0.6	3		
ALDICARB SULFONE	U	0.2	ug/L	1	0.2	4		
ALDICARB SULFOXIDE	U	0.6	ug/L	1	0.6	3		
CARBARYL	U	0.8	ug/L	1	0.8	5		
CARBOFURAN	U	0.4	ug/L	1	0.4	5		
METHIOCARB	U	0.2	ug/L	1	0.2	5		
METHOMYL	U	0.2	ug/L	1	0.2	2		
OXAMYL	U	1	ug/L	1	1	20		
PROPOXUR	U	0.9	ug/L	1	0.9	5		

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: WTP BAYSIDE Bayside GW Project Extraction Wells at 2540 Grant Avenue, San Lorenzo
Locator: BAY WELL HEAD Sample tap at the well, as shown in Drawing No. 2097-C-002
Lab ID: L225857-2 (P234698-2)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 05 2018, 11:20am Sample collector: GChow
Date Received: Dec 05 2018, 12:35pm Sample receiver: CSOOHOO
Sample Comments: Annual Sampling per DDW T22 and WDR; SUBCONTRACT DATA; 1613 for 2,3,7,8-TCDD only

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Tag
Method Reference						Matrix	
Run ID: R289894 / Work Group No.: WG226694							
Prep Date1: 10-DEC-18 Analyzed 12-Dec-18 01:37							
Method: EPA 547 - Glyphosate, HPLC						RawH2O	
Subcontract data from Alpha Analytical Lab							
Comment: U - ANALYTE INCLUDED IN ANALYSIS BUT NOT DETECTED AT OR ABOVE MDL							
SUBCONTRACT LAB DATA							
GLYPHOSATE	U	6	ug/L	1	6	25	
Run ID: R289894 / Work Group No.: WG226694							
Prep Date1: 10-DEC-18 Analyzed 10-Dec-18 21:13							
Method: EPA 549.2 - Diquat & Paraquat, HPLC						RawH2O	
Subcontract data from Alpha Analytical Lab							
Comment: U - ANALYTE INCLUDED IN ANALYSIS BUT NOT DETECTED AT OR ABOVE MDL							
SUBCONTRACT LAB DATA							
DIQUAT	U	0.6	ug/L	1	0.6	2	
Run ID: R289894 / Work Group No.: WG226694							
Prep Date1: 10-DEC-18 Analyzed 13-Dec-18 16:05							
Method: EPA 8260B - Trihalomethanes, GC/MS						GroundH2O	
Subcontract data from Alpha Analytical Lab							
Comment: U - ANALYTE INCLUDED IN ANALYSIS BUT NOT DETECTED AT OR ABOVE MDL							
SUBCONTRACT LAB DATA							
BROMODICHLOROMETHANE		**3.56**	ug/L	1	0.4	0.5	
BROMOFORM	U	0.3	ug/L	1	0.3	0.5	
CHLOROFORM		**29.71**	ug/L	1	0.4	0.5	
DIBROMOCHLOROMETHANE		**1.65**	ug/L	1	0.4	0.5	
TRIHALOMETHANES		**34.92**	ug/L	1	0.4	0.5	
Run ID: R289894 / Work Group No.: WG226694							
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 11:28							
Method: EPA 900.0 - NONE						RawH2O	
Subcontract data from FG Labs - Santa Paula							
Comment: MDL value is the MDA.							
SUBCONTRACT LAB DATA							
RADIONUCLIDES: ALPHA		**1.41**	pCi/L		1.16	3	
RADIONUCLIDES: BETA		**0.026**	pCi/L		1.2	4	
RADIONUCLIDES: ALPHA COUNTING ERROR	+/-	**1.17**	pCi/L				
RADIONUCLIDES: BETA COUNTING ERROR	+/-	**0.896**	pCi/L				
GROSS ALPHA MDA95		**1.16**	pCi/L				
GROSS BETA MDA95		**1.2**	pCi/L				
Run ID: R291218 / Work Group No.: WG227291							
Prep Date1: 12-DEC-18 Analyzed 27-Dec-18 12:53							
Method: EPA 903.0,903.1, 904.0 - Radium 226 by 903.0 or 903.1 and Radium 228 by 904.0						RawH2O	1
Subcontract data from FG Labs - Santa Paula							
Comment: MDL value is the MDA95.							
SUBCONTRACT LAB DATA							
RADIUM 228		**0**	pCi/L		0.506	1	
RADIUM 228 COUNTING ERROR	+/-	**0.334**	pCi/L				
RADIUM 228 MDA95		**0.506**	pCi/L				
Run ID: R291218 / Work Group No.: WG227291							
Prep Date1: 25-DEC-18 Analyzed 07-Jan-19 19:20							

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: WTP BAYSIDE Bayside GW Project Extraction Wells at 2540 Grant Avenue, San Lorenzo
Locator: BAY WELL HEAD Sample tap at the well, as shown in Drawing No. 2097-C-002
Lab ID: L225857-2 (P234698-2)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 05 2018, 11:20am Sample collector: GChow
Date Received: Dec 05 2018, 12:35pm Sample receiver: CSOOHOO
Sample Comments: Annual Sampling per DDW T22 and WDR; SUBCONTRACT DATA; 1613 for 2,3,7,8-TCDD only

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference							RawH2O	
Method: EPA 903.0,903.1, 904.0 - Radium 226 by 903.0 or 903.1 and Radium 228 by 904.0								
Subcontract data from FG Labs - Santa Paula								
Comment: MDL value is the MDA95.								
SUBCONTRACT LAB DATA								
RADIUM 226		**0**	pCi/L		0.304	1		
RADIUM 226 COUNTING ERROR	+/-	**0.044**	pCi/L					
RADIUM 226 MDA95		**0.304**	pCi/L					
Run ID: R291218 / Work Group No.: WG227291								
Prep Date1: 17-DEC-18 Analyzed 02-Jan-19 10:24								
Method: EPA 905.0 -							RawH2O	
Subcontract data from FG Labs - Santa Paula								
Comment: MDL value is the MDA.								
SUBCONTRACT LAB DATA								
STRONTIUM 90		**0.151**	pCi/L		0.546	2		
STRONTIUM 90 COUNTING ERROR	+/-	**0.319**	pCi/L					
STRONTIUM 90 MDA95		**0.546**	pCi/L					
Run ID: R291218 / Work Group No.: WG227291								
Prep Date1: 20-DEC-18 Analyzed 23-Dec-18 16:40								
Method: EPA 906.0 -							RawH2O	
Subcontract data from FG Labs - Santa Paula								
Comment: MDL value is the MDA.								
SUBCONTRACT LAB DATA								
TRITIUM		**121**	pCi/L		434	1000		
TRITIUM COUNTING ERROR	+/-	**271**	pCi/L					
TRITIUM MDA95		**434**	pCi/L					
Run ID: R291218 / Work Group No.: WG227291								
Prep Date1: 13-DEC-18 Analyzed 20-Dec-18 14:06								
Method: EPA 908.0 -							RawH2O	
Subcontract data from FG Labs - Santa Paula								
Comment: MDL value is the MDA.								
SUBCONTRACT LAB DATA								
URANIUM		**0.353**	pCi/L		0.342	1		
URANIUM COUNTING ERROR	+/-	**0.424**	pCi/L					
URANIUM MDA95		**0.342**	pCi/L					
Run ID: R291218 / Work Group No.: WG227291								
Prep Date1: 21-DEC-18 Analyzed 02-Jan-19 10:21								
Method: EPA 913.0 - RADON: EPA 913.0							RawH2O	
Subcontract data from FG Labs - Santa Paula								
Comment: SM7500Rn; SM7500Rn; MDL value is the MDA.								
SUBCONTRACT LAB DATA								
RADON 222		**855**	pCi/L		19.5			
RADON 222 COUNTING ERROR	+/-	**40.2**	pCi/L					
RADON 222 MDA95	+/-	**19.5**	pCi/L					
Run ID: R291218 / Work Group No.: WG227291								
Prep Date1: 07-DEC-18 Analyzed 07-Dec-18 19:22								

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: WTP BAYSIDE Bayside GW Project Extraction Wells at 2540 Grant Avenue, San Lorenzo
Locator: BAY WELL HEAD Sample tap at the well, as shown in Drawing No. 2097-C-002
Lab ID: L225857-2 (P234698-2)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 05 2018, 11:20am Sample collector: GChow
Date Received: Dec 05 2018, 12:35pm Sample receiver: CSOOHOO
Sample Comments: Annual Sampling per DDW T22 and WDR; SUBCONTRACT DATA; 1613 for 2,3,7,8-TCDD only

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference								
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal							RawH2O	
Subcontract data								
Comment: Original report transmitted to client. Copy of report archived with data packet.								
SUBCONTRACT LAB DATA								
DATA TRANSMITTAL								
Run ID: R291216 / Work Group No.: WG227290								
Prep Date1: 25-JAN-19 Analyzed 25-Jan-19 00:00								
Method: SM2150B - 1997, Ambient Temperature, one panelist							RawH2O	
Subcontract data from Caltest Analytical								
Comment: The odor of the sample was characterized as musty. The sample was tested at ambient conditions (19 degrees C) and was not dechlorinated.; Musty								
SUBCONTRACT LAB DATA								
THRESHOLD ODOR NUMBER		**1**	TON	1		1		
ODOR CHARACTERIZATION (SEE COMMENT)		**1**	Panelists					
NUMBER ANALYZING SAMPLE		**1**	Panelists					
TEMPERATURE		**19**	deg C					
Run ID: R289799 / Work Group No.: WG226601								
Prep Date1: 05-DEC-18 Analyzed 05-Dec-18 15:19								
Method: SM5540C - 2000, Colorimetric							RawH2O	
Subcontract data from Alpha Analytical Lab								
Comment: U - ANALYTE INCLUDED IN ANALYSIS BUT NOT DETECTED AT OR ABOVE MDL								
SUBCONTRACT LAB DATA								
MBAS	U	0.03	mg/L	1	0.03	0.05		
Run ID: R289894 / Work Group No.: WG226694								
Prep Date1: 06-DEC-18 Analyzed 07-Dec-18 16:15								

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: FIELD QC Sample collection QC
Locator: COLLECTION QC Field QC Sample submitted for analysis
Lab ID: L225857-3 (P234698-3)
Sample Type: QCFB (Field Blank Grab)
Date Collected: Dec 05 2018, 11:55am Sample collector: GChow
Date Received: Dec 05 2018, 12:35pm Sample receiver: CSOOHOO
Sample Comments: QCFB for L225857-1; Prep'd on 10/11/2018 by VOA Chemist

Method Reference						Matrix	Tag
Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	
Method: EPA 524.4 - Volatile Organics, GC/MS						DrinkH2O	
TARGET ANALYTES							
ALLYL CHLORIDE	U	0.36	ug/L	1	0.36		
TERT-AMYL METHYL ETHER	U	0.23	ug/L	1	0.23	3	
BENZENE	U	0.054	ug/L	1	0.054	0.5	
BROMOBENZENE	U	0.11	ug/L	1	0.11		
BROMOCHLOROMETHANE	U	0.15	ug/L	1	0.15		
BROMODICHLOROMETHANE	U	0.090	ug/L	1	0.09		
BROMOFORM	U	0.096	ug/L	1	0.096		
BROMOMETHANE	U	0.72	ug/L	1	0.72		
TERT-BUTYL ALCOHOL	U	0.57	ug/L	1	0.57	2	
N-BUTYLBENZENE	U	0.076	ug/L	1	0.076		
SEC-BUTYLBENZENE	U	0.069	ug/L	1	0.069		
TERT-BUTYLBENZENE	U	0.15	ug/L	1	0.15		
CARBON DISULFIDE	U	0.072	ug/L	1	0.072		
CARBON TETRACHLORIDE	U	0.14	ug/L	1	0.14	0.5	
CHLOROBENZENE	U	0.085	ug/L	1	0.085	0.5	
1-CHLOROBUTANE	U	0.076	ug/L	1	0.076		
CHLOROFORM	U	0.11	ug/L	1	0.11		
CHLOROMETHANE	U	0.30	ug/L	1	0.3		
O-CHLOROTOLUENE	U	0.17	ug/L	1	0.17		
P-CHLOROTOLUENE	U	0.15	ug/L	1	0.15		
DIBROMOCHLOROMETHANE	U	0.065	ug/L	1	0.065		
DIBROMOCHLOROPROPANE	U	0.11	ug/L	1	0.11		
DIBROMOMETHANE	U	0.088	ug/L	1	0.088		
1,2-DICHLOROBENZENE	U	0.082	ug/L	1	0.082	0.5	
1,3-DICHLOROBENZENE	U	0.071	ug/L	1	0.071		
1,4-DICHLOROBENZENE	U	0.070	ug/L	1	0.07	0.5	
DICHLORODIFLUOROMETHANE	U	0.23	ug/L	1	0.23	0.5	
1,1-DICHLOROETHANE	U	0.13	ug/L	1	0.13	0.5	
1,2-DICHLOROETHANE	U	0.11	ug/L	1	0.11	0.5	
1,1-DICHLOROETHENE	U	0.12	ug/L	1	0.12	0.5	
CIS-1,2-DICHLOROETHENE	U	0.14	ug/L	1	0.14	0.5	
TRANS-1,2-DICHLOROETHENE	U	0.10	ug/L	1	0.1	0.5	
1,2-DICHLOROPROPANE	U	0.070	ug/L	1	0.07	0.5	
1,3-DICHLOROPROPANE	U	0.064	ug/L	1	0.064		
1,1-DICHLOROPROPENE	U	0.14	ug/L	1	0.14		
CIS-1,3-DICHLOROPROPENE	U	0.099	ug/L	1	0.099	0.5	
TRANS-1,3-DICHLOROPROPENE	U	0.070	ug/L	1	0.07	0.5	
DIISOPROPYL ETHER	U	0.072	ug/L	1	0.072		
ETHYL BENZENE	U	0.053	ug/L	1	0.053	0.5	
ETHYL ETHER	U	0.11	ug/L	1	0.11		
ETHYLENE DIBROMIDE	U	0.060	ug/L	1	0.06		
ETHYLMETHACRYLATE	U	0.051	ug/L	1	0.051		
ETHYL-T-BUTYL ETHER	U	0.070	ug/L	1	0.07	3	
FLUOROTRICHLOROMETHANE	U	0.065	ug/L	1	0.065	5	
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	U	0.12	ug/L	1	0.12	10	
HEXACHLOROBUTADIENE	U	0.089	ug/L	1	0.089		
HEXACHLOROETHANE	U	0.18	ug/L	1	0.18		
IODOMETHANE	U	0.58	ug/L	1	0.58		
ISOPROPYLBENZENE	U	0.056	ug/L	1	0.056		
P-ISOPROPYLTOLUENE	U	0.062	ug/L	1	0.062		
METHYLENE CHLORIDE	U	0.092	ug/L	1	0.092	0.5	
METHYL-T-BUTYL ETHER	U	0.067	ug/L	1	0.067	3	

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: FIELD QC Sample collection QC
Locator: COLLECTION QC Field QC Sample submitted for analysis
Lab ID: L225857-3 (P234698-3)
Sample Type: QCFB (Field Blank Grab)
Date Collected: Dec 05 2018, 11:55am Sample collector: GChow
Date Received: Dec 05 2018, 12:35pm Sample receiver: CSOOHOO
Sample Comments: QCFB for L225857-1; Prep'd on 10/11/2018 by VOA Chemist

Method Reference — Matrix: Tag

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML
NAPHTHALENE	U	0.070	ug/L	1	0.07	
PENTACHLOROETHANE	U	0.38	ug/L	1	0.38	
N-PROPYLBENZENE	U	0.051	ug/L	1	0.051	
STYRENE	U	0.075	ug/L	1	0.075	0.5
1,1,1,2-TETRACHLOROETHANE	U	0.097	ug/L	1	0.097	
1,1,2,2-TETRACHLOROETHANE	U	0.13	ug/L	1	0.13	0.5
TETRACHLOROETHENE	U	0.10	ug/L	1	0.1	0.5
TETRAHYDROFURAN	U	0.37	ug/L	1	0.37	
TOLUENE	U	0.054	ug/L	1	0.054	0.5
1,2,3-TRICHLOROBENZENE	U	0.075	ug/L	1	0.075	
1,2,4-TRICHLOROBENZENE	U	0.096	ug/L	1	0.096	0.5
1,1,1-TRICHLOROETHANE	U	0.11	ug/L	1	0.11	0.5
1,1,2-TRICHLOROETHANE	U	0.079	ug/L	1	0.079	0.5
TRICHLOROETHENE	U	0.12	ug/L	1	0.12	0.5
1,2,3-TRICHLOROPROPANE	U	0.22	ug/L	1	0.22	
1,2,4-TRIMETHYLBENZENE	U	0.072	ug/L	1	0.072	
1,3,5-TRIMETHYLBENZENE	U	0.071	ug/L	1	0.071	
VINYL CHLORIDE	U	0.086	ug/L	1	0.086	0.5
O-XYLENE	U	0.079	ug/L	1	0.079	0.5
M+P XYLENES	U	0.14	ug/L	1	0.14	0.5
VALUE(S) USED TO CALCULATE OTHER VALUE(S)						
TOTAL 1,3-DICHLOROPROPENES	U	0.50	ug/L	1		0.5
TOTAL XYLENES	U	0.50	ug/L	1	0.22	0.5
INTERNAL STANDARD						
1,4-DIFLUOROBENZENE		103	% recovery	1		
D4-1,4-DICHLOROBENZENE		100	% recovery	1		
D5-CHLOROBENZENE		101	% recovery	1		
SURROGATE						
4-BROMOFLUOROBENZENE		96.8	% recovery	1		
D3-METHYL-T-BUTYL-ETHER		99.6	% recovery	1		
D4-1,2-DICHLOROBENZENE		99.2	% recovery	1		

Run ID: R289399 / Work Group No.: WG226338
Prep Date1: 06-DEC-18 Analyzed 06-Dec-18 14:25

Method: SRL 524M-TCP - SIM for TCP, PT, GC/MS — DrinkH2O

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML
TARGET ANALYTES						
1,2,3-TRICHLOROPROPANE	U	0.94	ng/L	1	0.94	
INTERNAL STANDARD						
D5-1,2,3-TRICHLOROPROPANE		81.1	% recovery			

Run ID: R289757 / Work Group No.: WG226465
Prep Date1: 13-DEC-18 Analyzed 13-Dec-18 15:16

Method: EPA 504.1 - EDB & DBCP, GC/ECD — DrinkH2O

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML
TARGET ANALYTES						
ETHYLENE DIBROMIDE	U	0.0030	ug/L	1	0.003	0.02
DIBROMOCHLOROPROPANE	U	0.0060	ug/L	1	0.006	0.01

Run ID: R289838 / Work Group No.: WG226554
Prep Date1: 12-DEC-18 Prep Date2: 18-DEC-18 Analyzed 18-Dec-18 15:47

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Analytical Report Prepared for DAVID BEHNKEN

Report generated on: Feb 22, 2019 01:05 pm
Login No.: L225945

Reported by:

KRISTI LORENSON
Laboratory Program Manager

Approved by:

NIRMELA ARSEM
Laboratory Services Division Manager

LSR B455-0706-1
Project Title: BAYSIDE GROUND WATER PROJECT

Login Performance Summary
1 - Sample received by the lab on: Dec 10 2018, 12:48 pm
0 - Lost Analyses
0 - Hold Time Exceedences
Turn-around-time not met

Samples included in this report:

Sample	Type Collected	Site	Locator	ClientID
L225945-1	GRAB 10-Dec-2018 11:25	GW BAYSIDE	BAY1-MW5D	MW5D

Legend to the laboratory qualifiers used in this report:
< - Less than
E - Estimated value, concentration outside calibration range. For SIP, E=DNQ, Estimated Concentration.
U - Analyte not detected
Qualifiers for subcontract work - See textvalue for description

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW5D Q APN 411-0003-0083 Via Barrett, San Lorenzo; Formerly BAY-MW-BARETT
ClientID: MW5D
Lab ID: L225945-1 (P234805-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 10 2018, 11:25am Sample collector: NPK/RV/DW
Date Received: Dec 10 2018, 12:48pm Sample receiver: ANG
Sample Comments: MW-5D; +FLD DATA: pH = 7.57; Cl2R = <0.02 mg/L; Depth to GW = 15.52' feet; GW Elevation = NA feet; Temperature = 21.7 deg C; Labelled as RAW WATER for the program.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference								
Method: EPA 8260B - Trihalomethanes, GC/MS							GroundH2O	
Subcontract data from Alpha Analytical Lab								
Comment: U - ANALYTE INCLUDED IN ANALYSIS BUT NOT DETECTED AT OR ABOVE MDL								
SUBCONTRACT LAB DATA								
BROMODICHLOROMETHANE	U	0.4	ug/L	1	0.4	0.5		
BROMOFORM	U	0.3	ug/L	1	0.3	0.5		
CHLOROFORM	U	0.4	ug/L	1	0.4	0.5		
DIBROMOCHLOROMETHANE	U	0.4	ug/L	1	0.4	0.5		
TRIHALOMETHANES	U	0.4	ug/L	1	0.4	0.5		
Run ID: R289990 / Work Group No.: WG226786								
Prep Date1: 18-DEC-18 Analyzed 18-Dec-18 15:38								
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal							GroundH2O	
Subcontract data								
Comment: Original report transmitted to client. Copy of report archived with data packet.								
SUBCONTRACT LAB DATA								
DATA TRANSMITTAL								
Run ID: R291800 / Work Group No.: WG227834								
Prep Date1: 21-FEB-19 Analyzed 21-Feb-19 00:00								
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal for oxygen 18							GroundH2O	
Subcontract data from Alpha Analytical Lab								
Comment: Refer to sublab data report attached								
SUBCONTRACT LAB DATA								
DATA TRANSMITTAL								
Run ID: R291803 / Work Group No.: WG227848								
Prep Date1: 13-JAN-19 Analyzed 13-Jan-19 00:00								
Method: SAMPLER PROVIDED FIELD MEASUREMENTS - DATA ENTRY LIST FOR FIELD DATA							GroundH2O	
FIELD ANALYSIS/OBSERVATION DATA PARAMETERS								
PH		**7.57**	pH units	1				
TEMPERATURE		**21.7**	deg C	1				
DEPTH		**15.52**	feet	1				
CHLORINE RESIDUAL: TOTAL	<	0.02	mg/L	1	0.02			
Run ID: R289697 / Work Group No.: WG226499								
Prep Date1: 10-DEC-18 Analyzed 10-Dec-18 11:25								
Method: EPA 300.1 - Ion Chromatography							GroundH2O	
Instrument calibrated 04-SEP-18								
TARGET ANALYTES								
CHLORIDE		**79**	mg/L	10	0.35			
NITRATE AS N		**0.19**	mg/L	10	0.019	0.4		
SULFATE		**46**	mg/L	10	0.5	0.5		
SURROGATE								
DICHLOROACETATE		99	% recovery	10				
Run ID: R289642 / Work Group No.: WG226409								
Prep Date1: 11-DEC-18 Analyzed 11-Dec-18 13:24								

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW5D Q APN 411-0003-0083 Via Barrett, San Lorenzo; Formerly BAY-MW-BARETT
ClientID: MW5D
Lab ID: L225945-1 (P234805-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 10 2018, 11:25am Sample collector: NPK/RV/DW
Date Received: Dec 10 2018, 12:48pm Sample receiver: ANG
Sample Comments: MW-5D; +FLD DATA: pH = 7.57; Cl2R = <0.02 mg/L; Depth to GW = 15.52' feet; GW Elevation = NA feet; Temperature = 21.7 deg C; Labelled as RAW WATER for the program.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method: EPA 552.2 - Haloacetic Acids							GroundH2O	
TARGET ANALYTES								
BROMOCHLOROACETIC ACID	**E**	**0.19**	ug/L	1	0.15			
BROMODICHLOROACETIC ACID	U	0.31	ug/L	1	0.31			
CHLORODIBROMOACETIC ACID	U	0.31	ug/L	1	0.31			
DIBROMOACETIC ACID	U	0.25	ug/L	1	0.25	1		
DICHLOROACETIC ACID	U	0.18	ug/L	1	0.18	1		
MONOBROMOACETIC ACID	U	0.29	ug/L	1	0.29	1		
MONOCHLOROACETIC ACID	U	0.65	ug/L	1	0.65	2		
TRIBROMOACETIC ACID	U	0.72	ug/L	1	0.72			
TRICHLOROACETIC ACID	U	0.17	ug/L	1	0.17	1		
VALUE CALCULATED FROM OTHER RESULTS								
HAA(5)	U	1.0	ug/L					
HAA (5) calculation uses a zero for any individual HAA result less than the California DLR for that HAA								
HAA(9)	U	1.0	ug/L					
INTERNAL STANDARD								
1,2,3-TRICHLOROPROPANE		99	% recovery		1			
SURROGATE								
2,3-DIBROMOPROPIONIC ACID		100	% recovery		1			
Run ID: R289906 / Work Group No.: WG226626								
Prep Date1: Analyzed 20-Dec-18 17:27								
Method: SM2320B - 1997, Titration							GroundH2O	
TARGET ANALYTES								
ALKALINITY: TOTAL AS CACO3		**230**	mg/L	1	5			
Run ID: R289650 / Work Group No.: WG226445								
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 06:59								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: CARBONATE	U	0.10	mg/L	1	0.1			
Run ID: R289655 / Work Group No.: WG226447								
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 08:24								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: BICARBONATE		**230**	mg/L	1	5			
Run ID: R289655 / Work Group No.: WG226447								
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 08:24								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: HYDROXIDE	U	0.10	mg/L	1	0.1			
Run ID: R289655 / Work Group No.: WG226447								
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 08:24								

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW5D Q APN 411-0003-0083 Via Barrett, San Lorenzo; Formerly BAY-MW-BARETT
ClientID: MW5D
Lab ID: L225945-1 (P234805-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 10 2018, 11:25am Sample collector: NPK/RV/DW
Date Received: Dec 10 2018, 12:48pm Sample receiver: ANG
Sample Comments: MW-5D; +FLD DATA: pH = 7.57; Cl2R = <0.02 mg/L; Depth to GW = 15.52' feet; GW Elevation = NA feet; Temperature = 21.7 deg C; Labelled as RAW WATER for the program.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method: SM2340C - 1997, Titration: EDTA							GroundH2O	
TARGET ANALYTES								
HARDNESS: TOTAL AS CACO3		**130**	mg/L	1	3			
Run ID: R289652 / Work Group No.: WG226441								
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 10:13								
Method: SM2540C - 1997, Dried at 180C							GroundH2O	
TARGET ANALYTES								
TOTAL DISSOLVED SOLIDS		**460**	mg/L	1.25	12			
Run ID: R289786 / Work Group No.: WG226468								
Prep Date1: 13-DEC-18 Analyzed 13-Dec-18 09:20								
Method: SM4500-NH3 B, C - 1997, Distillation & Titration							GroundH2O	
TARGET ANALYTES								
AMMONIA AS N	U	0.280	mg/L	1	0.28			
Run ID: R289836 / Work Group No.: WG226625								
Prep Date1: 20-DEC-18 Analyzed 20-Dec-18 11:45								
Method: EPA 200.7 - Rev. 4.4, ICP Scan							RawH2O	
TARGET ANALYTES								
CALCIUM		**35,600**	ug/L	1.04	22.4			
IRON		**270**	ug/L	1.04	5.2	100		
POTASSIUM		**1,960**	ug/L	1.04	19.9			
MAGNESIUM		**9,130**	ug/L	1.04	5.72			
MANGANESE		**197**	ug/L	1.04	0.0832	20		
SODIUM		**112,000**	ug/L	1.04	5.62			
Run ID: R289781 / Work Group No.: WG226562								
Prep Date1: 13-DEC-18 Prep Date2: 18-DEC-18 Analyzed 18-Dec-18 11:49								

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Analytical Report Prepared for DAVID BEHNKEN

Report generated on: Feb 22, 2019 01:05 pm
Login No.: L225984

Reported by:

KRISTI LORENSON
Laboratory Program Manager

Approved by:

NIRMELA ARSEM
Laboratory Services Division Manager

LSR B455-0706-1
Project Title: BAYSIDE GROUND WATER PROJECT

Login Performance Summary
1 - Sample received by the lab on: Dec 11 2018, 02:45 pm
0 - Lost Analyses
0 - Hold Time Exceedences
Turn-around-time not met

Samples included in this report:

Sample	Type Collected	Site	Locator	ClientID
L225984-1	GRAB 11-Dec-2018 13:10	GW BAYSIDE	BAY1-MW2I	MW2I

Legend to the laboratory qualifiers used in this report:
E - Estimated value, concentration outside calibration range. For SIP, E=DNQ, Estimated Concentration.
U - Analyte not detected
Qualifiers for subcontract work - See textvalue for description

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW2I OW-1 the same parcel as the Bayside Well on Oro Loma Property; aka BAY1-MW2D until 11-2009; formerly BAY1-MW2-190
ClientID: MW2I
Lab ID: L225984-1 (P234802-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 11 2018, 01:10pm Sample collector: JR/DW/NPK
Date Received: Dec 11 2018, 02:45pm Sample receiver: RMOLINA
Sample Comments: MW-2I; +FLD DATA: pH = 7.83 ; Cl2R = 0.0 mg/L; Depth to GW = 29.25 feet; GW Elevation = NA feet; Temp = 18.5 deg C;Labelled as RAW WATER for the program.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method: EPA 8260B - Trihalomethanes, GC/MS							GroundH2O	
Subcontract data from Alpha Analytical Lab								
Comment: U - ANALYTE INCLUDED IN ANALYSIS BUT NOT DETECTED AT OR ABOVE MDL								
SUBCONTRACT LAB DATA								
BROMODICHLOROMETHANE	U	0.4	ug/L	1	0.4	0.5		
BROMOFORM	U	0.3	ug/L	1	0.3	0.5		
CHLOROFORM	U	0.4	ug/L	1	0.4	0.5		
DIBROMOCHLOROMETHANE	U	0.4	ug/L	1	0.4	0.5		
TRIHALOMETHANES	U	0.4	ug/L	1	0.4	0.5		
Run ID: R289990 / Work Group No.: WG226786								
Prep Date1: 18-DEC-18 Analyzed 18-Dec-18 15:06								
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal							GroundH2O	
Subcontract data								
Comment: Original report transmitted to client. Copy of report archived with data packet.								
SUBCONTRACT LAB DATA								
DATA TRANSMITTAL								
Run ID: R291799 / Work Group No.: WG227833								
Prep Date1: 21-FEB-19 Analyzed 21-Feb-19 00:00								
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal for oxygen 18							GroundH2O	
Subcontract data from Alpha Analytical Lab								
Comment: Refer to sublab data report attached								
SUBCONTRACT LAB DATA								
DATA TRANSMITTAL								
Run ID: R291803 / Work Group No.: WG227848								
Prep Date1: 13-JAN-19 Analyzed 13-Jan-19 00:00								
Method: SAMPLER PROVIDED FIELD MEASUREMENTS - DATA ENTRY LIST FOR FIELD DATA							GroundH2O	
FIELD ANALYSIS/OBSERVATION DATA PARAMETERS								
PH		**7.83**	pH units	1				
TEMPERATURE		**18.5**	deg C	1				
DEPTH		**29.25**	feet	1				
CHLORINE RESIDUAL: TOTAL	U	0.02	mg/L	1	0.02			
Run ID: R289648 / Work Group No.: WG226442								
Prep Date1: 11-DEC-18 Analyzed 11-Dec-18 13:10								
Method: EPA 300.1 - Ion Chromatography							GroundH2O	1
Instrument calibrated 04-SEP-18								
TARGET ANALYTES								
CHLORIDE		**120**	mg/L	20	0.7			
SURROGATE								
DICHLOROACETATE		99	% recovery	20				
Run ID: R289664 / Work Group No.: WG226438								
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 13:04								

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW2I OW-1 the same parcel as the Bayside Well on Oro Loma Property; aka BAY1-MW2D until 11-2009; formerly BAY1-MW2-190
ClientID: MW2I
Lab ID: L225984-1 (P234802-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 11 2018, 01:10pm Sample collector: JR/DW/NPK
Date Received: Dec 11 2018, 02:45pm Sample receiver: RMOLINA
Sample Comments: MW-2I; +FLD DATA: pH = 7.83 ; Cl2R = 0.0 mg/L; Depth to GW = 29.25 feet; GW Elevation = NA feet; Temp = 18.5 deg C;Labelled as RAW WATER for the program.

Method Reference / Parameter	Qualifier	Result	Units	Dilution	MDL	Matrix Tag RL/ML
Method: EPA 300.1 - Ion Chromatography						GroundH2O
Instrument calibrated 04-SEP-18						
TARGET ANALYTES						
NITRATE AS N	U	0.019	mg/L	10	0.019	0.4
SULFATE		**22**	mg/L	10	0.5	0.5
SURROGATE						
DICHLOROACETATE		100	% recovery	10		
Run ID: R289664 / Work Group No.: WG226438						
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 12:27						
Method: EPA 552.2 - Haloacetic Acids						GroundH2O
TARGET ANALYTES						
BROMOCHLOROACETIC ACID	U	0.15	ug/L	1	0.15	
BROMODICHLOROACETIC ACID		**0.73**	ug/L	1	0.31	
CHLORODIBROMOACETIC ACID	U	0.31	ug/L	1	0.31	
DIBROMOACETIC ACID	U	0.25	ug/L	1	0.25	1
DICHLOROACETIC ACID	U	0.18	ug/L	1	0.18	1
MONOBROMOACETIC ACID	U	0.29	ug/L	1	0.29	1
MONOCHLOROACETIC ACID	U	0.65	ug/L	1	0.65	2
TRIBROMOACETIC ACID	U	0.72	ug/L	1	0.72	
TRICHLOROACETIC ACID	**E**	**0.22**	ug/L	1	0.17	1
VALUE CALCULATED FROM OTHER RESULTS						
HAA(5)	U	1.0	ug/L			
HAA (5) calculation uses a zero for any individual HAA result less than the California DLR for that HAA						
HAA(9)	U	1.0	ug/L			
INTERNAL STANDARD						
1,2,3-TRICHLOROPROPANE		100	% recovery		1	
SURROGATE						
2,3-DIBROMOPROPIONIC ACID		98	% recovery		1	
Run ID: R289912 / Work Group No.: WG226631						
Prep Date1: Analyzed 21-Dec-18 06:24						
Method: SM2320B - 1997, Titration						GroundH2O
TARGET ANALYTES						
ALKALINITY: TOTAL AS CACO3		**330**	mg/L	1	5	
Run ID: R289650 / Work Group No.: WG226445						
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 06:59						
Method: SM2320B-1997 - Calculation						GroundH2O
TARGET ANALYTES						
ALKALINITY: CARBONATE	U	0.10	mg/L	1	0.1	
Run ID: R289655 / Work Group No.: WG226447						
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 08:24						

RL is either the client requested or regulatory mandated Reporting Limit. ML is the regulatory mandated Minimum Level

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW2I OW-1 the same parcel as the Bayside Well on Oro Loma Property; aka BAY1-MW2D until 11-2009; formerly BAY1-MW2-190
ClientID: MW2I
Lab ID: L225984-1 (P234802-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 11 2018, 01:10pm Sample collector: JR/DW/NPK
Date Received: Dec 11 2018, 02:45pm Sample receiver: RMOLINA
Sample Comments: MW-2I; +FLD DATA: pH = 7.83 ; Cl2R = 0.0 mg/L; Depth to GW = 29.25 feet; GW Elevation = NA feet; Temp = 18.5 deg C;Labelled as RAW WATER for the program.

Parameter	Qualifier	Result	Units	Dilution	MDL	Matrix / Tag RL/ML
Method Reference						
Method: SM2320B-1997 - Calculation						GroundH2O
TARGET ANALYTES						
ALKALINITY: BICARBONATE		**330**	mg/L	1	5	
Run ID: R289655 / Work Group No.: WG226447						
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 08:24						
Method: SM2320B-1997 - Calculation						GroundH2O
TARGET ANALYTES						
ALKALINITY: HYDROXIDE	U	0.10	mg/L	1	0.1	
Run ID: R289655 / Work Group No.: WG226447						
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 08:24						
Method: SM2340C - 1997, Titration: EDTA						GroundH2O
TARGET ANALYTES						
HARDNESS: TOTAL AS CACO3		**110**	mg/L	1	3	
Run ID: R289674 / Work Group No.: WG226460						
Prep Date1: 13-DEC-18 Analyzed 13-Dec-18 07:05						
Method: SM2540C - 1997, Dried at 180C						GroundH2O
TARGET ANALYTES						
TOTAL DISSOLVED SOLIDS		**620**	mg/L	1.25	12	
Run ID: R289786 / Work Group No.: WG226468						
Prep Date1: 13-DEC-18 Analyzed 13-Dec-18 09:20						
Method: SM4500-NH3 B, C - 1997, Distillation & Titration						GroundH2O
TARGET ANALYTES						
AMMONIA AS N	U	0.280	mg/L	1	0.28	
Run ID: R289836 / Work Group No.: WG226625						
Prep Date1: 20-DEC-18 Analyzed 20-Dec-18 11:45						
Method: EPA 200.7 - Rev. 4.4, ICP Scan						RawH2O
TARGET ANALYTES						
CALCIUM		**15,800**	ug/L	1.04	22.4	
IRON		**1,260**	ug/L	1.04	5.2	100
POTASSIUM		**5,870**	ug/L	1.04	19.9	
MAGNESIUM		**14,200**	ug/L	1.04	5.72	
MANGANESE		**124**	ug/L	1.04	0.0832	20
SODIUM		**184,000**	ug/L	1.04	5.62	
Run ID: R289781 / Work Group No.: WG226562						
Prep Date1: 13-DEC-18 Prep Date2: 18-DEC-18 Analyzed 18-Dec-18 12:18						

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Analytical Report Prepared for DAVID BEHNKEN

Report generated on: Feb 22, 2019 01:05 pm
Login No.: L225986

Reported by:

KRISTI LORENSON
Laboratory Program Manager

Approved by:

NIRMELA ARSEM
Laboratory Services Division Manager

LSR B455-0706-1
Project Title: BAYSIDE GROUND WATER PROJECT

Login Performance Summary
1 - Sample received by the lab on: Dec 11 2018, 02:45 pm
0 - Lost Analyses
0 - Hold Time Exceedences
Turn-around-time not met

Samples included in this report:

Sample	Type Collected	Site	Locator	ClientID
L225986-1	GRAB 11-Dec-2018 10:45	GW BAYSIDE	BAY1-MW4	MW4

Legend to the laboratory qualifiers used in this report:
< - Less than
E - Estimated value, concentration outside calibration range. For SIP, E=DNQ, Estimated Concentration.
U - Analyte not detected
Qualifiers for subcontract work - See textvalue for description

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW4 OW-1 the same parcel as the Bayside Well on Oro Loma Property; formerly BAY1-MW5
ClientID: MW4
Lab ID: L225986-1 (P234803-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 11 2018, 10:45am Sample collector: NPK/JR/DW
Date Received: Dec 11 2018, 02:45pm Sample receiver: RMOLINA
Sample Comments: MW-4; +FLD DATA: pH = 7.73 ; Cl2R < 0.02 mg/L; Depth to GW = 11.15 feet; GW Elevation = NA feet; Temp = 19.2 deg C;Labelled as RAW WATER for the program.

Method Reference / Parameter	Qualifier	Result	Units	Dilution	MDL	Matrix RL/ML	Tag
Method: EPA 8260B - Trihalomethanes, GC/MS						GroundH2O	
Subcontract data from Alpha Analytical Lab							
Comment: U - ANALYTE INCLUDED IN ANALYSIS BUT NOT DETECTED AT OR ABOVE MDL							
SUBCONTRACT LAB DATA							
BROMODICHLOROMETHANE	U	0.4	ug/L	1	0.4	0.5	
BROMOFORM	U	0.3	ug/L	1	0.3	0.5	
CHLOROFORM	U	0.4	ug/L	1	0.4	0.5	
DIBROMOCHLOROMETHANE	U	0.4	ug/L	1	0.4	0.5	
TRIHALOMETHANES	U	0.4	ug/L	1	0.4	0.5	
Run ID: R289990 / Work Group No.: WG226786							
Prep Date1: 18-DEC-18 Analyzed 18-Dec-18 14:34							
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal						GroundH2O	
Subcontract data							
Comment: Original report transmitted to client. Copy of report archived with data packet.							
SUBCONTRACT LAB DATA							
DATA TRANSMITTAL							
Run ID: R291798 / Work Group No.: WG227832							
Prep Date1: 21-FEB-19 Analyzed 21-Feb-19 00:00							
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal for oxygen 18						GroundH2O	
Subcontract data from Alpha Analytical Lab							
Comment: Refer to sublab data report attached							
SUBCONTRACT LAB DATA							
DATA TRANSMITTAL							
Run ID: R291803 / Work Group No.: WG227848							
Prep Date1: 13-JAN-19 Analyzed 13-Jan-19 00:00							
Method: SAMPLER PROVIDED FIELD MEASUREMENTS - DATA ENTRY LIST FOR FIELD DATA						GroundH2O	
FIELD ANALYSIS/OBSERVATION DATA PARAMETERS							
PH		**7.73**	pH units	1			
TEMPERATURE		**19.2**	deg C	1			
DEPTH		**11.15**	feet	1			
CHLORINE RESIDUAL: TOTAL	<	0.02	mg/L	1	0.02		
Run ID: R289678 / Work Group No.: WG226482							
Prep Date1: 11-DEC-18 Analyzed 11-Dec-18 10:45							
Method: EPA 300.1 - Ion Chromatography						GroundH2O	
Instrument calibrated 04-SEP-18							
TARGET ANALYTES							
CHLORIDE		**48**	mg/L	10	0.35		
NITRATE AS N	U	0.019	mg/L	10	0.019	0.4	
SULFATE		**37**	mg/L	10	0.5	0.5	
SURROGATE							
DICHLOROACETATE		100	% recovery	10			
Run ID: R289664 / Work Group No.: WG226438							
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 13:41							

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW4 OW-1 the same parcel as the Bayside Well on Oro Loma Property; formerly BAY1-MW5
ClientID: MW4
Lab ID: L225986-1 (P234803-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 11 2018, 10:45am Sample collector: NPK/JR/DW
Date Received: Dec 11 2018, 02:45pm Sample receiver: RMOLINA
Sample Comments: MW-4; +FLD DATA: pH = 7.73 ; Cl2R < 0.02 mg/L; Depth to GW = 11.15 feet; GW Elevation = NA feet; Temp = 19.2 deg C;Labelled as RAW WATER for the program.

Method Reference / Parameter	Qualifier	Result	Units	Dilution	MDL	Matrix RL/ML	Tag
Method: EPA 552.2 - Haloacetic Acids						GroundH2O	
TARGET ANALYTES							
BROMOCHLOROACETIC ACID	U	0.15	ug/L	1	0.15		
BROMODICHLOROACETIC ACID	U	0.31	ug/L	1	0.31		
CHLORODIBROMOACETIC ACID	U	0.31	ug/L	1	0.31		
DIBROMOACETIC ACID	**E**	**0.27**	ug/L	1	0.25	1	
DICHLOROACETIC ACID	U	0.18	ug/L	1	0.18	1	
MONOBROMOACETIC ACID	U	0.29	ug/L	1	0.29	1	
MONOCHLOROACETIC ACID	U	0.65	ug/L	1	0.65	2	
TRIBROMOACETIC ACID	U	0.72	ug/L	1	0.72		
TRICHLOROACETIC ACID	**E**	**0.21**	ug/L	1	0.17	1	
VALUE CALCULATED FROM OTHER RESULTS							
HAA(5)	U	1.0	ug/L				
HAA (5) calculation uses a zero for any individual HAA result less than the California DLR for that HAA							
HAA(9)	U	1.0	ug/L				
INTERNAL STANDARD							
1,2,3-TRICHLOROPROPANE		100	% recovery		1		
SURROGATE							
2,3-DIBROMOPROPIONIC ACID		97	% recovery		1		
Run ID: R289912 / Work Group No.: WG226631							
Prep Date1: Analyzed 21-Dec-18 04:26							
Method: SM2320B - 1997, Titration						GroundH2O	
TARGET ANALYTES							
ALKALINITY: TOTAL AS CACO3		**220**	mg/L	1	5		
Run ID: R289650 / Work Group No.: WG226445							
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 06:59							
Method: SM2320B-1997 - Calculation						GroundH2O	
TARGET ANALYTES							
ALKALINITY: CARBONATE	U	0.10	mg/L	1	0.1		
Run ID: R289655 / Work Group No.: WG226447							
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 08:24							
Method: SM2320B-1997 - Calculation						GroundH2O	
TARGET ANALYTES							
ALKALINITY: HYDROXIDE	U	0.10	mg/L	1	0.1		
Run ID: R289655 / Work Group No.: WG226447							
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 08:24							
Method: SM2320B-1997 - Calculation						GroundH2O	
TARGET ANALYTES							
ALKALINITY: BICARBONATE		**220**	mg/L	1	5		
Run ID: R289655 / Work Group No.: WG226447							
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 08:24							

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW4 OW-1 the same parcel as the Bayside Well on Oro Loma Property; formerly BAY1-MW5
ClientID: MW4
Lab ID: L225986-1 (P234803-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 11 2018, 10:45am Sample collector: NPK/JR/DW
Date Received: Dec 11 2018, 02:45pm Sample receiver: RMOLINA
Sample Comments: MW-4; +FLD DATA: pH = 7.73 ; Cl2R < 0.02 mg/L; Depth to GW = 11.15 feet; GW Elevation = NA feet; Temp = 19.2 deg C;Labelled as RAW WATER for the program.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method: SM2340C - 1997, Titration: EDTA							GroundH2O	
TARGET ANALYTES								
HARDNESS: TOTAL AS CACO3		**100**	mg/L	1	3			
Run ID: R289674 / Work Group No.: WG226460								
Prep Date1: 13-DEC-18 Analyzed 13-Dec-18 07:05								
Method: SM2540C - 1997, Dried at 180C							GroundH2O	
TARGET ANALYTES								
TOTAL DISSOLVED SOLIDS		**380**	mg/L	1.25	12			
Run ID: R289786 / Work Group No.: WG226468								
Prep Date1: 13-DEC-18 Analyzed 13-Dec-18 09:20								
Method: SM4500-NH3 B, C - 1997, Distillation & Titration							GroundH2O	
TARGET ANALYTES								
AMMONIA AS N	U	0.280	mg/L	1	0.28			
Run ID: R289836 / Work Group No.: WG226625								
Prep Date1: 20-DEC-18 Analyzed 20-Dec-18 11:45								
Method: EPA 200.7 - Rev. 4.4, ICP Scan							RawH2O	1
TARGET ANALYTES								
SODIUM		**102,000**	ug/L	104	562			
Run ID: R289837 / Work Group No.: WG226593								
Prep Date1: 13-DEC-18 Prep Date2: 19-DEC-18 Analyzed 19-Dec-18 16:53								
Method: EPA 200.7 - Rev. 4.4, ICP Scan							RawH2O	
TARGET ANALYTES								
CALCIUM		**24,600**	ug/L	1.04	22.4			
IRON		**39.1**	ug/L	1.04	5.2	100		
POTASSIUM		**2,120**	ug/L	1.04	19.9			
MAGNESIUM		**9,010**	ug/L	1.04	5.72			
MANGANESE		**192**	ug/L	1.04	0.0832	20		
Run ID: R289837 / Work Group No.: WG226593								
Prep Date1: 13-DEC-18 Prep Date2: 19-DEC-18 Analyzed 19-Dec-18 15:30								

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Analytical Report Prepared for DAVID BEHNKEN

Report generated on: Feb 22, 2019 01:05 pm
Login No.: L226005

Reported by:

KRISTI LORENSON
Laboratory Program Manager

Approved by:

NIRMELA ARSEM
Laboratory Services Division Manager

LSR B455-0706-1
Project Title: BAYSIDE GROUND WATER PROJECT

Login Performance Summary
1 - Sample received by the lab on: Dec 12 2018, 01:10 pm
0 - Lost Analyses
0 - Hold Time Exceedences
Turn-around-time not met

Samples included in this report:

Sample	Type Collected	Site	Locator	ClientID
L226005-1	GRAB 12-Dec-2018 11:35	GW BAYSIDE	BAY1-MW6	MW6

Legend to the laboratory qualifiers used in this report:
E - Estimated value, concentration outside calibration range. For SIP, E=DNQ, Estimated Concentration.
U - Analyte not detected
Qualifiers for subcontract work - See textvalue for description

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW6 R APN 438-0010-003 2364 Baumann Ave., San Lorenzo; formerly BAY-MW-WORTHLEY
ClientID: MW6
Lab ID: L226005-1 (P234806-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 12 2018, 11:35am Sample collector: JR/ZW/NPK
Date Received: Dec 12 2018, 01:10pm Sample receiver: RMOLINA
Sample Comments: MW-6; +FLD DATA: pH = 6.90 ; Cl2R = 0.10 mg/L; Depth to GW = 11.40 feet; GW Elevation = NA feet;Temp = 20.9 deg C. Labelled as RAW WATER for the program.

Method Reference / Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method: EPA 8260B - Trihalomethanes, GC/MS							GroundH2O	
Subcontract data from Alpha Analytical Lab								
Comment: U - ANALYTE INCLUDED IN ANALYSIS BUT NOT DETECTED AT OR ABOVE MDL								
SUBCONTRACT LAB DATA								
BROMODICHLOROMETHANE	U	0.4	ug/L	1	0.4	0.5		
BROMOFORM	U	0.3	ug/L	1	0.3	0.5		
CHLOROFORM	U	0.4	ug/L	1	0.4	0.5		
DIBROMOCHLOROMETHANE	U	0.4	ug/L	1	0.4	0.5		
TRIHALOMETHANES	U	0.4	ug/L	1	0.4	0.5		
Run ID: R289990 / Work Group No.: WG226786								
Prep Date1: 18-DEC-18 Analyzed 18-Dec-18 13:29								
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal							GroundH2O	
Subcontract data								
Comment: Original report transmitted to client. Copy of report archived with data packet.								
SUBCONTRACT LAB DATA								
DATA TRANSMITTAL								
Run ID: R291796 / Work Group No.: WG227830								
Prep Date1: 21-FEB-19 Analyzed 21-Feb-19 00:00								
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal for oxygen 18							GroundH2O	
Subcontract data from Alpha Analytical Lab								
Comment: Refer to sublab data report attached								
SUBCONTRACT LAB DATA								
DATA TRANSMITTAL								
Run ID: R291803 / Work Group No.: WG227848								
Prep Date1: 13-JAN-19 Analyzed 13-Jan-19 00:00								
Method: SAMPLER PROVIDED FIELD MEASUREMENTS - DATA ENTRY LIST FOR FIELD DATA							GroundH2O	
FIELD ANALYSIS/OBSERVATION DATA PARAMETERS								
PH		**6.9**	pH units	1				
TEMPERATURE		**20.9**	deg C	1				
DEPTH		**11.4**	feet	1				
CHLORINE RESIDUAL: TOTAL		**0.1**	mg/L	1	0.08			
Run ID: R289858 / Work Group No.: WG226664								
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 11:35								
Method: EPA 300.1 - Ion Chromatography							GroundH2O	
Instrument calibrated 04-SEP-18								
TARGET ANALYTES								
CHLORIDE		**54**	mg/L	10	0.35			
NITRATE AS N	U	0.019	mg/L	10	0.019	0.4		
SULFATE		**46**	mg/L	10	0.5	0.5		
SURROGATE								
DICHLOROACETATE		100	% recovery	10				
Run ID: R289664 / Work Group No.: WG226438								
Prep Date1: 12-DEC-18 Analyzed 12-Dec-18 19:56								

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW6 R APN 438-0010-003 2364 Baumann Ave., San Lorenzo; formerly BAY-MW-WORTHLEY
ClientID: MW6
Lab ID: L226005-1 (P234806-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 12 2018, 11:35am Sample collector: JR/ZW/NPK
Date Received: Dec 12 2018, 01:10pm Sample receiver: RMOLINA
Sample Comments: MW-6; +FLD DATA: pH = 6.90 ; Cl2R = 0.10 mg/L; Depth to GW = 11.40 feet; GW Elevation = NA feet;Temp = 20.9 deg C. Labelled as RAW WATER for the program.

Method Reference / Parameter	Qualifier	Result	Units	Dilution	MDL	Matrix RL/ML	Tag
Method: EPA 552.2 - Haloacetic Acids						GroundH2O	
TARGET ANALYTES							
BROMOCHLOROACETIC ACID	U	0.15	ug/L	1	0.15		
BROMODICHLOROACETIC ACID	U	0.31	ug/L	1	0.31		
CHLORODIBROMOACETIC ACID	U	0.31	ug/L	1	0.31		
DIBROMOACETIC ACID	U	0.25	ug/L	1	0.25	1	
DICHLOROACETIC ACID	U	0.18	ug/L	1	0.18	1	
MONOBROMOACETIC ACID	U	0.29	ug/L	1	0.29	1	
MONOCHLOROACETIC ACID	U	0.65	ug/L	1	0.65	2	
TRIBROMOACETIC ACID	U	0.72	ug/L	1	0.72		
TRICHLOROACETIC ACID	**E**	**0.21**	ug/L	1	0.17	1	
VALUE CALCULATED FROM OTHER RESULTS							
HAA(5)	U	1.0	ug/L				
HAA (5) calculation uses a zero for any individual HAA result less than the California DLR for that HAA							
HAA(9)	U	1.0	ug/L				
INTERNAL STANDARD							
1,2,3-TRICHLOROPROPANE		97	% recovery		1		
SURROGATE							
2,3-DIBROMOPROPIONIC ACID		100	% recovery		1		
Run ID: R289912 / Work Group No.: WG226631							
Prep Date1: Analyzed 21-Dec-18 10:19							
Method: SM2320B - 1997, Titration						GroundH2O	
TARGET ANALYTES							
ALKALINITY: TOTAL AS CACO3		**230**	mg/L	1	5		
Run ID: R289702 / Work Group No.: WG226492							
Prep Date1: 14-DEC-18 Analyzed 14-Dec-18 08:44							
Method: SM2320B-1997 - Calculation						GroundH2O	
TARGET ANALYTES							
ALKALINITY: CARBONATE	U	0.10	mg/L	1	0.1		
Run ID: R289731 / Work Group No.: WG226529							
Prep Date1: 17-DEC-18 Analyzed 17-Dec-18 10:35							
Method: SM2320B-1997 - Calculation						GroundH2O	
TARGET ANALYTES							
ALKALINITY: HYDROXIDE	U	0.10	mg/L	1	0.1		
Run ID: R289731 / Work Group No.: WG226529							
Prep Date1: 17-DEC-18 Analyzed 17-Dec-18 10:35							
Method: SM2320B-1997 - Calculation						GroundH2O	
TARGET ANALYTES							
ALKALINITY: BICARBONATE		**230**	mg/L	1	5		
Run ID: R289731 / Work Group No.: WG226529							
Prep Date1: 17-DEC-18 Analyzed 17-Dec-18 10:35							

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW6 R APN 438-0010-003 2364 Baumann Ave., San Lorenzo; formerly BAY-MW-WORTHLEY
ClientID: MW6
Lab ID: L226005-1 (P234806-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 12 2018, 11:35am Sample collector: JR/ZW/NPK
Date Received: Dec 12 2018, 01:10pm Sample receiver: RMOLINA
Sample Comments: MW-6; +FLD DATA: pH = 6.90 ; Cl2R = 0.10 mg/L; Depth to GW = 11.40 feet; GW Elevation = NA feet;Temp = 20.9 deg C. Labelled as RAW WATER for the program.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method: SM2340C - 1997, Titration: EDTA							GroundH2O	
TARGET ANALYTES								
HARDNESS: TOTAL AS CACO3		**110**	mg/L	1	3			
Run ID: R289674 / Work Group No.: WG226460								
Prep Date1: 13-DEC-18 Analyzed 13-Dec-18 07:05								
Method: SM2540C - 1997, Dried at 180C							GroundH2O	
TARGET ANALYTES								
TOTAL DISSOLVED SOLIDS		**410**	mg/L	1	10			
Run ID: R289786 / Work Group No.: WG226468								
Prep Date1: 13-DEC-18 Analyzed 13-Dec-18 09:20								
Method: SM4500-NH3 B, C - 1997, Distillation & Titration							GroundH2O	
TARGET ANALYTES								
AMMONIA AS N	U	0.280	mg/L	1	0.28			
Run ID: R289836 / Work Group No.: WG226625								
Prep Date1: 20-DEC-18 Analyzed 20-Dec-18 11:45								
Method: EPA 200.7 - Rev. 4.4, ICP Scan							RawH2O	1
TARGET ANALYTES								
SODIUM		**97,200**	ug/L	104	562			
Run ID: R289837 / Work Group No.: WG226593								
Prep Date1: 13-DEC-18 Prep Date2: 19-DEC-18 Analyzed 19-Dec-18 17:01								
Method: EPA 200.7 - Rev. 4.4, ICP Scan							RawH2O	
TARGET ANALYTES								
CALCIUM		**30,500**	ug/L	1.04	22.4			
IRON		**43.4**	ug/L	1.04	5.2	100		
POTASSIUM		**3,560**	ug/L	1.04	19.9			
MAGNESIUM		**7,100**	ug/L	1.04	5.72			
MANGANESE		**234**	ug/L	1.04	0.0832	20		
Run ID: R289837 / Work Group No.: WG226593								
Prep Date1: 13-DEC-18 Prep Date2: 19-DEC-18 Analyzed 19-Dec-18 15:39								

RL is either the client requested or regulatory mandated Reporting Limit. ML is the regulatory mandated Minimum Level

EAST BAY MUNICIPAL UTILITY DISTRICT
Laboratory Services Division
Phone (510)287-1432 Fax (510)465-5462
PO Box 24055, MS 59, Oakland, CA 94623

Analytical Report Prepared for DAVID BEHNKEN

Report generated on: Feb 22, 2019 01:06 pm
Login No.: L226154

Reported by:

KRISTI LORENSON
Laboratory Program Manager

Approved by:

NIRMELA ARSEM
Laboratory Services Division Manager

LSR B455-0706-1
Project Title: BAYSIDE GROUND WATER PROJECT

Login Performance Summary
1 - Sample received by the lab on: Dec 19 2018, 03:21 pm
0 - Lost Analyses
0 - Hold Time Exceedences
Turn-around-time not met

Samples included in this report:

Sample	Type Collected	Site	Locator	ClientID
L226154-1	GRAB 19-Dec-2018 12:21	GW BAYSIDE	BAY1-MW7	MW7

Legend to the laboratory qualifiers used in this report:
U - Analyte not detected
Qualifiers for subcontract work - See textvalue for description

EAST BAY MUNICIPAL UTILITY DISTRICT
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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW7 S APN 411-0078-001 Via Buena Vista; formerly BAY-MW-SL PARK
ClientID: MW7
Lab ID: L226154-1 (P234828-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 19 2018, 12:21pm Sample collector: ZWu
Date Received: Dec 19 2018, 03:21pm Sample receiver: CSOOHOO
Sample Comments: MW-7; +FLD DATA: pH = 8.32 ; Cl2R = 0.3 mg/L; Depth to GW =8.81 feet; GW Elevation = N/A feet; Labelled as RAW WATER for the program.

Method Reference / Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method: EPA 8260B - Trihalomethanes, GC/MS							GroundH2O	
Subcontract data from Alpha Analytical Lab								
Comment: U - ANALYTE INCLUDED IN ANALYSIS BUT NOT DETECTED AT OR ABOVE MDL								
SUBCONTRACT LAB DATA								
BROMODICHLOROMETHANE	U	0.4	ug/L	1	0.4	0.5		
BROMOFORM	U	0.3	ug/L	1	0.3	0.5		
CHLOROFORM	U	0.4	ug/L	1	0.4	0.5		
DIBROMOCHLOROMETHANE	U	0.4	ug/L	1	0.4	0.5		
TRIHALOMETHANES	U	0.4	ug/L	1	0.4	0.5		
Run ID: R291022 / Work Group No.: WG227135								
Prep Date1: 21-DEC-18 Analyzed 21-Dec-18 14:24								
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal							GroundH2O	
Subcontract data								
Comment: Original report transmitted to client. Copy of report archived with data packet.								
SUBCONTRACT LAB DATA								
DATA TRANSMITTAL								
Run ID: R291801 / Work Group No.: WG227835								
Prep Date1: 21-FEB-19 Analyzed 21-Feb-19 00:00								
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal for oxygen 18							GroundH2O	
Subcontract data from Alpha Analytical Lab								
Comment: Refer to sublab data report attached								
SUBCONTRACT LAB DATA								
DATA TRANSMITTAL								
Run ID: R291803 / Work Group No.: WG227848								
Prep Date1: 13-JAN-19 Analyzed 13-Jan-19 00:00								
Method: SAMPLER PROVIDED FIELD MEASUREMENTS - DATA ENTRY LIST FOR FIELD DATA							GroundH2O	
FIELD ANALYSIS/OBSERVATION DATA PARAMETERS								
PH		**8.32**	pH units	1				
DEPTH		**8.81**	feet	1				
CHLORINE RESIDUAL: TOTAL		**0.3**	mg/L	1	0.08			
Run ID: R289854 / Work Group No.: WG226661								
Prep Date1: 19-DEC-18 Analyzed 19-Dec-18 12:21								
Method: EPA 300.1 - Ion Chromatography							GroundH2O	
Instrument calibrated 04-SEP-18								
TARGET ANALYTES								
CHLORIDE		**86**	mg/L	50	1.8			
NITRATE AS N	U	0.095	mg/L	50	0.095	0.4		
SULFATE		**50**	mg/L	50	2.5	0.5		
SURROGATE								
DICHLOROACETATE		99	% recovery	50				
Run ID: R289839 / Work Group No.: WG226607								
Prep Date1: 19-DEC-18 Analyzed 20-Dec-18 22:24								

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EAST BAY MUNICIPAL UTILITY DISTRICT
Laboratory Services Division
PO Box 24055, MS 59, Oakland, CA 94623
Phone (510)287-1432 Fax (510)465-5462

Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW7 S APN 411-0078-001 Via Buena Vista; formerly BAY-MW-SL PARK
ClientID: MW7
Lab ID: L226154-1 (P234828-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 19 2018, 12:21pm Sample collector: ZWu
Date Received: Dec 19 2018, 03:21pm Sample receiver: CSOOHOO
Sample Comments: MW-7; +FLD DATA: pH = 8.32 ; Cl2R = 0.3 mg/L; Depth to GW =8.81 feet; GW Elevation = N/A feet; Labelled as RAW WATER for the program.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference								
Method: EPA 552.2 - Haloacetic Acids							GroundH2O	
TARGET ANALYTES								
BROMOCHLOROACETIC ACID	U	0.15	ug/L	1	0.15			
BROMODICHLOROACETIC ACID	U	0.31	ug/L	1	0.31			
CHLORODIBROMOACETIC ACID	U	0.31	ug/L	1	0.31			
DIBROMOACETIC ACID	U	0.25	ug/L	1	0.25	1		
DICHLOROACETIC ACID	U	0.18	ug/L	1	0.18	1		
MONOBROMOACETIC ACID	U	0.29	ug/L	1	0.29	1		
MONOCHLOROACETIC ACID	U	0.65	ug/L	1	0.65	2		
TRIBROMOACETIC ACID	U	0.72	ug/L	1	0.72			
TRICHLOROACETIC ACID	U	0.17	ug/L	1	0.17	1		
VALUE CALCULATED FROM OTHER RESULTS								
HAA(5)	U	1.0	ug/L					
HAA (5) calculation uses a zero for any individual HAA result less than the California DLR for that HAA								
HAA(9)	U	1.0	ug/L					
INTERNAL STANDARD								
1,2,3-TRICHLOROPROPANE		100	% recovery		1			
SURROGATE								
2,3-DIBROMOPROPIONIC ACID		100	% recovery		1			
Run ID: R290070 / Work Group No.: WG226841								
Prep Date1: Analyzed 03-Jan-19 18:19								
Method: SM2320B - 1997, Titration							GroundH2O	
TARGET ANALYTES								
ALKALINITY: TOTAL AS CACO3		**230**	mg/L	1	5			
Run ID: R289855 / Work Group No.: WG226654								
Prep Date1: 21-DEC-18 Analyzed 21-Dec-18 08:41								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: CARBONATE	U	0.10	mg/L	1	0.1			
Run ID: R289859 / Work Group No.: WG226665								
Prep Date1: 21-DEC-18 Analyzed 21-Dec-18 10:57								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: BICARBONATE		**230**	mg/L	1	5			
Run ID: R289859 / Work Group No.: WG226665								
Prep Date1: 21-DEC-18 Analyzed 21-Dec-18 10:57								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: HYDROXIDE	U	0.10	mg/L	1	0.1			
Run ID: R289859 / Work Group No.: WG226665								
Prep Date1: 21-DEC-18 Analyzed 21-Dec-18 10:57								

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EAST BAY MUNICIPAL UTILITY DISTRICT
Laboratory Services Division
PO Box 24055, MS 59, Oakland, CA 94623
Phone (510)287-1432 Fax (510)465-5462

Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW7 S APN 411-0078-001 Via Buena Vista; formerly BAY-MW-SL PARK
ClientID: MW7
Lab ID: L226154-1 (P234828-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 19 2018, 12:21pm Sample collector: ZWu
Date Received: Dec 19 2018, 03:21pm Sample receiver: CSOOHOO
Sample Comments: MW-7; +FLD DATA: pH = 8.32 ; Cl2R = 0.3 mg/L; Depth to GW =8.81 feet; GW Elevation = N/A feet; Labelled as RAW WATER for the program.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method: SM2340C - 1997, Titration: EDTA							GroundH2O	
TARGET ANALYTES								
HARDNESS: TOTAL AS CACO3		**130**	mg/L	1	3			
Run ID: R289998 / Work Group No.: WG226788								
Prep Date1: 31-DEC-18 Analyzed 31-Dec-18 14:13								
Method: SM2540C - 1997, Dried at 180C							GroundH2O	
TARGET ANALYTES								
TOTAL DISSOLVED SOLIDS		**470**	mg/L	1	10			
Run ID: R290005 / Work Group No.: WG226650								
Prep Date1: 21-DEC-18 Analyzed 21-Dec-18 08:20								
Method: SM4500-NH3 B, C - 1997, Distillation & Titration							GroundH2O	
TARGET ANALYTES								
AMMONIA AS N	U	0.280	mg/L	1	0.28			
Run ID: R289973 / Work Group No.: WG226726								
Prep Date1: 27-DEC-18 Analyzed 27-Dec-18 12:05								
Method: EPA 200.7 - Rev. 4.4, ICP Scan							RawH2O	
TARGET ANALYTES								
CALCIUM		**36,100**	ug/L	1.04	22.4			
IRON		**164**	ug/L	1.04	5.2	100		
POTASSIUM		**2,460**	ug/L	1.04	19.9			
MAGNESIUM		**8,970**	ug/L	1.04	5.72			
MANGANESE		**236**	ug/L	1.04	0.0832	20		
SODIUM		**118,000**	ug/L	1.04	5.62			
Run ID: R290089 / Work Group No.: WG226889								
Prep Date1: 02-JAN-19 Prep Date2: 07-JAN-19 Analyzed 07-Jan-19 13:58								

RL is either the client requested or regulatory mandated Reporting Limit. ML is the regulatory mandated Minimum Level

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

November 29, 2018

Robbie C. Phillips
Alpha Analytical Laboratories, Inc.
208 Mason St.
Ukiah, CA 95482

RE: **18J2792**
Pace Workorder: *28545*

Dear Robbie Phillips:

Enclosed are the analytical results for sample(s) received by the laboratory on Wednesday, October 31, 2018. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ruth Welsh 11/29/2018
Ruth.Welsh@pacelabs.com

Customer Service Representative

Enclosures

As a valued client we would appreciate your comments on our service.
Please email PAESfeedback@pacelabs.com.

Total Number of Pages 9

CERTIFICATE OF ANALYSIS

RECEIVED 12/27/18

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water
Accreditor:	West Virginia Department of Environmental Protection, Division of Water and Waste Management
Accreditation ID:	395
Scope:	Non-Potable Water
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	State of Virginia
Accreditation ID:	460201
Scope:	Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

SAMPLE SUMMARY

Workorder: 28545 18J2792

Lab ID	Sample ID	Matrix	Date Collected	Date Received
285450001	18J2792-01	Water	10/24/2018 14:25	10/31/2018 10:30

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 28545 18J2792

Lab ID: **285450001** Date Received: 10/31/2018 10:30 Matrix: Water
Sample ID: **18J2792-01** Date Collected: 10/24/2018 14:25

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O		Analytical Method: D18O						
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	11/26/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	11/26/2018 00:00	NAU	

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS QUALIFIERS

Workorder: 28545 18J2792

DEFINITIONS/QUALIFIERS

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 28545 18J2792

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
285450001	18J2792-01			D18O	CSIA/1870

Pace Analytical

Client	Alpha Analytical Laboratories, Inc.	
	208 Mason St.	Pace Analytical Energy Services
	Ukiah, CA 95482	220 William Pitt Way
Project	18J2792	Pittsburgh
Project #	18J2792	Pennsylvania 15238
Report to	Robbie Phillips	United States
Tel:	707-468-0401	Tel: 412.826.5245
Email:	rphillips@alphalab.com	

REPORT OF ENVIRONMENTAL FORENSICS ISOTOPE ANALYSES

Date Received: 10/31/2018
Date Reported: 11/26/2018

Water samples submitted for ^{18}O and ^{2}H (‰ VSMOW) stable isotope analysis

Pace CSIA Lab ID	Client's Sample ID Description	$\delta^{2}H$ H_2O	$\delta^{18}O$ H_2O
285450001	18J2792-01	-53.24	-8.41

VSMOW: Vienna Standard Mean Ocean Water (hydrogen and oxygen isotope international standards)

Quality Control STDs	$\delta^{2}H$ H_2O	$\delta^{18}O$ H_2O
QC-1	-94.53	-13.67
QC-2	-94.43	-13.64
Mean	-94.48	-13.66
Analytical precision (1σ)	0.07	0.02

The δ18OH2O and δDH2O isotopes were subcontracted to Colorado Plateau Stable Laboratory (CPSIL).

SUBCONTRACT ORDER

28145

Alpha Analytical Laboratories, Inc.

18J2792

SENDING LABORATORY:	**RECEIVING LABORATORY:**
Alpha Analytical Laboratories, Inc.	Zymax / Pace Lab
208 Mason St.	220 William Pitt Way
Ukiah, CA 95482	Pittsburgh, PA 15238
Phone: (707)468-0401	Phone :(412) 826-5245
Fax: (707)468-5267	Fax: (412) 660-0256
Project Manager: Robbie C. Phillips	**Terms: Net 30**

Analysis	Due	Expires	Comments
18J2792-01 L225078-1 [Water] Sampled 10/24/18 14:25			
Oxygen 18 - Isotope / Hydrogen - 2	11/13/18 12:00	04/22/19 14:25	

Containers Supplied:

125ml Poly (A)

☐ *Report to State*

System Name: _____ **Employed by:** _____

User ID: _____ **Sampler:** _____

System Number: _____

+QC

+MDL

10°C

Released By	Date	Received By		Date	
	10-30-18		PARS	10.31.18	1030
Released By	Date	Received By		Date	

Cooler Receipt Form

Client Name: Alpha **Project:** 18J2792 **Lab Work Order:** 28545

A. **Shipping/Container Information** (circle appropriate response)

Courier: FedEx (UPS) USPS Client Other:_____ **Air bill Present:** (Yes) No

Tracking Number: 128942500161903986

Custody Seal on Cooler/Box Present: Yes (No) **Seals Intact:** Yes No

Cooler/Box Packing Material: Bubble Wrap Absorbent Foam (Other:)_____

Type of Ice: (Wet) Blue None **Ice Intact:** (Yes) Melted

Cooler Temperature: 1°C **Radiation Screened:** Yes (No) **Chain of Custody Present:** (Yes) No

Comments:_____

B. **Laboratory Assignment/Log-in** (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	✓			
Chain of Custody relinquished	✓			
Sampler Name & Signature on COC			✓	
Containers intact	✓			
Were samples in separate bags			✓	
Sample container labels match COC Sample name/date and time collected	✓			
Sufficient volume provided	✓			
PAES containers used			✓	
Are containers properly preserved for the requested testing? (as labeled)			✓	
If an unknown preservation state, were containers checked? Exception: VOA's coliform			✓	If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			✓	
Headspace present?			✓	

Comments:_____

Cooler contents examined/received by : LY **Date:** 10.31.18

Project Manager Review : ERJ **Date:** 11-1-18

18J2792

East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

Prelog or Login No.: L225078

Project Title: BAYSIDE GROUND WATER PROJECT
Account or Project: B455-0706-1

Client PM: DAVID BEHNKEN
Tel No.: 510-287-0327
Lab PM: KRISTI LORENSON

Sampled by: N. Klumpp
Rcvd: 24-OCT-18 15:35
Sample Date: 24-OCT-18

temp 3.2

Lab No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L225078-1	GRAB	14:25	GW BAYSIDE	BAY1-MW4	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1481488 PLSTS			14-NOV-18

ClientID: Bayside Well

Sample Comments: 1st set Every 25 acre-ft (~6 weeks) +FLD DATA: pH = 7.62; ODOR ND.; Labelled as RAW WATER for the program. T=19.8 degC, Cl2R=0.2mg/L
Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by	Robert Molla	Robert Molla Alvin C Ng	11 12 15:35	10/26/18 24-OCT-18
Received by	Rodney Santillan	Rodney Santillan	1112	10/26/18
Relinquished by	PH		1846	10-29-18
Received by	PH		2118	10-29-18
Relinquished by				
Received by				

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
VOAMA - Glass, amber, septa, Maleic A and Asc A, 40 m
PLSTS - Plastic, NM, 125 mL
A125N - Glass, amber, NM, septa top, NH4Cl, 125 mL

Reviewed by:_____ Date:_____

Approved by:_____ Date:_____

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
6398 Doughherty Road, Suite 3
Dublin CA 94568
(925)828-6226
PO# BRD-14208-CX Expires: 31-JUL-13

Please advise EBMUD laboratory if Due Date will be missed

Samples will be retained beyond the approval process only if requested by the client.

18J2792

Chain of Custody Attachment

(page 2 of 2

Submitted to: Pace CSIA
220 William Pitt Way
Pittsburgh, PA 15238
Attn: Dr. Wang Yi
(412)-826-5245

Through: Robbie Phillips
Alpha Analytical Laboratories
6398 Dougherty Road, Suite 3
Dublin, CA 94568
(925) 828-6226
Billing: Visa Card on File

Date samples submitted: October 26, 2018

Login#	Site/Locator	Sample Date / Time
L225078-1	GW BAYSIDE/ BAY1-MW4	24-OCT-18 14:25

Analyses : Hydrogen-2 and Oxygen-18 isotopes

Comments: Please comply with hold time (3 months).

TAT: Standard

Results to: Alpha and East Bay MUD (Kristi Lorenson)
EBMUD Laboratory
P.O. Box 24055 MS # 59
Oakland, California. 94623
Tel No: 510-287-1696
Fax No: 510-465-5462
kristi.lorenson@ebmud.com

+TRANSMITTAL Tracking

Sample ID(s): L2250 78

Lab Name	Analysis Name(s)	Printed
ALPHA	Oxygen-18	✓

Workgroup: WG226783

Reviewed by: JA Date: 12/31/18

Approved by: KM Date: 1/9/19