

FINAL
FOURTH QUARTER 2018 GROUNDWATER MONITORING
INFORMAL TECHNICAL INFORMATION REPORT
CG049 BASEWIDE GROUNDWATER MONITORING PROGRAM,
OPERABLE UNIT 5
MARCH AIR RESERVE BASE AND
FORMER MARCH AIR FORCE BASE, CALIFORNIA

Prepared for:



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May 16, 2019



**DEPARTMENT OF THE AIR FORCE
AIR FORCE CIVIL ENGINEER CENTER
INSTALLATION SUPPORT SECTION
MARCH AIR RESERVE BASE, CALIFORNIA**

16 May 2019

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SUBJECT: **Final Fourth Quarter 2018 Groundwater Monitoring Informal Technical Information Report, CG049 Basewide Groundwater Monitoring Program, Operable Unit 5, March Air Reserve Base and Former March Air Force Base, California.**

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2. Any comments received on this document will be addressed in the upcoming 2018-2019 CG049 Annual Monitoring Report.
2. If you have any questions or comments, please call me at (951) 655-5060.

A handwritten signature in black ink, appearing to read "E Lehto", is positioned above the typed name.

ERIC LEHTO
Remedial Project Manager
March ARB
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TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
LIST OF ACRONYMS AND ABBREVIATIONS.....		iv
EXECUTIVE SUMMARY		vi
1.0 INTRODUCTION		1-1
2.0 FIELD ACTIVITIES		2-1
2.1 POTENTIOMETRIC SURVEY		2-1
2.2 SAMPLE COLLECTION AND ANALYSIS.....		2-1
2.3 DATA QUALITY.....		2-3
3.0 MONITORING RESULTS		3-1
3.1 GROUNDWATER MONITORING RESULTS FOR THE UPPER ALLUVIAL UNIT		3-1
3.2 GROUNDWATER MONITORING RESULTS FOR THE LOWER ALLUVIAL UNIT		3-2
3.3 GROUNDWATER MONITORING RESULTS FOR THE BEDROCK UNIT		3-2
3.4 STORMWATER SAMPLING RESULTS		3-2
4.0 REFERENCES		4-1

The following tables, figures, and appendix are located after Section 4.0:

LIST OF TABLES

<u>Table</u>	<u>Title</u>
2-1	Summary of Potentiometric Data, Fourth Quarter 2018 Monitoring Period
2-2	Summary of Monitoring Wells Sampled, Fourth Quarter 2018 Monitoring Period
2-3	Summary of Water Quality Measurements, Fourth Quarter 2018 Monitoring Period
2-4	CG049 Groundwater Cleanup Goals
2-5	CG049 Maximum Concentrations Detected, Fourth Quarter 2018 Monitoring Period
2-6	VOC Concentrations Detected in the Upper Alluvial Unit, Fourth Quarter 2018 Monitoring Period
2-7	VOC Concentrations Detected in the Lower Alluvial Unit, Fourth Quarter 2018 Monitoring Period
2-8	VOC Concentrations Detected in the Bedrock Unit, Fourth Quarter 2018 Monitoring Period

LIST OF FIGURES

<u>Figures</u>	<u>Title</u>
2-1	Upper Alluvial Basewide Potentiometric Surface Map Fourth Quarter 2018
2-2	Lower Alluvial Basewide Potentiometric Surface Map Fourth Quarter 2018
2-3	Bedrock Basewide Potentiometric Surface Map Fourth Quarter 2018
2-4	Basewide Sampled Wells
2-5	Location of Water Supply Well Sampled in Fourth Quarter 2018

LIST OF APPENDICES

APPENDIX A MONITORING WELL SAMPLING LOGS

LIST OF ACRONYMS AND ABBREVIATIONS

$\mu\text{g/L}$	micrograms per liter
TM	trademark
°C	degrees Celsius
AECOM	AECOM Technical Services, Inc.
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
ARB	Air Reserve Base
AR	Administrative Record
Base	March Air Reserve Base and Former March Air Force Base
CDRL	Contract Deliverables Requirements List
CG049	consolidated groundwater Site 49
COC	chemical of concern
DCA	dichloroethane
DCE	dichloroethene
Dup	duplicate
Earth Tech	Earth Tech, Inc.
e.g.	for example (exempli gratia)
EGETS	Expanded Groundwater Extraction and Treatment System
EMWD	Eastern Municipal Water District
ft	feet or foot
HSU (or Unit)	Hydrostratigraphic Unit
ITIR	Informal Technical Information Report
MCL	maximum contaminant level
mg/L	milligrams per liter
mS/cm	milliseimens per centimeter
MS/MSD	matrix spike/matrix spike duplicate
mV	millivolt
No.	number
NTU	nephelometric turbidity unit
ORP	oxidization-reduction potential
OU	Operable Unit
OWS	oil/water separator

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

PCE	tetrachloroethene
PHG	public health goal
Temp.	temperature
TOC	top of casing
QA/QC	quality assurance/quality control
ROD	Record of Decision
SWRCB	State Water Resources Control Board
TCE	trichloroethene
Tetra Tech	Tetra Tech, Inc.
USEPA	United States Environmental Protection Agency
VOA	volatile organic analysis
VOC	volatile organic compound

EXECUTIVE SUMMARY

This Fourth Quarter 2018 Groundwater Monitoring Informal Technical Information Report (ITIR) for the semiannual groundwater monitoring event conducted at CG049 (Operable Unit 5), March Air Reserve Base and Former March Air Force Base (Base), California, was prepared for the Air Force Civil Engineer Center (AFCEC) to present field activities and results of ongoing Basewide groundwater monitoring programs for the Base. The groundwater sampling activities were performed during the Fourth Quarter 2018 by AECOM Technical Services, Inc. (AECOM). Additionally, a water supply well was sampled in October 2018 by the Eastern Municipal Water District. The Fourth Quarter 2018 potentiometric survey and summaries of groundwater contaminants detected during the Fourth Quarter 2018 reporting period are provided herein.

WORK PERFORMED

Field activities for the Fourth Quarter 2018 groundwater monitoring period included a potentiometric survey, collection of groundwater samples, and collection of a surface water sample from the stormwater drainage system. During the monitoring period, 16 monitoring wells and one stormwater outfall were sampled by AECOM, and one municipal water supply well (Perry1) was sampled by Eastern Municipal Water District.

1.0 INTRODUCTION

This Fourth Quarter 2018 Groundwater Monitoring Informal Technical Information Report (ITIR), CG049, Operable Unit (OU) 5 presents a brief description of semiannual groundwater sampling activities conducted during the Fourth Quarter 2018 at March Air Reserve Base (ARB) and Former March Air Force Base (AFB) (Base), California. The data were collected as part of the ongoing Basewide monitoring programs for the Air Force Civil Engineer Center (AFCEC). This report was prepared by AECOM Technical Services, Inc. (AECOM) for AFCEC in accordance with Task Order 0007, Contract FA8903-09-D-8547.

The Base covers approximately 2,700 acres within an unincorporated area situated at the north end of Perris Valley; the Base is bordered by the communities of Riverside, Moreno Valley, Perris, and Mead Valley. The Base is located approximately 60 miles east of Los Angeles and 90 miles north of San Diego. The western Base boundary is located along Interstate 215. Topography at the Base is generally flat with a slight southeast-trending slope.

The Fourth Quarter 2018 sampling event included samples collected from the consolidated groundwater Site 49 (CG049) in OU 5:

- Six monitoring wells at CG049-29, CG049-31, CG049-36, and off-Base (areas located along the eastern Base boundary [former OU 1]);
- Ten monitoring wells at CG049-08 and Site 33 (areas located on the northeastern side of the Flight Line [former OU 2]); and
- One municipal water supply well (Perry1) located off-Base.

The Fourth Quarter 2018 groundwater sampling event was conducted on 29 and 30 October 2018 by AECOM. The water supply well was sampled on 1 October 2018 by the Eastern Municipal Water District (EMWD). The stormwater sample was collected on 18 December 2018. The potentiometric survey and summaries of groundwater contaminants detected during Fourth Quarter 2018 are provided herein.

Analytical results for the extraction wells associated with the CG049-31 treatment system and the Expanded Groundwater Extraction and Treatment System (EGETS) were discussed in the *Final 2018 Annual Process Monitoring Report* (AECOM 2019a).

2.0 FIELD ACTIVITIES

Fourth Quarter 2018 field activities included a potentiometric survey and groundwater sampling to: 1) support groundwater monitoring objectives and 2) comply with the *OU 1 Record of Decision* (ROD) (Earth Tech 1996) requirements (until an OU 5 ROD is signed for CG049).

2.1 POTENTIOMETRIC SURVEY

The potentiometric survey for the Fourth Quarter 2018 monitoring event was conducted by AECOM largely between 25 October and 30 November 2018 (measurement of well 5M1MW02 was delayed until 24 January 2019). Water levels were measured in 349 wells. Groundwater levels were not measured in the following wells (planned for monitoring):

1. Wells 5MW34 and 6M2MW09 - The United States Geological Survey is performing a groundwater level survey and has data loggers installed in these two wells. Water level measurements at the well will resume after the USGS water level survey is complete.
2. Well 36DP04D -The groundwater level was not measured because there was a beehive in the well casing. The beehive was professionally relocated in April 2019.
3. Westbay Well OBMW06A-F - The well was vandalized and could not be measured. Repairs were made in April and May 2019, and the well is scheduled for measurement in Second Quarter 2019.
4. Private Well Terao - The well head is located on private property and has been dismantled, making groundwater measurements infeasible.

The data collected during the potentiometric survey are summarized in Table 2-1. Basewide potentiometric surface maps shown on Figures 2-1 through 2-3 represent the Upper Alluvial Hydrostratigraphic Unit (HSU or Unit), Lower Alluvial Unit, and Bedrock Unit, respectively.

2.2 SAMPLE COLLECTION AND ANALYSIS

Sixteen monitoring wells were sampled by AECOM (29 and 30 October 2018) and one water supply well by EMWD (1 October 2018). The rationale for sampling each well is listed in Table 2-2 and sampled well locations are shown on Figures 2-4 and 2-5. The 16 monitoring wells sampled in are those recommended for semiannual sampling in Table 5-1 of the *Final 2017-2018 CG049 Annual Groundwater Monitoring Report* (AECOM 2019b). On 18 December 2018, a water grab sample was

collected from the stormwater drainage system at the center inlet pipe to the main oil/water separator (OWS) (closed Site 9; see STORMWATER OWS on Figure 2-4).

Water quality measurements were collected during sample collection and are presented in Table 2-3; monitoring well sampling logs are included in Appendix A. Please note that many of the samples collected using HydraSleeve™ samplers exhibited high turbidity, with approximately 33 percent exceeding 10 nephelometric turbidity units (NTUs), 33 percent exceeding 100 NTUs, and 1 percent exceeding 1,000 NTUs. Although the the procedure for collecting no-purge samples does not require low turbidity (e.g., below 10 NTUs) for sampling; it should be noted that elevated turbidity may bias the analytical results high due to sorption of organic and inorganic compounds onto colloids. While the turbid samples are likely representative of the water-bearing formation, maximum contaminant levels (MCLs) are based on contaminant concentrations in tap water, which is very low in turbidity. The potential high bias cannot be quantified, but it should be noted that any introduced error would increase the protectiveness of human health and the environment.

The monitoring wells were sampled and analyzed according to the procedures presented in the following plans:

- *Final Basewide Generic Quality Program Plan* (AECOM 2013a);
- *Final CG049 Work Plan* (AECOM 2013b); and
- *Final CG049 Work Plan Addendum No.1* (AECOM 2014).

The sample collected by EMWD was analyzed only for trichloroethene (TCE). All groundwater samples collected by AECOM were analyzed for volatile organic compounds (VOCs) using United States Environmental Protection Agency (USEPA) Method 8260B. With the exceptions of Well 6M36MW11 and the stormwater sample, all samples were analyzed for a tailored VOC analyte list consisting of 17 compounds (see Table 2-2), reduced from 37 compounds; this reduction was requested by Tetra Tech (1999) and approved by the USEPA (2000). Well 6M36MW11 and the stormwater sample were analyzed for the non-reduced 37-compound VOC list. The 37 VOCs are listed on Worksheet 15 of the *Final CG049 Work Plan Addendum No.1* (AECOM 2014). Note that the worksheet also lists naphthalene, which is only included for sampling treated groundwater from the EGETS.

The proposed CG049 cleanup goals are listed in Table 2-4. Maximum contaminant concentrations detected in all three HSUs at levels equal to or greater than the cleanup goals are listed in Table 2-5. Analytical results of groundwater sampling conducted during the Fourth Quarter 2018 monitoring event are provided in Tables 2-6, 2-7, and 2-8 for the Upper Alluvial Unit, Lower Alluvial Unit, and Bedrock Unit, respectively.

2.3 DATA QUALITY

The Quality Assurance/Quality Control (QA/QC) program for the Fourth Quarter sampling event included the following:

- Field duplicate samples;
- Matrix spike/matrix spike duplicate samples;
- Trip blank samples; and
- Temperature blanks.

Based on the results from the QA/QC program, all of the data collected during the sampling event are acceptable. Further discussion of the QA/QC procedures and results will be presented in the forthcoming 2018-2019 CG049 Annual Groundwater Monitoring Report.

3.0 MONITORING RESULTS

Seventeen wells were sampled, including one municipal water supply well. Analytical results and detected concentrations are organized by the three HSUs (Upper Alluvial Unit, Lower Alluvial Unit, and Bedrock Unit) and are discussed below.

3.1 GROUNDWATER MONITORING RESULTS FOR THE UPPER ALLUVIAL UNIT

Eleven wells screened in the Upper Alluvial Unit were sampled during the monitoring period; these include Wells 6M8MW17, 6M8MW19, 6M8MW27, 6M8MW28, 434MW01, 29MW01, 31MW04, PANMW07, PANMW13, 6M36MW11 and OU1MW06. Analytical results for VOCs detected in the Upper Alluvial Unit during the Fourth Quarter 2018 sampling event are presented in Table 2-6 and are briefly summarized as follows:

- Benzene was detected above its cleanup goal (1 microgram per liter [$\mu\text{g/L}$]) in Well 6M36MW11, with a concentration of 23 $\mu\text{g/L}$.
- Chlorobenzene was detected above its cleanup goal (70 $\mu\text{g/L}$) in Well 6M36MW11, with a concentration of 1,600 $\mu\text{g/L}$.
- Cis-1,2-dichloroethene (DCE) was detected above its cleanup goal (6 $\mu\text{g/L}$) in Wells 6M8MW27 and 6M36MW11 with concentrations of 200 $\mu\text{g/L}$ and 150 $\mu\text{g/L}$, respectively.
- Tetrachloroethene (PCE) was detected above its cleanup goal (5 $\mu\text{g/L}$) only in Well OU1MW06 (7.3 $\mu\text{g/L}$) in the Eastern Base Boundary Area.
- TCE was detected above its cleanup goal (5 $\mu\text{g/L}$) in Wells 6M8MW27 and 434MW01 with concentrations of 35 $\mu\text{g/L}$ and 69 $\mu\text{g/L}$, respectively.
- Vinyl chloride was detected above its cleanup goal (0.5 $\mu\text{g/L}$) in four wells, with a maximum concentration of 33 $\mu\text{g/L}$ in Well 6M8MW27 (CG049-36).

Contaminant concentrations detected in the monitoring well samples (screened in the Upper Alluvial Unit) collected during the Fourth Quarter 2018 sampling event are largely consistent with recent and historical values (stable or declining). Note the Wells 6M36MW11 and 6M8MW19 are respectively located within the treatment areas associated with CG049-08 and CG49-36, and consequently exhibited lower chemical of concern (COC) concentrations in Fourth Quarter 2018 compared to those of Second Quarter 2017.

3.2 GROUNDWATER MONITORING RESULTS FOR THE LOWER ALLUVIAL UNIT

Four wells screened in the Lower Alluvial Unit were sampled during this monitoring period; these include Wells 453MW01, 453MW02, PANMW48A, and Water Supply Well Perry1. Analytical results for the VOCs detected during the Fourth Quarter 2018 sampling event are presented in Table 2-7 (except results for Perry1) and are briefly summarized as follows:

- Carbon tetrachloride was detected above its cleanup goal (0.5 µg/L) in two wells, with a maximum concentration of 12 µg/L in 453MW02 in CG049-08 (B453).
- 1,2-dichloroethane (DCA) was detected above its cleanup goal (0.5 µg/L) only in 453MW01 in CG049-08 (B453), with a concentration of 1.4 µg/L.
- TCE was detected above its cleanup goal (5 µg/L) in two wells, with a maximum concentration of 84 µg/L in 453MW01 in CG049-08 (B453). TCE was detected in PERRY1 at 0.36 µg/L.

Contaminant concentrations detected in monitoring wells (screened in the Lower Alluvial Unit) during the Fourth Quarter 2018 sampling event are consistent with historical trends (generally stable or declining).

3.3 GROUNDWATER MONITORING RESULTS FOR THE BEDROCK UNIT

Two wells screened in the Bedrock Unit were sampled during this monitoring period; these include Wells OU1MW15A and OU1MW25. Analytical results for the VOCs detected during the Fourth Quarter 2018 sampling event are presented in Table 2-8 and are briefly summarized as follows:

- TCE was detected above its cleanup goal (5 µg/L) Well OU1MW15A with a maximum concentration of 12 µg/L (northern portion of the eastern Base boundary).

Contaminant concentrations detected in monitoring wells (screened in the Bedrock Unit) during the Fourth Quarter 2018 sampling event are consistent with historical trends.

3.4 STORMWATER SAMPLING RESULTS

No VOCs were detected above reporting limits in the stormwater sample collected at sampling point STORMWATER OWS in December 2018.

4.0 REFERENCES

- AECOM Technical Services, Inc. 2019a. *Final 2018 Annual Process Monitoring Report, Operable Unit 1, March Air Reserve Base, California*. May. Administrative Record (AR) No. pending.
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LIST OF TABLES

- Table 2-1 Summary of Potentiometric Data, Fourth Quarter 2018 Monitoring Period
- Table 2-2 Summary of Monitoring Wells Sampled, Fourth Quarter 2018 Monitoring Period
- Table 2-3 Summary of Water Quality Measurements, Fourth Quarter 2018 Monitoring Period
- Table 2-4 CG049 Groundwater Cleanup Goals
- Table 2-5 CG049 Maximum Concentrations Detected, Fourth Quarter 2018 Monitoring Period
- Table 2-6 VOC Concentrations Detected in the Upper Alluvial Unit, Fourth Quarter 2018 Monitoring Period
- Table 2-7 VOC Concentrations Detected in the Lower Alluvial Unit, Fourth Quarter 2018 Monitoring Period
- Table 2-8 VOC Concentrations Detected in the Bedrock Unit, Fourth Quarter 2018 Monitoring Period

TABLE 2-1. SUMMARY OF POTENTIOMETRIC DATA
FOURTH QUARTER 2018 MONITORING PERIOD
MARCH ARB AND FORMER MARCH AFB, CALIFORNIA
(Page 1 of 9)

Well	TOC Elevation (ft msl)	Date Measured	Depth to Water (ft btoc)	Water Elevation (ft msl)
<u>CG049-01</u>				
5M1MW02	1,535.65	01/24/2019	12.13	1,523.52
<u>CG049-02</u>				
2EW01	1,535.55	11/12/2018	10.68	1,524.87
2EW02	1,534.14	11/12/2018	10.05	1,524.09
2MW07	1,526.13	11/12/2018	15.70	1,510.43
2MW08	1,526.32	11/12/2018	15.72	1,510.60
2MW09	1,521.61	11/06/2018	10.99	1,510.62
2PW01PRC	1,534.32	11/12/2018	10.38	1,523.94
2PW06PRC	1,533.78	11/12/2018	10.25	1,523.53
5M2MW02	1,534.97	11/12/2018	11.10	1,523.87
5M2MW05A	1,535.84	11/12/2018	11.81	1,524.03
5M2MW06	1,534.93	11/12/2018	11.45	1,523.48
6M2MW07	1,535.52	11/12/2018	12.09	1,523.43
6M2MW09	1,537.32	11/12/2018	NM	--
6M2MW10	1,537.52	11/12/2018	13.48	1,524.04
6M2MW12	1,536.10	11/12/2018	12.11	1,523.99
<u>Site 4</u>				
49MW06	1,506.47	11/14/2018	28.60	1,477.87
49MW08	1,482.92	11/19/2018	32.09	1,450.83
4MW04	1,532.88	11/16/2018	18.92	1,513.96
4MW05	1,514.21	11/14/2018	25.70	1,488.51
4MW06	1,514.29	11/14/2018	25.59	1,488.70
4MW07	1,504.66	11/08/2018	23.05	1,481.61
4MW08R	1,500.11	11/15/2018	28.36	1,471.75
4MW11	1,523.20	11/19/2018	11.48	1,511.72
4MW12	1,514.18	11/16/2018	8.03	1,506.15
4MW13	1,509.85	11/14/2018	27.85	1,482.00
4MW14	1,507.71	11/09/2018	12.96	1,494.75
4MW15	1,501.17	11/07/2018	24.67	1,476.50
4MW16	1,505.68	11/15/2018	33.96	1,471.72
4MW18	1,505.93	11/14/2018	27.60	1,478.33
4MW19	1,513.29	11/14/2018	29.81	1,483.48
4MW20	1,515.94	11/14/2018	8.82	1,507.12
4MW21	1,516.20	11/15/2018	8.86	1,507.34
4MW22	1,507.93	11/09/2018	12.73	1,495.20
4MW23	1,521.03	11/14/2018	12.15	1,508.88
4MW25A	1,509.43	11/15/2018	17.90	1,491.53
4MW26A	1,510.43	11/15/2018	12.88	1,497.55
4MW27A	1,511.31	11/14/2018	8.50	1,502.81
4MW28A	1,508.11	11/15/2018	22.03	1,486.08
4MW29	1,519.24	11/14/2018	22.13	1,497.11
4MW30	1,519.18	11/14/2018	22.28	1,496.90
4MW31	1,518.58	11/19/2018	7.56	1,511.02
4PZ01	1,524.97	11/14/2018	16.91	1,508.06
4PZ02	1,525.28	11/14/2018	17.20	1,508.08
4PZ03	1,522.06	11/14/2018	16.76	1,505.30
4PZ04	1,520.68	11/14/2018	22.20	1,498.48

TABLE 2-1. SUMMARY OF POTENTIOMETRIC DATA
FOURTH QUARTER 2018 MONITORING PERIOD
MARCH ARB AND FORMER MARCH AFB, CALIFORNIA
(Page 2 of 9)

Well	TOC Elevation (ft msl)	Date Measured	Depth to Water (ft btoc)	Water Elevation (ft msl)
<u>Site 4 (continued)</u>				
4PZ05	1,520.02	11/14/2018	23.82	1,496.20
4PZ06	1,518.33	11/14/2018	29.12	1,489.21
4PZ07	1,511.03	11/15/2018	6.12	1,504.91
4PZ08	1,511.07	11/15/2018	7.44	1,503.63
4PZ09	1,520.39	11/14/2018	16.94	1,503.45
4PZ10	1,520.39	11/14/2018	21.81	1,498.58
4PZ11	1,518.57	11/14/2018	27.55	1,491.02
4PZ12	1,518.70	11/14/2018	30.88	1,487.82
4PZ13	1,509.69	11/15/2018	16.19	1,493.50
6M4MW24	1,529.17	11/14/2018	16.77	1,512.40
<u>CG049-05</u>				
5MW01	1,494.87	10/30/2018	21.78	1,473.09
5MW02	1,492.50	11/27/2018	23.30	1,469.20
5MW03	1,491.42	11/27/2018	26.83	1,464.59
5MW04	1,490.00	11/27/2018	29.02	1,460.98
5MW05	1,496.37	11/01/2018	18.73	1,477.64
5MW06	1,495.32	10/30/2018	20.90	1,474.42
5MW07	1,483.71	11/20/2018	25.66	1,458.05
5MW08	1,481.92	11/20/2018	36.53	1,445.39
5MW09	1,484.66	11/21/2018	39.19	1,445.47
5MW10	1,489.50	11/27/2018	25.47	1,464.03
5MW14	1,485.81	11/28/2018	27.46	1,458.35
5MW18R	1,500.15	11/15/2018	28.42	1,471.73
5MW20	1,482.18	11/19/2018	29.34	1,452.84
5MW22	1,484.23	11/19/2018	36.04	1,448.19
5MW23	1,474.43	11/20/2018	41.62	1,432.81
5MW28	1,495.58	10/30/2018	20.97	1,474.61
5MW29	1,494.45	10/30/2018	21.14	1,473.31
5MW30	1,494.43	10/30/2018	21.50	1,472.93
5MW31R	1,500.17	11/15/2018	28.26	1,471.91
5MW32	1,473.41	11/20/2018	39.20	1,434.21
5MW33	1,466.90	11/19/2018	52.83	1,414.07
5MW34	1,465.99	11/19/2018	NM	--
5MW35	1,477.94	11/20/2018	47.77	1,430.17
5MW36	1,477.78	11/20/2018	47.21	1,430.57
<u>CG049-07</u>				
49MW03	1,475.36	11/06/2018	44.80	1,430.56
7MW01	1,491.31	11/30/2018	18.13	1,473.18
7MW02	1,490.73	11/27/2018	26.51	1,464.22
7MW03	1,490.76	11/27/2018	24.58	1,466.18
7MW04	1,490.55	11/27/2018	23.94	1,466.61
OU1MW20	1,489.47	11/27/2018	23.03	1,466.44
OU1MW21	1,489.40	11/27/2018	22.90	1,466.50
OU1MW22	1,488.61	11/20/2018	24.20	1,464.41
OU1MW23	1,488.42	11/20/2018	25.40	1,463.02

**TABLE 2-1. SUMMARY OF POTENTIOMETRIC DATA
FOURTH QUARTER 2018 MONITORING PERIOD
MARCH ARB AND FORMER MARCH AFB, CALIFORNIA**
(Page 3 of 9)

Well	TOC Elevation (ft msl)	Date Measured	Depth to Water (ft btoc)	Water Elevation (ft msl)
<u>CG049-08</u>				
2307MW04	1,538.81	11/05/2018	12.92	1,525.89
2310MW01	1,539.81	10/30/2018	12.90	1,526.91
5M8MW01	1,543.20	10/30/2018	15.50	1,527.70
5M8MW05	1,507.83	11/07/2018	8.53	1,499.30
6M36MW08	1,530.10	11/12/2018	8.13	1,521.97
6M8MW12	1,528.74	11/06/2018	6.00	1,522.74
6M8MW13	1,530.14	11/06/2018	7.57	1,522.57
6M8MW14	1,516.97	11/06/2018	9.47	1,507.50
6M8MW18	1,518.15	11/06/2018	10.38	1,507.77
<u>CG049-08 (B355/373)</u>				
28MW03	1,519.17	11/12/2018	11.64	1,507.53
5M8MW04	1,517.90	11/06/2018	10.20	1,507.70
6M8MW15	1,517.76	11/06/2018	10.00	1,507.76
6M8MW16	1,517.73	11/06/2018	10.05	1,507.68
6M8MW17	1,516.87	10/29/2018	9.85	1,507.02
6M8MW19	1,518.13	10/29/2018	10.74	1,507.39
6M8MW20	1,516.69	11/06/2018	9.70	1,506.99
6M8MW24	1,515.56	11/07/2018	9.26	1,506.30
6M8MW25	1,510.60	11/07/2018	6.65	1,503.95
6M8MW27	1,516.14	10/29/2018	9.28	1,506.86
6M8MW28	1,516.07	10/29/2018	8.90	1,507.17
RBEMW08	1,516.97	11/06/2018	9.81	1,507.16
<u>CG049-08 (B434)</u>				
434MW01	1,532.68	10/29/2018	10.06	1,522.62
49MW02	1,528.78	11/12/2018	8.54	1,520.24
<u>CG049-08 (B453)</u>				
453MW01	1,529.32	10/29/2018	15.92	1,513.40
453MW02	1,528.90	10/29/2018	16.22	1,512.68
<u>CG049-08 (B2300)</u>				
28MW01	1,550.47	10/30/2018	21.86	1,528.61
49MW07	1,538.62	11/06/2018	13.11	1,525.51
5M8MW02	1,539.06	10/30/2018	12.90	1,526.16
5M8MW07	1,537.84	11/05/2018	12.36	1,525.48
5M8MW09	1,540.89	10/30/2018	14.19	1,526.70
6M2300MW01	1,540.39	10/30/2018	13.71	1,526.68
6M8MW10	1,544.55	10/30/2018	15.99	1,528.56
6M8MW11	1,537.44	11/06/2018	12.61	1,524.83
<u>CG049-08 (B2307)</u>				
2307MW01	1,538.57	11/05/2018	12.79	1,525.78
2307MW02	1,538.46	11/05/2018	12.92	1,525.54
2307MW03	1,536.99	11/05/2018	12.95	1,524.04
2307MW05	1,538.97	11/05/2018	12.88	1,526.09
2307MW06	1,539.11	11/05/2018	13.05	1,526.06
49MW01	1,537.10	11/05/2018	12.34	1,524.76
5M8MW03	1,536.29	11/05/2018	11.74	1,524.55
5M8MW06	1,538.49	11/05/2018	12.49	1,526.00

**TABLE 2-1. SUMMARY OF POTENTIOMETRIC DATA
FOURTH QUARTER 2018 MONITORING PERIOD
MARCH ARB AND FORMER MARCH AFB, CALIFORNIA**

(Page 4 of 9)

Well	TOC Elevation (ft msl)	Date Measured	Depth to Water (ft btoc)	Water Elevation (ft msl)
<u>CG049-09</u>				
9MW01	1,496.24	11/16/2018	16.07	1,480.17
9MW02	1,497.21	11/01/2018	21.85	1,475.36
<u>CG049-11</u>				
5M11MW01	1,546.43	11/19/2018	17.30	1,529.13
<u>CG049-15</u>				
15MW01	1,492.37	10/30/2018	17.48	1,474.89
15MW02	1,492.88	11/30/2018	21.23	1,471.65
15MW03	1,494.82	10/30/2018	17.02	1,477.80
15MW04	1,493.37	11/30/2018	28.04	1,465.33
<u>Site 18</u>				
18MW02	1,497.42	11/15/2018	6.08	1,491.34
18MW04	1,500.52	11/15/2018	5.87	1,494.67
18MW08	1,503.60	11/15/2018	7.47	1,496.15
18MW09	1,500.40	11/15/2018	5.40	1,495.00
18MW13	1,497.76	11/15/2018	5.60	1,492.16
28MW07	1,496.48	11/09/2018	10.12	1,486.36
RBEMW04A	1,500.40	11/09/2018	8.98	1,491.42
RBEMW04B	1,500.24	11/09/2018	7.04	1,493.20
<u>CG049-27</u>				
5M27MW01	1,534.05	11/06/2018	10.36	1,523.69
5M27MW02	1,534.82	11/12/2018	11.33	1,523.49
5M27MW03	1,532.47	11/12/2018	9.23	1,523.24
6M27MW05A	1,534.88	11/12/2018	11.62	1,523.26
<u>CG049-29</u>				
29MW01	1,497.89	10/29/2018	15.84	1,482.05
29MW03	1,498.74	11/02/2018	23.17	1,475.57
29MW04	1,498.36	11/02/2018	22.60	1,475.76
29OW01	1,498.87	11/07/2018	23.20	1,475.67
29PW01	1,498.35	11/02/2018	23.06	1,475.29
<u>CG049-31A</u>				
31MW01	1,507.57	11/09/2018	12.77	1,494.80
31MW02	1,508.36	11/09/2018	10.15	1,498.21
31MW03	1,508.39	11/09/2018	13.37	1,495.02
31MW04	1,507.61	10/29/2018	12.70	1,494.91
31MW05	1,501.76	11/07/2018	21.40	1,480.36
31MW06	1,503.38	11/07/2018	11.99	1,491.39
31MW07	1,503.34	11/07/2018	12.37	1,490.97
31MW08	1,505.51	11/07/2018	8.02	1,497.49
31OW01	1,507.62	11/09/2018	13.18	1,494.44
31PW01	1,507.25	11/09/2018	12.83	1,494.42
31PW01PRC	1,505.60	11/09/2018	10.82	1,494.78
31PW03PRC	1,505.52	11/09/2018	11.27	1,494.25
31PW05PRC	1,505.03	11/09/2018	10.75	1,494.28
31PW07PRC	1,505.47	11/09/2018	11.00	1,494.47
31PW08PRC	1,505.69	11/09/2018	10.85	1,494.84

TABLE 2-1. SUMMARY OF POTENTIOMETRIC DATA
FOURTH QUARTER 2018 MONITORING PERIOD
MARCH ARB AND FORMER MARCH AFB, CALIFORNIA
(Page 5 of 9)

Well	TOC Elevation (ft msl)	Date Measured	Depth to Water (ft btoc)	Water Elevation (ft msl)
<u>CG049-31B</u>				
31BDEW05D	1,507.64	11/08/2018	17.54	1,490.10
31BGEW01	1,507.76	11/08/2018	15.24	1,492.52
31BMW02	1,507.73	11/08/2018	15.96	1,491.77
31BPZ01	1,507.62	11/08/2018	16.40	1,491.22
49MW05	1,506.36	11/08/2018	22.78	1,483.58
<u>Site 33</u>				
28MW04	1,522.71	11/09/2018	6.79	1,515.93
49MW04	1,512.60	11/08/2018	9.09	1,503.51
PANCP11	1,513.07	11/08/2018	8.90	1,504.17
PANCP13	1,510.08	11/08/2018	9.01	1,501.08
PANFP03	1,515.53	11/08/2018	8.69	1,506.84
PANFP07	1,520.01	10/30/2018	7.71	1,512.31
PANMW06	1,516.63	11/06/2018	9.95	1,506.68
PANMW07	1,514.22	10/29/2018	8.70	1,505.53
PANMW09	1,509.54	11/08/2018	8.01	1,501.54
PANMW10	1,508.18	11/08/2018	8.21	1,499.98
PANMW13	1,522.64	10/30/2018	10.93	1,511.72
PANMW14	1,516.82	11/06/2018	9.92	1,506.91
PANMW16	1,509.01	11/07/2018	10.11	1,498.91
PANMW17	1,522.57	10/30/2018	11.46	1,511.12
PANMW18	1,518.52	11/06/2018	10.65	1,507.87
PANMW19	1,518.64	11/06/2018	10.52	1,508.13
PANMW23	1,513.36	11/07/2018	8.45	1,504.91
PANMW24	1,517.67	11/06/2018	10.32	1,507.35
PANMW27	1,517.39	11/08/2018	9.88	1,507.51
PANMW28	1,514.83	11/08/2018	9.49	1,505.34
PANMW35	1,514.00	11/08/2018	9.28	1,504.72
PANMW37	1,517.41	11/08/2018	9.79	1,507.62
PANMW47	1,515.17	11/08/2018	9.75	1,505.42
PANMW48A	1,506.41	10/30/2018	9.66	1,496.76
PANOW02	1,512.39	11/08/2018	8.18	1,504.23
PANPZ02B	1,517.42	11/08/2018	8.43	1,508.99
<u>CG049-34</u>				
34MW01	1,498.80	11/07/2018	13.58	1,485.22
34MW02	1,499.46	11/07/2018	13.95	1,485.51
34MW04	1,503.96	11/07/2018	17.71	1,486.25
34MW05	1,504.44	11/07/2018	18.38	1,486.06
34MW06	1,497.17	11/07/2018	11.80	1,485.37
<u>CG049-36</u>				
36DP01D	1,525.42	11/12/2018	13.73	1,511.69
36DP03D	1,525.94	11/12/2018	14.02	1,511.92
36DP04D	1,526.32	11/12/2018	NM	--
36DP05D	1,526.58	11/12/2018	15.05	1,511.53
36DP06D	1,526.41	11/12/2018	14.37	1,512.04
36VEP01D	1,526.25	11/12/2018	14.24	1,512.01
36VEP02D	1,524.82	11/12/2018	13.14	1,511.68
36VEP03D	1,523.63	11/12/2018	11.80	1,511.83

**TABLE 2-1. SUMMARY OF POTENTIOMETRIC DATA
FOURTH QUARTER 2018 MONITORING PERIOD
MARCH ARB AND FORMER MARCH AFB, CALIFORNIA**

(Page 6 of 9)

Well	TOC Elevation (ft msl)	Date Measured	Depth to Water (ft btoc)	Water Elevation (ft msl)
<u>CG049-36 (continued)</u>				
36VEP04	1,524.68	11/12/2018	13.69	1,510.99
36VEP05	1,524.96	11/12/2018	13.06	1,511.90
36VEP06	1,524.81	11/12/2018	13.03	1,511.78
5M36MW02	1,524.24	11/12/2018	12.80	1,511.44
5M36MW03	1,525.87	11/12/2018	13.76	1,512.11
5M36MW04	1,524.46	11/12/2018	12.92	1,511.54
5M36MW05	1,526.77	11/12/2018	14.35	1,512.42
6M36MW01	1,524.35	11/12/2018	14.42	1,509.93
6M36MW06	1,526.68	11/12/2018	15.53	1,511.15
6M36MW07	1,526.40	11/12/2018	14.10	1,512.30
6M36MW09	1,524.97	11/14/2018	13.26	1,511.71
6M36MW10	1,525.02	11/12/2018	13.52	1,511.50
6M36MW11	1,526.42	10/29/2018	14.91	1,511.51
<u>EGETS</u>				
31AGEW01	1,508.08	11/09/2018	14.02	1,494.06
31BGEW02	1,506.56	10/25/2018	17.74	1,488.82
31BGEW03	1,506.02	10/25/2018	98.30	1,407.72
4EX01	1,513.22	10/25/2018	80.14	1,433.08
4EX02	1,512.75	10/25/2018	35.48	1,477.27
4MW01	1,511.19	11/14/2018	154.60	1,356.59
EX01	1,495.79	10/25/2018	29.35	1,466.44
EX02	1,494.34	10/25/2018	22.23	1,472.11
EX03	1,493.72	10/25/2018	23.62	1,470.10
EX04	1,491.71	10/25/2018	25.42	1,466.29
EX05A	1,492.79	10/26/2018	32.38	1,460.41
EX06	1,486.95	10/25/2018	31.36	1,455.59
OU1GEW01	1,497.38	10/25/2018	29.42	1,467.96
OU1GEW02	1,495.25	10/25/2018	28.26	1,466.99
OU1GEW03	1,492.77	10/25/2018	25.54	1,467.23
OU1GEW04	1,490.73	10/26/2018	29.34	1,461.39
OU1GEW05	1,488.23	10/25/2018	35.73	1,452.50
OU1MW12	1,486.89	10/26/2018	40.00	1,446.89
OU1MW16A	1,501.75	10/25/2018	76.92	1,424.83
OU1RW01	1,503.72	11/07/2018	25.26	1,478.46
OU1RW02	1,502.62	11/07/2018	24.41	1,478.21
OU1RW03	1,501.08	11/07/2018	22.87	1,478.21
OU1RW04	1,500.40	11/07/2018	22.67	1,477.73
OU1TW01	1,501.52	11/07/2018	21.97	1,479.55
OU1TW02	1,505.72	10/25/2018	24.71	1,481.01
OU1TW03	1,508.83	10/25/2018	45.37	1,463.46

TABLE 2-1. SUMMARY OF POTENTIOMETRIC DATA
FOURTH QUARTER 2018 MONITORING PERIOD
MARCH ARB AND FORMER MARCH AFB, CALIFORNIA
(Page 7 of 9)

Well	TOC Elevation (ft msl)	Date Measured	Depth to Water (ft btoc)	Water Elevation (ft msl)
<u>Eastern Base Boundary Area</u>				
49MW09	1,478.68	11/20/2018	42.15	1,436.53
EX07	1,491.91	11/27/2018	37.15	1,454.76
EX08	1,486.95	11/27/2018	36.41	1,450.54
OBMW01A	1,516.49	11/14/2018	33.87	1,482.62
OBMW01B	1,516.59	11/14/2018	33.27	1,483.32
OBMW02B	1,503.89	11/14/2018	26.23	1,477.66
OBMW03	1,503.79	11/15/2018	28.92	1,474.87
OBMW04A	1,489.50	11/15/2018	21.85	1,467.65
OBMW04B	1,489.55	11/15/2018	21.78	1,467.77
OBMW05A	1,475.76	11/20/2018	41.07	1,434.69
OBMW05B	1,475.77	11/20/2018	32.65	1,443.12
OBMW06A	1,459.81	11/06/2018	NM	--
OBMW06B	1,459.81	11/06/2018	NM	--
OBMW06C	1,459.81	11/06/2018	NM	--
OBMW06D	1,459.81	11/06/2018	NM	--
OBMW06E	1,459.81	11/06/2018	NM	--
OBMW06F	1,459.81	11/06/2018	NM	--
OBMW07A	1,481.61	11/21/2018	37.71	1,443.90
OBMW07B	1,481.56	11/21/2018	37.72	1,443.84
OBMW08A	1,477.73	11/05/2018	50.98	1,426.75
OBMW08B	1,477.73	11/05/2018	51.69	1,426.04
OBMW08C	1,477.73	11/05/2018	56.56	1,421.17
OBMW08D	1,477.73	11/05/2018	56.01	1,421.72
OBMW09B	1,482.08	11/19/2018	32.67	1,449.41
OBMW10AR	1,510.85	11/16/2018	26.18	1,484.67
OBMW10CR	1,510.83	11/16/2018	26.03	1,484.80
OBMW10DR	1,510.49	11/16/2018	24.64	1,485.85
OBMW10E	1,510.60	11/16/2018	24.72	1,485.88
OU1MW01	1,502.52	11/07/2018	23.03	1,479.49
OU1MW02	1,502.88	11/07/2018	23.21	1,479.67
OU1MW03	1,503.37	11/07/2018	24.29	1,479.08
OU1MW04	1,512.97	11/08/2018	85.51	1,427.46
OU1MW05	1,512.53	11/08/2018	89.19	1,423.34
OU1MW06	1,512.16	10/29/2018	28.85	1,483.31
OU1MW07	1,498.86	11/02/2018	22.60	1,476.26
OU1MW08	1,496.77	11/01/2018	21.90	1,474.87
OU1MW09	1,490.31	11/20/2018	20.02	1,470.29
OU1MW10	1,488.52	11/20/2018	26.31	1,462.21
OU1MW11	1,488.35	11/27/2018	29.82	1,458.53
OU1MW13	1,477.44	11/21/2018	40.00	1,437.44
OU1MW14	1,486.42	11/30/2018	19.77	1,466.65
OU1MW15A	1,503.60	10/30/2018	22.74	1,480.86
OU1MW15B	1,503.57	10/30/2018	23.12	1,480.45
OU1MW15S	1,503.68	10/30/2018	23.06	1,480.62
OU1MW16B	1,501.76	11/08/2018	23.45	1,478.31
OU1MW16S	1,501.74	11/08/2018	25.46	1,476.28
OU1MW18	1,482.50	11/20/2018	25.27	1,457.23

TABLE 2-1. SUMMARY OF POTENTIOMETRIC DATA
FOURTH QUARTER 2018 MONITORING PERIOD
MARCH ARB AND FORMER MARCH AFB, CALIFORNIA
(Page 8 of 9)

Well	TOC Elevation (ft msl)	Date Measured	Depth to Water (ft btoc)	Water Elevation (ft msl)
<u>Eastern Base Boundary Area (continued)</u>				
OU1MW19	1,503.09	11/08/2018	16.90	1,486.19
OU1MW24A	1,478.17	11/19/2018	40.23	1,437.94
OU1MW24B	1,478.19	11/19/2018	32.92	1,445.27
OU1MW25	1,505.15	10/30/2018	29.88	1,475.27
OU1MW27	1,506.37	11/15/2018	31.98	1,474.39
OU1OW01	1,503.60	11/08/2018	23.94	1,479.66
OU1OW02	1,503.53	11/07/2018	26.66	1,476.87
OU1OW03	1,501.38	11/07/2018	25.67	1,475.71
OU1OW04	1,500.62	11/07/2018	25.02	1,475.60
OU1PZ05	1,506.74	11/08/2018	25.34	1,481.40
OU1PZ06	1,505.18	11/08/2018	22.66	1,482.52
OU1PZ07	1,506.47	11/08/2018	23.67	1,482.80
OU1PZ08	1,508.22	11/08/2018	22.90	1,485.32
OU1PZ09	1,509.28	11/08/2018	25.92	1,483.36
OU1PZ10	1,512.14	11/16/2018	28.97	1,483.17
RBEMW01A	1,464.34	11/06/2018	44.20	1,420.14
RBEMW01B	1,464.34	11/06/2018	49.61	1,414.73
RBEMW01C	1,464.34	11/06/2018	54.82	1,409.52
RBEMW01D	1,464.34	11/06/2018	56.83	1,407.51
RBEMW01E	1,464.34	11/06/2018	65.76	1,398.58
RBEMW02A	1,478.86	11/19/2018	43.50	1,435.36
RBEMW02B	1,478.96	11/19/2018	36.35	1,442.61
RBEMW03A	1,497.80	11/15/2018	34.79	1,463.01
RBEMW07A	1,475.30	11/06/2018	25.76	1,449.54
RBEMW07B	1,475.30	11/06/2018	24.41	1,450.89
RBEMW07C	1,475.30	11/06/2018	23.85	1,451.45
RBEMW07D	1,475.30	11/06/2018	24.88	1,450.42
RBEMW07E	1,475.30	11/06/2018	23.12	1,452.18
RBEMW11A	1,472.56	11/06/2018	41.68	1,430.88
RBEMW11B	1,472.56	11/06/2018	43.70	1,428.86
RBEMW11C	1,472.56	11/06/2018	50.77	1,421.79
RBEMW11D	1,472.56	11/06/2018	57.73	1,414.83
RBEMW11E	1,472.56	11/06/2018	58.05	1,414.51
RBEMW13A	1,467.67	11/06/2018	53.65	1,414.02
RBEMW13B	1,467.67	11/06/2018	54.90	1,412.77
RBEMW13C	1,467.67	11/06/2018	55.65	1,412.02
RBEMW13D	1,467.67	11/06/2018	62.96	1,404.71
RBEMW13E	1,467.67	11/06/2018	65.94	1,401.73
<u>RBE</u>				
RBEMW05A	1,521.27	11/05/2018	24.07	1,497.20
RBEMW05B	1,521.27	11/05/2018	24.63	1,496.64
RBEMW05C	1,521.27	11/05/2018	28.12	1,493.15
RBEMW05D	1,521.27	11/05/2018	29.54	1,491.73
RBEMW05E	1,521.27	11/05/2018	31.31	1,489.96

**TABLE 2-1. SUMMARY OF POTENTIOMETRIC DATA
FOURTH QUARTER 2018 MONITORING PERIOD
MARCH ARB AND FORMER MARCH AFB, CALIFORNIA**

(Page 9 of 9)

Well	TOC Elevation (ft msl)	Date Measured	Depth to Water (ft btoc)	Water Elevation (ft msl)
<u>RBE (continued)</u>				
RBEMW06A2A	1,551.76	11/05/2018	23.01	1,528.75
RBEMW06A2B	1,551.76	11/05/2018	23.03	1,528.73
RBEMW06A2C	1,551.76	11/05/2018	23.47	1,528.29
RBEMW06A2D	1,551.76	11/05/2018	25.49	1,526.27
RBEMW06A2E	1,551.76	11/05/2018	26.01	1,525.75
RBEMW09A	1,522.29	11/05/2018	7.22	1,515.07
RBEMW09B	1,522.29	11/05/2018	7.05	1,515.24
RBEMW09C	1,522.29	11/05/2018	3.99	1,518.30
RBEMW09D	1,522.29	11/05/2018	5.04	1,517.25
RBEMW09E	1,522.29	11/05/2018	5.07	1,517.22
RBEMW09F	1,522.29	11/05/2018	10.79	1,511.50
RBEMW10A	1,514.24	11/05/2018	11.10	1,503.14
RBEMW10B	1,514.24	11/05/2018	11.81	1,502.43
RBEMW10C	1,514.24	11/05/2018	12.33	1,501.91
RBEMW10D	1,514.24	11/05/2018	12.53	1,501.71
RBEMW10E	1,514.24	11/05/2018	14.25	1,499.99
RBEMW10F	1,514.24	11/05/2018	14.77	1,499.47

Notes:

AFB Air Force Base
ARB Air Reserve Base
btoc below top of casing
CG049 consolidated groundwater Site 49
EGETS Expanded Groundwater Extraction and Treatment System
ft feet
msl mean sea level
NM not measured
RBE Regional Basin Evaluation
TOC top of casing

**TABLE 2-2. SUMMARY OF MONITORING WELLS SAMPLED
FOURTH QUARTER 2018 MONITORING PERIOD
MARCH ARB AND FORMER MARCH AFB, CALIFORNIA**
(Page 1 of 1)

Well	Sampling Date	Sampling Method	Sampling Rationale	VOCs (1)	VOCs (17)	VOCs (37)
<u>CG049-08 (B355/373)</u>						
6M8MW17	10/29/2018	Hydrasleeve	Basewide Plume Monitoring		X	
6M8MW19	10/29/2018	Hydrasleeve	Basewide Plume Monitoring		X	
6M8MW27	10/29/2018	Hydrasleeve	Basewide Plume Monitoring		X	
6M8MW28	10/29/2018	Hydrasleeve	Basewide Plume Monitoring		X	
<u>CG049-08 (B434)</u>						
434MW01	10/29/2018	Hydrasleeve	Basewide Plume Monitoring		X	
<u>CG049-08 (B453)</u>						
453MW01	10/29/2018	Hydrasleeve	Basewide Plume Monitoring		X	
453MW02	10/29/2018	Hydrasleeve	Basewide Plume Monitoring		X	
<u>CG049-29</u>						
29MW01	10/29/2018	Hydrasleeve	Basewide Plume Monitoring		X	
<u>CG049-31A</u>						
31MW04	10/29/2018	Hydrasleeve	Basewide Plume Monitoring		X	
<u>Site 33</u>						
PANMW07	10/29/2018	Hydrasleeve	Basewide Plume Monitoring		X	
PANMW13	10/30/2018	Hydrasleeve	Basewide Plume Monitoring		X	
PANMW48A	10/30/2018	Hydrasleeve	Basewide Plume Monitoring		X	
<u>CG049-36</u>						
6M36MW11	10/29/2018	Hydrasleeve	Basewide Plume Monitoring			X
<u>Eastern Base Boundary Area</u>						
OU1MW06	10/29/2018	Hydrasleeve	Basewide Plume Monitoring		X	
OU1MW15A	10/30/2018	Hydrasleeve	Basewide Plume Monitoring		X	
OU1MW25	10/30/2018	Hydrasleeve	Basewide Plume Monitoring		X	
<u>Water Supply Well (Municipal)^(a)</u>						
PERRY1		NA	Water Supply Well	X		

Notes:

^(a) Municipal water supply wells are sampled by the Eastern Municipal Water District and the analytical data are provided to the Air Force.

-- not applicable
(1) 1-compound analysis
(17) 17-compound analysis
(37) 37-compound analysis
AFB Air Force Base
ARB Air Reserve Base
CG049 consolidated groundwater Site 49
VOC volatile organic compound

TABLE 2-3. SUMMARY OF WATER QUALITY MEASUREMENTS
FOURTH QUARTER 2018 MONITORING PERIOD
MARCH ARB AND FORMER MARCH AFB, CALIFORNIA
(Page 1 of 1)

Well	Measure Date	ORP (mV)	Temperature (°C)	SC (mS/cm)	pH	Turbidity (NTU)	DO (ppm)
<u>CG049-08 (B355/373)</u>							
6M8MW17	10/29/2018	-109	29.38	1.01	6.66	0.4	0.00
6M8MW19	10/29/2018	-119	28.59	1.45	6.86	182	0.00
6M8MW27	10/29/2018	46	30.00	1.22	6.67	58.3	0.00
6M8MW28	10/29/2018	51	30.30	1.02	6.85	19.4	4.96
<u>CG049-08 (B434)</u>							
434MW01	10/29/2018	166	27.17	0.527	7.00	0.0	6.61
<u>CG049-08 (B453)</u>							
453MW01	10/29/2018	56	21.64	0.911	6.47	107	7.00
453MW02	10/29/2018	166	27.17	0.527	7.00	0.0	6.61
<u>CG049-29</u>							
29MW01	10/29/2018	174	25.63	0.910	7.16	62.2	0.00
<u>CG049-31A</u>							
31MW04	10/29/2018	205	27.39	0.607	7.60	56.1	0.87
<u>Site 33</u>							
PANMW07	10/29/2018	105	29.87	0.996	6.87	> 1,000	1.23
PANMW13	10/30/2018	171	27.32	0.874	6.34	397	0.87
PANMW48A	10/30/2018	42	27.90	1.08	6.41	185	3.69
<u>CG049-36</u>							
6M36MW11	10/29/2018	115	25.55	6.83	10.23	43.1	0.11
<u>Eastern Base Boundary Area</u>							
OU1MW06	10/29/2018	151	27.50	1.26	7.86	234	3.22
OU1MW15A	10/30/2018 ^(a)	--	--	--	--	--	--
OU1MW25	10/30/2018	75	20.44	0.566	6.05	0.0	6.37

Notes:

^(a) Not enough sample volume to collect water quality parameter data, however, water sample was collected and analyzed.

--	not measured	mV	millivolts
>	greater than	NTU	nephelometric turbidity units
°C	degrees Celsius	ORP	oxidation-reduction potential
AFB	Air Force Base	pH	negative logarithm of the hydrogen ion concentration
ARB	Air Reserve Base		
CG049	consolidated groundwater Site 49	ppm	parts per million
DO	dissolved oxygen	SC	specific conductance
mS/cm	microSiemens per centimeter		

**TABLE 2-4. CG049 GROUNDWATER CLEANUP GOALS
MARCH ARB AND FORMER MARCH AFB, CALIFORNIA**

Analyte	Groundwater	
	Cleanup Goal ($\mu\text{g/L}$)	Source*
benzene	1	State MCL
carbon tetrachloride	0.5	State MCL
chlorobenzene	70	State MCL
chloroform	80	State and Federal MCL (for total trihalomethanes)
1,1-dichloroethane	5	State MCL
1,2-dichloroethane	0.5	State MCL
1,1-dichloroethene	6	State MCL
cis-1,2-dichloroethene	6	State MCL
trans-1,2-dichloroethene	10	State MCL
ethylbenzene	300	State MCL
methyl tert-butyl ether (MTBE)	13	State MCL
tetrachloroethene (PCE)	5	State and Federal MCL
toluene	150	State MCL
trichloroethene (TCE)	5	State and Federal MCL
vinyl chloride	0.5	State MCL
m- & p-xylene	1,750	State MCL (for both speciated and total xylenes)
o-xylene	1,750	State MCL (for both speciated and total xylenes)

Notes:

* The current CG049 cleanup goals are the State MCLs (SWRCB 2019) or Federal MCLs (USEPA 2018), whichever is the lower value.

$\mu\text{g/L}$	micrograms per liter
AFB	Air Force Base
ARB	Air Reserve Base
CG049	consolidated groundwater Site 49
MCL	maximum contaminant level
SWRCB	State Water Resources Control Board
USEPA	United States Environmental Protection Agency

**TABLE 2-5. CG049 MAXIMUM CONCENTRATIONS DETECTED
FOURTH QUARTER 2018 MONITORING PERIOD
MARCH ARB AND FORMER MARCH AFB, CALIFORNIA**

Zone/Site	No. of Wells Sampled	Total Number of Wells Sampled with Contaminant Concentrations	Maximum Concentration Detected (µg/L)																
			benzene	carbon tetrachloride	chlorobenzene	chloroform	1,1-dichloroethane	1,2-dichloroethane	1,1-dichloroethene	cis-1,2-dichloroethene	trans-1,2-dichloroethene	ethylbenzene	methyl tert-butyl ether (MTBE)	tetrachloroethene (PCE)	toluene	trichloroethene (TCE)	vinyl chloride	m- & p-xylene	o-xylene
		Goal ^(a)	1	0.5	70	80	5	0.5	6	6	10	300	13	5	150	5	0.5	1,750	1,750
CG049-08 (B355/373)	4	4	0.69	--	0.13	1.3	0.66	--	0.35	200	1.1	0.75	--	0.49	2.9	35	33	11	0.35
CG049-08 (B434)	1	1	--	0.14	--	5.5	--	--	--	--	--	--	--	2.5	--	69	--	--	--
CG049-08 (B453)	2	2	--	12	--	5.5	--	1.4	--	0.54	--	--	--	1.9	--	77	--	--	--
CG049-29	1	1	--	--	--	1	--	--	--	--	--	--	--	1.1	--	3.2	--	--	--
CG049-31A	1	1	--	--	--	--	--	--	0.14	--	--	--	--	--	--	0.51	--	--	--
Site 33	3	3	--	0.28	--	2.6	--	0.11	--	0.72	--	--	--	2.3	--	4.8	--	--	--
CG049-36	1	1	23	--	1,600	--	--	0.32	0.24	150	2.2	8.4	--	0.15	14	1.2	12	38	36
Eastern Base Boundary Area	3	3	--	--	--	0.42	--	--	0.23	0.49	--	--	--	7.3	--	12	--	--	--

Notes:

^(a) CG049 Groundwater Cleanup Goals (Table 2-4).

Exceeds goal

-- not detected
µg/L micrograms per liter
AFB Air Force Base
ARB Air Reserve Base

CG049 consolidated groundwater Site 49
NA not analyzed
No. number
NP none promulgated

**TABLE 2-6. VOC CONCENTRATIONS IN THE UPPER ALLUVIAL UNIT
FOURTH QUARTER 2018 MONITORING PERIOD
MARCH ARB AND FORMER MARCH AFB, CALIFORNIA**
(Page 1 of 2)

			Volatile Organics																
			benzene	carbon tetrachloride	chlorobenzene	chloroform	1,1-dichloroethane	1,2-dichloroethane	1,1-dichloroethene	cis-1,2-dichloroethene	trans-1,2-dichloroethene	ethylbenzene	methyl tert-butyl ether (MTBE)	tetrachloroethene (PCE)	toluene	trichloroethene (TCE)	vinyl chloride	m- & p-xylene	o-xylene
Well	HSU	Units Goal ^(a)	µg/L 1	µg/L 0.5	µg/L 70	µg/L 80	µg/L 5	µg/L 0.5	µg/L 6	µg/L 6	µg/L 10	µg/L 300	µg/L 13	µg/L 5	µg/L 150	µg/L 5	µg/L 0.5	µg/L 1,750	µg/L 1,750
<u>CG049-08 (B355/373)</u>																			
6M8MW17	AU	10/29/2018	<0.10	<0.10	<0.10	<0.10	0.13 J	<0.10	<0.10	1.2	0.12 J	<0.10	<2.0	<0.15	0.74 J	0.28 J	4.2	<0.21	<0.10
6M8MW19	AU	10/29/2018	0.69 J	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	2.2	0.28 J	0.75 J	<2.0	<0.15	2.9	0.59 J	2.6	11	0.35 J
6M8MW27	AU	10/29/2018	0.12 J	<0.10	0.13 J	<0.10	0.66 J	<0.10	0.35 J	200	1.1	<0.10	<2.0	0.22 J	<0.10	35	33	<0.21	<0.10
6M8MW28	AU	10/29/2018	<0.10	<0.10	<0.10	1.3	<0.10	<0.10	<0.10	0.41 J	<0.10	<0.10	<2.0	0.49 J	<0.10	1.3	<0.12	<0.21	<0.10
<u>CG049-08 (B434)</u>																			
434MW01	AU	10/29/2018	<0.10	0.14 J	<0.10	5.5	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<2.0	2.5	<0.10	69	<0.12	<0.21	<0.10
<u>CG049-29</u>																			
29MW01	AU	10/29/2018	<0.10	<0.10	<0.10	1.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<2.0	1.1	<0.10	3.2	<0.12	<0.21	<0.10
<u>CG049-31A</u>																			
31MW04	AU	10/29/2018	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.14 J	<0.10	<0.10	<0.10	<2.0	<0.15	<0.10	0.51 J	<0.12	<0.21	<0.10
<u>Site 33</u>																			
PANMW07	AU	10/29/2018	<0.10	<0.10	<0.10	0.82 J	<0.10	0.11 J	<0.10	0.36 J	<0.10	<0.10	<2.0	1.1	<0.10	3.8	<0.12	<0.21	<0.10
PANMW13	AU	10/30/2018	<0.10	0.28 J	<0.10	2.6	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<2.0	2.3	<0.10	4.8	<0.12	<0.21	<0.10
<u>CG049-36</u>																			
6M36MW11	AU	10/29/2018	23	<0.10	1,600	<0.10	<0.10	0.32 J	0.24 J	150	2.2	8.4	<2.0	0.15 J	14	1.2	12	38	36
<u>Eastern Base Boundary Area</u>																			
OU1MW06	AU	10/29/2018	<0.10	<0.10	<0.10	0.12 J	<0.10	<0.10	<0.10	0.49 J	<0.10	<0.10	<2.0	7.3	<0.10	0.82 J	<0.12	<0.21	<0.10

**TABLE 2-6. VOC CONCENTRATIONS IN THE UPPER ALLUVIAL UNIT
FOURTH QUARTER 2018 MONITORING PERIOD
MARCH ARB AND FORMER MARCH AFB, CALIFORNIA**
(Page 2 of 2)

Notes:

^(a) CG049 Groundwater Cleanup Goals (Table 2-4).

 Exceeds goal

<	less than	CG049	consolidated groundwater Site 49
µg/L	micrograms per liter	HSU	hydrostratigraphic unit
AFB	Air Force Base	MDL	method detection limit
ARB	Air Reserve Base	RL	reporting limit
AU	upper alluvial	VOC	volatile organic compound

Laboratory-Assigned Qualifier

J Estimated value. Analyte detected at a level less than the RL and greater than or equal to the MDL. The user should be aware that this data may be quantitatively uncertain due to limitations near the limits of detection.

**TABLE 2-7. VOC CONCENTRATIONS IN THE LOWER ALLUVIAL UNIT
FOURTH QUARTER 2018 MONITORING PERIOD
MARCH ARB AND FORMER MARCH AFB, CALIFORNIA**

(Page 1 of 1)

			Volatile Organics																
		Units	benzene	carbon tetrachloride	chlorobenzene	chloroform	1,1-dichloroethane	1,2-dichloroethane	1,1-dichloroethene	cis-1,2-dichloroethene	trans-1,2-dichloroethene	ethylbenzene	methyl tert-butyl ether (MTBE)	tetrachloroethene (PCE)	toluene	trichloroethene (TCE)	vinyl chloride	m- & p-xylene	o-xylene
Well	HSU	Goal ^(a)	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
CG049-08 (B453)																			
453MW01	AL	10/29/2018	<0.40	9.9	<0.50	5.5	<1.0	1.4	<1.0	0.54 J	<1.0	<1.0	<2.0	1.4	<1.0	77	<0.50	<1.0	<1.0
		10/29/2018 ^(b)	<0.40	10	<0.50	6.0	<1.0	1.4	<1.0	0.62 J	<1.0	<1.0	<2.0	1.5	<1.0	84	<0.50	<1.0	<1.0
453MW02	AL	10/29/2018	<0.40	12	<0.50	4.4	<1.0	0.48 J	<1.0	0.24 J	<1.0	<1.0	<2.0	1.9	<1.0	48	<0.50	<1.0	<1.0
Site 33																			
PANMW48A	AL	10/30/2018	<0.40	0.13 J	<0.50	1.9	<1.0	<0.10	<1.0	0.72 J	<1.0	<1.0	<2.0	0.98 J	<1.0	1.2	<0.50	<1.0	<1.0

Notes:

^(a) CG049 Groundwater Cleanup Goals (Table 2-4).

^(b) Field Duplicate

 Exceeds goal

< less than
µg/L micrograms per liter

AFB Air Force Base

AL lower alluvial

ARB Air Reserve Base

CG049 consolidated groundwater Site 49

HSU hydrostratigraphic unit

MDL method detection limit

RL reporting limit

VOC volatile organic compound

Laboratory-Assigned Qualifier

J Estimated value. Analyte detected at a level less than the RL and greater than or equal to the MDL. The user should be aware that this data may be quantitatively uncertain due to limitations near the limits of detection.

**TABLE 2-8. VOC CONCENTRATIONS IN THE BEDROCK UNIT
FOURTH QUARTER 2018 MONITORING PERIOD
MARCH ARB AND FORMER MARCH AFB, CALIFORNIA**

			Volatile Organics																
Well	HSU	Units	benzene	carbon tetrachloride	chlorobenzene	chloroform	1,1-dichloroethane	1,2-dichloroethane	1,1-dichloroethene	cis-1,2-dichloroethene	trans-1,2-dichloroethene	ethylbenzene	methyl tert-butyl ether (MTBE)	tetrachloroethene (PCE)	toluene	trichloroethene (TCE)	vinyl chloride	m- & p-xylene	o-xylene
		Goal ^(a)	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
			1	0.5	70	80	5	0.5	6	6	10	300	13	5	150	5	0.5	1,750	1,750
Eastern Base Boundary Area																			
OU1MW15A	BD	10/30/2018	<0.40	<0.50	<0.50	0.42 J	<1.0	<0.50	0.23 J	0.37 J	<1.0	<1.0	<2.0	0.86 J	<1.0	12	<0.50	<1.0	<1.0
		10/30/2018 ^(b)	<0.40	<0.50	<0.50	0.33 J	<1.0	<0.50	0.21 J	0.41 J	<1.0	<1.0	<2.0	0.73 J	<1.0	10	<0.50	<1.0	<1.0
OU1MW25	BD	10/30/2018	<0.40	<0.50	<0.50	0.23 J	<1.0	<0.50	<0.10	0.32 J	<1.0	<1.0	<2.0	1.0	<1.0	4.7	<0.50	<1.0	<1.0

Notes:

^(a) CG049 Groundwater Cleanup Goals (Table 2-4).

^(b) Field Duplicate

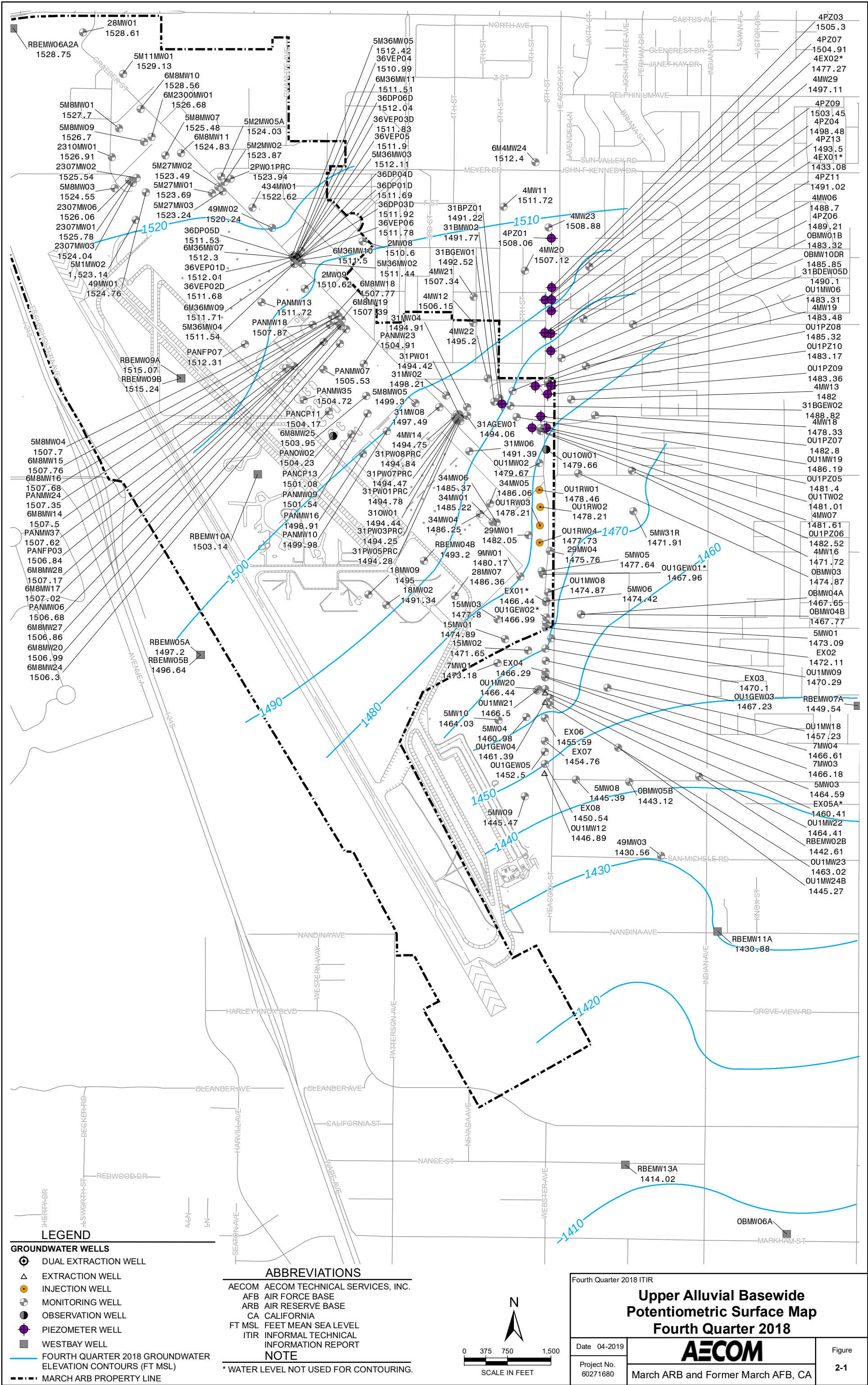
	Exceeds goal		
<	less than	CG049	consolidated groundwater Site 49
µg/L	micrograms per liter	HSU	hydrostratigraphic unit
AFB	Air Force Base	MDL	method detection limit
ARB	Air Reserve Base	RL	reporting limit
BD	bedrock	VOC	volatile organic compound

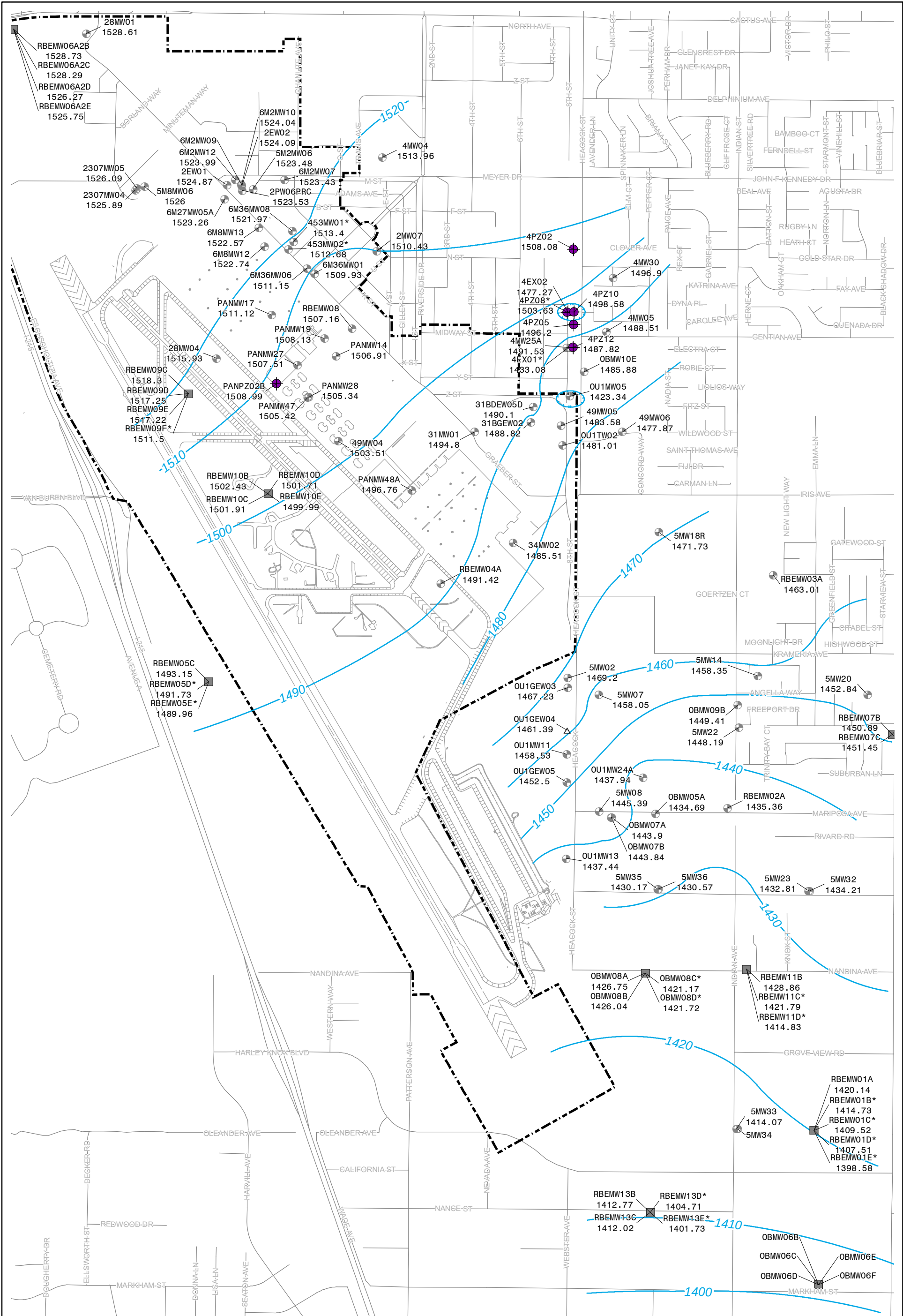
Laboratory-Assigned Qualifier

J Estimated value. Analyte detected at a level less than the RL and greater than or equal to the MDL. The user should be aware that this data may be quantitatively uncertain due to limitations near the limits of detection.

LIST OF FIGURES

- Figure 2-1 Upper Alluvial Basewide Potentiometric Surface Map Fourth Quarter 2018
- Figure 2-2 Lower Alluvial Basewide Potentiometric Surface Map Fourth Quarter 2018
- Figure 2-3 Bedrock Basewide Potentiometric Surface Map Fourth Quarter 2018
- Figure 2-4 Basewide Sampled Wells
- Figure 2-5 Location of Water Supply Well Sampled in Fourth Quarter 2018





LEGEND

△

EXTRACTION WELL

○

MONITORING WELL

■

PIEZOMETER WELL

◆

WESTBAY WELL

—

FOURTH QUARTER 2018 GROUNDWATER ELEVATION CONTOURS (FT MSL)

MARCH ARB PROPERTY LINE

ABBREVIATIONS

AECOM

AECOM TECHNICAL SERVICES, INC.

AFB

AIR FORCE BASE

ARB

AIR RESERVE BASE

CA

CALIFORNIA

FT MSL

FEET MEAN SEA LEVEL

ITIR

INFORMAL TECHNICAL INFORMATION REPORT

NOTE

* WATER LEVEL NOT USED FOR CONTOURING.

Fourth Quarter 2018 ITIR

Lower Alluvial Basewide Potentiometric Surface Map

Fourth Quarter 2018

Date

04-2019

Project No.

60271680

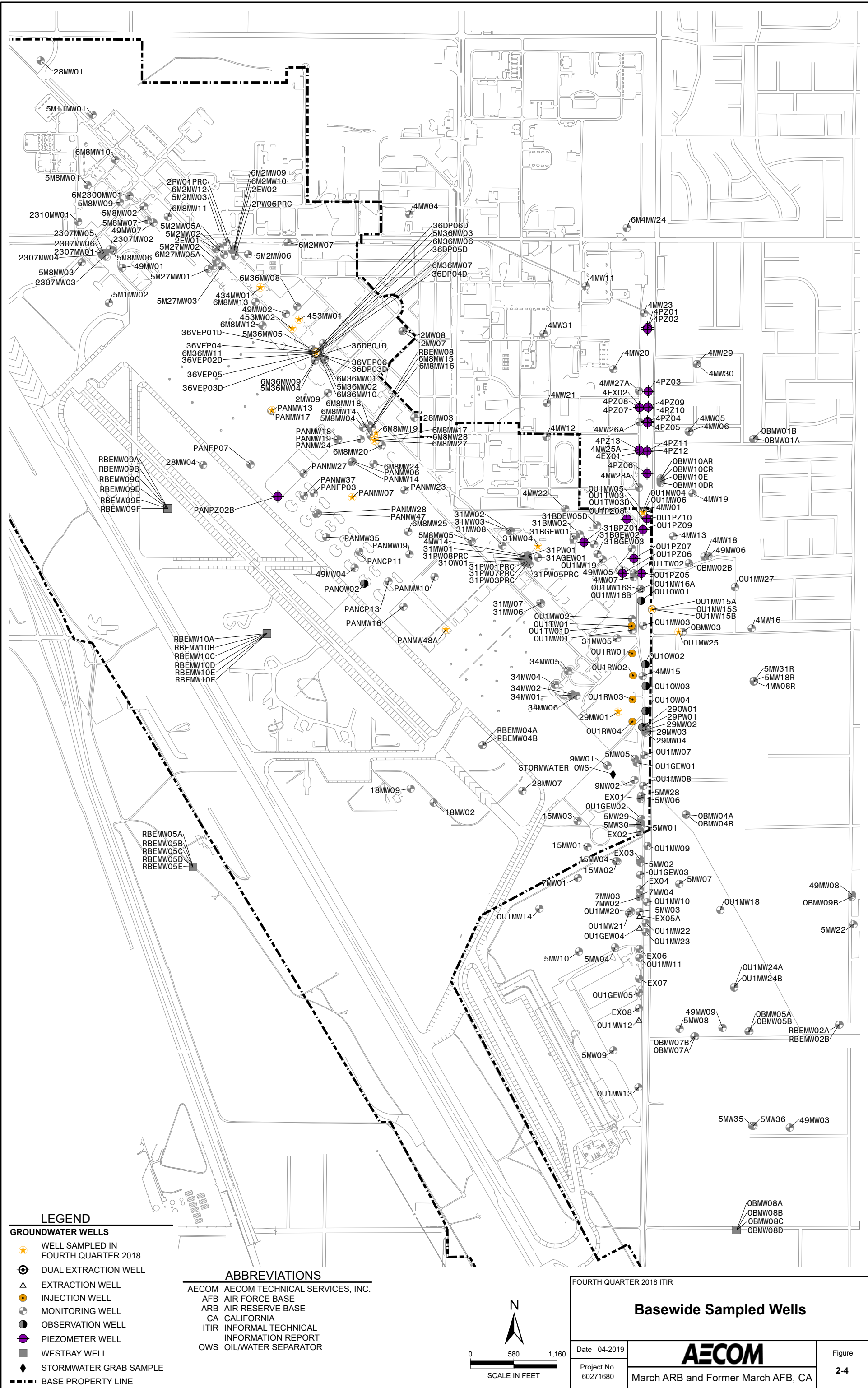
AECOM

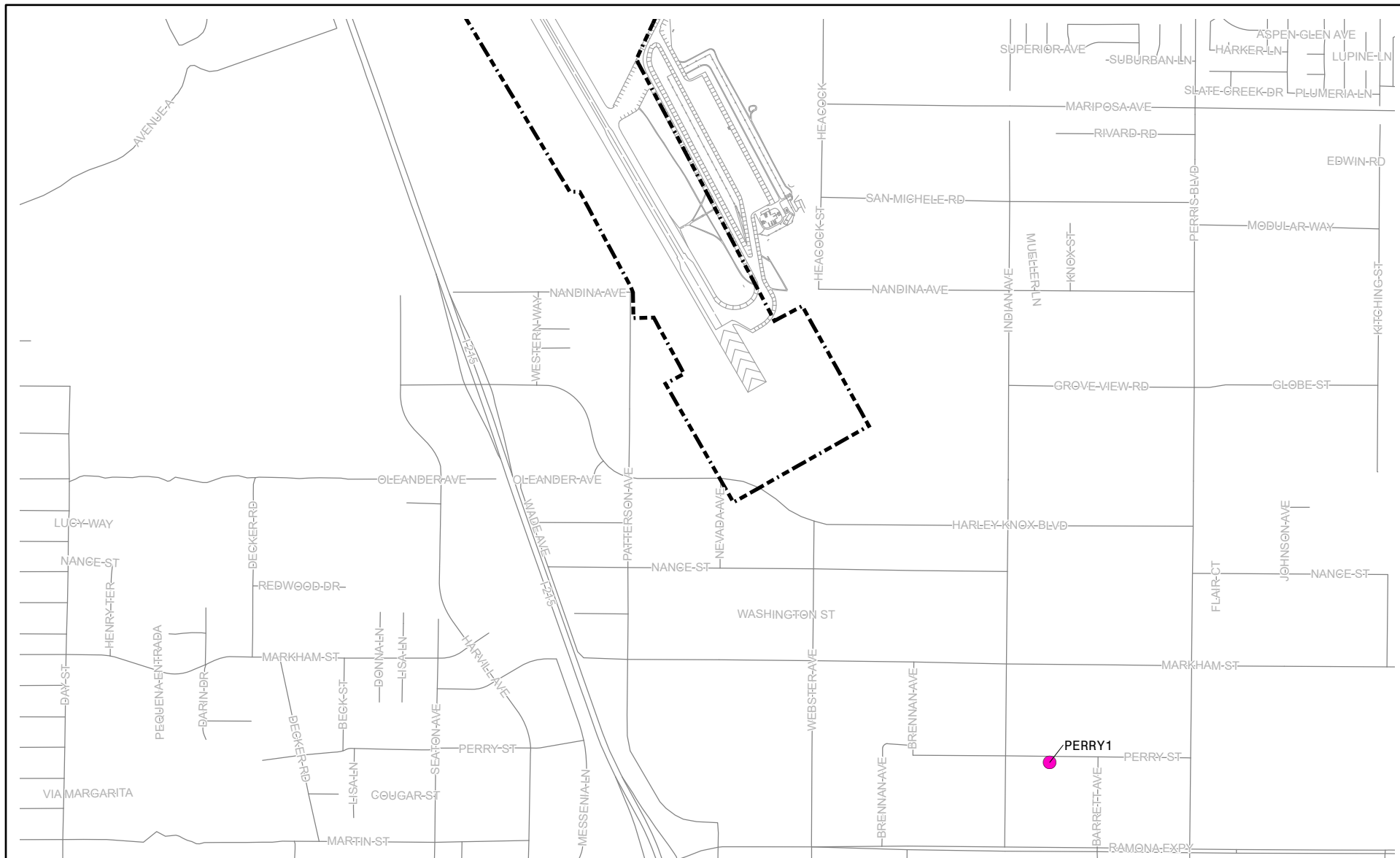
March ARB and Former March AFB, CA

Figure

2-2

File: Q:\DCS\Projects\ENV\ET\DATA\group\GIS\March_AFB\Project\Fourth_Quarter_2018_ITIR\Potentiometric_LA.mxd
Date: Wednesday, May 8, 2019 4:26:26 PM



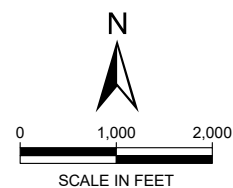


LEGEND

- WATER SUPPLY WELL
- - - MARCH ARB PROPERTY LINE

ABBREVIATIONS

AECOM AECOM TECHNICAL SERVICES, INC.
 AFB AIR FORCE BASE
 ARB AIR RESERVE BASE
 CA CALIFORNIA
 ITIR INFORMAL TECHNICAL INFORMATION REPORT



Fourth Quarter 2018 ITIR

Location for Water Supply Well Sampled in Fourth Quarter 2018

Date 05-2019

Project No.
60271680

AECOM

March ARB and Former March AFB, CA

Figure
2-5

APPENDIX A

MONITORING WELL SAMPLING LOGS



HydraSleeve Sample Log

B 29

Project Name: March ARB PBR - D.O. 0007 Groundwater SamplingProject/Task No.: 60271680-0009DL.CG049.H

Well Information

Well No.: 6M8MW17Location: March ARBSite: CG049-08 (B355/373)

Equipment Information

Interface Probe No.: Sounder No.: 252972Water Quality Meter No.: 21243

Deploy HydraSleeve

Date Deployed: 05/17/2018 Water Level Deployed 9.31 ft TOCHydraSleeve Size: HS-2 Sampling Depth: 37 ft TOC

Sample HydraSleeve

				Sample Container	
Sample Name(s)	Date	Time	Dup or MS/MSD	Type	No.
6M8MW17-2018Q4-WG	10-29-18	1130	--	40 mL VOA	3

Water Quality Information

Time	Water Level (ft TOC)	Water Temp. (°C)	pH	Cond. (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP (mV) +/-	Remarks (e.g. water clarity)
1135	9.85	29.38	6.66	1.01	0.00	0.4	-109	clear, Gray, floaters, toilet paper

Compare sample water level with deployment water level. Make note if significantly different.

Sampler Name: T. EnglishSampler Signature: [Signature]Date: 10-29-18Reviewer Name: Glenn HagstoftReviewer Signature: [Signature]Date: 11-13-18



HydraSleeve Sample Log

B 27

Project Name: March ARB PBR - D.O. 0007 Groundwater SamplingProject/Task No.: 60271680-0009DL.CG049.H

Well Information

Well No.: 6M8MW19Location: March ARBSite: CG049-08 (B355/373)

Equipment Information

Interface Probe No.: Sounder No.: 252712Water Quality Meter No.: 21243

Deploy HydraSleeve

Date Deployed: 05/18/2018 Water Level Deployed 10.61 ft TOCHydraSleeve Size: HS-2 Sampling Depth: 36 ft TOC

Sample HydraSleeve

				Sample Container	
Sample Name(s)	Date	Time	Dup or MS/MSD	Type	No.
6M8MW19-2018Q4-WG	10-29-18	1100	--	40 mL VOA	3

Water Quality Information

Time	Water Level (ft TOC)	Water Temp. (°C)	pH	Cond. (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP (mV) +/-	Remarks (e.g. water clarity)
1100	10.74	28.59	6.86	1.45	0.00	182	-119	cloudy, Gray sludges, Toilet water

Compare sample water level with deployment water level. Make note if significantly different.

Sampler Name: T. EnglishSampler Signature: [Signature] Date: 10-29-18Reviewer Name: Glenn WagstaffReviewer Signature: [Signature] Date: 11-13-18



HydraSleeve Sample Log

B 31

Project Name: March ARB PBR - D.O. 0007 Groundwater SamplingProject/Task No.: 60271680-0009DL.CG049.H

Well Information

Well No.: 6M8MW27Location: March ARBSite: CG049-08 (B355/373)

Equipment Information

Interface Probe No.: —Sounder No.: 252922Water Quality Meter No.: 21243

Deploy HydraSleeve

Date Deployed: 06/12/2018 Water Level Deployed 9.57 ft TOCHydraSleeve Size: HS-2 Sampling Depth: 36 ft TOC

Sample HydraSleeve

				Sample Container	
Sample Name(s)	Date	Time	Dup or MS/MSD	Type	No.
6M8MW27-2018Q4-WG	10-29-18	1:335	--	40 mL VOA	3

Water Quality Information

Time	Water Level (ft TOC)	Water Temp. (°C)	pH	Cond. (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP (mV) +/-	Remarks (e.g. water clarity)
10:340	9.28	8.0	6.67	1.22	0.00	58.3	46	cloudy, Gray, floaters

Compare sample water level with deployment water level. Make note if significantly different.

Sampler Name: T. EnglishSampler Signature: T. EnglishDate: 10-29-18Reviewer Name: Glen WiggstaffReviewer Signature: Glen WiggstaffDate: 11-13-18



HydraSleeve Sample Log

B 30

Project Name: March ARB PBR - D.O. 0007 Groundwater SamplingProject/Task No.: 60271680-0009DL.CG049.H

Well Information

Well No.: 6M8MW28Location: March ARBSite: CG049-08 (B355/373)

Equipment Information

Interface Probe No.: Sounder No.: 252972Water Quality Meter No.: 21243

Deploy HydraSleeve

Date Deployed: 05/17/2018 Water Level Deployed 8.65 ft TOCHydraSleeve Size: HS-2 Sampling Depth: 51 ft TOC

Sample HydraSleeve

				Sample Container	
Sample Name(s)	Date	Time	Dup or MS/MSD	Type	No.
6M8MW28-2018Q4-WG	10-29-18	1255	--	40 mL VOA	3

Water Quality Information

Time	Water Level (ft TOC)	Water Temp. (°C)	pH	Cond. (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP (mV) +/-	Remarks (e.g. water clarity)
1300	8.90	30.30	6.85	1.02	4.96	19.4	51	cloudy, Gray, floaters, odor

Compare sample water level with deployment water level. Make note if significantly different.

Sampler Name: T. EnglerSampler Signature: T. EnglerDate: 10-29-18Reviewer Name: Glenn WagstaffReviewer Signature: Glenn WagstaffDate: 11-13-18



HydraSleeve Sample Log

A 24

Project Name: March ARB PBR - D.O. 0007 Groundwater SamplingProject/Task No.: 60271680-0009DL.CG049.H

Well Information

Well No.: 434MW01Location: March ARBSite: CG049-08 (B434)

Equipment Information

Interface Probe No.: ~Sounder No.: 28380Water Quality Meter No.: 21383

Deploy HydraSleeve

Date Deployed: 06/12/2018 Water Level Deployed 10.30 ft TOCHydraSleeve Size: HS-2 Sampling Depth: 36 ft TOC

Sample HydraSleeve

				Sample Container	
Sample Name(s)	Date	Time	Dup or MS/MSD	Type	No.
434MW01-2018Q4-WG	10/29/18	1030	--	40 mL VOA	3

Water Quality Information

Time	Water Level (ft TOC)	Water Temp. (°C)	pH	Cond. (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP (mV) +/-	Remarks (e.g. water clarity)
1038	10.06	23.78	6.34	0.537	0.00	0.0	152	clear, colorless, no odor

Compare sample water level with deployment water level. Make note if significantly different.

Sampler Name: Anneesh NivandSampler Signature: [Signature]Date: 10/29/18Reviewer Name: Glenn LogstaffReviewer Signature: [Signature]Date: 11/13/18



HydraSleeve Sample Log

A 26

Project Name: March ARB PBR - D.O. 0007 Groundwater SamplingProject/Task No.: 60271680-0009DL.CG049.H

Well Information

Well No.: 453MW01Location: March ARBSite: CG049-08 (B453)

Equipment Information

Interface Probe No.: -Sounder No.: 34345 28380Water Quality Meter No.: 21383

Deploy HydraSleeve

Date Deployed: 06/05/2018 Water Level Deployed 15.77 ft TOCHydraSleeve Size: HS-2-1L Sampling Depth: 76 ft TOC

Sample HydraSleeve

				Sample Container	
Sample Name(s)	Date	Time	Dup or MS/MSD	Type	No.
453MW01-2018Q4-WG, MW1436-2018Q4-WG	10/29/18	0950	Duplicate	40 mL VOA	6

0700

Water Quality Information

Time	Water Level (ft TOC)	Water Temp. (°C)	pH	Cond. (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP (mV) +/-	Remarks (e.g. water clarity)
1000	15.92	21.64	6.47	0.911	7.00	107	86	cloudy, tan, no odor

Compare sample water level with deployment water level. Make note if significantly different.

Sampler Name: Aneesh NairSampler Signature: [Signature]Date: 10/29/18Reviewer Name: Glenn WaycraftReviewer Signature: [Signature]Date: 11/13/18



HydraSleeve Sample Log

A 25

Project Name: March ARB PBR - D.O. 0007 Groundwater SamplingProject/Task No.: 60271680-0009DL.CG049.H

Well Information

Well No.: 453MW02Location: March ARBSite: CG049-08 (B453)

Equipment Information

Interface Probe No.: —Sounder No.: 28380Water Quality Meter No.: 21383

Deploy HydraSleeve

Date Deployed: 06/05/2018 Water Level Deployed 16.11 ft TOCHydraSleeve Size: HS-2 Sampling Depth: 87 ft TOC

Sample HydraSleeve

				Sample Container	
Sample Name(s)	Date	Time	Dup or MS/MSD	Type	No.
453MW02-2018Q4-WG	10/29/18	1305	—	40 mL VOA	3

Water Quality Information

Time	Water Level (ft TOC)	Water Temp. (°C)	pH	Cond. (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP (mV) +/-	Remarks (e.g. water clarity)
1310	16.22	27.17	7.00	0.527	6.61	0.0	166	clear, colorless, no odor

Compare sample water level with deployment water level. Make note if significantly different.

Sampler Name: Aneesh NigamSampler Signature: [Signature]Date: 10/29/18Reviewer Name: Glenn WagstaffReviewer Signature: [Signature]Date: 11/13/18



HydraSleeve Sample Log

A 101

Project Name: March ARB PBR - D.O. 0007 Groundwater SamplingProject/Task No.: 60271680-0009DL.CG049.H**Well Information**Well No.: 29MW01Location: March ARBSite: CG049-29**Equipment Information**Interface Probe No.: -Sounder No.: 24380Water Quality Meter No.: 21383**Deploy HydraSleeve**Date Deployed: 06/07/2018 Water Level Deployed 17.67 ft TOCHydraSleeve Size: HS-2 Sampling Depth: 54 ft TOC**Sample HydraSleeve**

				Sample Container	
Sample Name(s)	Date	Time	Dup or MS/MSD	Type	No.
29MW01-2018Q4-WG	10/24/18	1450	--	40 mL VOA	3

Water Quality Information

Time	Water Level (ft TOC)	Water Temp. (°C)	pH	Cond. (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP (mV) +/-	Remarks (e.g. water clarity)
1455	15.84	25.63	7.66	0.910	0.00	62.2	174	tan, cloudy, no odor

Compare sample water level with deployment water level. Make note if significantly different.

Sampler Name: Aakash MehtaSampler Signature: [Signature]Date: 10/24/18Reviewer Name: Glenn WegstReviewer Signature: [Signature]Date: 11/13/18



HydraSleeve Sample Log

A 64

Project Name: March ARB PBR - D.O. 0007 Groundwater SamplingProject/Task No.: 60271680-0009DL.CG049.H**Well Information**Well No.: 31MW04Location: March ARBSite: CG049-31A**Equipment Information**Interface Probe No.: -Sonder No.: 28380Water Quality Meter No.: 21383**Deploy HydraSleeve**Date Deployed: 06/08/2018 Water Level Deployed 12.51 ft TOCHydraSleeve Size: HS-2 Sampling Depth: 89 ft TOC**Sample HydraSleeve**

				Sample Container	
Sample Name(s)	Date	Time	Dup or MS/MSD	Type	No.
31MW04-2018Q4-WG	10/29/18	1340	--	40 mL VOA	3

Water Quality Information

Time	Water Level (ft TOC)	Water Temp. (°C)	pH	Cond. (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP (mV) +/-	Remarks (e.g. water clarity)
1345	12.70	26.39	7.66	0.607	0.87	56.1	205	tan; cloudy, no odor

Compare sample water level with deployment water level. Make note if significantly different.

Sampler Name: Aneesh NirandSampler Signature: [Signature]Date: 10/29/18Reviewer Name: Glenn HagstaffReviewer Signature: [Signature]Date: 11/13/18



HydraSleeve Sample Log

B 62

Project Name: March ARB PBR - D.O. 0007 Groundwater SamplingProject/Task No.: 60271680-0009DL.CG049.H

Well Information

Well No.: PANMW07Location: March ARBSite: Site 33

Equipment Information

Interface Probe No.: 30937Sounder No.: —Water Quality Meter No.: 21243

Deploy HydraSleeve

Date Deployed: 05/23/2018 Water Level Deployed 8.60 ft TOCHydraSleeve Size: HS-2 Sampling Depth: 56 ft TOC

Sample HydraSleeve

				Sample Container	
Sample Name(s)	Date	Time	Dup or MS/MSD	Type	No.
PANMW07-2018Q4-WG	10-29-18	1405	--	40 mL VOA	3

Water Quality Information

Time	Water Level (ft TOC)	Water Temp. (°C)	pH	Cond. (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP (mV) +/-	Remarks (e.g. water clarity)
1410	8.70	29.87	6.87	0.996	1.23	over limit 1000	105	cloudy Tan Brown, no odor

Compare sample water level with deployment water level. Make note if significantly different.

Sampler Name: T. English Sampler Signature: T. English Date: 10-29-18Reviewer Name: Glenn Waystaff Reviewer Signature: Glenn Waystaff Date: 11-13-18



HydraSleeve Sample Log

B 70

Project Name: March ARB PBR - D.O. 0007 Groundwater SamplingProject/Task No.: 60271680-0009DL.CG049.H

Well Information

Well No.: PANMW13Location: March ARBSite: Site 33

Equipment Information

Interface Probe No.: 30937Sounder No.: —Water Quality Meter No.: 21243

Deploy HydraSleeve

Date Deployed: 05/23/2018 Water Level Deployed: 10.93 ft TOCHydraSleeve Size: HS-2 Sampling Depth: 54 ft TOC

Sample HydraSleeve

				Sample Container	
Sample Name(s)	Date	Time	Dup or MS/MSD	Type	No.
PANMW13-2018Q4-WG	10-30-18	1325	--	40 mL VOA	3

Water Quality Information

Time	Water Level (ft TOC)	Water Temp. (°C)	pH	Cond. (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP (mV) +/-	Remarks (e.g. water clarity)
1330	10.93	27.32	10.34	0.894	0.87	397	121	Tan, Brown, cloudy, no odor

Compare sample water level with deployment water level. Make note if significantly different.

Sampler Name: T. BagleySampler Signature: [Signature]Date: 10-30-18Reviewer Name: Glenn LaystallReviewer Signature: [Signature]Date: 11-13-18

Project Name: March ARB PBR - D.O. 0007 Groundwater Sampling

Project/Task No.: 60271680-0009DL.CG049.H

Well Information

Well No.: PANMW48A

Location: March ARB

Site: Site 33

Equipment Information

Interface Probe No.: 30937

Sounder No.: —

Water Quality Meter No.: 21243

Deploy HydraSleeve

Date Deployed: 05/23/2018 Water Level Deployed 9.43 ft TOC

HydraSleeve Size: HS-2-1L Sampling Depth: 81 ft TOC

Sample HydraSleeve

				Sample Container	
Sample Name(s)	Date	Time	Dup or MS/MSD	Type	No.
PANMW48A-2018Q4-WG	<u>1030-18</u>	<u>1410</u>	<u>MS/MSD</u>	<u>40 mL VOA</u>	<u>9</u>

Water Quality Information

Time	Water Level (ft TOC)	Water Temp. (°C)	pH	Cond. (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP (mV) +/-	Remarks (e.g. water clarity)
<u>1415</u>	<u>9.66</u>	<u>22.90</u>	<u>6.41</u>	<u>1.08</u>	<u>3.69</u>	<u>185</u>	<u>42</u>	<u>Tan, Cloudy, Bio odor</u>

Compare sample water level with deployment water level. Make note if significantly different.

Sampler Name: T. English

Sampler Signature: [Signature]

Date: 10-30-18

Reviewer Name: Glenn Lagstaff

Reviewer Signature: [Signature]

Date: 11-13-18

Project Name: March ARB PBR - D.O. 0007 Groundwater Sampling

Project/Task No.: 60271680-0009DL.CG049.H

Well Information

Well No.: 6M36MW11

Location: March ARB

Site: CG049-36

Equipment Information

Interface Probe No.:

Sounder No.: 252972

Water Quality Meter No.: 21243

Deploy HydraSleeve

Date Deployed: 06/06/2018 Water Level Deployed 14.52 ft TOC

HydraSleeve Size: HS-2 Sampling Depth: 38 ft TOC

Sample HydraSleeve

				Sample Container	
Sample Name(s)	Date	Time	Dup or MS/MSD	Type	No.
6M36MW11-2018Q4-WG	10-29-18	1000	--	40 mL VOA	3

Water Quality Information

Time	Water Level (ft TOC)	Water Temp. (°C)	pH	Cond. (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP (mV) +/-	Remarks (e.g. water clarity)
1005	—	25.35	10.23	6.83	0.11	43.1	115	clear/cloudy, Tan, solvent/brine color

Compare sample water level with deployment water level. Make note if significantly different.

Sampler Name: T. English

Sampler Signature: [Signature]

Date: 10-29-18

Reviewer Name: Glenn Lagstaff

Reviewer Signature: [Signature]

Date: 11-13-18



HydraSleeve Sample Log

A 73

Project Name: March ARB PBR - D.O. 0007 Groundwater SamplingProject/Task No.: 60271680-0009DL.CG049.H

Well Information

Well No.: OU1MW06Location: March ARBSite: Eastern Base Boundary Area

Equipment Information

Interface Probe No.: -Sounder No.: 28380Water Quality Meter No.: 21383

Deploy HydraSleeve

Date Deployed: 06/11/2018 Water Level Deployed 28.25 ft TOCHydraSleeve Size: HS-2 Sampling Depth: 55 ft TOC

Sample HydraSleeve

				Sample Container	
Sample Name(s)	Date	Time	Dup or MS/MSD	Type	No.
OU1MW06-2018Q4-WG	10/29/18	1410	--	40 mL VOA	3

Water Quality Information

Time	Water Level (ft TOC)	Water Temp. (°C)	pH	Cond. (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP (mV) +/-	Remarks (e.g. water clarity)
1415	28.85	27.50	7.86	1.26	3.22	234	151	orange, cloudy, no odor

Compare sample water level with deployment water level. Make note if significantly different.

Sampler Name: Anand N. NairSampler Signature: [Signature]Date: 10/22/18Reviewer Name: Glenn WagstaffReviewer Signature: [Signature]Date: 11/13/18



HydraSleeve Sample Log

C 68

Project Name: March ARB PBR - D.O. 0007 Groundwater SamplingProject/Task No.: 60271680-0009DL.CG049.H

Well Information

Well No.: OU1MW15ALocation: March ARBSite: Eastern Base Boundary Area

Equipment Information

Interface Probe No.: —Sonder No.: 21380Water Quality Meter No.: 28383

Deploy HydraSleeve

Date Deployed: 06/25/2018 Water Level Deployed 22.41 ft TOCHydraSleeve Size: HS-2-1L Sampling Depth: 77 ft TOC

Sample HydraSleeve

				Sample Container	
Sample Name(s)	Date	Time	Dup or MS/MSD	Type	No.
OU1MW15A-2018Q4-WG, MW1437-2018Q4-WG	10/30/18	10:05	Duplicate	40 mL VOA	6

0800

Water Quality Information

Time	Water Level (ft TOC)	Water Temp. (°C)	pH	Cond. (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP (mV) +/-	Remarks (e.g. water clarity)
1022	22.74	—	—	—	—	—	—	cloudy, orange, no odor

Compare sample water level with deployment water level. Make note if significantly different.

*not enough water for accurate WQ measurement.

Sampler Name: Aneesh NairSampler Signature: [Signature]Date: 10/30/18Reviewer Name: Glen WagstaffReviewer Signature: [Signature]Date: 11/13/18



HydraSleeve Sample Log

C 67

Project Name: March ARB PBR - D.O. 0007 Groundwater SamplingProject/Task No.: 60271680-0009DL.CG049.H**Well Information**Well No.: OU1MW25Location: March ARBSite: Eastern Base Boundary Area**Equipment Information**Interface Probe No.: -Sounder No.: 29380Water Quality Meter No.: 21383**Deploy HydraSleeve**Date Deployed: 06/04/2018 Water Level Deployed 29.55 ft TOCHydraSleeve Size: HS-2 Sampling Depth: 120 ft TOC**Sample HydraSleeve**

				Sample Container	
Sample Name(s)	Date	Time	Dup or MS/MSD	Type	No.
OU1MW25-2018Q4-WG	10/30/18	0945	--	40 mL VOA	3

Water Quality Information

Time	Water Level (ft TOC)	Water Temp. (°C)	pH	Cond. (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP (mV) +/-	Remarks (e.g. water clarity)
0950	29.88	20.44	6.05	0.566	6.37	0.0	75	clear, colorless, no odor

Compare sample water level with deployment water level. Make note if significantly different.

Sampler Name: Ahlesh Nimal Sampler Signature: [Signature] Date: 10/30/18Reviewer Name: Glenn Wagstaff Reviewer Signature: [Signature] Date: 11/13/18